

**Adjustments in Agriculture
—a National Basebook**

Adjustments in Agriculture

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—a National Basebook

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Introduction

THIS "BASEBOOK" was developed to fill the need for a unified source book that assembles, coordinates, and interprets data on U.S. agriculture. Its objective is to collect the factual background, trends, and problems of our agricultural economy, and present them in a usable manner for people concerned with U.S. agriculture — for teachers, research workers, and extension workers in the land grant college system; for farm leaders and farm organizations; for political leaders; for agricultural businessmen; for government agencies; and for all others interested in the role of agriculture in the future development of this country.

The initial development of the basebook began with discussions in the National Committee on Agricultural Policy. This committee is sponsored by the Farm Foundation in cooperation with the state extension services and land grant colleges. Representatives of the Cooperative Extension Service, of the land grant colleges, and the U.S. Department of Agriculture have served on this committee since its organization in 1949.

The Center for Agricultural and Economic Adjustment at Iowa State University, started in 1957 and financed in part by a special Kellogg Foundation grant, decided to assist

the Farm Foundation and the National Committee on Agricultural Policy with the development of the basebook, and to publish it. A steering committee was selected to plan the publication and to select authors from the nation's leading authorities in the field. Committee members were:

Joseph A. Ackerman
Farm Foundation

George M. Beal
Iowa State University

Earl O. Heady
Iowa State University

William G. Stucky
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J. Carroll Bottum
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USDA

C. Brice Ratchford
University of Missouri

Mervin G. Smith
Ohio State University

The most up-to-date data available at the time of the writing were used by the authors. Projections were made on the basis of these data. The reader can use these projections as a point of departure and modify the interpretations as new data, especially the 1960 census, would justify.

As used in the book, "farming" includes the production of principal crops and livestock products coming from U.S. farms. It is recognized that many specialized crop areas may have adjustment problems differing from those areas producing our principal crops.

The main emphasis in the basebook is on farming and the rural community. Some of the adjustments described have far-reaching implications for firms and organizations supplying farmers with goods and services, and marketing farm products. The authors are not pleading a special case for farmers but rather are presenting basic information so that the farm and nonfarm public may gain greater insight as they consider future programs and policies for agriculture.

The authors identify gaps in information in certain areas in agriculture. These suggest the need for further research so that our understanding can be improved.

A final purpose of this book is to stimulate similar studies, discussions, and publications of agricultural adjustment problems on the state level, perhaps using this volume as a pattern for the subject matter to be covered, and to permit conclusions to be drawn from state-by-state data.

The authors agreed that Mervin G. Smith would be Subject Matter Coordinator and Editor and that Carlton F. Christian would be General Editor. Each chapter develops a phase of agricultural adjustment but is coordinated and edited with other chapters to make a unified book. This unified approach was designed, however, to allow treatment of different aspects of the *same* element of agriculture. For example, James Bonnen evaluates people in farming as a production input. Calvin Beale and Karl Shoemaker examine farm people and their movements in the light of a national concern with human resources.

Editors



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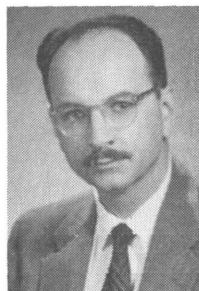
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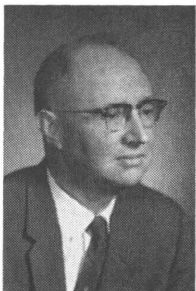
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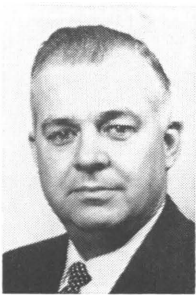
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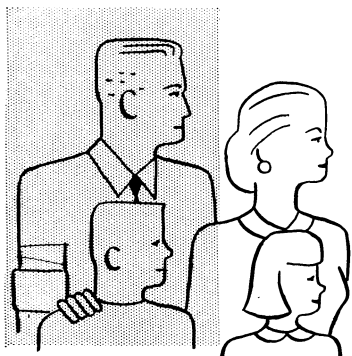
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CHAPTER 1

A Summary

Future Trends and Needed Adjustments in U.S. Agriculture

MERVIN G. SMITH
Ohio State University

CHANGES ARE TAKING PLACE faster in contemporary U.S. agriculture than at any other time in the history of the world. The need was never greater for people to be acquainted with the true situation in all phases of agriculture and in rural society and the likely trends in the next decade. This understanding is essential for our agricultural colleges, agricultural extension services, agricultural experiment stations, U.S. Department of Agriculture, farm organizations, rural communities, and the public. The rapid changes in agriculture call for changes and reorganization of the institutions associated with agriculture.

The greatest problem facing agriculture is the management of changes which accompany rapid adoption of new technology. Colleges, research and extension institutions, and farm organizations need to orient their activities more toward solving this problem. This is important for continued economic progress in the United States and it can be significant in foreign economic development and, therefore, in world affairs.

The agricultural adjustment problem in this country is related to the total economic revolutionary movement that is taking place in the world. Until a few years ago the industrial revolution centered around the Atlantic basin. The modern version is world-wide in scope and it is marked by *the rapidity with which underdeveloped nations want progress*. Rapid progress or adoption of new technology must be accompanied by rapid economic and social adjustment. Man has made great progress in scientific and technological discoveries. He has not done nearly so well in solving the problems of economic and social adjustment.

The most challenging problems today are how to facilitate economic and social change in a democracy. In the present world, if economic and social changes take place too slowly or not at all, or if they are misdirected, then the rate of adoption of new technology will be retarded, progress will be slow, social upheaval can occur, and the masses of people may not share in the benefits of progress.

Whether or not the agricultural research and educational institutions can take the leadership to solve the problems of agricultural adjustment in the United States is tremendously significant. The United States is looked upon as the leader in agricultural technology; but we will not continue to be a world leader unless we can keep U.S. agriculture in step with the rest of our economy. This could be the key to the development of rapid progress and peace in the entire world.

FARMING AND ECONOMIC PROGRESS

Rising incomes of farmers depend considerably on the continued growth of the total economy. When the national economy expands, the adjustments in farming to meet changes can be made much easier. The adjustments will enable farmers as well as the rest of society to share in the benefits of adopting new farm technology and the increased farm productivity. Farmers, therefore, have a profound interest in total economic growth in the economy.

Most of us think that our form of government and our policies in the United States have been the most conducive to growth. We are constantly searching for ways to preserve those principles which have been and will continue to be essential in promoting growth. We also are attempting to change and adapt government policies which will promote economic growth in our present and future economy.

Farming, on the other hand, has and can continue to contribute greatly to total economic growth. The two important contributions are (1) the release of labor for off-farm work as we get increased productivity per person on the farm, and (2) the lower cost of food resulting from greatly improved efficiency in farming. In the early history of our country 90 percent of the people were working on farms while now only 8 or 9 percent are farming. On the average, consumers are currently spending only slightly more than 20 percent of their incomes for high-quality convenience foods.

The improvement and continual recombining of the human, natural, and man-made resources are essential to economic growth. As growth takes place, agriculture and other segments of the economy become interwoven into a complicated pattern. The productive resources must move from one segment of the economy to another for greatest progress.

The production of all goods and services in the United States has increased about 3 percent per year for the last 80 years. In more recent years this has been 4 or more percent per year. The production per man-hour for the country in the last 10 years increased about 3 percent per year, while in farming it increased about 6 percent per year. However, the value of the production for one hour of work in farming in 1958 was only \$1.64 as compared with \$3.38 in nonfarm work. The rate of growth of the entire economy during the 1960's is expected to be as high or slightly higher than in the 1950's.

THE FARM PROBLEM

The farm problem in the United States is a growth problem. It arises from the rapid technological changes and growth in productivity in farming. The farming sector of the economy has not been able to digest rapidly all of the changes so that farmers could share proportionally in improved incomes. In other words, the whole structure of farming has lagged in adjustment.

Even though farm production increased 25 percent during the fifties and the number of farm workers declined 26 percent, incomes of farm people (in terms of what they can buy) declined 2 percent per person. In 1959 income per farm person, from all sources, was only 43 percent as much as income per nonfarm person.

When new technology is adopted rapidly, farm production is increased rapidly. Excess production results. The nature of demand for farm products is such that the small excess in the market greatly depresses farm prices and, therefore, farmers' incomes are depressed drastically. If farmers as a group could keep their production per farmer down to nearly a constant level, or if enough farmers went out of business to keep total production about the same, farm prices would not be depressed and farm incomes would increase as costs were reduced or efficiency improved. This restriction of production has not been done.

Therefore, it is to the advantage of the individual farmer to push his own production as high as possible. His only way to increase his income is to increase the number of units sold and to reduce his costs per unit.

Many farmers stay in farming even in the cost-price squeeze mainly because they have high fixed costs. Over a period of time, however, the situation can deteriorate so far that some farmers are forced out of farming. This helps to correct the situation, but it is too slow and brings serious chronic hardships in the whole farming sector of the economy.

A rise in prices pulls labor, capital, and land resources into farming more quickly than they are reduced when farm prices decline.

The surpluses and low returns on labor, capital, and land used in farming are caused by the greatly increased productivity of these farm resources, resulting in overproduction. The situation, then, is that too many of these resources are in farming relative to the demand for farm products. Consumers indicate, through their purchases and prices offered, that they prefer more of these resources used for other products or services. Total quantity of resources (more capital, less labor, and same land) in farm production has remained nearly the same in the United States since 1940, but farm production has increased about 50 percent.

The increase in prices paid for farm labor relative to prices of man-made resources such as fertilizer and machinery explains why capital has been substituted for labor and land. Fertilizer prices in the last five years were only about 51 percent above the mid-thirties prices, machinery prices were about 91 percent above, farm wage rates were about 355 percent above, and land values were about 225 percent above.

Farms which have not made adjustments in recent years are becoming farther and farther out of adjustment as more new technology is developed. The extent of farm

maladjustments is represented by the present deficiency in average size of the family farm. According to a recent study of crop costs on a group of farms in Ohio, the average cost of corn on 160-acre farms was 10 cents more per bushel than on 640-acre farms. This made a difference of 60 percent in the profits in growing corn. Family farms should double their present size and employ one-third to one-half less labor if they are to achieve maximum efficiency.

There are three main reasons why labor transfer out of farming has been most difficult: (1) the scattered location of farm labor in all parts of the country, making shift to other employment more difficult; (2) the training and experience of farm labor, oriented mostly toward farming; and (3) the number of births on farms greatly exceeding farming opportunities and making the number to transfer relatively large.

The advance in technology and the adjustment problems, particularly of farm labor, will likely continue for at least the next decade. Perhaps a question could be raised whether we should invest greatly in research to develop new farm technology aimed at replacing farm labor unless we also invest enough to solve and assist with the problems such farm labor has in transferring to higher income jobs off the farm.

Part-time farming has facilitated the transfer of some farm labor away from the farm and has resulted in improved incomes for these individuals. Income of farm people from off-farm work is about one-third of farmers' total incomes.

The farm problem is mainly the low income of farmers. However, underlying this or related to it are: (1) the difficulties of balancing over-all production with demand, (2) difficulties of enlarging the individual farm business and obtaining greater efficiency, and (3) the rural community and public affairs problems confronted in a rapidly growing and changing economy.

DEMAND FOR FARM PRODUCTS

In examining the imbalance between production and demand we need to look at the probable trends in demand and the possibilities for demand expansion in the next decade. Best analysis of trends in population, buying power of consumers, special food consumption programs and promotion, quality improvement, new uses of farm products, foreign trade, and relief indicate that total utilization of U.S. farm products will increase 10 to 14 percent by 1965 and 20 to 27 percent by 1970. The lower figures represent the increase without any special programs, and the higher figures would result from the most favorable assumptions that could be made as to programs and economic trends.

Prospects are not very bright for demand to increase enough to bring about a balance between farm production and demand. The most optimistic projections of utilization would mean that in the next 10 years demand might increase about as fast as farm production, assuming production increases at the same rate as during the 1950's. This would still leave production exceeding consumption as much as it does now and the surpluses as great as they have been. The surpluses on hand at present amount to about 12 to 13 percent of farm production in 1959. If farm production was held down to the 1959 production and the present surpluses were consumed, we would have production and consumption balanced by 1965.

It is seriously questioned whether various demand-expanding programs by the government can do much to close the gap between production and demand. However, many of these programs are worthwhile and can be justified for other purposes rather than just for correcting the imbalance. Domestic food expansion programs, including aid to low-income people, promotion and advertising, quality improvement, etc., might increase consumption at most 1 or 2 percent by 1970. A stepped-up program of finding new uses for farm products may not expand total demand since increased new uses for some farm products likely will

be counterbalanced by decreases resulting from nonfarm product substitutions.

Even with continued vigorous export programs, total agricultural exports are not expected to increase greatly, at least until the latter part of the 1960's. It would be optimistic to assume that even one-fourth of the increased food needs of underdeveloped countries would come from the United States by 1970, and this would mean only an increase of 2 percent in the utilization of U.S. farm products.

The main increase in demand for farm products will come from the increase in population in the United States of 9 percent by 1965 and 19 percent by 1970. One to 3 percent increase in demand might come from a 10 percent increase in incomes or purchasing power of consumers by 1965 and 20 percent by 1970. This income change will mean a further shift of food consumption toward livestock products, and this would require an increase in farm resources of about 4 percent by 1970 to make the corresponding shift toward more livestock production.

As incomes increase, people in the United States spend about .15 to .2 percent more for food for each 1 percent increase in income. Most of this increased expenditure goes for better quality and additional services or conveniences rather than for increased quantity of food. As the incomes reach higher levels in the United States, people respond less and less to changes in their incomes as measured by changes in expenditures for food.

In response to price changes, consumers will change their expenditures for food about 1 percent for each 4 or 5 percent change in prices. This also would make a difference of about $1\frac{1}{2}$ percent in the amount of farm production resources needed, considering that there would be some shift between livestock and cereal grain production.

Progress in improving farm incomes through greater marketing efficiency is possible but at best it will be slow. One of the main reasons why it is difficult to change

marketing costs of farm products is that prices of many items making up marketing costs (materials, facilities, utilities, freight rates, wage rates, and others) are determined in markets extending across other sectors of the economy. There is an opportunity, however, to improve efficiency and competition in marketing, which can increase returns to farmers.

SUPPLIES OF FARM PRODUCTS

Since the late 1930's agricultural productivity appears to have increased at a pace substantially greater than that of the non-farm economy. Total agricultural production has increased about 50 percent in the last 20 years.

The greatest increase in farm production since World War II has been in soybeans (180 percent), feed grains (45 percent), rice (70 percent), beef and veal (42 percent), and sugar beets (90 percent). Since 1940, corn yields have risen 81 percent, grain sorghums 150 percent, cotton 84 percent, wheat 40 percent, tobacco 51 percent, and potatoes 118 percent.

Increase in total farm production per man-hour since 1940 has been 185 percent, with only 89 percent for live-stock and 203 percent for crops. We use about 8 percent of our labor force for farm production while Russia uses between 40 and 50 percent.

Our carryover of wheat amounts to 130 percent of one year's domestic and export needs, cotton 60 percent, and corn 60 percent. We have more than twice as much corn and feed grains, three times as much wheat, and considerably more cotton than we need for carryover. In other words, about two-thirds of the Commodity Credit Corporation holdings are actually surplus stock. Feed grains as a group have been building up to a troublesome level. The important point is that, given a few years, the surplus might be worked off — if we did not continuously have excess production. The government has been taking about 8 to 9 percent of total U.S. farm production in the last few years.

About 60 percent of this is disposed of by giving it away or selling at discount prices, and the remaining 3 to 4 percent has been added to the surplus stock each year.

According to present production and consumption trends, excess production by 1965 could be 13 to 14 percent. Of course, restrictions may be applied by government to curtail this. If no further restrictions are used, the imbalance of production and consumption of feed grains is likely to grow worse by 1965, even with large increases in livestock. Further surplus pressure is expected in production of cotton, wheat, and milk by 1965. Excess production could easily continue for at least 15 years.

CROP PRODUCTION

We have more land available for crop production in the United States than we need to produce our requirements. Excluding Alaska and Hawaii, about 370 million acres were used for cultivated crops in 1960. Nearly 330 million of these acres were harvested. In addition, we have an estimated 243 million acres of land (110 forest, 105 pasture, 28 conservation reserve) which are fairly well adapted and could be used for crop production. There are about 45 million acres used for crops regardless of the fact that the land is not well adapted to crop production. This still leaves a net of about 200 million acres of extra land which could be cultivated. There may be a demand for the use of some of this land for timber and pasture production, but it still leaves a large reserve capacity for potential cultivated crop production if and when we might need it.

Cultivated land is owned mostly by individuals who have little opportunity to obtain an income from it except to produce farm products. It is difficult for farmers individually to remove excess acreage from production in order to balance over-all supply and demand of farm products unless they receive some remuneration for discontinuing the use of the land. The government may compel farmers to reduce acreage, but this meets with resistance unless

farmers are compensated. Even if farmers remove some land from production, they will tend to maximize their income either by increasing production on their remaining land or by bringing presently uncultivated land into cultivation. Then, in order to hold production down, more land needs to be removed from production. We have a real problem of harmonizing individual, group, and public interest in the ownership and use of land and water.

The greatest potential for increased farm production in the next 10 or 15 years is the adoption of new technology to increase yields per acre. Production increased about 25 percent during the 1950's but there was little change in acreage of land used. Additional capital investments and less labor made farmers more dependent on items purchased from nonfarm sources. As the prices of these items went up and farm prices decreased, the cost-price squeeze developed. Sixty to 65 percent of total costs of production on general farms in Ohio represented out-of-pocket costs. The chief factors increasing yields in the 1950's were combinations of fertilizer, irrigation, improved seed, mechanization, crop protection, and conservation. Increased use of fertilizer accounted for over one-half of the increased yields.

Today's — and tomorrow's — farmer must possess more management ability, more capital, and more technical skills than ever before to combine new technology and thus achieve the highest possible net income. The average investment per farm increased nearly 50 percent during the 1950's. Because of the differences among farmers, the production and farm income per farmer varies more widely than it ever has in the past.

We need to develop the most desirable patterns of land use in this country over the next few generations. This will require research, public education, discussion, and action. Once we develop what we think is desirable land use, we can design public policy to lead us in the desired direction. For example, it can be made the most profitable alternative

for individual farmers and others to use land in accordance with best public interest.

LIVESTOCK PRODUCTION TRENDS

The increase in productivity per hour by farmers in livestock production has not been nearly so great as in crop production. Main increases have come through improved feed utilization. Most of this has been with poultry, but break-throughs in research on other livestock can be expected. Gains in efficiency of labor are being made and are likely to take place through enlargement of individual farm operations, mechanization, automation, and more specialization. It is expected that livestock will be fed out on fewer farms, on farms with larger volume of business, on more specialized farms, and under more confined and dry-lot systems.

Grazing livestock and production of forage for livestock utilize about 60 percent of the total land area of the United States.

The shifting of the national diet toward livestock products and away from cereals has been about the equivalent of increasing demand 3 or 4 percent, in terms of farm resources required. This is about as much change as we might expect during the 1960's.

Since livestock production requires more farm resources to produce than cereal products, it has been proposed that we shift food consumption more toward livestock products. However, to make a substantial shift of this sort would require a costly subsidy to the consumer because of the higher price for livestock products. The estimated increased cost to U.S. consumers would be nearly one billion dollars to buy 1 percent more livestock products and 1 percent less cereals. The subsidy by government likely would be more than this to persuade people to make the shift. This 1 percent shift might require 2 or 3 percent more farm resources for production.

FARM SIZE, CAPITAL, AND TENURE

The family farm, defined as the farm where most of the labor and management are combined in the same individual or family, is still the dominant factor in U.S. farming. It does not seem to be losing out to larger-than-family farms, in spite of the great technological advance. The family farm closely associates the household and the farm business, but these do not need to be located at the same place. The farm family does not need to own the land or the capital. The only requirements are in regard to labor and management. It fulfills the desire for self-sufficiency and the freedom of enterprise in a modern commercial market system.

Most of the advantages of large-scale business can be realized on the family farm. Certain types of integration could be destructive to the family type of farm, if there is strict off-farm managerial control. For example, the combined integrated business might be most profitable with its farming segment operating at a loss.

Marked expansion in capital used per farm and in total capital investment in U.S. farming has occurred in the last 20 years. The new tractor power technology has pushed farming into larger units. Investment in the most efficient and productive family farms is much larger than investment in average farms. According to a recent study of family farms the estimated total investments required to obtain a net income of \$5,500 varied from \$73,000 to more than \$371,000 per farm.

Renting furnishes a means for expanding farm size. More renting is done in the higher farm income areas such as the Corn Belt than in the low farm income areas such as the Southeast. Partnerships, mostly father and son, offer opportunity for smooth transfer in ownership but are not favored by farmers for general use. There is a small increase in number of farm corporations, including family corporations, especially since the revision of federal tax

laws favoring small corporations. The amount of managerial power retained by the farm operator in corporations is variable depending on the tenure arrangements. The farm corporation is likely to increase but not likely to dominate for a long time.

Farm supply firms and marketing firms may expand their own sales by extending credit and other services to farmers where farmers cannot obtain such items elsewhere in order to expand the size of their farms.

It is difficult for many farmers to obtain ownership of land and also own all the capital required for a farm business large enough to obtain even \$2,500 net farm income. Present returns to land on the average are below the mortgage interest rates. Increasing amounts of external capital are likely to be needed in farming. There will be more and more separation between the people who own the farm resources and those who use them. This separation of resource ownership and use may mean a reduction in the role of the farmer as a manager with some types of tenure arrangements. These tenure arrangements probably will need to be changed if the farmers are to maintain control of the farm business.

FARM SUPPLY AND MARKETING ACTIVITIES

The total complex of agriculture, on and off the farm, is called agribusiness. The on-farm portion is declining but the off-farm portion has increased. Declining number of workers on the farm has been accompanied by an almost equal increase in employment in the farm supply industry.

Over 6 million workers are employed in the farm supply business in the United States. About 10 million are employed in transporting, processing, and distribution of farm products. The number of workers on farms now is about 7 million. This makes about 23 million workers in agribusiness — about one third of all employed workers.

About 60 percent of farm production expenditures are for items from off-farm sources. The feed industry has

been increasing rapidly. There are important economic and adjustment problems of farm supply firms mainly involving the need to increase the volume of business. Some machinery dealers and machinery manufacturers are starting to rent equipment to farmers, enabling farmers to expand their farm size. There is an increasing amount of machinery sold in "packages" for a whole production system.

Great change in the technology of nitrogen fertilizer production has taken place as the fertilizer has shifted from organic to synthetic origin. Competition is keen in the fertilizer business and adjustments are taking place.

The number of workers in food marketing increased 40 percent in the 20 years between 1939 and 1959. Farm workers declined about 33 percent in this period. Marketing services are increasing because of more built-in maid services, fewer people growing their own food, longer transportation of food, and more meals eaten away from home.

The size of the buying firms (marketing firms) have grown much larger than the size of the producer-seller (farmer). Large retail stores are increasing direct buying of farm products, bypassing brokers, wholesalers, and terminal markets, and therefore shortening the marketing channel. Marketing firms are making rapid adjustments to meet internal and external changes. Direct buying by retailers is likely to increase.

The processing food industry continues to increase. The number of assemblers of food, first step from farmers, are declining. Farm supply, feed dealers, hatcheries, and seed firms are increasing contract and integration activities.

Farmers need to adjust production and marketing to large scale buying practices. Cooperatives may help in obtaining large quantities for sale but coordination of production, timing, and quality is necessary too. With declining terminal and central markets, price making has changed and price news is more difficult to assemble.

Integration may stimulate production through superior

management. Cost reduction in marketing and financing, as well as in farm supply industries, should improve farm prices and reduce farm costs.

FEWER FARM PEOPLE

Only about 21.2 million (12 percent) of the present population are farm people and nearly one-fourth of these do so little farming that they should not be counted as farmers, leaving about 16 million (9 percent) of the population.

Rural nonfarm population now outnumber farm population almost 3 to 1, which means that farmers no longer dominate even the rural sections.

About half of the people who are leaving the farm are between the ages of 15 and 34. This helps to expand the younger nonfarm labor force. A net of 7.2 million persons left farms in the 1950's. Due to the high birth rate as compared to the death rate on the farm, the total farm population declined only 3.9 million in the fifties. Even if the movement off the farm is further encouraged, it is doubtful if the net movement will be as large in the 1960's. The movement off the farm in the 1950's was greatest in the South, among tenant families, and among Negro families.

Only about 15 percent of the farm youth will be able to enter farming during the 1960's. Farm youth have a special advantage in the area of agricultural related business. The total number of young people entering the labor force will increase very rapidly in the year 1965. For this reason it may be easier for farm labor to transfer to non-farm employment prior to 1965 than afterward.

RURAL COMMUNITY

The changes taking place in rural communities have given rise to many public problems. These problems are related to, and are nearly as great as, the problems of farming resulting from the changes in farm production and marketing.

The typical situation now is a network of rural communities containing specialized centers for education, shopping, medical service, church, and other services. This is replacing the single well-defined self-sufficient community.

The trend is toward larger units of operation and administration for social institutions which serve rural people. The one-teacher school, the one-doctor community, the part-time minister and church, the township welfare agency are all giving way to large units in order to get better services, new services, and more services. However, the more distant and impersonal services of the larger units make it more difficult for people to participate in the public affairs decisions.

All types of communities are undergoing adjustments whether their population is expanding, declining, or remaining stable.

To keep in step with changes, communities must (1) have widespread understanding of changes, trends, causes of change, and consequences of change; (2) understand need for people to develop and improve methods as well as take action for solving problems; (3) have flexibility and adaptability to changes; (4) determine and recognize goals of individuals, children, and the community; and (5) recognize the need for people in the community to give more time, thought, and energy to meet problems shared in by others. In other words, they need to give more attention to public affairs.

The most significant trend in rural schools is the consolidation of small schools into larger ones for efficient administration, tax support, improved quality of instruction, and more specialized services. The number of one-teacher schools declined about 87 percent in 40 years — 1917-18 to 1957-58.

More rural people participate in church affairs than in any other organized community activity. Rural churches in the next decade will face serious problems of adjustment in size, in quality of service, and in meeting needs of more

heterogeneous groups of people and fewer farm people. Most rural churches need to be two or three times as large in membership as they are now.

Farmers are buying twice as much medical care as they did in the late thirties and early forties. They still are not using physicians or dentists as much as rural nonfarm and urban people. Special federal aid for hospital construction and medical centers since 1945 has increased hospital service and improved medical service to rural people. Further increase in medical services, more coordinated hospital and other medical service plans, and improved and specialized services are needed by rural people.

Rural recreational services are increasing in importance and will demand more attention. Some of these services are often interrelated with rural and urban people. Farmers and rural people have increasingly shared in social security and welfare programs.

Rising taxes reflect the growing interdependence of our society and the increasing demand for such public services as welfare, medical care, social security, roads, schools, fire protection, farm programs, etc. Increasing local and state taxes will be required to finance more public services growing out of increasing population and density of population in some areas. Continued technological developments will have impact upon community services and facilities. More highly trained and educated citizens will be needed. Taxes tend to be highest in sparsely populated areas. Property taxes are decreasing in relative importance and income taxes are increasing.

With the rapid and drastic changes taking place rural people are developing much more interest in planning community development and using rural zoning as a means of public control to bring about the orderly development. Zoning may be used more, as it is already in California, for restricting the best land for farm use.

Local government, like the farmer, needs to adjust to technology and to technical expertness. They have been

slow to do this. Local governments in some cases seem to be breaking old boundaries. Modern needs are causing some of them to fragment with certain functions being combined into larger county, region, and state units.

A variety of means are being directed toward solving community problems and more are needed. These include such groups and activities as rural zoning, planning boards, community councils, and the rural development program.

GOVERNMENT INCOME AND ADJUSTMENT PROGRAMS

A basic conflict has existed between price- and income-supporting programs and production adjustment in that a price serving the income objective exerts a pull on production in the wrong direction.

Production restricting programs on certain crops have been ineffective in controlling total farm production, mainly because of rising yields and shift of land to uncontrolled crops. Programs for restricting total farm production, for example, soil bank, have not been put into effect on a large enough scale to be completely effective.

Land retirement on a larger scale probably could be more effective. There are a number of variations of land retirement. It may be voluntary or compulsory. It may be concentrated on good land areas or poor land areas and on parts of farms or on whole farms. It will vary in costs and control — larger costs with the voluntary program and more strict control with the compulsory program.

Marketing quotas might be more generally used. Some farmers would object to the strict controls necessary under quotas. In order to accommodate adjustment, quotas might be made negotiable. This would allow production to shift to larger farms and from one area to another as it would more likely do under free markets. The negotiable quotas would tend to be capitalized into the farming business and thus become a cost.

It is not possible to maintain the number of farm people in farming at the 1960 level. The farm resource which is

most in excess is farm labor. The level to which farm prices and incomes generally may be raised is limited, without conflicting with other segments of the economy. Perhaps more improvement in farm incomes can be achieved through assisting farm labor to transfer out of farming and assisting the remaining farmers to obtain sufficient size and efficiency in their farm business. This would include education of youth and adults, off-farm employment assistance, and community adjustment. A favorable aspect of this type of resource adjustment is that it would contribute to the total progress of society through still greater productivity and more valuable use of labor resources.

A complete government farm program for U.S. agriculture is not simple to develop. Strong consideration will be given to a combination of domestic and foreign demand expansion, labor and land transfer, marketing and production restrictions, education, and research.

LAND GRANT COLLEGE, AGRICULTURAL EDUCATION, AND RESEARCH

The land grant colleges, the agricultural experiment stations and USDA, the agricultural extension services, and agricultural education, are facing a real challenge. They have contributed greatly to general progress and farm efficiency. They need to face agriculture as it is today and adjust their programs so that they continue to contribute to general progress and farm efficiency. The answers to problems of adjusting to rapid changes in technology must be found. The education of youth and of future agricultural leaders must include methods of adaptation to change and skill in solving new problems which arise rapidly. With the specialized nature of agriculture or agribusiness more emphasis is needed on management. We also need to train people to work in the farm supply, processing, and marketing businesses as well as in farming. College students need a good balance between applied and basic training.

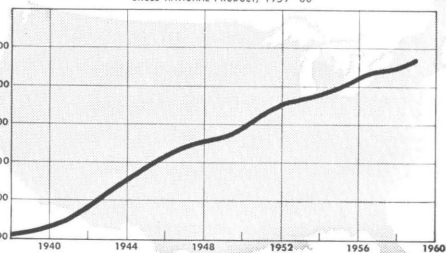
While there will be fewer farmers in the future, we will need more well trained farmers. The opportunities for employment in agricultural related businesses and services will continue large and perhaps increase. All these factors should be kept in mind in improving vocational agriculture and college training in agriculture.

The agricultural extension service needs to adapt its program on the one hand to do much more in the areas of individual farm and related agriculture business adjustment problems. On the other hand, the increased interdependence of rural people calls for much more educational efforts on community and general rural development. This includes many aspects of public affairs; those at the local level, and those at national and international level.

If agricultural education is to stress the areas mentioned here, then the agricultural experiment stations and other research agencies need to place emphasis on research in these areas. Much more study is needed on the problems of the individual farmer, the agricultural business firm and the farm people in making adjustments. We are seriously short of research on the use of basic resources of land and water, capital, labor, and management. Public affairs of rural communities need much more analysis. The orientation of much of the agricultural research in all areas may be influenced considerably if we objectively analyze the true situation and trends in agriculture and rural society.

Society expects the public supported agricultural, educational, and research institutions to take the lead in anticipating and developing understanding of the great problems of agriculture; to develop procedures, alternatives, and programs for adjusting to the rapid changes taking place; and to be an influential force in making agriculture, as well as the entire economy, strong.

GROSS NATIONAL PRODUCT, 1939 - 60



CHAPTER 2

The political, social, and economic setting of U. S. agriculture; the role of agriculture in economic growth.

Total Economic Growth and Agriculture

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AGRICULTURE is an inseparable part of our national economy. This is true of any country at any stage of economic development, because food and fiber are of primary importance. This fact must be recognized in considering agricultural problems.

Any generalization about a "farm economy" or an "agricultural sector" of the national economy, and any assumptions that farming is more or less exempt from economic laws and processes are self-defeating. This is true whether we subordinate economics as applied to farming by reference to its biological characteristics; its peculiar combination of land, labor, capital, and other resources; or the sociological results of decentralization.

AGRICULTURE'S ROLE IN ECONOMIC GROWTH

In the original, preindustrial, self-sufficient household economy, agriculture is identical with the total economy. This is often still true at an early stage of development where farm-grown producer and consumer goods are exchanged in considerable volume between farm people in organized markets. Agriculture is then the comprehensive industry of all industries. It produces not only food, feed, fibers, fuel, and a great variety of other raw materials, but also housing, textiles, clothing, "plant" and "equipment" such as barns, breeding stock, draft animals, plows, wagons, as well as such basic service as transportation, and even occupational training and entertainment. Even at this stage of a minimum division of labor there is considerable leeway for accumulating working capital.

Increasing production and rising incomes are achieved in proportion to the native ability of the individual farmers and their response to economic opportunities. This difference in native ability of individuals, families, or clans and the cumulative effects of added skills, experience, and physical assets results in an extremely wide difference in levels of productivity, income, and comfort of living within a single village. This is true even in the least developed areas of the world.

Some economic growth is not only possible, but has always occurred in agriculture at the preindustrial stage. These instances of growth, as well as the sharp differences in productivity, income, and wealth within underdeveloped economies, are usually ignored. This oversight is derived from the reliance on measures of accumulated assets and production in terms of market values in money which are inappropriate.

However, the leeway for improvements in human existence and for the rise of a civilization worthy of the name is extremely limited until the process of the division of labor, of work specialization, and of developing occupations and professions is underway. The process of separating from

agriculture the specialized crafts (such as woodworking, metalworking, textile work, food processing, construction work, and transportation), of transferring labor to them, and of developing better tools and work routines, together with the rise of urban industries and urban mass-consumption of farm products and of an organized exchange of goods and services are the essence of economic progress. In its course, farm work also becomes more and more specialized. It is ultimately confined to the production of plants and animals.

For an understanding of the social and economic dynamics of the democratic society and of the real issues of the world-wide farm problem, it is essential to identify economic development with the expansion of nonfarming activities and the transfer of manpower from farming. In this process farming makes a dual contribution: It must provide manpower to the nonfarming activities, and its shrinking share of the nation's manpower must supply an increasing proportion of the food and fibers for the urban population.

This latter contribution requires an increase in production per worker engaged in farming. This improvement in productivity depends increasingly on the purchase of farm supplies. Farms become more and more tied into the commercial economy and subject to the dictate of market prices. The obligation to pay taxes and the use of credit ties the farmer more closely to the commercial economy. The population on commercial farms participates in the benefits of a growing national economy only in so far as it succeeds in earning a rising net income per person.

An increase in the per capita income of farmers requires not only an increase in productivity per worker engaged in farming and an increase in the value of goods produced on the farm, but the value of farm produce depends on the response of consumers as a group to price changes and to changes in consumers' incomes. The proportion of the income spent on food declines as the income of families rises.

The economist puts it this way: The income elasticity of the demand for food is much smaller than for most other goods — and particularly for services. This is known as Engel's Law, and based on the physiological limits of the human capacity to consume food. Hence, a sharp rise in farm production leads quickly to price declines unless the capacity of the market for farm products expands materially. The market for farm products may expand if a growing number of consumers spend their rising purchasing power on more expensive foods.

Expansion in the capacity of the market for U.S. farm commodities need not be confined to the domestic economy; it could also occur in foreign countries. Whether domestic or foreign, urban industrial development is necessary for a rising income in farming. Such urban development creates the demand suction for an increasing volume of farm products. It simultaneously creates a rising farm demand for industrial goods that draws manpower from farming into other occupations, and thereby creates the incentive for increasing the productivity per farm worker. The magnitude of change that has taken place is best illustrated by the fact that at Thomas Jefferson's time 90 per cent of the people in the United States were working on the farm, while by 1960 this proportion had shrunk to less than 10 percent.

Farming depends on the growth and structural change of the total economy in its pursuit of a rising per capita income. This, in turn, implies that the real leverage for economic gains by farmers lies first and last in the creation and maintenance of conditions favorable for general economic growth. An expanding national economy makes farm problems more manageable because there will be opportunity for dynamic adjustments in agriculture.

If, on the other hand, the economy contracts — if instead of expanding it stagnates or even begins to shrink — farm problems become increasingly difficult. In case of prolonged and severe depression the flow of labor from the

farm to nonfarm employment may reverse itself and farm labor may back up in rural areas.

THE CONCEPT OF ECONOMIC GROWTH

The well-being of the farm population and the proper functioning of the farm industry depend inescapably on the growth of the national economy. Therefore it is important to have a firm grasp of what is actually involved in economic growth and how it can be measured. Unfortunately, the dynamic processes that constitute growth in a well-developed modern industrialized economy are so complex that they are difficult to measure. The usual explanations or measures oversimplify the combination of factors that have brought about growth.

This institutional setting must be kept clearly in mind. It indicates the wide dispersion of the power of decision making leading to economic action. Our modern society is determined to have economic action subordinated to its humane ideals and protected from the deprivation of ruthless materialism or irresponsible excesses of the use of power by individuals, groups, or the state. These goals are sought through continual amendment of the legislative framework, highly sophisticated supervision, and law enforcement.

The U.S. economy must function and grow within the basic institutions of our democracy. These emphasize freedom of enterprise, competitive markets with flexible prices, private property, the right of all workers to geographical as well as occupational mobility, a profit and loss system for all businesses, and free markets for labor, capital, and real estate. One aspect of such a system is a wide decentralization of decision making, risk bearing, and the allocation of productive resources. It offers effective incentives for efficiency, innovation, and saving and investing, and thereby puts a premium on progress and dynamic change.

Within this context the term "economic growth" is synonymous with economic progress, development, or ex-

pansion. "Growth" has the specific meaning and is defined in the present discussion as a continual rise in the capacity of the economy to meet the changing needs and expectations of the nation for goods and services.

Growth conceived in this way refers to all productive resources and our ability to use these resources under varying circumstances including those of stress and national emergencies. But growth includes more. It includes the capacity to renew those productive resources that are being depleted and to create new ones. This aspect of growth is of particular importance.

For a highly industrialized country which is also the leading power in a turbulent period of history, economic growth also implies inevitably a rise in the economy's military potential. The defense potential and the economic stature of the United States are closely interrelated. They are a source of strength and assistance to other nations and include participation in the economic development in other parts of the world.

The term "growth" is usually applied to living organisms, meaning an increase in size by assimilation of new matter. But as with so many biological, medical, or other metaphors used in economics, this one too can be mischievous. Some derive from it the assumption that growth is a part of a maturing process which must come to an end. This is an error, derived from a too narrow concept of the capacities of a human society. Measured by the idealistic goals of the free society that aspires to the good life for all its members, the economies of even the wealthiest countries are seriously underdeveloped. The wealthiest countries are far from a fulfillment of even major basic social goals.

In a growing economy, society gradually shifts emphasis from goods to services. Growth involves a continuous recombination of resources not only within the national boundaries but in distant parts of this world.

Economic growth is a normal process for a healthy and vigorous people. If this process is fully understood and

public policies facilitate it, there is good reason to count on continued growth in this and other countries.

THE FACTORS OF ECONOMIC GROWTH

As growth has been defined it is evident that the dynamic process of growth concerns several major factors or resources which taken together determine the capacity of the economy. For convenience, these factors have for centuries been lumped together under three categories: labor, land, and capital. Since these labels are rather crude I would prefer to name them: Human Resources, Natural Resources, and Man-made Resources.

Human Resources

The essential, powerful, and creative primary factor on which the capacity of a national economy depends and which generates its growth is the human resource. Indeed it is ultimately the unique resource of all resources. Natural resources are supplementary; they get their meaning only in so far as human ability and energy are applied to them and the specific materials they yield are demanded by consumers. Man-made resources, the machines so important in our economy, are the result of combining human and natural resources. They are in a continual process of reproduction and development.

The essential features of a nation's available human resource and its contribution to economic growth are the size, rate of growth, and age composition of its population, including the proportion of people of working age. Population increase is a normal condition for any society with vitality. But it is more than that. Throughout history, it has proved a powerful incentive for economic growth.

In recent decades population increases stimulated public and political interest in policies favorable to economic growth. Population increases without sufficient economic growth would create prolonged mass unemployment, a decline in per capita income, and serious poli-

tical friction. The political impulsion to avoid this outcome is strong indeed.

Population increase, however, acts alternately as cause and effect. Declining rates of population increase during the economic instability period of the twenties helped engender the stagnation of the thirties, but the economic stagnation and the high unemployment in turn held down population increase until the spell was broken by World War II. The much discussed sharp acceleration of population increase in certain underdeveloped countries caused by sharp reduction in infant mortality can seriously impede economic growth. But these are circumstances which have nothing in common with those prevailing in the U.S. economy.

Population statistics about the year-by-year changes in the number of people of both sexes in certain age groups are, of course, an extremely crude indicator of the productive value of human resources. The economically important factor is the so-called "labor force," namely the number of people of working age who are able and willing to take jobs.

Obviously, the concept of the labor force is very flexible. How large the actual supply of labor is depends on many conditions, such as the mores of the society, child labor laws, years of school attendance, the willingness of workers to change location and jobs, retirement age, social security, and many others.

With advanced economic development the tendency prevails to delay the average age for entry into the labor force and to reduce the average age of exit from the labor force. Simultaneously, the proportion of women in the labor force tends to increase.

Apart from the increasing size of the labor force, one of the major factors of economic growth is the improvement of the physical and mental working capacity of the individual worker. The physical fitness of the labor force depends on the status of health of the population. Improve-

ment in the general health requires an expanding economy. The availability of health facilities such as hospitals, pure water, and sanitation; the providing of medical care; the war against contagious diseases; the enforcement of pure food and drug laws; and the control of water and air pollution are all bound to have an impact on the capacity to work. As is true for most of the other factors, public health has a close tie with growth: it contributes to growth and it results from growth.

Closely related to the health of the labor force is its nutrition. Food is the number one raw material of any economy, irrespective of the degree of economic development. The quality and quantity of protective and energy-bearing foods consumed are underrated as an important contributing factor to the working capacity of the labor force. The less physical exertion involved in work of the labor force, the more the quality of the diet outweighs in importance the caloric content. Again, this adjustment depends on the process of economic growth as much as it contributes to it.

Good public health and high average level of nutrition, together with an increase in the labor force, are essential factors in economic growth. Of even greater significance are the native ability, the skills, experience, knowledge, and the inventive genius of management. All our institutions — education, government, business organization — are important in improving all aspects of human resources.

Education and training in all their forms convey existing knowledge to more and more people of all ages, but particularly to the young people. In the process, the capacity to think functionally, to sharpen the critical sense and judgment, and to convey methods of studying, doing research, and of contributing new knowledge are developed. Research, exploration, and innovation extend the frontiers of knowledge and techniques.

The sources from which new knowledge, new tech-

niques, and innovations flow are man's curiosity, his imagination, and his logic faculties. Here lie the main roots of genuine economic growth. Hence, it is essential that the economic system be so organized as to offer the widest latitude and an optimal incentive for the full play of creative capacities.

For a realistic grasp of the role of the human resources in economic growth, it is of strategic importance that the managerial function be recognized as another main root.

Even such progress as advances in basic and applied research, discoveries, inventions, potentially valuable patents, and the availability of better tools gives no assurance that the effective capacity of the economy has actually increased or will increase. Neither do extraordinary skills of workers necessarily insure increased capacity of the economy without managerial competence and initiative.

It is the function of management to combine the factors of production (i.e., labor, capital, and land) in such proportions and quality for such time and in such a manner as to maximize the net return of the business. This requires fitting the production program of the business tightly into the anticipated or potential market situations, with careful regard for the kind and degree of competition and for the changing character of demand. The dual managerial functions of organizing the business and day-to-day operations embrace both technical skill and a special art. Expert knowledge and experience are required, but so is a unique combination of abilities which differs from the qualifications of even the most competent workers.

Optimal economic growth of a nation rests crucially on the availability of business managers and on their competence and stature. This applies to private as well as public enterprise. While managerial skill can be taught in schools of higher learning, its full development must depend on training at the command post of a going business. In farming, in large numbers of craft shops, and in

retail and service firms with one man or family operation, management and labor are typically performed by the same person. Here the managerial talent is all important.

It is true, however, that investment in the "brain potential" of the nation is always temporarily at the expense of current production. Such allocation involves: (1) the withholding of a part of the population of working age from entry into the active labor force for education and training; (2) the employment of an increasing number of the active labor force in education, training, and research; and (3) the investment of capital in physical facilities for these services. In a free society the decision where human resources will be used is not made by central planning, but by the competitive bidding of employers in the labor market in response to the demand of private and public consumers of goods and services. However, the large system of public education and research enables the government, primarily at local and state level, to use productive resources for the development of human resources.

To sum up: The essential basis for economic growth is a labor force increasing in size, improving in health, with rising knowledge and skill in more and more specialized occupations, and organized toward greater efficiency. The net result is an improved potential production per worker.

Man-made Resources

How much effective productive capacity the human resources actually represent at any time depends on the capital resources available for production of goods and services. These capital resources consist of plant, equipment, and materials.

While it is possible to increase the productivity of labor without the use of more capital resources, primarily by better organization of work and more specialization, the extent of such improvement is very limited. The vast majority of feasible opportunities for more efficient use of labor also requires the use of more capital goods per worker

or per hour of work. Equipping workers with more mechanical power as substitute for animal power and crude manpower is one way to increase productivity. Economic growth requires, therefore, the availability of capital for transportation, physical plant, equipment, and raw material inventories needed to increase the economic productivity.

This sort of capital is subject to partial consumption or to deterioration due to wear and tear, and obsolescence resulting from new inventions and designs or because of changes in the demand. Economic growth must include ample allowance for depreciation on existing capital resources and continual addition to and improvement in these resources.

A crucial factor in economic growth is savings. Expansion of the man-made resources depends primarily on availability of private savings, namely, savings by individuals, nondistributed profits of corporations, and profits of all other business enterprises.

Natural Resources

A further factor that determines the effective capacity of an economy is popularly called natural resources. Their nature, their role in economic growth, and the importance of specific types of resources change with the progress in science and technology and the shifts in domestic and foreign demand. Contrary to popular notions, these resources have no value as such. They represent opportunities to apply management, labor, and capital to them for the purpose of deriving energy or materials from them. Once private or public capital or both have made natural resources accessible and productive, these resources become valuable.

There are two types of natural resources. One is perpetual such as carbon dioxide and nitrogen of the atmosphere. The other type is store resources such as deposits of organic materials or minerals in the soil or underground. Agriculture, forestry, horticulture, fisheries, and the generation of hydroelectric power depend chiefly on the utili-

zation of perpetual resources while mining deals chiefly with store resources.

It is a misconception — most popularly though not exclusively held in other countries — that U.S. agriculture has prospered because from the beginning it was endowed with uniquely rich resources. In the hands of the American Indians these resources yielded bitterly little. The application of imported human ingenuity and energy, and capital to the land carved an empire of prolific food and fiber production out of wilderness. This included the conquest of pestilence and disease. Only since 1948 has malaria been eradicated from the South.

The natural resources of the United States are uniquely favorable because our economic and political policies promoted the greatest free market area of the world. This market permits utilization of resources according to principles of greatest comparative advantage and a regional division of labor.

Economic growth requires that the existing opportunities in the geography of the country be utilized in so far as they yield the needed materials or energy at lower costs or with greater reliability than they can be obtained from other countries. Use of natural resources requires the application of human resources and a substantial amount of long-term capital investment. This holds for agriculture as well as mining and the single or multiple purpose use of water resources. In each of these resource uses the amount of manpower needed per unit of production can be reduced by additional investment of capital.

CONDITIONS FAVORABLE TO GROWTH

In a free society growth depends primarily on the use and combination of resources in accordance with the preference of the consumers expressed through their purchases of goods and services. Likewise the government's influence on use of resources reflects in effect the decisions of the

electorate, i.e., the same consumers. However, the majority of these consumers who influence the direction of the economy by their expenditures are also the people who compose the human resource. The use of resources is influenced by human beings as buyers and as workers who show preferences for working conditions, remuneration, and fringe benefits.

Hence, it is axiomatic that in the noncoercive society economic growth, as we have defined it, cannot be ordered or dictated by the state. Attempts to do so would have to begin by depriving the consumer of his freedom to determine the allocation of resources and would replace his decision with a decision by the government. This would involve the piecemeal transition from the free economy to a centrally planned and directed economy, which in turn ultimately necessitates the conversion of the political system into a totalitarian state. How well this is recognized by the nation can best be sensed by the careful language chosen by the Congress in the Employment Act of 1946 during the first Truman Administration. This decisive law which determines the economic policy of the federal government with reference to economic growth and stability begins with the following declaration of policy (Section 2):

The Congress declares that it is the continuing policy and responsibility of the Federal Government to use all practicable means consistent with its needs and obligations and other essential considerations of national policy, with the assistance and cooperation of industry, agriculture, labor, and state and local governments, to coordinate and utilize all its plans, functions, and resources for the purpose of creating and maintaining, in a manner calculated to foster and promote free competitive enterprise and the general welfare, conditions under which there will be afforded useful employment opportunities, including self-employment, for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power.

At present one-fifth of the national production of goods and services is purchased by federal, state, and local governments. This share will increase further if more economic tasks are assigned to the government.

There is disagreement on how far the government should go in assuming economic tasks and how this influences economic growth. However, the government has the responsibility and the power to promote conditions favorable to economic growth, to counteract the occurrence of conditions detrimental to it, and to stimulate growth in particular areas through activities such as the construction of highways or ports, the financing of research, and through public education and health.

The responsibility of the government includes the creation and maintenance of confidence in the strength and the stability of our whole economy. This confidence will enable the citizens of this country and the business leaders and governments of the industrially and commercially advanced nations of the world to make their decisions with the expectation of continued economic growth in the United States.

The government can do this by strengthening the free market force, encouraging the mobility of resources, contributing to the development of our human and natural resources, reducing or eliminating trade barriers at home and abroad, pursuing policies which guarantee the integrity of the U.S. dollar, encouraging saving and investment by private individuals, and by moderating the periodic fluctuations of the business cycle by restraining excessive expansion in booms and counteracting excessive contraction in recessions.

The freely convertible U.S. dollar backed by a large gold reserve is not only the measure of value in this country; it is also the reserve currency of leading countries of the free world and an international standard for comparison of prices. Maintenance of the stability of our dollar's purchas-

ing power, or defense against continual rise in the general price level not only at a rapid but at a creeping pace, is a vital prerequisite of a sustainable rate of growth in the United States and is important for development elsewhere.

In all countries one important instrument for stimulating growth is an expansion of foreign trade. Free convertibility of a "hard" currency facilitates foreign trade. Competition in the domestic and the world market is one of the most effective forces promoting price stability and economic growth.

Monetary and credit policies are important factors in economic growth. These policies influence particularly the rate of capital formation and the flow of capital into productive investments.

For example, investment favorable to economic growth can be stimulated by accelerated depreciation of capital in our tax laws, particularly in high risk business ventures. Such provisions are particularly important for overseas investment. Management of the public debt can influence the flow of investment funds needed for expansion of the economy.

Innovations, research, and the general advancement of technology, and their practical application are some of the main forces that generate growth. The resulting reduction of costs and improvement in returns anywhere in the trade chain from producer to consumer encourage investment and stimulate growth.

Public policies and private actions can create conditions favorable to economic growth in many ways. Preferential tax-treatment of investment and expenditures in research activities is one of them. The government can encourage and support research projects.

Changes are inherent in the process of growth. Private initiative and public policies which result in greater occupational and interregional mobility of labor, greater mobility of capital, and greater mobility in use of all resources

are bound to be favorable to growth. Mobility in this sense is extremely important to farmers and to growth of agriculture.

CONDITIONS HARMFUL TO GROWTH

Conversely, any rigidities which stifle or interfere with the mobility of resources are bound to be harmful to growth. Rigidities in prices, interest rates, wages, rents, supply, and demand tend to stifle or interfere with mobility of resources.

The Staff Report of the Joint Economic Committee of the Congress on Employment, Growth, and Price Levels of December 24, 1959, had this to say on policies for American agriculture (p. 203):

10. Since mobility of people and of resources out of agriculture into other industries is the only ultimate long-term solution to the problem the Federal Government should take all reasonable measures which facilitate this process — special aids to education in rural areas to provide skills usable in other industries, relocation allowances and strengthening of employment service facilities, and encouragement of movement of nonfarm enterprises to rural areas to provide job opportunities to those who prefer rural to urban living even when working in nonfarm occupations.

11. It has been suggested that the ultimate solution to the problem of overproduction lies in providing agriculture with the same type of market structure as in some industries, giving the producers, through market organization, control of supply and giving them the power to keep goods off the market when they think appropriate. This other policy of adding to the monopoly and quasi-monopoly elements in the economy would add significantly to inflationary tendencies as well as have other undesirable effects on the market structure of the economy. It would be a serious deterioration of the overall structure of the American economy.

If growth is to continue at a healthy rate or be accelerated, it is highly important that governmental programs and regulations encourage efficiencies and not just maintain the status quo.

If the government conducts its monetary, fiscal, and antitrust policies in a way that gives business people confidence in the stability of the economy and its currency, the average citizen will have faith in the equity and justice of the economic system, thrift and capital formation will be encouraged, and savings will flow to growth-promoting investment, not into the hoarding of goods.

Inflation depreciates long-term obligations, enhances the value of physical assets, and inadvertently brings about drastic changes in the distribution of wealth and incomes. It disorganizes the proper functioning of the capitalist system and thereby diminishes growth. Hence, a sustainable rate of growth cannot be stepped up by public spending financed by increasing the public debt. It follows that any policy actions resulting in an undermining of the confidence of the business community in the continuity and vitality of economic institutions or the steadiness of development must be deleterious to growth.

One situation in which the flow of capital investment may be influenced is where the government enters into a field of business or intervenes in a market. Example of the latter was entry of the government into commodity markets as part of the price support program. Reduction may occur in the flow of private investment due to the fact that market intervention by public agencies with special authority subject to political change — either under executive discretion or as the result of new legislation — represents an additional risk factor.

Freezing or controlling rent is an example of static policies aimed at social relief which impede economic growth by impairing the dynamic self-adjusting processes of the market. The typical result of rent control everywhere has been sharp reduction in new construction, physical

deterioration in housing previously built, and idling of a large part of the construction industry.

Monopolistic arrangements, irrespective of the social or political arguments on their behalf, and irrespective of whether they apply to agriculture, industry, commerce, banking, or labor, impede the self-adjusting processes of the market economy and tend to diminish growth. Production allotments or marketing quotas have tended to freeze the competitive production pattern and to hinder the allocation of productive resources toward greater efficiency. The impact of such static devices can be mitigated to some extent by making allotments and quotas negotiable.

However, rigidities within a dynamic economy delay adjustment but do not do away with the need for it. As a result, maladjustments accumulate and make the ultimately inevitable correction more and more difficult, painful, and costly.

Reluctance of workers to move to new jobs or new locations may impede growth. Some aspects of our gains in national wealth tend to slow down shifts in our labor force. For example, home ownership, longer and better education for children, seniority rights and fringe benefits under union contracts, and unemployment benefits under state laws stop some workers from moving to better jobs.

The tendency to limit mobility of the labor force has also been strengthened to some extent by the increasing endeavor of business to reduce the costly turnover of workers and hold particularly the skilled workers even in slack periods by spreading the work with a reduction of working hours. Firms tend more and more to stabilize work forces by working overtime in busy periods rather than by adding workers in order to avoid costs of unemployment benefits, costs of turnover, and adverse effects on quality of work.

CHARACTERISTICS OF GROWTH

The growth of a national economy ought to be balanced. In reality, this balance is difficult to attain because

of a multitude of hard, compelling circumstances. Yet, in formulating economic policies, everything practical should be done to remove the obstacles to balanced growth. If some businesses develop faster than others, all sorts of bottlenecks in supplies or services result.

Growth, according to all historical experience, has its roots in increases in productivity which result from a combination of new skills, the availability of capital, and favorable cost factors, and can only proceed vigorously with expanding demand.

The start of more rapid growth is usually a matter of chance, beginning in one or a few enterprises in a small area or a region. Innovations in production, processing, transportation, distribution, or shifts in consumer preference are other factors of growth and are difficult to predict. New scientific or technical knowledge and managerial initiative must converge to start growth in one special type of production.

Growth of the national economy involves continual change within the economy such as new investment and shifts in the labor force. The mobility of workers can be increased by helping new entrants into the labor force to find their way into new or expanding types of employment or to the new locations of businesses. The main flexibility in the labor force lies in guidance of the new generation. But the dislocation involved in vigorous growth also requires vocational and often geographical changes for senior workers and their families as in the case of farmers, coal miners, and steelworkers. It is this sort of adjustment which involves hardship, social and political resistance, and policies of retrenchment which try to protect the status quo. To avoid such blocking of growth requires effective assistance to constructive adjustments.

Growth requires in some fields of activity considerable time for developing the facilities and expansion of large capacities with long-term investment. This leads to a staggered progress of growth. But this unevenness in expansion

of businesses is overshadowed in the national economy by the ebb and flow of the business cycle with its expansive and contractive phases. A mild recession serves frequently as the gestation period during which a great deal of matured innovation is more fully used in production processes. But more severe and prolonged recessions curtail employment, profits, capital formation, investment, and public revenues to such an extent that they reduce the rate of growth. Hence, during prolonged recessions, monetary, fiscal, and public procurement policies — and such built-in stabilizers as the corporate income tax and unemployment insurance payments — may act as an aid to continued growth.

In the process of growth, some businesses and some areas decline or deteriorate. This is due to change in the technology, in demand, in comparative costs, and in the structure of the economy. For example, as deposits of gold and silver were exhausted in certain parts of California, boom towns became ghost towns. Progressive mechanization of coal mining operations caused serious chronic unemployment in certain parts of the East. Shifts in location of factories or failure of enterprises may have the same effect. Consolidation of farms into larger units reduces population and curtails business in some areas. Areas which do not participate in the increase in productivity and income are by comparison retarded.

These pockets of deterioration or stagnation represent primarily idle or underemployed human and other resources which should be mobilized. This can be achieved by starting new enterprises in the depressed areas, or by migration of the people to areas with labor shortage. A legitimate function of government is to assist any local and regional initiative and to foster conditions favoring adjustments. The Committee for Rural Development Program and the Committee to Coordinate Federal Urban Area Assistance Programs are charged with federal guidance and coordination of public efforts to engender growth.

THE MEASUREMENT OF GROWTH

In attempting to measure economic growth, the usual practice in this country is to use estimates of secondary nature, such as employment, production, and income. In fact, some people consider changes in production as identical with growth. It must be emphasized at the outset that we do not possess adequate methods for measuring economic growth itself, that is the increase in a nation's *capacity* to produce goods and services.

Statistics on the number of people gainfully employed, the unemployed, and the sum of both representing the labor force, come relatively close to measuring growth potential because they deal with the employment or nonemployment of the most essential resource — labor.

The Bureau of the Census makes monthly estimates — based on 35,000 household interviews during a sample week — of the civilians fourteen years of age or over that are employed. The classification "total labor force" combines all civilians employed or unemployed and members of the Armed Forces stationed in the United States or abroad.

In the U.S. labor market several million people are at any one time moving from one job to another. Most of these job changes occur without any unemployment. However, even when the economy is booming, there remains a certain amount of unemployment.

The proportion of the population ten years old or over (former definition) in the labor force amounted to roughly 50 percent just prior to both World Wars (1916 and 1941). In the years 1957–59 the total labor force, including the Armed Forces, ranged from 57 to 61 percent of the population fourteen years old or over.

These data do not provide clues to changes in the real labor capacity of the population. Number of hours worked per person per year affects the productive potential of our labor force. In a free economy reduction in the hours of work per week and even in the number of workdays per

week is considered an achievement resulting from growth. Shorter work hours and work weeks may be used for all sorts of part-time employment or do-it-yourself activities which yield real income. Another limitation to measuring growth by employment is the omission from our statistics of all work performed by housewives and their unpaid helpers.

It is obvious that the more a rising gain in productivity reduces hours of gainful employment per worker per year, the greater will be the reserve capacity of the economy — a capacity which can be mobilized in an emergency or at any time the people want to attain maximum production.

From the foregoing, it may be concluded that labor force and employment statistics provide indicators as to the population's desire to participate in the labor force, and to the extent to which desired employment remains unsatisfied. Those statistics are more useful for these two purposes than for directly measuring growth.

The main measures of evidence of growth on which economists rely concern changes in national product and its components. The gross national product (GNP) or expenditure account, calculated and published by the U.S. Department of Commerce, comprises the total annual production of marketable goods and services in terms of current market prices. It embodies four categories: expenditures for personal consumption; government purchases of goods and services; gross private domestic investment in buildings, equipment and business inventories; and finally, net exports of goods and services or additions to assets owned abroad. While these estimates are free from duplication and count only goods and services purchased by private or public consumers or additions to the country's capital stock, it is nevertheless, as its name indicates, a gross and not a net estimate.

Gross national product includes additions to the capital

10

stock. It does not deduct the necessary depreciation of durable capital goods due to ordinary wear and tear and due to obsolescence, i.e., the capital consumption.

A net national product (NNP) is also calculated by deducting from the GNP an estimated aggregate capital consumption.

For purposes of estimating the rate of economic growth the GNP figures are adjusted for changes in the general price level. In order to exclude the effect of the population growth, these adjusted GNP figures can then also be expressed in per capita terms. Finally, in order to refine the GNP and to measure changes in productivity, the "Real GNP" can be expressed in terms per hour of employment of wage and salary workers.

GNP accounts give a great deal of detailed information about personal consumption expenditures (such as the proportion of durable goods, nondurable goods, and services), gross private domestic investment (such as the proportion in new residential and other construction, durable equipment for business and change in business inventories), and government purchases of goods and services (such as the federal share for national defense and other purposes, and the shares of state and local government).

The part of GNP data relating most directly to growth is the gross private investment in farm and nonfarm producers' plant and equipment. In 1959, with a GNP of \$479 billion, the total plant and equipment investment amounted to \$42 billion or 9 percent of the GNP (the nonfarm portion being \$36.9 billion, the farm portion, \$4.7 billion). Additional support to growth is found in government expenditures on research and development.

While GNP statistics are a very useful accounting tool for indicating some aspects of the economy, they are not designed to permit a direct measurement of growth, as that term was defined earlier. It must also be recognized that

they are not well suited for making direct international comparisons, primarily because they ignore all goods and services which are not exchanged for payment in money.

THE HISTORICAL RATE OF GROWTH

For the past 80 years — as far back as usable data are available — the Real GNP in the United States has increased at an average rate of about 3 percent per year (Figures 2.1 and 2.2). This annual average rate amounts to doubling production every 23 to 24 years, or quadrupling it in less than 50 years. Table 2.1 summarizes several of the series frequently referred to in estimating growth in the U.S. economy.

Special reference should be called to the difference in productivity per man-hour in farming and in nonfarm work for the period 1947-58. The annual increase in farm production per man-hour was 6.2 percent for the period. Yet, in considering this remarkable rate of progress in produc-

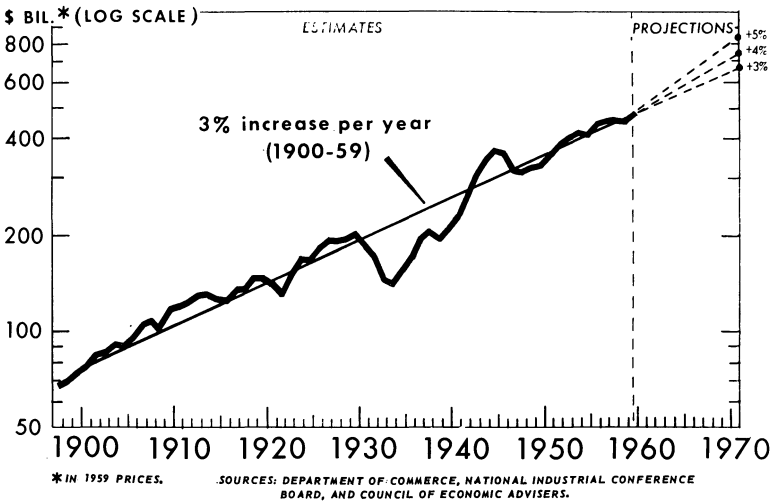
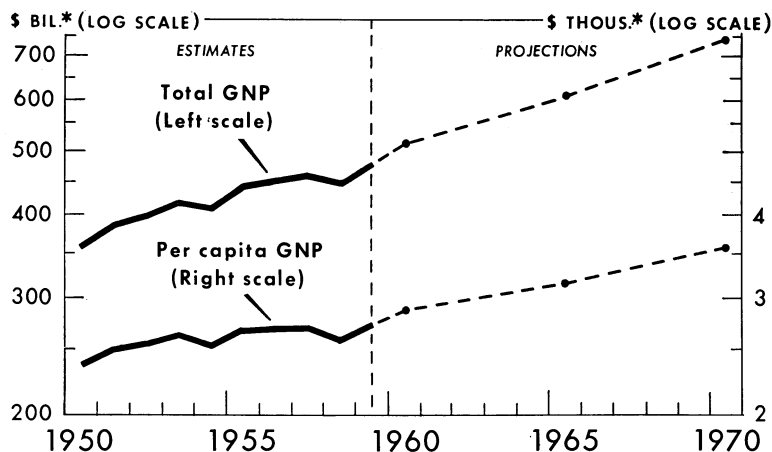


Fig. 2.1 — Farm output in the United States.



* IN 1959 PRICES.

SOURCES: DEPARTMENT OF COMMERCE, DEPARTMENT OF LABOR, AND COUNCIL OF ECONOMIC ADVISERS.

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Fig. 2.2 — Real gross national product of the United States with projection to 1970.

TABLE 2.1
AVERAGE PERCENTAGE CHANGES ANNUALLY IN U.S. ECONOMY FOR
SPECIFIC PERIODS

	(Percent)
Increases in total production (goods and services)	
GNP — 80 years	3.0
Industrial production (Fed. Res. Bd. index)	
1919-57	3.7
1948-57	4.4
Increase in U.S. labor force (since 1930)	1.3*
Increase in productivity per worker (since 1930)	1.7†
Increase in productivity per man-hour worked	
1909-59	2.4‡
1948-59	3.1‡
Increase in productivity per farm worker	
1947-58	6.2‡

* See Figure 2.3. † See Figure 2.4. ‡ See Figure 2.5.

TABLE 2.2
U.S. FARM POPULATION, NUMBER OF FARMS, AND FARM WORKERS

Year	Farm population	Number of farms	Farm workers	U.S. total employment
	(million)	(million)	(million)	(percent)
1910	32.1	6.6	11.5	31
1959	21.2	4.6	5.8	9

tivity, it must not be overlooked that the value of production per man-hour in farming was in 1958 only \$1.64 compared with \$3.38 for the value produced per man-hour in nonfarm work.

Changes in farm population, number of farms, and farm employment provide further indicators of rates of growth of the total economy (Table 2.2).

From 1930-59 the U.S. labor force increased by 40 percent, while the farm labor force decreased by 40 percent.

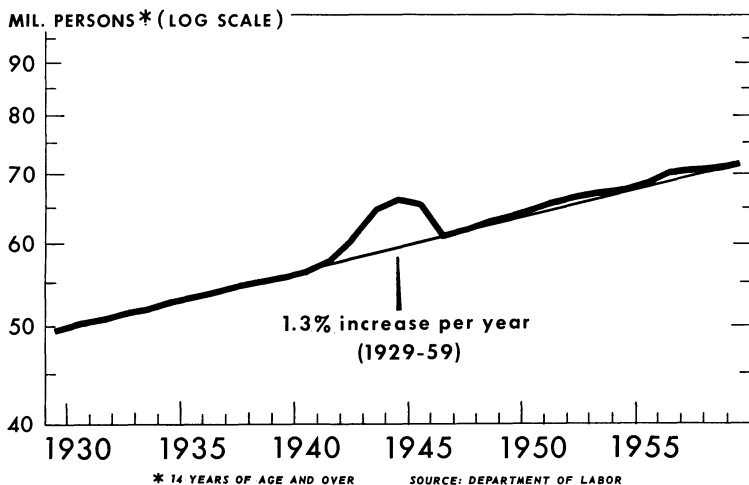
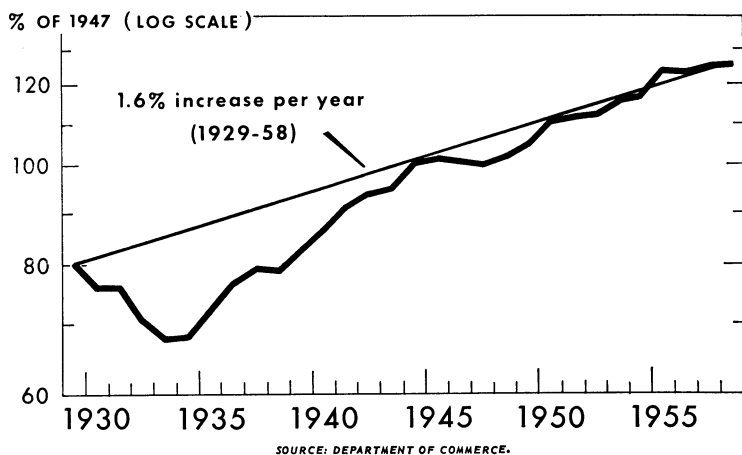


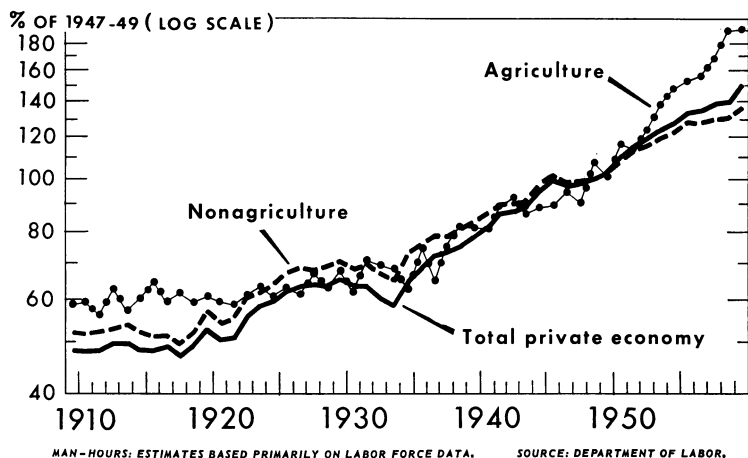
Fig. 2.3 — Total U.S. labor force.



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Fig. 2.4 — Real gross national product in the United States per person engaged in production.



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Fig. 2.5 — Real product per man-hour in the U.S. private economy.

The percentage of disposable personal income (i.e., personal income minus personal income taxes) saved has ranged in the years 1950-59 from 6.1 to 7.9 percent, after having reached a high of 25.1 percent in the war years with their reduced supply of consumer durable goods and many services (1944), and a low of 4.5 percent in postwar years of high consumption expenditures (1949).

PROSPECTS FOR THE NEXT DECADE

While it is impossible to forecast or predict the future developments of the United States or any other economy with any degree of accuracy, it is nevertheless a useful procedure to compose some projections of what may happen under certain assumptions. The projections in Table 2.3 are based on the assumption that there will be neither war nor serious depressions.

If this projection should come true, the per capita share in the gross national product would increase up to 1970 by 2.5 percent per year in terms of dollars of constant purchasing power.

The Bureau of the Census has projected for the decade 1960-70 an increase of the population from 180 million to 208 million, or a growth of 28.4 percent. This is a slightly higher rate than in the preceding decade (Figure 2.6).

TABLE 2.3
PROJECTION OF GROSS NATIONAL PRODUCT IN 1958 PRICES

Year	Total GNP	GNP
	(\$ billion)	(\$ per capita)
1950	352	2,300
1955	435	2,600
1960	505	2,800
1965	598	3,100
1970	732	3,500

Source: Department of Commerce, Office of Business Economics; Bureau of Labor Statistics.

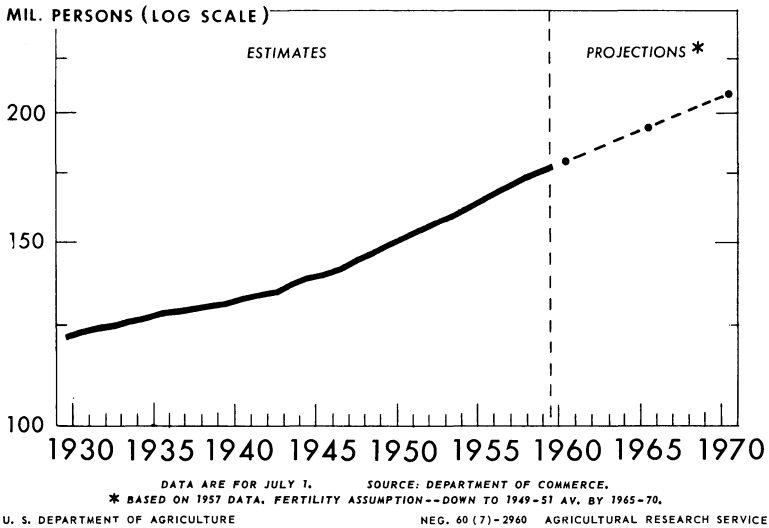
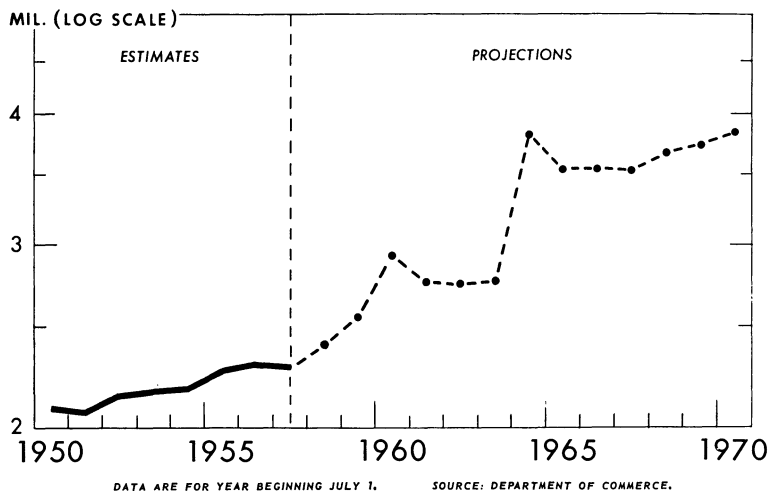


Fig. 2.6 — Population growth in the United States with projection to 1970.

In the sixties, the increase of the number of persons reaching the age of eighteen will be much larger than in the fifties (Figure 2.7). It was about 2.2 million per year from 1950-55, and reached 2.6 million only by 1960. The annual numbers of these young people ready to enter the labor force or college are expected to develop as follows (in millions):

1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
2.9	2.8	2.8	2.8	3.8	3.6	3.6	3.6	3.7	3.8

As the projected figures indicate, it is anticipated that by 1965 and thereafter the entry of young people into the labor force will probably be one million higher than it was prior to that year. The Bureau of the Census and the Bureau of Labor Statistics project a growth of the labor force by 1970 of 18 percent or of 13.5 million workers to a total of 87.1 million compared with 73.6 in 1960.



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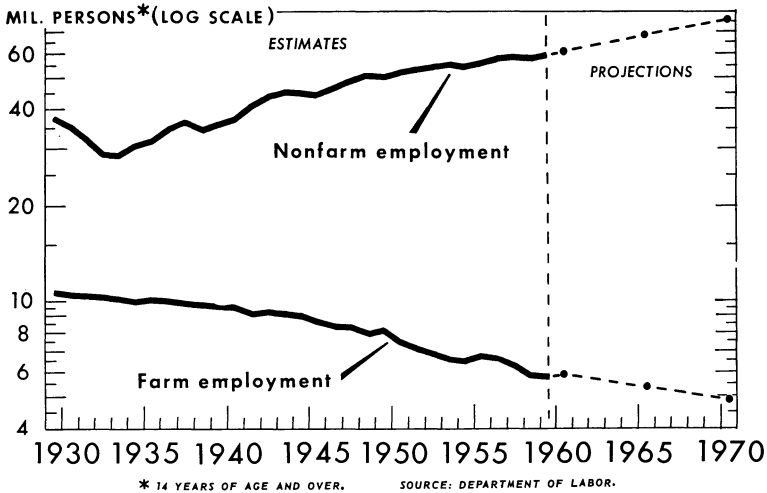
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Fig. 2.7 — Persons in the United States reaching eighteen years of age with projection to 1970.

Total employment, which is expected to rise by 20 percent, is likely to vary greatly by industries as follows: 30 percent or more increase in the construction, finance, insurance, and real estate business; 25-29 percent in trade, government, and all other services; 15-24 percent in manufacturing; and only 5-14 percent in transportation, public utilities, and mining. For farming, employment is expected to decline from 5.9 million workers in 1960 to 4.9 million by 1970 (Figure 2.8).

While all these figures are not forecasts of what *will* happen, but projections of what *may* happen in the coming decade, they imply the probability of a continued healthy expansion of the national economy. If this should come true, it would create a great need for further dynamic adjustments in farming and will offer opportunity for improving the income of the farmers.

Even with this favorable outlook, changes and adjust-



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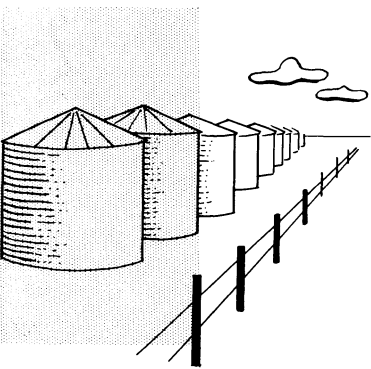
Fig. 2.8 — Farm and nonfarm employment in the United States with projection to 1970.

ments accompanying dynamic growth of the nation will bring considerable hardship for many individuals and families. It is the duty of our humane society to alleviate hardship by assisting people in making adjustments. But it lies beyond the power of government to avoid the adjustments which are involved in economic growth.

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CHAPTER 3

*The farm problem defined;
its causes; unique characteristics
of agriculture—needs and progress
in adjustment.*

Nature of the Farm Problem

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THE NATION'S COMMERCIAL FARMS are in the midst of a problem of growth stemming from rapid technological and economic advance. Economic and technological advance might place premiums on products from and returns in farming if the United States were a poor nation. However, the nation is wealthy and per capita incomes are great. Hence, further rapid progress in technological and economic development multiplies farmers' problems within farming and in comparison with other segments of our economy. It also calls, through the market, for adjustment in the land, labor, and capital used in farming.

Growth has been a main characteristic of the U.S. economy in postwar years. Starting from a 1947-49 base period and in money terms, gross national product increased by 90 percent to 1959, partly due to price increases. Total disposable income (amount people have to spend after taxes) increased by 83 percent and income per capita of the nonfarm population rose 40 percent in this period.

In the same time span, farm income has declined, both absolutely and relatively. Total net income from farming declined by 20 percent from 1947-49 to 1959. Income per capita from farm sources increased by only 16 percent, even though the farm population decreased by 30 percent.

We have attained a level of economic development and per capita income where further economic progress does not reward farm and nonfarm sectors equally.

The decline in net income of farming has not come

TABLE 3.1

FARM POPULATION, LABOR FORCE, AND INCOME PER PERSON IN FARMING
AND IN THE NONFARM LABOR FORCE

Year	Farm population	Farm popu- lation as percent of U.S. total	Persons employed on farms	Income per person in farming		Income per person of nonfarm population
				<i>From farming</i>	<i>All sources</i>	
	(million)		(million)			
1946	26.5	18.7	10.3	\$ 644	\$ 806	\$ 1,295
1947	27.1	18.8	10.4	644	825	1,394
1948	25.9	17.7	10.4	765	962	1,534
1949	25.9	17.4	10.0	567	767	1,511
1950	25.1	16.5	9.9	626	838	1,585
1951	24.2	15.7	9.5	751	983	1,763
1952	24.3	15.5	9.1	711	962	1,849
1953	22.7	14.2	8.9	666	931	1,902
1954	22.1	13.6	8.6	660	925	1,849
1955	22.4	13.6	8.4	610	894	1,975
1956	22.3	13.3	7.8	600	901	2,073
1957	21.6	12.6	7.6	665	974	2,102
1958	21.4	12.3	7.5	768	1066	2,066
1959	21.2	12.0	7.3	690	1001	2,131

Source: USDA Agricultural Outlook Charts, 1960.

because farming has lagged in efficiency and production. To the contrary, farmers have improved technology rapidly, with productivity growing accordingly. Farm production increased by about 50 percent over the 20 years 1940-59, and even by 25 percent in the ten years 1950-59.

While income has increased per person remaining in farming, this increase has been slower and smaller than for workers and managers in other industries. In general, the return to resources employed in farming has been much lower than for resources of the same quality employed in other industries.

Income from farming per person has scarcely increased in the postwar period (Table 3.1). Total income from all sources, per person in farming, has increased about 20 percent mainly due to farm families turning to more off-farm work. However, the income per person of the non-farm population grew much more rapidly, increasing by about 65 percent since 1946.

THE FARMER'S DILEMMA AND PRODUCTION ADJUSTMENT

Farm families find themselves faced with a dilemma. Individually, it is initially profitable for them to adopt new technologies and to increase capital expenditures and farm production accordingly. But farming is highly competitive and demand elasticity is extremely low. Therefore, income is depressed as the majority of farmers improve their operations and aggregate production is increased.

It is not profitable for the individual farmer to retrench, discarding recent technology and the capital investment it represents. If he does so, he finds the diminution in his own production too small to show up in the total supply, or to have any effect in increasing market price. He would end up producing less at a lower price and with a greatly reduced income.

The competitive nature of farming is a strong force leading to continued technological and economic progress. But at the same time, this progress, which benefits consum-

ers in variety and favorable price of food, causes short-run income burdens on farmers.

Under economic growth, with national income increasing and farm production outpacing population growth, farmers have been caught in a price-cost squeeze. A decline in income for farm families has resulted except for those who increased scale and decreased per unit costs more than enough to offset the decline in price. This adjustment is impossible for all farmers because of the limits on land area in farming. Generally, some farmers can expand only if others reduce their acreage or give up farming. The extreme difficulty of increasing demand for major farm products serves to restrain all farmers from simultaneously increasing production, as a means of beating the price-cost squeeze.

INFLUENCE OF FARM PRICES ON USE OF FIXED RESOURCES

Farmers do, of course, make adjustments in their production as prices change. For individual commodities they are highly responsive to both increases and decreases in prices. History of changes in production of such commodities as hogs and soybeans proves this to be true. As price of an individual commodity such as pork increases relative to the price of competing products, hog numbers are increased readily, considering the time lag necessary for formulating breeding plans after change in the price. With a decrease in pork prices, relative to prices of feed and competing commodities, hog numbers and marketings are decreased readily, given time for farmers to change their production plans. Acreage of soybeans or other crops change similarly as prices of these products change relative to the prices of competing crops.

These types of changes have little effect on the total quantities of resources used in farming and on total farm production. As soybean acreage is increased or decreased relative to corn, for example, total farm production remains about the same.

Total production does not respond so readily to price changes in both directions. Over time with improvements in technology, favorable farm prices have encouraged rapid increases in total farm production.

As farm prices have declined relative to farm costs and to returns on labor and capital in other economic sectors, farm production has not shown a similar tendency towards rapid retraction. Even in the depths of recession, total farm production has not declined as in other industries.

This short-run tendency of farm production to be maintained under unfavorable prices, or even to increase during these periods under the force of improved technology, evidently arises for several reasons.

An important portion of the costs in farming are fixed and continue in the same magnitude regardless of the amount produced. The individual farmer's opportunity to change plans and limit income reduction comes largely from his ability to adopt new technology or use more land, labor, and capital, and expand production by a greater proportion than the increase in his direct costs. Evidently enough farmers do make these adjustments so that reduction in production by some farmers who must curtail or cease production during periods of unfavorable prices, is completely offset.

A more important variable relating to maintenance of farm production is the fixity of some costs or resources in the industry. Some of these are fixed in quantity for relatively long periods of time. 'At one extreme is land which is fixed absolutely and with few alternatives to farm uses, except for the small portion devoted to industrial, residential, transportation, and recreational uses.

Even the quantity of buildings and machinery is highly fixed for an important number of years, once investment has been made in them. As long as they will pay any returns above their salvage value in other uses, they continue to be employed in farming. Land is an extreme example of this limited flexibility in use of farm resources. Its reser-

vation price, the level of return necessary to keep it in production, is extremely low since the major part of it has no alternative use except for farming. Hence, regardless of the level to which crop prices decline, farm and ranch land continues to be held in production as long as the return from it covers the cash costs of the crops and livestock produced on it.

The value of an important quantity of land, buildings, and machinery used in farming tends to decline, with appropriate time lag, as readily as the prices of the commodities which they produce. Aside from government support prices, a decline in livestock prices is accompanied with a decline in feed prices, so that production of livestock continues even under general recession of prices and income. Similarly, given a decline in crop prices, land is continued in production on rented farms since the share value of rental declines with crop prices. On owner operated farms, land is not withdrawn from production as long as prices at a lower level cover out-of-pocket costs. Even when one farmer relinquishes his farm and moves from farming, a neighboring operator usually stands ready to take it over and keep it in production.

The combination of competitive structure, fixed costs, and flexible costs of items originating on the farm tend to maintain over-all farm production during prolonged periods of unfavorable prices and incomes. In other major industries made up of a few large firms a reduction in demand is more quickly accompanied by curtailed production and release of labor and raw materials and the variable costs which they represent.

The rate at which total farm production might be curtailed, under an extremely long period of unfavorable farm prices and income, is not known. Obviously though, if unfavorable prices and low incomes prevailed for a sufficiently long time, more land would be withdrawn from intensive agricultural uses — such as field crops — and diverted to forestry, grasses, and similar uses. Along with these shifts

in use of land would come shifts in employment of labor and capital. These land use shifts would tend to become concentrated in particular geographic locations or communities rather than spread evenly through all farming regions.

ECONOMIC GROWTH PROBLEM

Farming in a wealthy, growing economy will generally face a cost-price squeeze, and a less favorable income situation than other major economic sectors. The reason lies in the so-called magnitudes of income elasticities of demand. Income elasticity indicates for a particular commodity, or particular groups of commodities, how much more food consumers will buy as their incomes increase — expressed as percentage. If expenditure increases by 1 percent with each 1 percent increase in consumer income, the income elasticity is 1.0, indicating that expenditure on the commodity, or the demand, increases in the same proportion as income. If, however, the increase in expenditures is only .5 percent, the income elasticity is only .5, indicating that growth in demand for the commodity approximates only half the rate of growth in income.

Industries which produce commodities with high income elasticities are in the most advantageous position to use more resources and increase production as national and per capita income grow.

Those industries of low income elasticities are much less favored, largely because they represent commodities for which the consumer is well supplied and has little capacity for further expansion. Evidently, the income elasticity for that part of food produced on U.S. farms is only .15 percent, meaning that, on the average, a 1 percent increase in per capita income causes only a .15 percent increase in expenditure on food.

As incomes of consumers increase, food no longer becomes their major concern. They want relatively more home appliances, better housing, medicine and health serv-

ices, recreation, travel, and education. As the U.S. consumer's income increases, he does not buy any more pounds of food, but simply changes the composition from fats, starchy foods, and such staples to more fresh vegetables, better cuts of meat, fruits, etc. Food consumed per person, measured in pounds, has not increased in the last 40 years. Even this .15 percent increase in expenditures for food represents largely demand for improved quality and more processing and retailing services.

In contrast, consumer expenditures increase rapidly on many nonfood products as income grows even more than 1 percent.

This situation will continue, aside from temporary setbacks, as national and per family incomes continue to increase. "Good living" no longer is characterized simply by getting enough food, clothing, and shelter for subsistence. Use of the nation's resources will shift accordingly under further economic growth, with a declining proportion of national income from farming and a smaller proportion of labor and other resources used in it. Consumers express their wishes through prices paid in the market.

The consumer's willingness to pay higher prices for nonfarm goods and services keeps up the cost of steel, labor, petroleum, and other materials which produce the "more luxury" goods. Consequently, the cost of tractors, lumber, fuel, fertilizer, and other cost items of the farm is kept up, because of the nature of consumer demand and the organization of industries which produce and fabricate these materials.

This, then, is the major cause of the farm price squeeze in a period in which national income is growing and farm production has moved ahead of the rate of population growth. This cost-price squeeze plus signals from the consumer that he believes too many productive resources are employed in farming had already started in the 1920's. It is not a phenomenon of postwar years; it is not a "hangover" from war. It was, of course, obscured by the abnormal de-

mand conditions of depression of the thirties and the war conditions of the forties. Now it is back with us as a mark of a wealthy society in which hunger is the concern of few.

The tendency for farm production expenses to press upward, due to inflation and demand for labor and capital by other industries, and the rigidity of prices for farm supplies, while farm commodity prices decline, is illustrated in Figure 3.1. Production expenses have taken an increasing proportion of gross farm income since the end of the war. Even between 1950 and 1959, production expenses of farming increased on the average from 60 percent of gross farm income to 70 percent.

The increasing proportion of expense to gross farm income arises from adoption of new technology, increased use of capital in farming, and from the shift in consumer demand toward more fresh fruits and vegetables and higher quality meats, and away from such staples as potatoes, cereals, fats, and oils.

EFFECT OF EXCESS FARM PRODUCTION ON PRICES

Surpluses and low returns in farming arose because the productivity of resources used by farmers increased and the amount of these resources used remained large relative to demand. Even under economic growth and income elasticities of zero, the farmers' position would be relatively

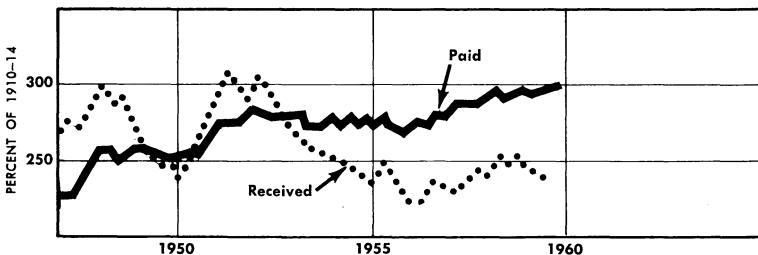


Fig. 3.1 — Trend in prices paid and prices received by U.S. farmers, 1950-59.

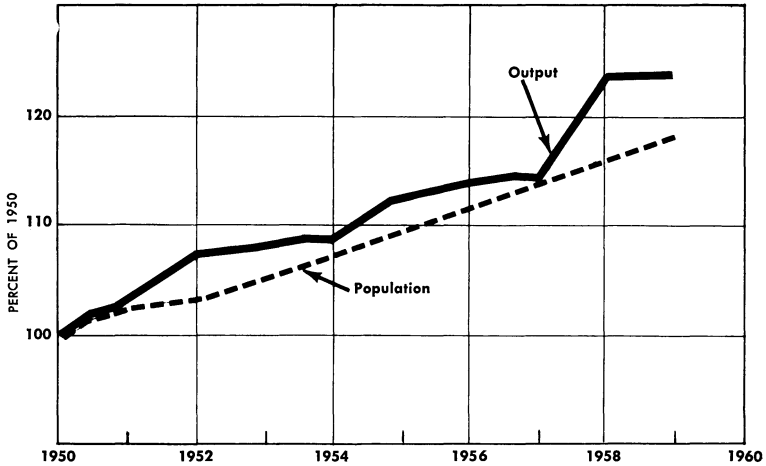


Fig. 3.2 — Indices of growth in farm output and population in the United States, 1950–59.

favorable, if increase in production only paralleled population growth. Or, if increase in production exceeds that of population, markets outside the country would be needed to enable returns on resources used in farming (especially labor and capital) to compare favorably with those used in other industries. Rate of increase in farm production has consistently exceeded the rate of population growth in the last decade (see Figure 3.2). The average rate of increase in farm production was 2.4 percent over the 10-year period 1950–59. The average rate of increase in population was only 1.7 percent in the same period.

This difference in growth rate is small. However, because of the so-called low *price* elasticity of demand for major farm products, the difference in growth rates causes severe depression of farm prices and income. Price elasticity of demand is different from income elasticity of demand in this respect: price elasticity is an indication of change in quantity purchased by consumers as the price

of the commodity itself changes — expressed in percentages. For example, if a 1 percent increase in quantity purchased is accompanied by a 1 percent decline in price, the price elasticity is -1.0 . An increase in amount marketed then will leave income from the product approximately unchanged. If, however, the decline in price is greater than the increase in amount purchased, the price elasticity is less than -1.0 and a larger supply will return less total value than a smaller supply.

In contrast, a price elasticity greater than -1.0 , (increase in supply accompanied by a smaller percentage decrease in price) allows a greater supply to bring more revenue in the market than a smaller supply. The difference is illustrated in Table 3.2 where we assume an original output of 100, a price of \$1.00 and a total value of \$100 (million).

In the new situation A, price elasticity is high — greater than -1.0 . Consequently as supply is increased by 10 percent from the original situation, price declines by only 5 percent. Even with the decline in price, total value increases. Total value is increased, with more supply, because price declines by a smaller percentage than the increase in supply. (The demand elasticity is greater than -1.0 .) In new situation B, however, price elasticity is low (less than -1.0) and a 10 percent increase in supply causes a 20 percent decrease in price. Since price declines

TABLE 3.2

EFFECT OF PRICE ELASTICITY ON SUPPLY, UNIT PRICE, AND TOTAL VALUE

	Supply	Unit price	Total value
	(<i>million</i>)		(<i>million</i>)
Original situation	100	\$1.00	\$100
New situation			
A (price elasticity 2.0)	110	.95	104.5
B (price elasticity 0.5)	110	.80	88

by a greater percent than the increase in supply, total value also decreases. The decline in price more than offsets the increase in supply.

Unfortunately, from a farm income standpoint, the situation in farming is that of B. Demand is inelastic, from a price-quantity standpoint. A modest increase in production can cause a marked decline in price and income.

As illustrated in Figure 3.2, the rate of increase in farm production has been only slightly greater than the rate of increase in population or number of domestic consumers. Yet, because demand for farm products is so inelastic, this small excess places a heavy burden on prices and farm incomes. Past demand studies have shown that for each 1.0 percent increase in output, hog prices decline by about 2.5 percent; cattle and calves, veal, and poultry by about 1.7 percent; eggs by about 5 percent; dairy products by 5 percent; and feed grains by about 2.5 percent. Wheat has about the same elasticity as feed grains if it is used for this purpose. The price decline for a 1 percent increase in production is much greater for wheat used as food. These figures apply to the situation in which quantity of the individual product increases. The price of an individual commodity also decreases when the quantity of a competing or substitute commodity increases.¹

NATURE OF FARMING

The competitive nature of farming and low price elasticity of demand for farm products promote economic progress from the standpoint of total society. They cause pressure on the individual to improve technology and increase productivity. Consequently, since the magnitude of demand for food is tied quite rigidly to the size of population or number of consumers, the strong trend is for each unit to be produced at lower cost. Resources used in farming

¹ Stated in terms of elasticity of demand, percentages in this paragraph would be: Hogs, — 0.4; cattle, calves, veal, and poultry, — 0.6; eggs, — 0.2; dairy products, — 0.2; and feed grains, — 0.4.

are thus "saved," so that they can be diverted to other economic sectors where consumers desire other goods and services as their incomes increase. The extent of these savings over the past two decades is indicated in Table 3.3. Not only has the U.S. consumer had a wide variety and quantity of food for selection, but each unit of food has been produced at lower cost. With growing population, total food requirements or demand have increased, but it has been possible to produce this greater amount with about the same total quantity of resources as previously. Without this improved efficiency, total resources used in farming would have needed to increase by upwards of 45 percent between 1940 and 1959 to allow for growth in population and improved nutritional standards.

TABLE 3.3
INDICES OF FARM PRODUCTION AND RESOURCES USED, U.S., 1940-58

Year	Total farm production	Total farm resources used	Resources per unit of production
1940	100	100	100
1941	104	100	96
1942	117	104	90
1943	115	104	90
1944	118	104	89
1945	116	102	89
1946	120	102	85
1947	116	102	89
1948	127	103	81
1949	123	104	81
1950	123	104	81
1951	130	107	82
1952	132	107	81
1953	133	106	80
1954	133	106	80
1955	138	105	76
1956	140	105	75
1957	140	105	75
1958	152	103	68
1959	152	103	68

Source: USDA

As individual farmers use more capital resources and push production upward against the inelastic demand for food and fiber, income per farmer can be maintained only as there are fewer farms and farmers. Declining number of farmers has been the main source of resource savings in farming over the past 20 years. Farmers who remained in the industry have, on the average, expanded their use of capital other than land by over 100 percent since 1940. These capital expenditures took place in adopting new technology and extending existing technology.

By individual categories, the increase in capital expenditures were 135 percent for machinery, 142 percent for fertilizer and lime, 125 percent for feed and livestock, and 37 percent for miscellaneous items. But at the same time, the number of farms declined by 30 percent and total farm labor declined by 47 percent. The substitution of capital for labor left total value of resources used in farming about the same while total production increased by 52 percent.

The drive by individual farmers to use new capital and technology on the existing farming area is particularly encouraged in a competitive farm industry with an inelastic demand for its products. It is an unending process because the gains to the individual farmer from expending production are partly or entirely dissipated as the majority of farmers follow this procedure and farm prices and income are depressed in the manner explained above. Hence, the process becomes continuous as the individual farmer tries to increase his income by increasing production and lowering unit costs.

But because of low demand elasticities, and especially in a growing economy where alternative employment of labor and capital is available at favorable rates, farm families with limited capital and managerial ability particularly find that they can increase their income by transfer to non-farm industries. As they do so and income and farm resources are recombined into fewer remaining farms, economic gains to society are realized. In general, use of labor

in farming can be decreased as capital is substituted for it. With some surplus labor and machinery in major producing regions, farm consolidation can take place with a saving of total costs in farming relative to total production. When two farms of 160 acres are consolidated, for example, the new farm unit seldom needs to duplicate the machinery of the two previous units.

SURPLUS LABOR LOWERS FARM INCOME

Conservatively figured, considering some change in the composition of farm production, only about 50 percent of the 1940 farm labor force was needed to obtain the 1959 production. Labor was freed to produce other goods and services desired by consumers in a wealthy and growing economy. Declines of important magnitude took place in the farm labor force and farm population between 1940 and 1959. Even though farm population declined by 30 percent and farm employment by 45 per cent, this change was not large enough to bring labor returns in farming to a level comparable with other industries. The farm labor force would have had to decline by another third of the 1959 level if net income per worker in farming were to equal the average wage return of workers in manufacturing industries [even with additions to farm income of (a) 20 percent for cost of living differentials and (b) 6.7 billion dollars of income from nonfarm sources]. Even then, this level of return to a third smaller farm labor force would have allowed no interest return on the capital used in farming.

Returns to labor in farming consistently lagged behind wage rates in manufacturing and service sectors of the economy. This condition prevailed because of the historic excess of births in the farm population over farming opportunities. The large labor supply born within the farming industry, much larger than replacement rates for farm operators, helped cause overproduction and lowered prices of commodities and, on the average, to keep returns to labor

low. Of course, not all farm workers had the education, skill, and experience to make them comparable with wage workers in manufacturing and service industries. This is a condition which can be remedied by society through improved educational, counseling, and employment services.

TECHNOLOGICAL ADVANCE AND ECONOMIC PROGRESS

Farmers adopted production-increasing technology not simply because of its discovery, but because it was profitable to do so. Few farmers adopt new techniques for the sake of being innovators *per se*. Largely they do so because they can thus increase profits. They can increase profits only if new materials and machines are priced favorably relative to the price of products they produce. This has been the condition over recent decades. While all prices increased due to inflation, prices of important production supplies did not increase as rapidly as farm commodities in early postwar years. Accordingly, the actual cost of these farm supplies decreased; their prices were lower relative to commodity prices than they were in postwar years. As Table 3.4 indicates, the prices of fertilizer, machinery, and all cost items were lower in the 1950's relative to prices received by farmers than in the prewar period 1935-39 when surpluses also existed, or even during the war.

Farm commodity prices declined generally, relative to

TABLE 3.4

INDEX OF PRICES RECEIVED AND PRICES PAID BY FARMERS, 1935-59. 1935-39=100.

Index of:	Period				
	1935-39	1940-44	1945-49	1950-54	1955-59
Prices received by farmers . . .	100	144	231	252	221
Price of fertilizer	100	100	132	150	151
Price of machinery	100	102	130	173	191
Price of labor	100	178	333	395	455
Price of land (alone)	100	112	188	254	325
Prices paid, all costs	100	122	184	220	229

Source: USDA

the prices of farm production items and compared to the prewar period in the past five years. The decline in farm prices was eased by government support prices and, with improved technology, an economic climate favorable to increased production has been maintained. Farm supplies purchased from nonfarm sectors have not declined even with recent depression of commodity prices. However, without support prices at levels of recent years, price ratios would have been less favorable to purchase of those items from nonfarm sources and to increased production.

These favorable price ratios not only favor greater use of these production items, but also favor their substitution for land and labor. By 1955-59 the price of machinery had risen by only 91 percent while wages of hired farm labor, a main resource for which machinery substitutes, had increased by 355 percent. Similarly, the price of fertilizer, a resource which serves as a substitute for land, increased by only 51 percent while land price increased by 225 percent. Unlike labor, land was not withdrawn from production over the last two decades. Cropland remained almost constant. Price supports and government programs employed over the period retarded adjustments in land used for farming.

Recent technologies also include those which require a larger farming unit and a greater production per farm, if they are to be used profitably. Cost advantages for farms with larger acreages or animal numbers arise mainly from mechanical innovations relating to power, machinery, equipment, and buildings. Power units, field machines, harvesters of greater capacity, and larger crop handling equipment particularly increased the size or acreage range over which it is possible to get declining per unit costs in cotton, corn, wheat, and other field crops. Increased capacity and productivity of these machines has greatly increased the number of acres, animals, and birds which can be handled by one man or the farm family. Since the fixed costs of these high capacity machines are greater than those of machines in prewar days, the per unit costs decline more

sharply with larger production. For the same reason, the economic disadvantage pinches more sharply farms of small acreage.

ECONOMIC PROGRESS AS IT AFFECTS FARMERS AND THE NATION

Technological improvement, in farming and nonfarm sectors, is the important source of economic progress and rising per capita incomes. Without improvements in technology, limits to the size of national income would soon be encountered: or while national income might increase gradually with population and size of the labor force, per capita income would decline as population grew.

Fortunately in the United States, particularly as a result of technological advance and improved skill of people, national income has grown more rapidly than population, with a consequent rise in income per capita. Labor productivity has increased throughout the economy, as well as in farming. The nonfarm worker can obtain his family's food requirements with fewer hours of work than at any previous time in history. But also, because of technological progress in farming and other industries, farm people also can acquire nonfarm goods and services with a smaller outlay of labor than in previous decades.

This general type of progress, with more goods and services available with less human effort, is valued highly by U.S. and other societies. It is desired no less in farming than in other industries. Farming has contributed importantly to this process, as labor has been freed for use in other industries and capital requirements per unit of food production have been kept relatively low.

The relative contribution of the farm labor force has increased greatly in the last century (Table 3.5). Even in the last decade, the number of persons supported by one farm worker has increased from 15.5 to 26. Without advance in farm productivity since 1910, nearly 20 million

TABLE 3.5

PERSONS SUPPORTED BY FARM WORKERS AND FARM LABOR "SAVINGS"
FOR THE NATIONAL ECONOMY, FROM TECHNICAL CHANGE
AND CAPITAL INVESTMENTS

Year	Number persons supported by one farm worker	Percent increase over pre- vious 10 years	Persons ac- tually em- ployed in farming	Persons needed to produce food at 1910 productivity rates in farming	Labor force "saved" by farm advance, compared with 1910
			(million)	(million)	(million workers)
1850...	4.2	3	5.7	.....	.....
1860...	4.5	7	7.3	.....	.....
1870...	5.1	13	8.0	.....	.....
1880...	5.6	8	10.1	.....	.....
1890...	5.8	7	11.7	.....	.....
1900...	7.0	20	12.8	.....	.....
1910...	7.1	1	13.6	13.6	0.0
1920...	8.3	6	12.5	14.9	2.4
1930...	9.8	18	11.0	15.4	4.4
1940...	10.7	9	11.0	16.5	5.5
1950...	15.5	46	9.9	21.8	11.9
1960*..	26.0	58	7.1	26.3	19.1

* Preliminary

Source: Based on data in USDA Agricultural Outlook Charts for 1959 and 1960.

more workers would have been needed in farming to meet domestic food needs and exports at 1959 levels.

The portion of gain in economic progress to society contributed by the farm industry has not been made without sacrifice on the part of the farmer. True, other industries contribute to economic progress and they adjust labor and other resources accordingly. Down through history, changes in technology and demand have revolutionized the structure of some industries and diminished the relative magnitude of others. Capital has been substituted for labor, or workers have shifted from industries with low income elasticities of demand to those where the elasticities are higher. Table 3.6 indicates the general types of long-run adaptations which have taken place.

TABLE 3.6

SHIFTS IN DISTRIBUTION OF U.S. LABOR FORCE AMONG INDUSTRIAL SECTORS, 1890-1920 AND 1920-50

Industry	1890			1920			1950			Change 1890 to 1920 (percent)	Change 1920 to 1950 (percent)
	No. (000)	Percent	No. (000)	Percent	No. (000)	Percent	No. (000)				
Farming.....	9,990	42	11,120	27	7,015	12			+ 11	- 37	
Forestry & fishing.....	180	1	280	1	127	0 *			+ 56	- 55	
<i>Total primary</i>	10,170	43	11,400	28	7,142	12			+ 12	- 37	
Mining.....	480	2	1,230	3	1,035	2			+156	- 16	
Manufacturing.....	4,750	20	10,880	27	15,930	27			+129	+ 46	
Construction.....	1,440	6	2,170	7	3,940	7			+ 51	+ 82	
Transportation & utilities.....	1,530	7	4,190	10	4,750	8			+174	+ 13	
<i>Total secondary</i>	8,200	35	18,470	45	25,758	44			+125	+ 40	
Trade & finance.....	1,990	8	4,860	12	12,650	22			+144	+160	
Personal services.....	640	3	1,630	4	3,600	6			+155	+121	
Other services.....	2,570	11	4,810	11	9,310	16			+ 87	+ 94	
<i>Total tertiary</i>	5,200	22	11,300	27	25,560	44			+117	+126	
<i>All industries</i> †.....	23,570	100	41,170	100	58,460	100			+ 75	+ 42	

* Less than 1 percent.

† Exclude unallocated workers.

Source: Fabricant, Solomon, "The Changing Industrial Distribution of Gainful Workers," *Conference on Income and Wealth*. Vol. XI. National Bureau of Economic Research, Inc., New York, 1949; and Stigler, George, "Trends in Employment in the Service Industries," National Bureau of Economic Research, Inc., New York, 1956. Comparable data for primary, secondary, and tertiary classification estimated from data in the *U.S. Census of Population, 1950*. Vol. II, Part I.

The farm industry has faced all of these types of adjustments. New technology in the form of mechanical and biological innovations substitutes for both farm labor and land. With low price and income elasticities of demand in farming, the farm industry cannot expand as rapidly as others where income elasticities are higher. Because of these low demand elasticities, a rate of growth in production which exceeds population growth severely depresses farm income. The demand for farm labor shrinks accordingly and migration must take place if (1) persons with limited opportunities in farming, because of lack of capital and managerial ability, are to take advantage of alternatives elsewhere in the economy where they can earn higher incomes and (2) those who remain in farming are able to operate with enough capital and land and on a scale which will provide their families with satisfactory incomes.

This adjustment problem is more difficult for farm people than for many industrial workers. There are several reasons why this is true, but two are particularly important. Especially important is the tie that holds the farm family to a particular piece of land and the country-wide dispersion of farming. It is not as easy for a western Kansas wheat farmer, for example, to shift to employment in the electronics industry at San Francisco as it is for a worker to shift between manufacturing or service industries within the city of Detroit. In the latter case, skills required in the two positions may be highly similar and the worker need not shift the location of his home. In addition to other complexities, transportation costs and lack of communication services hamper transfer of the Kansas wheat farmer.

Also important has been the educational training and vocational guidance facilities available in rural communities. Education and training directed at farm youth has focused on farming, even in regions where number of births greatly exceeds farming opportunities and out-migration has been necessary.

NEEDS FOR ADJUSTMENT

The economic problems of farming and the national economy over the past decade promise to continue in the 1960's. With further growth in national income, demand for farm products will not grow as fast as for goods and services produced in other sectors. Technological improvement will continue, with the effect of replacing labor in industries such as farming. Surplus-farm capacity and the tendency towards, or potential of farm surpluses, will continue over the next decade, unless unforeseen "break-through" comes in demand in such areas as foreign markets and new industrial uses, or unless we have effective controls on production.

The pressure for adjustment of the production and recombination of resources used in farming will continue. Two major sets of variables or forces are at work and will continue to call for adjustments in farming. On the one hand there are those facets of economic growth which place a "suction" on the farm industry from the outside. They cause the demand for products to grow differently, as the consumer uses his growing income to buy more of some goods and services and less of others. These forces tend to reward labor and capital more handsomely in industries other than farming, and cause these resources to be shifted accordingly.

On the other hand, technical advance making it possible to expand production will allow capital to replace labor in farming. In large part, the basic adjustments in farming must come from the production or supply side. This adjustment is possible only if the magnitude of resources used in production is changed.

Levels of farm income and returns on resources used in farming in future years will depend on the rate and extent to which resource combinations and total farm production are modified to correspond with consumer demand and national economic growth. Emphasis will continue to

be on farm labor, although some major adjustments in land use also are in sight.

Farming has contributed importantly to economic progress by meeting per capita food needs with fewer resources. Farm labor has been freed for use elsewhere in the economy. But much of the labor thus freed has been left stranded in farming with two consequences. First, the income of many farm families has been depressed, resulting in a level of living which is inconsistent with the degree and possibility of wealth and economic growth in the U.S. economy. Second, the consuming society has not gained all of the contribution possible from increased productivity in farming.

PROGRESS IN ADJUSTMENT

The adjustments in prospect for farming, both as a result of technical change within the farm industry and economic growth in the general economy, are not of revolutionary nature. The number of farms and the size of the farm population, aside from temporary recession periods, declined continuously over the past several decades. These trends took place with growth in the national economy during both prosperous and depressed periods for farming, although the rate of change was more rapid during years when income of farmers declined. For example, in the 1947-52 period of prosperity in farming, the number of farm workers declined by 1.2 million persons or 12 percent. During the period 1953-59, one of continued surpluses and depressed prices, the number of farm workers declined by 1.5 million or 17 percent.

In both periods, higher wages outside of farming "pulled" workers from farming, but in the latter period, low farm incomes also "pushed" labor from the farm industry.

Price support programs and other government farm programs have not prohibited the basic process of labor adjustment to economic growth. While prices of farm commodities drew forth a greater farm production than con-

sumers demanded, rising returns to capital and higher wage rates in other industries caused labor to transfer from farming. Government farm programs have likely been less important than positive programs in education, vocational guidance, and employment services to facilitate the movement of farm workers into better jobs.

It makes little sense for society to make large capital investment in promoting farm technology, which has the main effect of displacing farm labor, without investing equally in guiding this farm labor to production of nonfarm goods and services desired by consumers.

CHANGE IN RESOURCE ORGANIZATION ON FARMS

While the change in resource combinations of the total farm industry has been great, even greater changes have taken place in the resource combinations on individual farms. The resources used in farming (Table 3.7) emphasize these differences. Resources used in the total farm industry increased by only 10 percent over the 20-year period 1930-39 through 1950-58. While the increase in fertilizer, machinery, and livestock was large, the decline in labor used and the stable amount of land used tempered the total increase. Because of the decrease in number of farms, total resources per farm increased by 60 percent in this period. Real estate per farm increased by 63 percent by 1958, while the increase for all farms was only 12 percent.² As an average, per farm use of production items such as fertilizer, machinery, feed, and livestock services increased twice as much as on all farms. Between the periods 1930-39 and 1950-58, per farm use of purchased production items increased by 138 percent. The comparable figure for the total farm industry was only 60 percent. The index of nonpurchased production items, mainly labor, declined by 31 percent for the farm industry but by only 5 percent for the average farm.

² These figures are magnified somewhat by the fact that farms which have "disappeared" or declined in number have been especially those with few resources.

TABLE 3.7
RESOURCES USED BY TOTAL U.S. FARM INDUSTRY PER FARM FOR SELECTED PERIODS

Item	Total U.S. (millions)				Average per farm			
	1930-39	1940-49	1950-58	1959	1930-39	1940-49	1950-58	1959
Cropland (acre)	477	470	472	470	71.2	78.2	92.6	102.2
All land in farms (acre)	919	1,005	1,042	1,045	137.2	167.5	204.3	227.2
Workers (number)	12.3	10.4	8.5	7.4	1.8	1.7	1.7	1.6
Man-hours used (hr.)*	21.7	18.9	13.0	11.1	3,239	3,150	2,549	2,413
Total inputs ‡	100	109	111	110 †	100	122	146	160 †
Farm real estate ‡	100	103	112	112 †	100	115	147	163 †
Machinery & equipment ‡ . . .	100	156	266	274 †	100	174	376	399 †
Fertilizer & lime ‡	100	248	474	536 †	100	278	624	780 †
Feed, seed & livestock services ‡	100	205	313	381 †	100	229	412	555 †
Purchased items ‡	100	133	160	167 †	100	149	238	243 †
Non-purchased items ‡	100	86	71	65 †	100	96	94	95 †

* Billions for U.S.

† 1958.

‡ Index.

Source: Economic Report of the President. Washington, 1960. pp. 104-5.

The trends pointed out above for the past two decades will continue for the next, and perhaps at an increased rate, if relatively full employment and ample employment opportunities are maintained in the national economy. Continuance of these conditions and increased communication between farm and urban communities will speed up the tempo at which changes in occupation and location will take place. This provides the opportunity for the remaining farms to expand in land and total capital assets. Forthcoming technology for farming will certainly encourage this. But even in the absence of new technology, the full adjustment potential growing out of currently known technology and existing prices of production items will bring about further changes in the direction emphasized by Table 3.7.

RANGE IN FARM INCOME IS LARGE

The farming industry is not, of course, homogeneous. It has two major income problems: (1) that of commercial farming wherein production outpaced demand and therefore incomes have been low accordingly and (2) that of chronically low income farms, with farm families owning so few production resources that meager incomes would be forthcoming under any level of prices. The latter farms are concentrated in the South, although all regions have a few of them.

Change is taking place in the proportion of farms at different income levels. As Table 3.8 indicates, the number of commercial farms with sales of less than \$5,000 has declined continuously over the past 30 years, while farms with sales greater than this amount have increased in number.

A farm with gross sales amounting to less than \$5,000 cannot provide a return to farm labor comparable with other industries where the wage to skilled labor approximates this amount. Nearly a million farms still fall in this category.

TABLE 3.8
NUMBER OF FARMS BY ECONOMIC CLASS, UNITED STATES, SPECIFIED YEARS, 1929-54

Economic class	Value of sales (1954 prices)	Number of farms					Percent of U.S. farm sales in 1954
		1929	1939	1944	1949	1954	
	(dollars)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	
Commercial farms:							
Class I.....	25,000 and over	47	60	91	103	134	31.3
Class II.....	10,000-24,999	205	252	347	381	449	26.9
Class III.....	5,000- 9,999	560	585	723	712	707	20.5
Class IV.....	2,500- 4,999	1,078	1,015	976	882	811	12.1
Class V*.....	1,200- 2,499	1,274	1,070	867	661	536	5.7
Class VI*.....	250- 1,199	1,559	1,283	937	717	463	1.4
TOTAL.....		4,723	4,265	3,941	3,465	3,100	
Noncommercial farms:							
Part-time and residential†.....	Under 2,500	924	1,181	1,345	1,670	1,507	2.0‡
Subsistence*.....	Under 250	556	504	393	247	175	
TOTAL.....		1,480	1,685	1,738	1,917	1,682	

* With operator not working off the farm as much as 100 days and farm sales greater than income of family members from off-farm sources.

† With operator working off the farm 100 or more days, or other income of family members exceeding sales from the farm.

‡ Combined figure for part-time, residential, and subsistence farms.

Source: "Family Farms in a Changing Economy." USDA Agr. Info. Bul. No. 171, 1957.

Families on these farms have too few production resources to gain incomes in farming consistent with incomes which now characterize the U.S. economy and the growth associated with it. This was true even at the higher level of prices earlier in the decade.

Families on these farm units face the need for either shifting to other occupations where labor returns are higher or expanding their operations so that the amount of capital employed allows increased returns to their labor. Children on these farms will have to make much of this adjustment. An important proportion of farmers are at advanced age levels and lack the training for migration to other industries. Their values and customs frequently tie them to communities where industrial employment opportunities are limited. Age also prevents many from borrowing more capital and extending scale of operations to levels apparently necessary for favorable incomes in the decades ahead.

Opportunity does exist, however, for those in favorable locations to engage in part-time farming and supplement incomes accordingly. Part-time farming serves also as a means of adding income for beginners. Income to farm people from nonfarm sources increased from a fifth of total income in 1945 to a third in 1959. This opportunity is greatest in states with dense populations and greater concentration of other industry. It is generally lacking, however, in areas where adjustment needs are large, such as much of the area in the western half of the nation.

CHANGES IN LARGE-SCALE AND FAMILY FARMS

As illustrated in Table 3.8, most of the change in farm numbers has taken place in farms with gross sales per annum of less than \$2,500. The number of farms with sales smaller than this amount declined from 2.4 million in 1939 to one million in 1954. The number of farms with sales greater than \$2,500 has remained nearly constant. The

number of these farms increased from 1.9 million in 1939 to 2.1 million in 1944 and remained at the latter level in both 1949 and 1954.

The reduction in farm labor force came almost entirely on farms with annual sales of less than \$2,500. These farms produce so little that even as their labor and other resources are withdrawn from farming, production is affected only slightly. In 1954, for example, commercial farms with annual sales exceeding \$2,500 provided over 90 percent of all market sales.

The bulk of the farm income pressure still falls on family farms. The proportion of large-scale farms, those with a size of farm business greater than ordinarily handled by a farm operator and his family, has not increased in the last 30 years. In fact, the absolute number of such farms has declined almost steadily at 4,000 per year over the past 30 years. The proportion of family-scale farms has scarcely changed in the past 20 years and still constitutes about two-thirds of all farms (Table 3.9). Similarly, the proportion of small-scale family farms has held remarkably constant over the same period.

Farms with sales of over \$2,500 per year have changed, however, as a result of the technological revolution, changes in prices, and in the quantities and kinds of resources used in production. For example, the family-scale or typical farms indicated in Table 3.9 increased farm size from 200 acres in 1940 to 318 acres in 1954, an increase of more than 50 percent. Small-scale family farms increased size from 95 acres in 1940 to 116 acres in 1954. Despite these increases in land and in other capital resources, incomes of these family farms have not kept pace with incomes in other major sectors of the national economy in the last decade. In fact, the net income of family farms has declined over the past five years, though scale of operations and production increased. The decline in net income came about because of lower prices for products sold and higher

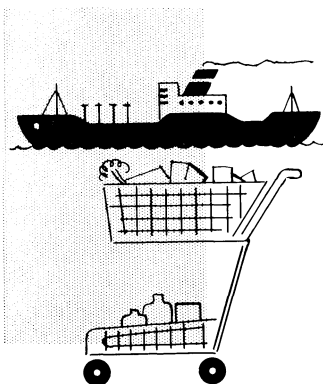
production costs. Evidently the farm income problem is not readily solved simply by an increase in scale of operations and greater production per farm.

TABLE 3.9
PERCENTAGE OF FARMS AND SALES REPRESENTED BY LARGE-SCALE AND
FAMILY FARMS, 1929-54

Size of operations	1929	1939	1944	1949	1954
<i>(Percentage of commercial farms in group)</i>					
Large-scale farms*	4.3	4.6	4.4	4.5	4.3
Family farms:					
Family scale or typical..	66.0	62.8	63.9	62.9	63.5
Small scale	29.7	32.6	31.7	32.6	32.2
All commercial farms.	100.0	100.0	100.0	100.0	100.0
<i>(Percentage of sales from group)</i>					
Large-scale farms	30	35	34	33	31
Family farms:					
Family scale or typical..	64	59	60	61	63
Small scale	6	6	6	6	6
All commercial farms.	100	100	100	100	100

* Large-scale farms are those with size of output exceeding that normally handled by operator and family labor; family-scale farms are those which productively employ at least the operator; small-scale family farms are those with sales over \$2500 but too small to productively employ full-time, able-bodied operator. The classifications in each year consider the prevailing technology and labor requirements under it.

Source: McElveen, J. V., "Family Farms in a Changing Economy," Agr. Info. Bul. No. 171, USDA, Washington, 1957.



CHAPTER 4

The factors of demand; measurements of the increase in demand possible through action programs.

Present and Future Demand for Farm Products

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THE NATIONAL ECONOMY has expanded substantially during the 1950's. Total population and income per person each increased about a fifth in ten years. Both factors tend to increase the utilization of farm products and, if farm production had stood still, should have raised farm prices and incomes substantially. Actually, prices received by farmers were somewhat lower at the end of the decade than at the beginning, and stocks of corn, wheat, and cotton were accumulating in government hands from 1952 on. The total net income of farm operators early in 1960 was also below the level of the corresponding months in 1950, just prior to the outbreak of hostilities in Korea.

Evidently, during the 1950's the production of farm products in the United States exceeded their utilization, or we should not have had the big increase in government holdings of farm products. Furthermore, the amount of farm products passing into final utilization increased rapidly enough during the 1950's to reduce prices of farm products both in absolute terms and relative to the prices of things farmers buy. The supply of farm products has been outrunning the demand by an amount somewhat larger than the rate of increase in the government's holdings of price supported commodities.

Chapter 5 will appraise present and prospective supplies of farm products. The present chapter will analyze in some detail the various "normal" factors which influence the demand for farm products and their probable consequences during the decade ahead. Against this background, the potentials of various special programs to influence demand will also be appraised.

The school lunch program and the direct distribution of food to persons on public assistance are examples of programs to influence demand. Exports for famine relief and for the economic development of friendly foreign countries are others.

Producers of particular commodities express considerable faith in the effectiveness of advertising and promotion in expanding their markets. Some people express similar hopes as to the effectiveness of quality improvement on the farm or in merchandising and processing channels. Still others hope that new industrial uses will provide profitable outlets for millions of tons of farm products, or they hope to establish new crops in the United States which would displace products which we currently import.

Others look to export subsidies or other forms of multiple price systems to move current surpluses into use and to increase farmers' income from the total production.

All the above measures involve purposeful action on the part of government agencies or of producer groups.

Growth of human population in our own country and in foreign countries is looked upon by some as the ultimate solution to the problem of surpluses. In fact, they believe that at some future time we will be struggling with the problem of food scarcity.

There is a kernel of truth in nearly every one of these expectations; at least the *directions* of the effects of particular programs are correctly anticipated in most cases. What is lacking in virtually all cases is a sense of proportion — an understanding of the relative magnitudes of the potential contributions of each program to surplus removal or demand expansion.

The main purpose of this chapter is to enable intelligent laymen and professional workers in disciplines other than economics to see in proper perspective these programs to influence demand. Then our discussions, political energies, teaching, and other activities will reflect a sharper focus on the factors and programs that hold the greatest promise (on the demand side) for alleviating the current farm income and agricultural adjustment problem.

THE UTILIZATION OF U.S. FARM PRODUCTION

To understand the effects of different factors upon the demand for farm products, we look first at the relative magnitudes of the streams of farm products flowing into different final uses.

As indicated in Table 4.1, domestic uses of farm products accounted for 88 percent of the total, 77 percent as food and 11 percent as nonfood products.¹ An additional 12 percent of total utilization were exports to foreign countries and shipments to U.S. territories, including the new states of Alaska and Hawaii.²

¹ In this calculation, feed and seed are treated as intermediate goods used up in the production process. In effect, the farm value of feed and seed is subtracted from the total farm value of crop production.

² All of the production and utilization figures in Chapter 4 apply to continental United States; they do not include Alaska and Hawaii. Shipments from the mainland to Hawaii and Alaska are included in the category "exports and shipments."

TABLE 4.1
UTILIZATION OF FARM COMMODITIES, UNITED STATES, 1958

Item	Percent of total utilization 1958 *	Approximate farm value 1958 †
	(percent)	(billion)
Total, all types of final utilization *	100.0	\$30.5
Domestic use, total	88.3	27.0
Food	77.0	23.6
Nonfood	11.3	3.4
Feed for work animals	0.8	0.3
Fibers and leather	5.6	1.7
Tobacco	2.0	0.6
Alcoholic beverages	0.8	0.2
Industrial oils and soap	1.2	0.4
Other nonfood use	0.9	0.3
Exports and shipments	11.7	3.6

* Net utilization, excluding pasture. Also excludes changes in storage stocks, feed consumed by livestock (other than work animals), and seed, as these are "intermediate" uses, and their value is included in that of final utilization. Based on 1958 quantities of each commodity going into each end use multiplied by its 1947-49 average farm price.

† Subaggregates of the official USDA index number, which is calculated in terms of 1947-49 average prices for each commodity, multiplied by 0.92, the ratio of the 1958 index of prices received by farmers (all commodities) to the average level of that index in 1947-49.

Source: Agricultural Marketing Service, Statistical and Historical Research Branch. Based on revisions as of April 1960 of figures in Supplement for 1958 to Measuring the Supply and Utilization of Farm Commodities (Supplement for 1958 to *Agriculture Handbook No. 91*, September 1959).

Each demand expansion factor or program could be "tried on for size" initially in terms of the percentage of total utilization to which it might apply. For example, new industrial uses of farm products would affect some part of the fibers and leather, industrial oils and soap, and other nonfood use categories, totaling about 8 percent of all utilization.

As indicated in Table 4.2, most domestic nonfood uses declined from 1950 to 1958. Domestic food use increased about in line with population growth. Exports and shipments rose substantially from 1950 to 1958. An attempt at demand expansion might be regarded as successful if it

TABLE 4.2

CHANGES IN UTILIZATION OF FARM COMMODITIES, UNITED STATES, 1950-58
(As Percentages of Annual Average Total Utilization in 1947-49)

Item	Utilization in 1950	Utilization in 1958	Change 1950 to 1958
<i>(Percentage of annual average total utilization in 1947-49)</i>			
Total utilization excl. pasture, domestic use of feed for food, livestock, domestic use of seed, and changes in storage stocks.	101.4	113.3	11.9
Domestic use	92.1	100.1	8.0
Food	76.1	87.3	11.2
Nonfood	16.0	12.8	- 3.2
Feed for work animals	2.2	.9	- 1.3
Fibers and leather	8.0	6.3	- 1.7
Tobacco	2.3	2.3	0.0
Alcoholic beverages	1.1	.9	- .2
Industrial oils, soap	1.9	1.3	- .6
Other nonfood use	0.5	1.1	.6
Exports and shipments	9.4	13.2	3.8

Source: Agricultural Marketing Service, Statistical and Historical Research Branch. Based on revisions as of April 1960 of figures in Supplement for 1958 to Measuring the Supply and Utilization of Farm Commodities (Supplement for 1958 to *Agriculture Handbook No. 91*, September 1959).

either accelerated the growth of an expanding utilization category or slowed the decline of a contracting category relative to what would have happened in the absence of the attempt.

The amount of a commodity utilized for a given purpose will generally increase if its price is lowered and decrease if its price is raised. The ratio of the percentage change in utilization to the corresponding change in price is called "the price elasticity of demand" and a line connecting the various possible combinations of price and utilization is called a "demand curve." Price elasticities of demand are always negative or, in the limiting case, zero.

Figure 4.1 shows that the price elasticity of demand for wheat for domestic food use is extremely small — on the

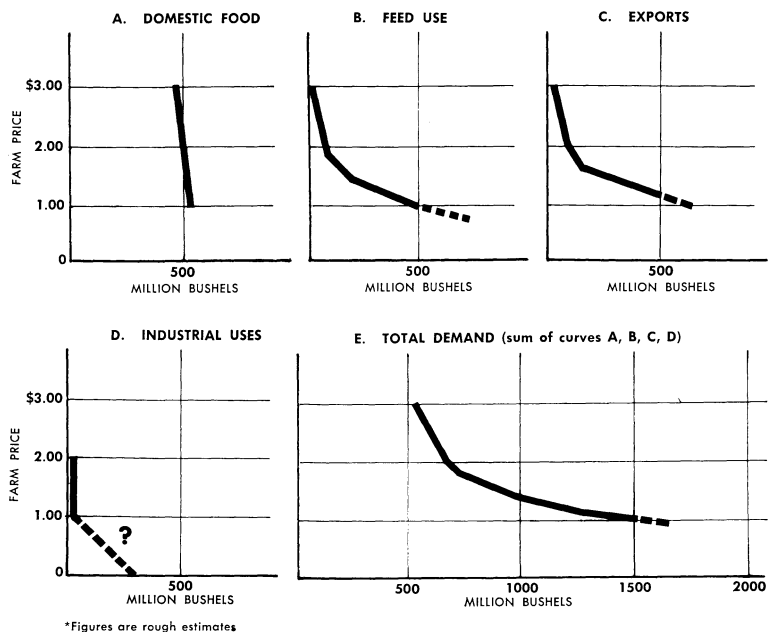


Fig. 4.1 — Total demand for wheat and demands for particular end uses. Figures are rough estimates.

order of -0.1 . Demand elasticities for wheat in export and feed uses are quite small for prices about \$2.00 a bushel, but become relatively large if the price of wheat declines to (respectively) feed grain or world market levels. Industrial uses of wheat are almost negligible when wheat prices are above \$1.00 a bushel — i.e., the price elasticity of demand is close to zero — but the quantity so used *might* expand considerably if a large and dependable supply of wheat were available at (say) 25 cents a bushel.³

³ A government support price for wheat at \$2.00 a bushel could be represented in the lower right-hand section of Figure 4.1 as a heavy horizontal line at a farm price of \$2.00. This is in effect a perfectly elastic "demand curve" which determines the price of wheat received by farmers whenever production exceeds about 700 million bushels. Quantities in excess of about 700 million bushels can be moved into export, feed, or industrial uses only by means of subsidies which reduce the price of wheat to purchasers below the support level.

Price elasticities of consumer demand for major foods range from zero to -1.0 , and the price elasticity of consumer demand for "all food" (a term to be defined shortly) is approximately -0.25 . A 10 percent increase in population normally shifts total consumer demand curves (consumption) 10 percent to the right; a 10 percent increase in average income per consumer also shifts demand curves to the right but much less than 10 percent in the cases of most foods. (The ratio of a percentage change in the quantity of a commodity purchased to the corresponding percentage change in consumer income — both variables on a per capita basis — is called an "income elasticity of demand" or, simply, an "income elasticity." Income elasticities are positive for most foods but not for all. Staples such as potatoes, sugar, cereals, and fats and oils may have zero or even negative income elasticities. (In contrast, price elasticities of demand are never positive.)

FACTORS AFFECTING U.S. CONSUMPTION OF FOOD

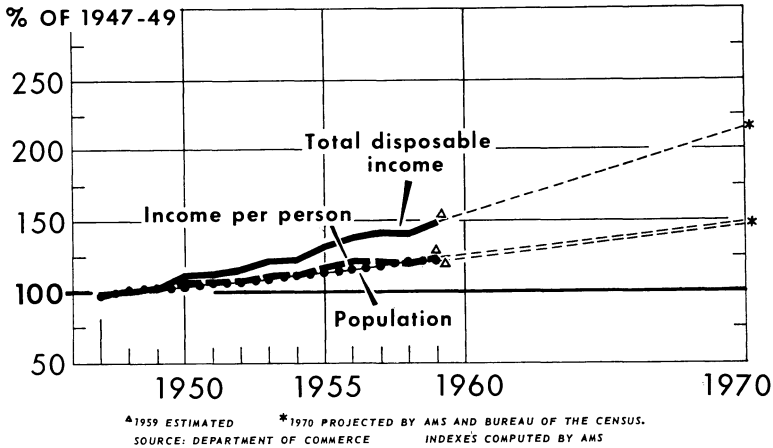
In everyday speech, the phrase "more food" has a different meaning than it has to experts in either animal or human nutrition or to agricultural economists. Does "more food" mean simply more calories? If we bought all of our calories in the form of flour and cereal products, fats and oils, and sugar, the national grocery bill would be only about one-third of what it is today, and the cash income received by farmers for marketing food products (grain, soybeans, cotton seed, sugar beets, sugar cane, etc.) would be reduced to about one-sixth of its current level!

On the other hand, if we bought all our calories in the form of livestock products, the national grocery bill would be almost doubled and the cash receipts of farmers from sales of food livestock and livestock products would rise to about two and one-half times the current level. So, an increase in the total number of calories of food consumed may or may not increase economic well-being of farmers.

The comparison in the preceding paragraph suggests some possible economic definitions of "more food." Suppose that the retail prices of all individual foods are held constant at their level in some base period (say 1947-49). Now, suppose that consumers buy enough additional livestock products to cover an additional 10 percent of their total calorie requirement, and that they reduce their purchases of flour and cereal products enough to keep their total calorie intake constant. The average retail cost per calorie would have increased about 15 percent, and the national grocery bill for a given number of consumers would have increased 15 percent without any increase in retail prices of individual foods. The total income paid out to farmers and marketing agencies would have increased by 15 percent, and it would be reasonable to say that the demand for food at retail had increased by 15 percent. The official index of per capita food consumption is constructed on these principles.

However, the farmer may not be particularly interested in an increase in demand at the retail level if all of this increase takes the form of increased charges for marketing services. If the calories in our previous example were weighted by or calculated according to the average 1947-49 prices received by farmers for each commodity and a 10 percent shift were made in the source of calories from cereals to livestock, the average cost per calorie as sold by the farmer would increase about 22 percent. As each individual price in this calculation is held constant, it is reasonable to say that demand at the farm price level has increased by 22 percent. This measure of demand is the one that is most relevant to this book, in which we are focusing on problems of imbalance and prospects for adjustment as they affect farm people and the rest of our population.

Population and income are the factors most influential in increasing domestic consumption of food. Population in



U. S. DEPARTMENT OF AGRICULTURE

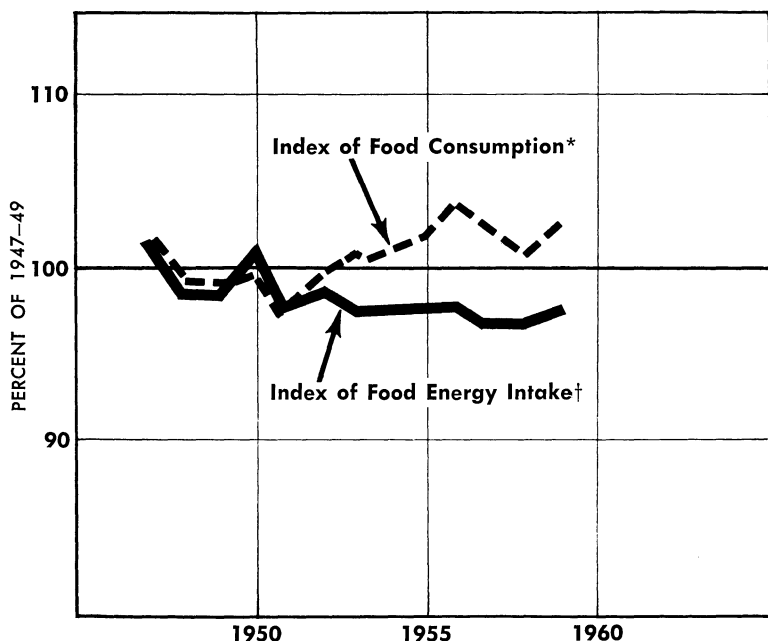
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Fig. 4.2 — Real income and population in the United States. Income is figured in 1958 dollars.

the United States from 1947-49 to 1958 increased by 18.8 percent and disposable income per person (measured in 1958 prices) increased 18.1 percent. The projections to 1970 imply a further increase of about 20 percent in each of these variables from 1959 to 1970. Other things being equal, a 20 percent increase in the consuming population would be expected to increase consumption of food by 20 percent.

Our knowledge of both animal and human nutrition would suggest that calorie requirements would increase in direct proportion to the number of consumers. This is equivalent to saying that the average number of calories of food energy per person will remain constant.

During 1957-59, the calorie consumption per person shown in Figure 4.3 averaged from 2.5 percent to 3 percent lower than in 1947-49. Whatever may be the effects of prosperity, it has evidently not led to an increase in consumption of calories!



*Per capita quantities of food purchased weighted by 1947-49 retail prices

†Per capita calories available in food as purchased

Fig. 4.3 — Index of food consumption and food energy intake in the United States.

Nutritionists would doubtless think of age distribution (as well as total population) as influencing requirements for food energy. Calculations based on dietary allowances for different age groups recommended by the National Research Council suggest that the average calorie requirement per person declined about 2 percent from 1940 to 1950 and another 1 percent from 1950 to 1960.⁴ The chief cause was

⁴ National Research Council, based on *Recommended Dietary Allowances*, Revised 1958, National Academy of Sciences, National Research Council Publication 589, 1958, p. 18. The age distribution figures for 1960 and 1970 were based on Series 2 of the projections reported in *Current Population Reports*, P-25, No. 187, cited below.

an increase in the percentage of children under ten in the total population, from 16.6 percent in 1940 to 19.5 percent in 1950 and 21.8 percent in 1960. This percentage is not expected to increase during the 1960's, and may even decline a trifle by 1970.⁵ If we assume that the 1955-57 level of birth rates will continue, there may be a microscopic increase in average calorie requirements between 1960 and 1970 — something like one-fourth of a percent.

The per capita food consumption has trended slightly upward during the past decade as indicated in Figure 4.3, increasing about 2 percent. Food consumption rose about one-tenth as much as disposable income per capita.

If we divide the value of food consumption per capita by the per capita intake of calories, we obtain an indication of average cost per calorie. In 1957-59 cost per calorie averaged 4 or 5 percent higher than it did a decade earlier. Most of the increase in expenditure by consumers per calorie can be attributed to the increase in disposable income; about 1 percent of the increase may have been due to the fact that retail prices of food increased about 16 percent over this period while all consumer prices increased more than 22 percent. The remaining increase in average cost per calorie implies an income elasticity of 0.15 to 0.20 for "all food."

Other factors not strictly economic might have influenced changes in food habits over the decade — nutritional education, changing attitudes toward overweight, further extension of central heating, and promotion and advertising of particular foods — may each have had some slight effects on total calorie intake and the average cost per calorie.

Table 4.3 illustrates what it means to increase the demand for food by upgrading the quality of the diet, or at least by increasing the average resource cost per calorie. As of 1947-49, the retail cost per calorie obtained from flour

⁵ Bureau of the Census, *Current Population Report*, Series P-25, No. 187, November 10, 1958.

TABLE 4.3

SOURCES OF CALORIES BY FOOD GROUPS, CONTINENTAL UNITED STATES,
1909-13, 1947-49, AND 1959

Food group	Relative retail cost per calorie 1947-49*	Percent of total calories obtained from each food group:		
		1909-13	1947-49	1959†
	(percent)		(percent)	
Flour and cereal products.....	30	37.2	23.8	20.8
Sugar, fats and oils (incl. butter and fat pork cuts).....	40	27.5	34.6	36.1
Dry beans, potatoes, etc.....	70	7.5	6.6	6.3
Dairy products (excl. butter).....	120	9.6	13.5	13.9
Meat, poultry, eggs, and fish.....	240	13.5	15.2	16.8
Fruits and vegetables.....	300	4.7	6.3	6.1
Tea and coffee.....	‡	0	0	0
Total or average.....	100	100.0	100.0	100.0
Average cost per calorie.....	100	88	100	103

* In terms of average retail prices of each food group in 1947-49. Calculated by dividing percentages of total retail cost of food per capita (1947-49) for each food group by corresponding percentage of total calories obtained from that group, and rounding to nearest 10 percent of the average 1947-49 retail cost per calorie for all foods.

† Preliminary as of April 1960.

‡ Contain negligible numbers of calories.

Source: Calculated from figures in Tables 40 and 47 of Supplement for 1956 to Consumption of Food in the United States, 1909-52 (Supplement for 1956 to *Agriculture Handbook No. 62*, September 1957). Preliminary figures for 1959 from Agricultural Marketing Service, Statistical and Historical Research Branch.

and cereal products was 30 percent as much as the average cost per calorie, whereas a calorie obtained from meat, poultry, and eggs was about 240 percent as expensive as the average calorie.

Over the half century from 1909-13 to 1959, the percentage of total calories obtained from flour and cereal products has shrunk tremendously while the percentage of food energy obtained from livestock products has greatly increased.

At the retail price level, the average cost per calorie over half a century increased 15 index points, or 17 percent over the 1909-13 figure. This suggests that there is a *possibility*

of expanding the demand for food products very substantially through a further shift in consumption from cereal products to meat, eggs, and dairy products.

However, the shift indicated required nearly 50 years or two generations to complete. It is much more relevant to note that the increase in average cost per calorie from 1947-49 to 1959 was only 3 percent; there is no reason to expect that the gain obtainable from this source during the next decade will be any more than 3 percent.⁶

By combining some food groups in Table 4.3 estimates can be made of average cost per calorie at the farm level. If we group all livestock products together (excepting butter and fat cuts of pork), the average cost per calorie for this group of foods at retail in 1947-49 was about 180 percent of the average for all foods. The average cost per calorie for a group of commodities including flour and cereal products, fats and oils, sugar, dry beans, and potatoes was about 40 percent of the average cost per calorie.

The farmer's share of the consumer's dollar spent for livestock products is more than twice as large as the farmer's share of a retail dollar spent for the latter group of products. Measured at 1947-49 levels of prices received by farmers, the cost per calorie of livestock products was about 240 percent of the average, while the cost per calorie of the other group of products was only about 20 percent as large as the average for all farm food products.

From 1947-49 to 1959, the percentage of calories obtained from the livestock group rose by 2 percent of total calorie intake. If this had been completely offset by a reduc-

⁶ There is no conceptual basis for the discrepancy between the estimate of 3 percent derived from Table 4.3 and that of 4 to 5 percent derived from Figure 4.3. The difference could be due largely to rounding errors, as the indexes in Figure 4.3 are published only to the nearest whole number. Note that the ratio of "104" to "100" could mean anything from

$$\frac{103.6}{100.4} = 103.2 \text{ to } \frac{104.4}{99.6} = 104.8,$$

or increases of 3 to 5 percent. Also, the relative costs per calorie in Table 4.3 are calculated with less refinement than is the USDA index of per capita food consumption.

tion in calories obtained from the low-cost calorie group (as, indeed, it was except for a slight decline in calories obtained from fruits and vegetables), the average retail cost per calorie would have increased by 2.8 percent. The average cost per calorie at the farm price level would have increased about 4.4 percent. Hence, in terms of demands made upon farm resources (and resources provided by firms manufacturing and selling production goods to farmers), increases in the average farm cost per calorie of domestic food consumption might expand farm-level demand by as much as 4 percent during the next decade.

Part of the increase in average cost per calorie between 1947-49 and 1959 may have been due to the fact that retail prices of other goods and services increased more rapidly than did those for food; if food prices held their own during the next ten years relative to other retail prices, the increase in average cost per calorie at the farm level might not be over 3 percent.⁷

What effects do increases in consumer income have upon the demand for food? The Agricultural Marketing Service surveyed purchases of food by nonfarm families in the United States as of 1955. The results of statistical analyses by George R. Rockwell based on this survey may be expressed in terms of income elasticities, namely, the percent increases in consumption or purchase of specified commodities that are associated with 1 percent increases in income per family member.⁸

Measured in terms of *expenditures* per person, the income elasticity of demand for food among nonfarm families in 1955 was about 0.20. The higher-income families prob-

⁷ When food prices fall relative to prices of other consumer goods, food consumption (as measured by a price-weighted index) tends to increase as indicated by the elasticity of demand for food.

⁸ George R. Rockwell, Jr., *Income and Household Size: Their Effects on Food Consumption*, Marketing Research Report No. 340, Agricultural Marketing Service, June 1959. See especially Table 2 and Table 3. Some of the figures in the text are based on rough, rounded calculations from data in Tables 2 and 3.

ably bought a little more marketing services per unit of food than the lower-income families. Allowing for this, the income elasticity of total consumer demand for food was about 0.15.

The income elasticity of consumption of livestock products was about 0.2, very roughly the same as that of fruits and vegetables other than potatoes and sweet potatoes.

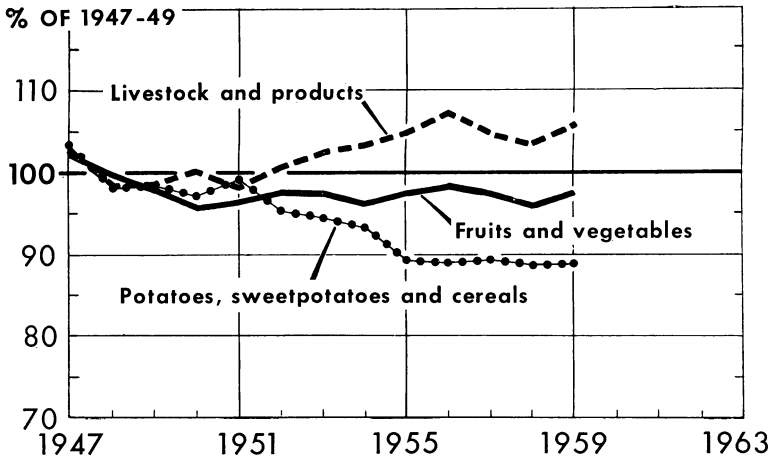
The income elasticity of demand for low-cost calories such as flour, bakery products, sugar, fats and oils, etc., appeared to be slightly greater than zero, but perhaps not significantly so.

It is clear that the response of U.S. food consumption to increases in consumer income is relatively small. Moreover, it will probably decrease as income levels rise further. When families in the 1955 study were divided into thirds, the income elasticity of food expenditures among the lowest-income third was 0.25, among the middle-income group 0.21, and among the highest-income third 0.15.

It is almost certain that the income elasticity of demand for food in the United States was considerably higher during the 1930's, when average levels of income were low and many persons were unemployed, than it is today.

The further increases in income levels expected during the 1960's should make food consumption even more sluggish in response to changes in consumer purchasing power. In an affluent society, food is among the first of the commodity groups to reach a saturation, or satiation, point for the bulk of consumers.

The income elasticity of demand for resources at the farm level is a little greater than at the retail level, as a large proportion of the farm resources used in food production are devoted to livestock products and fruits and vegetables, which have higher-than-average income elasticities of demand at retail. However, the average income elasticity of demand for farm resources used in food production as of 1955 could hardly have been greater than 0.2.



* PER CAPITA CIVILIAN CONSUMPTION, U. S. (USING 1947-49 RETAIL PRICES AS WEIGHTS)

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Fig. 4.4 — Food consumption trends in the United States.

Trends in food consumption patterns as indicated in Figure 4.4 are in a direction favorable to demand expansion, but the rate of increase is likely to be slow.

MARKETING MARGINS FOR FOOD AND THE NATURE OF DEMAND AT THE FARM PRICE LEVEL

In a number of places, we have pointed out that responses of consumers to price changes and income changes show up differently at the farm level than at the retail level.

Between the farmer and the consumer lies a vast and complex marketing system. This complexity can be reduced somewhat if we follow a unit of a particular farm product through its marketing sequence. Nevertheless, the ramifications of the marketing process as raw products are separated into different physical or chemical "fractions" or combined and blended into new forms should be kept in mind when interpreting such over-all measures as "the farmer's share of the consumer's food dollar."

It is the author's opinion that most professional workers

providing research and educational services to farmers tend to overestimate the arbitrary elements in the marketing system and to underestimate the extent to which marketing margins (over any short span of years) are influenced by relatively rigid elements in marketing costs.

In 1960, the farmer got slightly less than 40 cents of the consumer's food dollar, so superficially the opportunities for transferring income from marketing agencies to farmers look quite substantial. However, the real opportunities here (at least in the short run) turn out to be much smaller than might appear at first glance, just as the real prospect for demand expansion through shifting from low-cost to high-cost calories turns out to be much below the theoretical maximum.

The marketing margin on pork (Figures 4.5A and 4.5B)

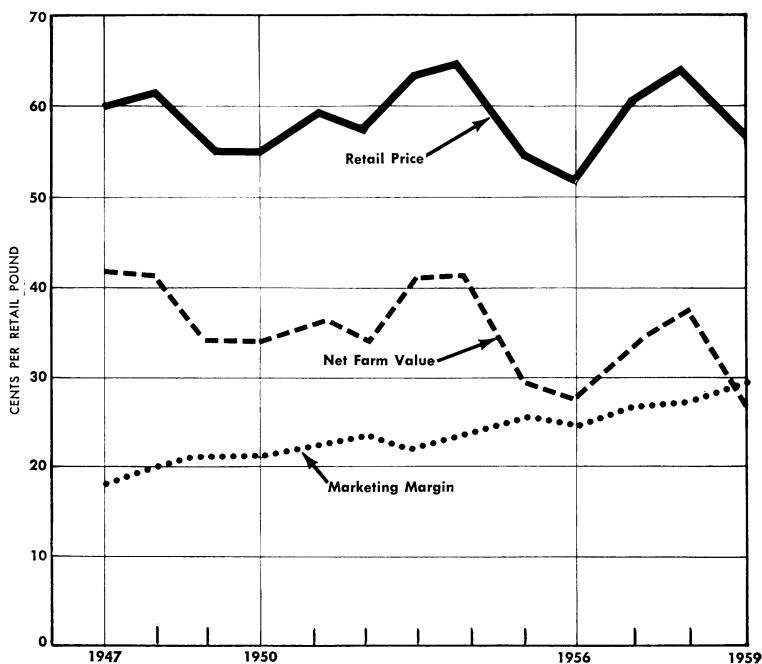


Fig. 4.5A — U.S. pork prices, 1947–59.

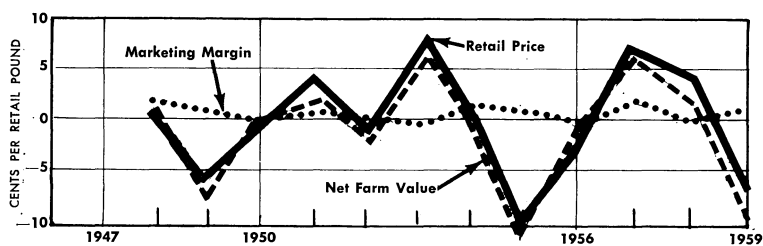
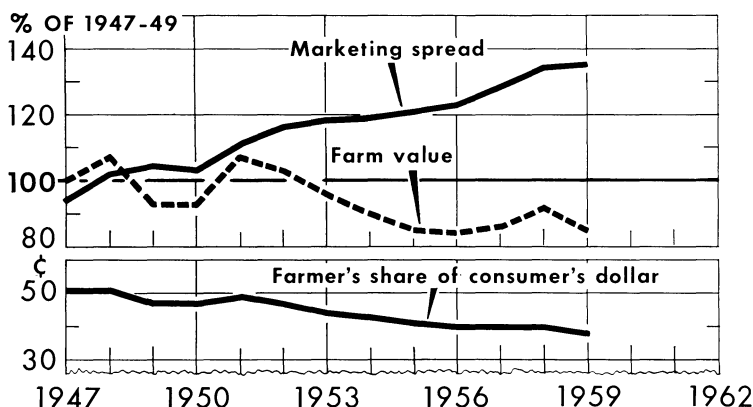


Fig. 4.5B — Year to year changes in pork prices in the United States.

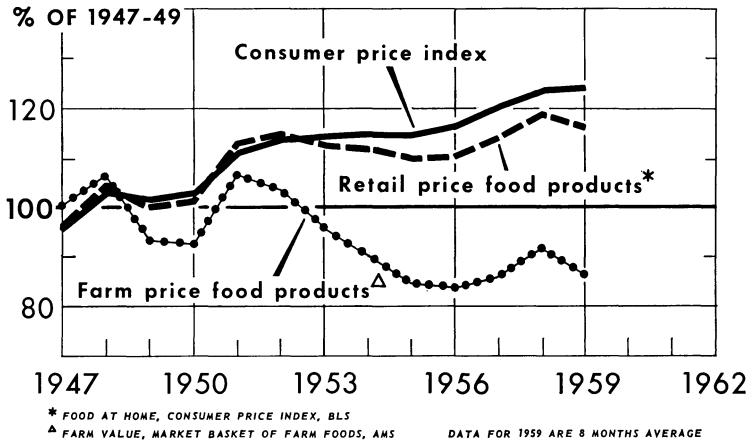
has widened at an average rate of a cent a year, but has rarely deviated from this trend by more than a cent a pound between adjacent years. The retail price of pork has changed by as much as 10 cents from one year to the next, and in most years the change in the net farm value has been nearly the same as that in the retail price. Except for the upward trend in the marketing margin, this is the pattern we would expect.

The pattern for all food products is roughly similar to



DATA ARE FOR AVERAGE QUANTITIES OF FARM FOODS PURCHASED BY URBAN FAMILIES IN 1952
1959 DATA PRELIMINARY

Fig. 4.6 — Marketing spread and farm value of market basket.



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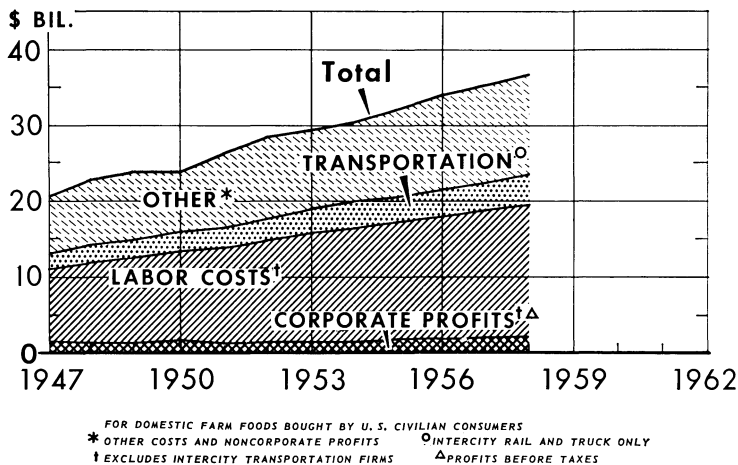
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Fig. 4.7 — Food prices and consumer price index in the United States.

that for pork (Figures 4.6 and 4.7). The marketing spread between the retail value and the farm value of the “food market basket” (based on the average quantities of farm food products purchased by urban families in 1952) shows a strong but relatively smooth upward trend, rising more strongly during the first two years of hostilities in Korea, leveling off for a time, and rising strongly again from 1956 to 1958, a period in which inflation was again a major economic problem. Apart from this trend in the marketing spread, the food price changes from year to year have been quite similar at the farm and at the retail price levels.

The pattern of the consumer price index in Figure 4.7 looks strikingly like that of the food marketing spread in Figure 4.6. The similarity suggests that increases in the food marketing spread reflect forces that operate throughout the economy.

In 1958, labor costs accounted for 47 percent of the total U.S. food marketing bill (Figure 4.8), the same pro-



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Fig. 4.8 — Total U.S. farm food marketing bill.

portion as in 1947-49.⁹ Average hourly earnings of food marketing employees increased 65 percent from 1947-49 to 1958. Despite substantial increases in the volume of products handled per man-hour, the cost of labor per unit of product marketed increased by 31 percent. All marketing charges per unit increased by 35 percent by 1958, based on preliminary figures.

Costs of rail and intercity truck transportation accounted for 11 percent of the total food marketing bill in 1958. Corporate profits made up about 6 percent of the marketing bill in 1958 as well as in 1947-49.

"Other costs and noncorporate profits" (Figure 4.8) made up about 37 percent of the marketing bill in 1947-49 and 36 percent in 1958. It includes costs of fuel, electric power, containers, packaging materials, intracity transportation, depreciation, insurance, rent, interest on borrowed capital,

⁹ Figures in this and the next two paragraphs are taken from *The Marketing Bill for Farm Food Products*, USDA, Agricultural Marketing Service, Report No. AMS-326, August 1929. See especially Table 5, p. 14, and Table 6, p. 16.

taxes other than those on income, and other items not included in the labor, transportation, and corporate profits components. It also includes the profits of unincorporated marketing firms.

We have already noted similarities in the patterns of the consumer price index and the food marketing spread. Wholesale prices of all commodities other than farm products and food showed a similar pattern, and increased 26 percent between 1947-49 and 1958.¹⁰

In summary, the evidence is that many elements of food marketing costs (materials, utilities, freight rates, wage rates, and others) are determined in markets which extend across many other sectors of the economy. When wage rates of industrial workers rise, so do wage rates of food marketing employees; when steel prices rise, so do prices of containers and most other metal products used in food marketing. Over any short span of years, cost increases of this sort, reflecting broad trends in the entire economy, exert a powerful upward pressure upon the food marketing spread.

We should not infer too much from these considerations. The time patterns shown are quite consistent with the existence of considerable inefficiencies in the food marketing system, both in the technical aspects of processing and handling and in the costs of packaging, promoting, and advertising branded products, some of which reflect particular competitive situations among marketing firms rather than the wishes of consumers. Though some sectors of the food marketing system are highly competitive, the time pattern shown by the marketing spread would be equally consistent with the existence of a considerable degree of monopoly power, exercised uniformly over a period of years.

Attempts to increase the degree of competition in particular food marketing industries *could* increase the farmer's

¹⁰ Council of Economic Advisers, *Economic Indicators*, Washington, D.C., May 1960, p. 24.

share of the consumer's food dollar. Also, given active competition in any sector of the food marketing system, new methods and techniques that reduce the marketing costs of individual firms will tend to be adopted by almost all firms performing a given operation. As a result, the farmer's share of the consumer's dollar will be increased *relative to what it would otherwise have been*.

But progress in raising farm incomes by such means will at best be slow. The basic problem of imbalance between supply and demand for farm products as an aggregate has more than offset such improvements in efficiency as have occurred in particular branches of the food marketing system during the past decade.

PROSPECTS FOR EXPANDING THE U.S. DEMAND FOR FOOD BY MEANS OF SPECIAL PROGRAMS

We have discussed above the major "normal" factors that affect prospects for expanding domestic demand for farm food products. Calorie intake per person is not likely to increase during the decade ahead. If the past trend toward consuming more of our calories in the form of livestock products and less as cereals and potatoes continues, the amount of farm resources needed per calorie might increase by as much as 4 percent during the next ten years. A projected increase of about 20 percent in disposable income per capita (measured in constant prices) would be mainly responsible for this effect if it materializes.

A projected 19 percent increase in population between 1960 and 1970 will be by far the most important force tending to increase the domestic demand for food.¹¹ Broadly speaking, the increase in population will be about five times as powerful a demand factor during the 1960's as will the expected increase in per capita income and the consequent changes in the commodity pattern of food consumption.

An increase of 4 or 5 percent in retail food prices rela-

¹¹ Based on Series II projections in Bureau of the Census, *Current Population Reports*, Series P-25, No. 187, November 10, 1958.

tive to prices of other goods and services would tend to reduce food consumption by about 1 percent (measured in terms of retail value) or as much as 1.5 percent in terms of amount of farm resources required. A further decline in farm prices relative to other prices during the 1960's would tend to increase domestic food consumption, though it would not be proper to say that reduced prices would increase "demand."

Commodity Promotion and Advertising

Our presentation so far has been in terms of national totals and aggregates, including total calories per person from whatever source. The extreme stability of total calorie intake per person, as well as the relative sluggishness of changes in average cost per calorie, should temper our expectations concerning various special programs and promotional campaigns directed toward a single commodity.

We know both from statistical analyses and from common observation that pork, beef, lamb, chicken, and turkey compete for the consumer's pocketbook and for a favored place on his table. An increase in the supply of pork in a given year not only decreases the price of pork, it also decreases the price of beef by perhaps a third as much and causes some reductions in prices of poultry meats relative to the levels they would otherwise have maintained.

If the per capita supply of pork increases by 10 percent, the retail price of pork will tend to fall about 15 percent; if the per capita supply of beef remains constant under these circumstances, the price of beef may well fall 4 or 5 percent.

Now, suppose we have a 10 percent increase in the supplies of both pork and beef: The average price of the two meats combined will drop by the average *direct* effect of the supply of each meat upon its own price and the average *indirect* effect of the supply of each meat upon the price of the other. Hence, the price change accompanying a 10 percent increase in consumption of an aggregate such as

"all meat" is greater than would be expected if we simply took account of the direct effects of the supply of each individual commodity upon its own price.

For example, the price elasticities of consumer demand for beef and pork at the retail level appear to be around -0.8 and -0.7 ; however, the price elasticity of consumer demand for all meat appears to be about -0.6 and that for all livestock products about -0.5 .¹²

Competition exists between more remotely related food products. The stability of total calorie intake per capita implies that increases in calories obtained from livestock products as a group must be offset by corresponding reductions in calories obtained from foods primarily of crop origin.

Although statistical analyses are lacking, it seems almost certain that a similar effect would take place, if demand for one meat was increased through promotional efforts. The chances are that something like one-half of the gain secured for the particular meat would be offset by decreases in the demands for competing meats and poultry products; total calorie intake might be stabilized through slight reductions in the consumption of cereal products, potatoes, and other foods.

Effects such as those just mentioned, if they occurred, would increase the average amount of farm resources required per calorie and hence the demand for farm food products. However, there has been no convincing evidence so far that promotional efforts on a commodity as important to farm income as beef or pork have actually succeeded in raising the level of national demand for the commodity.

The optimism entertained by some farm groups with respect to the effectiveness of advertising may stem from stories of successful promotion of a particular brand in competition with other brands having identical physical and chemical properties once the packaging is removed. Promotion undoubtedly can sharply increase the sales of a partic-

¹² Karl A. Fox, "Factors Affecting Farm Income, Farm Prices, and Food Consumption," *Agr. Econ. Research* 3:65-82, July 1951.

ular brand of cheese or bacon. But the author seriously doubts that the *total* demand for cheese or bacon is increased significantly by such efforts. Advertising programs concerning such major products as beef or pork will encounter an even greater sluggishness of consumer response.

Some of those who expect large increases in the demand for food products as a result of advertising seem unaware of the large volume of advertising that has been going on for many years. Supermarkets are among the most regular and active advertisers in local newspapers and often spend an amount on local advertising equivalent to 1 percent or more of gross sales.

Food processors are not bashful about mentioning their products. In 1957, total advertising expenditures for all goods and services amounted to over 10 billion dollars. Approximately 2.1 billion dollars was spent on advertising for "food and food beverages." This proportion, about 20 percent of all advertising expense, is almost equal to the proportion of disposable personal income spent for food. On the surface, at least, it would appear that food is getting a fair share of attention in the form of advertising.

The great bulk of money spent for advertising food products is spent in an attempt to shift customers from one store to another in a particular locality or from one brand of a narrowly defined product to another closely competing brand. Only a small fraction of the total advertising effort goes into promoting a commodity rather than a store or a brand. We have no evidence of successful demand expansion for a major commodity, and we know that if such an expansion did occur, it would be partly offset by reductions in the demand for other foods.

Quality Improvement

The potential of quality improvement as a means of demand expansion is also greatly overestimated by some producer groups. The narrow price differentials between grades for certain commodities, such as butter, suggest that the

economic potential in terms of price and income gains to farmers resulting from further quality improvement may be small. Improvements in quality of eggs and fluid milk over and above the minimum levels enjoined by public health authorities probably will not bring substantial price premiums from consumers. Some other commodities, such as hogs, cattle, and potatoes, show wider price differentials and, at least on the surface, appear to offer some hope of farm income gains through quality improvement.

The effects of further research directed toward quality improvement may be large relative to the cost of the research and development work going on in this field. However, the effects of quality improvement upon the total demand for food will almost certainly be small — possibly on the order of 0.1 percent per year in terms of retail value consumed.

Other Special Programs

Giving food to needy persons or providing it to them at reduced prices commends itself on humanitarian grounds. However, in the United States today, a very small percentage of the total population is poor enough to welcome such aid. In 1958, less than 4 percent of the United States' population was receiving public assistance.

This may be an unduly restrictive definition of our impoverished group; but it must be conceded that even these individuals are consuming about as many calories of food energy as they need or as they are likely to consume even with the aid of special programs. Most of them would, however, be glad to improve the quality of their diets, if means were offered.

Considering administrative and other complications, it is estimated that special programs to increase food consumption among low income families would not increase food consumption in terms of total farm resource requirements by more than 1 percent. Moreover, this net increase through programs such as the Food Stamp Plan or Food

Allotment Plan would be a one-shot affair — i.e., the demand for food might be increased by 1 percent in (say) 1961, but the year-to-year changes in demand from 1961 on would not be affected. Dropping the program any one year would mean a decline of 1 percent in demand for food.

Programs to increase food consumption by subsidized reductions in retail prices to all consumers would be conditioned by the price elasticity of demand at retail for all food, which appears to be approximately -0.25 . Total expenditures for food products at retail are about \$60 billion a year. To increase food consumption by 1 percent would require a decrease in retail food prices of 4 percent, or a subsidy of about \$2,400 million. The farm value of 1 percent of our total food consumption, as indicated in Table 4.1, would be about \$240 million.

Hence, the cost of a general subsidy to increase food consumption by 1 percent would be nearly 10 times as great as the amount paid at the farm level to buy up a 1 percent surplus of raw farm products.

Programs With Nutritional Objectives

The higher income levels of recent years have greatly reduced the dietary deficiencies that were observed in the 1930's; further increase in income will also tend to reduce the percentages of our population who are consuming less than recommended nutritional requirements.

Economists at the University of Minnesota estimated the effects on national food consumption of various diets providing minimum needs for calories, proteins, and each of the vitamins and minerals regarded as essential to health.¹³ The differences between the diets would consist in their variety and average cost per calorie. According to the Minnesota study, if all consumers followed a "liberal cost" diet plan, the net increase in total food consumption

¹³ John M. Wetmore, Martin E. Abel, Elmer W. Learn, and Willard W. Cochrane, *Policies for Expanding the Demand for Farm Food Products in the United States; Part I, History and Potentials*, Minn. Agr. Exp. Sta. Tech. Bul. 231, April 1959.

above the actual level of 1955 would be about 2.3 percent. A "moderate cost" diet would result in a net *decrease* of 5.5 percent, and a "low cost" diet in a net *decrease* of about 22 percent.

These estimates suggest that, where food is concerned, the United States is indeed an "affluent society."

The "one-third of a nation" that was ill-fed in the mid-1930's has shrunk to 5 or 10 percent of a nation if we use the same real income standard to define poverty.

FACTORS AFFECTING U.S. NONFOOD USE OF FARM PRODUCTS

Domestic nonfood uses accounted for 11 percent of total utilization of farm products in 1958. Of the various nonfood uses indicated in Table 4.1, feed for work stock is now of negligible importance and will certainly not increase. Fibers, leather, and tobacco accounted for seven-tenths of the total nonfood use in 1958, or 7.6 percent of total utilization.

Use of cotton and wool per person has decreased quite substantially during the past decade and consumption of tobacco has trended downward at least slightly since 1953

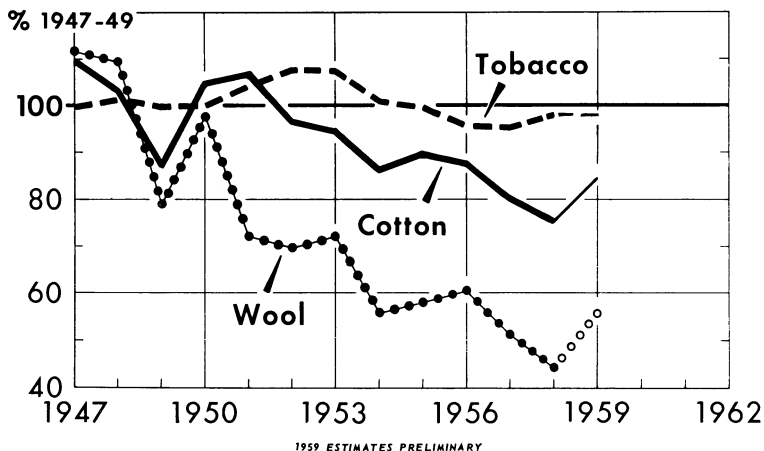


Fig. 4.9 — Use of nonfood farm products per person in the United States.

(Figure 4.9). As utilization of farm products for domestic food has increased slightly more than in proportion to population, the share of fibers, leather, and tobacco in total utilization has declined in recent years and will probably decrease in relative importance during the 1960's.

Not much of a campaign can be based upon expanding the consumption of alcoholic beverages, which account for less than 1 percent of total utilization of farm products. Domestic use of industrial oils and soap decreased in absolute as well as relative terms from 1950 to 1958. Other non-food use increased sufficiently to offset the decline in industrial oils and soap.

Recommendations and bills for converting surplus grain into alcohol and requiring manufacturers, service station operators, and motorists to use a certain percentage of the resulting alcohol in mixtures with gasoline have been introduced in Congress from time to time during the past 30 years. While the technological problems could perhaps be solved, the restrictions upon motorists, distributors, and manufacturers which would be involved run counter to our mores. If alcohol were desirable as a motor fuel additive, this alcohol could be obtained much more cheaply from petroleum by-products.

Corn would have to be priced at less than 50 cents a bushel to qualify as a "commercial" raw material for industrial alcohol.

We may make more progress in finding industrial uses (most of them of small volume relative to the total farm surplus) for the more complex and expensive molecules derivable from farm products than for the "lowest common denominators" — alcohol and starch — that have received most attention in the past. Over the next few years, positive effects of the chemical industries in finding new uses for farm products will probably not offset the effects of new competitors based on materials of nonfarm origin.¹⁴

¹⁴ Morton Smutz, "The Relationship Between the Agricultural and Chemical Industries," in CAA Report 2, *A Report of the Seminar on Demand for Farm Products*, Center for Agricultural Adjustment, Iowa State University, Spring Quarter, 1959, pp. 87-90.

Some attention has been directed toward introducing new crops, now imported from other countries, into the United States. The mutual benefits of trade according to comparative advantage are well-known, and we would obviously be worse off if we tried to raise tropical fruits and coffee in domestic greenhouses.

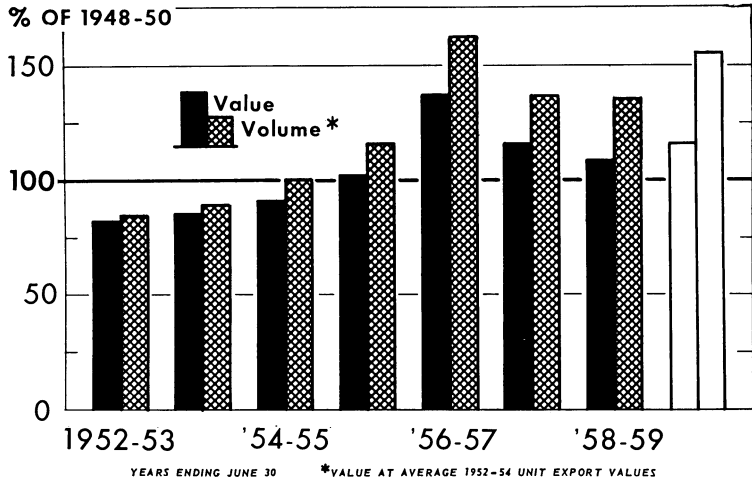
A leading agronomist in a 1959 seminar presentation at Iowa State University, listed acreage potentials for new crops at 2.5 million acres, equivalent to about 0.7 percent of our current total crop acreage.¹⁵ If these crops were successfully grown in the United States, they would for the most part displace imports which were sources of dollar exchange for friendly foreign countries who in turn import other farm products and nonfarm goods from us. The speaker also pointed out that years are required for adapting new crops to growing conditions in the United States. It seems that most research and experimentation in this area have a relatively long-term payoff and would make little contribution to the agricultural adjustment problem within the decade ahead.

In summary, it seems likely that the percent of total utilization of farm products in domestic nonfood uses will decrease somewhat further during the 1960's. While many valuable products or by-products and corresponding new uses of farm products and their derivatives may be developed, their direct effect is not likely to expand total domestic use of farm products by more than 1 percent in the next decade. This effect will probably be more than offset by further inroads of synthetic products into markets formerly dominated by fibers and other products of farm origin.

FACTORS AFFECTING FOREIGN UTILIZATION OF U.S. FARM PRODUCTS

In 1958, exports and shipments accounted for about 12 percent of our total utilization of farm products. Figure 4.10

¹⁵ I. J. Johnson, "Potentials for New Crops to Meet New Existing Demands," in CAA Report 2, *op. cit.*, pp. 91-96.



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Fig. 4.10 — Value and volume of U.S. agricultural exports.

shows clearly that the volume of farm exports has been at a high level during the past four or five years compared with the level of the early 1950's.

An appraisal of the prospects for agricultural exports from the United States during the decade ahead implicitly involves an appraisal of the entire supply and demand balance for farm commodities country by country for the entire world. An increase in our own agricultural exports, conditions in other countries remaining constant, would depress prices to some extent in almost every country in the world, except to the extent that the importing countries resort to price controls and other forms of government intervention.

In recent years, the Food and Agriculture Organization (FAO) and the Foreign Agricultural Service of USDA have made considerable progress in organizing world data on farm production and trade.¹⁶ World farm production from

¹⁶ Foreign Agricultural Trade Outlook Charts, 1960, USDA, Washington, D.C., November 1959. See especially pp. 4-16.

1956 through 1959 has averaged about 4 percent higher than the 1952-54 average level. In the major countries which buy our farm products for dollars, per capita farm production during 1956-59 has averaged 5 or 6 percent above 1952-54.

Total farm production in major competing countries (Canada, Mexico, Australia, and Argentina) has increased during the 1950's and has fluctuated with no definite trend on a per capita basis. As three of these countries export extremely large percentages of their farm production, the increase in total production is perhaps more significant than the inconclusive fluctuations in production per person.

These upward trends in world farm production are hard to reconcile with the picture many laymen entertain of a world full of starving people who would form a willing and inexhaustible disposal outlet for any amount of surplus grain or other products from the United States.

The figures on relative costs per calorie of livestock products and cereals previously cited give one clue as to the real situation. It is possible for a consumer in the United States, buying his food at retail prices and largely in the form of livestock products, to spend at least ten times as many dollars for food as might an Indian villager, particularly if the rice or wheat consumed by the latter is valued at farm prices.

According to our standards, calories are cheap. Ten or 12 bushels of wheat a year, with a farm value of \$20.00 or \$25.00, would provide enough energy to keep an average human being alive. Actual food expenditures per person in the United States run something more than \$300 per capita.

The world food surveys of recent years indicate that the majority of people in underdeveloped countries are getting as many calories as they require to maintain their body weight and customary levels of activity. Furthermore, their diets consist very largely of grains.

As economic development proceeds in such countries and standards of living rise, there is a tendency to shift

away from grain and other low-cost calories to a somewhat more varied and slightly more expensive diet, though still a low-cost diet according to U.S. standards.

Very few people in the world are anxious to increase their per capita consumption of cereal products. Yet the great bulk of our surplus of edible farm products consists of wheat, corn, and other grains which in this country are used primarily for feed. Some countries with relatively high standards of living, as in Western Europe, *might* be willing to use larger quantities of U.S. grain for livestock feed, if it were made available for this purpose at bargain prices. But this is not what humanitarians have in mind.

In countries with extremely low levels of income, the importation of U.S. grain for use as dairy and poultry feed would represent a tremendous jump in cost per calorie compared to the present basic diet of cereals. If grain were given away at the bin sites and elevators in Iowa and Kansas, the cost of transporting the grain to U.S. ports and thence overseas to Asia or Africa or Latin America would still make livestock production based upon these grains an expensive source of calories as compared with the direct food use of "commercial" grain.

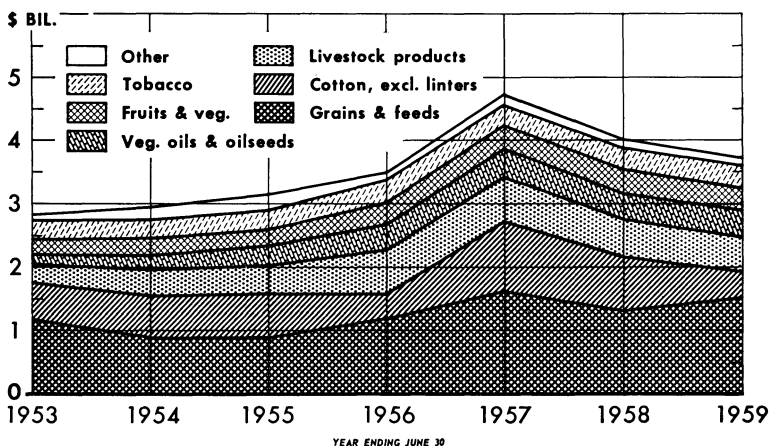
These considerations do not indicate that nothing can be done to use our farm surpluses for the benefit of people in the less developed countries. Much is being done. For example, in 1959, 34 percent of our agricultural exports were made under government programs on terms extremely favorable to the importing countries.¹⁷ The other 66 percent of our agricultural exports in 1959 were paid for in dollars, but some of these products were sold at considerably less than the domestic U.S. price. In general, the most favorable terms of all were made to the least developed countries.

Countries such as Canada, Denmark, Australia, and Argentina view with disfavor our use of subsidies to promote commercial exports. Their officials no doubt sympa-

¹⁷ *Ibid.*, p. 8.

thize with our desire to help underdeveloped countries through grants and loans. Under the terms of our Public Law 480, imports of farm products in connection with such grants and loans are supposed to be in addition to normal imports. In practice, there is no doubt some increase in total imports and also some displacement of commercial imports. The latter effect is a matter of concern to other exporting countries. Some permanent shifts in consumption and exports may result from subsidies to promote U.S. exports, especially where economic development takes place.

With the aid of the devices and programs just mentioned, we increased our exports (in physical terms) by more than 50 percent from 1954-55 to 1956-57. Exports declined moderately in 1957-58 and 1958-59, but in 1959-60 they will probably equal the 1956-57 peak. The commodity composition of our exports is shown in Figure 4.11. World agricultural exports leveled off in the years 1956 and 1957 at around \$28 billion and declined slightly in 1958. Agricultural exports from the United States have accounted for about one-sixth of the world total during these years.



USDA

FAS-NEG, 1940

Fig. 4.11 — Commodity composition of U.S. exports.

There is essentially no more magic in the export market than there is in the domestic marketing system. The more obvious or plausible opportunities for expanding exports have been recognized and pursued by the U.S. government since World War II, and efforts were considerably increased with the passage in 1954 of Public Law 480.

Buyers and sellers throughout the world are in daily contact with one another. Eleven commodities make up two-thirds of total world agricultural trade, and 72 percent of U.S. agricultural exports (in 1958-59) went to 14 countries.

World trade seems mysterious because most of us have not given it serious thought. We can readily visualize an Iowa ham being transported to Chicago, displayed and sold in a supermarket, and cooked and served by a Chicago housewife. If a second Iowa ham were sold and served in London, England, we would have entered the mysterious world of foreign trade — yet the only physical operation that has been added is another 4,000 miles of transportation services.

It is even easier to visualize the import side of foreign trade when we see canned hams from Denmark and the Netherlands displayed for sale in a Los Angeles supermarket. The attitudes and responses of U.S. consumers and U.S. hog producers to these imports may help us to sense the probable reactions of consumers and producers in other countries.

Experience of the 1950's demonstrates that we cannot export our farm surplus problem in its entirety. But there are possibilities for some further expansion of exports along two different lines.

The first of these lies in the implementation of large scale programs of economic aid to underdeveloped countries. The following arithmetic may be useful in getting a rough notion of the magnitudes that could be involved:

1. Our exports of wheat from the United States in the 1957-58 crop year amounted to 400 million bushels. This

would provide enough calories to maintain about 60 million people at the consumption levels prevailing in Southeast Asia.

2. Underdeveloped countries in the non-Communist world have a combined population of about 1 billion persons. This population is growing by something like 2 percent a year, or by 60 million people within three years.

3. The 400 million bushels of wheat we exported in 1957-58 were equivalent to 3 percent of our total farm production, or somewhat less than the net increase in private and government inventories of farm products (including livestock on farms) in each of the years 1958 and 1959.

If all underdeveloped countries were to get *all* of their increased calorie requirements from the United States, the increase in exports would catch up with our present rate of surplus production sometime between 1965 and 1970.

The arithmetic just presented may raise unrealistic expectations concerning the volume of exports that will actually be made in the 1960's to further economic development abroad. For example, it might be more economical for us to ship fertilizers to underdeveloped countries than to ship grain. It might be even more desirable to ship steel, cement, and machinery to these countries so that they can build factories and produce their own chemical fertilizers. And it might be even more economical and more desirable from a long-run standpoint if we simply "exported" several thousand engineers, management experts, extension and experiment station specialists, and other key personnel to help the countries to help themselves so that, even during their period of heaviest capital investment, they do not become unduly dependent upon gifts or loans of food from the United States.

In the short run, say five or ten years, overzealous promotion of wheat shipments to Asia could even have the effect of transferring part of our surplus problem to the rice-exporting countries, which are financially much less able than we are to sustain low prices for their major export

crop. To some extent, wheat calories could simply displace rice calories.

Over a period of ten to twenty years, however, successful economic development would raise per capita incomes and encourage a shift toward higher cost calories. This "second wave" could exert a significant pull upon farming in the exporting countries, but the bulk of the increased demand would have to be met through farming improvements in the currently underdeveloped nations themselves.

Another possibility that has received less public attention would be an expansion of agricultural imports by the industrialized nations of Western Europe. These countries have greatly improved their industrial facilities in recent years and have had considerable success in expanding their exports of manufactured goods to the United States and other nations. Some of the most populous countries in Western Europe are producing part of their wheat and other farm products at very high unit costs. They have done this in part for reasons of national security and also because of difficulties in financing imports from the United States and other Western Hemisphere countries during much of the period since World War I. But since 1957, the "dollar shortage" has apparently turned into a "dollar surplus," and the economic reason for restricting agricultural imports has lost much of its force.

On economic grounds, the countries of Western Europe would now be justified in reducing their tariffs, in liberalizing or removing their import quotas on farm products, and in reducing their price support guarantees to their own farmers. The latter adjustment especially is politically difficult, and might take many years to accomplish under the most favorable conditions. World political developments during the next few years may or may not weaken the national security argument for maintaining high cost food production in some countries.

These factors are not likely to affect our exports very much before 1965. Under the most favorable circum-

stances, our exports of wheat, feed grains, oilseeds, and other products to Western Europe could expand significantly in the late 1960's and early 1970's. But an increase of one-third in such exports would be equivalent to only 2 per cent of our total farm output.

PROBLEMS IN DEALING WITH EXISTING SURPLUS STOCKS

Stocks of corn have increased in each successive year from 1952 through 1960 (Figure 4.12). Despite vigorous attempts to restrict acreage and production of wheat, as well as to expand exports, we have accumulated more than a year's supply of wheat (almost three years' supply in terms of domestic food use only).

We reduced our stocks of cotton rather substantially from 1956 to 1958, but the carryover has changed very little during the past two years.

There is little justification, either economic or strategic, for having year-end stocks greater than 400 million bushels of wheat, 500 to 800 million bushels of corn, and perhaps 5 million bales of cotton. The estimated carryovers in 1960

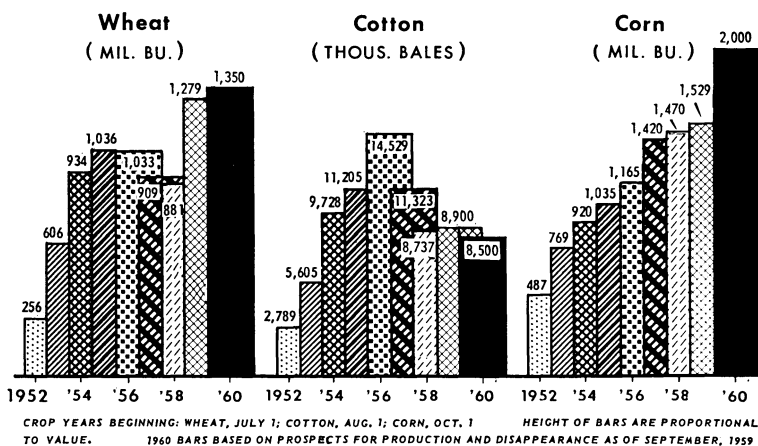


Fig. 4.12 — Carryover of major U.S. farm commodities.

are approximately 1,350 million bushels of wheat, 2,000 million bushels of corn, and 8.5 million bales of cotton.

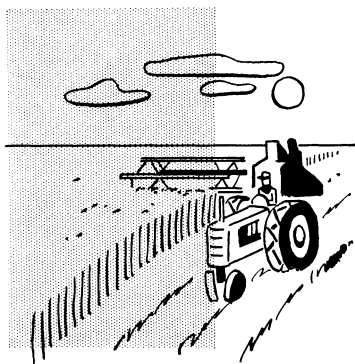
The surpluses of these three commodities above desirable levels would have a farm value of about 4 billion dollars, equivalent to 12 or 13 percent of total farm production in 1959. If we set out to eliminate these surpluses by 1970, the annual rate of utilization during the 1960's would have to be increased about $1\frac{1}{4}$ percent on this account.

The existence of surplus stocks will be discussed more fully in Chapter 5. They are mentioned at this point to emphasize the total job that needs to be done to achieve a balance between supply and demand for farm products and to help us consider more realistically the extent to which demand expansion can be expected to restore this balance.

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CHAPTER 5

Farm production inputs; their productivity; size of surpluses; prospect for future balance of production and consumption.

The Nation's Present and Future Supply of Farm Products

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PRODUCTION ON U.S. FARMS in the 1960's is characterized by far more complex organization than even a decade or two ago. U.S. society and its agriculture have changed dramatically. Farming is still experiencing a revolution in its technology and organization for which there appears to be no previous parallel in scope or speed. The self-sufficient family farm of the nineteenth century is being transformed into a commercial family farm so highly specialized that in many cases it produces only one product.

This technological and organizational transformation has greatly reduced the total labor requirements in U.S. farming and caused a vast expansion in many other re-

source needs. The minimum size of the total resources necessary for an efficient farm unit has grown greatly and continues to do so. This great growth in minimum capital needs may yet force major changes in the legal and organizational form of the typical U.S. farm. An increasing proportion of the resources used in farming are purchased from the nonfarm sector. This is due in part to the creation of completely new capital items (e.g., various pieces of machinery and equipment, insecticides, herbicides, and commercial inorganic fertilizers) but also to the substitution of nonfarm for farm produced power. Tractors, gasoline, oil, and electrical power equipment displaced and released for other uses the land, labor, and capital used to produce horses and mules and their feed.

All this has made farming far more dependent on the nation's commercial and industrial markets. No one commercial farm has a large enough share of the market to influence the price in the market by changing its production. But increasingly commercial farmers are forced to deal across markets with buyers and sellers many of whom, unlike the commercial farmer, exercise considerable market power.

It is in the nature of farming that production responds slowly to price change. Farming is not a continuous production process like many industries but is tied to biological growth and to the seasons of the year. Once the farmer has committed his resources in a particular season (after weather has had its way), production — for all practical purposes — is determined. No subsequent change in price during the growing season can have much effect on the total national production. Over two or more production periods the production of individual commodities is more responsive to price, although total farm production is still fairly unresponsive. It is far easier to transfer land, capital, and other resources from the production of one farm commodity to another than it is to expel resources from farming entirely or to draw new resources into farm production.

It is also true that a rise in prices pulls resources into farming more easily than resources may be squeezed out by the same percentage decline in prices. This phenomenon has long been observed.¹ Recent analysis of mobility of capital invested in farming and changes in use of resources accompanying downward price movements indicates very great if not insurmountable problems in squeezing out surplus resources through lower farm prices.² These characteristics of farm production make present income and surplus problems more difficult. New organizational forms and new technology have piled up products faster than farmers' capacity to adjust to such change. The net result has been overproduction, depressed incomes, and an apparent chronic imbalance between production and the consumption of many farm products.

FARM PRODUCTION, RESOURCE USE, AND PRODUCTIVITY

Production Outstrips Population Growth

Total farm production doubled between the end of the first World War and 1960. It has increased about 30 percent since the end of the second World War, with most of this, a 23 percent increase, coming in the decade following 1950. Over this decade U.S. population has grown from 151 to 180 million people, an increase of 19 percent. Thus farm production grew steadily though slowly during the three decades previous to World War II and then expanded far more rapidly during and after the war. Farm production has grown at a spectacular rate since 1950, even outstripping an unprecedented growth in population (Figure 5.1).

During the early 1950's crop production grew fairly slowly compared to the bounding expansion in the production of livestock and livestock products. However, during

¹ John K. Galbraith and John D. Black, "Maintenance of Agricultural Production During Depression: The Explanations Reviewed," *Journal of Political Economy* 46:305-23, 1938.

² Glenn L. Johnson, "Supply Function — Some Facts and Notions," in *Agricultural Adjustment Problems in a Growing Economy*, (by E. O. Heady, et al.), Iowa State University Press, Ames, 1958, pp. 74-93.

TABLE 5.1
INDEX OF PRODUCTION OF FARM PRODUCTS, 1910-1959*
(1947-49 = 100)

Commodity groups	1910	1920	1930	1940	1950	1958	1959†
Crops.....	69	83	76	85	97	118	118
Feed grains.....	90	100	73	85	104	135	142
Hay and forage.....	74	92	75	105	106	122	115
Food grains.....	52	70	72	67	83	117	93
Vegetables.....	56	68	79	88	102	108	103
Fruits and nuts.....	53	73	75	96	101	109	117
Sugar crops.....	80	107	88	109	117	122	135
Cotton.....	82	94	98	88	70	80	103
Tobacco.....	55	73	81	72	101	86	89
Oil crops.....	9	15	23	56	115	180	161
Livestock and livestock products.....	60	64	78	87	107	124	130
Meat animals.....	66	68	78	89	109	124	134
Dairy products.....	58	65	84	92	101	111	111
Poultry and eggs.....	47	49	65	70	111	145	150
Total farm production.....	61	70	72	82	101	124	126

* "Changes in Farm Production and Efficiency: A Summary Report," *Statistical Bulletin 233*, USDA, Washington, D.C., July 1960.

† Preliminary.

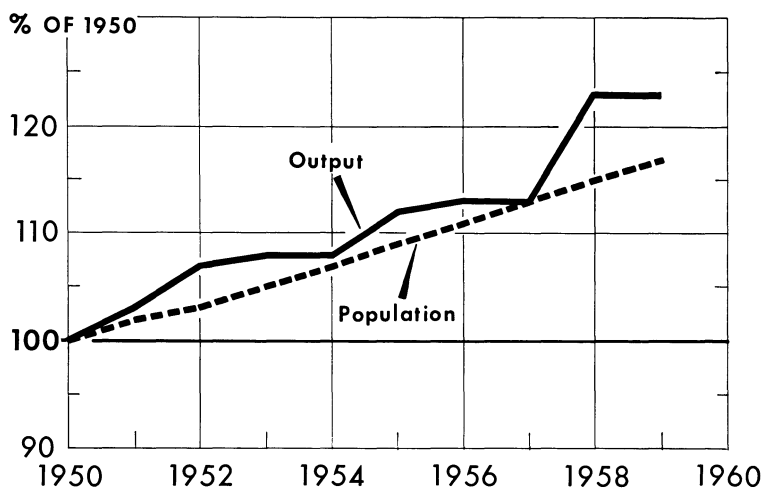
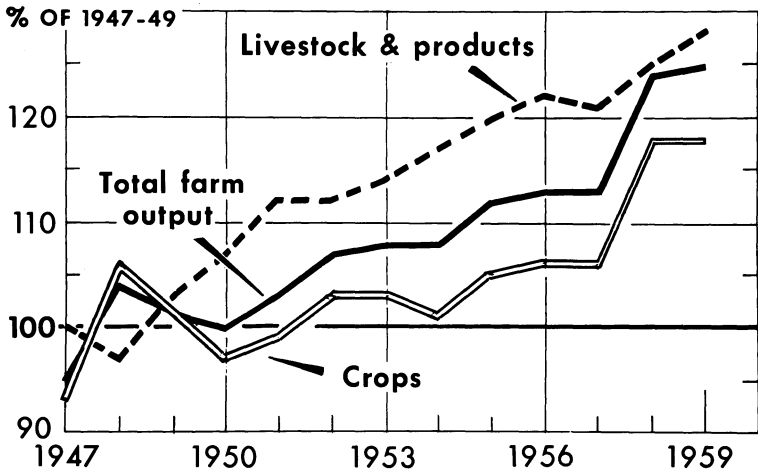


Fig. 5.1 — U.S. population and farm output.



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Fig. 5.2 — Farm output in the United States.

the latter half of the decade of the 1950's the growth of livestock production slowed and crop production expanded more rapidly than the production of livestock and livestock products. Over the decade as a whole, livestock and livestock products have expanded somewhat more than crop production (Figure 5.2).

The greatest post-World War II increases in the production of individual farm commodities have been in soybeans, poultry meat, sugar beets, corn, beef, and rice (Figure 5.3). More modest increases have occurred in the production of citrus fruit, other fruits, and eggs. Cotton production has varied greatly but there is no upward trend. Potato production levels are also about at the same level as in the immediate post-World War II years. The levels of production have actually declined for wheat, peanuts, and tobacco. It should be noted there is no general correlation between increases in production and commodities with surplus difficulties.

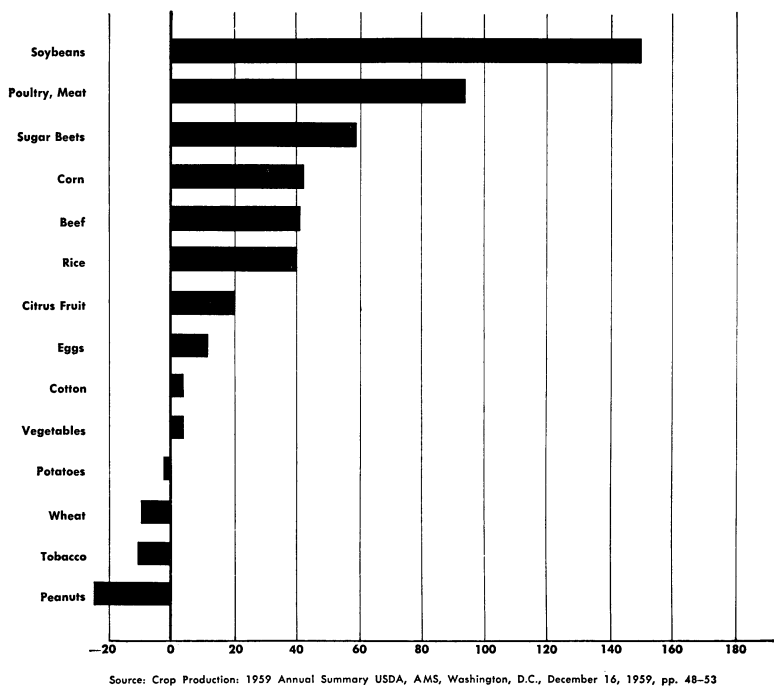
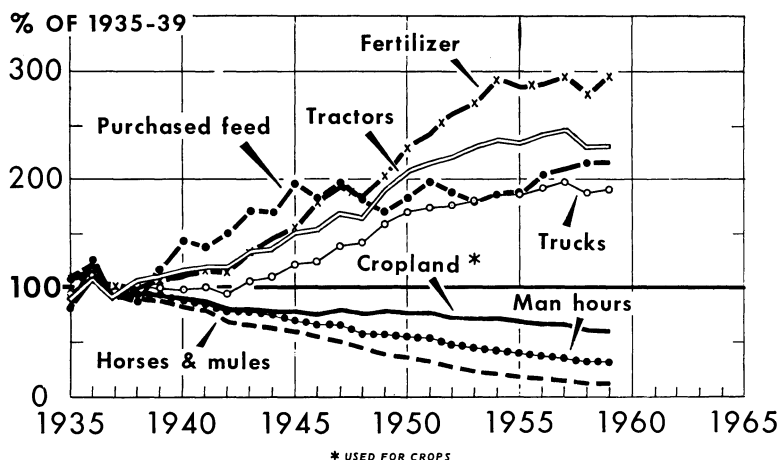


Fig. 5.3 — The percentage of change in production for U.S. farm commodities, 1947-49 to 1959.

Labor Used on U.S. Farms Cut One-Half

The revolution in farm organization and technology has had profound effects upon the nature of some of the resources going into farming and the mixture of these resources used today as compared even with a generation ago (Figure 5.4). The total amount of labor used in farm production has been reduced by more than half, or from around 24 billion man-hours in 1920 to 11 billion man-hours in 1959. Most of this decline has occurred since 1940 when 20.5 billion man-hours of labor were still being used in farming.



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Fig. 5.4—Selected resources used per unit of U.S. farm output.

Since 1920 the farm population has declined by slightly more than 11 million people, or 35 percent. To offset farm population growth and accomplish this reduction in population, better than 26 million people migrated from farms over the period since 1920. Eighteen million of these people migrated after 1940. Since 1940 farming has experienced some of the highest rates of migration in its history, yet in the judgment of many economists there is still more labor in farming today than is currently needed.

The opportunity to move labor resources out of farming are not likely to be as good in the 1960's and 1970's as they were in the forties and fifties. Since 1930, the number of persons annually reaching eighteen years of age has varied between 2 and 2.5 million persons. Thus the number entering the labor force each year has not grown as the economy has expanded. Migration from farms has been the main source of labor needed to fill the many new nonfarm jobs created by growth. However, a sharp rise in the annual

number of new entrants to the labor force has begun. As Karl Brandt points out in Chapter 2, by 1965 the number of persons annually reaching eighteen years of age will have risen to 3.8 million. By 1975 there will be more than 4 million per year.

The potential farm migrant obviously faces greater competition for nonfarm jobs in the years ahead. It will be a competition in which the farm person typically is handicapped by a lower level of education just when automation in industry and commerce is forcing higher average requirements of education and training.

In addition to the new technologies, improved quality of farm labor and management made the transformation of farming possible. Although still lagging behind the urban population in education, farm people today are obtaining more training and education than they ever have. In 1957 about 43 percent of all farm people between 25 and 34 years of age had finished high school and between 2 and 3 percent had finished college. For the U.S. population as a whole, including farm people, 58 percent of this same age group had finished high school and 10 percent had finished college.³

One of the more unique aspects of farming, and one which underlies some of its more difficult problems, is the fact that labor, management, and even equity ownership of a typical family farm is combined in the same individual. Thus as the quality of farm labor has been improved through training and education so too has management. As with total farm labor, the number of farms, have been reduced particularly rapidly since World War II. In 1940 there were 6.4 million farms by census definition. These had declined to around 4.6 million by 1959, of which probably no more than 2 million were truly commercial family farms.

The total land area in farms changed hardly at all since

³ Bureau of the Census, *Current Population Reports*, Washington, D.C., Series P-20. No. 77.

1935. Total cropland has not varied significantly from 400 million acres since 1920. Actual acres of cropland harvested has been reduced some since World War II (Figure 5.5). For a time the area of open and wooded pasture appeared to be growing slowly, but by 1960 it did not seem to be expanding. We have continued our attempts to improve the quality of the land we do use. In addition to major river basin and other land development investments, individual farmers are improving their land through investment in such things as drainage, terracing, leveling, and primary and supplemental irrigation. In 1940 only 18 million acres of U.S. farmland were irrigated. By 1959 about 32 million acres were under irrigation. Two-thirds of this acreage is in the West.

Increased fertilizer applications continue to expand the capacity of the land on which it has been applied. Fertilizer use has expanded particularly rapidly in the post-World War II years. In 1920 one million tons of plant

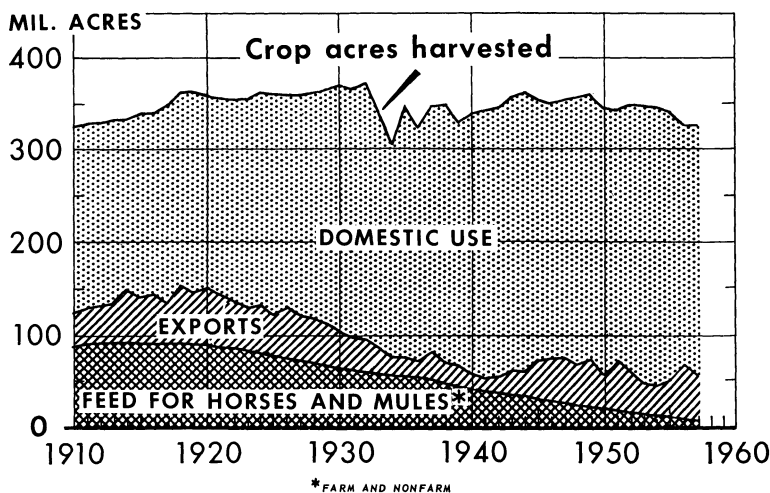


Fig. 5.5 — Uses of harvested U.S. cropland.

nutrients were used in agriculture. By 1959 fertilizer use had grown more than sixfold to about 6.5 million tons of plant nutrients annually. The use of lime on farms expanded almost ninefold between 1920 and 1959. In the early 1960's we were using over 22 million tons annually.

Power and Equipment Transform U.S. Farms

At the time of World War I the source of power for the U.S. farm was for all practical purposes limited to human and animal power. The U.S. farm in the 1960's is powered only to an insignificant extent by horses and mules and by less than half the annual human (man-hour) labor used during World War I; but the farm now uses billions of kilowatts in electrical energy and millions of deisel and gas powered combustion engines. In contrast to a peak inventory of more than 26 million horses and mules during World War I, we now have only 3 million horses and mules on farms.

In 1935, when statistics on farm use of electrical energy were first gathered, only 11 percent of all U.S. farms were using electrical power supplied by central generating stations. Today more than 95 percent of all our farms have such power. Over the same period the total amount of electrical power used annually on farms has risen from 1.7 to well over 22 billion kilowatt hours. The average amount of energy consumed per farm has tripled in the post-World War II years.

Tractors were introduced on farms during the first decade of this century. By 1920 U.S. farmers were operating a quarter of a million tractors. By 1940 this had increased sixfold to 1.5 million tractors. In 1960 there were 4.75 million tractors on U.S. farms.

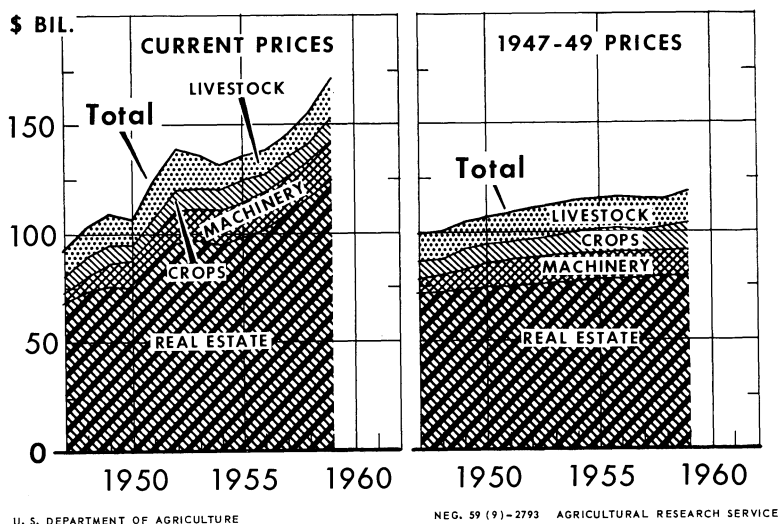
The automobile and the motor truck began to appear on U.S. farms soon after 1900. By 1960 there were 3 million trucks on farms, twice the number of 1945 and about three times the number on farms just before World War II. There were a million automobiles on U.S. farms

by the end of World War I. The number of automobiles grew steadily until World War II; since that time the farm auto inventory has remained at a level of around four and a quarter million automobiles.

The development of the internal combustion engine fostered many new forms of farming equipment. To mention only a few of them, U.S. farmers in the 1960's are using over a million grain combines, three-quarters of a million corn pickers, well over half a million pickup balers, and a quarter of a million field forage harvesters. Almost three-quarters of a million U.S. farms are equipped with milking machines. Seventy-five percent or more of all of this equipment inventory has appeared on the American farm scene since 1940.

This technical and organizational transformation greatly increased the minimum set of physical assets necessary to organize an efficient farm. We have no direct way of measuring this, but changes in actual assets give some indication. During the 1950's the total value of physical assets in farming (measured in 1947-49 dollars) increased about 15 percent (Figure 5.6). This represents an increase in the average value of real assets per farm worker of 55 to 60 percent. Since there has been something like a 19 percent decline in the number of farms (census definition) over the decade of the 1950's, the statistics indicate an average increase in assets per farm of about 40 percent. However, both the increase in assets per farm and assets per worker probably overstate the case considerably.

The reduction in number of farms and farm workers during the fifties came predominantly from the less productive U.S. farms which typically control very few assets. Even if all their assets were redistributed to the remaining farms very little would be added to the average stock of assets of remaining farms. Dropping farms that have few assets from the computation of an asset average leaves the unjustified impression that assets held by the rest have risen. It is more likely that the increase in real assets per



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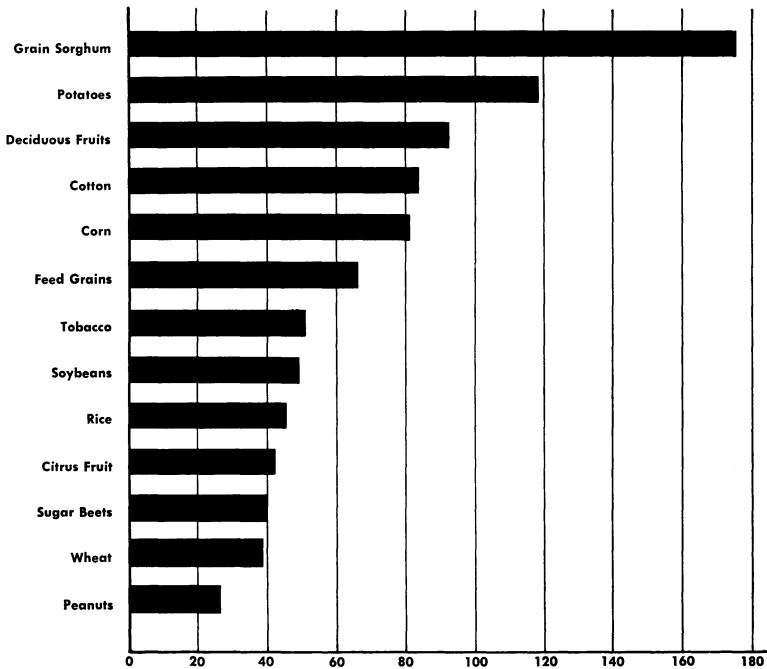
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Fig. 5.6 — Value of physical farm assets in the United States.

farm is more nearly the same as the increase in total assets in farming. One might assume that real assets per farm have grown no more than 25 percent over the decade and that real assets per worker have grown perhaps as much as 30 to 35 percent over the same period. Since economic conditions and technology have affected different types of farms quite differently, the increase in assets varies greatly between types of farms. However, on all types of farms, the amount of resources necessary for an efficient farm has grown greatly and continues to do so.

Productivity

Farm productivity in the United States has risen at an unprecedented rate since the midthirties. Crop yields have grown at a magnificent pace (Figure 5.7). This has been particularly true of grain sorghums, potatoes, cotton, fruit, and corn. The USDA over-all index of crop production per acre indicates a 40 percent increase from 1940 to 1959.



Source: Crop Production: 1959 Annual Summary USDA, Washington, D.C., December 16, 1959, pp. 46-47
 Crop Production: 1956 Annual Summary USDA, Washington, D.C., December 17, 1956, pp. 40-41

Fig. 5.7 — The percentages of increases in U.S. crop yields, 1940-59.

Livestock production per unit of breeding stock increased 36 percent over the same period. For each unit of resources used (land, labor, and capital combined), farm production rose 47 percent from 1940 to 1959.

When productivity is expressed in terms of labor used in farming the result is quite different — and much higher. Total farm production per man-hour of labor rose 185 percent between 1940 and 1960. The increase has been much less per man-hour for livestock and livestock products (about 89 percent) contrasted with crop production per man-hour which increased 203 percent since 1940.

These increases in farm productivity have profound

meaning for the U.S. society. One requirement for transforming an agrarian society into one predominantly industrial is the marked decline in the proportion of the total labor force needed to produce food for the society. The classical Industrial Revolution began in this country in the middle decades of the last century. By 1875 no more than half of the U.S. labor force was employed in farming. By the turn of the century the proportion of our total labor force in farming had declined to about one-third, and by 1920 it was down to one-fourth of the total labor force. By 1960 only 8 percent of our total labor force was engaged in farming, and the outlook points toward a further decline.

What this has meant to our economy in changes and increased capacity is perhaps easiest seen by contrasting our present situation with that of the Soviet Union. With a total labor force in 1959 of almost 115 million persons, as contrasted to slightly more than 72 million in the United States, Russia faces labor shortages which by their own admission severely hamper the continued rapid economic growth of the Soviet Union. The Soviet Union uses 40 to 50 percent of their total labor force just to produce their food. The Soviet Union in 1959 also had better than a million more men in their armed forces than we had in ours. Soviet labor force statistics are uncertain figures at best; but it is probable that the Soviet Union has available for industrial, commercial, and service type employment fewer workers than are available to the United States from a far smaller total labor force. This is the result primarily of a vast difference in farm productivity between the two nations.

The Soviet Union would probably be happier living with the surplus problem which is associated with our rapid increases in farm output and productivity than with the shortages and limitations to further economic growth which their far lower farm productivity has forced upon them.

THE SIZE OF THE SURPLUS

How large were the U.S. farm surpluses as we entered the 1960's? How big an adjustment would be involved in the elimination of the flow of surplus commodities? Before attempting an answer to these questions, an important distinction should be made between a *stock* of commodities on hand at any one point in time and the *flow* of commodities produced over a period of years.

When one is concerned with the impact of surplus upon the price of a commodity at any given point in time, it is the existing *stock* of that commodity in commercial and government hands that has the important economic impact. Expectations about the approaching harvest are, of course, of increasing importance the closer one gets to harvest time.

On the other hand, when someone speaks of adjusting the farm organization and its resources used in farming in order to eliminate or reduce surpluses and to raise farm incomes, he should be concerned with the *flow* of excess production over time. The longer the period of time under consideration the more important become the flows of commodities being produced.

Carryover Stocks

Three commodities, wheat, cotton, and corn, constituted the bulk of surplus stocks in 1960. In 1952, during the Korean War, carryover stocks were at either exceedingly low levels (cotton and wheat) or at very reasonable levels (corn). By 1956 carryover stocks clearly had grown to excessive levels and have remained so since. (See Chapter 4, Figure 4.12.)

In the summer and fall of 1960 the carryover consisted of 1.3 billion bushels of wheat, 7.6 million bales of cotton, and 1.9 billion bushels of corn. This represents 130 percent of a full year's consumption and export needs for

wheat, almost 60 percent of a full year's needs for cotton and around 60 percent of a full year's requirements for corn. What portion of these supplies are in surplus?

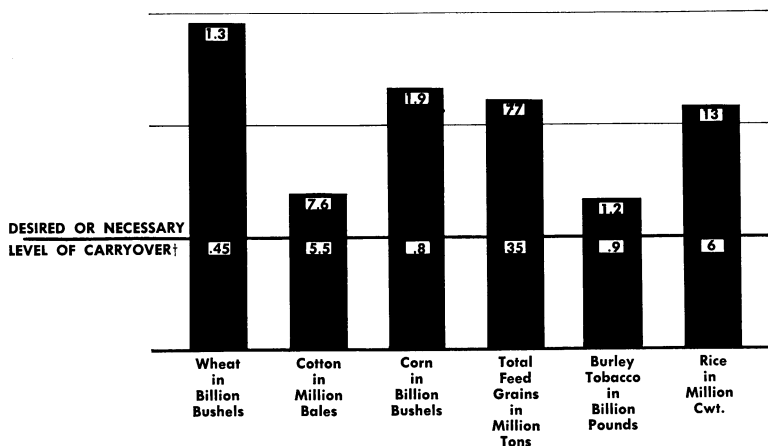
Besides annual domestic consumption and export requirements, additional supplies are needed as protection against the uncertainties of the world, particularly war and crop failure. How much of a hedge should we have against the hazards of an uncertain world? Professor M. R. Benedict of the University of California provides one answer to this complicated and difficult question. It is his judgment that we should probably maintain carryovers of around 800 million bushels of corn, 400 to 500 million bushels of wheat, and 5 to 6 million bales of cotton.⁴ Somewhat similar estimates were made in a USDA study of reserve levels for storable products. Both the USDA study and that of Benedict take into consideration yield variation, demand variability, "pipeline needs," war contingency reserves, and storage costs.⁵

We had a carryover of 1.5 billion bushels of corn on October 1, 1959. Production was so great during the 1959-60 crop year that the carryover jumped to 1.9 billion bushels of corn by October, 1960. Thus carryover grew from 45 percent of a total year's usual requirements for domestic consumption and export to around 60 percent of a year's requirements. Benedict estimates that we need carryover stocks of only one quarter of a total year's consumption and export needs. Well over half of our current carryover stocks are surplus.

In July 1960, the carryover of wheat into the 1960-61 crop year was over 130 percent of an average year's con-

⁴ M. R. Benedict, "Current Imbalance of Supply and Demand for Farm Products," *Policy for Commercial Agriculture: Its Relation to Economic Growth and Stability*, Joint Economic Committee, 85th Congress, 1st Session, Washington, D.C., 1957.

⁵ Karl Fox and O. V. Wells, "Reserve Levels for Storable Products: A Study of Factors Relating to the Determination of Reserve Levels for Storable Farm Products," *Senate Document No. 130*, 82nd Congress, 2nd Session, Washington, D.C., 1952.



*Current carryover data from USDA Commodity Situation reports

†See footnotes 4 and 5 to text

Fig. 5.8 — Carryover into the 1960–61 crop year of U.S. farm commodities as compared to the “desired” or “necessary” level of carryover.

sumption and export requirements or slightly less than 1.3 billion bushels. According to Benedict, 40 to 50 percent of a year’s requirements approximate the “desired” or necessary level of carryover. By this standard, two-thirds of our present carryover stock is surplus. By July, 1961 the crop year carryover for wheat is expected to reach 1.5 billion bushels.

Benedict considers 5 to 6 million bales of cotton the “desired” level of carryover. We actually had 7.6 million bales at the end of the crop year on August 1, 1960. Thus, well over a third of the carryover was surplus stock. Cotton carryover stocks have declined steadily since the peak of 14.5 million bales in August, 1956.

In general, one-third of the cotton carryover, more than half of the corn carryover, and two-thirds of the wheat carryover are clearly in excess of current needs and may be

described as surplus. These three commodities account for 85 to 90 percent of the Commodity Credit Corporation investment in inventory.

Other commodities also exhibit excess carryovers. What has been said about corn holds true for feed grains in general. This is partly because corn constitutes the bulk of all feed grain supplies. Also as allotments have limited the acreages of many other crops, barley, oat, and grain sorghum production has been increased.

An all-time record for feed grain, 67.7 million tons, was carried into the 1959-60 crop year on October 1, 1959. The carryover rose to 77 million tons by October, 1960. As with corn, this is better than twice the carryover that can be justified. There is every indication that the increasing carryover trend will continue.

Stocks of rice became excessive in 1955 and rose to a peak in 1956 of 35 million hundredweight — six to seven times larger than what might be described as reasonable or “desirable.” The carryover of rice from the 1959-60 crop year was 13 million hundredweight, still two to three times a normal level. Carryover level for rice is expected to decline to around 9 million hundredweight by August, 1961.

Tobacco stocks have been very large in recent years but in 1960 seemed to be adjusting slowly downward as the industry accepted increasingly stringent acreage limitations. Due to the nature of the curing process, the tobacco industry has a normal carryover of around a one and one-half to two years supply of tobacco. In 1960 the carryover of flue-cured tobacco was within this range. Burley tobacco carryover, however, amounted to just under a two and one-quarter year supply — clearly too large.

Except for cotton and tobacco, well over half the carryover maintained in these commodities is in excess of the nation's needs. This means that at least two-thirds of the Commodity Credit Corporation holdings of farm commodities

and perhaps as much as three-quarters is pure surplus stock under 1960 conditions.

Stocks, however, are not the most important dimension of the surplus. The really crucial element over the long run is the existence of a continuing annual production in excess of regular commercial consumption and exports. If there were no flow of excess production to be faced, carryover stocks, even much larger than those of 1960, would mean little more than some few years of inconvenience and cost to farmers and society.

The Annual Flow of Surplus Production

The relationship between production and consumption of farm products today is out of balance, and chronic, not temporary, over-production plagues U.S. farmers.⁶ How large is the imbalance between U.S. farm production and consumption? Research by Dale E. Hathaway and John F. Stollsteimer indicates that from the Korean War through 1956, 8.7 percent of the total U.S. farm production was in excess of what the commercial market handled at prevailing commercial market prices.⁷ Statistics in the Commodity Credit Corporation monthly "Report of Financial Condition and Operations" indicate that the 8.7 percent annual imbalance has not declined. Very rough calculations indicate that Commodity Credit Corporation gross removals from the market averaged over 9 percent of all farm production in the 1957-58 crop year and close to 11 percent of all farm production in the 1958-59 crop year. No more recent data are available at this writing.

The degree of imbalance between production and con-

⁶ James T. Bonnen, "American Agriculture in 1965," *Policy for Commercial Agriculture: Its Relation to Economic Growth and Stability*, Joint Economic Committee, 85th Congress, 1st Session, Washington, D.C., 1957, pp. 145-56.

⁷ Dale E. Hathaway and John F. Stollsteimer, "The Impact of Price Support Programs Upon the Available Supplies of Farm Products, 1948-56," *Tech. Bul. No. 277*, Mich. Agr. Exp. Sta., East Lansing, May 1960.

TABLE 5.2

ANNUAL FLOW OF SURPLUS PRODUCTION AS A PERCENT OF TOTAL PRODUCTION
FOR VARIOUS FARM COMMODITIES*

Commodity	Crop marketing year					1952-56 Av.
	1952	1953	1954	1955	1956	
Food grains†	27.7	38.5	44.0	36.4	19.4	33.1
Feed grains‡	9.2	12.3	10.7	11.7	10.4	10.9
Cotton	11.0	28.4	11.8	41.0	27.6	24.1
Tobacco	5.2	4.2	9.4	3.5	6.4	5.7
Dairy products	0.2	6.8	6.1	3.1	3.5	4.0
Oilseeds§	4.2	11.6	7.1	2.1	12.1	7.6
All farm products	6.3	10.8	8.8	9.6	7.5	8.7

* The figures in this table are computed by dividing annual gross CCC removals by the index of farm production for the various commodities over their relevant marketing years. The data for the table come from Dale E. Hathaway and John F. Stollsteimer *op. cit.*

† Food grains include wheat, rye, and rice, but only wheat and rice are of any significance.

‡ Feed grains include corn, oats, barley, and grain sorghums.

§ Oilseeds include peanuts, flaxseed, and soybeans.

sumption differs greatly among farm products. The largest annual surplus flow occurred in food grains, cotton, and feed grains, in that order (Table 5.2).

Between mid-1952 and mid-1957, the Commodity Credit Corporation, on the average, took off the commercial market each year 33 percent of all wheat and other food grains. In short, at prevailing commercial market prices, we have been producing 50 percent more food grains (primarily wheat) each year than the market will handle at those prices.

Each year on the average between mid-1952 and mid-1957, 24 percent of all the cotton produced went to the Commodity Credit Corporation. In other words, we have been producing almost one-third more cotton each year than the commercial markets can handle at prevailing prices. Much of what went into the Commodity Credit Corporation was disposed of at less than market price and the rest added to carryover.

Over the same period, corn and other feed grains moved into or through Commodity Credit Corporation hands to the extent of about 11 percent of the volume produced.

Over the same period, the volume of tobacco moving into or through Commodity Credit Corporation hands each year equaled 5.7 percent of all the tobacco produced.

Significant amounts of butter, cheese, and powdered dry milk have been purchased by the Commodity Credit Corporation over the past few years. Between mid-1952 and mid-1957 this flow of Commodity Credit Corporation purchases averaged 4 percent of the total volume of milk produced on the farm.

The best indication we have of the economic imbalance between production and consumption is the annual flow of production going to the Commodity Credit Corporation. This volume of Commodity Credit Corporation purchases divided by total farm production provides a measure of the relative size of the annual flow of farm products which commercial markets cannot (or at least do not) handle at prevailing commercial prices. Between mid-1952 and mid-1957 the total flow of farm products going into or through the Commodity Credit Corporation averaged 8.7 percent of total farm production. This is the best measure we have of the relative size of the annual economic surplus.

We have been able to dispose of much of this annual flow of surplus production through extraordinary governmental measures. Over the period of the 1952 through 1956 crop years, Hathaway and Stollsteimer's figures indicate that well over half the commodities taken off the market by the Commodity Credit Corporation were eventually used primarily abroad through extensive export subsidy, free donation, and barter, and to a lesser extent at home in domestic school lunch and welfare program distributions of food.

To be specific, 1.5 percent of annual production was disposed of here at home and 3.4 percent of annual production was disposed of abroad by the Commodity Credit Corporation. As a result of these disposal programs only 3.7

percent of annual farm output has been added to Commodity Credit Corporation stocks each year. Extraordinary efforts such as these do not reduce the basic imbalance. They only absorb temporarily a portion of the flow of farm commodities.

Most of these emergency programs show some sign of becoming permanent features of our foreign aid and domestic social investment and welfare policies. If this happens the volume of commodities handled in such programs will certainly cease to be considered part of an economic surplus.

THE FUTURE BALANCE BETWEEN PRODUCTION AND CONSUMPTION

Is this fundamental imbalance between production and consumption likely to widen or grow smaller by 1965 or by 1975?

Many things condition long run changes in the production and consumption of farm products. Population increase is the largest single factor in the growth of consumption. In 1959 U.S. population stood at 177 million persons. By mid-1960 it was about 180 million. The Bureau of the Census has projected total population to be 196 million persons by 1965, a 9 percent increase in population over 1959.⁸ The post-World War II evidence of trend is inconclusive but increases in per capita consumption could add 1 to 2 percent to consumption by 1965. Thus, total food consumption should increase at a minimum 10 percent and most probably about 12 percent between 1959 and 1965. Total food consumption could increase by as much as 14 percent by 1965 under the most favorable of conditions.⁹

Estimates of the impact of organizational and tech-

⁸ Meyer Zitter and Jacob S. Siegel, "Illustrative Projections of the Population of the United States, by Age and Sex, 1960 to 1980," *Current Population Reports*, U.S. Bureau of the Census, Series P-25, No. 187, November 1958. This is the census projection Series II which assumes a continuation of the 1955-57 level of fertility.

⁹ See the discussion in Chapter 4.

nological change on farm production have been constructed.¹⁰ These estimates indicate that, using the same amount of resources (i.e., land, capital, livestock inventory) U. S. farmers could easily produce 15 percent more by 1965. Implied here is a potential increase in our excess production flow by 1965 to around 13 to 14 percent of total farm production per year. Of course, some rather drastic things, both political and economic, very likely would happen before an annual imbalance got that large. But this is a good indication of the pressures to which the farmer, and U.S. agriculture generally, is likely to be subjected during the 1960's.

Consider the specific cases of three major surplus crops: wheat, cotton, and corn. Despite the increase in population, total domestic wheat consumption and export requirements should remain near present levels or possibly decline slightly. Yet it is expected that by 1965, as a result of yield increases, we shall be able to produce 5 to 10 percent more wheat on present acreage.¹¹

Total annual cotton requirements for 1965 will remain near the present level of 12.5 to 13 million bales. The expected yield increase in cotton production comes to around 18 percent, lifting average U. S. cotton yields to more than a bale of cotton per acre by 1965. Naturally, when this is combined with existing overcapacity, one can see that continuing pressure will be placed on the human and other resources engaged in the production of cotton.

Substantial increases in livestock inventories are expected by 1965. This should be the most rapidly expanding major sector of farm production. As a result, 10 to 12 percent more feed grains will be needed by 1965. However, we overproduced by about that much in 1960, and feed grain

¹⁰ James T. Bonnen, "American Agriculture in 1965," *Policy for Commercial Agriculture in Its Relation to Economic Growth and Stability*, Joint Economic Committee, 85th Congress, 1st Session, Washington, D.C., 1957, pp. 145-56.

¹¹ James T. Bonnen, *op. cit.* The data on specific commodities in the following paragraphs are from this same source.

yields can be expected to increase another 5 to 10 percent by 1965. Thus, the imbalance between production and consumption in feed grains will continue.

By 1965, total milk consumption is expected to be 5 to 8 percent over 1959. Milk production per cow should increase at least 10 percent. With an average annual imbalance between production and consumption of milk of around 4 percent per year, this will add significantly to the economic pressure on the average dairy farmer.

In none of the major farm commodities in surplus in 1960 will the pressure of excess capacity lessen before 1965. Our capacity to produce will continue to grow more rapidly than consumption, thus potentially enlarging the present imbalance and increasing the resulting flow of surplus production.

A study by R. P. Christensen, S. E. Johnson, and R. V. Baumann of the USDA elaborates much the same conclusions for wheat, feed, and livestock relationships over the period of 1960 to 1965.¹² Although he discusses primarily the growth of demand, a study by Rex Daly also implies about the same conclusion for 1965.¹³

The prospect for a lessening of the pressures of excess capacity by 1975 appear only a little better than for 1965. Naturally, analysis and conclusions for 1975 are subject to far more uncertainty than those for 1965. A number of analyses have been published for 1975.¹⁴ Census projections of population indicate a population of 235 million persons by 1975, an increase of 33 percent over 1959. Total consumption of farm products, under the most reasonable as-

¹² R. P. Christensen, S. E. Johnson, and R. V. Baumann, "Production Prospects for Wheat, Feed, and Livestock: 1960-65," ARS 43-115, USDA, Washington, D.C., December 1959.

¹³ Rex F. Daly, "Prospective Domestic Demands for Food and Fiber," *Policy for Commercial Agriculture: Its Relation to Economic Growth and Stability*, Joint Economic Committee, 85th Congress, 1st Session, Washington, D.C., 1957, pp. 108-18.

¹⁴ See References for writings by Barton, Daly, and Rogers.

sumptions, should increase between 35 to 40 percent from 1959 to 1975. Yet in many cases the yields of individual commodities are still expected to rise faster than the growth in the consumption of the commodity.

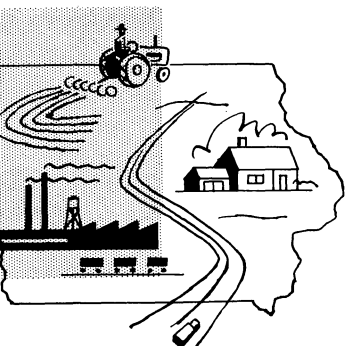
The imbalance of production and consumption of farm products could be eliminated under certain conditions which are not now anticipated or considered in most projections. Any war, even on a localized scale such as the Korean War, would turn our surplus flows and stocks into real assets. Domestic social investment and welfare programs on a larger scale and put on a permanent policy basis could add appreciably to domestic consumption of farm products. Of even greater potential would be a serious and sustained program of economic aid on an unprecedented scale for the underdeveloped nations of the free world. It is easy to see a major role in such an effort for food and fiber products from U.S. farms. Many major shifts in public policy such as these could close the surplus gap appreciably, but they would have to be major changes. Also, sustained droughts of a widespread nature, such as those of the 1930's, could temporarily halt the additions to surplus stocks and perhaps even reduce present carryover stocks.

Barring the calamity of war, or a sustained general drought, or drastic changes in public policy, by 1965 or 1975, surplus production of some degree is likely to be a continuous and prominent feature of U.S. farming. Going into the 1960's, well over half the carryover stocks were pure surplus. Each year about 9 percent of all farm production goes to the Commodity Credit Corporation. About 60 percent of this surplus flow is eventually disposed of by being given away or sold at well below commercial market prices. The most reasonable expectation is that the annual flow of surplus production will grow larger. Clearly the pressures on the returns earned by people and resources in farming will become more intense over the years ahead.

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CHAPTER 6

National concerns with land use; nonagricultural requirements for land; future land use problems.

The Nation's Present and Future Land Use and Crop Production

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THE LAND available for crops and cropland pasture in the 48 contiguous states of continental United States totaled about 466 million acres in 1959, or nearly a fourth of the total land area of 1,904 million acres (Table 6.1).¹ In addition, 630 million acres of open pasture and grazing land and 270 million acres of woodland and forest pasture were used for grazing livestock. These grazing lands are about 47 percent of the total land area, but much of this land is

¹ The estimates of land uses for 1959 should be recognized as preliminary, and subject to revision when the "Conservation Needs Inventory" is completed and the tabulations from the 1959 Agricultural Census become available. Revised estimates of the land available for crops and cropland pasture may fall within a range of 460 to 470 million acres.

TABLE 6.1

MAJOR USES OF ALL LAND IN THE CONTINENTAL UNITED STATES, 1954, WITH
PRELIMINARY APPROXIMATIONS FOR 1959*

Land use	Acreage, in millions		Percentage of total	
	1954	1959	1954	1959
<i>Land used for crops, pasture, and forest:</i>				
Cropland used chiefly for crops:				
Cropland harvested, failure, fallow, and soil bank	380	379	20.0	19.9
Land in soil-improvement crops and idle cropland not harvested or pastured	19	21	1.0	1.1
Total†	399	400	21.0	21.0
Cropland used only for pasture . . .	66	66**	3.4	3.5
Total cropland available for crops	465	466	24.4	24.5
Pasture and grazing land, not cropland and not woodland . . .	633	630††	33.2	33.1
<i>Woodland and forest‡</i>				
Pastured	301	270	15.8	14.2
Not pastured	314	345	16.5	18.1
Total	615	615	32.3	32.3
Special use§	110	118	5.8	6.1
Miscellaneous|| . . . . .	81	75	4.3	4.0
Grand total	1,904	1,904	100.0	100.0

* Data for 1954 from *Major Uses of Land in the United States*, Agr. Info. Bul. 168, January 1957. Estimates based on data assembled from current records and reports of state and federal agencies dealing with agriculture and public land management, and from the reports of the Bureau of the Census for the 1954 Census of Agriculture. For data on each major use in Alaska and Hawaii, see Table 6.2.

† Total cropland used chiefly for crops includes cropland harvested (including crops, gardens, and orchards not otherwise reported, and wild hay harvested); crop failure; summer fallow; cropland in soil-improvement and cover crops not harvested or pastured, or used for another crop; and temporarily idle cropland.

‡ Woodland and forest, excluding 26 million acres withdrawn from primary forest use for parks and other special public-use areas, and duplications of 7 million acres with pasture (not woodland) reported by the 1954 Agricultural Census.

§ Urban and town areas, farmsteads and farm roads and lanes, highway and railroad rights-of-way, airports, parks, wildlife refuges, national defense areas, flood-control areas, and other special-use areas.

|| Includes miscellaneous unaccounted-for areas not included among other major uses, including marshes, bare rock areas, deserts, sand dunes, and other lands which now generally have low value for agricultural purposes but which have social utility for wildlife and recreational use and potential value for minerals.

** Includes much cropland recently seeded to pasture.

†† Approximately 460 million acres in open permanent pasture in farms, and 170 million acres in nonforest rangeland not in farms.

located in semiarid and desert regions, where the forage available per acre is very low. In many of the drier areas, from 20 to 40 acres are required to provide a season's grazing for one cow.

If we include all the land used for grazing as well as the cropland, about 72 per cent of the total land area is available for use in crop and livestock production. The balance of our total land area is in woodland and forest not used for grazing, or in special uses such as urban and town sites, recreation areas, transportation facilities, and a residual of 75 million acres largely made up of wasteland such as marshes, deserts, and sand dunes.

Alaska's land resources are still undeveloped (Table 6.2). Lands located under climatic and soil conditions some-

TABLE 6.2
MAJOR USES OF LAND, ALASKA AND HAWAII, 1950, WITH PRELIMINARY
APPROXIMATIONS FOR 1959

Land use	Alaska		Hawaii		Total	
	1950	1959	1950	1959	1950	1959
	<i>Thousand acres</i>		<i>Thousand acres</i>		<i>Thousand acres</i>	
Total cropland and arable land*	12	20	465	460	477	480
Grassland and other pasture, excluding cropland pasture † . . .	363	355	796	801	1,159	1,156
Forest and woodland ‡ .	153,008	...	1,211	...	154,219	.....
Other land §	212,099	...	1,628	...	213,727	.....
Total land area	365,482	...	4,100	...	359,582	.....

* Total cropland includes cropland harvested, crop failure, cropland idle, fallow, cropland in soil-improvement crops, cropland for future harvest, and cropland pastured. Cropland pastured includes cropland that was used for pasture but that could have been used for crops without additional clearing, draining, and irrigating.

† Grassland and other pasture includes rough areas and brushland pastured and any other land pastured that was not considered as either woodland or cropland.

‡ Includes forest and woodland, pastured and not pastured. Insufficient information for a 1959 estimate.

§ Other land includes all unaccounted-for land areas, including urban and special-use areas, grassland areas not in farms, tundra, nonvegetated lava flows, sandy beaches, and rock areas. Insufficient information for a 1959 estimate.

TABLE 6.3

LAND IN SPECIAL-USE AREAS OF THE CONTINENTAL UNITED STATES, 1954, WITH
PRELIMINARY APPROXIMATIONS FOR 1959*

Item	Acreage, in millions		Percentage of total	
	1954	1959	1954	1959
Urban areas	18.6	21.1	16.9	17.8
Highways and roads	19.8	....	17.9	....
Railroads	3.4	....	3.1	....
Airports	1.3	....	1.2	....
Total rural transportation areas	24.5	27.0	22.2	22.8
Farmsteads, farm roads, and lanes	11.0	10.0	10.0	8.5
National parks	14.0	....	12.7	....
State parks	4.7	....	4.3	....
Total parks	18.7	20.0	17.0	16.9
Federal wildlife areas	3.9	....	3.5	....
State wildlife areas	4.9	....	4.5	....
Total wildlife areas	8.8	10.4	8.0	8.8
National defense areas	21.5	21.5	19.5	18.2
Flood-control and navigation areas	3.9	4.8	3.5	4.0
Federal industrial areas	2.0	2.0	1.8	1.7
Publicly-owned institutional sites and miscellaneous other uses	1.2	1.5	1.1	1.3
Grand total	110.2	118.3	100.0	100.0

* For basis of classification, see footnotes to Table 7 in *Major Uses of Land in the United States*, Agr. Info. Bul. No. 168, ARS-USDA, January 1957.

† Preliminary data indicate that the special-use areas expanded about 1.5 million acres annually from 1954 to 1959.

what similar to the areas best adapted for farming in Alaska support a flourishing agriculture in the Scandinavian countries. More complete information for all states, including Alaska and Hawaii, is available as a result of the 1959 Cen-

The land in special-use areas in the 48 contiguous states of continental United States is classified in Table 6.3. Preliminary data indicate that the special-use areas expanded

about 1.5 million acres annually from 1954 to 1959. Urban, transportation, and recreational uses are making more and more inroads on available land resources in some areas, especially along both the Atlantic and the Pacific coasts. But it should be noted that for the country as a whole, land in special uses accounts for only about 6 percent of our total land area. Although many difficult local problems arise in areas of rapid "rurbanization," special uses will absorb only a small percentage of our total cropland. However, once productive cropland is devoted to these special uses, it is more or less permanently subtracted from the productive cropland base. In many areas, unplanned expansion has seriously disrupted the local agricultural economy.

The farm uses of our land resources were, as we entered the 1960's, more than adequate for producing the farm products for which outlets were available. In our attempts to control crop surpluses, we established a Conservation Reserve Program which absorbed 22 million acres of cropland in 1959. About an equal acreage of cropland was either idle or devoted to soil-improvement crops. Even within the area available for crops, a much larger acreage could be planted if profitable outlets were available for the resulting production.

We have large areas of abandoned cropland in the humid eastern states that would be cultivated very intensively if they were located in some of the densely populated countries of Europe or Asia, but they cannot profitably be used for crop production under prevailing and prospective economic conditions. In 1959 continental United States contained about 110 million acres of grassland and 105 million acres of woodland fairly well adapted for use in the cropland rotation.² As an offset to this acreage, some 40 to 45 million acres physically ill-suited for cropland rotation

² See page 14 of "A 50-Year Look Ahead at U. S. Agriculture," USDA, June 1959. A more detailed discussion of potential land and water resources is found in "Water Resources Activities in the United States," Select Committee on National Water Resources, United States Senate. Committee Print No. 12, December 1959.

were nevertheless in production; but subtracting 45 million acres from the potential cropland area of 215 million acres still leaves an additional 170 million acres that could be used in the cropland rotation if demands for farm products warranted such expansion. So large an expansion would absorb woodlands that may also be needed to produce timber. If urgent need for much more cropland should arise in the future, it would be necessary to reconcile competing demands for timber versus other farm products.

We are fortunate to have tremendous flexibility in the use of our land resources. We can shift into grazing or forestry additional land which for some years to come is not likely to be needed for crop production. Land shifted to these uses can be regarded as a *contingency reserve* of cropland — against emergencies or for future needs.³

The greatest benefits from the potential flexibility in use of our land resources cannot be realized unless we recognize the impediments to shifting uses in response to prospective needs. The land used for crops as well as much of the grazing and timber land is owned by farmers and other private landowners. Their primary aim is to obtain a high current income from the land. Pressure for current income may prevent prudent and protective use of their land resources if protection results in less net income than exploitive production.

Farmers will continue production of surplus crops unless other more profitable alternatives become available. Attempts to ration land devoted to surplus crops — by acreage allotments or other devices — are likely to be at least partly offset by substituting labor, capital, and other resources for land to increase production on the remaining acreage. One of our unfinished tasks is development of better ways to harmonize individual, group, and public interests in the

³ For a statement on the desirability of maintaining a contingency reserve of cropland, see Johnson, Sherman E., "Farming Systems in Relation to Soil Conservation." Proceedings of the United Nations Scientific Conference on the Conservation and Utilization of Resources, Vol. VI, 1949.

ownership and use of land and water. This unsolved problem should be kept in mind as we consider more in detail the use of land for crops.

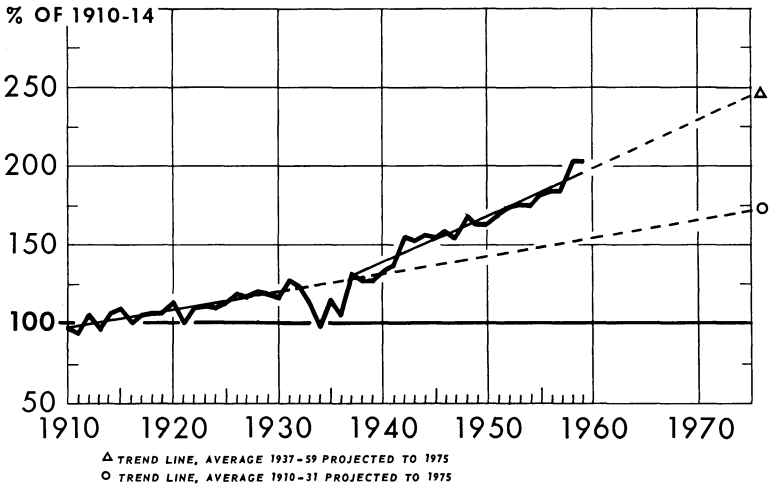
USE OF CROPLAND AND CHANGES IN PRODUCTION IN THE 1950'S

The total acreage of land used for crops remained relatively constant in recent years, but important shifts occurred in the various regions. Compared with the 1940's, the land used for crops increased in the Mountain, Pacific, Northern Plains, and Corn Belt states. Decreases occurred in the Southeastern, Appalachian, and Northeastern states.

Within wide limits, the acreage of land actually planted to crops depends upon available outlets for farm products and the relative economy of increasing yield per acre rather than cultivating additional areas of land. In the 1950's, farmers devoted much more attention to increasing yields per acre by the application of improved technology than to extending the area of land used for crops. The choice was partly influenced by land rationing farm programs. Land already in use for crops was improved by drainage, irrigation, terracing, and other land improvements. Some additional cropland was developed by irrigation and by plowing up native sod for wheat production. But these additions were more than offset by reductions in other areas, that were partly the result of soil bank operations.

Yield per acre is greatly dependent upon the application of improved technology in crop production. The rate of adoption of improved technology became a torrent in the postwar years. The rapid adoption of new techniques by farmers largely accounts for the continuously increasing total production of farm products.

Figure 6.1 emphasizes the greatly accelerated adoption of technology in the postwar years. On this chart it is interesting to compare trends in production extended from two different base periods, 1910-31 and 1937-59. The trend of farm production has stayed above the increase in U.S.



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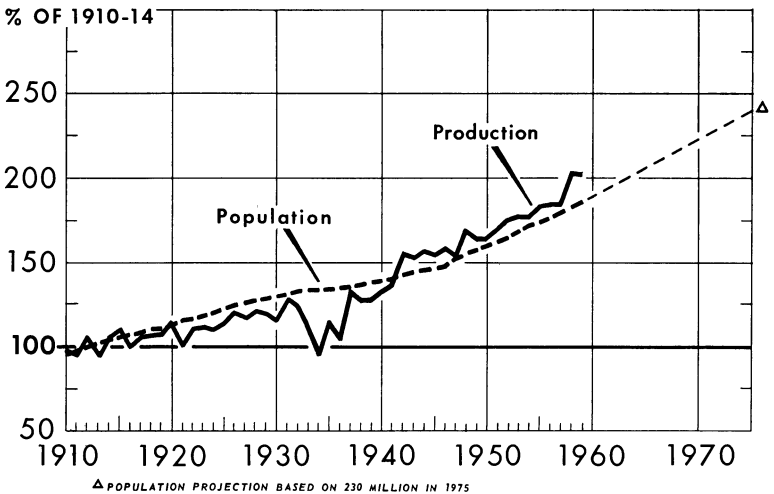
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Fig. 6.1 — Farm production trends in the United States with projection to 1975.

population in the postwar period (Figure 6.2). In considering future production trends in relation to projected needs by 1975, we should bear in mind that current production is above outlets despite restriction programs.

Although more cropland can be made available in future years, if economic conditions warrant such expansion, adoption of improved technology to obtain higher yield per acre is likely to be the greatest source of increases in production in the 1960's. Therefore, we should have clearly in mind what is involved in application of improved technology.

First, the new techniques must be made available through research. But unless they are tested for practical and economical application before they are recommended for adoption, there may be a considerable time lag between discovery and adoption. A few venturesome farmers may try out new discoveries, but most farmers will adopt the



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Fig. 6.2 — Population and farm production in the United States with population projection to 1975.

new techniques only if they are convinced that the new methods will increase their net incomes. Rate of adoption, therefore, also depends on economic conditions, and on the required capital investment.

Under the prosperity conditions of the immediate post-war years, farmers made large investments in new machinery and in real-estate improvements. They also greatly accelerated use of chemical fertilizer, pesticides, and other current expenditures. These investments provided a strong momentum for the production expansion that continued into the 1950's.

Farm prices declined about 20 percent from the peak of 1951 to 1959. Net incomes of farm operators dropped about 27 percent, and still farm production rose about 20 percent in those years. Production continued to rise, despite reductions in farm prices and in net incomes for the reasons indicated by Heady in Chapter 3.

After many farmers bought sufficient machinery to operate larger farms, they found that purchase or rental of additional land would add to net income. If improved technology was applied for the first time on the land which changed hands, the yield per acre was increased, resulting in higher production.

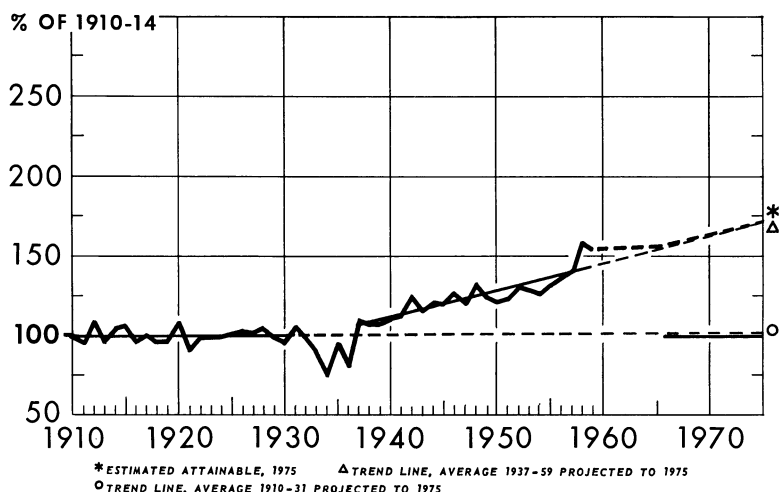
The total resources used in farm production changed very little from 1951 to 1959, while total output increased about 20 percent.⁴ But the investments in machinery and equipment, and the additional operating expenses for more chemical fertilizer, pesticides, and other supplies, resulted in large substitutions of capital and management for labor and land. The hours of farmwork required in 1959 were 27 percent less than in 1951. But the value of farm capital per worker was 80 percent higher than in 1951. The capital assets per worker were 44.5 percent above 1951 even when they were valued at constant prices in both years.

Farmers substituted purchased supplies for both family and hired labor, and for land. This is evident from examination of available data. Adoption of improved technology resulted in a much larger production with consequent downward pressure on farm prices. But the larger production has been produced at lower cost *per unit of product* than would have been incurred with no change in technology. This, plus adverse changes in cost-price relationships, has reduced net incomes and weakened the cash position of farmers.

CROP PRODUCTION PER ACRE

Although concerted attempts to restrict the acreage of land used for crops from 1954 to 1959 resulted in net reduction of 16 million acres, total crop production increased because of rising yields per acre. Acreage limitations and support prices on allotment crops stimulated substitution of fertilizer and other resources for land.

⁴ See Table 1, page 50, of *Agricultural Outlook Charts, 1960*, USDA, November 1959.



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Fig. 6.3 — U.S. crop production per acre.

“Attainable crop production per acre” and projected trends to 1975 are illustrated in Figure 6.3. Crop production per acre increased each year from 1950 to 1958 with the exception of 1954. The large increase in 1958 reflects very favorable growing conditions in many areas which were not repeated in 1959, but production per acre in 1959 was far above any year previous to 1958.

The chief sources of increase in crop production per acre in the 1950's were chemical fertilizer, irrigation, improved seed, mechanization, crop protection, and conservation. Calculated in plant nutrients, the use of chemical fertilizer increased about 55 percent from 1951 to 1959. Durost and Barton have estimated that additional use of fertilizer contributed two-thirds of the increase in crop production per acre from 1951-52 to 1955.⁵ They also calcu-

⁵ Donald D. Durost, and Glen T. Barton, “Changing Sources of Farm Output,” Production Research Report No. 36, ARS-USDA, February 1960.

lated that increases in irrigation accounted for 5 to 10 per cent of the increase in crop production per acre in the same period.

Hybrid seed corn contributed very significantly to yield increases in the 1940's but to a lesser extent in the 1950's. By that time hybrid seed was in general use. Hybrid seed has also become available for grain sorghums and, combined with favorable weather, produced a sharp rise in yields per acre of this crop in 1958 and 1959. The effect of other sources of increased production per acre is much more difficult to estimate except in combination with other factors. Crop protection has been very important in maintaining yields per acre that would have been reduced by plant diseases, insect pests, and weeds.

Conservation activities usually involve a combination of practices applied on the individual farm. Consequently, separate measurement is difficult. A single technical improvement, such as terracing, may be responsible for a perceptible increase in production per acre. However, its effects will be multiplied if it is combined with adequate application of chemical fertilizer, protection against crop pests, and with other crop, soil, and water management practices that provide an overall favorable environment for crop growth. Consequently, the increase in crop production per acre in recent years can be more accurately characterized as the result of adoption by farmers of *combinations of new technology* rather than separately attributed to single improvements.

MANAGEMENT AND TECHNICAL SKILLS FOR INCREASING CROP PRODUCTION

The new technology of crop production makes vastly greater demands on both management and technical skills than the simpler practices which prevailed a generation ago. The successful farm operator today has a much more

complex job of determining the highest income potentialities. He also must have sufficient engineering ability to operate high-priced equipment and to make repairs to case of breakdown. He must be informed about the most suitable crop varieties, the most economical application of chemical fertilizer, the best tillage practices for his soil conditions, and the most effective pesticides to protect his crops against diseases, weeds, and insect damage. He must be able to operate the entire combination of new technology to achieve the highest possible net income from its use.

Mechanization has greatly increased the acreage of land that can be operated by a farm family. This has encouraged expansion of farm size, which, combined with rising land values, has resulted in a much higher capital investment for a farm unit. The average investment per farm increased 44 percent from 1951 to 1959. If we measure the change in constant prices, the investment still shows an increase of 30 percent from 1951 to 1959.

As a result of all these changes, the range in both production and net incomes has widened between the farms operated under capable management and those operated by farmers who are lagging in adoption of the new technology. The lag may be accounted for partly by the lack of capital to invest in new technology, or to unwillingness or inability to assume the risks incident to the larger investment in land improvements, equipment, and current operating expenses.

We should note, however, that a higher level of basic education, capped with vocational courses in the high schools and colleges, and continued through extension and other adult education programs, trained capable operators to cope with the complexities of a modern farm business.

Successful use of the new technology involves much more than adoption of new techniques. Capable management is required to combine the new methods into a profitable system of farming. More capital is needed for improved equipment and for higher operating expenses. Successful

adoption of the new technology involves substitution of brains for brawn, of machines for hand labor, and of capital for both land and labor. It requires a delicately balanced combination of capable management, capital investment, and technical skills.

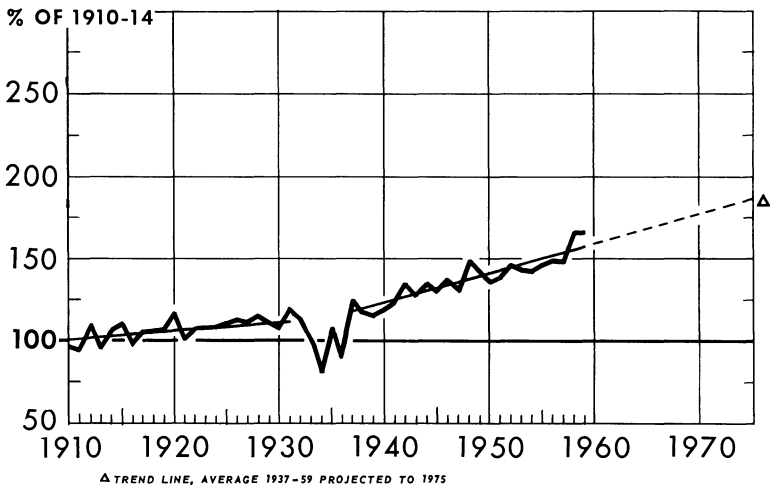
CROP PRODUCTION — RECENT AND PROSPECTIVE

The annual production of all crops from 1910 to 1959 and the projected trendline to 1975 are indicated in Figure 6.4. Unless unforeseen foreign needs develop, it should not be difficult to satisfy demands for crop production by 1975 under average weather conditions.

Increases in crop production since 1953 occurred despite concerted efforts to restrict production. We have much additional land which could be used for crops if larger markets were available. Further adoption of known technology is likely to mean continued increases in production per acre. In fact, some recent analyses project conservative increases in crop yields to 1965 and conclude that under specified conditions, which include continuation of present programs, we could have 15 to 18 million surplus acres by 1965 in addition to the 1960 Conservation Reserve Program of 28 million acres.⁶

If market outlets increased sufficiently to make expanded production profitable, more land would be planted to crops and increases in yields per acre would be accelerated. Either widespread drought of the severity experienced in the 1930's, or worldwide emergency demands on our food production capacity, could alter the prospect of easy balance with prospective needs up to 1975. But if our farm plant is well maintained, our World War II experience indicates that with average weather, farmers can expand production rapidly in response to urgent demands for farm products.

⁶ Raymond P. Christensen, Sherman E. Johnson, and Ross V. Baumann, "Production Prospects for Wheat, Feed, and Livestock, 1960-65," ARS 43-115, December 1959.



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Fig. 6.4 — Crop production in the United States.

PROBLEMS AHEAD

This summary appraisal of our land resources indicates tremendous potential flexibility in their use. The land problems of the 1960's are not likely to be those of meeting demands of U.S. consumers for food. The question of "food enough" will probably not arise unless we are confronted with international emergencies. The chief questions are likely to center on wise, efficient, and profitable uses of our land resources in view of our great potential productive capacity. We will be concerned with how to maintain a *contingency reserve* for emergencies and for the future, and still provide opportunities for farmers to earn incomes comparable with those obtainable in other occupations.

Despite the current adequacy of our land resource base, we must not permit wasteful use of our national heritage. Wasteful use during our development period resulted in soil depletion and land abandonment, and in forest lands cut over and burned over with no provision for restocking.

The national interest requires prudent use and protection of our land and water resources: (1) To assure continued efficient production, (2) to insure against emergency needs, and (3) to provide a heritage for future generations.

Our rapidly growing population will need more living space, more recreation areas, more transportation facilities, and more space for factories in our mechanized economy. Careful planning is needed to provide for these uses because the land once committed to them cannot readily be shifted. Adequate provision is also needed for our timber requirements and for watershed protection, and a reserve of potential cropland maintained.

The possibility of adjusting uses of cropland in response to prospective demands is considerably limited by the need for reconciling private, group, and public interests in the use of our land and water resources. For example, continuation of low net farm incomes over several years could force many individual farmers to neglect prudent and protective use of their land, to postpone repairs on farm buildings, and to avoid purchase of new equipment. If the farm plant were permitted to deteriorate in this way, it would be much more difficult to increase production in response to urgent needs.

If the farm plant is well maintained, however, farmers are quite willing to expand production in response to more attractive prices and higher net incomes. Increase in production under those conditions harmonizes private, group, and public interests because farmers, both as individuals and as a group, gain from expanding production, and the general public obtains a larger supply of farm products at lower prices than otherwise would prevail.

In the 1950's, however, production continued to expand despite slackening prices and lower net farm incomes. Attempts to slow down the increase in production were usually ineffective because they did not reconcile the conflict between individual and group interests. Farmers as a group would have obtained higher incomes if production had ex-

panded less rapidly, or if additional outlets for the products had been developed. Production continued to exceed available outlets, and programs were not developed that assured individual farmers that they would benefit financially from holding production in check. Consequently, each operator attempted to maximize his net income by producing as much as possible within the restrictions imposed by the farm programs in operation.

Our experience indicates that achievement of flexibility by restraining production or by finding additional markets is much more difficult than increasing production in response to greater demands. Reconciliation of private, group, and public interests under those conditions is one of our unsolved problems. We have learned how to produce abundantly, but we have not learned how to combine abundant production with prosperity for the great majority of farm people. By our neglect of this problem, we have tacitly assumed that it would solve itself. Perhaps it would if enough time were given for sufficient loss and withdrawal of land, labor, and capital from farming, and if technology, prices, and costs changed less rapidly than they have in postwar years. Farmers adapt their operations fairly well to moderate changes in their economic environment, but when changes come in torrents as they have in recent years, maladjustments and distress are inevitable unless counter-vailing actions are taken.

It is our responsibility as citizens to find solutions to the unsolved problems in the use of our land and water resources — through support of objective research and through public education, discussion, and action. It is our responsibility as individuals, as groups, and as a nation.

Individual users of land and water have primary responsibility for protecting and improving this heritage. But all U.S. citizens have an interest in guarding against misuse of our resource base. Sustained use of publicly owned watersheds, forests, grazing land, and recreation and wildlife areas, is especially dependent on citizen interest.

Systems established for use and ownership of land are subject to orderly modification. If we consider it of sufficient importance, we can have wide distribution of land ownership with a preponderance of owner-operated family farms. We can provide an economic environment that will permit sustained and profitable operation of family farms. We can develop communities where full-time and part-time farms will prosper side by side, and where urban residents will find "roots in the earth," and will help to enrich a new "rurban" culture. We can guide urban expansion into rural areas to the benefit of both rural and urban industry. We can develop recreational facilities from the most suitable and accessible of our natural resources. We can conserve and improve our soil and water resources. We can protect our watersheds, and can channel scarce water supplies into the most beneficial uses. We can husband our timber and grazing resources for sustained production and use.

These and other desirable objectives can be achieved if we, as a nation, become convinced that they need to be done. Progress on these tasks will first require an understanding of the problems we face, and then analysis and consideration of alternative solutions. We need to agree on the objectives to be attained, and then develop programs to achieve them.

Agreement on objectives is frequently time-consuming because it depends upon public understanding and acceptance of the need for action. On reaching such understanding and acceptance, we can undertake the jobs to be done — as individuals, as groups, and as public agencies dedicated to serve the public welfare. These were the methods used by our forefathers to achieve better use of land. The Homestead Act was the product of long discussion and evolutionary development of our land policy. So was the creation of the Department of Agriculture and the land-grant colleges.

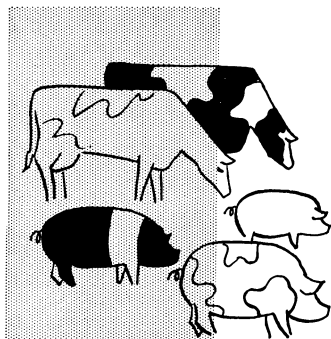
Most of the tasks that need to be undertaken can be

carried out by private individuals if the economic environment makes nationally desirable objectives the most profitable alternatives for individual farmers and other private users of land and water. Reconciliation of private, group, and public interests, however, will require public investment in research, education, and regulatory and other programs designed to improve our uses of land and water for the greatest continuous benefit of individuals, groups, and the general public.

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Recent trends; feed efficiency potentials; economies of scale in livestock production; economics of location.



Present and Future Livestock Production

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THE TOTAL SUPPLY AND COMPOSITION of livestock products depend basically on supply of feed and forage available. Changes in technique of feeding, breeding, and management modify the volume of production. In very large measure livestock and livestock products represent the major return from the grass and forage land of this country. Over one billion acres, nearly 60 percent of the total land area of the continental United States, are used for hay or grazing. (See Table 6.1, Chapter 6.) Grass, hay, forage, and forested rangelands provide more than one-half of the feed for all livestock.¹ Livestock makes use of some lands,

¹ H. H. Wooten and C. P. Barnes, "A Billion Acres of Grasslands," in *Grass, Yearbook of Agriculture* 1948, USDA, Washington, D.C., 1948, p. 25.

TABLE 7.1

NUMBER OF LIVESTOCK AND POULTRY ON U. S. FARMS, JANUARY 1, 1949-58
AND 1960

Class of livestock and poultry	Average 1949-58	1960
	1,000 head	1,000 head
Cattle.....	89,612	101,520
Milk cows, 2 yrs.....	23,361	21,331
Hogs.....	54,478	58,464
All sheep.....	31,167	33,621
Stock sheep.....	27,100	29,481
Horses and mules.....	5,482	3,089
Chickens.....	407,448	366,859
Turkeys.....	5,173	5,673

Source: *Livestock and Poultry Inventory*, Crop Reporting Board, AMS, USDA
Jan. 1, 1960.

particularly in western regions, that has limited alternative uses. While all domestic animals utilize some grass and forage, swine and poultry require considerably more grains and concentrates in the finishing rations than do the ruminants.

The national production of livestock is usually measured in terms of the total number of head of the several species. The inventory of livestock on January 1, 1960 was the second largest on record (Table 7.1).

Significant postwar trends in numbers of livestock in-

TABLE 7.2

AVERAGE NUMBERS OF DIFFERENT CLASSES OF BEEF CATTLE FOR TWO TIME
PERIODS AND COMPARATIVE RATIOS FOR THE TWO PERIODS

Item	1935-39	1956-60
Cows—million.....	10,600	25,467
Bulls—million.....	1,625	1,712
Steers—million.....	5,406	9,871
Calves—million.....	10,515	19,376
Ratio—bulls to cows.....	.153	.067
Ratio—cows to steers.....	1.96	2.58
Ratio—cows to calves.....	1.01	1.31

Source: Computed from *Annual Livestock and Poultry Inventory Series*, Crop Reporting Board, AMS, USDA.

clude a continued decline in cows and heifers kept for milk, in numbers of chickens, and in horses and mules. Hogs have increased only moderately. On the other hand, cattle not kept for milk have increased rather rapidly in the post-war period. The changed composition of the national beef cattle herd is quite significant (Table 7.2).

Since World War II, a larger proportion of the national beef cattle herd has been composed of cows and heifers. The ratio of bulls to cows is half that of prewar while there are more cows to steers. These changes in composition reflect a general tendency toward marketing of cattle at younger ages. In contrast to prewar management, the fifties and early sixties have seen fewer steer cattle marketed at two and three years of age.

MEASURES OF LIVESTOCK PRODUCTION

Inventory numbers of livestock and poultry at a particular point in time, while useful, measure national production only at a particular level of the production process. Livestock output should be considered a flow of products, i.e., live animal, milk, poultry, meat, and eggs from U.S. farms and ranches. Data on total production of meat, poultry, and dairy products give an indication of this magnitude. A measure of products at processing and marketing stages gives an accounting of the production available for consumption (Table 7.3).

Statistics of livestock numbers and of inventory of livestock products are useful for year to year comparisons within the respective classes and species of livestock. However, to relate livestock production to total feed supply the measure of "animal unit" developed by the USDA is probably more useful.

Method of Computing "Animal Units"

Numbers of each class of livestock are converted into the standard "animal unit" by comparing consumption of feed by each species to consumption of feed by one milk cow. Three standardized series have been developed: (1) a

TABLE 7.3
COMPARISON OF U.S. PRODUCTION OF ANIMAL PRODUCTS, 1946-48
AND 1956-58

Product	Average production		Percentage change
	1946-48	1956-58	
	<i>(Million pounds)</i>		
Beef.....	9,626	14,005	+ 45.5
Pork.....	10,569	10,741	+ 1.6
Veal.....	1,490	1,450	- 2.7
Lamb and mutton.....	838	712	- 15.0
Total "red meats".....	22,524	26,908	+ 19.5
Chickens*.....	2,753†	4,879	+ 77.2
Turkeys*.....	491	1,043	+112.4
Milk.....	113.7	125.4	+ 10.3
Eggs (dozen).....	5,079	5,390	+ 6.1

* Ready-to-cook basis.

† For years 1947-49. Ready-to-cook basis not available prior to 1947.

Source: Agricultural Statistics, USDA, and *Food Situation*, USDA, May 1960.

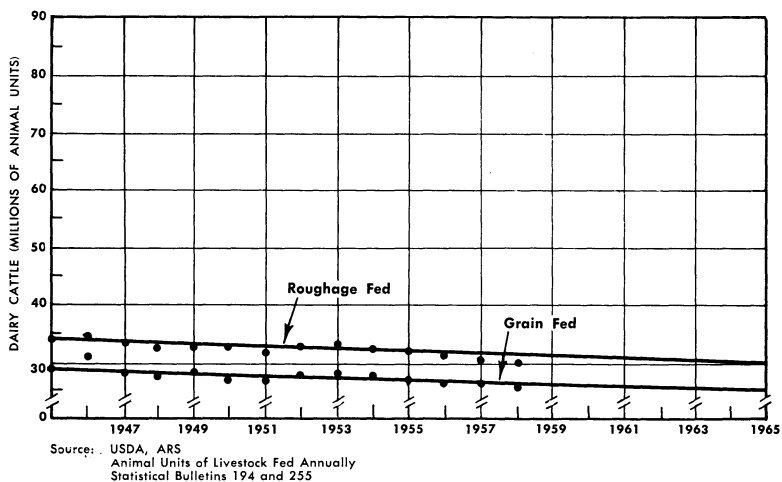


Fig. 7.1 — Animal units of dairy cattle fed annually with trend line (1946-58).

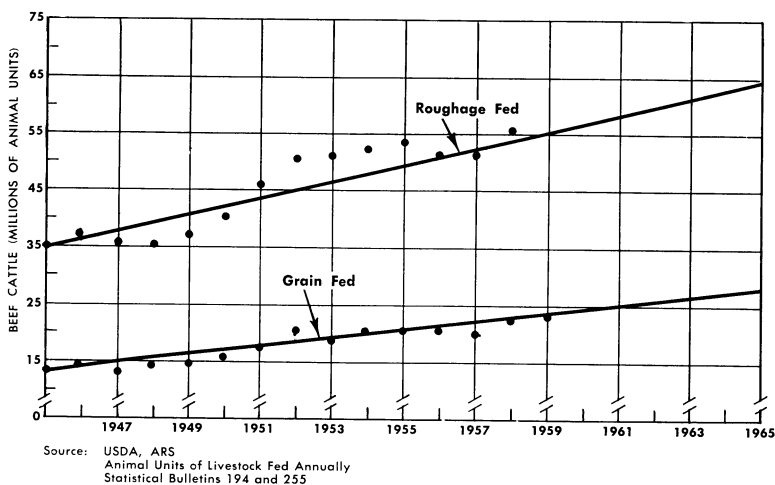


Fig. 7.2 — Animal units of beef cattle fed annually with trend line (1946–58).

grain consuming animal unit, (2) a roughage consuming animal unit, and (3) a combined grain-roughage consuming unit.² These series account for and combine inventory numbers of classes of livestock as well as those fed during the year. In essence, these series represent estimated total feed consumption for each species and for all livestock.

Trends in dairy cattle animal units after World War II show about the same decline in both grain consuming and roughage consuming units (Figure 7.1). In contrast to the dairy cattle is the beef cattle trend, where a rather strong upward trend in both grain and roughage consuming units has occurred in the postwar period. The rather strong upward trend in beef cattle is significant when measured in terms of roughage consuming units (Figure 7.2).

The trend for hogs and poultry is upward in terms of grain consuming units. In case of poultry, this has occurred

² Cf. R. D. Jennings, *Animal Units of Livestock Fed Annually*, USDA Stat. Bul. 194, October 1956, and subsequent series. Also *Agricultural Handbook No. 118*, Vol. 2, Chap. 5. USDA, September 1957.

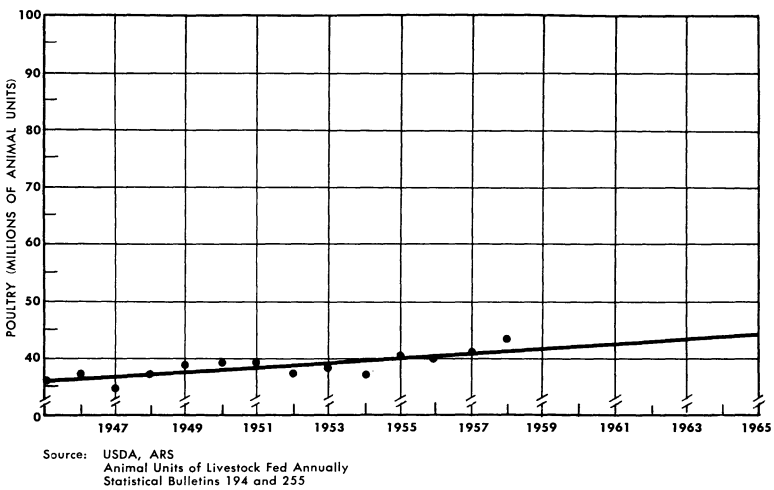


Fig. 7.3 — Animal units of poultry fed annually with trend line (1946–58).

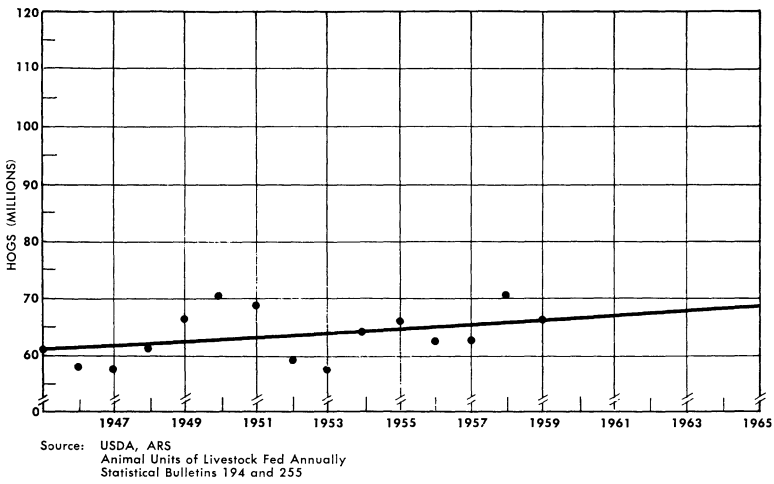


Fig. 7.4 — Animal units of hogs fed annually with trend line (1946–58).

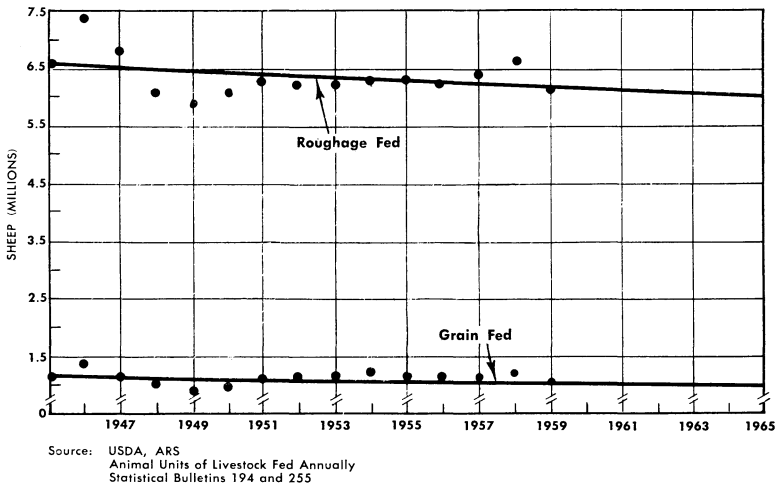


Fig. 7.5 — Animal units of sheep and goats fed annually with trend line (1946–58).

in spite of a sharply declining inventory of chickens kept for egg production and reflects greatly increased feed grain requirements of rapidly expanding numbers of broilers and turkeys kept for meat production (Figures 7.3, 7.4, 7.5).

Sheep classified as grain consuming units declined but increased slightly as roughage consuming animals.

When viewed in the aggregate, including all kinds of livestock, the total grain and roughage consuming animal units remained remarkably stable between 1949 and 1958. Variation has been between 102 to 114 million animal units.³ The peak of 120 million animal units attained in 1943 with wartime wheat feeding and other incentive programs had not been achieved again as the U.S. farm economy entered the 1960's.

Red meat production increased nearly one-fifth between 1946–48 and 1959, while chickens and turkeys have increased 77 and 112 percent respectively. The 45 percent

³ USDA, *Stat. Bul. No. 225*, October 1959, Table 1.

increase for beef in contrast to only a 1.6 percent increase in pork is significant (Table 7.3).

Data on meat, milk, and egg production suggest that an increasing proportion of the feed grains produced is utilized by beef cattle, broilers, and turkeys. This diversion of feed grains reflects the relative strength of beef prices to pork prices.

Postwar efficiency in broiler and turkey meat production resulted in lowered costs and in relative prices and thus expanded market opportunity. While dairy cattle show a downward trend as measured in terms of either grain or roughage consuming animal units, total milk production has increased a modest 10 percent in the postwar period. It is worth restating that while the aggregate measure of livestock in this country has remained quite stable between 1949 and 1959, the production of meat and livestock products has increased substantially. Only veal, lamb, and mutton show declines in production. Significant is the increase in beef in total production of red meat. This reflects increased grain feeding. To a lesser degree, improved forages are no doubt responsible for increases in both beef and milk production.

SYSTEMS OF PRODUCTION

Almost from the Colonial times some degree of specialized livestock production took place according to geographical areas. After the Civil War, the tendency for geographical specialization became more evident. For many decades the Mountain and Great Plains regions specialized in the range sheep and cattle business, the Northeast and the Lake States in dairying, the Corn Belt in hog and cattle finishing. While each of these areas followed somewhat uniform methods or systems of production, there was and continues to be considerable variation in livestock production methods.

Beef cattle production has a wide diversity in systems, part of which is associated with alternative opportunities

for use of land. More than half of the beef cattle in this country are produced in the western states. Beef cattle as well as sheep utilizing range and forested pasture provide the major use of the land in this area. This region will likely continue to be a leading producing area for feeder cattle.

The term "baby beef production systems" applies to more intensive grain feeding of beef animals, beginning while they are very young and just able to eat grains. These animals are usually marketed at twelve to eighteen months of age. This system, though not general, is practiced in the Corn Belt and associated areas where cows are kept and where sufficient grain is produced on the same farm to "feed out" calves.

Sheep production systems include the common farm-flock procedure used in the humid farming areas of the eastern half of the United States and the rangeland system used in western ranges. About two-thirds of the sheep in this country are handled by herders on open rangelands.

Swine production is largely centered in the north central states in association with intensive corn production. In contrast to sheep and cattle, swine traditionally have been generally farrowed and fattened on the same farm. Cattle, and to some extent sheep, have a two-stage system of production: a large proportion of the young are produced on western or other range areas and then shipped to grain producing areas for finishing.

Intensive dairying enterprises tend to be located nearer population centers. Dairy enterprises outside fluid milk sheds tend to be smaller and are located in areas where good forage is available and with processed and manufactured dairy product outlets. Dairy cows kept on many midwestern farms produce milk for family consumption and a little butterfat for sale.

Poultry enterprises in the north central region, until recently, were largely farm laying flocks. Production of poultry for meat has become a highly specialized operation

and has in the case of both broilers and turkeys developed in highly localized areas.

Considerable space would be required to detail the shifts in importance among regions of the United States in various livestock enterprises. Enterprise specialization is increasing rapidly. In 1954 there were reported 3.3 million commercial farms. Of these, 16 percent were classified as dairy farms having received more than 50 percent of their farm income from dairying. Similarly, almost 5 percent were classified as poultry farms and 21 percent as livestock farms. However, these measures do not fully indicate the extent of specialization.

In 1935 only 716 farms reported as many as 3,200 chickens four months old and over per farm. In the 1954 census nearly 6,500 farms reported 3,200 or more chickens per farm and these farms marketed 17 per cent of all eggs reported sold. Broilers were first reported separately in the 1954 census. Slightly over 4,000 farms reported having sold 40,000 or more broilers per farm during 1954.

In the thirties turkeys were usually a sideline enterprise on many farms, but by 1960 most turkey production had been concentrated on specialized farms. In 1940 there were 443,000 farms reporting 2.3 million turkeys. In 1954 83,500 farms reported 5.3 million birds.

The poultry industry has undergone further rapid concentration since the 1954 census. Cattle and lamb feeding and hog feeding enterprises of large scale were reported in the late fifties. There appears to be pressure to increase man-hour productivity on livestock and poultry farms through improved feeding, disease control, and enlarging the size of business.

PRODUCTIVITY PER MAN-HOUR

The amazing story of the tremendous increase in productivity per man-hour in farming is familiar. Less well known is the variation in the impact of technology among different enterprises (Table 7.4).

TABLE 7.4
FARM PRODUCTION PER MAN-HOUR

Enterprises	Percent increase during decade	
	1939-48	1949-58
All farm products	62	81
All livestock and livestock products	25	38
Meat animals	6	9
Milk cows	35	35
Poultry	22	92
All crops	65	93
Feed grains	102	132
Hay and forage	67	43
Food grains	93	141
Vegetables	44	58
Fruits and nuts	9	30
Sugar crops	25	118
Cotton	45	79
Tobacco	27	62
Oil crops	100	118

Source: Compiled from Table 17, *Changes in Farm Production and Efficiency*, USDA Stat. Bul. 233, September 1959.

The contrast between livestock and crop enterprise is striking. Particularly noteworthy is the relatively small increase in man-hour productivity in growing meat animals. Only in the poultry enterprises does increase in man-hour productivity in the 1950's approach that of some of the crop enterprises.

Mechanization, power, fertilizer, and improved seeds contributed to increasing production of feed and food grains per worker. Increased man-hour productivity made possible tremendous increase in crop acreages per worker and stimulated the combination of small farms into large units.

Productivity per man-hour achieved in animal enterprises is chiefly associated with the great improvement in knowledge of nutrition which revolutionized poultry feeding and brought substantial improvement in swine, cattle, and sheep feeding. Behind these gains are the basic discoveries indicating the qualitative and quantitative requirements

TABLE 7.5
FEED UNITS CONSUMED PER UNIT OF POULTRY MEAT PRODUCTION, UNITED STATES, 1940-57

Year*	For broilers			For turkeys		
	<i>Feed units</i> †		<i>Pounds liveweight produced by 100 feed units</i> †‡	<i>Feed units</i> †		<i>Pounds liveweight produced by 100 feed units</i> †‡
	<i>Per broiler produced</i>	<i>Per 100 pounds liveweight</i>		<i>Per turkey raised</i>	<i>Per 100 pounds liveweight</i>	
	<i>(Units)</i>	<i>(Units)</i>		<i>(Units)</i>	<i>(Units)</i>	<i>(Pounds)</i>
1940.....	14.3	489	20.4	114	723	13.8
1941.....	13.8	466	21.5	116	723	13.8
1942.....	14.1	482	20.7	107	666	15.0
1943.....	13.5	451	22.2	111	668	15.0
1944.....	13.6	448	22.3	112	650	15.4
1945.....	13.8	459	21.8	113	634	15.8
1946.....	13.5	448	22.3	113	630	15.9
1947.....	13.2	434	23.0	115	630	15.9
1948.....	12.5	410	24.4	114	610	16.4
1949.....	11.8	382	26.2	109	592	16.9
1950.....	11.5	374	26.7	100	561	17.8
1951.....	11.2	366	27.3	94	556	18.0
1952.....	11.0	359	27.9	95	561	17.8
1953.....	10.9	351	28.5	93	545	18.3
1954.....	10.6	342	29.2	89	537	18.6
1955.....	10.2	318	31.4	93	560	17.9
1956.....	10.1	313	31.9	95	569	17.6
1957.....	9.7	295	33.9	100	585	17.1

* Beginning October.

† A feed unit is the approximate equivalent in value to a pound of corn.

‡ Computed.

Source: Agricultural Outlook Charts, 1960, USDA, November 1959.

for at least a dozen vitamins, mineral requirements for different species of livestock, the role of balance in nutrients, and the efficiency of high energy diets. Research in disease and parasite control has kept pace so that these productivity gains have been maintained.

The productivity gains per man-hour in livestock production so far are largely those in physical efficiency. The possibility of improving productivity per man-hour in livestock husbandry through larger farms and changing systems of production began to unfold in the 1950's through various types of "integration" arrangements. Indeed, the prospect of increasing labor productivity is one of the incentives in so-called integration arrangements.

The rapidly increasing scale of broiler and turkey enterprises was made possible in part by greatly improved feeding efficiency associated with much improved methods of disease control (Table 7.5).

Less dramatic increases have occurred in other species of livestock (Table 7.6). Some of these "gains" in other species probably are because of differences in age when marketed, changes in relative proportion of breeding stock to other animals, etc.

TABLE 7.6

TRENDS IN FEED UNITS OF ALL FEEDS CONSUMED PER UNIT OF PRODUCTION BY DIFFERENT CLASSES OF LIVESTOCK *

Year	Milk cows per 100 pounds of milk	Cattle and calves per 100 pounds produced	Hens and pullets per 100 eggs produced	Hogs per 100 pounds produced
	(Pounds)	(Pounds)	(Pounds)	(Pounds)
1940-1944	114	1,015	63	538
1945-1949	112	967	62	535
1950-1955	108	924	58	520
1956	104	897	55	519

* A feed unit is the equivalent in feeding value of a pound of corn.

Source: *Food*, The Yearbook of Agriculture 1959, USDA, Washington, D.C., 1959, p. 332.

POTENTIAL IMPROVEMENT IN FEED EFFICIENCY

Outstanding features of the published material on efficiency of feed utilization by livestock are a gradual trend toward greater efficiency and the step by step lowering of feed requirements as research findings are put to use. This can be documented more carefully with swine than with beef cattle and sheep.

Developments In Swine Feeding

The new developments with swine at the present time and estimated possible effects of future innovations are selected from the best experimental lots at the agricultural experiment stations of states where swine represent a major part of farm income.

It appears that research in nutrition is not the limiting factor in swine production. Possible areas for more improvement will be: (1) in the area of amino acid balance — either by breeding corn and soybeans with a superior amino acid composition, by introducing new protein sources, or by supplementation with amino acids made by the chemical industry; (2) through a more intense study of mineral interrelationships; and (3) by improving energy utilization.

Additional improvement in feed efficiency will result from breeding programs. This has already been evidenced by the performance of the superior animals now in the swine testing stations and by the development of more intensive selection and superior gene concentration techniques. It has been shown experimentally that correctly controlled temperature and humidity can decrease the amount of feed per 100 pounds of gain by at least 50 pounds for swine.

Disease is a limiting factor in many areas where farmers are attempting to establish an intense swine operation under confinement. Much additional research on the effect of nutrition on disease resistance is urgently needed.

New management techniques resulting from studies of the hog's response to various stimuli and the use of relaxing drugs may promote additional gains.

Considering the research in progress and estimating that the intensity of effort will increase in the future, at least one major innovation should be available by 1965 and a second one before 1980. Therefore, it would seem feasibly possible to produce 1 pound of pork on less than 2 pounds of feed by 1980.

Applying research findings to general farm conditions will be more difficult than making the findings in the first place. Some good swine producers are now getting feed efficiencies equal or superior to those obtained by the agricultural experiment stations. The people most likely to be in the commercial hog business by 1980 should be producing swine on the same amount of feed as is possible under the experimental conditions today. The best figure that has been reported is 1 pound of gain on slightly over 2 pounds of feed. Admittedly, this is for a few animals fed "impractical rations" under very carefully controlled conditions. But when the diverse factors of breeding, feeding, disease, and environmental control are tempered by the right kind of management, it is believed today's best experimental values can be realized by good producers in 1980.

Developments In Cattle and Sheep Feeding

The efficiency which will be obtained with meat producing ruminants (Table 7.7) will be determined largely by the age and size of the animal produced and the type of feed available. Young animals are more efficient users of feeds. If gains occurring as a result of feeding estrogenic-like materials to beef cattle and sheep can be retained and additional research can develop more specific additives which produce desired growth effects without the threat of secondary effects on reproductive organs and other body tissues, a large increase in feed efficiency can be expected.

TABLE 7.7
ESTIMATED EFFICIENCY INCREMENTS FOR RUMINANTS

Year	Reason for improvement	Best experimental lbs. feed per lbs. gain	Feedlot performance
<i>Beef cattle</i>			
1960.....	.....	6-6½	7-8
1970.....	Nutritive balance	5-5½	6½
1980.....	Change in production pattern and improved genetic capabilities	4½	5½
<i>Sheep</i>			
1960.....	.....	5-5½	6-7
1970.....	Change in production	4-4½	5½
1980.....	Nutritive balance, cumulative	3½	4

The conventional fattening ration containing about 15 to 20 percent roughage and fed for 120 days can be expected to produce 1 pound of steer gain for about 6½ pounds of feed. Pelleted lamb rations are more efficient, producing 1 pound of lamb for 5½ pounds of feed.

A beginning has been made on a series of investigations into fundamental factors underlying the utilization of feed by ruminants and the part rumen microorganisms play in breaking down the feed. As this research is intensified and applied, it is possible that additional control over factors affecting feed intake, rate of passage of feed through the gastrointestinal tract, and the activities of rumen bacteria may allow us to gain additional control and permit an additional 10 to 20 percent improvement in the utilization of feed.

Many diseases in ruminants, such as bloating, are associated with improper balance of food or by the animal taking in unusually large amounts of feed in a short period of time. Research on rumen microorganisms should help reduce these conditions and the resulting periods of low gains.

Properly applied research has roughly halved the amount of feed required to produce pork (Table 7.8),

TABLE 7.8
IMPROVEMENTS IN FEED EFFICIENCY IN SWINE

Year	Reasons for improvement	Lbs. of feed per 100 lbs. gain
<i>Ration (cumulative improvements)</i>		
1910	Corn + minerals	600-1,200
1920	+ low quality protein	540
1930	+ mixed protein	400
1945	+ soybean meal + B vitamins	370
1950	+ antibiotics	340
1954	Mixed proteins (better amino acid balance)	300
1959	Results from selected swine testing stations	
	Best lots	260
	Average lots	295
<i>Projected improvements</i>		
1965	Temperature control, best conditions	250
1970	Disease control, "germ free"	225
1975	Gains from breeding program (cumulative)	205
1980	Gains from improved nutrition under above conditions (cumulative)	190
	Management gains (cumulative)	175

whereas the only real improvement in feed efficiency in ruminants during the same 50 year period has been the 10 to 15 percent that resulted from the use of estrogenic-like materials in the meat producing animals and some gains resulting from the marketing of younger, lighter weight animals.

There appears little likelihood that control of temperature will be a major factor in beef and sheep production by 1980. Since the time required for reproduction of these animals is long, improvement through breeding will not progress as rapidly as has occurred with poultry or which may occur with swine. A compensating factor is the high degree with which rate of gain is inherited in beef cattle as compared to swine.

Improvement of feed conversion efficiency will likely continue to receive the greatest emphasis among livestock breeders and nutritionists. Performance and progeny tests records will become more important in breeding programs.

Several geneticists have suggested that in the production of swine three or four lines will eventually tend to predominate, just as has happened in broiler production.

Considerable progress in cattle breeding is possible with organized programs of progeny testing being undertaken by land-grant colleges and by private organizations. Results of a 112 day progeny test group of a private research organization suggest a wide variation in performance in weight gains among cattle. Several lots of ten head each gained in excess of 3.8 pounds daily compared with average gains of 3 pounds.⁴

FACTORS AFFECTING LOCATION OF LIVESTOCK PRODUCTION

Improvement in feed-conversion of cattle, swine, and sheep coupled with improved disease control procedures will set loose a new force affecting locations of and systems of livestock feeding.

Other things being equal, whether important shifts in location of feeding can take place is dependent in part on relative transportation costs of feed versus livestock products. Indeed, feeding enterprises in feed-deficit areas will be quite sensitive to freight rates. The present rates on the Mississippi River and the influence of the St. Lawrence Seaway would suggest lower freight rates on grains and feed. It is possible that only finishing operations can take place in areas near population centers.

Relative costs of transporting hogs, for example, live or in carcass is dependent on live and dressed meat rates and the dressing yield of hogs. When the feed conversion ratio falls, eventually a point will be reached at which it would be cheaper to move the grain to feeding establishments nearer population centers. It appears that while we are approaching that point we had not reached it by 1960.

⁴ *One Hundred and Twelve Day Report*, Coddington-Armour Research, Foraker, Oklahoma, June 1960.

LARGER UNITS SHOW SOME SAVINGS

Economies of large scale operations will also be a factor in future livestock production systems. Cost of production data by states or regions are difficult to obtain but are important in relation to movement of products from some areas to distant markets.

A clue to the effect of size on cost was reported in a study of California feedlot operations. This analysis assumed feed costs for all in the California location to be roughly similar and concentrated on costs other than feed as related to size. (Other costs include labor, depreciation, interest on investment, taxes, death losses, etc.)⁵ Daily non-feed costs declined 35 percent as size of operation increased from 480 head to 18,000 head units. While there are problems of comparability, it is suggestive of the impact of size. It might be that these cost reductions are sufficient to overcome transport costs on feed requirements from distant points.

Similar data for swine enterprises from Purdue University indicate that there might be substantial economies of scale. Higher returns per man-hour can be achieved.

Economics of Larger Unit Operations

Achievement of sufficient scale to increase man-hour productivity, through improved facilities arrangements, fuller use of facilities, application of appropriate genetic nutrition technology, and superior management are obviously necessary. The feed-livestock economy cannot long remain out of step in man-hour productivity compared with other farm enterprises. In the livestock enterprises great opportunities exist for improvement of red meat animal production. Certainly we must approach that presently achieved in turkey and broiler meat production.

⁵ John A. Hopkin, "Economies of Size in the Cattle-Feeding Industry of California," *J. Farm Econ.*, Vol. 40, No. 2, May 1958. Also Tech. Bul. 138, Agr. Exp. Sta., Univ. of Arizona, December 1959.

The implications of moving to this level of attainment are staggering. Some that might be mentioned are:

1. Larger units obviously mean fewer total number of operations. For example, it has been suggested that 100,000 farmers with 100 sows each could produce all the hogs we are now producing. If real economies of scale exist beyond 100 sows, enterprises say to 200-sow unit or to 600-sow unit, one can readily calculate the possible impact on number of individual farms needed to produce our pork.

2. As another possibility, one could imagine commercial separation of pig raising and brooding from that of finishing operations and even area specialization in each of these activities. Feeder pig operations may become more extensive than we have heretofore considered commercially feasible. This two-stage operation has long been a characteristic in beef cattle, i.e., range production with finishing often carried on at widely separated points.

3. If large unit operations mean substantial reductions in costs through the application of the best in technology and management, it is possible that hog feeding operations, for example, can be separated from feed growing operations. Further reductions in feed required per pound of gain will make increasingly possible further extensive feeding operations nearer population centers.

4. Implications of some changes in livestock feeding would include shifts in the type of associated processing and marketing facilities. It is likely that the type of marketing services required by larger unit operations will be different from those demanded under conditions of small, widely dispersed production units.

Specialized Feeding Operations

Specialized operations can achieve better use of facilities, capital, and management. To what extent these advantages can be incorporated in typical Corn Belt feeding

operations is a question for concentrated study. It might be that advantages of combining the growing of feed and feeding livestock offset the advantages of specialization.

Economics of Location of Production Enterprises

The piling up of population in cities and the continuance of this trend means that a new dimension in the production-market relations must be reckoned with. The eastern Corn Belt conceivably has less problems of adjustment on this score. However, the western Corn Belt may have to face up to the prospect of declining relative importance of livestock feeding to the extent that feed production for nearby livestock feeding cannot overcome economies of specialization and location near large market centers.

Disease and Sanitation Control

This is probably a more important problem with swine, particularly on larger farms. A higher degree of management is required to maintain acceptable levels of sanitation control. Special disease problems, not now apparent, will be uncovered as farms become larger. The skills of the veterinary profession will be required to cope with these new problems.

Uniform Quality and Quantity Control

One of the forces coming from large scale retailing is the pressure and need for more uniformity in flow of animals and animal products through the market system. Seasonal and cyclical variation in supplies has long plagued the industry. Integration may be the answer in some cases. In other situations, larger farm marketing combinations may be effective. Ways of recognizing quality in both beef and pork must be improved to facilitate buying and selling. The longer the distance between producer and consumer, in

the market channel sense, the greater the importance of quality identification. Breeders and geneticists must take increasing heed of the need for improving quality uniformity of animals.

Choice of Business Arrangements

A variety of plans and contracts providing capital, facilities, and management are available to producers and feeders. These contracts require close scrutiny on the part of feeders. Consideration must be given to the matter of risk sharing or risk transfers. Also involved are problems of managerial control. Different producers and feeders no doubt will weigh these factors differently. A considerable "shakedown" period in contractual and other arrangements is likely in the immediate future.

MORE COMPETITION COMING

These are some of the problems posed by forces arising from the present and prospective technology and from increasing population concentration. Traditional livestock feeding areas face competition from new areas. Corn Belt feeding is still big league. It is possible that the new feeding areas can, through the use of the best in technology, management, production, and through newer arrangements in processing and marketing effectively compete with the Corn Belt. These new areas will not be hampered by having to unlearn older methods. However, the economical use of labor on many Corn Belt farms can be achieved through an efficient livestock feeding enterprise. Even though these feeding enterprises will likely not be as large as specialized feeding operations, complementary relationships of feed production and livestock finishing will in many cases offset cost advantages of large scale units. Further, no better alternative than livestock feeding for underemployed labor is available on many farms. A considerable force exists in these relationships to sustain a large share of livestock finishing in the Corn Belt.

MAJOR ADJUSTMENTS ARE AHEAD

The major adjustments in livestock production are ahead of us. Population concentrations and rapidly expanding technology are pressing hard on livestock producers to change their methods and size of business. The pressure to change will encourage new business arrangements in production, relocation of some livestock feeding (not all of it), relocation of plants, and new type of marketing institutions.

It is fortunate for the livestock industry that the prospective adjustments in technique on individual farms, between areas, and among processing and marketing firms can be done in a framework of ever-expanding demand for livestock products within the foreseeable future. These adjustments and impacts on particular farms, areas, processors, and marketing firms would be exceedingly painful in a static general demand situation. On the other hand, these same conditions of expanding demand contribute in part to the need for adjustments in the feed-livestock marketing complex.

"ANIMAL AGRICULTURE" AS A TOOL IN AGRICULTURAL ADJUSTMENT

Preceding chapters emphasized the expanding capacity of the U.S. farm plant. The continued existence of large surplus stocks of feed and food grains testifies to this great capacity.

Large surpluses of feed grains generated the expectation in many quarters of increased animal production as a means to reduce feed grain "surpluses" and to improve human nutrition through greater consumption of milk, meat, eggs, and other animal products.

If feed grain surpluses were used for increased feeding of livestock and poultry, certainly rather large short-run dislocations and derangement of the livestock industry would take place. Furthermore, such a "crash" program

would provide only temporary relief, inasmuch as the present backlog of technology applied to our land resources will produce an excess of feed grain supplies in the future, as Bonnen states in Chapter 5.

In view of the present supply and demand imbalance, expansion of the livestock industry has appeared to be an attractive solution. In recent years this notion gained popularity in the annual forums of the National Institute of Animal Agriculture. The initial program and discussion at the Institute supported three general and related objectives: (1) improved human nutrition, (2) increased production and consumption of poultry and livestock products, and (3) soil building and better land use.⁶

Implied in these efforts was greater consumption of livestock products. The Institute speakers hoped it might promote a voluntary program of "storing more grain on the hoof" and an expanding livestock industry was seen "as the best, if not the only, adequate answer to the devastating cyclic problem of farm surpluses."⁷

It has been calculated that animals and poultry, as converters of hay and grain to meats, eggs, etc., require roughly seven times as many nutrients as would be required to feed our population on a strictly cereal diet. Since 1930 this recurring idea has been expressed in a number of ways. For example, it was said that "one pint more milk per day," or "one additional pat of butter," or "one additional slice of bacon" would cause that particular surplus to evaporate. This notion has considerable appeal to livestock, dairy, and poultry producers during periods of low prices.

This solution to expand livestock numbers presupposes a willingness and ability of consumers to purchase more food. In Chapter 4, Fox points out the limitations to increasing demand for even these additional minute quantities of good foods. It also has appeal from the standpoint of the possibility of increasing the amount of land resources used

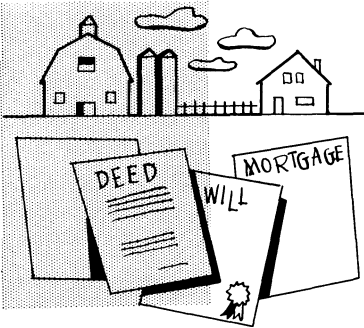
⁶ Cf. *Proceedings First National Institute of Animal Agriculture*, 1951.

⁷ *Ibid.*, p. 20.

in producing the total national food supply. The inverse application of the seven to one ratio for direct versus indirect consumption of farm products seems simple enough. It would increase the need for land resources.

This general idea has merit for the longer run. However, it requires an increase in the demand for animal products arising from increasing per capita income, as well as from a growing population. Likewise, increased consumption of animal products could occur if prices of these products declined relative to other food products. Changes in either demand for meat products or in costs are not likely to be great enough to have a significant impact on increasing the derived demand for land resources.

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The family farm; economies in farm size; capital requirements; leasing arrangements; problems in building up equity.

Farm Size, Capital, and Tenure Requirements

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FOR EVERY 100 FARMS in 1940 there were only 75 in 1958, but the average farm in 1958 had 1.4 times as much land and produced products with nearly twice the value with 46 percent less labor.

What do these astonishing rates of change mean for rural society in the future? Do they mean that rapid technical advance is incompatible with the historic institution of family farms, or is it merely incompatible with as large a number of farms as we now have? Do these rates of change mean that most potential economies of scale are beyond or within the size limits of well-operated family farms? To what extent are they expanding the capital re-

quirements of farms? Are land and capital requirements expanding beyond the ability of families to retain major control over their farms? If so, what tenure changes are likely to occur?

CONCEPT OF THE FAMILY FARM

In handling these questions, our concept of the family farm is a family unit of production. In industry, such units are called the family store, the family shop, the family mill, and the like. In farming, they are called family farms. In both industry and farming, a family unit of production is a business organization in which most of its labor and managerial activities are combined in the same individual or family. This means that a given farm — the King ranch, for example — is not a family unit of production if the family that supplies most of its managerial direction is not also the family that supplies most of its labor. Conversely, a given farm, such as a sharecropper unit, is not a family unit of production if the family that supplies most of the labor is not also the family that supplies most of the managerial direction.

Conceivably, the whole of U.S. agriculture could be made up of farms of sizes falling chiefly within the labor capacities of individual families but with no one of them qualifying as a family unit of production. Each farm might be small enough for each family to do most of the work, but with tenure arrangements that lodged most of the management in someone else. The Delta plantation system, for example, was characterized by this situation under the older sharecropper regime. This may be true also of some "integrated" farms, as in broiler production, for example.

Two farms may not possess the same degree of "family-ness," if in one instance, the family supplies all labor and management, and in the other instance, only 75 percent of each. One may quibble over how much hired labor on a farm is consistent with the family farm and over the degree of restrictions on the operator's managerial powers.

A perfect definition of the family farm is not possible. For example, at one extreme, we may conceive the family farm to be any farm unit on which all the labor and managerial roles are lodged in the same skin. But this "perfect definition" would exclude many large farms that are viewed as family units in the everyday meaning of the word. At the other logical extreme, we may conceive a family farm to be any farm unit that lodges the complete managerial function in a single family but does not limit the amount of permissible hired labor. According to this definition, the Ford Motor Company was until recently a family production unit, and its counterpart in farming would be a family farm.

To avoid the realistic absurdities of either of these logically "perfect" definitions, this chapter conceives the family farm to be *any farm on which most of the labor and managerial activities are carried out by the same individual or family*.

Thus conceived, the family farm ties into four broad facts that are relevant to our problem:

1. It involves the close association of the household and the farm business, but the farm need not be the place of family residence. The latter is accidental. For example, the widespread separation of crop and livestock production on the same farms in the Great Plains has been associated with a 7 to 15 percent shift of family residence from farms to towns. But this change has not altered the fact that the families who do most of the managerial direction of farm activities also do most of the farmwork. Thus the farms of this region remain as much family units of production as before.

2. The possibility of family farms does not rest on the ownership of capital resources but upon the family's possession of managerial power to direct farm operations. This possession of managerial power may be accomplished through various tenure forms. Any particular tenure form

may or may not be compatible with family farms, depending on how it is actually drawn and implemented in practice.

For example, there are instances of full-owner operators ceasing to be family farmers because they have so bargained away control over farm operations that they have become virtually hired laborers. Such instances are found most frequently in cases of very perishable crops, where timing is of the essence and where alternative market outlets are not available.

Again, tenancy is compatible with family farms because, generally speaking, tenants make managerial decisions with little or no interference from landlords except when permanent improvements are involved. Thus, the Corn Belt is commonly recognized as second to none in the dominance of family farms and yet for decades the percentage of renter-operators in this region has been among the highest in the nation. But in some forms, tenancy may be incompatible with family farms. For example, the share-cropper system generally lodges so much managerial power in landlords that tenants are essentially directed laborers, paid with a share of the crop instead of money.

Contract farming arrangements may or may not be compatible with family farms. Certainly they are incompatible with family farms to the extent that they are merely an adjunct to complete "integration." Under this circumstance contractual arrangements are so drawn and implemented that they are merely a mechanism by which processors and distributors of farm products take over so much control of farm operations that the farmer is reduced essentially to a worker status.

But contract arrangements may be so drawn and implemented that they do not materially shrink the farmer's managerial power. This has been true of contract production of fruits, sugar beets, and vegetables throughout the Intermountain states and elsewhere. In these instances,

contract farming is essentially a system of negotiated prices which shifts price risks to marketing agencies without altering other risks peculiar to farm production. Thus, in making production decisions, farmers know the prices they will receive for their products. Under this circumstance, contract farming is no more incompatible with family farming than is wheat production with its marketing quotas and price floors. The same principle might be applied to hog production and cattle and sheep feeding.

Finally, corporate tenure may be compatible or incompatible with family farms. It is incompatible if controlling stock is taken over by absentee owners who in turn hire professional managers to direct completely the farm operations. This reduces self-bossed farmers to the status of foremen or directed workers. However, if most of the controlling stock is vested in the farm-operating family, as is frequently the case, corporate tenure is as compatible with the family farm as is fee simple ownership of land.

3. Either subsistence or commercial farming is compatible with family units of production, but these two characteristics trace to quite different concepts of freedom. Historically, subsistence farming is rooted in the self-sufficient-man ideal, according to which a completely free man contains within his control all the capabilities and other resources to meet his needs. Thus he enjoys a freedom of action that is wholly independent of willingness of others to take off his hands the products he does not need in exchange for those he does need. To the feudal system of land tenure, for example, it was a contradiction to think of men as free and at the same time as dependent for their livelihood upon a market exchange. No one has bespoken this noncommercial concept of freedom more truly than did Jefferson in his saying that commerce involves dependence on "the caprice of customers," which "begets subservience and venality," which in turn "suffocates the germ of virtue"

and therefore renders men the "fit tool for the designs of ambition."¹

By combining the managerial role of feudal lords and the labor role of serfs, the rise of the institution of family farms in the New World in great measure enabled our forefathers to transmute the ancient self-sufficiency concept of a free man into a democratic way of life. In Jefferson's time, for example, family units of production were as characteristic of industry as they were of farming. But in contrast to the family farm of his day, the family shop or family store was a highly commercialized institution. The livelihood of the operator depended upon "the caprice of customers" which in turn begat "subservience and venality."²

The family farm of the youthful United States was a vehicle through which common man achieved a high approximation of the ancient and medieval self-sufficiency ideal of freedom. It was also a prime vehicle of the enterprise concept of freedom, which stemmed from the seventeenth century natural rights philosophers, and of the deep-seated ethic of industry stemming from the Protestant founders of the sixteenth century.³ At the heart of the enterprise concept of freedom is the judgment that owners or their legal agents have the exclusive right (power) to prescribe the rules under which their businesses shall operate; therefore, a chief function of government is to prevent any encroachment upon this complete managerial power of proprietors by others, including government itself. The key ethic belief in industry is that one fails in his obligation to do the best he can for himself, his family, his country, and even all men, if he places love of the "easy" or backward ways above excellence in any employment of his choice.

¹ Notes on the State of Virginia, 1782, Query XIX.

² *Ibid.*

³ These concepts are treated in detail in the senior author's paper, *American Creeds and the Problem of Excess Capacity in Agriculture*, USDA, Agr. Res. Serv., Farm Econ. Res. Div. pp. 34-47.

4. Given the low productive farm and farm marketing technology characteristic of the early years of the United States, the family farm is compatible with each of the three value systems just cited. (a) It is compatible with the self-sufficiency view of freedom as nondependence on market relationships. With such technology even the most diligent family can scarcely do otherwise than produce mainly for its own subsistence. (b) It is also compatible with the enterprise concept of freedom. Neither trade nor the absence of trade necessarily involves interference by outsiders with complete managerial prerogatives of proprietors to run their businesses as they please. (c) Finally, the low productive farm technology in the youthful Republic was eminently compatible with the key belief of industry; there was no impediment to families directly investing their time and energies in producing capital goods instead of wasting themselves in unproductive leisure. In this way, most capital formation of the nineteenth century United States stemmed from striving for excellence by relatively non-commercial family farmers. As Moulton has aptly observed:

Under conditions of pioneer life in America. . . capital goods were largely created by direct apportionment of the farmer's energy to that purpose. The farmer. . . devoted those portions of the year during which it was impossible for him to plant, cultivate, or harvest his crops, to the clearing and improving of land, the digging of ditches, and the construction of fences and farm buildings. . . . Since the farming classes until the middle of the nineteenth century made up the bulk of our population, the larger proportion of capital equipment in America until comparatively recent times was the result of an individual process of utilizing off seasons of the year which could not . . . be turned to account in the creation of consumer goods.⁴

This industriousness (practice of the work ethic) destroyed the subsistence type of farm which was the exponent of the age-old belief in freedom as personal independence

from the "caprice of customers." The highly productive commercial farm of the 1960's is the nation's chief perpetuator of the enterprise concept of freedom as noninterference with the natural right (or power) of proprietors to run their businesses under what rules they please.

There is no assurance that continued allegiance to the work ethic of industry may not lead eventually to the destruction of the modern commercial family farm. For this ethic:

. . . includes the judgment that esteem and acceptability of any institution is merited by superior proficiency in performing a social function such as feeding and clothing the nation. Therefore, should technological advance appreciably outstrip its capacities to keep in step, even the most efficient family farms possible would soon be identified with wasted manpower, land, and other resources. Under this circumstance, it is difficult to see how the family could escape the doom of the very work ethic it has so long and conspicuously fostered. . . .⁵

Increasing Proportions of Farms Qualify As Family Farms

The upper size limit of family farms is considered here as the amount of land and other resources whose labor requirements are approximately 3 man-years. The labor force of an ordinary farm family is approximately 1.5 man-years.

The lower size limit of any self-supporting family farm is the smallest amount of land and other resources needed to support farm operating and family living expenses from farm earnings. Whatever the limit may be, we know it is rising rapidly. For every 100 commercial farms with less than \$10,000 worth of sales in 1949, there were only 85 in 1954, the latest year for which data were available (Table 8.1). Furthermore, farms with smaller sales disappear more

⁴ Harold G. Moulton, *The Formation of Capital*, The Brookings Institution, Washington, D. C., pp. 11-12. 1935.

⁵ John M. Brewster, "Technological Advance and the Future of the Family Farm," *Jour. Farm Econ.*, 40:1604-5. 1958.

TABLE 8.1

CHANGE IN NUMBER OF FARMS BY ECONOMIC CLASS, UNITED STATES AND REGIONS, 1949 AND 1954*†

Region and year	Unit	All commercial	Economic class‡						All non-commercial
			I	II	III	IV	V	VI	
United States:									
1949.....	Thous.	3,705	103	381	721	882	901	717	1,673
1954.....	Thous.	3,327	134	449	707	812	763	462	1,455
Change.....	Pct.	-10.2	29.8	17.8	- 2.0	- 8.0	-15.3	-35.5	-13.0
Northeast:									
1949.....	Thous.	283	12	46	74	69	53	29	160
1954.....	Thous.	254	14	51	67	59	43	20	123
Change.....	Pct.	-10.1	21.8	9.7	- 8.9	-15.1	-18.3	-30.6	-23.0
Corn Belt:									
1949.....	Thous.	771	20	118	207	192	146	88	223
1954.....	Thous.	705	30	150	192	156	117	60	196
Change.....	Pct.	- 8.6	50.1	26.7	- 7.5	-18.4	-20.0	-31.3	-12.1
Lake States:									
1949.....	Thous.	410	4	38	118	130	84	36	93
1954.....	Thous.	379	6	49	113	133	72	26	78
Change.....	Pct.	- 7.4	46.5	28.8	- 3.8	-13.1	-13.9	-27.1	-16.3
Appalachian:									
1949.....	Thous.	568	4	15	47	113	193	176	402
1954§.....	Thous.	522	5	19	62	140	171	125	348
Change.....	Pct.	- 8.1	27.1	22.5	32.2	5.2	-11.2	-29.0	-13.6
Southeast:									
1949.....	Thous.	355	4	10	22	63	119	137	251
1954||.....	Thous.	303	7	16	33	72	96	79	222
Change.....	Pct.	-14.8	50.5	57.6	50.0	15.0	-19.3	-42.5	-11.5
Delta States:									
1949.....	Thous.	340	4	9	17	47	117	146	217
1954**.....	Thous.	298	7	13	26	65	111	76	175
Change.....	Pct.	-12.5	77.7	43.8	47.3	38.3	- 4.5	-48.3	-19.7

[204]

TABLE 8.1 (Continued)

Region and year	Unit	All com- mercial	Economic class ‡						All non- commercial
			<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	
Southern Plains:									
1949.....	Thous.	319	14	39	58	75	77	56	154
1954††.....	Thous.	256	15	34	46	59	61	41	156
Change.....	Pct.	— 19.8	1.8	— 12.6	— 20.4	— 21.3	— 20.7	— 26.1	1.3
Northern Plains:									
1949.....	Thous.	338	10	47	103	101	55	22	32
1954.....	Thous.	316	10	55	101	89	45	16	29
Change.....	Pct.	— 6.4	7.6	17.4	— 2.3	— 12.2	— 18.4	— 26.0	— 10.3
Mountain:									
1949.....	Thous.	149	12	27	38	35	25	12	45
1954.....	Thous.	136	13	28	34	30	22	9	43
Change.....	Pct.	— 8.8	11.0	3.3	— 9.3	— 16.1	— 14.9	— 20.3	— 3.8
Pacific:									
1949.....	Thous.	172	19	31	37	37	34	14	94
1954.....	Thous.	157	27	34	33	29	26	8	85
Change.....	Pct.	— 8.7	39.7	10.2	— 11.2	— 20.7	— 23.9	— 40.9	— 9.7

* Farm prices approximately the same in 1949 and 1954.

† Percentages computed from unrounded data.

‡ Class limits fixed by value of sales: Class I, \$25,000 and over; Class II, \$10,000 to \$24,999; Class III, \$5,000 to \$9,999; Class IV, \$2,500 to \$4,999; Class V, \$1,200 to \$2,499; Class VI, \$250 to \$1,199, including only farms with 100 days or more of off-farm work by operator or income of farm operator and members of his family from nonfarm sources greater than value of all farm products sold.

§ Includes disappearance of 18,000 sharecroppers.

|| Includes disappearance of 30,000 sharecroppers.

** Includes disappearance of 25,000 sharecroppers.

†† Includes disappearance of 6,000 sharecroppers.

Source: Census of Agriculture, 1954.

rapidly. For every 100 commercial farms with less than \$5,000 worth of sales in 1949 there were only 82 five years later.

While the minimum size limit of farms is increasing sharply, the really serious question is whether larger-than-family farms are increasing more rapidly than family farms. Evidence shows that these larger farms are qualifying as family farms by cutting back on the amount of hired labor used. Preliminary results of a study by Radoje Nikolitch, USDA, indicate this is so. Farms in census economic classes I and II appear to be increasingly within the size limit of family farms (see Table 8.1). Thus for every 100 farms in 1949 with sales of \$10,000 or over that used 1.5 man-years or more of hired labor, there were only 95 in 1954. Also, for every 100 farms in this group that had less than 1.5 man-years of hired work in 1949, there were 132 in 1954. The same trend is apparent even if not more than 1 man-year of hired labor, or even no hired labor, were allowed on family farms.

These trends were the same in all regions except the Pacific, where the percentage of farms using 1.5 or more man-years of hired labor increased slightly faster than farms using less than this amount.

Assuming that hired labor was as productive as family labor, it is estimated that family labor accounted for 31 percent of total production of all farms in economic classes I and II in 1949, compared with 39 percent in 1954.

The foregoing trends suggest no incompatibility between technological advance and the institution of family farms. This is precisely the result to be expected on conceptual grounds, because there is a fundamental difference in the nature of the "Industrial Revolution" in agriculture and in industry. This fact is evident from the vantage point of earlier times when farming and manufacture were alike with respect to the sequence in which production steps were carried out. Normally in both instances they were done

sequentially, one after another, usually by the same individual or family.

The shift to machine methods quickly wiped out this age-old similarity. With minor exceptions of certain specialized poultry and livestock operations,⁶ a shift to machine farming leaves relatively undisturbed the sequential pattern of operations that has prevailed in farming since the domestication of plants and animals. In contrast, the same shift to industry transmutes this older sequence of operations into the modern simultaneous pattern characteristic of the factory system. Thus in farming, the "Industrial Revolution" is merely a spectacular change in the gadgets with which operations are performed, whereas in industry it is a further revolution in the sequence of productive operations.⁷

This second aspect of technical change is the one that demolishes the older order of family production units. It multiplies the number of concurrent operations far beyond the number of workers in a family. From the standpoint of sheer physical necessity, in industry such advance has long since replaced the premachine system of family units with immensely larger ones. They often require thousands of workers fastened to different concurrent tasks that must be coordinated and guided by layer upon layer of supervisors and managers.

Technical advance in farming, which is merely spectacular change in the gadgets with which operations are performed, remains by-and-large as compatible as hand techniques with either family or larger-than-family units of production. This compatibility with family units lies in the fact that with the minor exceptions noted, farm operations remain as widely separated by time intervals after mechanization as before. Hence the number of things that can be

⁶ For discussion of these exceptions, see John M. Brewster, "Technological Advance and the Future of the Family Farm," *Jour. Farm Econ.*, pp. 40:1606-7. 1958.

done at the same time in farming remains as close as ever to the number of workers in an ordinary family. But machine methods are equally compatible with larger-than-family units, as they introduce no new obstacle to expanding farm size beyond the capacity of an ordinary family to do the work in any particular operation. This means that either in the premachine era or the present, the conditions responsible for the predominance of family or larger-than-family farms lie outside the operating requirements of farm technologies.

As the total acreage of land available for farming is now approximately fixed and as machine methods increase the area of land and other materials which one man can handle per unit of time, the only necessary consequence of technical advance, as thus far experienced in farming, is a reduction of the total farm population. When land and capital are organized into larger family units of production, this reduction in population is accompanied by a declining number of family farms, such as is now occurring.

ECONOMIES OF FARM SIZE

These facts suggest that most potential economies of larger farm units are realized within the size limit of family farms. No systematic study of this matter has yet been made, although some studies have been made for particular areas and types of farming. These studies indicate that only negligible economies of scale are achievable beyond the upper size limit of family farms. Four of these studies are cited.

1. In his study of optimum sized corn-livestock farms for given combinations of equipment in northeastern Nebraska, Scoville found that virtually no additional economies of size were realized beyond a 2-man, 2-tractor farm, representing 440 acres. Under 1935-45 cost price relation-

⁷ As explained elsewhere, this fundamental difference between machine industry and agriculture stems from the contrasting nature of materials handled in each case. (John M. Brewster, "The Machine Process in Agriculture and Industry," *Jour. Farm Econ.*, p. 70, February 1950.)

ships, the total cost per dollar of production on a farm of this size was 87 cents compared with 86 cents for a 7-tractor, 5-man farm, representing 1,760 acres.⁸

2. Using least-cost machine combinations for farms of different sizes in north-central Iowa with a corn-oat-meadow rotation, Heady and his colleagues found that cost per \$100 of value of crops decreased sharply for farms up to 160 acres in size. Appreciably lower per unit costs were realized up to 320 acres, but from there on up to 880 acres only negligible economies were achieved. Beyond this point, costs per units of production began to rise somewhat, "because of lack of timeliness in operations resulting in declines in per acre yields."⁹ The physical yields employed in this study were averages for a 10-year period. Costs and investments were based on prices at 1949 levels.

3. Using "synthetic farm models" in "determining the relationship between size of farm businesses and long-run unit costs" for New England dairy farms, I. F. Fellows and others found that "operators of one-man farms can achieve a unit cost level approximately equal to the level on farms of larger size when a similar level of management efficiency is achieved."¹⁰

4. In his 1954 study of northern Illinois farms, Mosher found that "the optimum use of land, labor, and capital was on farms 260 to 339 acres. The net earnings per acre, per \$100 invested, and per man were smaller for farms under 260 acres and were no larger for farms of 340 or more acres." These were mainly hog-grain farms. The average total labor on farms in this size group was 20.5 months.¹¹

⁸ Orlin J. Scoville, *Relationship Between Size of Farm and Utilization of Machinery, Equipment and Labor on Nebraska Corn-Livestock Farms*, USDA Tech. Bul. 1037, Tables 14, 17, 19, pp. 40, 42, 44. 1951.

⁹ E. O. Heady, Dean E. McKee, and C. B. Haver, *Farm Size Adjustments in Iowa and Cost Economies in Production for Farms of Different Sizes*, Iowa Agr. Exp. Sta. Res. Bul. 428, p. 427, and Fig. 18, p. 434, 1955.

¹⁰ I. F. Fellows, G. E. Frick, and S. B. Weeks, *Production Efficiency on New England Dairy Farms*, Conn. Agr. Col. Bul. 285, 1952. See especially Fig. 6, p. 35.

¹¹ M. L. Mosher, *Farms Are Growing Larger*, Ill. Agr. Exp. Sta. Bul. 613, pp. 40-41 and Fig. 5, p. 14, 1957.

Studies such as these indicate that significant economies of size are achieved in moving up the scale to the point at which a "line of equipment" is fully utilized, which is well within the size limits of family farms. Beyond this point, little additional economies of scale are realized.

This is precisely the result to be expected on conceptual grounds, because up to 1960, as previously explained, technological advance in agriculture with minor exceptions had not changed the older sequential pattern of operations into the modern simultaneous pattern characteristic of the factory system. This means that expanding farms beyond family size limits merely multiplies the same units of technology that are already on well-organized family farms. In general, there is nothing technologically unique about larger-than-family units of production in farming. This means that now, as in the premachine era, virtually all potential economics of scale are realized well within the size limits of family farms.

Although the evidence shows no appreciable cost advantage for larger-than-family units, well-operated family farms may be at a serious competitive disadvantage with integrated firms that carry on farm operations, such as broiler production, mainly as an adjunct to other operations such as merchandizing feed or farm products themselves. For what is vital to the integrated firm is profits on its operations as a whole rather than on each specific operation. Thus its overall profit position may be improved, even though it may take a loss on its farm operations, provided the loss is more than offset by the assurance of steady flow of products of uniform quality from its farm operations. The family farm could hardly withstand this kind of competition, even if it were able to produce as cheaply as the integrated firm at the farm level.

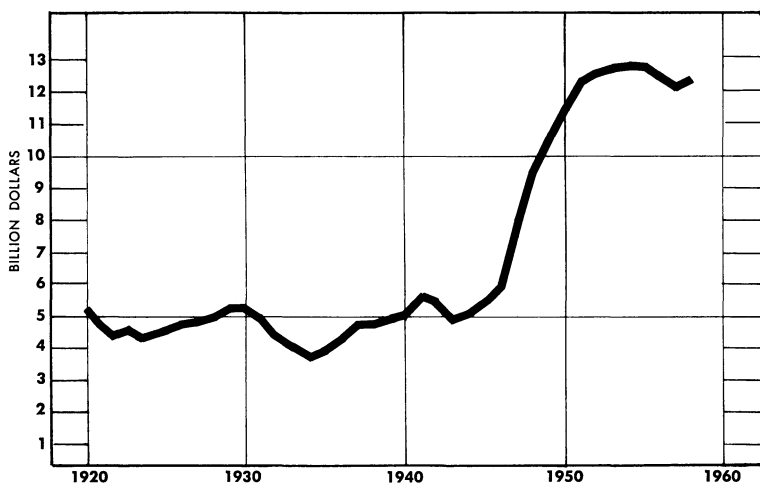
INCREASING CAPITAL REQUIREMENTS

Increasing the amount of land and other materials, which one man can handle and the rapid substitution of machine power and equipment for horsepowered equipment

has led to marked expansion of capital requirements per farm in the last two decades. Five observations from available data are especially pertinent.

1. Net investment in farm power and machinery increased by \$5.4 billion during the 1946–51 period, about 90 percent of which took place on commercial farms (Fig. 8.1). This was equivalent to nearly \$1,500 per commercial farm.¹² By increasing the acreage and other materials a man can handle per unit of time, this new machine technology generated great pressure for larger farms and hence a smaller total number of farms. From 1949 to 1954, acres per farm increased by more than 12 percent, reflecting an 11 percent decline in total farms and nearly 16 percent reduction in the farm population.

2. Although annual purchases of new farm power and equipment have been less than depreciation on past invest-



*Net investment equals total purchases minus depreciation, includes tractors, trucks, automobiles for farm use and all machinery and equipment.

Source: Derived from "The Farm Income Situation," FIS-169, July 1958, AMS, Dept. of Agriculture

Fig. 8.1 — Net investment in farm power, machinery, and equipment in the United States, 1920–58 (1947–49 prices).

¹² This average is based on the 1950 number of commercial farms. Figure 8.1 was developed by our coworker, Radoje Nikolitch.

TABLE 8.2

CAPITAL ASSETS OF SELECTED TYPES OF AVERAGE SIZE COMMERCIAL FARMS, SPECIFIED YEARS, 1939-59*

Type of farm, region, item	Unit	1947-49 Dollars					Index 1939 = 100			
		1939	1944	1949	1954	1959	1944	1949	1954	1959
Dairy farm										
(Eastern Wisconsin):										
Gross cash income	Dol.	4,723	6,248	6,395	7,801	9,133	132	135	165	193
Total land	Acre	116	122	126	132	140	105	109	114	121
Value land & buildings.	Dol.	13,777	14,490	14,965	15,678	16,628	105	109	114	121
Power & machinery	Dol.	2,140	3,303	4,197	4,992	4,762	154	196	233	222
Livestock	Dol.	4,275	5,282	4,890	5,770	6,086	124	114	135	142
Total capital	Dol.	20,192	23,075	24,052	26,440	27,476	114	119	131	136
Hog-beef fattening										
(Corn belt):										
Gross cash income	Dol.	12,683	17,537	20,508	21,679	27,157	138	162	171	214
Total land	Acre	178	188	193	198	212	106	108	111	119
Value land & buildings.	Dol.	24,987	26,390	27,092	27,794	29,760	106	108	111	119
Power & machinery	Dol.	3,062	3,737	4,531	5,652	4,735	122	148	185	155
Livestock	Dol.	7,704	9,743	9,952	9,537	10,991	126	129	124	143
Total capital	Dol.	35,753	39,870	41,575	42,983	45,486	112	116	120	127
Cotton										
(Texas Black Prairie):										
Gross cash income	Dol.	3,619	3,879	6,397	6,493	6,620	107	177	179	183
Total land	Acre	141	149	159	174	187	106	113	123	133

TABLE 8.2 (Continued)

Type of farm, region, item	Unit	1947-49 Dollars					Index 1939 = 100			
		1939	1944	1949	1954	1959	1944	1949	1954	1959
Value land & buildings.	Dol.	12,157	12,847	13,709	15,002	16,123	106	113	123	133
Power & machinery....	Dol.	1,139	1,643	1,929	2,351	2,202	144	169	206	193
Livestock.....	Dol.	1,040	1,236	1,147	1,318	1,278	119	110	127	123
Total capital.....	Dol.	14,336	15,726	16,785	18,671	19,603	110	117	130	137
Wheat-grain sorghum (Southern Plains):										
Gross cash income.....	Dol.	3,647	12,393	12,303	7,958	15,991	340	337	218	438
Total land.....	Acre	599	663	688	714	744	111	115	119	124
Value land & buildings.	Dol.	38,132	42,207	43,798	45,453	47,363	111	115	119	124
Power & machinery....	Dol.	2,988	3,448	5,125	5,875	5,376	115	172	197	180
Livestock.....	Dol.	2,086	3,881	3,033	3,645	4,540	186	145	175	218
Total capital.....	Dol.	43,206	49,536	51,956	54,973	57,279	115	120	127	133
Cattle ranch (Intermountain):										
Gross cash income.....	Dol.	8,216	12,147	11,365	11,372	15,086	148	138	138	184
Total land.....	Acre	1,595	1,697	1,610	1,690	1,730	106	101	106	108
Value land & buildings.	Dol.	26,286	27,967	26,533	27,851	28,510	106	101	106	108
Power & machinery....	Dol.	2,198	2,579	2,792	3,225	3,468	117	127	147	158
Livestock.....	Dol.	33,248	35,756	35,521	38,321	42,802	108	107	115	129
Total capital.....	Dol.	61,732	66,302	64,846	69,397	74,780	107	105	112	121

* Excluding crop inventories.

Source: Unpublished data, Costs, Income, and Efficiency Research Branch, Farm Economics Research Division, U.S. Agricultural Research Service.

ments since 1951, acreage expansion per farm was greater in the 1954-59 period for each of the selected types of farms (Table 8.2) than in the previous 5-year period. For example, the average wheat-grain-sorghum farm increased by 30 acres in 1954-59 compared with 25 acres in the previous 5 years. This pressure of new power technology for larger farms was reflected in a 16 percent decline in all farms in the 1950's, compared with a 10 percent decline in the 1940's.

3. In 1959, the total investment of selected types of farms of average size in given areas was a third larger than at the beginning of World War II (Table 8.2). The total ranged from nearly \$20,000 for a cotton farm of average size in the Texas Black Prairie area to nearly \$75,000 for a cattle ranch of average size in the Intermountain region.

4. The total investment for farms of average size is much below the capital requirements of larger well-operated family farms toward which U.S. farming is tending. For example, as shown in Table 8.2, the average hog-beef fattening farm of the Corn Belt represented a total investment of more than \$35,000 (1947-49 dollars). In contrast, Mosher's study of central Illinois farms shows investment for family farms ranging to more than \$230,000, with \$100,000 frequently found (Table 8.3). Average invest-

TABLE 8.3
INVESTMENT BY SIZE OF FARM, NORTHERN ILLINOIS, 1954

Size group (acres)	Number of farms in sample	Number of men per farm	Investment per farm (dollars)
50- 99	50	1.1	41,146
100-179	50	1.3	72,553
180-259	50	1.4	101,481
260-339	50	1.7	130,839
340-419	50	2.1	167,959
420-499	50	2.4	194,920
500-579	50	2.5	230,567
580 or more	50	3.2	293,139

Source: From Table 1 of M. L. Mosher, *Farms Are Growing Larger*, Ill. Agr. Exp. Sta. Bul. 613, 1957.

TABLE 8.4

CAPITAL REQUIREMENTS FOR FARMS RETURNING SPECIFIED EARNINGS
(Budgeted for selected farms under projected cost-price relationships) *

		Annual earnings of farmer's labor and mgt.			
Type of farm, area, and item	Unit	\$2,500	\$3,500	\$4,500	\$5,500
Beef-cattle ranch (cow-calf), (South Central Oklahoma):					
Gross cash receipts	Dol.	19,408	26,620	35,879	45,180
Total land	Acre	1,953	2,687	3,650	4,386
Total investment	Dol.	166,772	229,275	308,186	371,620
Land and buildings	Dol.	114,181	156,788	212,250	255,500
Power and machinery	Dol.	3,014	4,636	4,660	5,500
Livestock	Dol.	41,986	57,408	77,376	93,120
Fences and water ponds	Dol.	7,591	10,443	13,900	17,500
Dairy (Willamette Valley, Oregon):					
Gross cash receipts	Dol.	15,525	17,825	21,850	25,300
Total land (irrigated cropland)	Acre	54	62	76	88
Total investment	Dol.	50,321	55,702	65,119	73,191
Land and buildings	Dol.	28,190	31,622	37,627	42,774
Livestock	Dol.	10,071	11,563	14,174	16,412
Irrigation equipment	Dol.	2,673	3,069	3,762	4,356
Fence	Dol.	416	477	585	678
Power and machinery	Dol.	8,971	8,971	8,971	8,971
Potato-general (Snake River Valley, Idaho):					
Gross cash receipts	Dol.	11,000	15,626	20,252	27,500
Total land	Acre	80	100	120	160
Total investment	Dol.	29,712	43,886	56,617	72,862
Land and buildings	Dol.	20,040	28,733	36,023	48,876
Power and machinery incl. irrigation equipment	Dol.	9,672	14,153	20,594	23,986
Cotton (Mississippi Delta, loam soil):					
Gross cash receipts	Dol.	9,924	13,287	20,459	23,324
Total cropland	Acre	128	172	264	301
Total investment	Dol.	28,782	35,743	62,019	67,675
Land and buildings	Dol.	21,231	27,746	43,145	47,698
Power and machinery	Dol.	7,551	7,997	18,874	19,977

* Preliminary

ment for the group of farms of optimum size (260 to 339 acres) was above \$130,000.

Similar high-level investment requirements are indicated by preliminary results of a study underway on minimum resource requirements needed to return given levels of earnings for the farmer's labor and management. Under projected cost-price relationships, budgeted farms (Table 8.4) show that the minimum total investment needed for \$2,500 farmer's earnings ranged from nearly \$30,000 for a potato farm in Snake River Valley, Idaho to more than \$166,000 for a beef-cattle ranch in south-central Oklahoma. For farmer's earnings of \$5,500, the estimated investment ranged from nearly \$73,000 to more than \$371,000 for the same types of farms and areas. All these units fell within the size limits of family farms. They also fell within census economic classes I and II, (\$10,000 annual sales or more) which are the only classes that are expanding in agriculture as a whole (Table 8.4).

5. As previously explained, in most types of farming, ownership of both land and capital is not an essential characteristic of family farms, although most of the farm equipment and livestock usually is owned by the farmer. From this standpoint, expansion of working capital requirements is more significant than total capital requirements. From available data, two points stand out:

a. For the selected types of farms shown in Table 8.5, operating capital for 1959 ranged from nearly \$10,000 for an average size wheat-grain-sorghum farm in the southern Great Plains to more than \$46,000 for an average size cattle ranch in the Intermountain states (1947-49 dollars). Operating capital represented well over a third of the total investment in the average dairy farm, and more than 60 percent of the total for the cattle ranch of average size.

b. More striking than these absolute amounts is the rate at which operating capital requirements have been expanding. During the 1939-59 period, this increase ranged from more than 30 percent for the average cattle ranch in

the Intermountain states to more than 95 percent for the average wheat-grain-sorghum farm in the Southern Plains.

TENURE AND ACQUIRING FARM RESOURCES

Two questions are involved in the abilities of farmers to acquire farm resources: (1) Is the farmer able to control (with reasonable certainty) sufficient land and capital with which he combines his management and labor to

TABLE 8.5

TOTAL INVESTMENT AND WORKING CAPITAL FOR SELECTED TYPES OF FARMS,
1939 AND 1959 (1947-49 DOLLARS)

Type of farm, region, and item	Unit	1939	1959	Percentage increase
Dairy farm (Eastern Wisconsin):				
Total investment	Dol.	20,192	27,476	36.1
Working capital:				
Power and machinery	Dol.	2,140	4,762	122.5
Livestock	Dol.	4,275	6,086	42.4
All	Dol.	6,415	10,848	69.1
Proportion of total investment . . .	Pct.	31.8	39.5	.....
Hog-beef fattening (Corn Belt):				
Total investment	Dol.	35,753	45,486	27.2
Working capital:				
Power and machinery	Dol.	3,062	4,735	54.6
Livestock	Dol.	7,704	10,991	42.7
All	Dol.	10,766	15,726	46.1
Proportion of total investment . . .	Pct.	30.1	34.6	.....
Wheat-grain sorghum (Southern Plains):				
Total investment	Dol.	43,206	57,279	32.6
Working capital:				
Power and machinery	Dol.	2,988	5,376	79.9
Livestock	Dol.	2,086	4,540	117.6
All	Dol.	5,074	9,916	95.4
Proportion of total investment . . .	Pct.	11.7	17.3	.....
Cattle ranch (Intermountain):				
Total investment	Dol.	61,732	74,780	21.1
Working capital:				
Power and machinery	Dol.	2,198	3,468	57.8
Livestock	Dol.	33,248	42,802	28.7
All	Dol.	35,446	46,270	30.5
Proportion of total investment . . .	Pct.	57.4	61.9	.....

Source: Unpublished data, Costs, Income, and Efficiency Research Branch, Farm Economics Research Division, ARS, USDA.

yield an adequate current and expected future income; and (2) Is the farmer able to obtain equity in land and capital? In considering the tenure aspects of acquiring land and capital, these two questions, even though related, may be treated separately.

Getting Control of Farm Resources

The means by which farmers gain control, or obtain the services of, land and capital without owning them can be grouped into five types of arrangements. Although a farmer may use any one or a combination of these arrangements with or instead of owner proprietorship, their relationship to farm size is best treated individually as: (1) leases; (2) partnerships and family arrangements; (3) corporations; (4) transactions with off-farm industry; and (5) integration through contract.

LEASES

Leasing is the most common means of separating ownership and control of the resources used in farming and is expected to remain so in the near future.¹³ Although the number and proportion of census-defined "tenants" is declining, the proportion of land under lease remains relatively constant. Improvements in the tenure structure, therefore, might start with refinements in leasing practices and rental markets.

The inferior status of tenancy carried over from earlier periods is rapidly disappearing in commercial farm areas in which landlord-tenant arrangements are used effectively to combine resources for higher income. For example, more than 42 percent of the farmland in the high farm income areas of the Corn Belt and the eastern Great Plains is rented. Areas of low farm income, on the other hand, have

¹³ Denman makes a similar observation about the "mature" agricultural economy of Britain: "... the obvious merits of the contractual tenant system in the eyes of the typical British farmer is likely to secure its dominant place in the future economy of agriculture." D. R. Denman, "The Future of Ownership of Rural Land in Britain," *Land Econ.*, 36(1):62, 1960.

small percentages of land under lease. The Southeast has less than 25 percent of its farmland under lease; the Northeast, only 14 percent.

In most commercial farm areas, leasing is associated with increasing farm size and decreasing farm numbers. As a general rule, rented farms must be larger than owned farms in order to provide the operator with the same total income. Except in the South, the size of tenant farms ranges from a fifth larger to more than twice as large as full owner farms.

The potential for farm size expansion through leasing separate tracts of land from several owners has scarcely been scratched. Theoretically, there is no limit to the number of farms a tenant may rent but, in fact, half of the tenants rent from only one landlord and very few rent from more than two. Given the present incentives to expand farm size, particularly those of younger operators, multiple-leasing probably will become more frequent among renters.

Information available suggests that increasing numbers of operators of large farms prefer to balance the amount of owned land with a minimum level of use of their machinery (or livestock) and add leased land up to the maximum capacity of their machinery (or livestock). These part owners are increasing in importance both numerically and proportionately, and their combinations of owned and rented land suggest a new role for farm leasing arrangements. Leasing is a means of expanding farm size to utilize unused labor, management, or capital capacity without the risk and equity problems of acquiring ownership.

The limitations of farm leases to permit farm expansion are found not in the broad classes of leases but in the specific terms of the leases which are determined more by habit and custom than by leasing in general. For example, livestock-share leases often are useful in expanding dairy operations. The custom of 50-50 sharing, however, may force a manager with limited capital to a small farm where his contributions would represent about 50 percent of the total.

With the small farm, his labor and management may be so under-utilized that capital formation is impossible. In this case, a 30-70 livestock-share arrangement on a larger farm with the tenant providing a smaller share of the resources might afford the operator greater opportunity for higher income and expanded farm size.¹⁴

As a form of tenure, leasing has the advantages of increased operator mobility and flexibility, with more rapid farm expansion. The main disadvantages of the lease as a means of expanding farm size are: (1) less certainty of continued access to the land than unencumbered ownership; and (2) obstructive terms and conditions of particular leases. From the standpoint of research, extension, and public programs, energies might be directed more effectively toward improvements in leasing conditions and arrangements than toward converting tenancy into owner-proprietorship.

PARTNERSHIPS AND FAMILY ARRANGEMENTS

The liability features of most partnerships call for close family relationships. One of the most significant aspects of partnerships and family arrangements is the restrictions placed on outsiders getting into farming. Very widespread use of tenure arrangements that require a personal, or family, "in" could restrict farming opportunities to a favored few. At the extreme, efficiency in farming could suffer.

The full extent of personal or family relationships between farm owners and farm operators is not known, but in some regions they are substantial. For example: (1) A study of leasing practices showed that some areas of the Midwest had about two-thirds of the leases from parents.¹⁵

¹⁴ See, for example, Howard Hill and Sydney Staniforth. *A Modification of Leasing Arrangements to Expand Farm Opportunities*, Wis. Agr. Exp. Sta. Res. Bul. 213, 1959.

¹⁵ Virgil L. Hurlburt, *Farm Rental Practices and Problems in the Midwest*, Iowa State Univ. Bul. 416, 1954. p. 107.

(2) Another study of leasing agreements between individuals in the Great Plains revealed that as high as 35 percent were with relatives.¹⁶

The partnership also is often used to own land in the Great Plains. For example, 26 percent of the land is held by partners or owners who hold at least some land in partnership (not including husband-wife partnership).¹⁷

Perhaps most important of the partnerships is the father-son agreement. This type of partnership, common among livestock-share arrangements, may be useful in providing a smooth transfer of the farm enterprise between generations. To the extent to which such arrangements prevent disruption in the intergenerational turnover in management, they may be helpful in expansion of farm size. From a societal viewpoint, disadvantage may be that entry into farming would be restricted to sons or sons-in-law.

CORPORATIONS

Among production industries, farming has a conspicuous lack of incorporated firms. Although available data are not specific, the number of farm corporations in the United States is almost certainly less than 5,000. The primary reason for the very limited use of the corporation in farming has been the small size of operating units.

When revisions in the federal income tax law removed one of the barriers to incorporation of some family farms, a surge of interest in this device occurred. Although tax advantages are apparent mainly to operators of the comparatively few large family farms, the general awareness of the corporate organization in farming will almost certainly increase its use. In Iowa, for example, 35 of the 116 family-farm corporations were formed in the year fol-

¹⁶ *Great Plains Survey of Tenure and Finance*, 1958. More than half of these leases were with parents.

¹⁷ R. W. Strohbehn and G. Wunderlich, *Land Ownership in the Great Plains States*, 1958. USDA Statis. Bul. 261. 1960.

lowing the tax change and in Oregon, 25 percent of these corporations were formed in 1957-58. Data from the Internal Revenue Service also suggest a recent increase in the number of farm corporations.

In other industries, the corporation is a proved sire of large organizations. Why has the corporation not been used in farming? The nature of the production process in most types of farming permits efficient operation of relatively small, widely dispersed units. Beyond a certain point in farm size, the corporate farm will find its advantages simply in replication of these farm units. Economies might come in centralized purchase of supplies, large-scale buying or renting of capital items, central farm management, transportation and storage, and direct selling. Under such a multiunit corporation, what happens to the operator on the individual farm unit?

The farmer in the capacity of a "unit manager" is subject to general policies of the central management. The resources he uses are furnished, negotiated for by him, or subject to audit by central management. The broad outlines of management are provided, but he has wide discretion within a season or a rotation. He retains all attributes of a manager and may, in fact, contribute a larger amount of management than under the precorporation organization. Special services, such as machinery repair, insemination, spraying, and transportation can be provided by the central management. Even research and education might be part of a larger corporation's activities. As resources are not owned or rented by the farm operator but by the corporation, the transfer and replacement of the operator-manager need not interfere with production.

The aggregation of resources by multiunit firms under conditions such as those suggested could be extended virtually without limit. The economies of increased numbers of farms, however, would be overcome eventually by difficulties resulting from geographic and bureaucratic dispersion. The giant, centralized corporation in farming is possible, but its economic advantages are doubtful at this time.

The limited family-farm corporation, however, has the well-known qualities of limited liability, perpetual life, flexible organization, and (if it uses the partnership option) possibly a tax advantage. As only rather large operations can gain a great deal by incorporation, it is unlikely that very great numbers of farms will incorporate in the near future. The farms that do incorporate, however, will be large, will account for production out of proportion to their small number, and will set the pattern for the not quite-so-near future.

TRANSACTIONS WITH OFF-FARM INDUSTRY

Many large-scale industries furnish farm supplies for sale, such as fertilizer, gasoline, herbicides, and pesticides.¹⁸ The resources employed by these farm supply industries are just as much a part of the capital of farm production as are the resources found on farms. Widespread and intensive use of these supplies from off the farm may alter considerably the nature of contracts and other *tenure instruments used to obtain those supplies*. At one extreme is a primitive, self-sufficient agriculture requiring few or no supplies that originate outside the farm. At the other extreme, we could imagine a farm business with all productive capital owned by someone other than the farmer and with essentially all resources rented, hired, or bought from off-farm industry. Farming is tending toward the latter. Davis and Goldberg, in their analysis of agribusiness, show that between 1947 and 1954 the value of off-farm supplies used for farm production increased nearly 50 per cent.¹⁹ Information available suggests that the value of these supplies has continued to rise since 1954.

If such off-farm supplies become an important part of the total resources of the farm, the farm family may be relieved from much of the responsibility of furnishing its own capital. The burden of capital formation, although paid

¹⁸ In a slightly different context, Ogren and Scoville discuss these inputs in greater detail in Chapter 19.

¹⁹ John H. Davis and Ray A. Goldberg, *A Concept of Agribusiness*, Boston, Harvard Univ. Press, 1957, p. 12.

for from farm production, would fall on nonfarm corporations. To some extent, the vertical integration of the broiler industry is an extreme case in point.

VERTICAL INTEGRATION

In certain types of farm production, vertical integration through contracts has been a means of drawing together relatively large quantities of resources.²⁰ For many years, contract farming in a number of enterprises caused little notice, even though there was some transfer of managerial control in cropping practices, use of resources, and marketing. Real concern appeared at the development of widespread separation of resource ownership and the operator resulting from contracts such as those found in the broiler industry.

A most, if not *the* most, critical feature will be the nature of the contract instrument (oral or written) that determines the ownership, use, and return for the resource use in farm business. With ownership of a specific resource goes a roughly proportional amount of control.²¹

In summary, does the tenure system permit the accumulation of large enough quantities of resources for a farmer to earn an adequate income, even though he may contribute only his labor and management? The answer is a qualified "yes." The various means discussed above may be useful in earning adequate income and in expanding farm size. Tenure impediments to income and farm expansion stem not from a particular *type* of tenure arrangement but from the unsuitability of a *particular* arrangement to a *particular* economic circumstance.

Obtaining Equity in Land and Capital

If the farm family that has no resources other than its own labor and management seeks to own all or part of the

²⁰ L. A. Jones and R. L. Mighell, *Vertical Integration as a Source of Farm Capital*, Symposium on Capital and Credit, Knoxville, Tenn., 1960.

²¹ Walter G. Miller, "Farm Tenure Perspective of Vertical Integration," *Jour. Farm Econ.*, 42(2):307-14, 1960.

land and capital of the farm, it will require a surplus of income above that necessary for family consumption. In simplest terms, the family has two alternatives: (1) lower its level of consumption; or (2) use more of its labor and management (i.e., work harder).

The latter alternative can be accomplished by: (1) making intensive use of available resources; (2) contracting for the use of additional resources owned by someone else (such as leasing, integrating, as discussed above); or (3) supplementing farm income with off-farm employment.

The choice taken by the farm family will depend largely upon the relative rate of return of each alternative.

Our estimates show that a relatively large proportion of the farms do not have sufficient resources to yield a labor and management return to a farm family of at least \$2,500. Between 60 and 75 percent of the commercial farms today could not meet this standard. Of the 11 major types of farms examined, average investment in the period 1950-59 of farms with \$2,500 net farm family income ranged from \$12,306 for peanut-cotton farms in the southern Coastal Plains to \$124,082 for winter-wheat farms in the Southern Plains.²²

For farmers who do not already have equity in their land and capital, the acquisition of equity may be difficult. The gains in value of farm capital have been beneficial, in a sense, to those who owned their capital, but to those who now seek to obtain equity, increasing capital values represent only a mounting obstacle.

Total farm assets increased from \$53 billion in 1940 to \$208 billion in 1960. Grove estimates that 30 percent of this increase was a net investment and 70 percent was a capital gain to owners. Eighty percent of this capital gain in the 1940-60 period was in land values.²³ Even to those

²² Estimates are based on proportion of farms meeting the capital requirement of 1950-59 average of 11 major types of farms. Source: *Farm Costs and Returns, Commercial Family-Operated Farms by Type and Location*, USDA Agr. Info. Bul. 176, 1959.

²³ Ernest Grove, "Farm Capital Gains — A Supplement to Farm Income?" *Agr. Econ. Res.*, 12(2):41-42, 1960.

who have gains in the value of the land they own, this "paper prosperity" means little unless the land is sold. When it is sold, the "gain" to the seller is an "expense" to the buyer.

More than three-fifths of the total farm investment is in real estate.²⁴ Unless the operator has nonfarm sources of capital or inherits or marries land, he can acquire land ownership only with savings earned from his labor, management, and capital. If the owner holds title before he holds full equity, the return to the land can be used to pay for the land. If the earnings from the land are inadequate to pay for the land, the purchaser must pay for it from returns on his other resources. In the long run, the land is supposed to pay for itself. In the short run, of course, such a large fixed investment could require the owner to dip deeply into his labor and management return to preserve his equity. Although land values have been rising, the return to land has been declining and is currently below the mortgage rate of interest.²⁵ If the returns to land continue to fall, some major adjustments in the land market, and possibly in the entire tenure arrangements, may be anticipated. Although the mortgage debt load of farmers is light compared, say, with the 1930's, a downward adjustment of land values could wash out a portion of their anticipated savings and retirement income. Buyers with mortgages or purchase contracts would be faced with even more serious problems.

The recent increase of interest in low-equity finance, particularly the installment land contract,²⁶ represents, in part, a demand for farm enlargement. Under the land contract, recovery of the land by the seller upon default by the buyer usually is swift and final — much more so than

²⁴ About three-fourths of "productive assets" are real estate. (Scofield).

²⁵ W. H. Scofield, *Current Developments in the Farm Real Estate Market*, ARS 43-118, 1960, p. 24.

²⁶ In 1958, the installment land contract was used in about 20 percent of farmland transfers. Between 1946 and 1958, the percentage of transfers by contract doubled. Paul L. Holm, "Financing Farmland Transfers," *Agr. Fin. Rev.* 21:24, 1959.

with the conventional mortgage. Rather than affording greater "opportunities," the recent trends in methods of selling real estate may present serious difficulties for farmers with the misfortune to incur a loss of their land's earning capacity.²⁷

Resources with productive values are traditionally transferred by law or will to descendants of the owner on his death. Land (or real estate) comprises most of this class of resources. Nearly a third of the owners acquire part or all of their farmland through inheritance or gift. Another 15 percent buy land from relatives and, although the relationship may not affect price, it may affect the opportunity to buy. As the quantity of resources necessary for successful operation increases, the opportunity for operators to acquire equity in land probably will depend more and more upon inheritance and other family arrangements.

A relatively small proportion of all farms seems to be capable of amassing capital internally. Thus a need for external capital sources will continue. Expectations are that widespread ownership of resources by persons other than the farmer and his family will persist. Foretelling the way in which this external capital will be supplied is difficult, if not impossible, because it will depend most upon where and by whom tenure and finance innovations are made.

EXPANDING RESOURCE REQUIREMENTS AND MANAGERIAL CONTROL BY FARM FAMILIES

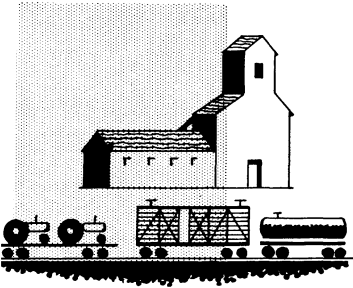
The family farm as a production unit has strong likelihood of survival in the foreseeable future. But farm units require larger and larger bundles of resources. The means by which the farm family acquires these resources vary but in one way or another, a substantial amount of separation between resource ownership and resource use is likely to continue. In some types of farming, separation of resource ownership and use may increase.

²⁷ The Balance Sheet of Agriculture does not include the unpaid balance of installment land contracts as a liability. If installment contracts were included, "real estate debt" would be increased by \$2 to \$3 billion.

The separation of resource ownership and control is not inherently incompatible with our concept of the family farm. Furthermore, all major types of tenure arrangements provide for wide variations in the distribution of control over resources between owner and user. Control over farm operations may depend more upon the particular agreement than on a class of tenure arrangements.

However, widespread separation of ownership and use of resources could diminish the role of the farm operator in making decisions that affect the size and character of the farm. Management is not easily identified and measured, so a reduction in the relative importance of operators of family farms may not be readily apparent. The effects of changes occurring in farm corporation and contract farming, for example, have had time to do no more than arouse speculation. If the family farm does disappear, it will have been through loss of control over the use of land and capital. Ownership of land and capital is not a necessary condition for farm operators to maintain control of their farms, but unless adaptations in the tenure structure are made, loss of ownership of resources probably will mean loss of control of the farm unit. Much depends upon the farmers themselves. If farmers grow in their capacity as managers as resource requirements grow, separation of ownership and control could enhance their economic power — perhaps in the same way as in other major production industries in America.²⁸

²⁸ Adolphe Berle Jr., *Power Without Property*, Harcourt Brace and Co., New York, 1959.



Nonfarm production inputs—mixed feeds, fertilizers, farm machinery; role of cooperatives; farm marketing channels.

Farm Supply and Marketing Activities in Relation to Agricultural Adjustment

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FARMERS HAVE BECOME increasingly dependent on the rest of the economy — both for production services and marketing services. Farmers buy more and more of the materials and services used in crop and livestock production.

The reduction in number of workers on farms would have been impossible without the workers and capital in farm supply and marketing firms providing production and marketing services to farmers. Thus, while the number of workers directly engaged in farm production has declined, there has been an increase in the number of workers in feed mills, fertilizer plants, farm machinery plants, farm supply stores, food processing plants, and retail food stores,

and other businesses supplying processing, transportation, and distribution services to farmers. This total complex of activities — on and off the farm — is often referred to as “agribusiness.” As a part of the total economy, agribusiness is remaining relatively constant but the “on-farm” portion is declining.

FARM SUPPLY INDUSTRIES

The total quantity of resources used in farm production has changed little since 1940, but there has been a large increase in the use of nonfarm production resources. Over the same period, the quantity of operator and family labor, real estate, and capital produced on the farm has declined by about one-fourth in terms of constant dollars (Fig. 9.1). Purchased resources (machinery, fertilizers, hired labor, feed mixing services and additives, pesticides, veterinarian services, etc.) have increased by 40 percent.

Between 1948 and 1958, the quantity of farm labor declined from 45 percent of total resources used to only 30 percent (Fig. 9.2). The share of expenditures represented

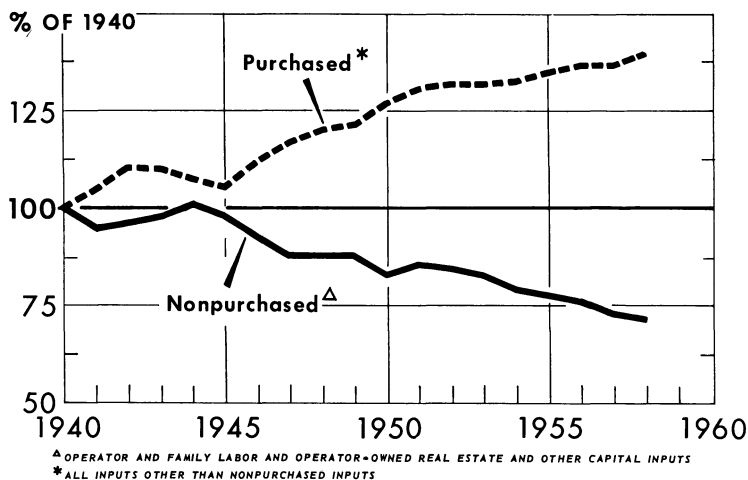


Fig. 9.1 — Purchased and nonpurchased inputs used on U.S. farms.



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Fig. 9.2—Major input groups as percentages of total inputs.

by machinery rose from 16 to 22 percent. The use of fertilizer and lime has increased rapidly; from 1947-48 to 1958 these two items rose from 3 to 5 percent of all resources. The proportion of resources represented by land has remained almost constant. These changes reflect the growing importance of purchased items and the declining importance of production items produced by the farmer.

In 1958 farmers spent over \$15 billion for current production expenses, excluding hired labor and capital expenditures for buildings, motor vehicles, and other machinery and equipment. In 1947-49 these expenditures averaged less than \$11 billion and in 1935-39 less than \$3 billion (Table 9.1). Farmers' expenditures for fertilizers and for the operation of motor vehicles are among the largest items that come exclusively from the nonfarm segment of the economy. A substantial part of farmers' expenditures for livestock, feeds, and seed represents farmers' receipts from sale of these items. Of all farm production expenditures, about 60 percent are estimated to come from off-farm sources.

TABLE 9.1
CURRENT FARM OPERATING EXPENSES, 1935-39, 1947-49, AND 1958

Item	1935-39 average	1947-49 average	1958
	(<i>Million</i>)	(<i>Million</i>)	(<i>Million</i>)
Feed	\$ 675	\$ 3,589	\$ 4,512
Livestock	352	1,499	2,680
Seed	165	546	534
Fertilizer and lime	252	825	1,305
Petroleum, fuel and oil	307	989	1,507
Other motor vehicle operations	192	703	1,304
Repairs on buildings and machinery	321	979	977
Miscellaneous*	648	1,568	2,468
Total excluding hired labor	\$2,912	\$10,698	\$15,287
Hired labor	920	2,903	2,885
Total	\$3,832	\$13,601	\$18,172

* Includes pesticides, ginning, electricity, and telephones (business share), livestock marketing charges, containers, veterinary services and medicines, net insurance premiums, short-term interest, and various other expenses.

Source: Farm Income Situation, USDA.

In addition to the expenditures for current operating expenses, farmers also paid substantial amounts for new construction and major improvements on buildings, motor vehicles and other machinery and equipment, taxes, mortgage interest, and rents to nonfarm landlords (Table 9.2). These expenditures also represent payments for services coming from outside farming. Farm capital expenditures have risen sharply over the 1935-39 period, reflecting both farmers' needs for more machinery and equipment and the sharp increases in cost of these items.

Analyses of future production needs suggest a further increase in the importance of production resource items from off-farm sources. It has been estimated by Barton and Daly¹ that production needed in 1965 could be obtained on perhaps 40 to 50 million fewer acres of cropland than we have used in recent years. The authors estimated that by

¹ Glen T. Barton and Rex Daly, "Prospects for Agriculture in a Growing Economy," in *Problems and Policies of American Agriculture*, Iowa State Univ. Press, Ames, 1959.

TABLE 9.2

FARMERS' CASH EXPENDITURES FOR OTHER THAN CURRENT OPERATING ITEMS,
1935-39, 1947-49, AND 1958

Item	1935-39 average	1947-49 average	1958
	(<i>Million</i>)	(<i>Million</i>)	(<i>Million</i>)
Farm capital expenditures.....	\$ 736	\$ 4,018	\$ 4,440
Property taxes and farm mortgage interest.....	791	1,037	1,870
Net rent to nonfarm landlords.....	413	1,257	1,142
Total.....	\$1,940	\$ 6,282	\$ 7,452

Source: Farm Income Situation, USDA.

1975, with projected increases in crop yields, our needs for farm products will require the use of about as much cropland and cropland pasture as we have used in recent years. They consider that by 1975 we may need one-third fewer man-hours of farm labor or two million fewer workers in farming, but that nonfarm expenditures may increase by about 50 percent and all resources used in farming may increase by 15 percent.

These projections are based upon continual rapid growth of the economy, a population of 230 million persons in 1975 (this estimate of population is lower than some others), and a relatively high level of exports of farm products. Neither the demand nor supply projections allow for the reduction of existing surplus stocks.

The increasing relative importance of the farm supply industry has contributed to the reduction in employment on the farm. But declining employment on the farm has been accompanied by an almost equal increase in employment in the farm supply industry. Davis and Goldberg, using USDA data, estimated that five million persons were employed in the farm supply industry in 1947 and six million in 1954.² There were ten million persons employed in

² J. H. Davis and R. A. Goldberg, *A Concept of Agribusiness*, Graduate School of Business Administration, Harvard Univ., Boston, 1957.

farming in 1947 and eight million in 1954. The number of workers on farms now is a little over seven million and the number employed in the farm supply industries probably has risen a little since 1954.

Farm supply manufacturing industries range from a few large ones to a considerable number that are small. The total number of business firms is somewhat smaller than indicated in Table 9.3 since some firms have more than one establishment.

Feed Industry Grows Rapidly

The mixed-feed industry is one of the largest and most rapidly growing of the farm supply industries.³ Value of shipments of prepared animal feeds increased fourfold from 1939 to 1954 according to the Bureau of the Census. The number of manufacturing establishments increased rapidly from 1927 to 1947, but has since declined.

Feed manufacturing is becoming more decentralized,

TABLE 9.3

SELECTED FARM SUPPLY MANUFACTURING INDUSTRIES; NUMBER OF PLANTS AND EMPLOYEES, 1954 AND 1958

Industry	Plants with 20 or more employees		Number of employees*	
	1954	1958	1954	1958
			(Thousand)	(Thousand)
Prepared animal feeds.	685	720	60	59
Tractors.	74	68	65	60
Farm machinery, except tractors. . .	397	449	74	75
Insecticides & fungicides.	78	90	7	7
Fertilizers.	418	406	32	31

* Including those in plants employing less than 20.

Source: 1958 Census of Manufacturers, Preliminary General Statistics, U. S. Department of Commerce, 1959.

³ Much of the information in this section is taken from John V. Brensike, "The Changing Structure of Markets for Commercial Feeds," *Jour. Farm Econ.*, 40(5):1201-11, 1958.

with an increasing number of plants in the South Atlantic and South Central regions. This shift implies that the industry is becoming more demand-oriented.

As a result of keen competition, manufacturers tend to produce a wide variety of formulas, and many sizes of bags. Only a few of these sell in large volume. Brensike estimates that about 10 percent of the formulas account for 65 percent of volume of the typical firm. Many firms could reduce costs by closing out low-volume formulas.

The retail feed business includes many small independent firms. In 1954 the census reported 16,530 hay, grain, and feed stores, with payrolls of 62,337 persons. In addition, a number of farm supply retailers handle feeds as a sideline. Competition among retailers is keen, and in addition, manufacturers frequently sell direct to livestock feeders.

In 1954 the four largest feed manufacturing companies accounted for 21 percent of shipments for the industry. The 20 largest companies accounted for 43 percent of total value of shipments.

There is little horizontal integration or combination among feed dealers, but a number of retail outlets are owned by feed manufacturers. Selling prices usually are established by the manufacturer through periodic price lists. The retailer has considerable latitude with respect to quantity rates, special charges or discounts, credit practices, and special services. Competition among dealers usually involves special services, including grower integration or contract arrangements, rather than price competition. The feed industry is increasing its participation in farm production activities through bulk handling of feeds, and providing technical services in connection with integration contracts.

Eight Machinery Manufacturers Produce "Full Line"

More persons are employed in farm machinery manufacture than in any other farm supply industry. The industry includes many small firms that produce only a few

items. Eight companies are classified as "full-line" firms, producing tractors, tractor equipment, and a wide variety of their machines. These firms produce about 65 percent of the sales of the industry. There are about 12 to 15 medium-sized companies that produce for a broad domestic market. These firms account for about 10 percent of sales.

The census in 1954 reported 18,689 retail farm equipment dealers with a payroll of 79,625 persons. There also were 1,112 farm and garden machinery wholesalers who hired 46,026 persons.

Full-line equipment manufacturers follow a policy of exclusive franchises for dealers. Each firm has sought to obtain wide distribution for its product. As a result, many dealerships were set up, and competition among them has been strong.⁴

Important economic problems in the industry have included the development of an adequate volume of business by the numerous dealers, maintenance of heavy inventories because of the highly seasonal demand for machinery, and development of adequate sources of credit for farmers and for dealers.

The problem of building an adequate volume of business is being met by a sharp reduction in number of dealers. Increased size of business, greater diversification of products carried by dealers, and more extensive financing arrangements by the manufacturers have helped to alleviate the problem of carrying heavy inventories.

It is increasingly difficult for farmers to find the capital needed to acquire expensive machines. Because of the increasing costliness of farm machinery, some manufacturers and dealers are renting machinery to farmers. This practice is largely experimental, but is growing in importance, particularly for used equipment. In addition to mak-

⁴ Part of the material in this section is based on W. G. Phillips, "The Changing Structure of Markets for Farm Machinery," *Jour. Farm Econ.*, 40 (5):1172-85, 1958.

ing it easier for farmers to obtain machinery, rental provides more flexibility in farm operation and may provide tax advantages to some farmers.

Some equipment manufacturers and dealers are giving increasing attention to the sale of equipment for a production system or a materials-handling system. For example, plans and equipment may be provided for the entire process of cutting, drying, handling, and storage of hay. This approach to equipment selling requires additional knowledge on the part of the dealer in order to design an efficient layout for each individual farm.

Fertilizer Use Shows Phenomenal Growth

Another important farm supply industry includes the manufacture and sale of fertilizers.⁵ Characteristics of the industry of significance to farm adjustment problems include a phenomenal increase in use of fertilizers, a tendency for fertilizer prices to decline relative to the prices of nearly all other production resource items, and a sharp increase in the proportion of fertilizer applied by dealers for farmers.

Changing technology has had a profound effect on production of nitrogen fertilizer. Facilities for production of nitrogen for explosives are adaptable to the production of fertilizer. In 1900, about 90 percent of nitrogen fertilizer came from organic or natural sources. By 1960, nearly 90 percent was of synthetic origin. Since World War II the government has sold or leased to private industry munition plants with an annual capacity of 531,000 tons of nitrogen. In addition, private plants with a capacity of 1.1 million tons were built under rapid tax amortization benefits. On January 1, 1959 the total capacity for producing nitrogen for all purposes was 4.4 million tons, compared with a little

⁵ Part of the material in this section is drawn from E. L. Baum and S. L. Clement, "The Changing Structure of the Fertilizer Industry in the United States," and discussion by Calvin L. Berry, *Jour. Farm Econ.*, 40(5): 1186-1200, 1958.

more than 1.6 million tons on January 1, 1951. In 1958, 2.37 million tons of nitrogen were used as fertilizers.

Along with increased capacity, the number of firms manufacturing nitrogen has increased from four major producers to about seventeen. These are widely scattered over the United States.

The phosphate industry is much older than nitrogen manufacture. Control of phosphate minerals by a limited number of firms has given this industry considerable stability. In recent years, the importance of the Midwest as a market area increased. More concentrated materials were developed and ammonium phosphates introduced. Among the producers of primary fertilizer materials the phosphate industry is outstanding in the degree of vertical integration in the production of mixed fertilizers.

Potash is produced in the United States by about ten plants. The industry has grown rapidly in volume but not in number of firms. Technical progress has been rapid and prices have tended to remain relatively constant.

The fertilizer mixing industry includes integrated firms owned by phosphate producers, and many independent firms which buy primary materials and blend them into formulas. Fillers, conditioners, and other materials are added. These firms are located in the market areas served and usually do not ship their products great distances.

Mixing firms have been criticized from time to time for production inefficiency, particularly with respect to the uneconomically low concentrations of nutrients in dry-mixes, and a lack of attention to farmers' economic interests in pushing the sale of brands of mixed fertilizers. However, nutrient concentration of fertilizers has been increasing rapidly. In recent years, the industry has had excess capacity for nitrogen. Competition has been severe among dealers. Manufacturers and distributors have actively promoted use of fertilizers, and there is a growing tendency for them to sell direct to farmers.

LENDERS SUPPLY \$21 BILLION TO FARMERS

Firms making loans to farmers comprise one of the more important farm supply industries. Although farmers have financed most of their capital needs internally, the rapid growth in capital needed by farmers caused them to borrow an increasing part of their investment requirements in recent years. On July 1, 1959 the total indebtedness of farmers amounted to \$21 billion. Forty percent of this was provided by merchants, farm equipment dealers, and individual lenders and 30 percent by commercial banks. Other important sources of credit included life insurance companies, Federal Land Banks, Production Credit Associations, and the Farmers Home Administration (Table 9.4). Capital provided through land purchase contracts is not included in this table. This form of financing has been increasing and now amounts to about \$2 or \$3 billion.

TABLE 9.4

AMOUNT OF FARM LOANS OUTSTANDING, JULY 1, 1959 (BY TYPE OF LOAN AND SOURCE OF FUNDS)*

Type of loan and source	Amount of loans
	(<i>Million</i>)
Farm-mortgage debt:	
Federal land banks	\$ 2,065
Farmers Home Administration	388
Life insurance companies	2,661
Insured commercial banks	1,443
Individuals and miscellaneous	4,697
Total	\$11,254
Farmers' non-real estate debt:	
Loans by banks and federally sponsored agencies except CCC	\$ 5,800
Loans, book credits, and miscellaneous lenders	3,700
Total	\$ 9,500
Grand total	\$20,754

*Excludes \$2.5 billion of price-support loans made or guaranteed by CCC.
Source: The Balance Sheet of Agriculture, USDA.

The growing complexity of farming is resulting in changes in the activities of lenders. Commercial banks are finding it advantageous to employ agriculturally trained men to service farm loans. About 1,200 banks now have one or more agriculturists on their staff.

Many farm supply firms, including cooperatives, are developing contracting arrangements with farmers as a means of supplying farmers with capital. There is no information on the amount of capital made available to farmers in this manner, but the total is substantial. Farm machinery companies and dealers have always been active in financing purchases of new farm equipment.

COOPERATIVES INCREASE SALES TO FARMERS

Farmer cooperatives play an important role in the farm supply industry. In 1957, there were 979 electric power cooperatives with more than four million members. There were 7,406 farmer cooperatives handling production supplies — of these, 4,500 sold feed, 3,790 sold seed, 4,143 handled fertilizer, and 2,794 handled petroleum products.

The sales of feed, fertilizers and lime, and petroleum by farmer cooperatives are about 20 percent of the total sales of these important farm supplies (Table 9.5). The proportion handled by cooperatives has been increasing, particularly for fertilizers and petroleum products.

MARKETING ACTIVITIES

On the marketing side, farmers are more and more dependent on processing and distributing agencies to provide the outlets for farm products. The marketing system bridges the gap between the farmer and city consumer, and permits farmers to specialize on production. It bridges the gap in several ways — in distance, in time, and in form. Because of the vast network of distribution facilities, today's market for most farm products is nationwide.

TABLE 9.5
PURCHASES OF PRODUCTION SUPPLIES AND EQUIPMENT BY FARMERS, AND NET SALES OF SUCH ITEMS BY FARMER COOPERATIVES,
UNITED STATES, 1950-51 AND 1957-58

Item	Total purchases by farmers, annual average *		Net sales by farmer cooperatives, annual average †		Percent of total handled by cooperatives	
	1950-51	1957-58	1950-51	1957-58	1950-51	1957-58
	<i>(Million)</i>		<i>(Million)</i>		<i>(Percent)</i>	
Feed ‡	\$ 3,749.1	\$ 4,297.3	\$ 694.3	\$ 808.4	18.5	18.8
Seed ‡	346.3	534.2	90.5	95.8	26.1	17.9
Fertilizer and lime	1,031.5	1,291.2	156.1	283.3	15.1	21.9
Petroleum §	1,265.0	1,507.0	224.4	325.0	17.7	21.6
Sub-total	\$ 6,391.9	\$ 7,629.7	\$1,165.3	\$1,512.5	18.2	19.8
Farm machinery, motor vehicles, other equipment	\$ 3,648.6	\$ 3,447.9	\$ 68.0	72.0	1.9	2.1
Other farm supplies || . . . . .	2,467.5	2,434.4	261.6	323.9	10.6	13.3
Total †	\$12,508.0	\$13,512.0	\$1,494.9	\$1,908.4	12.0	14.1

* Average of total cash purchases for calendar years 1950 and 1951, and 1957 and 1958.

† Average of fiscal years of cooperatives ending between July 1 and June 30 each year. Excludes sales of meats and groceries and petroleum to nonfarmers. Adjustments were not made, however, for small amounts of seed, fertilizer, pesticides, building materials, and appliances sold to nonfarmers.

‡ Total purchases include an estimated 10 percent of feed and 5 percent of seed purchased through noncommercial channels; i.e., one farmer from another.

§ Total purchases includes only 40 percent of purchases for farm automobiles as proportion chargeable for production purposes. Total volume of cooperatives adjusted to exclude sales to nonfarmers and commercial firms.

|| Includes pesticides, building materials, containers, automotive supplies, fencing, roofing, farm hardware, and similar items. Sales by cooperatives include miscellaneous farm equipment.

Source: Farmer Cooperative Service, USDA. Preliminary data.

The importance of marketing activities in agribusiness can be illustrated both by the farm and marketing shares of consumer expenditures and by trends in number of workers on farms and in marketing activities.

Marketing Takes Larger Share of Consumer Expenditures

For most consumer goods derived from farm products, the returns to marketing agencies are a much larger part of consumer expenditures than are the farmer's returns, especially for those farm products that are used as raw materials in manufacturing or processing. In 1958, U.S. civilian consumers spent about \$86 billion for food and alcoholic beverages, textile products, tobacco, and leather products that were derived from domestically produced farm products (Table 9.6).⁶ Of this total, farmers received an estimated \$23 billion or about 27 percent of consumer expenditures. Their share was somewhat higher for food products than for nonfood products principally because of the greater processing involved in the nonfood products. The farmer's share of a "market basket" of food products purchased by urban consumers at grocery stores averaged 38 percent in 1959.⁷ But the farmer's share is also low for many food products — such as bread, crackers, prepared breakfast food — where the final form bought by the consumer differs greatly from the raw product sold by the farmer.

The estimates in Table 9.6 refer only to the major groups of consumer items derived principally from farm products. Not included in any of these groups are many nonfood products like paint and soap, which contain considerable amounts of fats and oils. An automobile may have farm-produced raw materials in its upholstery, cushions, tires, and paint.

⁶ The derivation and limitations of statistics (for the year 1954) comparable to those in Table 9.6 are described in "The Marketing Bill for Agricultural Products," *Agr. Econ. Res.*, 6:101-7, October 1955.

⁷ The statistics for the "Market Basket" are published regularly in the quarterly AMS report, *The Marketing and Transportation Situation*, and analysis and description of these statistics are given in *Farm-Retail Spreads for Food Products*, USDA Misc. Publ. 741.

TABLE 9.6

CONSUMER EXPENDITURES, FARM VALUE, AND MARKETING BILL FOR PRINCIPAL GROUPS OF AGRICULTURAL PRODUCTS, 1958

Item	Consumer expenditure *	Farm value	Marketing bill †	Excise taxes
	(Billion)	(Billion)	(Billion)	(Billion)
Food	\$57.7	\$20.8	\$36.9	\$. . .
Nonfood:				
Textile products	11.0	1.1	9.9	. . .
Alcoholic beverages	8.3	.5	4.5	3.3
Tobacco products	5.7	.7	2.6	2.4
Leather products	3.4	.2	3.2	. . .
Total nonfood	\$28.4	\$ 2.5	\$20.2	\$5.7
Total food and nonfood	\$86.1	\$23.3	\$57.1	\$5.7

* These statistics do not include expenditures for such imported products as coffee, tea, bananas, sugar, pineapples, wool, and silk. Also excluded are some nonfarm products such as seafoods and clothing made from synthetic fibers. Thus, total consumer expenditures for food, clothing and shoes, alcoholic beverages, and tobacco products, as reported by the Department of Commerce, are about a third higher.

† Consumer expenditures minus farm value of equivalent quantity, except for alcoholic beverages and tobacco products where estimates of federal, state, and local excise taxes also are subtracted.

Source: Agricultural Marketing Service.

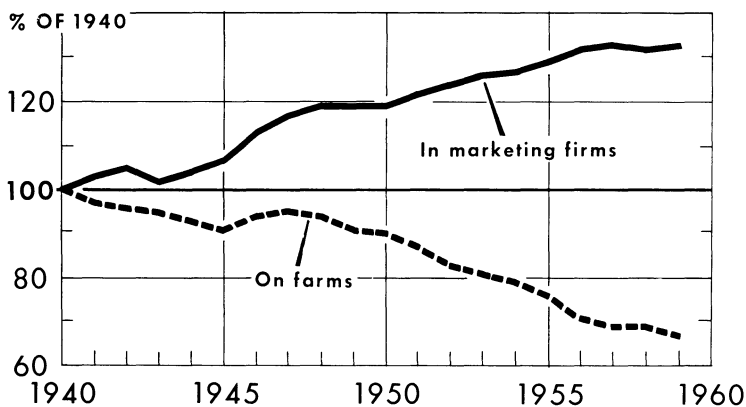
The share of consumer expenditures for food and fiber going for off-farm activities in the processing and distributing of farm products has tended to increase. In 1959, for example, marketing agencies received the largest proportion of consumer expenditures for food on record except for the depression years of 1932 and 1933 when farm prices of food products were very low in relation to price levels in the nonagricultural economy. (Comparable time-series data for nonfood products are not available.) This trend likely will continue as more and more services are provided by marketing agencies, especially for food products.

More Labor in Marketing, Less on Farms

Almost ten million workers (on an equivalent full-time basis) are needed to process, transport, and distribute the farm products. This figure includes only those workers

directly employed in marketing farm products, not those employed by firms providing services, equipment, and supplies to marketing firms. The ten million workers in marketing compares with a little more than seven million workers on farms. These figures, however, are not directly comparable with those for food marketing because the number on farms includes many part-time family and hired workers not adjusted to a full-time basis.

Changes in the labor used in marketing food products relative to changes in number of workers on farms indicate the increased importance of food marketing services (Figure 9.3). Between 1939 and 1959, for example, the number of full-time jobs in marketing domestically produced food products rose from 3.8 million to 5.3 million, an increase of 40 percent.⁸ During this same period, the number of workers on farms declined by a third. This divergent relative change in numbers of workers was caused in part by the faster productivity gain among farm workers than among marketing workers; however, the



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Fig. 9.3 — A comparison of U.S. workers in farm production and in marketing of food.

⁸ Similar data are not available for nonfood products.

increase in marketing services relative to farming appears to be the more important factor.

The built-in maid services now provided with many food products are quite familiar. Also, a much larger proportion of the food supply now goes through the marketing system because of the continued decrease in number of people living on farms and growing their own food supply. Urbanization and specialization in farm production make for long transportation hauls. More meals eaten away from home are another important factor. These influences are all likely to increase marketing services for food in future years.

COORDINATION OF FARM PRODUCTION AND MARKETING

With the growth of agribusiness, coordination of farming and business has increased. Vertical integration is a term commonly applied to this growing farm-business coordination. It exists in varying degrees and forms. A farmer whose operations are vertically integrated shares some of the management decisions and risks in production with one or more related businesses — for instance, his suppliers, processors, or distributors — or he does some of his own processing or distributing. Farmer-businessmen arrangements can extend from connections only slightly closer than an open-market relationship to the complete ownership and operation of the farm by off-farm business.⁹

Changes in Marketing Channels¹⁰

Increasing coordination in farm production and off-farm business is reflected in “shorter” marketing channels — that is, farm products change ownership fewer times between the farmer and the consumer even though the distance that farm products move to market has increased greatly in many instances.

⁹ *Contract Farming and Vertical Integration in Agriculture*, USDA Info. Bul. No. 198, July 1958.

¹⁰ This section is based on *Changing Marketing Channels for Farm Foods*, AMS-350.

Marketing channels for farm products in the United States have gone through three principal phases of change during the history of our country. In the early Colonial period marketing channels were short, both in numbers of middlemen and in distance. The few people who were dependent on purchased foods and other farm products generally bought either directly from farmers or from small retailers who bought from farmers.

During the nineteenth century, the typical marketing channel for farm products in the United States became longer and more complex. Specialized marketing firms arose such as grain buyers, livestock dealers, fruit and vegetable shippers, and other specialized country assemblers. Large central markets for farm products were established. Commission merchants, jobbers, brokers, order buyers, and other forms of wholesalers became an important part of the marketing system for moving products from thousands of country assembly points to the hundreds of thousands of neighborhood retail stores.

Improvements in transportation, growth of urban centers, and specialization of production areas all combined to lengthen marketing channels and increase the number of marketing agencies and the number of times the products changed hands between the farmer and the ultimate consumer. As the number and complexity of marketing channels grew, public criticism of marketing developed. Many farmers and consumers believed these marketing intermediaries performed no essential functions, and their participation made the price spread between farmers and consumers wider than it should be.

In recent decades, farm products have again been moving through shorter and more direct marketing channels but with an important difference from the Colonial period. Buyers of farm products are now for the most part large-scale processors and retail chains or affiliated retail buying groups instead of vendors, peddlers, and country storekeepers. The size of the buying firms has grown much more than has the size of the farmer-seller.

Large processing firms organized around 1900 began selling directly to retailers. Food processing companies that adopted direct marketing set up organizations and facilities for selling directly to the many small retail stores. Warehouses, commonly called branch houses, were maintained in the larger cities from which products were distributed to retail stores. More recently, the formation and rapid growth of large retail food-store companies has been a strong force in shortening marketing channels for food and increasing direct buying of farm products.

Changes in the Organization and Practices of Marketing Firms

The channels used for marketing farm products have always been in a state of transition. But marketing in general — the institutions, organization, structure, and the services they perform — is changing constantly. Some of the changes are related primarily to “internal” factors such as development of new product forms, new processes for preserving quality, and improved methods for transporting and handling farm products. Other changes may be in the nature of adjustments to “external” factors such as higher consumers’ real income, changes in the size and location of population, changes in the business environment and competitive forces, and developments in technology on the farm that affect the supply of farm products.

RETAILING

The growth of supermarkets with their large-scale retailing and mass merchandising is the dominant factor influencing changes in the organization, marketing channels, and buying practices for farm food products.

Supermarkets are a small but growing proportion of the total number of grocery stores, but they account for a large part of total grocery store sales. In 1959, supermarkets (stores with sales of over \$375,000) were 11 percent of the total, but these stores accounted for 69 percent of grocery store sales. This was an increase from 43 percent of sales in 1952. Superettes (annual sales of \$75,000 to

\$375,000) were 20 percent of the total in number and 24 percent of sales. The remaining 69 percent of the total number — almost 200,000 stores — accounted for only 7 percent of sales.¹¹

The current trend is toward fewer retail stores, larger supermarkets with more items, and greater emphasis on nonfood lines. However, different trends are developing in some areas. These include delicatessen chains and miniature supermarkets with a relatively complete merchandising line but with minimum selection. These smaller retailers can offer location, service, and convenience features that may compete effectively with the large competitors.

Many chain retailers and large independent retailers now own and operate their own warehouse facilities, and perform many of the functions formerly performed by independent wholesale houses. Some wholesalers have sponsored successful voluntary retail groups who merchandise and operate under a common name; their operations are similar to those of a chain organization. Other independent retailers have joined cooperative wholesale buying groups to obtain the advantages of large-scale buying and merchandising.

Many of the larger chains and voluntary and cooperative retail groups have central purchasing departments that buy directly from manufacturers and shippers. Direct buying gives retailers greater control over their supply. They can arrange with manufacturers and shippers to make and supply the type, grade, and quality of product they specify. Direct buying frees retailers from dependence upon wholesalers for the type of product and the volume needed, at the time it is needed.

Direct buying by retail food stores from manufacturers, country assemblers, and farmers is likely to continue to increase because (1) the number of corporate chains large enough to engage in direct buying is increasing, and (2)

¹¹ The definitions and statistics are based on the 1960 edition of "Facts in Grocery Distribution" published by the *Progressive Grocer*.

the voluntary and cooperative groups are doing an increasing proportion of the buying for independent retailers.

Small chains are growing larger by acquiring independent stores and stores of other chains, and by building new stores. The advantages of being large enough to warrant direct buying and private brands often provide a motive for expansion. The most rapid growth in size of chainstores has been in the intermediate size group. The proportion of total grocery store sales accounted for by the three or four largest chains has stayed at about the same level in recent years.

WHOLESALE

The growth of large-scale retailing has affected the organization and services performed by the wholesale trade. A small number of wholesalers with efficient mechanized operations now handle a large share of the wholesale grocery business. The number of small wholesalers is declining and they are getting a smaller share of the total business.

Despite direct buying by retail food chains, sales of food wholesalers have not decreased. This is partly because of the increase in wholesalers affiliated with voluntary and cooperative groups. Sales to hotels, restaurants, institutions, and buyers other than retail food stores account for a larger share of total sales of grocery wholesalers than formerly.

The increased coordination of retailing with the wholesaling and other functions of the marketing system has reduced the flow of products through organized terminal and wholesale markets. More fruits and vegetables now move directly from suppliers to retailers or retailer-affiliated wholesalers. For example, the volume of fruits handled by terminal fruit auctions has dropped from 160,000 carlots in 1929 to about 55,000 carlots (with somewhat larger loads per cars) in 1957.¹²

¹² *The Changing Role of the Fruit Auctions*, U.S. Agr. Mktg. Serv., Mktg. Res. Rpt. No. 331, June 1959.

The proportion of eggs and butter moving through produce exchanges has fallen off so much that prices based on these auctions cover only a small fraction of the total supply. In Chicago, for example, about one-half of the eggs move direct from country points to retail outlets.¹³ The importance of central markets for livestock has declined markedly in recent decades. In 1923, terminal markets handled 77 percent of all hogs slaughtered under federal inspection; by 1955 this percentage was down to 37.¹⁴

In the wholesaling of nonfood products there is also evidence of increasing coordination of the processing and distributing steps with products moving through fewer buyers and sellers than formerly.

PROCESSING

Large-scale operations appeared in the processing of farm products before they developed in wholesaling and retailing. Large companies first appeared in the meat packing industry and by 1900 the five largest meat packers bought nearly half of all slaughter animals sold in the United States. During the first three decades of this century large companies were organized in the baking, milling, canning, dairy, and tobacco industries.

The size and scope of processing operations has continued to increase but there are still a large number of small establishments and companies processing farm products. Trends have varied greatly among industries. The growth of large-scale plants and reduction in numbers of small plants have been much more pronounced in some industries than others. Shifts in production areas have caused changes in locations of many plants in some industries.

In 1956-57, 34.7 thousand corporations processing food and beverages, textiles, apparel and leather products, and

¹³ *Movement of Shell Eggs Into Retail Channels in the Chicago Metropolitan Area*, U.S. Agr. Mktg. Serv. AMS-338, September 1959.

¹⁴ *Livestock Auction Markets in the United States — Development, Volume Handled, and Marketing Charges*, U.S. Agr. Mktg. Serv., Mktg. Res. Rpt. No. 223, March 1958.

tobacco products reported total assets of \$36.1 billion on their income tax returns.¹⁵ For 1948–49, a larger number of corporations — 36.6 thousand — reported only \$27.3 billion in assets.

Many companies in recent years have expanded their operations by mergers; others built new plants. The advantage of having a full line has encouraged companies to diversify their production, sometimes by merging with companies that manufactured different products. Technological developments stimulated large investments by processors since the end of World War II. Expenditures for new plant and equipment by food processors varied between three-quarters and \$1 billion annually. Total annual investments of all processors of farm products have approached \$2 billion in some years.

ASSEMBLY

Assemblers are the first link in providing markets to farmers for their products. The number of assemblers is declining. In part, the reduction was a long delayed adjustment to improvements in transportation facilities. With improved roads and use of motortrucks, large establishments drawing products from a wider area became feasible and more economical. The functions of assemblers have been integrated into the activities of other marketing firms by direct deliveries to processors and other buyers. The location and type of assemblers changed also in response to changes in location of production and in marketing practices.

Integration Activities of Farm Supply Firms

Among farm supply firms, feed dealers, hatcheries, and seed firms have been active in developing contracts and other integrating arrangements with farmers. The outstanding example of feed dealer-farmer integration is found in broiler production. It is estimated that about 95 percent

¹⁵ "Statistics of Income 1956–57," Internal Revenue Service.

of all broilers are produced under contract or under the direct ownership of feed dealers or processing firms. Under these contracts broilers usually are owned by the contractor. He also furnishes chicks, feed, and other supplies. The farmer receives a flat fee per broiler produced or a minimum guarantee plus a bonus, calculated on the basis of feed conversion efficiency. A growing proportion of turkeys are produced under similar contracts.

In the hatchery industry, egg producers under contract are supplied with breeding stock. The contract provides for purchase of eggs usually at a guaranteed minimum price plus incentive bonus payments.

Hatcheries, feed dealers, and poultry processors frequently are integrated to some degree through either outright ownership, contracts, or agreements.

Feed firms are experimenting with various kinds of production contracts with hog producers. At present the proportion of hogs produced under contract is very small.

Much of the vegetable seed production is regulated by contracts between farmers and seed companies. These companies in turn have contracts with large wholesalers and retail seed dealers.

Under the contract the farmer prepares the seedbed, cultivates, and irrigates the crop. The company rogues, harvests, threshes, cleans, and stores the seed. The company also provides seed. The contract usually specifies price and time of delivery of the crop. The entire vegetable seed industry is thus closely integrated. These arrangements are said to improve regulation of the supply, reduce needed carryover, reduce price risks, and protect quality.

About three-fourths of the hybrid corn seed is produced under contracts with seed companies. Several of them are farmer cooperatives. The contracts are quite similar to those in the vegetable seed industry.

The grass and legume seed industries are not highly integrated except for the production of certified seeds where contracting is customary. Among forage crops, private

varieties are increasing in importance. This is particularly true for alfalfa. If continued, this trend will stimulate integration.

EFFECTS ON AGRICULTURAL ADJUSTMENT

Large-Scale Buyers of Farm Products

Trends in the organization, size, and scope of firms marketing farm products have important repercussions on farmers, through the markets in which farmers sell.

Buyers tend to be larger and fewer in number. In many country sales of farm products, the farmer obtains a bid from only one buyer. Unless the farmer has adequate knowledge of prices being paid in other transactions for products of the same quality, he may accept a price that is lower than he could have obtained from other buyers. With highly perishable products and no other buyers readily available, he may have little alternative than to accept the only price offered.

Procurement of farm products by processors and retailers through specification buying direct from shippers and farmers is likely to increase. Buyers prefer to buy from farmers who can supply a large volume of products having uniform, specified characteristics. Products that meet the buyers' specifications may receive price premiums, so long as the supply is relatively limited.

Many farmers must decide how to adjust their production and marketing programs to large-scale buying practices. Some may need to increase their volume of production.

Contract or specification buyers frequently offer a higher price for quantity deliveries. For example, in 1959, one egg marketing cooperative offered a premium of 2 cents a dozen on deliveries of from 150 dozen to 749 dozen eggs a week, and 3 cents on deliveries of 750 dozen or more. (One hundred and fifty dozen eggs is the annual production from about 350 hens, and 750 dozen would require about 1,800 hens.) A differential of 3 cents a dozen would

mean an additional net income of 30 cents per hen in a year — a substantial inducement either to expand size of flock or get out of egg production.

The small farmer is likely to have increasing difficulty in finding satisfactory outlets for his products. Retailers, whether chains or affiliated independents, merchandise large quantities of products through concentrated advertising and promotion. These retail groups need a large supply of uniform quality products. Cooperative selling may meet the need for large quantities of products, but coordination of production, in timing and quality, also will be necessary.

The by-passing of wholesale markets through direct buying has weakened the position of many traditional markets as price-making centers. Trading in butter and eggs on the New York and Chicago Merchantile Exchanges and central markets in some other cities has declined to low levels. Many observers contend that the volume of sales in these markets is so low that prices do not always reflect changes in supply and demand conditions. Different methods are needed in some instances for pricing of commodities purchased from farmers.

Providing adequate market news on prices to farmers as a growing volume of farm products by-passes terminal markets is a related problem, and is of major importance to farmers. The collection, summarization, and reporting of satisfactory price data become more costly and difficult as direct sales at country points increases.

Farmers are not the only group needing to adjust to changes in the agribusiness sector of our economy. Trends in the production and marketing of farm products also have important repercussions on the marketing agencies of farm products, especially the smaller firms. Small-scale assemblers and processors of farm products are likely to have increasing difficulty in finding outlets that will enable them to compete effectively with larger-scale buyers. For example, the small-scale firms may need to work more

closely with farmers in improving production practices and in doing more sorting and grading to obtain a uniform supply of standardized products.

Effects of Marketing Costs and Services on Farm Prices

In a broad sense, a highly developed marketing system contributes both to a higher level and greater stability of farm prices. The price variability resulting from seasonal and cyclical fluctuations in farm production and marketing is reduced by storage, refrigeration, and processing facilities that help provide a more even flow of products to consumers. Processing has widened the market for many food products by making them available in more forms, in all seasons of the year, and to consumers all over the country. This is particularly important for perishable farm products.

The increasing importance of marketing costs may tend to make farm prices more variable. The costs that make up the spread between farm and retail prices are "sticky" (because labor costs are a high proportion of total costs). Spreads per unit are likely to be as high (or in some cases higher) for a large volume marketed as for a small volume. Thus, for a given percentage change in the retail price, the percentage change at the farm level is likely to be greater. The smaller proportion that the farm price is of the retail price, the greater the impact on farm prices.

Most of the products derived from the so-called basic farm commodities — wheat, cotton, corn, tobacco, rice, and peanuts — are products for which the farmer's share is 20 percent or less. That is, they are products for which large percentage changes in farm prices would have relatively little effect on retail prices.

Marketing and marketing costs are not, however, the primary cause of either instable or low farm prices. The stability of farm production as a whole plus the inherent instability in the production of many individual farm products overshadow marketing as a cause of instable farm

prices. But an efficient marketing system does and can contribute greatly toward stabilizing and improving farm income.

The efficiency of this marketing system is not measured by the share of the consumer's dollar which it takes, nor do these percentage shares of the consumer's food dollar measure the net returns of either farmers or marketing firms. As the marketing system performs more and more services relative to farming, a larger share will go to marketing. One of the important implications of this trend to agricultural adjustment is that fluctuations in prices at the farm level have less effect relatively on retail prices than formerly, and therefore less effect on consumption.

On the cost side, the increasing proportion of farm resource items that are purchased by farmers, and the rigid nature of prices for many of these make it more difficult for farmers to withstand periods of low prices. However, increased use of purchased items has been accompanied by improved production efficiency that has tended to offset the effect of these factors.¹⁶

Contract Farming Speeds Adoption of Technology

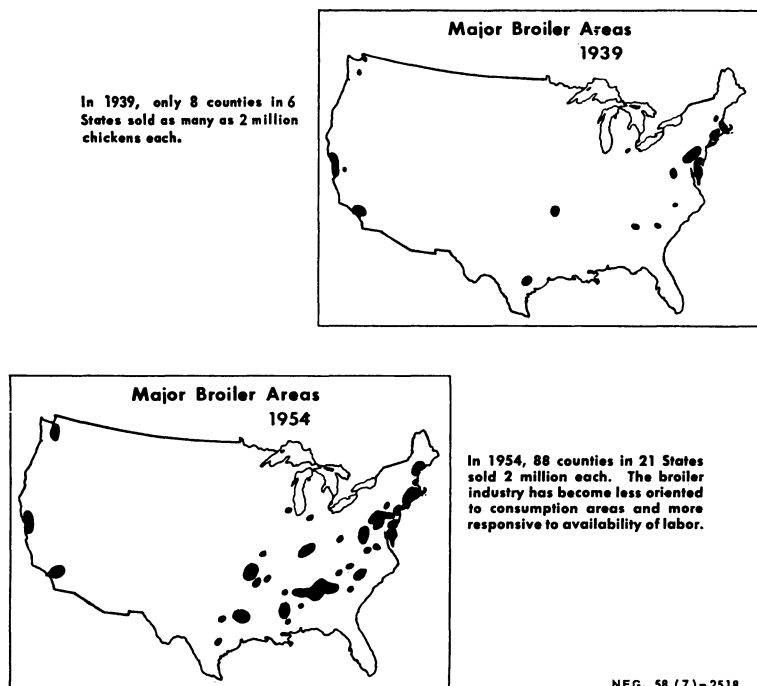
An increase in the number of integration arrangements between farmers and suppliers, processors, and distributors speeds up technical progress. As a result, efficiency is improved and a better quality of product is obtained. Contract farming arrangements usually provide for management assistance. They encourage the use of improved strains or varieties, carefully balanced livestock rations, and improved marketing and handling practices.

Integration may stimulate production. If farmers can market produce only if they have a contract, as is the case with sugar beets and some vegetable crops grown for processing, contract arrangements may restrain production. However, if integration arrangements facilitate the acquisi-

¹⁶ W. H. Brown, "Are Farmers More Vulnerable to the Price-Cost Squeeze?" *Jour. Farm Econ.*, 41:558-68, 1959.

tion of capital and technical knowledge by farmers, production may be stimulated. This has clearly been the case with broiler production which increased about 34 fold in 25 years. A similar but less spectacular growth is occurring in turkey production. It is probable that integration has been an important factor in the growth of this industry.

A small beginning in integrated hog production has been made. Further extension of contract hog production can stimulate production. For each of these industries the principal business firms that engage in contracting are feed dealers or feed distributors. The contractor provides feed for which the grower does not pay until he has sold his product.



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Fig. 9.4 — Regional changes follow vertical integration. This is illustrated by shifts in broiler production since 1940.

The contracting activities of suppliers and processors may influence the location of farm production. Contracting in the broiler industry has made the feed supply and working capital more fluid. Feed has tended to move into areas where there was an abundance of low-cost labor, particularly in the Southeast. New broiler processing facilities developed in the areas expanding production. Figure 9.4 indicates the regional shifts in location of the broiler industry between 1939 and 1954.

One of the important avenues of agricultural adjustment involves cost reduction to improve the competitive position of our farm products with foreign farm products and with synthetic substitutes. Opportunities for cost reduction or improving efficiency will increasingly be found in the off-farm industries of food and fiber production, processing, and distribution since they now comprise two-thirds to three-fourths of the total employment and total cost. This brief review of some of the industries serving farming points out some of the ways in which efficiency can be improved.

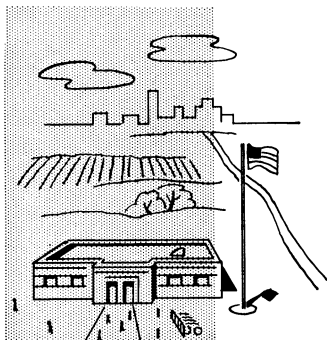
Cost reduction and improving efficiency in marketing and financing should improve demand for farm products and also permit better prices to be paid for farm products. Cost reduction in the farm supply industries should reduce farmers' costs.

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CHAPTER 10



Trends in off-farm work; hired farm labor; age and sex patterns in migration; opportunities for farm people.

Adjustments in Rural Human Resources

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IT IS DIFFICULT to discuss adjustments in rural human resources without first defining the people who comprise this resource. Under the rapidly changing conditions of rural life, the concepts "rural" and "farm" have become increasingly difficult to agree upon and their operating definitions have changed. The rural U.S. population of the mid-twentieth century has been defined as including those persons who live outside population centers of 2,500 or more inhabitants. It excludes persons who live in the densely settled fringes of metropolitan cities.

NUMBERS OF PEOPLE: FARM AND OTHER RURAL

Farm people have traditionally been defined in federal statistics as persons who say they live on a farm. This simple, subjective method used to give results that were reasonably comparable with data on number of farms as obtained by detailed questions on acreage of farmland and value of crops produced or sold in censuses of agriculture.

Gradually, the proportion of people who reported themselves as farm residents, but who had no agricultural occupation or income, increased. Hundreds of thousands, for example, rented former farmhouses for cash and were improperly retained in the farm population statistics. At the same time, the Bureau of the Census found it increasingly difficult to administer the census of agriculture under the old rules which did not require all places to actually sell farm products in order to qualify as farms. To improve the statistics, it was decided to restrict the term "farm" in the 1959 Census of Agriculture to places selling farm products and having a certain minimum number of acres. Farm residence was determined in the 1960 Census of Population by the criteria of acreage and sales used in the agriculture census.¹

Unpublished sample surveys run by the Bureau of the Census and the Agricultural Marketing Service indicate that this change in definition of farm population will probably result in lowering the official count of farm residents by about five million. Since the last estimate of farm population under the old definition was about 21 million, the change in definition alone will reduce the level of farm population by from 20 to 25 percent.

It should be emphasized that the people being dropped from the farm category have virtually no direct economic dependence on farming. They either live on places on which farming operations — other than for home use — have

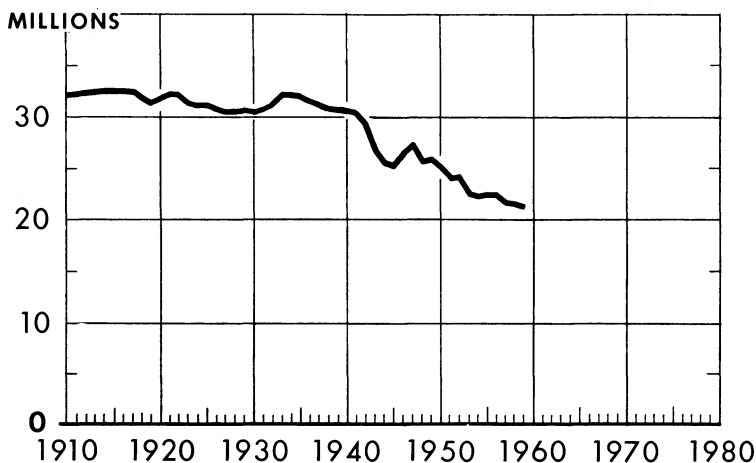
¹ To be precise, a farm is now a place of 10 acres or more from which at least \$50 worth of products were sold in the last year, or a place of less than 10 acres from which at least \$250 worth of products were sold.

ceased or they have been incorrectly identified as farm residents because the house and yard they occupy for cash is considered to be located on a farm. Unfortunately, the 1960 census farm population statistics will not be available until late 1961. Thus, the remainder of this discussion of farm population must be in terms of the former definition. It is known, though, that the farm population under the new definition will show sharper differences from the nonfarm population's social and economic characteristics than was true under the broader old definition.

Trends in Farm Population

The estimated farm population in 1959 was 21,172,000. Despite the increasing inflation of the farm population figure by persons not engaged in farming — as mentioned above — the farm population has fallen from 25,058,000 in 1950 and 30,547,000 in 1940 (Figure 10.1).

The latter figure is not too much different from the all-



BASED ON COOPERATIVE ESTIMATES OF THE AGRICULTURAL MARKETING SERVICE AND THE BUREAU OF THE CENSUS

U. S. DEPARTMENT OF AGRICULTURE

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Fig. 10.1 — Trend of farm population in the United States.

time high of 32,530,000 estimated to have been reached in 1916. Nearly half of all farm people live in the South, broadly defined, but the proportion doing so is falling year by year because of the heavy outmigrations from the South Central states. The Great Plains states also continue to lose more rapidly than the national average, but other northern and western areas have been more stable.

A combination of high birth rate and heavy outmigration has caused the age distribution of farm people to differ from that common to the urban United States. The farm population has a high proportion of children and a low proportion of young adults. For example, in the farm population there are 24 persons between ten and nineteen years of age for every 10 between the ages of twenty and twenty-nine. In urban areas this ratio is only 12 to 10.

The proportion of elderly persons in the farm population is no higher than the national average, because many elderly farm people move to the cities. However, the out-movement of younger adults from farm areas has been so heavy in recent years that in 1959 for the first time farm people forty-five years old and over outnumbered those at ages eighteen to forty-four. This condition may be essentially temporary. As older farm adults die or retire there will no longer be equal numbers of younger farm adults available to replace them.

When farm population statistics were first collected (1920), almost 17 percent of the farm people were of nonwhite races. Ninety-six percent of these were Negro. The next 20 years saw a moderate decline in nonwhite farm residents, both in numbers and proportion, as the cotton plantation system in the Southeast began to break up. The decline was greatly accelerated after 1940. More than two million southern Negro farm people left their farms in the 1940-50 decade. This movement was clearly fostered by rapid farm mechanization, lowered need for tenant operators, abundant nonfarm employment and income opportunities, and military conscription. But it may be that purely

social factors — such as changing attitudes towards the acceptance of traditional patterns of race relations — were also of major importance.

Nonwhite farm people numbered about 3,150,000 in 1959, or 14.5 percent of the total.² The prospect is that this number will go much lower. The majority of nonwhite farmers are still small-to-medium scale tenants, subject to the hazards that acreage adjustments, land retirement programs, and changing technology pose for tenants.

Changes in Dependency on Farming

One of the principal ways in which farm people have adjusted to economic conditions is by taking off-farm employment. Inadequate income from farming, the enhanced cash needs of modern living standards, increased prevalence of good roads and automobiles, and dispersal of industry to rural areas all contributed to this trend, as ample testimony from farmers indicates. In April of 1940 — at a time when many farmers were in economic distress but nonfarm work was not plentiful — 21.5 percent of employed farm residents worked wholly or primarily outside of farming. By 1959, unpublished data show this percentage to have risen to 40.6 percent.

The mechanism of this change is two-fold. (1) The proportion of employed farm men who work at nonfarm jobs has more than doubled. (2) The proportion of farm women who have any employment has risen considerably, from 12 percent in 1940 to 28 percent nearly 20 years later. As a result of extensive nonfarm jobholding, about 30 percent of the income farm families received as we entered the 1960's came from nonfarm sources.

The increased participation of farm operators in the off-farm labor market has not been accomplished by taking *part-time* jobs. The proportion of farm operators who did part-time off-farm work (1–199 days a year) was the same

² Bureau of the Census, unpublished data.

in 1954 as in 1934 — about 25 percent. But the proportion of farmers working on a *full-time* basis off the farm (200 days or more) rose steadily throughout this period from 6 percent to 22 percent.

The availability of off-farm work has enabled many farm families to remain on the farm as they wished when otherwise they would have felt the necessity to leave. The effects of full-time off-farm work on the farm operation may be far from beneficial, but this consideration will not be examined here.

Families living on places called farms and having a male member working entirely or primarily at a nonfarm job frequently have little farm production. The revised farm population definition will remove more than half of these families from the farm population classification. In the new farm population, less than one-third of the employed workers will be in nonfarm jobs compared with the 40 percent listed under the old method of classification.³

Trends in Rural-Nonfarm Population

In these days of shrinking farm population, many professional workers who once served farm people almost exclusively are now anxiously widening their work to include the nonfarm population. The rural-nonfarm population has always been with us, but received little attention as a residual and somewhat heterogeneous population left after the urban and farm populations were counted.

Although it was not until World War II that rural-nonfarm people first equaled farm people in numbers, the 1960 census will show between 45 and 50 million rural-nonfarm population. This will be approximately three times as large as the farm population by the new definition.

The rural-nonfarm population is a mixture of village residents, open-country nonfarm residents, highway "string" settlements, military personnel, and residents of

³ Bureau of the Census, unpublished data.

institutions. Rural colleges, prisons, hospitals, and other institutions are always classed as nonfarm. About 6 percent of the civilian workers in this group (rural-nonfarm) are engaged in farming, the majority as hired workers.⁴ Rural-nonfarm workers engage in farming, mining, and construction to a greater extent than city workers, but otherwise their industrial distribution is very much like that of city people.

Occupationally, the rural-nonfarm population has a considerably higher-than-average proportion of such workers as clergymen, teachers, carpenters, saw-mill hands, textile-mill operatives, auto mechanics, fishermen, cooks, and laborers. Many of these pursuits are not well paid. This fact shows up in a median income differential of \$600-\$800 between urban and rural-nonfarm families.⁵ The occupational and income structure of the rural-nonfarm population is being upgraded, however, by improved accessibility to a wider variety of jobs and by increased movement of urban people into rural-nonfarm areas.

To an increasing extent, the rural population tends to concentrate along main roads, within easy commuting distance of cities or rural-located industries. The result of the decline in the farm population and the redistribution of the rural-nonfarm population is the partial depopulation of vast areas. It is not widely appreciated that in the 1950's, when the national population grew by about 28 million (or more than 18 percent), half or more of the total land area of the nation experienced a population decline that was often severe. In contrast to the atmosphere of boom and bustle that pervades most urban areas, many rural people are daily confronted with such visible effects of population loss as brush-grown fields, abandoned barns, and deteriorating houses.

⁴ Bureau of the Census, unpublished data.

⁵ Based on 1949 census data.

Trends in Hired Farm Labor

No group of agricultural people has been more affected by the changes in recent years than the hired farm workers. For every two farm operators who have farming as their sole or principal job, there is on the average one hired worker whose main occupation is farm labor.

The approximately one and one-half million farm jobs that provide primary employment at wages during a year greatly understate the total number of people involved in hired farm labor. In many types of farming, mechanization has eliminated the need for a full-time hired hand without lessening the need for seasonal workers. Thus, to an increasing extent, persons engaged in hired farm work are so employed for only short periods of the year. The total number of persons doing any hired farm work has increased in recent years rather than declined. In 1958, 4,200,000 people did some farm wage work, but of this number 45 percent worked less than 25 days and an additional 37 percent worked from 25 to 149 days (Table 10.1).

TABLE 10.1
PERSONS DOING FARM WAGE WORK, 1946-58

Year	Amount of work			
	<i>Total</i>	<i>Under 25 days</i>	<i>25 to 149 days</i>	<i>150 days or more</i>
1946	2,770,000	817,000	1,089,000	864,000
1952	2,980,000	1,008,000	1,252,000	720,000
1958	4,212,000	1,893,000	1,653,000	756,000
<i>Percent Distribution</i>				
1946	100	29	40	31
1952	100	34	42	24
1958	100	45	37	18

Source: *The Hired Farm Working Force of 1958*, USDA, pp.6, 9.

In 1952, only three million people did any farm wage work. One-third of them (34 percent) worked less than 25 days. After earlier declines, the number of full-time hired workers has been rather stable since 1952. Migratory workers, exclusive of foreign nationals, make up about 10 percent of the total hired farm work force. They do not tend to migrate in large numbers for less than 25 days of work annually. On the other hand, they do not have full-time farm work of at least 250 days annually to the extent that nonmigratory workers do.

One result of the increasingly seasonal and temporary nature of farm labor has been a shift in the residence pattern of farm workers. Formerly, the great majority lived on farms. For example, in April 1940, three-fourths of the hired farm workers were farm residents. Only one-fourth of the remainder were urban. By contrast, in February 1959, only half of the persons who did at least 25 days of farm wage work in the previous year were farm residents. (The data are not strictly comparable, but the trend is real.) The number of farm workers living on farms has fallen, but the number living in cities, villages, and other nonfarm residences and commuting to the farms has greatly increased.

Three-fifths of the white people who ever do farm wage work look on it as a temporary type of work. It often is associated with a particular period in youth, and is not engaged in for more than three calendar years. Farm labor is much more frequently a permanent type of employment for Negroes and other nonwhites. Negroes comprise only a small minority of beginning farm wage workers, but constitute close to half of the core of workers who have spent at least ten years in such work. It is forecast that in the future, the number of farm wage workers will decline. Of the major occupation groups, hired farm workers have the poorest education and the lowest income. With minor exceptions they are unprotected by minimum wage legislation or unemployment compensation.

MIGRATION

Extent of Farm-Nonfarm Migration

A common adjustment of many farm people to the complex of factors affecting agriculture has been physical migration to nonfarm places. This has been going on for many years. The extent of the movement is not precisely measured, but it is estimated that on the basis of the old farm definition, about 12,118,000 persons left farms from April 1950 to April 1959 or lived on places which were declassified as farms in the period. The latter element is a relatively minor part of the total. Partly counterbalancing this outmovement was a movement to farms of 4,869,000 persons (including a small number of cases where places were reclassified as farm without in-migration of occupants). This resulted in a net outmigration for the nine-year period of 7,249,000 persons. During the same time, about 5,100,000 children were born into the farm population and 1,737,000 farm residents died. This 3,363,000 natural increase in the farm population (excess of births over deaths) partly offset the heavy loss through net outmigration, leaving a net decrease in the size of the total farm population of 3,886,000 from 1950 to 1959.

Inasmuch as the total nonfarm population of the nation increased by about 27,400,000 from 1950 to 1959, migrants from farms made up over a fourth of the nonfarm growth. If one looks at the age range in which migrants from farms are concentrated — fifteen to thirty-four years — the effects of the farm-to-nonfarm migration are even more striking. The number of nonfarm people in this age group rose by somewhat less than 1,600,000 from 1950 to 1959, but the number would have declined by nearly 2,500,000 had not over 4,000,000 young people left farms in the period.

Such a decline would have occurred because the non-farm youth entering this age range were born during the low birth rate period of the 1930's and were fewer in num-

bers than those leaving the group (becoming thirty-five years old). In a decade of generally full employment, the migratory movement of farm youth was a tremendous contribution to industries needing young adult workers.

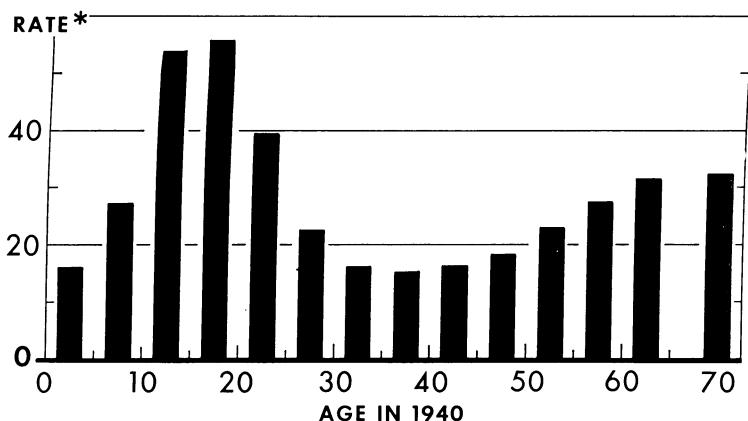
This contribution of the farm population to growth of the nonfarm young adult population will soon begin to recede in both numerical and relative importance. Farm births have been slowly declining, thus shrinking the sources of migrants. More important, the huge number of nonfarm children born during the war and postwar years are now beginning to reach adulthood and furnish nonfarm areas with their own growing sources of workers. One may infer that in coming years farm young people seeking nonfarm jobs will experience more severe competition from nonfarm youth than they have since World War II.

Age and Sex Patterns of Farm Migration

Although patterns of migration differ somewhat from region to region, net outmigration rates are generally far highest for persons in their late teens and early twenties. More than half of all teen-aged farm youth in 1940 had left their farm homes by 1950 (Figure 10.2). Such rates have persisted in the 1950's.

In some areas of severe agricultural adjustment, such as central Oklahoma and east Texas, these rates reach 75 percent within a decade's time. The outmigration of girls becomes heavy at an earlier age than that of boys and is more complete, leaving the farm population with its traditional excess of men over women.

Net outmigration rates decline greatly when farm people reach their thirties and forties, averaging less than 17 percent for a ten-year period. People of these ages are usually young enough to make a reasonable personal and economic adjustment in nonfarm life, but presumably the great majority are either satisfied with farming or at least have made their choice and tend to stick with it. Their capital investment in farming is often large. With further



*CHANGE DUE TO NET MIGRATION EXPRESSED AS A PERCENTAGE OF SURVIVORS TO 1950 OF PERSONS LIVING IN 1940

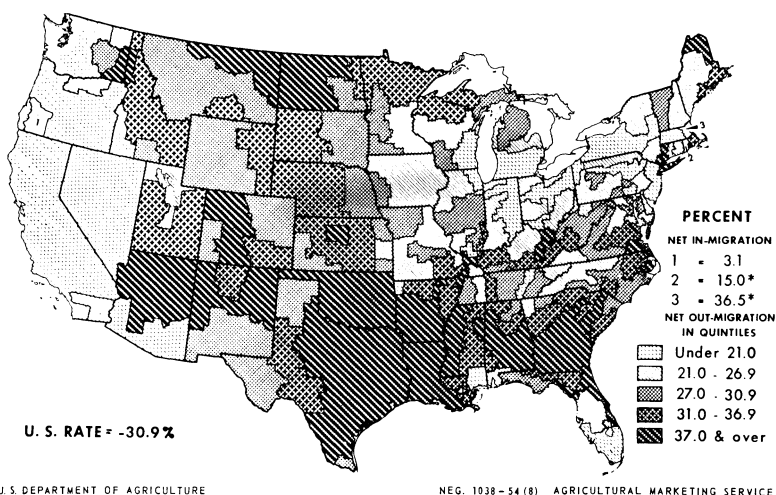
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Fig. 10.2 — Rate of outmigration from the U.S. farm population, 1940-50.

increasing age, and the onset of physical infirmities, widowhood, or planned retirement, the outmigration rate rises again, to a figure about double that in middle age.

A majority of migrants from farms come from the South, including a majority of all white migrants. Since 1940 the heaviest rates of outmovement came from a broad crescent extending westward from the old Cotton Belt of the Southeast through most of Texas and northward through the Great Plains to the Canadian border. The areas within this crescent have usually been characterized by high birth rate and by cash-crop farming systems that have undergone extensive changes in technology, tenure, and size of farm. Access to nonfarm employment opportunities is lacking over large sections of these areas. Where such opportunities are present the farmland is often so poor that farming is abandoned when off-farm work is taken. High outmigration from farms is also evident from certain smaller districts which include such high birth rate areas as Indian, Spanish-American, and Mormon parts of the Moun-



* THESE APPARENT RATES OF NET IN-MIGRATION ARE A RESULT OF PROBLEMS ARISING FROM URBAN-RURAL DEFINITION CHANGES BETWEEN 1940 AND 1950 AND PROBABLY SHOULD NOT BE CONSIDERED RELIABLE.

Fig. 10.3 — Net migration from the U.S. rural-farm population for state economic areas, 1940-50.

tain states; the Palouse country; the northern Great Lakes cut-over country; the Aroostook potato district of northern Maine; and the mining and subsistence farming sections of eastern Kentucky (Figure 10.3).

Outmigration has been lower than average from most of the Corn Belt and Dairy Belt lands of the Midwest and Northeast. This seems attributable at least in part to smaller size of farm families resulting in less "surplus" labor force, to higher levels of farm living, and to less abandonment of farming because of more nonfarm employment opportunities and better farmland. Outmigration has also been very low from the Pacific states, where certain types of farming are still expanding and new irrigation projects still opening. Within the South, farm outmigration has not been high from most of the Florida Peninsula, much of the interior plateaus and mountains where cotton is absent, or from some of the flue-cured tobacco districts of the Piedmont and Coastal Plain.

Data are not available to measure the destinations of migrants on a national basis. It is evident from data on growth of the population by residence distribution, however, that most have gone to urban places. Some migrants do not stray far from home. On the other hand, from the Midwest many thousands have gone to the Pacific states and the Southwest, at the same time that thousands of former southern farm people have poured into the most industrialized parts of the Midwest.

What motivates people to leave the farm? Obviously the reasons differ from person to person. The following list is based upon reasons most often cited by farm people in recent years. (The list is not intended to reflect order of importance.)

1. The anticipation of higher earnings from nonfarm work, especially in the light of the high cash requirements for modern living.
2. The ready availability of nonfarm jobs in many parts of the country.
3. Difficulties of getting started in farming today, particularly the high capital investment required and the intense competition for available land.
4. The attraction of city life and nonfarm occupations to young people, associated with higher educational attainment of farm youth and increased exposure to nonfarm life.
5. Effects of compulsory military service on former farm youth, such as acquisition of nonfarm skills and "worldly" attitudes and aspirations.
6. Emergence of certain ethnic groups, such as Negroes, Indians, and Spanish-Americans, into the main-streams of life in the United States and associated dissatisfaction on their part with the ethnic-oriented restraints of their rural homelands.
7. Decline in the number of farms available for operation because of the consolidation of existing farms into larger units.

8. Decline in the need for tenant farmers and full-time farm-resident hired workers because of changing technology and other factors.
9. Decline in the manpower needed in farming due to acreage allotment rents and the placement of millions of acres in the conservation reserve.
10. Subdivision of farms near cities for housing developments.
11. Stepped-up takeover of farms for highways, military use, industrial facilities, recreational purposes, and timber production.
12. Increased real estate taxes.
13. Persistence in some areas of such older rural disadvantages as poor roads and schools.

The volume of farm migration in any year may be influenced to some extent by the course of national events. A new acreage allotment cut or soil bank plan will result in an increase in outmigration from farms in the year in which it is put into effect. The inauguration of a social security program may retard outmovement temporarily as farmers seek to qualify for benefits by staying on the farm longer than they otherwise might have.

An economic recession invariably sends a few ex-farm youth back to the parental fold. The effects of such events have rarely lasted for more than one year. Since the end of World War I, only the prolonged depression of the 1930's and the war conditions of the 1940's seem to have had large-scale longer term consequences on the size of the farm population. During the 1930's, migration from farms was definitely slowed because of the lack of nonfarm jobs. However, a true back-to-the-farm movement was evident only for about a year and a half at the depth of the depression.

The advent of the war created a tremendous outpouring from the farms for both military and industrial purposes that resulted in a rapid and lasting reduction in the farm population.

The decline in the farm population obviously has not reached its end. No abatement of the desire to consolidate farms into larger units is in sight. Also, there are still many small-to-medium scale farmers of middle age or older, with up to 20 years of activity remaining. Their farms will not become available for consolidation until after the death of the owner. In light of the fact that the farm population is only half as large under the new definition as it was in 1940, it is obvious that the bulk of decline and outmigration has already taken place. Both the number and rate of migrants are likely to drop in the future.

It should be noted, however, that even if the number of farms reaches a point of stability, a rather high rate of outmigration will persist among young farm people. This is true because of the continued high birth rate of farm families. The number of children born to farm couples is two-thirds greater than is required for the replacement of the population.⁶ Thus, even should it become economically feasible for the farm population to maintain a stable level, about 40 percent of the farm children would still have to seek their fortunes in nonfarm ways.

OPPORTUNITIES FOR FARM PEOPLE

It is generally agreed that there is an excess of people in farming. The 1960 census will reveal the changes that have taken place since the 1950 and 1955 censuses.

In 1955, 69.6 percent of total farms (census definition) were commercial farms and produced 98 percent of market sales. At that time 27 percent of the total farms had gross sales of \$5,000 or more annually. They produced 78 percent of all market sales of farm products.

A look at the human resources in terms of present situation and magnitude of adjustments faced will help bring into focus the specific phases of the problem.

⁶ Despite the well-known urban "baby boom," farm women are still bearing more than one and a half times as many children per woman as are urban women. Rural nonfarm women are intermediate between the two other groups. See *Current Population Reports*, U.S. Bureau of the Census, Series P-20, No. 84.

TABLE 10.2
OPERATORS OF COMMERCIAL FARMS BY AGE GROUPS AND ECONOMIC CLASS,
1949 CENSUS DATA *

Age in years	Classes I and II	Class III	Class IV	Class V	Class VI	Total, all classes
<i>Percent of commercial farm operators</i>						
0-25	2.5	2.2	2.9	5.2	4.7	3.6
25-34	21.1	19.5	17.6	15.9	12.3	17.0
35-44	30.3	28.8	26.0	23.5	17.4	24.8
45-54	24.9	25.3	22.0	21.9	18.4	22.3
55-64	14.8	16.8	18.9	19.1	22.6	18.7
65+	6.4	7.4	12.6	14.4	24.6	13.5
<i>Total number of operators, all ages</i>						
481,386	748,932	903,411	912,664	722,666	3,769,059	
<i>Median age of commercial farm operators, years</i>						
43.7	44.8	46.6	47.6	53.6	47.1	

* Class limits fixed by value of sales: Class I, \$25,000+; Class II, \$10,000-\$24,099; Class III, \$5,000-\$9,999; Class IV, \$2,500-\$4,999; Class V, \$1,200-\$2,499; Class VI, \$250-\$1,199.

Source: *Farms and Farm People*, USDA and Bureau of the Census cooperating, June 1953.

Older farm operators are more numerous on less productive farms (Table 10.2).⁷ More than 45 percent of the Class VI operators (\$250-\$1099 farm income) were over fifty-five years of age and approximately a third of the Classes IV and V operators (\$1200-\$4999 farm income) were over fifty-five. There were relatively few operators under twenty-five years of age in any category, but the percentage increased sharply on the better units in the twenty-five to forty-four year age group.

The outmigration figures given earlier in the chapter indicate that substantial changes have occurred within the farming sector since 1950. However, we do not know how much the farm income pattern by age groups may have changed.

⁷ Karl Shoemaker, *Opportunities and Limitations in Employment of Farm People Within and Outside of Farming*, USDA, AEP-89, 1958.

In terms of opportunities in farming, particularly for young farm people, we know that the size of the farm has continued to increase and there is every reason to anticipate that this trend will continue through the 1960's.

Mechanization in the Corn Belt, in the plains, and more recently in the Cotton Belt, has been a big factor in increasing the size of farm. Yet one wonders how much mechanization is still to come and what impact this will have on size of farm.

Farm size can be measured both in terms of acres and volume of business. Some of our larger farms are heavily mechanized livestock feed lot, broiler, laying flock, or turkey operations on a relatively small number of acres. Still others are very extensive livestock ranching operations or cash crop farms including large acreages.

On most farms a high degree of coordination of mechanized equipment is still to be achieved. This is particularly true of the general livestock and dairy farms. As this is achieved family farms will be still larger and the need for labor or human resources in farming will be further reduced.

Existing Operators

Based on an opportunity study, Nesius points out that there are 776,000 commercial farm operators under thirty-five years of age, 276,000 of whom have farm sales of \$5,000 or more.⁸ He states, "While it is not known how many young farm operators leave the farm annually after they are established, it is safe to assume that at least 500,000 in the United States, in the commercial farm operator group, need seriously to consider their low income status and determine whether it can be improved by a change to another occupation or a recombination of resources for a higher income producing unit."

⁸ Ernest Nesius, "Opportunities and Limitations in Programs for Younger and More Flexible Persons Now in Agriculture," in *Problems and Policies of American Agriculture*, Iowa State Univ. Press, Ames, 1959.

Youth

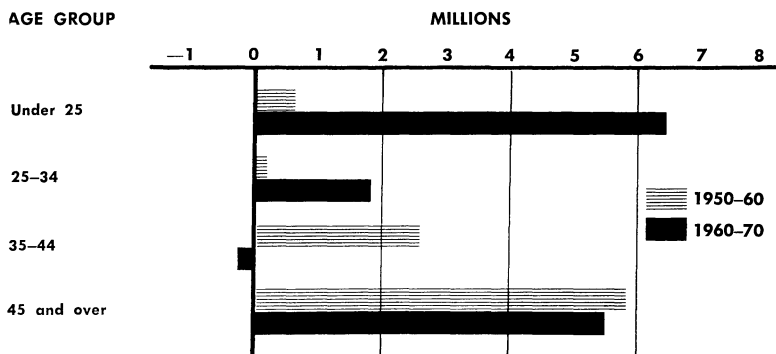
The Shoemaker study concluded that of the 2,200,000 males ten to nineteen years of age in rural farm operator families during the 1955-64 period, only 10 to 15 percent would have an opportunity to become successful farm operators with a relatively satisfactory income, based on the assumptions made in the study. With the outmigration that has occurred from farming since the 1955 census, and the increased competition from urban youth, it is probable that during the sixties a slightly higher percentage than the 10 to 15 percent may have an opportunity in farming.

Perhaps the major hurdle in becoming a farm operator is the capital investment required to purchase and operate a larger farm. Availability of a large enough farm unit is another limiting factor. A third limitation (though not as universally recognized as is justified) is the training in production technology, marketing, and business management required to operate an adequate farm efficiently.

Description of Overall Manpower Situation

To bring the problem of nonfarm alternatives into perspective, let us look at the manpower situation projected to 1970. It is estimated that to provide needed goods and services for a population of 208 million people, anticipated in 1970, the national income will have increased from \$500 billion in 1960 to about \$750 billion in 1970, at 1958 prices. An expansion of these dimensions would require an estimated increase of about 13.5 million workers to a total labor force of 87 million by 1970. This assumes a continued increase in production per man-hour and a somewhat shorter work year than in 1960.

The population here today — and available to be counted — indicates that an increase of 13.5 million in the labor force is possible. However, the question is: Who are these additional people, and will the individuals make the necessary adjustments from one industry to another, including people now underemployed in farming.



Source: Manpower Challenge of the 1960s, U. S. Department of Labor

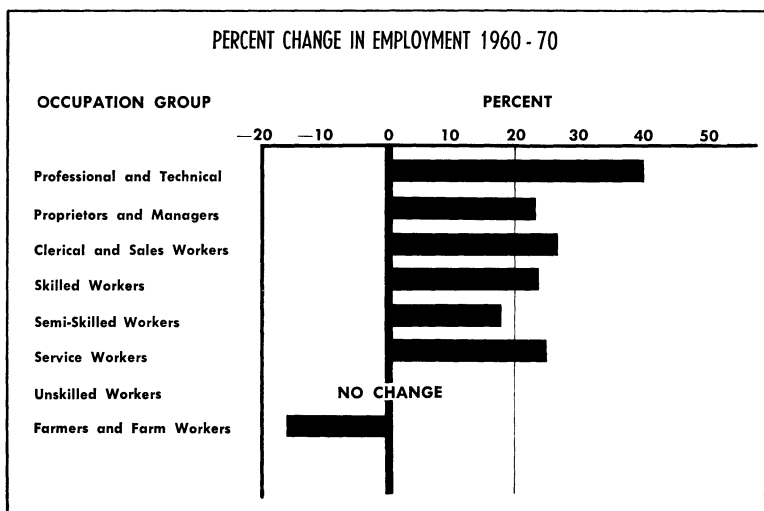
Fig. 10.4—Changes in the number of workers in each age group 1950 to 1960 and 1960 to 1970.

Because of the low birth rate of the 1930's, there will continue to be a shortage of men and women in the labor force who were born in those years. By 1970 they will be in the thirty to forty year age group. Figure 10.4 shows that of the 13.5 million increase in the labor force only 1.6 million or 12 percent will come from the prime age group of twenty-five to forty-four years.

Women are an increasingly important factor in our labor force. By 1970 there will be 30 million women workers, six million or 25 percent more than in 1960. This compares with a 15 percent increase for men.

Occupational Opportunities

Young Americans now in training need to be informed about occupational opportunities. Assuming a continuation of the basic trends and occupations in the United States during the first half of the twentieth century, our growing economy will require about 40 percent more professional and technical people by 1970 than were employed in 1960 (Figure 10.5). This group will command the highest income and have the greatest increase in job opportunities.



Source: Manpower Challenge of the 1960s, U. S. Department of Labor

Fig. 10.5 — Percent change in U.S. employment, 1960–70.

There will be substantial increases in requirements for proprietors and managers, clerical and sales people, skilled craftsmen and service workers, with smaller increases among semiskilled workers. The need for unskilled labor is not expected to increase.

The 17 percent decline projected for farmers and farm workers in Figure 10.5 reflects a continuation of the current rate of decline. This does not attempt to indicate need or situation as a result of the change in census definition mentioned earlier.

Bonnen points out in Chapter 5 that total farm production per man-hour of labor has risen 185 percent since 1940. This fact combined with the low productivity of at least 50 percent of farm operators as reflected in the income figures of the last census, suggests that the need for farmers and farm workers in 1970 would be substantially less.

Young people raised on farms should be informed of the growing trend in demand for their services in areas

TABLE 10.3

NUMBER OF EMPLOYEES IN PRODUCTION AND SERVICE INDUSTRIES IN 1960*

Production industries	Million workers	Service industries	Million workers
Manufacturing	16	Trade	11.5
Farming	6	Government services	8.0
Construction	3	Transportation and Public Utilities	4.0
Mining	1	Finance, Insurance, Real Estate	2.5
		All other services	6.5
Total	26	Total	32.5

* Excludes domestic service and the self-employed outside of agriculture.
Source: *Manpower Challenge of the 1960's*, U.S. Dept. of Labor.

other than farming before they decide what vocation to prepare for and what schooling and training they will need to qualify for good jobs off the farm. The manpower problem in farming of the future will be one of quality rather than quantity.

Nonfarm Opportunities for Farm People

More people are employed in the service industries than in the production industries (Table 10.3). Employment will continue to grow faster in the service industries.

We are told that most new workers replace someone. Hence, it is significant that in a recent year, more than eight million different workers changed jobs. These eight million workers made 11.5 million job changes. About two-thirds of these job changes were to a completely different industry, and about one-half of them were to a completely different occupation group, according to the U.S. Department of Labor.

Today's labor force is also quite mobile — about 7 percent of all male workers are now living in a county different from the one they were in the year before. More than half of this 7 percent moved to a different state.

What does this mean to farm people interested in non-farm jobs? First, farmers in the twenty-five to forty-four year age group with special skills have an advantage. They are in the age group that generally spells stability to the industrialist. The increase in this age group is quite small — 12 percent of total labor force increase from 1960 to 1970 — and people with skills are in demand. Their big decision will be to make the change, to move the children, and which job to take.

This does not necessarily mean that everyone changing from a farm to a nonfarm occupation will have to leave the community in which they now live. The nature of the community, the present industrial development, current job alternatives, and the skill capabilities of the individual will be the determining factors.

Agribusiness Opportunities

The expanding functions performed by off-farm industries as farmers buy more of their production supplies and consumers demand more processing and services, cause many people to be enthusiastic about nonfarm jobs for farm people in farm related industries.

In 1954, 40 percent of total consumer expenditures were for food, fiber, and tobacco products. To produce this \$93-95 billion worth (end products at the consumer level), farmers bought \$16.4 billion of farming supplies or 7 percent of total consumer purchases.

There are many jobs in both the farm supply and food assembling, processing, and distribution fields. A wide range of skills are required. Particularly in the farm supply sales and service end, people with farm background and equal levels of training with their nonfarm competitors may have an advantage in obtaining jobs.

The degree to which farm related businesses can or will absorb people from farming will depend largely on the training and ability of farm people to meet the job requirements. Employers, particularly in the farm supply busi-

ness, frequently say they prefer to hire people with farm background. They nearly always qualify this by adding — “but we can’t find enough of them who have the necessary training.

Young people planning to take nonfarm jobs should realize:

1. They are one of 26 million who will enter the labor force for the first time during the sixties.
2. Education will be more important than ever — high school enrollments will increase nearly 50 percent during the 1960’s and college enrollments will increase by 70 percent.
3. Seventy percent of the new young entrants to the labor force in the 1960’s will be high school graduates or have some college training.
4. While the number of semiskilled workers are not increasing as rapidly as some other groups (Figure 10.5), some of these may move up, making room for more from farms.
5. The varied farm experience background may be an asset in many jobs such as construction, road building, operating machinery, and in farm related businesses, and may speed one’s progress.
6. If they are among the 7.5 million entering the labor force in the 1960’s who have not completed high school — or the 2.5 million who did not even complete grade school — the competition will be heavy, the pay will probably be less, and they will face more frequent periods of unemployment.⁹

Farm youth still in school should acquaint themselves with career opportunities and equip themselves to do the job to which they are best suited. If they are out of school and do not have the training for skilled jobs they may want to explore the opportunities to obtain needed training.

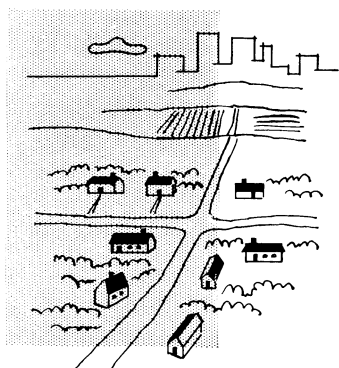
⁹ U.S. Dept. of Labor, *Manpower Challenge of the 1960’s*, pp. 16, 17.

There are jobs requiring technical training unfilled — yet as we entered the 1960's about 5 percent of the labor force was unemployed. This general situation probably will continue.

The big challenge for farm people desiring to change occupations will be to meet the technical and professional requirements of alternative opportunities.

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CHAPTER 11

*Community interdependence; school,
church, and medical needs and
adjustments; taxes; zoning;
local government.*

Adjustments in Community Facilities Taking Place and Needed

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THE COMMUNITY in which the farm family dwells is undergoing changes which are as basic, as involved, and in some ways as rapid as the changes in production and marketing of food and fiber. The role of the farmer in the community and his relationships with the nonfarm members are in transition. Some of the community services which are important for the welfare of the farmer and his family are also rapidly changing. Other service organizations are being forced — sometimes reluctantly — to consider the adjustments which will be required for survival together with reasonable quality of service, economy of cost, or efficiency of operation.

Some of these changes within the community are caused in part by adjustments under way in farming. For example, the trend toward larger-scale farm units requiring a smaller labor force may not only cut down the total number of farm people in the community but reduce the number per square mile. This may handicap schools, churches, and local government by reducing the volume of business and increasing per capita costs. In one such New York community, a rural mail carrier reported losing an average of a family a year for the 20 years he had been on the route.

Other changes in the community reflect impersonal forces of society for change. For example, in another small rural service center long favored by its location on one of the principal highways, construction of a parallel thruway some miles distant resulted in a precipitous drop in volume of business for several services as traffic was diverted to the new route.

The establishment of an industrial plant in a southern rural community in 1951 gave direct employment by 1957 to about 500 persons and clearly gave an economic boost to the area as well as to the employees. Yet both plant management and local leaders indicated a strained relationship between community and plant. Changing standards in the larger society as to what constitutes an adequate school plant and curriculum have an effect at the local community level. Changing patterns in the use of time and changing values with respect to leisure create a demand for new recreational services in the community or result in some families leaving the home community.

Still other changes within the community flow from the impersonal but real forces which result from the changing internal character of the community, as when farmers become both factory workers and "moonlight" farmers or when urban-working commuters take up residence in the rural community and become the new majority or articulate innovators.

The effects of this wide range of forces for change vary widely from community to community, depending on location, size, competitive position, resources, and action taken by local people to make the necessary adjustments. Nor are the effects of the forces for change necessarily the same for each type of facility or organized social system within each community.

THE COMMUNITY

An Over-All Trend to Community Interdependence

Historically, in much of the rural United States, people first grouped themselves on a locality basis into what came to be called neighborhoods.¹ This form of social grouping in the open country, around the crossroads, and around hamlet centers was the locale for much of the social life and was typically the location of essential services such as the general store, blacksmith shop, elementary school, and church.

Then villages and small towns sprang up, often at the crossroads of transport and communication. These became centers for the more specialized services. For several reasons most centers incorporated as municipalities and cut themselves off as legal governmental units distinct from the surrounding countryside and from the people served who lived in the country.

By the period of World War I, a town-country community, sometimes referred to as "rurban," emerged in rural America, and neighborhoods began to weaken. This new pattern typically had no legal basis or governmental recognition; it was, however, a social reality. It was the result of the impersonal social forces at work — automobiles, improved roads, use by country people of the services offered in the village and town center, and the need for a larger population base to support such services as education for which standards of rural people were rising. Quite typically

¹ A summary of changing community patterns is given in John H. Kolb, *Emerging Rural Communities*, Univ. of Wis. Press, Madison, 1959, pp. 3-11.

this emerging town-country rural community was then conceived of as comparatively self-sufficient in providing the essential economic, educational, health, religious, communication, and other services required.

There is now growing recognition that the concept of easily identifiable, highly self-sufficient communities providing nearly all the services and opportunities needed does not fit the facts of the changing rural scene. Rather, as Kolb points out for Wisconsin and as is supported by New York and other research, "multiple community patterns are the most recent to emerge."² These are the result of an over-all trend to mutual interdependence among locality groups with different functions localized among different centers and with farm families typically using a number of centers for services.

For example, church and elementary school services and convenience goods may be obtained at one center; high school, banking, and doctor services may be at a second center; general hospital services and dress-up clothing are at a third; and specialized medical and hospital services may be at still another center.

The centers are becoming more specialized in the services rendered and functions performed, just as farmers are specializing in their enterprises. Thus a network of interrelated communities is developing with supporting services; this trend is likely to continue, leaving patterns in flux for some time to come.

The image which rural people themselves currently have of their community varies greatly. Some persist in thinking primarily in terms of the limited geographic and social area described more technically by "neighborhood." Some seem to be social isolates with no real sense of group ties. Perhaps for the majority, some version of the town-country community represents their "real" community — sometimes along with a neighborhood identification. Other parts of the complex of functionally interdependent places — in the concept of the majority — are nothing more

² *Ibid.*, p. 9.

than locations in which to obtain selected services. Still others, although physically resident in the town-country community, identify themselves little with it but are cosmopolitan in their range of contacts.

In the over-all view, change and diversity characterize the contemporary community situation of the rural United States. Research in New York, Wisconsin, Mississippi, and elsewhere has shown that "community" and "neighborhood" persist in significance in the daily lives of a great many farm and other rural people, although the ties that bind are more voluntary and more psychological in nature than in the past.

In the multiple patterns emerging, each type of social and economic service tends to have its own unique service area, distinct from that of all other services in the territory, and over-all there is little similarity between the areas served by the various community facilities and the areas encompassed by governmental units.

The over-all trend for the important organized social systems which serve rural people in the community is toward bigger units of operation and administration. The pressures are toward units which are considered — on the basis of experience or the judgment of "experts" — large enough to provide sufficient "volume of business" to permit the desired quality and type of service or to operate more efficiently or economically.

The one-teacher school, the one-doctor community, the country church served on a part-time basis, the administration of public assistance on a township basis are all giving way.

The trend results in new services, better quality services, or services which could not otherwise be afforded. One cost is that, in general, services are becoming more removed — in miles — from the farm population. Other costs include the tendency to more impersonal social relationships and the increased difficulty for the typical citizen to participate, or participate wisely, in decision-making on public problems.

Three Types of Communities in Relation to Adjustment

Awareness of the "population explosion" might lead some to conclude that all communities must be growing. On the other hand, the well-known decline in farm population reviewed in Chapter 10 and the continued surplus of farm youth might suggest that all communities including substantial numbers of farm people must be declining. Neither extreme represents the facts.

In relation to adjustment, one can classify the communities which provide the services for farm people as (1) expanding, (2) stable, or (3) declining. The relative number of each of the three types clearly varies widely by regions and among states. However, precise measurement on a community area basis is limited. The best available indicator is the population changes in community centers. Our data — until the results of the 1960 Census of Population are available — are limited to incorporated centers as reported in the 1950 and earlier censuses.

Take Iowa, for instance, a state where two-thirds of the counties lost population between 1940 and 1950 and where farm population declined 21.6 percent in the same period. In that decade, the majority of all centers of 5,000 population or over in 1940 were classified as "expanding" by 1950, on the basis of having had an annual rate of growth of 10 percent or more (Table 11.1). The majority of all centers between 500 and 5,000 population were "stable," neither growing as much as 10 percent a year nor losing that much annually. While almost half of the centers of under 500 were stable, 31 percent were "declining," as they had suffered a loss of 10 percent or more per year. Above 5,000 population, no center was declining, but below this the smaller the population, the larger the percentage of centers classified as declining.

In North Dakota, which lost 22.3 percent of the farm population between 1940 and 1950 and lost 3.5 percent of the total population, the general trend for the larger centers to gain and the smaller to lose also held. The details differ, however, because a decided majority of all

TABLE 11.1

INCORPORATED CENTERS IN IOWA CLASSIFIED BY SIZE IN 1940 AND BY GROWTH 1940-50

Size of center	1940	1940-50		
	<i>Total number</i>	<i>Percent expanding*</i>	<i>Percent stable†</i>	<i>Percent declining‡</i>
Less than 500.....	503	21	48	31
500-999.....	210	19	60	21
1,000-1,749.....	94	20	66	14
1,750-2,499.....	33	18	76	6
2,500-4,999.....	45	36	60	4
5,000-9,999.....	22	55	45	0
10,000-24,999.....	10	30	70	0
25,000-49,999.....	6	50	50	0
50,000 and over.....	5	80	20	0

* "Expanding" defined as population increase of 10 percent or more 1940-50.

† "Stable" defined as increase or decrease of less than 10 percent 1940-50.

‡ "Declining" defined as decrease of 10 percent or more 1940-50.

Source: Data based on U.S. Census of Population.

North Dakota centers of over 1,000 population were in the expanding category, a bare majority in the 500-999 size group were stable, and 43 percent of those under 500 were declining. No place of over 1,000 was declining.

Washington, although incurring a 17.7 percent decline in the farm population, is a different story with a 37 percent gain in total population from 1940 to 1950 and a 73.1 percent increase in the rural nonfarm population. The majority of all centers over 500 in size were "expanding" during the decade; no size category had a majority of centers in the "stable" class. Although nearly half of the centers even under 500 were expanding, this size group — as in other states — had the largest percentage declining (20 percent). With one exception, declining centers were limited to those under 1,750 in population.

Mississippi's story, with virtually no change in total population but a 21.6 percent decline in farm people, is much like Washington's. The majority of all centers of over 1,000 were expanding; 37 percent of those under 500 were declining.

New York's case is distinctly different from the others cited. In this state the already relatively small farm population declined by another 19 percent but total population increased by 10 percent over the 1940-1950 period. In contrast with the other states cited, the majority of centers of less than 2,500 population in 1940 had expanded by 1950 (Table 11.2). The smaller the center, the larger the percentage classified as expanding, to the point where 66 percent of those under 500 were in the growth category. The majority of centers over 2,500 were stable, and in general the larger the center the more likely it was to be stable. The few cases of decline were principally smaller centers, as in the other states, but reached only 6 percent for centers of less than 500.³

TABLE 11.2
INCORPORATED CENTERS IN NEW YORK CLASSIFIED BY SIZE IN 1940 AND BY
GROWTH 1940-50

Size of center	1940	1940-50		
	<i>Total number</i>	<i>Percent expanding*</i>	<i>Percent stable†</i>	<i>Percent declining‡</i>
Less than 500.....	116	66	28	6
500-999.....	144	55	42	3
1,000-1,749.....	99	55	44	1
1,750-2,499.....	35	54	46	...
2,500-4,999.....	84	39	58	3
5,000-9,999.....	48	33	67	0
10,000-24,999.....	47	47	53	0
25,000-49,999.....	10	20	80	0
50,000 and over (except New York City).....	12	8	92	0

* "Expanding" defined as population increase of 10 percent or more 1940-50.

† "Stable" defined as increase or decrease of less than 10 percent 1940-50.

‡ "Declining" defined as decrease of 10 percent or more 1940-50.

Source: Centers with 1940 and 1950 populations taken from W. A. Anderson, *City and Village Population in New York State, 1940 to 1950*, mimeo., October 1954.

³ The ebbs and flows of population in New York towns decade by decade for a century are given in Dolores Schubert and E. A. Lutz, *Some Population Changes in New York State, 1850-1950, and Some Implications for Rural Government*, Cornell Univ. Dept. of Agr. Econ. Bul. A. E. 999, August 1955.

The relation between farm population clearly shifts, changing functions of community centers in relation to their size. Community adjustments by size of community is one which varies widely across the nation. However, growth or decline in population is not the only internal factor which produces change in communities. The communities which are stable in population may undergo changes equally as drastic as those which are expanding or declining. For example, it is difficult to see how a shift of the occupational structure within a small community can fail to bring about adjustments in the community's social structure and processes.⁴

Alternative Adjustments for the Three Types of Communities

It is well established that as people seek to meet such basic needs as education, religion, health care, and government, they establish regular, more or less predictable behavior patterns. These established patterns are disrupted by social change, and effort is required to reestablish equilibrium or order and to reduce the period of disorganization. The adjustments to the rapid changes under way in the communities and community facilities for rural people will cost time, energy, money, leadership, and perhaps some changes in attitudes and cherished values.

The changes in the three types of communities result in somewhat different consequences. There are different alternatives in adjustments to changes.

DECLINING COMMUNITIES

One alternative for declining communities is to attempt to maintain existing services such as schools. This alternative requires higher per capita economic costs to maintain services at the existing level of quality. Without higher per capita costs, the quality of service is likely to decline.

⁴This point and some of the points in the following section have been stated by George M. Beal in *Iowa's Changing Agricultural and Rural Life*, a paper presented at the Fifteenth Annual Short Course for Soil Conservation District Commissioners, Department of Economics and Sociology, Iowa State University, Ames.

Even with higher per capita costs, the comparative disadvantage of the people with respect to services may increase unless the income and wealth of the area grows to compensate for the decrease in population.

A declining community is likely to require its citizens to give more time and energy to maintaining existing services and organizations. Declining communities are likely to lose their attraction for young people and the most able. Accordingly, leadership drifts into the hands of the old or the less able, and the adjustment capacity of the community is further retarded.

A second alternative for declining communities is to abandon their efforts to maintain their independent position and to adjust to change by reorganization, combination, and consolidation with other communities in line with the trend toward a multiple-community pattern. This appears to be the way services demanded by modern society will most often be provided at a reasonable cost. Yet this alternative is not without its costs in hurt feelings — when leadership roles are lost or the status position in the official hierarchy is reduced — in lost membership, in decreased participation and involvement, and in social conflict.

EXPANDING COMMUNITIES

Although U.S. society believes growth is desirable, the practical consequences of rapid growth of population at the community level are all too well-known. The pressure of people on schools, churches, public health and sanitation facilities, police and fire protection, etc., is a familiar story of the past decade. So, too, is the social disorganization which frequently accompanies unanticipated and undirected growth.

The facilities and services must somehow be provided at some acceptable level of quality and bearable cost. The community must seek new balance in organizations, services, and facilities in response to the changes. The alter-

native to social disorganization in an expanding community is planning, more social direction, and more organized expansion and growth. Within this broad alternative are various combinations of public and private, official, and citizen effort. It is likely that farm and other rural people must learn to accept government controls, such as zoning, which were previously unnecessary or rejected.

STABLE COMMUNITIES

Although a community may be stable in terms of number of people, it is not exempt from problems of adjustment. The adjustments ahead in farm size and the farm labor force will require shifts from farm to nonfarm employment for a community to remain stable in numbers in the future. Stability of numbers may be maintained by developing or bringing in industry, serving as a bedroom area for commuting workers, developing service industries such as in recreation, etc. Each of these adjustments to maintain numbers of people and a tax base brings a stress on traditional behavior patterns in the community. Shifts occur in power positions in the community. Some organizations have difficulties in maintaining active support. New organizations arise to compete with the old for time and money, and conflicts sometimes develop.

Reorganization will be necessary for organizations with a declining or changing clientele. Expansion will be required on the part of others. Over-all, the need will be likely for more planning, and more purposive effort to meet changing situations and needs.

The Challenge to Communities in the Changing Situation

There are at least five things which are being done and which must be done for communities to keep in step with the changing times.

First is the necessity of understanding change as it affects communities. What are the trends? What are the forces for change? What are the likely consequences of

trends under way? We need to separate those changes and trends which have an impersonal inevitability from those which are to some extent controllable. It is important to distinguish those problems of adjustment which a single community has the capacity to handle from those problems where a rational solution requires joining hands with other communities.

Second, with understanding of change comes the necessity of using, improving, and developing ways by which people in communities can most effectively work together on their common problems. Here farm and nonfarm people cannot afford to go their separate ways. For the most part, there are no established patterns by which communities work systematically at community problems as a whole. This is not easy to do. There are no simple formulas or pat answers. Most typically, one group in the community has looked at only one type of problem — schools, business, health, etc. But planning boards, community councils, and similar devices are all part of the search to find the way to do this job. More ingenuity is required. We must be willing to experiment.

Third, a conscious effort must be made to preserve flexibility — the ability to adapt to change — in the various systems which operate within the community. Efforts must be made to build flexibility where it does not exist.

This is especially important in building links between the local community and larger governmental and social units, in view of the trend toward centralization. We need to know the characteristics of a system that has the greatest capacity to adapt to change.

Fourth, as we study the question of how to meet these common problems, we begin to see the need for determining and clearly recognizing the goals for ourselves, for our children, for our communities, and for our nation. This may lead us to examine more closely the values which guide us in the selection of goals, to see where the values are in agreement and where they are not. The answers at

the community level are extremely important in determining the inner strength of our national society for meeting the challenge which it faces.

The question of whether a sound citizen or a persuasive crook becomes sheriff of the county does not affect alone the effectiveness and honesty with which local affairs are conducted, it determines whether a part of our democracy is strong or weak, and many such acts make up the whole. When the humble citizen votes, or sits on a jury, or discusses affairs with his neighbor at the corner garage, he may little grasp the connection, but he is, for his fraction of the summation, determining whether the bright youngster down the street will have to die on some future battlefield, and if he does whether he will die in vain. The great measures are determining of progress, but they are founded on all the little ones, and they are responsive to the will of the people.⁵

Fifth, all of this points clearly to one further requirement. This is the necessity for individuals, as citizens in their community, to give more time, more thought, more energy to meeting these difficult problems which are shared in common with other citizens. Whether we like it or not, the times call for more attention to public affairs.

A DANGER

By 1950, nearly 60 percent of the population of the United States lived in the 168 standard metropolitan areas — counties including or dominated by a city of 50,000 or more. The national Industrial Conference Board has estimated that as of spring 1960 nearly a third of the entire population was within the boundaries of the 15 largest of these. Such trends underscore the numerical significance of the population in large centers and the problems of these centers. A consequence may be to increase the difficulty of getting serious attention given to the adjustment problems of the smaller community.

⁵ Vannevar Bush, *Modern Arms and Free Men*, Simon and Schuster, New York, 1949, p. 97 in paper cover edition.

Rural Community Facilities—Some Common Denominators

Density of population is an important factor in determining the size of operating units for schools, churches, hospitals, etc. Historically, because of the land requirements for farming and the consequent comparatively low population density of farming communities, rural areas have generally fewer pupils per school, fewer members per church, fewer beds per hospital, etc., than urban areas. This fundamental fact underlies much of the disparity in quality and specialization of services which has been traditional between rural and urban, not only in the United States but worldwide.

This inherent obstacle of low density and smaller potential "volume of business" per square mile requires people in rural areas to exert more effort and spend more money per capita to achieve parity with urban areas in quality and range of services.

There is clearly a trend toward larger and larger units of operation and administration and a widened basis of support for many of the facilities which serve rural people. With the growth of specialized services and with the enlarged population base needed to economically and efficiently support such services, these trends will continue. The impact of these trends on communities and the adjustments required will be related to the size and competitive position of a community and to whether it is expanding, stable, or declining.

SCHOOLS

In one rural community after another, the public school is the largest single institutionalized facility as measured by cost of facilities and operation or by number of persons directly or indirectly involved.

Adjustments Under Way

Probably the most significant trend with respect to rural elementary schools has been the consolidation of small districts into large ones for administration and tax

support. This has been accompanied by the abandonment of one-teacher schools in favor of the multiple classroom unit.

The consolidation process brought open-country areas into legal cooperation with villages, towns, and even cities in the provision of facilities, especially for secondary schools. Typically, in consolidation, the open-country school buildings are abandoned and the new buildings located in a village or town center. Elementary and high school districts have been combined.

There are variations from legal consolidation with a common central administrative, support, and attendance area (at least for the high school). Some districts are voluntarily contracting with others for secondary school services or for both elementary and secondary services, thus retaining their independence for tax purposes. Consolidated districts are banding together to provide certain specialized services on a cooperative basis which separately they could not afford. Elsewhere, adoption of a county unit system of administration and support is accompanied by separate community schools. In 1955-56, a fourth of all counties, located principally in nine southern states, were on a single district basis.⁶

From 1942 to 1957 the number of independent public school districts was reduced 53.5 percent, from 108,579 in 1942 to 50,440 in the school year 1956-57.⁷ Small districts decreased the fastest; large districts gained, with the breaking point between loss or gain somewhere around an enrollment of 600. Districts with fewer than 600 enrolled had about 30 percent fewer pupils in 1957 than in 1952; larger districts gained nearly 35 percent in enrollment in the same period.

⁶ Walter H. Gaumnitz, *Small Schools are Growing Larger: A Statistical Appraisal*, U.S. Dept. of Health, Education and Welfare, Office of Education, Circ. No. 601, September 1959, Table 1.

⁷ Walter H. Gaumnitz, "Independent School Districts Decrease and Increase," *School Life*, 42(4):14-17, December 1959. In 1952 there were 2,409 "dependent" school districts operated as a part of state, county, municipal, town, or university governments while in 1957 2,467 such units were reported.

The average school district covered 42.6 square miles in 1952 and 56.2 square miles in 1957, an area increase of nearly 30 percent.⁸ One-teacher public schools reached their numerical high in 1917-18 with 196,037; by 1957-58 they had declined to 25,783, or an 87 percent loss.⁹ The annual rate of disappearance of one-teacher schools by decades has been as follows:

	<i>Schools Closed</i>
1917-18 to 1927-28	3,997
1927-28 to 1937-38	3,473
1937-38 to 1947-48	4,650
1947-48 to 1957-58	4,906

These reductions have taken place almost wholly in rural communities but have occurred unevenly across the nation. Fewer than 100 one-teacher schools remained in 1958 in each of 22 states; these included not only the most urbanized states but some of the most rural in the nation. Half of the remaining one-teacher schools are in the Plains states; however, in 1958, over 1,000 such schools remained in each of 11 states. The timing of consolidation and the annual rate of eliminating small schools has moved unevenly from state to state and region to region.

This continued combination of schools and the growth of enlarged attendance units has been paralleled by the growth of a large and costly school transportation system. In 1919-20 only 356,000 pupils were reported by the U.S. Office of Education as transported. By 1950-51 some 7,300,000 were transported daily in a fleet of 120,000 vehicles.¹⁰

Transportation requires a nine to ten times larger share of the total school budget in the most rural counties, on the average, than in city school systems.

⁸ *Ibid.*

⁹ Walter H. Gaumnitz, "The Exodus of the One-Teacher School," *School Life*, 42(6):13-14, February 1960.

¹⁰ Reported in Lowry Nelson, *American Farm Life*, Harvard Univ. Press, Cambridge, 1954, p. 90.

Average salaries of rural school teachers are estimated to have increased 50 percent (in actual dollars) between 1948 and 1956. Other costs of support have also increased.

Other adjustments under way include: (1) The addition of new buildings in expanding communities and in those stable and declining communities where combinations have taken place; (2) changes in curriculum and growing interest in curriculum revision (this includes pressure on vocational agriculture in secondary schools, a growing concern with adequate college preparatory courses, and increased attention to business and nonagricultural vocational courses); and (3) shifts in the basis of support from property to other sources of revenue and from local to state and federal funds.

The Situation in the 1950's

Wide diversity is characteristic of the quality of rural school facilities in the United States, reflecting the large measure of local control, along with variations in such other important aspects as local tax base, state aid, and the value systems of local people. The rural schools in the United States continue to be significant: Seventy-five percent of all schools, two-thirds of all public high schools, and about 45 percent of the children enrolled in public schools are in centers of under 2,500 people. Twenty-two percent of the total public school staff and 20 percent of the public school enrollment in 1955-56 were located in the 1,706 counties classified by the U.S. Office of Education as "rural" on the basis of 1950 census data. These same rural counties included 49 percent of all districts operating public schools and 40 percent of all school plants. They served 6.2 million children at a cost of \$1.4 billion.¹¹

Much of the disparity between rural and urban children with respect to enrollment during the elementary and secondary school ages has disappeared. However, disparity

¹¹ Walter H. Gaumnitz, "Some Rural School Facts," *School Life*, 42(7):32-33, March 1960.

continues, over-all, on many measures of quality of education conventionally used, such as average salaries of instructional staff and expenditures per pupil. An overriding continuing characteristic of rural schools is small enrollment. In 1957, 60 percent of all independent school districts — 30,312 in all — enrolled fewer than 50 pupils. About 90 percent have a number below the minimum which many educators are advocating for quality, diversity, and efficiency of educational services.

Adjustments Needed

It is clear that there will be continuing pressures for further reorganization of school districts. The minimum enrollment size advocated by specialists in education has moved upward to about 1,200 to 1,500 pupils in grades 1-12. Many rural communities can anticipate adjustments which will be involved in further reduction of one-teacher schools, accelerated combination of already consolidated schools into larger units on a multiple community basis with one center getting the high school and the other centers retaining elementary schools, and increased cooperation among several school systems to provide more specialized and more costly services.

Typically, further reorganization will require legal units to include both town and country or rural and urban where previously the two segments went their separate ways, at least legally. In some instances, the forces set in motion by school reorganization will lead to the expansion of one of the cooperating communities and stability or decline for the other cooperators.

In expanding communities, the pressure toward large schools for the elementary grades seems to have overreached itself; therefore, more such communities are likely to have new elementary buildings decentralized throughout the district. The location of such buildings often changes neighborhood and smaller community alignments.

Curriculum evaluation needs to be accelerated. With the increased level of educational aspiration, as reflected in college enrollments, there will be need for increased standardization of college preparatory courses. An increasing number of communities will face problems of developing and supporting community or junior colleges. For the noncollege-bound youth, more communities need to consider the development of vocational high schools on a multiple-community basis. The place of extracurricular activities, especially interschool athletics, needs appraisal.

Continuing attention must be given to equality of educational opportunity within and among communities. Providing such opportunity will involve even further attention to methods of providing funds and equalizing support, in addition to requiring adjustments in strongly-held values. For some groups, such as the children of migrant farm workers, much more effective linkage will be required among several school systems which are often in different and even widely separated states.

Because of the growing costs of operating school facilities, some communities — especially declining ones — will find it desirable to control settlement to prevent the establishment of year-round residences in locations where the cost of maintaining all-weather roads and school bus transportation will be excessive.

An evaluation is required of the appropriate role of the public school in providing educational services for out-of-school adults.

In the adjustments ahead, there is danger of conflict between the demands of the larger society and the judgments of the expert, on the one hand, and the self-interest and traditional values of the local community, on the other. In arriving at wise decisions and minimizing conflicts, it will be important to examine as carefully and objectively as possible all of the consequences to various alternatives proposed.

CHURCHES

As measured by membership, attendance, and support, more rural adults participate in some way in church affairs than in any other voluntary nonfamily, nonoccupational organized activity. Research suggests that the church continues to have a higher importance to the majority of rural people than any other formal social organization in which they participate voluntarily. There is some evidence that many rural people prefer to keep the center of their religious activities close to home, although the same people are willing to travel considerable distances for economic, educational, and medical services.

Rural Church Adjustments Under Way

Adequate data are not available on a national or representative basis to provide even reasonably exact information about rural church adjustments currently under way. There is support, with varying degrees of reliability, for the following summary of trends:

1. Although the total number of churches in continental United States increased from an estimated 243,000 in 1940 to nearly 307,000 in 1957, the number of rural — especially of open-country churches — has been decreasing.¹² One source estimates the rural church decline at about 20,000 between 1930 and 1955.¹³ Local studies, however, show diversity in even this aspect of the rural church situation. Expanding communities increase their churches; cases may be cited of new vigor coming to existing weak open-country and hamlet churches with the influx of nonfarm people. Even stable communities may increase church numbers as population shifts are paralleled by new denominational interests or as the population base

¹² Benson Y. Landis, editor, *Yearbook of American Churches* (edition for 1959), National Council of the Churches of Christ in the U.S.A., New York, September 1958. Number for 1940 calculated from data given Tables II and III, pp. 294-95. Same source shows nearly 286,000 churches in 1950. Data for 1957 given page 267.

¹³ Everett M. Rogers, *Social Change in Rural Society*, Appleton-Century-Crofts, Inc., New York, 1960, p. 213.

permits a new church to become established for those who formerly had to travel some distance to attend a church of their faith.

2. Where rural church decreases have occurred, it appears that most typically the open-country church has been closed and some form of merger with a village-centered church has taken place. In this process, some discontinue church attendance; the general effect is for a larger percentage of town and village church membership to come from the open country.

3. It appears that there are more farm people with church affiliations than at any time in the past.¹⁴ All evidence shows a higher percentage of total population was enrolled as church members during the 1950's than at any time previously.¹⁵ There is some support for the belief that farm people are sharing in this trend.

4. The average number of members per church has clearly been increasing for all religious bodies as a whole in the United States. The average has moved from 265 in 1940 to 339 in 1957.¹⁶ Presumably churches in rural areas have in general shared to some extent in this trend.

5. Nationally, the dollar value of new construction of religious buildings more than doubled between 1950 and 1957, going from a reported \$409 million to \$868 million.¹⁷ Expanding communities have undoubtedly been most affected by new construction.

6. Along with a limited amount of church reorganization of the type represented by merger, federation, and the larger parish, there has been considerable development of interdenominational cooperation of the type represented by local, county, and state councils of churches.¹⁸

¹⁴ Nelson, *op. cit.*, p. 104.

¹⁵ Landis, *op. cit.*, p. 293.

¹⁶ *Ibid.*, p. 295.

¹⁷ *Ibid.*, p. 300.

¹⁸ A study in 1950 found 503 federated churches in the United States. See Landis, *op. cit.*, pp. 127-225 for list of state and local councils with paid and unpaid staff.

Thus, churches show some evidence of the same trends which characterize school systems.

The Current Rural Church Situation

As with rural schools, a prevailing general characteristic of the rural church is the small membership when compared with the average city church. In Indiana, the average rural church membership was 127 in 1955.¹⁹ A five-county sample of rural churches in Montana in 1958 averaged 103 members.²⁰ One of the most careful studies of the rural church has been made in Missouri, where average membership of churches was as follows by location:²¹

Open-country	92
Small villages (200 to 999)	142
Large villages (1000 to 2499)	238
Small cities (2500 to 4999)	376

Where some form of reorganization and combination has not taken place, the church remains where other services have been abandoned. In Covington County, Mississippi as late as 1941 there was a church building for each 182 persons 10 years of age and over. Here, where 58 of the 76 churches were in the open country, there was a rural church to every seven square miles.²² In 1958 an Ohio county had 26 rural churches of the same denomination. Only three had more than 100 members and five of the churches were in a seven mile square area.²³

It is clear that the rural church situation cannot be accurately portrayed without distinguishing between sect-

¹⁹ Rogers, *op. cit.*, p. 214.

²⁰ *Ibid.*

²¹ Lawrence M. Hepple, *The Church in Rural Missouri: Part V. Rural-Urban Churches Compared*, Missouri Agr. Exp. Sta. Bul. 633E, July 1959. Churches listed here were classified by administrative organization.

²² Harold Hoffsommer and Herbert Pryor, *Neighborhoods and Communities in Covington County, Mississippi*, USDA, BAE, Washington, D.C., July 1941.

²³ Rogers, *op. cit.*, p. 212.

and church-type religious organization and distinguishing among denominations. Sects are sometimes referred to as "Pentecostal" or "fundamentalist" churches. Size of sect-type groups is not strongly related to the size of center in which located; they are always small. Certain denominations tend to maintain rural churches at a size level comparatively large and in line with their small city churches.

In comparing the rural with other churches on such measures as full- or part-time ministers, training of ministers, amount of group activity, frequency of Sunday worship services, budgets, etc., it becomes essential to distinguish sect- and church-type organizations. In the Missouri study, 27 percent of the open-country church groups were sect-type as compared with 18 percent in small villages, 38 percent in large villages and 36 percent in small cities. The religious values of sects and the basis of organization call for different measures of quality and efficiency of religious facilities than are usually applied to church-type organizations.

The Missouri study makes clear that for the church-type organization, size of the group is the factor highly associated with many measures of church activity. Therefore, the disadvantaged position of rural churches on many of the measures is believed to flow from the size factor rather than simply from the location factor.

Although considerable stress is placed by rural church leadership on the community role of the church, a Wisconsin study concluded that rural churches serve to integrate groups or classes.²⁴ In Wisconsin, no general movement similar to school reorganization is evident for churches. Rather, in situations studied there was evidence of "overlapping church areas, of religious contacts crisscrossing community boundaries, and of some neighborhood churches operating with little regard to those of like

²⁴ Louis Bultena, "Rural Churches and Community Integration," *Rural Sociology*, 9:257-64, September 1944.

²⁵ Kolb, *op. cit.*, p. 131.

interests in nearby villages and towns.”²⁵ The conclusion was drawn that “organized religious interests were being directed toward churches rather than toward communities.”

Rural Church Adjustments Needed

Rural churches as a whole in the next decade will face the same general type of adjustments as other facilities such as schools. The nature of the adjustments will be related to the type of community — expanding, stable, or declining. Even open-country churches will increasingly face the problem of accommodating to a more heterogeneous clientele with a smaller proportion directly engaged in farming.

The adjustments made will be related to whether the individual congregation is a church- or sect-type organization. The church-type organizations, especially for the denominations not having what specialists consider to be a reasonable size, will be under increasing pressure to reorganize in some way to provide higher quality and higher cost services. For some time, Protestant groups have advocated one organized church per 1,000 of the population. Some church leaders have adopted a minimum standard of about 300 members per church with one full-time minister.

In the Missouri study, recognizing that the optimum might vary from one religious body to another and with population density, it was assumed that a full-time clergyman could minister to the religious needs of 400 persons in the rural areas. The great majority of Missouri churches studied had fewer than 100 members, indicating the tremendous amount of adjustment involved if standards were to be met.

With increasing heterogeneity of population and with the changes in social and economic structure which will continue to take place as farm people adjust to change and as new people move in, communities may find sects becoming established where they did not previously exist.

MEDICAL SERVICES

Analysis of the medical services situation from the standpoint of farm and other rural people is complicated by two factors: (1) the absence of adequate statistical information regarding facilities and trends in rural areas on a national or reasonably representative basis, and (2) the changing patterns in the use of medical facilities by rural people so that data on resources located within rural communities or counties gives an incomplete picture of the actual availability and use of resources. With these limitations in mind, the following general trends may be indicated.

Adjustments Under Way in Medical Facilities

1. With the changing nature of the practice of medicine, hospital facilities have increasing importance in providing high quality medical service. Availability of good hospital facilities influences the decisions of private physicians as to where they locate. Patients develop more favorable attitudes toward the use of hospitals.

In 1946, after careful studies indicating great deficiencies in hospital facilities throughout the nation but especially in rural and low-income areas, Congress passed the Hill-Burton Hospital Construction Act. This provided for federal assistance for a systematic nationwide hospital building program channeled through states to cooperate with local public and private sponsors. In 1954 the Act was broadened to provide assistance for the construction of diagnostic or treatment centers, nursing homes, and rehabilitation facilities.

The 3,514 projects approved for construction by June 1957 were designed to add 152,593 beds — mostly in general hospitals — and 824 facilities for out-patient care — chiefly public health centers.²⁶ The significance of this program for rural areas is indicated by the fact that, of 1,111 new general hospitals approved by 1957, 564 were

²⁶ U.S. Dept. of Health, Education and Welfare, *Annual Report, 1957*, Washington, D.C., p. 123.

in communities having no hospital before the program started. In addition, inadequate facilities were supplemented; obsolete facilities were replaced. Over half (53 percent) of all facilities approved are located in communities of less than 5,000 population and only 13 percent in cities of more than 50,000.

Statewide planning, taking into account priority needs among communities in relation to recognized standards, was a keystone of the method used in providing the federal assistance. Federal funds amounted to about one-third of the total cost and improved the distribution of general hospitals serving rural people.²⁷ However, in some areas, there were declines in locally available hospital beds in relation to population.

A basic objective in state plans has been to establish coordinated hospital systems on a regional basis so that the small, most isolated rural health centers and hospitals would be effectively linked with larger hospitals providing specialized facilities and personnel.²⁸ Important gains have been made toward this objective.

Hospitals and other facilities built under this program have required community action. Consequently, many areas have organized on a community, multi-community, county, or regional basis to obtain the desired facilities.²⁹

As a result of the aggressive action taken to meet needs, the number of beds in general and special hospitals (excluding mental) has kept pace with population growth for the nation as a whole.³⁰ In total, accessibility to hospital

²⁷ Leslie Morgan Abbe and Anna Mae Baney, *The Nation's Health Facilities: Ten Years of the Hill-Burton Hospital and Medical Facilities Program, 1946-1956*, U.S. Dept. of Health, Education and Welfare, Public Health Service Pub. No. 616, Washington, D.C., 1958, p. 21.

²⁸ V. M. Hoge, "Hospitals and Public Health Centers," *The Annals of the American Academy of Political and Social Sciences*, 273:34-42, January 1951.

²⁹ For illustration of community action to provide hospital facilities, see Elsie S. Manny and Charles E. Rogers, *Hospitals for Rural People*, USDA Farmers' Bul. No. 2110, 1957.

³⁰ *Health, Education, and Welfare Trends*, U.S. Dept. of Health, Education and Welfare, Washington, D.C., 1960 edition, p. 51.

service for farm people increased during the 1950's and the quality of accessible service improved.

2. A second major development with respect to health services for farm people involves the financial support of services received. By 1947 the federal voluntary insurance program developed in 1936 primarily for low-income farm families was curtailed. At the peak, this program had about 620,000 farm people in 1,100 counties enrolled in locally organized and controlled prepayment plans which provided for physicians' care, hospitalization, drugs, and dental care.³¹

Among farm people, voluntary cooperative prepayment plans on a local basis under nongovernmental auspices began to develop on a scattered basis as early as 1929. During the fifties, farm people joined others increasingly in the voluntary health insurance available through non-profit agencies such as Blue Cross and Blue Shield, through insurance companies, and through plans developed by industry and by consumer cooperatives. By 1955, slightly more than half of the farm families in the United States had one or more members covered by some health insurance.³² Benefits most often apply to hospitalization, but applied to surgical care for 43 percent of the farm families in the 1955 study and to other health care for 36 percent. The percentage covered is much higher in some areas.

In many instances the prepaid plans for farm families have involved local Granges, Farm Bureaus, Home Bureaus, and dairy and other cooperatives. In some rural areas it has been found that the community can be used as the group for enrolling members in voluntary health insurance.³³ For one-fifth of the enrolled farm families, the

³¹ Milton I. Roemer, "Rural Programs of Medical Care," *The Annals of the American Academy of Political and Social Sciences*, 273:160-68, January 1951.

³² Donald G. Hay, *Enrollment in Voluntary Health Insurance in Rural Areas*, USDA, Agr. Info. Bul. No. 188, April 1958.

³³ Donald G. Hay and Selz C. Mayo, "Extending Voluntary Health Insurance Through Community Organization," *Public Health Reports*, 71(5):477-80, May 1956.

health insurance policy was connected with the off-farm employment of a family member. The Veterans Administration program of medical care has relieved some of the pressure on local community medical facilities.

3. It is likely that an increasing proportion of farm and other rural people have been reached by public health programs, principally of a preventive and diagnostic nature, conducted through organized local health departments and through the schools. Between 1947 and 1957, 400 additional counties were included within full-time local (usually county) health departments.³⁴ Between 1948 and 1956 there was a net increase of over 500 in the number of public health centers in the United States, three-fifths of them in the southeastern states. However, a national study concludes that there has been no growth in local health department services since 1950 when inflation and population increase are considered.³⁵ Studies in New York counties have shown a shift in use of county health department services toward problems such as environmental sanitation.

4. A trend is the development, again typically on a county basis, of publicly supported mental health clinics and of voluntary associations to carry on mental health education. Of all residential and major occupational groups, it appears farm families are least apt to use professional aid when mental health problems are felt to exist. Nevertheless, farm families are increasingly having the opportunity to use mental health facilities.

5. With the growing dependence of the practicing physician on the resources of the hospital, the clinic, and the laboratory, and with the growing specialization of medical practice, small and declining communities have had difficulty in replacing and holding general practitioners. It appears that the turnover rate of young doctors who establish a practice in rural areas is high. Even in states

³⁴ Barker S. Sanders, "Local Health Departments, Growth or Illusion?" *Public Health Reports*, 74(1):13-20, January 1959.

³⁵ *Ibid.*

such as New York which have a physician-population ratio rating as the most favorable, the ratios in nonmetropolitan counties are below the level considered as desirable. Some nonmetropolitan counties studied over an eight-year period have improved their position with respect to specialists but have slipped backward or not improved with respect to general physicians.

6. The concern for medical and auxiliary personnel, especially in rural areas, has resulted in a wide variety of efforts to meet these needs. These include governmentally supported efforts to train more personnel, professional association efforts to recruit and place personnel, community efforts to provide facilities which would attract doctors, and other activities and programs.

The Current Situation for Medical and Health Resources

On a nationwide basis, rural farm people are not using physicians or dentists as much as rural nonfarm and urban people.³⁶ Neither are they generally making as much use of preventive services or of prepayment plans. However, farmers were buying twice as much medical care in 1955 as in 1941, allowing for changes in the price level.³⁷ Despite the gains, rural areas as a whole continue to be less favored in available resources. The services most readily available are likely to be characterized by smallness of size, as in the case of hospitals, or by less specialization, as in the case of doctors.

Adjustments Needed in Medical and Health Services for Rural Areas

Further reorganization of medical and health care facilities will be needed if farm people in many communities

³⁶ *Health, Education, and Welfare Trends*, U.S. Dept. of Health, Education and Welfare, Washington, D.C., 1960, p. 40.

³⁷ Jean L. Pennock, "Changes in Family Spending — Medical Care," *Farm Family Spending in the United States*, USDA, Agr. Info. Bul. No. 192, June 1958, pp. 23-28. See also Alvin L. Bertrand and Donald G. Hay, *Farmers' Expenditures for Health Care in 1955*, USDA, Agr. Info. Bul. No. 191, June 1958.

are to have adequate private and public health services. Expansion of coordinated hospital service plans on a large area basis will be required. Communities and counties will find it necessary to cooperate in providing funds to pay for facilities and personnel. In the process, many small and declining communities will have to give up having a resident doctor. Other communities will find it necessary to give up their small hospital.

In the adjustments ahead, still further experimentation can be expected as to forms of organization which will provide low population density areas with the quality of medical service desired; an expansion of some system of private group practice seems likely.

The changing nature of illness, in which communicable disease problems have been replaced by problems of chronic illness, aging, and mental health, will affect medical and health care facilities needed. For example, there will be a growing need for nursing homes.

Specialized services will be required to deal with growing and emerging public health problems — sanitation, water and air pollution, and radiation.

OTHER COMMUNITY SERVICES

Schools, churches, and medical facilities are used here to illustrate trends under way and adjustments needed with respect to community services important for farm people, but they are only a part of the package of publicly and privately supported services which make up the levels and standards of living of today's farmers. A few of the other services can be mentioned only briefly.

Provisions for Security and Welfare

Since the mid-thirties, government, especially state and federal government, has assumed a role in the provisions of security and welfare services in great contrast with the past. Farm people have gradually and increasingly shared in the benefits of these services. In fact, it has been public policy at the national level that federal funds for some

of the services would go to predominantly rural states to establish, extend, and strengthen the services.

Coverage of hired farm workers under the old age and survivors insurance provisions of the Social Security Act was initiated in 1950. Farm operators in 1954 became the last major occupational group to be offered coverage.³⁸ The direct effect of this national program will be to make public assistance costs of local welfare agencies lower than they would be otherwise. Indirect effects on the community have yet to be adequately assessed.

Under the Social Security Act of 1935, and subsequent amendments, the federal government makes grants-in-aid to the states for what are known as categorical forms of assistance — aid (including medical) to the aged, aid to dependent children, aid to the blind, and aid to the permanently and totally disabled. Only what is known as “general assistance” (poor relief) is excluded from federal financial support or other participation. One condition of the federal grants to the states is an approved state plan which must provide, among other things, for supervision by the state of local agencies upon which state rules, regulations, and standards are mandatory.³⁹ Nevertheless, differences among and within states persist with respect to the programs of public assistance. The states are free to decide on the kinds of local units which shall administer these programs, so that in excess of 10,000 local units administer public social welfare.⁴⁰ Basically, the new programs have been carried on through the traditional units of government, although with a strengthening of the county. In the future, these units face the same adjustment problems of finding an optimum size from the standpoint of quality of service and economy of cost per capita as do services such as schools and public health.

³⁸ “Old-Age, Survivors, and Disability Insurance: Development of Agricultural Coverage,” *Social Security Bul.*, 21(6):3-6, June 1958.

³⁹ *Characteristics of State Public Assistance Plans Under the Social Security Act*, Public Assistance Report No. 27, U.S. Dept. of Health, Education and Welfare, 1956.

⁴⁰ Wayne Vasey, *Government and Social Welfare*, New York, Henry Holt and Company, 1958, p. 434.

The Social Security Act of 1935 provided funds for child welfare services to be used in predominantly rural and other areas of special need. Similarly, grants-in-aid to states for services to crippled children were authorized. Federal funds for these services have expanded greatly. The number of children receiving child welfare casework services increased consistently in rural states reporting between 1946 and 1957. In contrast to trends in the urban and semi-rural states, the rates of children served in relation to total children increased.⁴¹

Family counseling services through voluntary family service agencies employing professionally trained casework personnel are available almost exclusively in urban areas.⁴² A population base of about 50,000 is considered necessary to support an agency of even minimum size. A small but growing number of farm families use the services of such agencies for help on crucial problems of family life. The experience with the intensive approach to farm and home management in at least some areas brought to the foreground the importance of such professional counseling resources. In more instances than anticipated, solution to the management problems of the farm hinged upon a successful resolution of problems of interpersonal relationships within the farm family.

Recreational Services

Adults in small village- or town-centered communities not uncommonly place recreation — especially for youth — at or near the top of their list of current community problems. An adequate census of trends in recreational facilities, indoor and outdoor, for individuals and groups of all ages, is lacking for rural communities. Casual observation indicates the growth of facilities, both publicly

⁴¹ Helen R. Jeter and Henry C. Lagewski, *Children Served by Public Child Welfare Programs: 1957 with Trend Data 1946-1957*, Children's Bureau Statistical Series No. 45, U.S. Dept. of Health, Education and Welfare, 1958.

⁴² A description of these services and the distribution of the 284 member agencies of the Family Service Association of America is given in *Family Service Highlights*, Vol. 20, No. 5, May-June 1959.

and privately supported, in many rural communities, parallel to that for the large centers in many respects — supervised summer playgrounds, ball leagues for different age groups of boys, bowling, etc.

As measured by expenditures, the interest of farm families in recreation is growing, and at a faster rate than for nonfarm families. Average expenditures in 1955 for a selected list of recreational goods and services were twice that in 1941 (in comparable dollars) and the spread between farm and urban families was narrowed.⁴³ Undoubtedly some of the increased expenditures involved use of facilities outside the home community. The ability of communities to provide or maintain recreational facilities will be linked, as for other services, to population trends and to the wealth and tax base. In some states, such as New York, state funds are available to communities on a matching basis for recreational programs just as for many other services.

Farmers and rural communities in the future are likely to be increasingly affected by the demand for outdoor recreational facilities on the part of the nonfarm population, especially the metropolitan population.⁴⁴ In some communities this could mean the conversion of substantial areas to parks, forests, and wildlife areas. A pattern is beginning to develop in which farmers and other private landowners cooperate with a public agency to provide hunting and fishing to nonfarm sportsmen. Farm families are finding that one way to increase income is to provide a farm living experience for city residents.

Other Community Services in Process of Change

Federal grants-in-aid to states on a matching basis for rural libraries were initiated for a five-year period in

⁴³ Emma G. Holmes, "Changes in Family Spending — Recreation and Reading, Transportation, and Education," *Farm Family Spending in the United States*, USDA, Agr. Info. Bul. No. 192, June 1958, pp. 28–33.

⁴⁴ Marion Clawson, "The Crisis in Outdoor Recreation," *American Forests*, Vol. 65, Nos. 3 and 4, March–April 1959.

1956. By January 1, 1960 over 1200 rural counties were reported as receiving new or improved services; 65 of these had no previous library service.⁴⁵ Some states are devising state aid formulas which provide powerful incentive for the development of county or multi-county library systems.

In 1949 Congress authorized the Rural Electrification Administration to improve and expand telephone service in rural areas, through local cooperatives. In 1950 only 38 percent of farm households had telephones. In contrast to more adequate telephone service, public transportation has become less available in smaller communities as rail passenger and freight service and even bus service have been curtailed. The consequence is that rural families without private transportation are more isolated physically than they have been for several decades. This situation is most likely to exist in small, declining communities away from the main traffic thoroughfares.

Farm and other voluntary organizations provide community services and facilities. As one example, the Grange in cooperation with the Sears-Roebuck Foundation has conducted a community service program for the past decade through subordinate Granges. Several studies documented the great increase in organized groups in rural areas and the tendency to become more specialized, more dependent on professional and paid leadership, and to affiliate together on a county or larger area basis.⁴⁶ The growth of organized interest groups raises questions about the comparative importance of community vs. special in-

⁴⁵ Wyllis E. Wright (ed.), *American Library and Book Trade Annual*, 1960, sponsored by Councils of National Library Association and Library Journal, R. R. Bowker Co., New York, 1960, p. 71.

⁴⁶ In Wisconsin, for example, organized groups were estimated to have increased by as much as 60 percent for the 15-year period ending in 1950; see Kolb, *op. cit.*, p. 143. New York studies in rural communities over a 10-year period ending in 1957-58 documented an increase both in the number of organizations within communities and in the level of participation in such groups.

terest groups for rural people. The question is more properly one of the interrelationship between the two types of groups.

TAXATION

Taxes have been going up. The rise is predominantly a reflection of the demands upon government to do things requiring public funds. The demands in turn reflect the growing interdependence of individuals, families, and communities. Publicly financed welfare and medical care, social security, roads, schools, fire protection, farm programs, and so on would have been inconceivable on the present-day scale a half-century or century ago in a society where individuals, families, and rural communities were much more nearly self-sufficient and self-reliant.

We consider community taxation as including that by state and local governments because financial interrelationships between them are close, varied, and growing, arising in part from the legal status of local units as creations of their respective state laws and constitutions. Nor can we wholly ignore federal taxes. They are levied on the same public. Growing amounts are spent for federal grants to state and local governments, or for purposes which relieve these governments of financial responsibilities they otherwise would carry. Thus federally-financed social security to some degree lightens the load on state and local welfare operations.

Adjustments Under Way

State and local taxes grew from about \$10.5 billion in 1945 to about \$30.3 billion in 1957. In the latter year non-tax revenues from fees, charges, federal aid, and the like totaled an additional \$15.4 billion.⁴⁷ In recent years, tax increases have substantially exceeded those of the earlier

⁴⁷ E. A. Lutz, *Local and State Financing in the United States and New York State*, Cornell Dept. of Agr. Econ., A. E. Ext. 51, 1960.

postwar period. State and local taxes rose from 4.9 percent of the gross national product in 1945 to 7.0 percent in 1957. This is greater than the 1929 ratio of 6.2 percent, and less than the 1940 figure of 8.7 percent. Taxes have not been enough to meet capital construction and other financial needs. State and local net long-term debt rose from about \$14 billion in 1945 to \$47 billion in 1957.

Local and state taxes have been rising in a postwar situation where the federal government continued to require heavy tax revenues largely — but by no means exclusively — for national security and related operations. Federal taxes in 1957 were over two and a half times the combined state and local taxes in contrast to the period between world wars when state and local collections typically exceeded the federal taxes, usually by a wide margin.

Realistic appraisals of the 1960's foresee continuing increases in amounts of state and local taxes collected, barring a major national catastrophe such as war. The largest local and state expenditures by far are for education, accounting for almost 30 percent (\$14.1 billion) of 1957 expenditures. Next largest are for roads and streets, 16.5 percent (\$7.8 billion) of the 1957 total. Other financially significant functions include aid to the needy or welfare, hospital and other medical and health care (physical and mental), water supply, sewage disposal, policing, fire protection, etc.

In any of these functions one can see the probability of larger expenditures because of such factors as: (1) growing population and increasing density of settlement and urbanization in some areas; (2) rising standards of living with consequent demand for improved governmental as well as private services; (3) continuing technological development with its many-sided impact upon community facilities; (4) the growing necessity for a more highly trained labor force and better educated and more discerning citizenry; and (5) the necessity for improved facilities supported by community government.

While continued tax growth appears probable, the rate of growth is less certain. Analysts have estimated state-local expenditure increases at rates ranging from somewhat less than anticipated rates of increase in the gross national product to substantially more. As production — and incomes — expand, we could meet taxes needed for expenditures out of some of the additional income, while at the same time the ratio of taxes to income could remain steady or even continue to increase moderately. We implicitly assume here that taxes, whatever their kind, are met largely from incomes, personal or corporate.

These estimates of state and local tax growth anticipate actions to be taken by approximately 100,000 local and state governments in the United States. As in the past, tax changes will differ greatly among communities. They will depend upon political, economic, and social circumstances, and the governmental services expected of the particular state and local governments.

During the 25 years between 1932 and 1957, state and local taxes per capita rose most sharply in states of the Southeast extending on west to New Mexico. They rose least in the Northeast, in most Great Lakes states, and in scattered states elsewhere. The pattern of gains in personal incomes per capita is approximately similar, implying a relationship between economic growth and tax growth.

Among communities within states, local tax increases in recent years appear to be least in city centers, greatest in the expanding suburbs, and somewhere between in other areas. In relatively sparsely settled and declining rural areas, taxes per capita are often high even though government services are modest, as a result of dividing governmental costs for such things as schools and roads among comparatively few people.

Extreme variations among local tax rates arise from many causes, some clear and others obscure. Taxes on farm real estate per \$100 of full value averaged \$2.22 in Maine in 1959; at the other extreme, they averaged 31 cents in

New Mexico.⁴⁸ The same taxes as a ratio of net farm income ranged from an average of 23 percent in Massachusetts to 2 percent in Alabama. School tax rates in 1957–58 ranged among New York school districts from \$35.58 per \$1,000 of full value of taxable real property to \$2.92 per \$1,000, while the median rate was \$13.90.⁴⁹

Among factors contributing to these variations are: (1) the kinds and quality of public services financed; (2) the share of services financed through local taxes generally and the property tax in particular; (3) the share of financing assumed by state or federal governments; (4) the share financed through fees, charges, and other income; (5) the density or sparsity of population settlement; (6) the economic resources reflected in the local tax base per capita or per unit of service; (7) the volume of operations of the government performing local services; (8) efficiency of performing services; and (9) the degree of growth or decline of the community.

Although property taxes have increased in dollar amounts over a long period (to \$12.9 billion in 1957), they have been declining in relative importance among all local, state, and federal taxes. These trends are likely to continue. Between 1927 and 1957, property taxes dropped from 77.7 percent of state and local tax revenue to 44.6 percent.⁵⁰ Their importance among state tax revenues shrank from 23.0 percent to 3.3 percent, and among local taxes from 97.3 percent to 86.7 percent.

The property tax has been superseded as the most important revenue producer by the individual and corporate income taxes. The latter are the mainstay of the federal revenue system, accounting for \$56.8 billion of \$77.4 billion of federal tax collections in 1957. They are also used by many state governments, comprising \$2.6 billion of

⁴⁸ *Farm Real Estate Taxes*, USDA, ARS43–130, August 1960.

⁴⁹ New York State Education Department, Part II of the Fifty-fifth Annual Statistical Report, January 1959.

⁵⁰ Frederick L. Bird, *The General Property Tax Findings of the 1957 Census of Governments*, Public Administrative Service, Chicago, 1960, p. 5.

\$16.3 billion of 1957 state tax collections. Some local governments, principally urban communities, also use a uniform rather than graduated, low-rate "earned income" or "payroll" tax.

General sales and gross receipts taxes have been adopted by many state or local governments, or by both in a few states. Selective sales taxes, such as on motor fuel, alcoholic beverages, and tobacco, raise important amounts of revenue, as do the social security payroll taxes, accruing primarily to federal and state treasuries including federal and state trust funds.

The mainstay of federal finance is the income tax, while most local governments rely heavily or exclusively upon the property tax. State taxes are typically more diversified in kind, as states have turned to new revenues to relieve or supplement their onetime considerable dependence on the property tax.

As the property tax has declined in relative importance, federal taxes, primarily on income, have assumed dominance, and state taxes have risen faster than local. These trends are an outgrowth of federal and state assumption of political, administrative, and financial responsibility for doing more things relative to local governments. They have been paralleled by growth of federal aid to states, and by state aid to local governments.

The growth of capital requirements for farming and the changing relative importance of different kinds of taxes affect individual farmers differently according to the tax structure to which they are subject in a state and community. The proportion of farm capital tied up in real estate has declined while that in equipment, livestock, and other personal property has increased.

In states and localities where personal property is legally or practically exempt from the property tax, the relative property tax burden on the farm business — as a proportion of business income or labor income or capital invested — may be declining. The farmers who are more prosperous

may find their tax contribution consisting largely of income (and other) taxes to federal and state governments.

On the other hand, in states and communities where personal property is rigorously included under the property tax — where the property tax raises most local revenues and where local revenues are a high proportion of the local and state total — farmers with low incomes may find their increasing capital requirements subject to a relatively high property tax burden.

Adjustments Needed

Among adjustments related to taxation that appear needed in most rural communities are the following:

1. Recognition that in the intricate web of services performed “beyond the line fence” and required by the growing interdependence of individuals, families, and communities, there must be included some functions that government can perform better than any practical combination of private interests.

2. Realization that these services cost money and that the money for the most part must come from taxes or from other publicly levied charges.

3. Willingness to see the need for and to support thorough and comprehensive studies of local and state systems of taxes and services. Such studies should result in defining more clearly the adjustments necessary to adopt taxes to the requirements of a “good” tax system under changing economic and social circumstances.

4. Recognition that failure to exercise governmental power available locally is more likely to result in “home ruin” than “home rule.” This is one thing that communities can do something about while realizing that other more impersonal factors have also contributed toward the movement of power, responsibility, and taxes to state and federal governments.

5. Closer local and state attention to an equitable and practical definition of taxable property, and to improvement

of property appraisals or assessments and property tax administration generally.

6. Consideration and action looking toward state grants of power to local governments to levy taxes other than on property. Such taxes must be equitable, of course, and capable of efficient local use or of local levy with state administration of collections.

7. Recognition that, for a number of reasons, sharing federal and state collected taxes through grants-in-aid to local governments is often a defensible alternative to complete local financing on the one hand, or to state or federal assumption of complete responsibility on the other.

8. Greater willingness to initiate or assent to local governmental consolidation and cooperation in the interest of tax equity, effective administration, and political responsiveness. This is particularly important in school consolidation partly because local governments predominate in administering and financing elementary and secondary education, and this function is typically the most expensive by far of local government operations.

9. In sparsely settled areas, a willingness to consider ways of limiting residence or public services in remote locations which require excessive costs per capita for performing functions such as school transportation and road maintenance.

ZONING⁵¹

With the development of roads and automotive transport, communication facilities, and electric power, the city in a sense has moved to the onetime country. The countryside is being exploited for a growing variety of uses beyond the traditional farming-forestry-fishing. Between 1940 and 1958, while the continental United States (excluding

⁵¹ We have borrowed generously in this section from Erling D. Solberg of Farm Economics Research Division, Agricultural Research Service, USDA, particularly his *Talks on Rural Zoning*, USDA, January 1960, and *The How and Why of Rural Zoning*, USDA Agr. Info. Bul. No. 196, December 1958.

Alaska) gained 41 million people and farm population declined by almost 10 million, the rural nonfarm people increased by 27 million — more than the 24 million of urban gain.⁵²

In many central cities the resident population is numerically stable or declining while the suburban periphery bulges farther and farther out, pushing fingers along highway arteries, or leapfrogging past more or less open country to form urban-oriented pockets or more scattered roadside centers.

The developments are not limited to subdivisions with neat ranch-type houses but include a great variety: (1) residential construction from the most expensive to the cheapest and most nondescript; (2) trailer parks and isolated trailers; (3) industries — light and heavy, sound and fly-by-night, obnoxious and desirable; (4) roadhouses and ginmills; (5) junk yards and auto wrecking lots; (6) car sales agencies and shopping centers; and (7) drive-in theaters and golf driving ranges. Nor are developments limited to an hour's drive from city employment. The remotest wooded lake shore or mountain ski slope may be crowded with "recreationists" in their season. Summer homes and cottages extend the range of seasonal urban settlement miles beyond the year-round commuting distance.

The multiplication of rural land use possibilities has led to farmer and general interest in zoning what were once rural areas. People hope to facilitate by public control more orderly and better planned community development. Private exploitation of land use free of public control brought farmers three groups of problems:

1. Excessive taxes resulting from a shifting to farm taxpayers of development and service costs such as for new schools, public water supply, sewage disposal, and the like.

⁵² See Erling D. Solberg, *Talks on Rural Zoning*, p. 85.

2. Adverse effects of nonfarm land uses on farm operations, including diversion of some of the best farm land to other uses, lowering the water table, and trespass hazards to crops and livestock.

3. Objections of nearby nonfarm people to some farming activities and practices such as spraying and dusting, manuring, and keeping farm animals and poultry with consequent obnoxious smells, noises, and flies.⁵³

Local governments enact and enforce zoning ordinances under a grant of the police power of the state government — the power to protect the public health, safety, and welfare. As of 1952, incorporated population centers — cities, towns, and villages — in all but five states had the power to zone; all counties in 16 states and certain ones in 15 others had this power; towns or townships in 12 north-eastern and Lake states could zone; and six states had granted this authority to various miscellaneous units. Ten states had withheld zoning authority outside of incorporated places.⁵⁴ Probably only a small minority of nonurban local governments possessing power to zone have exercised it.

Zoning preceded and accompanied by intelligent, comprehensive community planning is one way to help achieve the following objectives, depending among other things upon purposes set forth in state enabling legislation by which zoning regulations must be guided:⁵⁵

1. Preserving the best farm lands for agricultural use by protection from urban encroachment.

2. Fostering orderly development of lands best suited to residential, industrial, and other uses.

3. Protecting lands submarginal for farming, for forestry, recreation, and other purposes.

⁵³ *Ibid.*, pp. 89–91.

⁵⁴ *Ibid.*, p. 15.

⁵⁵ See Solberg, *The How and Why of Rural Zoning*, pp. 3–4.

4. Facilitating adequate and economical provision of water, sewerage, schools, parks, and other public services in areas best suited to intensive development.

5. Preserving opportunities for industry and commerce dependent upon farming, in part by conserving farm land use.

6. Preserving expensive public highways from roadside encroachment, and protecting their traffic-carrying capacity.

7. Preventing residential developments that shortly create sanitation problems as a result of inadequate water supply and waste disposal.

8. Reducing wasteful public expenditure resulting from excessive road mileage.

California has apparently gone farther than other states in devising and using zoning legislation to restrict good farm land to farm and related uses. Under the zoning laws of Wisconsin, some counties have restricted use of cutover timber lands, submarginal for farming purposes, to forestry, recreation, and related uses.

Community adjustments needed in relation to zoning include:

1. Recognition that public regulation of this sort can be a positive benefit in long range conservation and enhancement of property values, and the community economic base. The traditional rural antagonism to zoning or other local regulation often reflects a cultural lag which fails to weigh adequately the degree of interdependence of people in modern rural communities.

2. Fuller realization of the impact of arterial highway and expressway construction upon rural development.

3. Greater willingness to study closely state legislation authorizing local zoning authority, and to press for objectives in legislation which fit rural needs better than laws designed primarily for urban areas.

4. Willingness to work together in larger communities and if need be to support zoning authority for political units large enough to provide zoning for the whole community.

5. Recognition that zoning regulates future development and will not correct mistakes already made. The need for zoning as one means of carrying out a community plan must be foreseen in time to prevent costly mistakes.

LOCAL GOVERNMENT

Local governments are adapting their facilities to meet current needs, though, as is frequently the case with other community institutions, less quickly than many wish.

Local governments, as political subdivisions, are controlled by the legal framework of their respective states within the limits of the federal constitution and laws. Variety among states therefore characterizes them. For numerous reasons, including intrastate variations in local conditions of many kinds, local governments usually differ greatly within a state as well, in area, population, economic base, and governing authority.

The federal Census Bureau counted over 102,000 governments in the United States in 1957, ranging from 91 in Rhode Island to over 6,000 apiece in Nebraska, Illinois, Minnesota, and Kansas.⁵⁶ The Census divided them into the following types:

Counties	3,047
Municipalities	17,183
Townships	17,198
Special districts	14,405
School districts	50,446
States	48
United States	1
	<hr/>
	102,328

⁵⁶ Governments Division, U.S. Bureau of the Census, *Governments in the United States, 1957 Census of Governments*, Vol. I, No. 1, Table 1.

County governments extend most widely over the United States and cover all but a small fraction of its area. Township (or town) governments occur largely in the Northeast, Midwest, and the northeastern edge of the Great Plains. Special taxing or improvement districts, almost half of which are for fire protection, soil conservation, or drainage purposes, appear in every state, but a few states account for most of them. The Census does not count under this type the large additional numbers of special districts which lack the semi-independent status of a local government.

School districts are by far the most numerous local units of government. They range from none in a few states (Maryland, North Carolina, Rhode Island, Virginia) where other local governments are responsible for schools (county, town or township, or municipality), to almost 5,000 in Nebraska where the small school district of tradition continues.

Local governments generally are most numerous from the Dakotas and Kansas on east through the Midwest and North Atlantic areas, primarily but not exclusively because of the school districts. In much of this region, a rural citizen lives in a minimum of three political subdivisions — the county, town or township, and school district. In addition he may be within the boundaries of a small municipality or one or more special districts. Some parts of this region are heavily populated but the association between population and numbers of local governments appears neither close nor consistent.

The kind and location of local boundaries by and large have carried over from an earlier era. The states and their people have been slow to change them. The outstanding exception is school districts which consolidation movements in some states have reduced from 109,000 in 1942 to 50,000 in 1957.

New York history may illustrate. There, school districts decreased from 6,064 to 1,664 between 1942 and 1957 with a current ultimate goal of something like 500. The last

county was added in 1898; the number of towns (townships) has altered little in a hundred years; the municipality (city and village) total has changed little in a generation; special districts have proliferated largely from suburban development outside the municipalities in the towns, primarily under town administration.

Almost half the towns in New York in 1950 had fewer people than a hundred years earlier when boundaries had become fairly well stabilized. Extremes in population and tax base have probably been growing as economic activity concentrated in industrial centers, as farm population declined, and as submarginal lands have been withdrawn from farming. The 1957 full, equalized value of taxable real property ranged among 932 towns from less than \$300,000 to almost \$2,800,000,000.

The rural counties and townships have generally shown little change in numbers or boundaries in recent decades, but this should not imply little change in government operations in rural communities. What may be occurring, as in farming and other sectors of society, is growing functional specialization and fragmentation in local government. Federal, state, and local highway men, for example (or agricultural extension men), communicate and work with each other as professional experts. Their ties are welded by close working relations among their official highway agencies. The ties are further strengthened by professional highway and engineering organizations, standards, and codes. The operational associations to a considerable degree bypass local and state political or policy control that is ostensibly exercised by representative governing bodies. We may be witnessing the disintegration of local centers of control over community government, somewhat as the onetime local chicken grower and general farmer now sees himself as part of a national broiler or layer industry with few direct ties to farmers in other specialties in his home area.

Consolidation of school districts may be taking place more than in other local governments, partly because the

former are single-function governments whose purposes are within the field of specialization and expertness of a national professional group — the educators.

Another type of change in rural local government is the development of cooperative action among these units. For example, mutual fire defense plans make possible the coordinated operation of numerous fire protection districts within an area. Local governments may share use of expensive and specialized highway equipment, or may agree to perform for each other highway maintenance operations such as snow removal. Sweeping New York legislation has made it possible for local governments to cooperate in joint operation or financing of any local functions which those governments have the power to undertake individually.

Another change which goes on as counties and townships remain stable in numbers is the consolidation of some functions in the county. These larger local governments also appear to be assuming responsibility for new activities more readily than the smaller units. For example, one county in recent years has taken over welfare activities formerly carried by the city and townships of the county; it has similarly assumed responsibility for public health. It, rather than its constituent city or townships, undertook construction and operation of a general hospital. It likewise built and operated an airport.

Among the adjustments in local government that appear needed are:

1. Recognition by those interested in community action that local government can no more afford to ignore technological advances and technical expertness with their many implications, than the farmer or rancher. Like the farmer, this probably means increasing the area or intensity of operations, or both, reducing the number of operating units, increasing capital investment in plant, equipment, and materials, and spending more money and imagination in improving personal know-how or technical and managerial

competence. The penalty of failure to act probably is that people will continue to turn elsewhere, such as to state and federal governments, for action.

2. More effective and farsighted leadership by state governments which will re-examine the pattern of local governmental units, and their organization, administration, and finance; and which will reshape the state legal framework upon which local governments depend so that people can adapt to community requirements. Depending on the state, this may mean state pressure and encouragement combined with grants of state power to localities for consolidation of local governments. More effective organization and management of locally performed functions is needed. More equitable and adequate local taxing power and tax administration combined with state support both financial and administrative would be helpful. It may mean broader grants of power encouraging and permitting local inter-governmental cooperative arrangements both for finance and administration.

3. Careful state and local weighing of the desirability of strengthening community centers of political, managerial, and financial control. The alternative of this is control of more and more highly specialized government functions on a national basis, largely by experts in the specialties.

COMMUNITY ORGANIZATION FOR ADJUSTMENT

As indicated earlier, individual communities typically are not organized in a way which would permit a comprehensive appraisal of community needs and action for adjustment to the changing situation. Yet there is a tradition of voluntary action through free associations which continues to impress foreign visitors.⁵⁷ In this tradition, a variety of means are used to meet problems. Zoning, planning boards, and community councils are examples of

⁵⁷ "Community Development in the USA," a special issue of *International Review of Community Development*, No. 4, 1959.

means being tried on a somewhat broader basis. The Rural Development program is another illustration of special relevance for rural areas.

With the accelerating rate of change and the increased importance of the forces for change which originate outside the community, increased competence in working together on common problems is imperative for people in rural communities. In continuing to provide the community facilities which farm people must have, what has been referred to as the "principle of unit requirements" provides a starting point for planning. This principle has to do with the service involved, such as pupils, together with the people, area, and money required to provide the service.⁵⁸ With changing standards for the services, cooperation of several communities will increasingly be required to provide the necessary population, area, and money. And "sooner or later the institution of local government is found to be fundamental to many of these intercommunity relations and necessary for their effective action."⁵⁹

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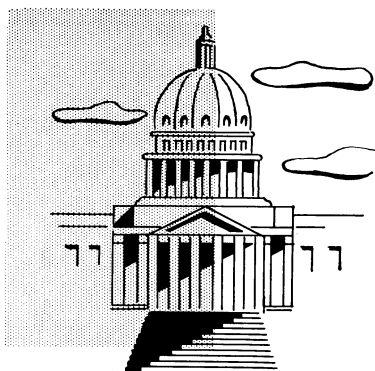
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⁵⁸ Kolb, *op. cit.*, pp. 104-5.

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CHAPTER 12

*Economic pressures for adjustment;
price supports and storage; other
programs; limitations of income
programs.*

Government Programs in Relation to Agricultural Adjustment

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BY AND LARGE, free markets subject farming to economic pressures to adjust in ways that keep it an efficient part of a changing, progressive economy. The pressures show up as low earnings of farm resources that produce little or that produce for a market burdened by surpluses. It does not necessarily follow that the pressures, though strong, are always effective, or that responses to them, where they occur, are sufficiently prompt to make low earnings only temporary.

Without considerations of efficiency, the United States has had for more than 30 years a policy of protecting farmers — or at least certain groups of farmers — from falling

prices, whatever the cause of price decline. Sharp conflict between agricultural adjustment and such government programs is clearly possible, but the extent to which government programs actually have retarded adjustment or must necessarily do so is debatable and needs further research.

Other programs, in which some beginnings have been made, attempt to facilitate adjustment. To the extent that adjustment is achieved, earnings of resources employed in farming are improved. Such programs are income programs in a certain sense. These programs often involve the reduction in number of farms and farmers. As some people see it, this is not a satisfactory solution to the farm problem.

This chapter discusses the extent to which programs may eliminate the need for farm adjustment, conflict with it, or facilitate it. Only the briefest comments on the possibilities and difficulties of income programs for farmers can be made here. The principal question is the extent to which emphasis on agricultural adjustment is inconsistent with government farm programs.

PROGRAMS TO IMPROVE FARM INCOME

Farmers gain economic advantages by adoption of new technology whether prices are high or low. This generally increases production. As explained in Chapter 3, an excess of production typically reduces farm prices much more than proportionately, and the income consequences for farmers are severe.

In a free-market situation, the way of restoring farm income is to withdraw farm resources, usually labor and often land, from production of farm products. One line of argument for income programs is that adjusting farm labor and land resources is not a flexible, precise enough process to maintain acceptable prices and incomes when technology is advancing rapidly. Lags in making downward adjustments (in labor and land) can be large and persistent, and income in most of farming is depressed. The earnings of

all farm resources are reduced — not just the excess farm resources—while the imbalance continues.

Several means of improving farm income have been tried, and many more have been proposed. Here they are grouped into principal types for the purpose of considering their relation to farm adjustment.

Price Support and Storage

The government can effectively support prices and farm incomes, for at least a time, by diverting production from the market to government storage by a loan or purchase program. Essentially, the government takes over the amount the market will not absorb at the support price.

If supports are set high enough to be satisfactory to farmers from an income standpoint and if something like a war does not create exceptional demands, the gap between production and market takings will continue or increase. The accumulation of more and more stocks at high government cost will eventually force a change in policy. A means must be found to dispose of stocks outside commercial channels, production must be controlled, or supports must be lowered to an ineffective level.

The less storable the product, the more quickly the change is forced. An important reason for the great difficulty support programs encountered in the late 1950's was that a war did not interrupt the accumulation of surpluses as had happened in the early 1940's and again in 1950.

Price support and storage can smooth out annual variations in prices of storable commodities by accumulation of stocks in high production years and liquidation in low production years. Unless production could be controlled or demand in some way subsidized, this would be approximately equivalent to stabilizing free market prices.

Stabilization might be achieved at a higher price level with production control or subsidized demand. Though price support and storage might be essential, the burden

for sustained improvement in farm income would rest upon production control or subsidized demand. Even the best-run stabilization operation probably would involve some unrecovered storage costs for the government, and government would assume the function of carrying inventories not required in the day-to-day operations of marketers and processors.

Continuation of loan, purchase, and storage programs at scaled-down levels are also proposed as a means of transition from prices considerably too high to clear the market to substantially free-market price levels. Supports would be gradually lowered by using lower percentages of parity or by a formula that eventually worked down to the free market prices.

The effects of price supports on farm adjustment depend a great deal on the level and permanence of supports and on the extent to which they are coupled with other types of programs. Any price support creates incentives that work against the success of the program in more or less degree. If the incentives to widen the gap between production and market outlets are in no way offset, the accumulation of stocks and high costs defeat the program.

The higher the price supports, the more difficult it becomes to administer controls of production. A basic conflict between income programs and production adjustments is that a price serving the income objective exerts a pull on production in the wrong direction.

Programs to Expand Demand

These might be undertaken to broaden markets domestically or abroad. Possibilities of expanding demand sufficiently to close the gap that existed in the late 1950's between production and commercial markets are discussed in Chapter 4. Though prospects for major accomplishments through this approach do not appear to be bright, it is useful to consider what farm adjustments would be necessary even if demand expanded.

A large-scale program to expand domestic food demand would require some important adjustments in farming to fit the new demand pattern. The greater demand would take the form mainly of a shift in the kinds of food eaten rather than an increase in pounds consumed. Use of red meats, dairy products, and several fruits and vegetables would rise; cereals, potatoes, beans, and some other foods would decline. The new diets would require more farm resources for their production than the old, but surpluses of such crops as wheat and cotton would be reduced only if some farmers shifted to crops benefiting from demand expansion.

Programs to broaden foreign outlets have been important in recent years (especially under U.S. Public Law 480). Programs to expand our agricultural exports call for less adjustment in old patterns of farm production because some of the leading surplus products have established export markets.

More labor and land would be needed in farming with successful demand expansion than would otherwise be the case, but several features of farmers' adjustment problems would remain. The severe economic disadvantage of farms much too small for efficient operation would be only slightly modified. The economic incentives to increase farm size would remain. A decline in numbers of farms and farmers would still be needed, and questions about the education of rural youth, off-farm work for farmers, farm consolidation, and community adjustments in rural areas would still be pertinent.

Programs to Control Production

The principal form of production control has been restriction of acreage of wheat, cotton, corn (before 1959), and some other crops. Rising yields per acre weakened the effects on controlled crops, and shift of land to uncontrolled crops has made conventional acreage controls almost wholly ineffective in restricting total production. More

stringent controls would be less acceptable to farmers but would be required to provide a real test of the production-control approach.

Programs using government payments to retire unproductive cropland, as under the Conservation Reserve, attempt to restrict production by reducing the farm resource base. When land is retired in whole-farm units, labor and capital usually are withdrawn from farming along with land.

The program has the advantage of retiring the land least productively used in farming and most likely to stay out if once retired. But because most of the land is poor, large acreages must be retired to affect production very much. Local economic activity may be so much depressed by land retirement in communities where poor cropland is concentrated that objections from businesses dependent upon farming become a major obstacle to the program.

Withholding good cropland from production or using it less intensively, as in grass, would be a necessary part of a prompt, decisive curtailment of total crop production. An attempt to induce voluntary retirement of good as well as poor cropland by means of payments to farmers was made under the Acreage Reserve Program of 1956-58. The program was expensive but not sufficient to cut production much, especially in face of exceptionally good weather in 1958. Apparently, an effective program of this type must involve large acreages. Payments would have to be large to obtain sufficient acreage by voluntary participation.

Strict, compulsory controls of farm production are potentially more effective than the acreage restrictions used to date. Quotas might be placed directly on quantities marketed in the case of commodities not fed to livestock, and land not used for the production of controlled crops could be required to be held idle. Several difficult administrative problems would arise. The controls probably would be more objectionable to farmers than the old acreage restrictions.

When compulsory quotas are used on land or production, individual farmers can increase their incomes if they alone can expand production at the prices made possible by supply control. But if all producers did this, the program would break down and prices would fall. To make quota systems or compulsory land retirement effective, farmers must be willing to accept controls that prevent the breakdown of the program.

Demands for most farm products at the farm level of marketing are sufficiently inelastic to make supply control (smaller production) a possible way of improving producers' income. This is not true for every farm product, however, and for a few products, demand over several years may prove to be much more elastic than over a year or so. Persistently high prices for a crop like cotton might encourage production abroad and induce manufacturers to turn to synthetic raw materials.

Producers having control of only a part of the total supply affecting their markets usually cannot maintain prices for long. What is said in Chapter 4 about inelastic demand applies to the total demand for a particular product, not to the demand for a part produced by a fraction of the producers. Careful study of market possibilities is necessary before production and market control is undertaken.

Often controls attempt to adjust over-extended farm production in the same direction as free prices would. It is difficult to design controls that will bring about production adjustments in the same places as free prices. Quotas usually are assigned on a historical basis, and production is reduced over the whole producing area rather than in the regions of lowest comparative advantage. Probably cotton controls have prevented production shifts to the high-yielding Delta and irrigated areas of the West. Use of minimum quotas in tobacco, a crop for which the average acreage per grower was small when the program began, redistributed production of some types toward the smallest and least efficient units.

Though the over-all efficiency of farming has not been greatly modified by such effects, they could be important if extended to many products over many years. For this reason, it is often proposed that quotas on quantities sold (not on acreages) be made negotiable. Then production could be gradually transferred in a voluntary way to the most efficient regions and farmers.

Though production controls may have important, direct effects on production of particular products, major adjustments may be affected only slightly (such as reduction of the farm labor force and disappearance of uneconomically small farms). Regardless of the level of prices and income, there is a strong economic incentive to consolidate farms as long as costs per unit of production would be materially lower on larger farms.

Under production control, the opportunity for employment of labor on farms is sharply limited and farm workers who have the ability and opportunity to be successful in other occupations usually do not stay on farms where they are clearly not needed. However, excess labor existed on low-income cotton and tobacco farms both before and after farm programs began. Other causes, lack of education, family ties, age, etc. — beyond the level of prices and incomes — kept excess labor on many farms.

Despite price supports and acreage controls during the 1950's, farm size increased and the farm labor force declined about as much as previous experience would lead one to expect without these controls.

Direct Payment Programs

If demand expansion, production control, or both cannot close the gap between production and market outlets at acceptable prices, payments might be made directly to farmers to make up part or all of the difference between actual and acceptable prices. If payments were limited to a base amount of production for each farmer, market prices might guide adjustments in use of farm resources and kinds

of farm products produced. Probably total payments to individual producers would have to be limited. The probable cost of a program containing both limitations would necessitate modest price and income objectives for the program.

Payments related to volume of sales would not ease the economic pressure to any great extent to these farmers with seriously inadequate size of farms. Reductions in the number of farms and farmers could be expected. If payments were large in relation to prices, however, there would be an incentive to hold farm size at about the point represented by the limitation on payments to a single producer. Limitation on payments should not handicap farms large enough for fully efficient operation. However, most farms are already too small for fully efficient operation.

Other Income Programs

Two-price export plans provide for sales abroad at lower prices than at home. Enlargement of foreign sales would ease adjustment problems of farmers producing for export, but opportunities for expansion of market outlets by this means alone appear limited.

Marketing agreements and orders provide a degree of control over prices, marketings, or both under government auspices. Control over total sales or ability to divert products from their highest value use to secondary uses such as processing usually is necessary to raise prices importantly, though significant gains for farmers can sometimes be obtained from improved distribution between markets or product promotion. Chief examples have been in fruits and vegetables whose production is concentrated in small geographic areas.

Federal marketing orders in fluid milk markets establish minimum prices to be paid to producers for fresh milk sold to consumers, and state marketing orders may also set minimum retail prices. Prohibitions against sales at lower prices restrict sales to the quantity the market will

take at the minimum prices. Milk not sold in bottles and cartons goes into lower-value manufacturing uses. The existence of large manufactured milk markets supported much of the time by government programs has provided an outlet for surplus milk, but in several markets expansion of production has reduced the blended average of fluid and surplus prices to unsatisfactory levels. The need then arises for holding production in line with market outlets by administrative means when prices are set above free-market price levels under milk marketing orders that attempt to do more than stabilize the market.

The term "self-help" often is applied to programs in which farmer-dominated committees would use marketing orders or supply control to improve prices and incomes. Where a high degree of bargaining power is sought, effective control of market supply is essential. Control over supply under marketing orders has similar effects on efficiency and adjustment as previously pointed out in the discussion of government controls. One important comment applies to all forms of income programs for farmers. If more people stay in farming than can find well-paying job opportunities on the land, competition for farms to operate will gradually capitalize the benefits of income improvement into the price of land. The valuation put on certificates under some forms of supply control also would cancel out the benefits of income improvement programs. Then the labor earnings of farm people are not improved.

Maintenance of reasonable farm incomes should not have to depend solely upon farmers' adjustments of labor and other resources under pressure of free prices and rapid technological change. Income programs should facilitate rather than hinder adjustment of resources in farming in the long run.

PROGRAMS TO FACILITATE ADJUSTMENT

Farm adjustment can be facilitated by a number of activities not having adjustment as their main purpose as

well as by special adjustment programs. Bringing about a better balance between the number of people seeking to make a living in farming and the number of opportunities for profitable farming illustrates this point.

Usually the most satisfactory adjustment of labor resources, from either the economic or the human viewpoint, comes about when young people choose the occupations in which their opportunities are greatest. The general abilities, special skills, and awareness of alternatives possessed by farm youth are highly important in this regard. Thus the general educational policy of the United States has an important bearing upon labor mobility. So also does the occupational training provided in rural areas. In view of what students will do later in life, heavy emphasis is misplaced on vocational agriculture as compared with emphasis on other vocational training.

The ability of farm adults to seek out their best opportunities would be increased by an employment service that regarded job-finding for rural people as a principal function and by training programs to teach industrial skills. Farm management advice through the extension service frequently should consider off-farm work as well as ways of improving the farm business.

The general economic climate is extremely important, for unless rapid growth provides ample job opportunities off the farm, labor will continue to be dammed up in farming. Social security and other potential welfare programs influence the age at which farmers retire and adjustments made at that time.

Reorganization and management of farms to fit future conditions require understanding by farmers of what adjustments will be needed. Farm management and technical advice through government agricultural agencies is important in establishing this understanding.

Credit programs to assist reorganization have a place where ordinary credit facilities will not suffice.

When a reorganized type of farming is needed over a

large area, special adjustment programs might be undertaken. For example, shifting from wheat production to range and livestock in the highest-risk areas of the Great Plains would require much reorganization of farms and several years for the establishment of grass and retraining of farmers in livestock production. A comprehensive regional program might be the most effective way to achieve so difficult an adjustment.

Growing population and rising incomes in our economy are increasing the demand for land for recreational, watershed, and other nonfarm uses often involving public investment. Purchase or lease of submarginal farm land for such use can aid in farm adjustment while providing for rapidly growing public needs. Probably opportunities for private development of fishing, hunting, camping, and other recreational resources now devoted to unproductive farm uses are going unrecognized. Public policy and land owners ordinarily have paid little attention to expanding recreational use of land under private ownership.

Several approaches to adjustment involving farm people are brought together in the Rural Development Program. Development of local nonfarm resources is particularly effective in broadening employment opportunities for underemployed farm workers. Assistance to small farmers with good potential for managing large and more efficient farms is closely related to this, because farm consolidation can proceed most rapidly when other operators of small farms are turning to off-farm work.

CONCLUDING REMARKS

It is not likely that any feasible income program can maintain the number of farm people at the 1960 level or prevent the disappearance or consolidation of many small farms. These are not matters in which farmers really have a wide choice.

Choice does exist with respect to the degree of adjustments. The desire to maintain the status quo in farming

may conflict with objectives held for the economy at large. A growing, technologically progressive, and adaptable economy is essential to raising the level of living and to bearing the burdens thrust upon the nation by dangers and responsibilities abroad. Farmers can justifiably ask to share more fully in the benefits of the progress to which farming has contributed so much.

Probably the natural adjustments made by farmers with assistance would not maintain acceptable incomes in farming during the 1960's, and income adjustment programs will be required. Adjustments toward efficient farm production will be needed if income programs are to work and to serve their purpose. Minimizing conflict with adjustment is one consideration in shaping income programs; conflicts may have to be accepted in some respects, especially in the short run. Programs can also be utilized to facilitate adjustment, and to the extent this is accomplished progress will be made toward better farm incomes and a more efficient total economy.

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CHAPTER 13

*Role of education in agriculture;
college curriculums; teachers;
the extension service; vocational
agriculture.*

Changes in Education to Meet Agricultural and Rural Adjustments

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THE ADVANCE of the American people in well-being, in comfortable living, in culture and refinement, in productive capacity, in usefulness as citizens, must for the most part be attributed to education. Most of the important differences between man 10,000 years ago and today are due to education.

The people of the United States have long believed in the necessity for some education for all the people. We know that an enlightened electorate is essential in our form of government. The success of a democracy thrives or languishes by the ability of its people to choose wisely. We designed a nationwide public school system that pro-

duces a degree of literacy no other nation has matched. Our land-grant colleges were created to provide higher educational opportunities for the masses, i.e., for the sons and daughters of farmers and mechanics. These institutions have done a remarkable job, and their impact has been felt not only in the United States but throughout the entire world.

Education furnished one of the great drives behind our economic growth. It stimulated both sides of the production-consumption equation. However, as significant as the contributions of the past may be, they are no cause for complacency. Although education has made great strides forward in this country, it obviously has not succeeded in solving many economic, social, and political problems of the individual, community, state, nation, and the world.

U.S. agriculture, like the rest of the economy, is undergoing rapid and accelerating change due to technological and scientific developments and improved methods of organization and management. These changes have resulted in steadily rising per capita incomes during the past two decades for the population as a whole. However, the U.S. farming industry has been in a persistently unfavorable position from the standpoint of prices received, incomes, employment opportunities, and in other respects. Education must help achieve a more positive, continuous adjustment which will assure farming its full share of the benefits of economic growth. Farmers basically want equality of opportunity with the rest of society. This includes not only income opportunities but also social, educational, and other types of opportunities.

Numerous adjustments are required if the gains of technological progress in farming are to be fully realized by both farmers and total society. Unless the adoption of new technology is accompanied by the necessary resource adjustments, society may be prevented from reaping the full rewards of the technological progress because it is denied the use of resources released from farming for other

purposes. Unless excess resources are moved out of farming, overproduction and surpluses will persist, depressing farm prices and incomes.

Many of the needed adjustments are controlled by society as a whole rather than by the farm sector alone. The broad public—farm and nonfarm—needs to understand the problems and issues before society as a whole can take constructive steps in the common national interest. This kind of improved understanding of public issues can be fostered only by institutions that enjoy the full confidence of the public and mobilize all their educational resources to meet the challenge.

A NEW CONCEPT OF AGRICULTURE

In an address on education and self-education, Whitehead said:

There have been moments in history when new worlds were discovered. There was such a moment when Columbus discovered America. Creation widened to man's view. There is such a moment now. We are all aware that the immediate future holds within it possibilities different from anything that has been known in the past. Our views are widened.

Mankind has entered upon a new phase. It is no good saying that you will go on in the future as you have in the past.¹

Our views of agriculture have also widened. As a result of recent adjustments in agriculture, a new concept of agriculture is emerging. In this concept, agriculture is defined to include three important segments of our economy.

The first segment includes the farmers engaged in the production of crops and livestock. Approximately seven million people are employed on farms in the United States.

The second segment includes those industries which furnish supplies and services to farmers. This group of

¹ Alfred North Whitehead, *Essays in Science and Philosophy*, Philosophical Library, New York, 1948, p. 123.

industries employs over six million people and is vital to the emerging concept of "agribusiness."

The third segment includes those industries and commercial enterprises that process, store, handle, and merchandise farm products. This is the largest of the three segments in terms of the number of people employed. Currently, this group of industries employs more than ten million people, and it will grow larger in proportion to farming.

Together these three groups employ approximately 37 percent of the total number of persons employed in the United States. Taking this broad view, more than one out of every three employed persons work in agriculture. Any way you look at it, these three groups are important segments of the national economy.

By defining agriculture in this way, we are able to draw a sharp distinction between farming and agriculture. Historically, agricultural education was developed with the primary objective of producing graduates who were ostensibly to become farmers; thus little or no distinction was made between farming and agriculture. The training of farmers is important. We should continue to do the best job possible of training those who wish to return to the land, but this in itself is no longer adequate as the sole function of agricultural education.

Producing efficient farmers is not enough. The supply industries as well as the processing and marketing industries must be efficient if we are to compete effectively with synthetic products and other regions of the world in the market place. As agriculture becomes more highly specialized and competitive, and as we seek better methods and greater efficiency, more advanced and broader knowledge is required.

Moreover, the social and economic problems with which the farm family must deal are continually increasing. These extend beyond the farm borders and become inter-

woven into the entire rural community. Thus, agricultural education in the future must deal not only with agriculture but also with a wide variety of human and public problems.

NEW EDUCATIONAL PROGRAMS FOR AGRICULTURE

Modern agriculture requires well-educated, adaptable, capable young people who can adjust to changing times. The agricultural education program must be broad enough and flexible enough for each individual to develop commensurate with his own abilities.

Many agricultural education programs of the past have been aimed mainly at farming rather than agriculture in its broadest sense. They have been weighted heavily with applied training and have been weak in fundamentals. Many agricultural college curricula have failed to achieve a balance between science, business, technology, and liberal arts and thus have failed to produce well-rounded graduates capable of meeting the demands of a rapidly changing society.

How well are our educational institutions organized to serve agriculture defined in this broad sense? Agricultural education might be divided into at least three areas: (1) agricultural college; (2) agricultural extension — continuing adult education for those engaged in agriculture; and (3) agricultural education in public schools. The important question is whether these institutions are adjusting fast enough to the changing needs.

COLLEGES OF AGRICULTURE

General Education of Agricultural College Students

The general educational needs of the agricultural college student should be kept in mind because, in the first place, most students are not sure what they will want to do when they finish college. In the second place, they are not sure what their needs will be in terms of training for future leadership and enlightened citizenship. A good general education should be stressed regardless of the major

interest of the individual student. The educational experience should be designed to prepare students to cope with the constant adjustments required in a dynamic world.

Balance Between Applied and Basic Training

Most faculty members recognize that agricultural colleges were not established solely for the purpose of providing vocational education. This is not to deny the importance of some applied training. The question is how much applied training and how much basic training should be included in the curriculum. If we lean heavily toward applied training, the student may be better prepared for his first job. On the other hand, applied training may become out of date by the time the student has been on the job for a short while. In the long run, a basic understanding of principles may serve him better than simple knowledge of how to do things. The answer is subjective, but neither extreme appears to be the most desirable solution.

The authors are of the opinion that a student should have enough applied training to enable him to obtain a job and be successful in his first employment. Beyond this, it would appear much better for the student to devote his time to basic training, which will serve him over a much longer period of time, than mere training in technology which may change from day to day.

The twin objectives of "learning how to make a living" and "learning how to live" must be kept in mind as any curriculum is developed. Most institutions are not interested in training mere technicians. As has been said, "Man does not live by bread alone." Educational institutions should be producing educated individuals who are not only technically competent but also capable of assuming roles of leadership in an increasingly complex society.

Haphazard curricula do not develop such individuals. The social, economic, political, and technical problems of the world must be kept clearly in mind as the educational program is planned. The graduates of tomorrow will live

in a world with increased leisure time. Social problems will change as the dividing line between the city and the country disappears. Economic and political problems will become increasingly important as we attempt to live peacefully with our neighbors of the world.

Minimum Levels of Attainment for a Degree

The agricultural college must formulate objectives which can be used to guide the development of its educational program. The concept proposed here is one of minimum levels of attainment in specific areas of knowledge. The idea is that if a student reaches a minimum level of proficiency — particularly as to principles — in a specific area of knowledge, he will have sufficient background information to deal with complex problems and adjustments to be faced in later years. To insure that a student has achieved the minimum level of attainment in a specific area, different kinds of tests could be administered or the student could be required to complete certain academic work in the area involved, or a combination of the two approaches might be used.

The concept of minimum levels of attainment insures that a student not only meets minimum standards where degrees are awarded, but also has a reasonable balance of training in the various areas of knowledge that are essential in meeting the objective of the educational program.

Maximum Freedom for the Student

Students, fortunately, are not a homogeneous group. They come to college from different places with different backgrounds and with different objectives in mind. Consequently, each student wants a slightly different program. How much freedom should the student be given to develop his own program? Opinions on this subject vary widely, and curricula vary from those with little or no freedom to those allowing considerable choice on the part of the student.

Some educators believe that all students should be required to take certain courses. Others believe that students should be permitted to take the courses of their own choice with the faculty deciding what kind of degree will be awarded when the student has completed a prescribed number of courses. These are interesting extremes, but there should be a reasonable compromise which protects the standards and attains the objectives of the institution and still meets the needs of individual students.

A Practical Approach

To bring together the two concepts of minimum levels of attainment for a degree and maximum freedom for the student obviously involves compromise. Since curriculum development is subjective, there is no way of proving whether the compromise is optimum in terms of the objectives sought. The evaluation must simply be made in subjective terms, but with frequent and thorough re-evaluation.

One way to deal with minimum levels of attainment is to think in terms of the areas of knowledge, understanding, skills, and attitudes which should be included in the curriculum. One should think in terms of the competence which one wants to develop in the student and then develop a training program to attain them. However, instead of using an example dealing with competence, we will consider an example using areas of knowledge and semester hours. We shall assume that a minimum of 120 semester hours are required for graduation. Ten percent of the courses might be devoted to languages. Four courses would meet the requirements in this area.

Requiring 20 percent of the student's courses in social science and humanities would call for eight to ten courses in this area during his four years. In this category the student could study history with the idea of giving him a better understanding of the problems man has faced over time, how he solved them, and how this experience could

be used in solving present and future problems. Some work in political science will give the student a better understanding of the political system we have and how it affects the lives of individuals and the growth and development of society. Some psychology will give the student a better understanding of individual behavior, while sociology helps explain group behavior. Economics could be included to give the student a better understanding of our economic system and how it operates and of how to operate an individual enterprise in the most efficient way. Many other courses can be included under this category, but the above will serve as an example.

Requiring 20 percent as a minimum in the physical and biological sciences would permit eight to ten courses in this area. This could include a year in mathematics, a year of chemistry, a year or more of biological sciences, a course in physics, and perhaps other courses in these sciences.

The next category would be designated as "major requirements." Perhaps 20 percent of the total should be set aside for the major, or specialization. These courses could be additional science, business, or applied science or technology courses. The department offering the major would attempt to use this amount of time to give the student the best possible training in the chosen major.

The next area could be termed "restricted electives." About 20 percent of the student's total time would be allocated to courses selected by the student and his adviser. These would probably be courses in departments other than the department offering the major, but would be related to the main interest of the student.

The last category, "free electives," could be 10 percent of the student's total course requirements. This would permit the student four or five courses of his own choice which may or may not have any relationship to the chosen major. The student, in consultation with his adviser, should make use of free electives to round out his educational program.

In reviewing the above six categories it should be noted

that 50 percent of the student's time is allocated to required courses as a minimum for all students, and that 50 percent depends upon the student's choice of curriculum, major, and individual preference. Again it should be emphasized that these choices are subjective, but this compromise should provide an opportunity to develop a reasonably well-balanced program for the individual student. Minimum standards are protected and yet considerable freedom is permitted. The flexibility in such a program will provide the student with the necessary background to deal with the complex problems in a changing economy.

Good Teachers

Thomas H. Huxley said, "I care not what subject is taught, if only it be taught well." There is much wisdom in this statement. The authors would not go so far as to eliminate areas of knowledge considered essential, but they would be quite willing to substitute one course for another within a reasonable range if this would bring a student into contact with an outstanding teacher who can stimulate a student to think creatively.

John M. Mason said, "The aim of education should be to convert the mind into a living fountain and not a reservoir. That which is filled by merely pumping in will be emptied by pumping out." The goal should be teaching students to think, not to imitate or to memorize. If the objective of college training is to affect the behavioral pattern of students after they go out into the world, then it seems obvious enough that teachers must prepare their students to think for themselves. The kind of decisions people make depend upon the values they hold "dear" and the information they have at their command.

THE EXTENSION SERVICE

Extension, in fifty years of development, together with the research and resident instruction resources of the land-grant institutions, has developed a unique system for service in over 3,000 counties aimed at better, wiser manage-

ment decisions in the individual farm or family unit. Throughout the years the extension service has developed a sensitivity to people and to problems and concerns at the local level. It enjoys today a high degree of acceptance and a reputation for objectivity and integrity. Living in the United States, and particularly rural living, has been vastly improved as a result of extension's efforts.

The increasing competitiveness of farming, the unremitting pressure for constant innovation, and the national interest in an efficient agriculture all demand continuing and improved extension education in management and technology for farm people.

Scope of Extension's Responsibility in Agricultural Adjustment

Much of the resources of the agricultural educational institutions have been directed toward improving farm production and efficiency. Today, in addition to helping to maintain these increasing rates of production, many people are asking the land-grant institutions, and particularly the extension service, to devote more of their resources to solving the adjustment problems which arise as a result of economic changes associated with modern agriculture.

These adjustments center around bringing the aggregate total land, labor, capital, and management devoted to farming into line with needed agricultural production, combining resources in proportions that are in line with modern technology, and finally, using these resources on farms of efficient size.

In addition, a whole series of social, economic, and institutional changes are needed as a result of these primary adjustments and technical advances. These include the supply and marketing organizations which serve farming, schools, roads, churches, and all other community services. They also include urban development, taxation, and

water and land use. Adjustments are also required in areas associated with human resources, such as vocational guidance, training of rural youth, adult education programs in agriculture, and problems of the aged.

Since all these problems affect the broad public, farm and nonfarm, and require understanding and decisions by society as a whole, extension has a dual responsibility. It must bring to the farm public a better understanding of agriculture as an industry and its relationship to the rest of the economy. Farm people need to understand the limitations of what they as independent operators can do to improve their conditions, and the need for industry-wide approaches to the solution of many agricultural problems. Extension must also bring to the nonfarm public an understanding of the vital role of agriculture in the U.S. economy, of trends in agriculture which affect the welfare of the nation. They also need to understand the reasons for public policies that deal realistically with the basic causes of the chronic farm problem. The gap in understanding between farm and nonfarm groups must be bridged in order to produce a favorable climate for constructive public discussion and action on the problems of agricultural adjustment.

In trying to develop understanding of the agricultural adjustment problems created by economic progress, the educator's approach should be: (1) to analyze the problem, (2) to set forth the possible solutions, (3) to appraise the consequences of each of the solutions as objectively as possible, and (4) to allow each individual or group to choose which course of action best meets their values and over-all goals.

People make their decisions in the policy area on the basis of facts, what they think are facts, and upon personal values. The less facts they have available the more they rely upon their values and beliefs. These are largely the result of their cultural, religious, and economic background.

The function of the educator is to supply the facts, identify and clarify the issues involved, and provide the framework so that the individual may make a wiser decision.

People traditionally desire freedom from governmental intervention but they realize that economic and social growth and progress create complex new public problems that may demand more rather than less governmental intervention. Society can only be as good as the people composing it and operating it. Extension must accept this new challenge by providing all individuals with the basis for knowledge and judgment that is needed for great decisions. It needs to conduct a broad continuing education program designed to insure that the development of the individuals, the productiveness of their efforts, and their ability to make decisions are as great as can be achieved through educational means.

Programs Underway

Extension in its awareness of persistent change has initiated various programs to aid rural people in solving their adjustment problems. A few selected programs with their purposes and procedures are as follows:

PUBLIC AFFAIRS

The objective of educational programs in this area are to develop: (1) an active interest in public affairs, (2) an understanding of the problems, the alternative solutions, and the consequences of each of the solutions, (3) the ability to make decisions on public policy issues on the basis of a critical examination of the evidence and logical thinking, and (4) a desire and ability to participate effectively in the solution.

COUNTY PROGRAM PROJECTION

This activity involves county leaders in projecting where their county is headed economically, socially, ethically, and spiritually, with particular reference to agricul-

ture. It also includes an evaluation of these trends and a consideration of how they may be modified more in line with local people's goals.

RURAL DEVELOPMENT

This program has been aimed at helping the people in counties which have standards of living below a given economic level to appraise their situation and to develop plans for improving it. It usually has involved the entire county or region and may include programs for: (1) increasing the productivity of the farms in the area, (2) bringing in new or more industry, or (3) facilitating movement of surplus labor out of the area to other areas with more industrial opportunities.

COMMUNITY DEVELOPMENT

This program is directed at improving the ability of the people to identify and solve the problems affecting their welfare through their own initiative using available resources. It involves the entire community and may involve any or all the group activities of the community. In certain states, extension already is using this approach to solve area problems.

FARM AND HOME DEVELOPMENT

The purpose of this activity is to aid individual families in adjusting their farm businesses and homes to the new technological and economic conditions. With the rapid changes taking place, many farm families have expressed a need for aid with their individual problems in this area.

SUPPLY AND MARKETING FIRM ADJUSTMENT

The adjustments taking place on farms plus the technical changes directly affecting the marketing and supply firms make many changes necessary in the operation of these firms. Many states have extension activities to aid these firms in making needed adjustments.

Improving Service Through Specialization

Extension needs to make some changes if it is to continue to serve the growing needs of agriculture. Greater specialization seems to offer possibilities for meeting the needs. Some means of specialization being used and considered and which might be appropriate in the adjustment area are as follows:

1. Shift some of the resources of extension from increasing technology to increasing adjustments through: (a) increasing the proportion of the central staff's time spent on adjustments, particularly the economic and sociology staff, the supervisory staff, and the information staff; (b) giving priority to adjustments at the county level with the privilege of dropping certain other activities; and (c) assisting in retraining or equipping the staff to do the work in the adjustment area.

2. Increase the specialist staff and assign to them the responsibility of holding more of the formal meetings at the local level in agricultural adjustment or in other areas. Provide for more of the specialized extension work at the district level while continuing the organizational and more general extension work at the county level.

3. Appoint specialists to be responsible for the presentation of the adjustment program in regions or districts of the state.

4. Coordinate the work on a two or more county basis with each county worker specializing in certain subject matter fields in addition to his general duties. The county leader would be responsible for the over-all extension program in his county but in addition would be responsible for the presentation of his specialized subject matter in the entire group of the counties.

5. The reorganization of extension as suggested in 4 would probably result in each local extension office serving more than one county. In this way the staff at each unit can be enlarged, permitting greater specialization in each office.

AGRICULTURAL EDUCATION IN PUBLIC SCHOOLS

Place In School System

Agricultural education is a function of the entire school system rather than a function of a department in a secondary school or university. The elementary schools have long drawn on farm life and experiences in teaching basic subjects. Children are interested in animals and plants and are curious about their sources of food, clothing, and shelter. Because of the unique character of agriculture and its importance in the national economy, education about agriculture should be an integral part of the over-all elementary and secondary teaching program. Teachers should be given enough training in agriculture to provide the important facts about food and agriculture as a part of the basic courses.

Considering that agriculture is a major part of our national economy and that it affects every man, woman, and child, it is inconceivable that a modern program of general education would not include education in food and agriculture. It receives entirely inadequate and sometimes prejudiced treatment in our programs of general education.

Vocational Agriculture

The high school vocational agriculture program has been efficient and successful. It has shown boys how to be better farmers and how to improve their income opportunities. In addition, vocational agriculture education has contributed to college preparation. Studies indicate that a high percentage of the students enrolled in the colleges of agriculture have been influenced by their courses in vocational agriculture. Teachers of agriculture, because they worked closely with the students and their parents, have been able to be particularly helpful in counseling rural youth.

Vocational agriculture training programs have helped change the structure of agriculture and the role of agriculture in the national economy. The program helped develop better citizens, and these citizens contributed much to their

communities and strengthened leadership in agriculture. But with improvement in the productivity and income of some farmers has come a reduction in the number of farming opportunities for rural youth. Attention needs to be given to the vocational opportunities for those farm boys who no longer have satisfactory alternatives in farming, and at the same time improve the opportunities for those who remain in the farming occupation. A complete vocational education program should be developed as a supplement to general education for the farm youth.

Little change has been made in vocational agriculture education since its inception. The content of the courses in vocational agriculture as well as its place in the curriculum need re-examination. Educational leaders need to determine the proper emphasis to be given in courses in order to broadly educate young people who, to the limit of their respective abilities, can adjust to changing times.

Much agricultural education has been along the lines which brought about increased productivity in farming and the need for adjustment. Little attention has been given to the problems of adjustment and remodeling public education in agriculture to fit present and prospective conditions.

Studies show that only about 15 percent of the boys on farms will find opportunities in farming in the future. There is further indication that many of the young people growing up on farms will have inferior training as compared with those from urban areas. Fewer farm boys than nonfarm boys plan to go to college. A large proportion of farm boys, unless properly trained, will be qualified for only unskilled jobs. What is of more importance is that less than 20 percent of the boys who expect to farm are planning to take further training beyond high school and only a small percentage will actually take some additional formal training. Yet if the farmer of the future is to be a manager as well as a laborer, he will need much better training than most farmers now have. Vocational agriculture programs in secondary schools must be broad enough and flexible enough

so that the student will develop commensurate with his own abilities, so that he can step immediately into a job or can further pursue his education at the college of his choice.

There is further need for post-high school instruction, universally available, which will supplement secondary schools and colleges by promoting vocational and general education of adults. Efforts over a generation to provide the complete vocational education of farmers during the secondary school period have proved inadequate. The complexity of farming and the role of agriculture to economic growth requires more maturity on the part of students. The rapid development in agriculture requires a continuous re-education of those who have received basic education. Organized systematic instruction should be available to farmers and farmers' wives through their active careers in farming. This requires the coordinated efforts of all agencies.

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