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Policy Under Economic Development

HISTORY WILL PROVE that problems of agriculture follow a definite pattern over time and under economic development. This statement will apply to all countries, regardless of current income levels and resource productivity and the social systems which provide the decision environment for state planners or individual farmers. Quantities needed to prove this proposition are time and economic growth in sufficient magnitude.

The current problem settings of agriculture appear to be highly dissimilar over the globe. Hunger and food shortages prevail in some regions. The immediate problem is to find methods for increasing the supply of farm products. The problem is the obverse in other regions. Consumers are well fed. Surpluses exist and the problem is to restrain supply against other national needs. A common element exists among these extreme settings, however. Value productivity of human effort in agriculture is low, either absolutely or relative to earnings in nonfarm sectors. Still, the opportunities are different because nonfarm employment opportunties exist for absorbing agricultural labor in highly developed economies, but not in those where food is still scarce.

Differences in food supply exist not because of physical differentials in climate and natural resources, the causes or variables often cited, but because of uneven rates of economic development. Given economic growth and per capita incomes of current magnitudes in the United States, economic pressures on agriculture of India, Russia, or the Congo

will be largely those experienced by North American farmers over the past several decades. Unfortunately, economic development previously has progressed slowly in such countries. Many decades will be necessary before they will experience the pleasure of farm problems in nature and magnitude of those prevailing in America. The term "pleasure" is used in long-run context.

Basic U.S. farm problems arise because per capita income and resource productivity have been pushed to high levels. Consumers are well off and food is abundant and of relatively small cost. Those who suffer hunger or malnutrition do so largely because of personal choice and motivation. Illness and misfortune cause a few to desire more food and improved nutrition, but high per capita income and low food costs together cause food to be among the lesser of consumer urgencies. In long-run context, America thus can proclaim the last half century largely as the period in which it transgressed from one with the masses concerned first with food and second with consumer goods extending beyond the basic elements of existence to one where the direct concern is with goods of affluence. Food for subsistence is taken for granted and is no longer the primary motivational force behind family economic activity.

This state of well being began emergence at the turn of the century, but only in the last several decades has it sharply focused on the mass of consumers. If it is not submerged in the flow of consumer goods or the ravages of atomic war at the end of another half century, American society may look back to this period of transition with pleasure and self-satisfaction. The pains of the transition then will be largely forgotten. The period can be remembered as the stage of growth in which primary concern turned from quest to overcome hunger, cold and sickness and major devotion of resources to it. Old-timers may even long for this period—accompanied as it was by farm surpluses, depressed farm incomes and large public outlays to ease the farm problem—against an affluent society searching for goods and services to entertain itself during time freed, by economic progress, from acquiring a living. Newer generations, however, will take it lightly as a stage relegated to history and worthy of less thought than a previous generation's decision to initiate and repeal prohibition, grant women suffrage, modify the income tax structure, invest in space exploration or reapportion legislatures. In an initial period of development, man's problems are of biological orientation: to have enough food and to dispel discomfort of hunger, cold and illness. In another period, it is to have enough food to allow expansion of his society. But in a later period, his problems have psychological orientation: in deciding, among the greater welter of goods and services within his means, the combination which leads to enjoyment rather than frustration.

In another half century, United States society will be better experienced in affluence. It will have learned how to cope with the economic and social problems which attend its first-stage attainment. It is then that problems of agriculture will have been of short-run context. In this

sense, the current monograph is of short-run context. It deals with the problems of agricutlure and in wealthy society where economic growth is rapid but the stage of growth still causes problems to fall on agriculture and to be of public concern. This environment is one which likely will exist in the American economy through the 1970's. It is one which will gradually emerge in other countries as economic development progresses and societies are able to bend their concentration from pursuits to lessen basic human discomforts, to those allowing exploration of want patterns which have possibility of fulfillment under economic development.

Given the uneven progress of economic development over the world, however, much of the structure explained in this text will have application mainly over the next half century. But with the transpiration of time, American society will be more aware of the developmental process and will have provided environment which both facilitate and accommodate it. In the early 1960's the main problems of agriculture are inability of the industry to absorb the shocks and disturbances in equilibrium which stem from national economic progress stimulated from both private and public sectors.

AGRICULTURE IN A MORE STABLE ECONOMY

Problems of agriculture are noteworthy not only because they stem from high attainment in the cherished goal of economic opulence, but also because certain facets of economic security and industrial self determination attained by other sectors, as an outcome of social and political constructs of a free society, prevail less widely in agriculture. The major problems of the industry no longer can be framed as those of agriculture in an unstable economy. Great fluctuations and insecurity, such as that illustrating the 1930's, no longer characterizes national economic endeavor. True, small recessions have prevailed since World War II and will continue to do so. But mass unemployment will never be allowed to return. Even under national instability of magnitudes experienced in postwar years, farm income has suffered little, and sometimes not at all.

Agriculture has more typically faced relative income depression when the national economy and employment were at highest levels. Aside from that created by generally desired economic expansion, instability and insecurity have been much lessened at the national level. Instability of magnitude over the past century, or the human misery accompanying it, will not be repeated in the future. Growth will be promoted and attained not only as an end in itself but as a method of minimizing insecurity and instability. The American business community does not desire public legislation and research which concentrates on solutions to a depression of the magnitudes of the 1930's. It does not prefer monetary policy which turns money supply loose in a free market so that after major depression has come about it can be proven that a higher real

price for money will eventually cause greater supply of it. Neither is it likely to prefer that efforts of scientists be devoted mainly to pure econometric explanation of the self-generating and distributed lag characteristics of the business cycle, under the assumption that these are natural or transcendental phenomena to be described and then left alone. It does not want governmental appropriations to provide public works and small purchases from a firm during extended recession. It does want positive monetary and fiscal policy to maintain growth and prevent major depressions.

American industry does not use unstable competition of "pure model" type, with price largely an unknown quantity. Instead, through self-administered and necessarily informal arrangements, price is given an important degree of short-run stability and competition is typically on other basis in the short run. Production and employment of plant are adjusted in the short run to prices which do not fluctuate in the manner of the pure competition model. To be certain, there is competition in sufficient magnitude to promote growth and progress, but not in the manner leading to great instability as under pure competition. Lessening of instability which arises under laissez faire approach to the business cycle, or from structure of prices under pure competition, likely allows business firms and industries to use investment strategies which give greater stimulus to economic growth. Faced with instability of pure price competition and deep business fluctuations, assets must be used more sparingly and in strategy to meet sudden setbacks. Provided with some stability in these areas, but with competition for "share of the market," in resource acquisition and in technology relating to production costs and consumer demand, business firms are able to invest more in research and development leading to progress.

The stability mechanisms preferred and used by industry lessen competition at the level of product price in the short run, but they allow intensification of competition in other directions. Over the long run, price competition does prevail because substitution possibilities are great across industries, commodities and resources. Optimally, progress is best promoted through policy which allows degree of security leading to investment in product and resource improvement or substitution, rather than in uncertainty precaution *per se.* It also is best promoted if those who invest are allowed some distribution of the gains. Herein lies a central issue of the farm policy problem.

In a similar vein, American labor does not desire policies which provide unemployment compensation during extended depressions, or even in mild recessions or "rolling adjustment." It, too, prefers positive policy which promotes economic growth and job opportunities. And like American business, it prefers some stability in price of its service, rather than to have each laborer serve in atomistic competition with all others under great fluctuation in rewards. It has been provided with legislation to bargain accordingly and has attained great short-run stability in expectation of prices of its services.

But labor, too, is competitive within its ranks; enough so that growth and progress results from this quantitatively largest input of the industrial complex. Labor also is competitive with capital, and prices of the two resources cannot deviate greatly from substitution rates without causing replacement of the former. Even that common element of all economic sectors, the consuming household, prefers similar positive orientation. Policies which provide the family with food stamps to prevent hunger during unemployment are not among its urgent desires. Neither is unemployment compensation which replaces a fraction of its normal income and maintains a portion of its usual expenditures during recession. Its preference is for public policy which promotes growth and extends its income and budget over the consumption plane.

Aside from war, the major threat to economic security is widescale unemployment and unused plant capacity—the return to the major depression. But this is a state incompatible with the wishes of any major domestic sector or with the nation's world responsibilities—including an image to be maintained in international political competition. The United States cannot afford a major depression, even in terms of sacrifice in world status. It will not have one and this point need not be labored. Economic growth is an important means for attaining a desired degree of security. It is pursued as a means of meeting world political competition and of contributing to that noble purpose of growth in underdeveloped world regions. But economic growth is more than this. It is the most effective means available in Western-type societies for preventing the violent business cycle and widescale unemployment of plant and labor. It will be pursued vigorously for these reasons.

Growth will characterize the American economy in future decades. Recessions or rolling adjustments, identified under newly coined descriptions, will prevail. But the nation will not allow a major portion of its resources to become unemployed. Growth itself does not solve the peculiar short-run problems of agriculture. Major farm problems arise mainly from economic progress. Others would exist in either the presence or absence of growth. During the 1960's, economic growth alone, in the absence of specific policy, will not erase either the surplus or poverty problems unique to agriculture. Growth will never solve the problems of price and income instability which grow out of farm commodity cycles.

PROBLEM OF COMMERCIAL AGRICULTURE IN ADVANCED SOCIETY

As part of the nation's total growth complex, technology has been advanced rapidly in agriculture. Developed land area once served as an important restraint on output and supply of food products. Relative to its productivity and to domestic food demand, the supply of land is now effectively greater than at any time in the past century. Space or building site has never served as restraint on supply of industrial firms.

Agriculture is now similar in the sense that land area or supply has been much reduced as restraint on the industry's commodity supply function. New technologies, represented by capital items such as chemicals and improved biological strains, have developed rapidly as substitutes for land. The marginal substitution rates of these capital items for land have been increasing since 1930. Capital items in the form of fertilizer, insecticides, improved varieties and machines also serve as substitutes for labor. Consequently labor input has declined greatly in response to (1) price of labor which is high relative to that of capital and (2) substitution rates which have grown to favor capital. High labor returns in industrial sectors also have served to increase the flow of labor from agriculture, a phenomenon partly reflected in the price complex favoring substitution of capital for labor in farming. If labor were an inanimate resource, transfer enforced by technological change and economic progress would give rise to concern by few people. But since labor does, in fact, have a household attached to it, the transfer can impose family sacrifices and costs, and many persons must accept it unwillingly.

National economic growth has differential impact on agriculture and industrial sectors because of magnitudes of income elasticities of demand. For aggregate food in physical form at the U.S. level of per capita incomes, the income elasticity effectively is zero; meaning that as income increases further, food poundage intake remains practically constant. Even the elasticity of aggregate food expenditures in respect to income is low—around .15. This indicates that consumers, wealthy in world standards, increase expenditures on food by less than 2 percent for each 10 percent increase in income. Most of this increase is allocated to packaging, freezing, improved quality and similar services incorporated with a given quantity of food.

Domestic growth in demand for food in physical form is restrained to the rate of population growth. This is in contrast to industries which produce goods of affluence where demand grows not only with population, but also as a function of per capita income. Income elasticities of demand exceed unity, indicating expenditure increase more than proportional to per capita income increase, for commodity aggregates such as kitchen mechanisms, recreation, education, communication, automobiles and others. These are the industries favored in investment return under economic growth, not only because of their high income elasticities but because growth-inspired technology also reduces their real costs of production. In contrast, technological change which reduces the real cost of production for agricultural commodities tends to be offset by price depression where shift in supply exceeds the rate of population growth. This indeed has been the situation of American agriculture in the two decades since 1940. The condition continues to prevail because of low labor mobility (relative to the magnitude of labor surplus created through new technology), a competitive structure favoring rapid technological advance, and the rapid injection of new technology as a result of its favorable pricing.

Economic growth and technological change also cause disruptions in selected nonfarm industries. Changes in consumer preferences, obsolescence of old techniques and new products cause plants and workers to become surplus relative to a particular activity. However, these resources often have much greater short-run flexibility and adaptability than those specialized to agriculture. Machines, manpower and buildings can be quite readily shifted, at a given location, from radios to television, from handwashing machines to automatic washers or from sausage grinders to boats. Barns, tractors and husbandry men are not so readily shifted from wheat to electronics or from hogs to automatic transmissions.

Industry and labor do not have complete security of income and employment, in respect to either aggregate economic fluctuations or "within rank" competition. But they have more effective short-run mechanisms and institutions for these purposes than does agriculture. Their competitive mold is obviously different from that of agriculture. Even on Main Street of the farm village, competition among merchants typically is not in terms of price, but in share of the market and in similar resources or restraint. Most aggregates of industry are more homogeneous than the agricultural industry, both in respect to commodity and other characteristics. The trade association, the professional organization or the labor union thus more often can speak with a single voice, as a lobby or economic pressure group. Not only does protective legislation exist, reflecting or providing the bargaining power of these groups, but also these groups more often possess means which can be initiated by member organizations.

Agriculture has protective legislation but generally lacks the power of self initiation. In aggregate it must depend mainly on public legislation to obtain means of increasing price and managing output. In contrast, oligopolistic industries can raise prices, through leader followship or tacit understanding. Similarly, labor can call a strike without prior persuasion of congressmen for the need. Neither of these two groups must wait through long legislative process for writing bills, obtaining committee clearance and in attaining legislative majority and presidential signature.

Mechanisms and Problems in Distribution of Progress Gains

Other firms and industries are competitors. Competition is difficult to stifle in a large and complex economy such as that of the United States. Substitution possibilities extend over broad ranges of industries and resources. If steel becomes too costly, substitution will be made through aluminum and other materials. If labor becomes too costly, capital and machines are substituted for it. Within an industry, firms develop new products and resource mixes in order to compete more effectively with each other. Over the long run, the price for product or resource of one set of firms cannot be separated from that of competing firm aggregates or industries. In the short run, however, industrial

firms have much greater price stability than has agriculture. Competition exists, but more nearly over share of market for a given demand quantity at a given price. Through this structure of short-run price stability, major nonfarm resource and industry groups are able to hold onto a larger share of the gains of economic progress, before benefit of progress becomes spread predominantly to consumers.

Distribution of gains and losses of technical and economic progress provide the main basis for policy problems of commercial agriculture. Because of the demand and competitive structures characterizing agriculture, individuals within the industry must bear the major portion of costs associated with progress. As a competitive industry, the farm sector does not have effective means for retaining any large portion of the rewards from the technical advance which it initiates. These gains are quickly and widely dispersed to consumers and the processing sectors which connect farm firms with households. Because food demand in aggregate is inelastic, greater output brings smaller revenue to the aggregate of food producers. Accordingly, returns to resources are low because resources involve people who are not readily yanked from the industry. Older persons bear capital losses and often are unable to move to other industries to realize positive awards of progress.

Certainly this is the main policy issue for commercial agriculture in the decades ahead: How can it remain competitive in the sense of promoting progress and still realize an equitable share of the gains stemming from this progress? This condition has been attained much more in industry than in agriculture. One of our main concerns in this book is with policy to better guarantee positive-sum utility outcomes from progress. This is the essential concern of commerical farm policy in the decades ahead. Starting from the 1950's, the need is to bring a mix of conditions to agriculture which currently have wider application in nonfarm industry. This needed mix includes: better use of the pricing mechanism than during the 1950's; methods for retaining a more equitable share of the progress payoff in agricuture; and elimination of some extreme sacrifices from short-run price competiton. Industrial sectors have attained a workable degree of these conditions, but still compete on a long-run price basis, as well as on bases other than price in the short run. Under their mix of conditions they have made tremendous contributions to progress.

American society has set up precedent and mechanism, indicating that persons providing a basis for progress should be able to receive a positive share of the social payoff so generated. This sharing is guaranteed in patent laws. The first few farmers who adopt innovations do realize positive payoff. The masses who follow in adopting innovations and augmenting the supply function, however, are the ones who make the greatest absolute contribution to lessening the real price of food and to freeing resources from agriculture. Yet these producers are promised negative payoffs or costs for the contribution, because their incomes are reduced from the process under inelastic demand.

Other Income Problems

Policy problems arise mainly out of concern with income level. We have mentioned one broad problem of income giving rise to need for public farm policy; namely, policy to guarantee an equitable distribution of the gains and costs associated with progress in agriculture. This is the major policy problem of commercial agriculture. We treat it in detail in subsequent chapters. In addition, there are three other income problems which give rise to need for policy and which are discussed in subsequent chapters. A major one is that of low income and poverty in agriculture. Poverty is widerspread, in proportion of people, in agriculture than in the national economy. The two income problems mentioned thus far, equity in the distribution of real income gains from progress and poverty, have quite different settings. The first is more a problem of relative level of income; the second, more a problem of absolute level. The poverty problem stems but little from recent rapid progress of agriculture. It has cause of deeper and longer standing. But it poses an important problem in giving low-income people stranded in agriculture a larger opportunity to take advantage and participate in national economic progress. In this sense, it also can be termed a problem in economic progress.

The two remaining income problems of major or mass concern have much less relationship to economic growth. Both of these are almost purely problems in instability. One stems from the distributed lag or cobweb nature of producer response. It is represented by the commodity cycle, with rather violent inter-year fluctuation in price, production and farm income. Its reflection is notable for such commodities as hogs, potatoes, beef and others where the production period and the expectation models used by farmers leads to distinct commodity cycles. A second stems from the stochastic or random nature of weather. It is more particularly the problem, aside from irrigated areas, of agriculture west of the 100th meridian. But it does have reflection in other producing areas. Drouth and other calamities of weather wipe out income for a year or series of years, while farm costs continue. Both of the income problems stemming from instability variables touch upon large groups of producers but cannot be solved by farmers independently. They also call for group action, if their effects on income are to be lessened, of the nature discussed in later chapters.

ATTAINMENT OF BASIC GOALS AND PUBLIC POLICY

The centuries-sought primary goal or commodity of man is already attained in large degree by American society. He no longer need devote a major portion of his time and resources for acquiring food, shelter and medical aid to keep him alive. Aside from certain exotic characteristics of food, he takes it largely for granted as basic to life, but of little greater concern. Although its price is still higher, he views food per se in a category only slightly beyond water and air for human consumption.

The first visitor from Mars or other planet, brought to earth in space vehicles which are necessary commodities of rich societies, might ask perplexing questions to "man on the street" representation of American mores and values. He might ask: Why, in a society as rich as that in the United States, need anyone pay for food? Why is education largely provided free and allocated apart from prices while food is not, particularly since food for subsistence is necessary before one can enjoy and absorb education? Why are commodities of secondary and tertiary nature, such as waters for fishermen and duck hunters or national parks for general consumption, provided outside of the market when commodities of primary nature such as food are not? Why does a rich society encourage production of electricity to most consumers at reasonable price, with simultaneous guarantee to producers of market rates of resource returns, without doing so comparably for food? Why should communication through the postal system be completely socialized, with prices to consumers representing only a fraction of the per unit cost and with labor used for the enterprise rewarded at market rates, when food is essential for life and for existence to enjoy the services of communication? Why in general have so many goods of the secondary or tertiary nature been placed in the category of public utilities when a primary good has not?

There are reasons why America used this order and method for the supplying and pricing of different categories of goods. (The explanation might be hard to impress on the Martian, if he too came from a rich society with a particular set of values where the opposite ordering had been followed and had he not read the American Constitution. If he had read the Constitution, he might wonder why so many people of agriculture do not have access to equality of economic opportunity as against the general populace.) Perhaps our society did not consider this regime of food supply, factor return and consumer pricing because it could not foresee the level to which economic progress in general, and that of agriculture in particular, could be pushed. A century or more back, it may have supposed that the main preoccupation of man would continue to be that of food. Obviously, this is no longer true, with net income of agriculture being less than 5 percent of consumer disposable income and the agricultural labor force being less than 10 percent of the national labor force. Hence rather than make agriculture a public utility and provide a minimum quantity of food at zero price to all consumers, an alternative but quite similar route has been followed. Food itself has not been socialized or made into a public utility, but resources causing its supply to increase and its real cost to decline were so treated. Through public investment in research and development, society has augmented the agricultural supply function and diminished the resource demand function. Consequently food is produced abundantly and, because it fills biological preferences and has low demand elasticities, comes at low real cost to consumers.

To be certain, the market basket is not filled at low price. The cost

of the market basket is at current levels more because of the amount of packages, tin foil, prizes, frozen condition, barbecue preparation and self-mix commodities incorporated with food, than because of high price for food per se. But even then, research and development has made food abundant and cheap, with less than 8 percent of the nation's non-land resources required to produce it. This proportion of resources for food will drop below 5 percent, or even lower if the international opportunities and responsibilities mentioned later are not exploited.

Effectively, this route to food and subsistence was more efficient than one which might have caused 25 percent of the nation's resources to be devoted to agriculture; with food per se available to consumers at zero price. The United States long has had definite and conscious public policy leading to the development of agriculture and the lessening of the real price of food. This developmental policy has had reflection over the past century largely in the public investment in, and conduct of, research and education leading to farm technical advance. (Previous to this period, it took the form explained later.)

This public investment, in agricultural colleges and the USDA, was highly successful in aggregate benefit to consumers and in greatly aiding the nation to attain affluent consumption level. But, to the public which provided the funds, to the staff and administrators of agricultural colleges and even to farmers themselves, this was largely an unwitting process and outcome. Research and development as a social or public activity was undertaken with focus on greater income or benefit to farmers. The fact that the consuming society would be a major beneficiary, a notable attainment and group, was not foreseen because early legislators, administrators and farmers had little knowledge of price and income elasticities of demand. In recent decades, wartime demand excluded, the rapid and continuous progress in technology and food supply has caused larger farm outputs to fetch smaller revenue; a debit in the agricultural economy but a credit in the consumer economy.

The Martian might ask: What could be better than abundant food at low price, if some economic sector is not caused to sacrifice for this noble attainment? From a consumer's standpoint, little could be better than abundant food at low price; unless the Martian took pity on "poor World persons" who must devote any part of their income and resources for acquiring food, and daily dropped a free bundle of food on each doorstep. The "food drop" would not, of course, be optimum for farmers; just as benevolence on the part of Switzerland, in providing each American family annually with a new car, would not cause U.S. auto producers to be made "better off." Public policy in economic development in food supply is a noble and worthy policy. It has been efficiently pursued in the United States and the returns to American society have been great.

Development of U.S. agriculture was not left to the forces of the free market, nor was there ever an attempt to completely replace the private sector in these activities. Gauged in its own progress rate and against

agriculture of other nations, U.S. agriculture evidently has had a near-optimum mix of investment and assistance by the private and public sectors. The nature and extent of public assistance has changed with the passage of time, economic growth and alteration of demand elasticities. At earlier stages of growth, the public sector made a relatively greater contribution to progress of agriculture. Gradually, the private sector is coming to make the largest contribution. As indicated in a later chapter even research expenditures of private firms have come to equal or exceed those of land-grant colleges and the USDA.

In the broad perspective of time, shift in agricultural policy from that of early America to that of the present has been consistent with changes in economic structure and market possibilities. But in isolated decades, policy has not always been abreast of the change about agriculture. In the first century of the nation, most consumers were farmers and income gains to the latter meant utility gains to the former. Nearing the end of the second century, however, most consumers are not farmers and what is best for the next generation of consumers is not necessarily best for this generation of farmers. (This is a difference which disappears only if we look far enough into the future.) Historically, and unwittingly, American farm policy has been oriented appropriately towards consumers, if we consider the change in social structure mentioned above. In the long-run context of democratic society, consumer focus of policy is correct since this is the ultimate end of economic and political activity. Over several generations, in societies which do not maintain permanent and inflexible caste systems, consumers with origin in one producing sector are not unique from those with origin in another. In the short run, however, this is much less true and policy to benefit the present or future consuming society is not always consistent with benefit to a producing sector such as agriculture.

Fortunately for American society, early policy aimed at gain for agriculture, and with emphasis on economic development, particularly benefited subsequent generations of consumers; a type of "wind-fall profit" which did not serve in the payoff calculus with policy initiation. In recent decades, however, it has become necessary to distinguish between the gains to consumers of future generations and gains and losses of farmers in this generation. Agricultural policy has been formulated accordingly, with elements for gains to both existing side by side. Too frequently, and more than in past generations, these elements are in conflict within the current generation or decade—much more so than for developmental policies of a century ago. This point is illustrated in the brief historic review of policy which follows.

POLICY MEANING

Governments initiate and implement agricultural policy for one or both of two purposes: to benefit consumers or to provide gain to producers. Policies fall mainly under two categories: (1) developmental policy and (2) compensation policy.

We term *developmental policies* those which have focus on the supply functions of commodities and resources. Developmental policies generally have the purpose or effect of increasing commodity supply. Generally, too, they reduce the real price of food to consumers. In other words, the commodity supply function is shifted to the right, in price-quantity space, through reduction in the price of resources, through alteration of productivity coefficients entering the production function or through increase in supply and supply elasticities of resources used in agriculture.

We term *compensation policies* those which attempt to compensate farmers in various manners in order that positive-sum utility outcomes, or the Pareto-better conditions outlined later, can be better guaranteed. Thus while developmental policy has the effect of moving the supply schedule to the right, compensation policy tries to restrain the rate of supply increase, or to decrease supply, in order that farm income can be increased. Compensation policy also may operate on the variables of the food demand function, in order that commodity price and farm income might be increased. Or, it might be directed towards direct payments to compensate farm producers for sacrifices which fall on them as they contribute to advancing technology of agriculture. In developmental policy, the main effect is in causing supply to increase at a faster pace; in compensation policy, the main effect is to restrain supply, increase demand or make direct transfer payments.

The two general policies outlined above are those of major economic concern and political importance for commercial agriculture. Other policies have somewhat different purposes, but often can be classified under the above headings. The regulation of markets and protection of food quality under the Pure Food and Drug Act is an attempt to affect the supply function of farm commodity with particular characteristics. Soil Conservation policy is of specific nature, but it also is an attempt to alter the supply function of agricultural commodities in present and future time periods. Farm credit policy is one altering the price of a resource (capital) and is expected to have an effect in changing commodity supply functions of individual farm firms. Alteration of supply and demand functions is not the end or goal of farm policy, but only a means. The end of relevance is increased farm income or consumer welfare. In some societies, policy focuses on the food supply function with the major end of safeguarding consumer subsistence and utility. In others, policy focuses on the food supply function as a means of increasing farmer income. Developmental policy with effect of supply increase can provide gains to both producers and consumers under certain conditions of price elasticity of demand for food. Under other elasticity regimes, policy which shifts the supply function to the right provides positive payoff to consumers and some producers, but negative payoff to other producers.

Policies aimed at instability variables of agriculture have focus on the commodity supply function. For example, an ever-normal granary plan which causes the market supply of grain to be lessened in bumper years but increased in drought years operates on the supply function,

but is hardly a developmental policy. Monetary policy and low interest rates—to increase the demand for money and the supply of employment opportunities—is a similar policy with effect on structural relationships underlying the market, but is not directly a national developmental policy. Laissez faire also is public policy, since the structure of the economy in respect to supply and demand of particular resources and commodities and the pattern of resource and income allocation has a particular configuration under it. It is a policy approach as much as is public ownership of resources to produce education through schools and communication through the postal system. In cases such as education, postal services and police protection, the public has made the decision that the services can be supplied more efficiently and equitably by public production than through private supply. In sectors where production and supply functions have been left to private firms and industries, society has made a similar decision. Our concern here, however, is with policy where the public has directly undertaken alteration of demand and supply functions of commodities or otherwise has altered the flow of income and the gains of progress among consumers and farm producers.

HISTORIC AND ECONOMIC PATTERN OF POLICY

The policy matrix of American agriculture has contained elements both for development of the industry and for income support or compensation. Developmental policy began with initiation of public decision-making by the United States as an independent nation. It has continued vigorously up to the present. Policy to support incomes and provide compensation is of much more recent origin, dating mainly back to the 1920's.

But even before initiation of the United States as an autonomous political entity, farm policy was already showing some of the characteristics of that followed today. Gray reports that production quotas were used in Virginia tobacco production as early as 1621.[1] "Stinting of production" was used to bolster prices. Each grower was allowed 1,000 plants with nine leaves harvested per plant. In 1630, quotas were raised to 2,000 plants per man, woman and child and tobacco was not to be sold at less than 6 pence per pound. Outright sale of tobacco, except through merchants, was prohibited. In the latter year, not more than 14 leaves per plant could be tended and only nine could be harvested. Over the period 1639–41, an aggregate annual quota of only 1,200,000 pounds of "good quality, stripped and smoothed tobacco" could be sold.

That the public should actively provide policy for agriculture was decided early in the nation's history. There was, of course, debate over

[1] L. C. Gray, *History of Agriculture in the Southern States to 1860*, Carnegie Institute, Washington, 1933, pp. 224–70.

whether the structure of agriculture should develop under the forces of the free market as they prevailed at that time, or under a mold provided through public policy. The latter became the basis under which agricultural development took place. In the debate between Hamilton and Jefferson, the former wanted to commercialize land distribution.[2] Evidently the supply would have been distributed to the private sector, with distribution to farmers then made accordingly. Jefferson, whose philosophy came to prevail, wanted greater access in total supply and a nation of farmers who worked their own land. Hamilton would have allowed large sales to individuals and speculators, with land sold to greatest financial advantage. Rather than Hamilton's plan of private sales and distribution, the pattern of the family farm was established in public distribution directly to farmers.

Initial Policy for Development of Agriculture

The American public has long played a direct and major role in the development of agriculture.[3] Its policy has not been laissez faire, but direct assistance and intervention in the market for factors; particularly if we consider technical knowledge as a particular resource. Developmental policy has had the effect of getting resources effectively utilized and of increasing the supply of agricultural commodities. Aside from ownership of productive units and resources, no other country has had a more direct and effective participation of the public sector in technical development and supply increase. Even initial development of agriculture was not left completely to the free market. The private sector contributed greatly to the growth and development of the industry, but so did the public sector.

Early policy for agriculture concentrated on the public acquisition and public distribution of land resources for farmers. The emphasis was accordingly because labor was abundant and prospective farmers possessed their own supply. Capital, while extremly short, was a lesser component of production in the techniques of the time. The public created agencies to disburse the supply and land was allocated at very specific prices. These prices for resources were just as purposeful as commodity price supports of recent decades. Land was provided to farmers at prices ranging from zero upward, depending on the time and the method used. The *immediate* purpose was to provide farmers and potential farmers with resources at favorable prices, as a means of increasing their income. The method was accepted as the "American way,"

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[2] See M. R. Benedict, *Farm Policies of the United States, 1790–1950*, Twentieth Century Fund, New York, 1953, pp. 5–13.

[3] H. W. Broude (in G. J. Aitken (ed.) *The State and Economic Growth*, Social Science Research Council, New York, 1959) shows that for the U.S. economy, the government was decisive in westward development and while the public outlay was small, the public role in stimulating growth for the whole economy was large. He states that the government was never negligible, even in the most autonomous sectors. For a somewhat similar discussion, see Cyril E. Black, "The Politics of Economic Growth," *World Politics*, July 1961.

although it entailed public rationing rather than private sale and market distribution of land resources. Farmers of the time not only would have protested but would have taken musket in hand had it been otherwise, even though the next set of transactions in land were turned largely over to the market. The *secondary* (but perhaps the more important) purpose of this public policy was development of the nation and the consequent securing of its territories. Given the setting in respect to market development, population increase and demand elasticities, the immediate purpose was mainly compatible and complementary with the second purpose. Would-be farmers and settlers not only wished more income, but most even wanted a greater amount and variety of food and clothing. Public policy gave them land, or sold it at low price, and allowed them to have this increment in real income. It also caused the land to be settled and national income to grow.

But connecting the settler who benefited from government distribution and pricing of land and the consuming society was a market environment which allowed farmers to develop their land and increase commodity supply to the direct benefit of both groups. Under development and commercialization of agriculture, with production exceeding subsistence needs of families and a portion of output flowing to the market, the market was highly elastic and accommodated an expansion of supply. First, the population was increasing rapidly, and slow but steady industrialization led more of them to the city where they produced much less of their own food. Second, people were poor in today's standard and increase in supply leading to a decline in real price of food could cause per capita consumption to increase. Price elasticity of demand for food in aggregate probably was such that greater output selling at a lower price, with percentage increase in output being greater than percentage decline in price, fetched a larger farm revenue. Too, starting from a low level, increase in national and per capita income allowed a large parallel increase in per capita expenditures on food, except for the few commodities of the time which could be classed as inferior goods. Hence, the public policy of settling the lands and increasing the supply of farm commodities could qualify as effort to benefit both consumers and farm producers.

But since the majority of households were those of farms, only the one facet needed to be made explicit. To provide farmers with more resources was to provide them in the aggregate, with opportunity for even more income. Farmers who accepted this opportunity, by settling public land which was free or priced lowly, could remain on it accepting the capital gain forthcoming from a growing population and consumer market. Or, they could exercise right to the capital gain; selling the land and moving to new locations where public policy again provided them with resources at low prices. Much of the early ability of agriculture to develop and increase commodity supply stemmed from this capital gain; a source of developmental funds which grew not from the efforts of agriculture but from development of the economy around agriculture. As

population, the national economy and market demand for farm commodities grew rapidly relative to agricultural supply, prices of developed land also grew. Farm assets and equity increased similarly and farmers could borrow greater quantities of funds, on the basis of capital gain in land values.

The capital gains, representing the difference between the publicly determined price at which land was distributed to settlers and that which came to prevail because of population and national economic growth, provided inheritances for the next generation of farmers. These inheritances provided capital which could serve for further development of agriculture (in either settled or new regions). This source of capital is often forgotten in comparisons which contrast the historic development of American agriculture with that currently found in India. Indian cultivators lack, because new land is not available, this opportunity for capital gain and its reinvestment in agricultural development.

As long as American public policy could provide farmers with favorably priced land and eventual capital gains, they sought little else. They were not pleased with the high cost of borrowed capital or with short-lived depressions. But since subsistence and a large family labor supply were in their possession, they could "wait out" the opportunity to realize the expected capital gain forthcoming from land development and growth of society. Given the conventional or customary goals and motivations in consumption, this opportunity stemming from public policy was highly acceptable and satisfactory. Farmers asked little more from the public. Relative to the standards of income and consumption, this policy of resource pricing policy had much more permanence in economic effect than commodity price policy of recent decades. Its longer-run effect was more akin to current policy which might provide farmers with several shares of IBM stock. These latter assets would augment real income by a small amount, but farmers could hold them for capital gain and purchase other assets from their sale. Or, they could hold the stock for retirement purposes. Both consumers and farmers would now be better off, had we reconstituted this historic capital gain policy and used funds devoted to price supports and storage of recent decades to purchase IBM or other growth stocks for farmers.

Complementarity in Early Developmental Policy

Agricultural development policy allowed complementarity among such goals as farm income attainment, consumer welfare and general economic growth during the first century of the United States as an independent nation. Farmers of average efficiency expected little more of public policy than that it provide them with resources to acquire current income at the standard subsistence level and the prospect of a capital gain for asset accumulation. Bravery, hard labor and insulation to hardship were required for utilization of this opportunity to overcome nature's niggardliness and the disadvantage of little capital. But simultaneous development of agriculture, increase in population and con-

sumer sector and national economic growth fed one on the other. Policy concentrating on larger supply and low price of resources allows complementarity among the three goals of (1) increased farm income, (2) greater consumer welfare and (3) enhanced national economic growth, only under conditions where markets are expanding and demand is of sufficient elasticity in respect to price. This is true because policy leading to decrease in price or increase in quantity of resources has the strong effect of increasing product supply. We have no empirical quantities indicating magnitudes of price elasticities in the first century of American society. Apparently, however, the rate of population increase and restricted diets of consumers plus the elasticity of the international market, provided an elasticity regime which allowed greater output to be accompanied by greater revenue of agriculture. Population and demand for food increased at a pace equal to that of agricultural supply. A large portion of the increase in supply was consumed directly by a growing number of farm families. However, demand for food also grew rapidly in nonfarm consumer sectors. Without increase in food supply, the real price of food would have increased and/or population growth would have been restrained.

Second Stage in Agricultural Development Policy

This first and widely implemented public agricultural policy was highly successful. It was consistent both with income interest of farmers and national economic development. Nationally, gluts of farm products did not arise and the public was not forced to provide commodity storage and price supports to offset success in increasing supply of farm products. This policy had lasting effect for particular generations of farmers, as the feed back of economic development caused land values to increase and gave rise to capital gains largely apart from the efforts of those who broke out the soil. But opportunity for this early developmental policy ceased to exist with complete settlement of the public domain.

As a next step in policy for agriculture, society again looked in the direction of resource pricing and supply—variables related to supply of farm products. They turned to public support of research for agriculture. Although additional land for settlement at publicly determined prices was lacking, the equivalent existed in the possibility of new technology to increase the productivity of settled land. And the second major element of policy for agriculture turned in this direction. Research to increase the productivity of land and other resources could have been left entirely to the private sector. But American society did not choose to do so. It socialized research and set up the U.S. Department of Agriculture and the agricultural colleges to uncover new technology and communicate knowledge to farmers. This policy element was not forced on farmers. It came largely at their request, just as had been true of the previous policy in respect to land distribution and pricing.

Rudimentary knowledge of economic relationships and agricultural

production processes would throw this element of policy in the same developmental category as previous land distribution and pricing. Both represent manipulation of variables by the public which tend to augment output and the supply function. This point is illustrated by the simple relationships below where particular algebraic forms are used for simplicity purposes. (Our analysis following involves only a shift in the supply function and not a change in structure as represented by a change in elasticity or slope of the supply function.) The production function for the industry (see footnote discussion) is (1.1) where Q_p is the quantity produced, X is resource input and π and b are coefficients of production.[4] The resource requirements equation is (1.2) and the

$$Q_p = \pi X^b \tag{1.1}$$

$$X = \pi^{-1/b} Q_p^{1/b} \tag{1.2}$$

$$Q_d = cP^{-e} \tag{1.3}$$

demand equation is (1.3) where Q_d is consumer purchase at specific price, P is price per unit, e is elasticity of demand and c reflects the effect of population, per capita income and other relevant demand variables. The industry supply equation becomes that in (1.4) where quantity produced in expressed as a function of the quantities already defined (see footnote 4).

$$Q_s = (b\pi^{1/b} P P_x^{-1})^{b/(1-b)} \tag{1.4}$$

$$R = c^{1/e} Q^{1-1/e} \tag{1.5}$$

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[4] More exactly, $\pi = aX_1^{b_1}, X_2^{b_2}, \cdots, X_n^{b_n}$ and represents the production effect of fixed resources not under consideration at the moment while for the particular algebraic form, b is the elasticity of production. Selection of one algebraic form does not affect the conclusions since those presented are general.

In the relations discussed for equations (1.1) through (1.5) we simply skip several steps in aggregation, for purposes of simplified presentation of certain illustrations. For example, rather than present production and supply functions for individual firms and aggregate these to obtain a set of industry relations, we simply start with a production function for the industry, and move immediately to an industry supply function in a static context. We do so because our intent is the "simplest possible" presentation or illustration of certain conditions and outcome. To start in the more detailed manner of firms and aggregation would cause the presentation to be more complex and clumsy. (Some will charge that we have already made it too complex.) Other problems to be analyzed would have their focus of interest in the variances among strata of farms and in the nonstatic factors affecting decisions and supply response.

However, since our focus of interest here is in aggregate relations in production, especially in respect to *ex poste* outcomes in production, resource use and incomes, we feel justified in "abbreviating" our analysis in the manner outlined. We look upon it as the counterpart of graphical presentation in other books where concern is not exercised over simple presentation of aggregate relationship. While we recognize the limitations of the static, aggregate approach for selected purposes and predictions, we believe that they serve well for the goals of illustration at hand. If nothing else, the reader might satisfy himself by supposing that there are n firms in the industry which we portray here, and that the firms' production and supply functions are simply n^{-1} portion of those for the industry.

It is obvious that a reduction in P_x in (1.4), the per unit price of resource, is expected to cause production to increase. This is the expectation of developmental policy which lowers the price of a resource such as land. If we look upon technical knowledge as a resource, as it generally is, and the public lowers its price, output would be expected to increase similarly. If, however, we view the effect of technical change to be that of increasing the production coefficients π and b in (1.1), the effect will be similar, since larger magnitudes for these in (1.4) will also cause Q_s, supply quantity, to be greater. The total revenue of the industry, R, is derived from the demand equation as price times quantity and is expressed in (1.5).[5]

From this it is apparent that whether R, total revenue, increases with Q, quantity, will depend on the magnitude of e, the price elasticity coefficient in (1.3). If e, the price elasticity of demand, is 1.0, the value of $1-1/e$ is zero and greater output will not increase or decrease revenue with Q. If e is less than 1.0, $1-1/e$ is negative, causing revenue to decline as Q increases in (1.5). In the opposite case, where e is greater than 1.0, $1-1/e$ is positive causing R to become greater as Q increases. Evidently, the turn to research as the second major policy element for agriculture was under the unwitting belief of price elasticities of demand greater than unity. Only so could total revenue of agriculture be increased generally from an increase in supply, the expected result from technological improvement. The public thus adopted socialized research services as a means for increasing farm income. This was certainly the primary reason for policy which had the public, rather than the private, sector invest in and undertake the major portion of research and education in agriculture. Other secondary reasons may have existed and are mentioned in legislative documents. However, it is clear that the dominating reason for establishing socialized or public research for agriculture was to aid farmers and increase farm income. Major research for other economic sectors was left to private firms. But in agriculture, the public invested in its own research plants, hired the personnel and went about the production of new techniques, just as it had in producing postal and educational services.

The second stage of policy was initiated before the first, public distribution and pricing of land, was completed for two reasons: (1) The supply of unsettled public land, the basis of the first policy element, was nearing exhaustion and (2) farmers in older settled regions wished developmental gain similar to that which had accrued to their fathers and grandfathers—who needed move only a few hundred, rather than a few thousand, miles west to realize it. While refined elasticity estimates are lacking, the demand situation at time of establishing the agricultural colleges and USDA was one which allowed developmental

[5] This revenue relationship exists because $R=PQ$ and from (1.3) $P=c^{1/e}Q^{-1/e}$, with the latter value of P substituted into the revenue equation.

policy leading to an increase in supply, to be consistent with greater farm income. America's rate of population growth in the nineteenth century was one of the greatest on record for a major country. Foreign demand was expanding and a growing portion of the population was in cities and produced less of their food. The level of urban per capita income was not high and reduction in the real price of food, as well as national economic growth and per capita income improvement, provided demand elasticities favoring greater consumer outlays on food.

Establishment of the USDA and the land-grant colleges around 1860 did not result in an immediate burst in new technology and farm product supply. The main momentum in development of agriculture in the half century following the Civil War was probably the capital gains still flowing from early land policy and the effects of public education. Not until a quarter century later was federal aid for experiments made to states, although a fair number of states had already appropriated funds for this purpose. The Department of Agriculture was consolidated and raised to Cabinet status in the decades of the 1880's. The state experiment stations were created by the Hatch Act in 1887, the state extension services through the Smith-Lever Act of 1914 and vocational agricultural training by the Smith-Hughes Act in 1916. Hence, this general complex of agricultural development policy did not gain great momentum until after the turn of the century, although its basis had been created earlier. The major outpouring of results has been in the last four decades when federal and state appropriations have increased greatly and during a period when demand elasticities have been much less consistent with (1) greater income from increased supply and (2) certainty of positive-sum utility outcomes in the distribution of progress gains among producers and consumers. (See Chapter 16 for portions of outcome from technical improvement and greater resource use.)

However, the lack of a more vigorous research and education program as a means of augmenting agricultural revenue was not looked upon as a major restraint to opportunity for farming and farm income. Some public lands remained to be settled after 1860. Too, rapid growth in population and consumer demand, and the national economic development accompanying it, continued its feedback to agriculture. Further capital gains accrued to farmers in settled regions as land values grew and as more resources were used on given land. Improvement in agriculture did occur as farmers became acquainted with climatic and other characteristics of new regions and as their own practical experimentation bore fruits. Still, farmers sometimes experienced market gluts and were beginning to learn about depressions. This development was inevitable as farming moved more from subsistence to commercial, with a greater proportion of the product marketed. Initial public policy relating to demand increase arose accordingly. Land grants were made to railroads to catalyze development of marketing facilities, as well as to bring further settlement of the frontier and national development.

Agricultural developmental policy, expressed through public investment in research and educational facilities, picked up momentum as land area became fully settled. Creation of public facilities for production of new technology by society soon spread to every state. Many states now have several experiment stations. Appropriations for agricultural research and education has increased rapidly in recent decades. Public appropriations for these purposes have increased greatly since World War II, with the need sold to the public largely as a means of increasing farm income.

Acceptance of Developmental Policy

Agricultural developmental policies were readily accepted in the century and a half after formation of American society because (1) the stage of national economic development caused them to be successful in increasing farm income and (2) they were consistent with the particular value orientation of pioneer farmers. This value orientation revolved around individualism and freedom of decision. Agricultural developmental policies placed resources and techniques in farmers' possession, allowing them no less expression of individualism. The two goals, increased farm income and independence, were not competitive in the early stages of national economic development. Policies which gave farmers land at restrained prices or technical knowledge at zero prices simply provided the substance for more families to exercise individualism, or for given families to have more "decision subject matter." But at later stages of economic development and higher per capita incomes, with consumer stomachs filled to the limit of physical desires, demand elasticity settings need not cause agricultural developmental policies to produce positively of both farm income and greater opportunity in individualism.

Policy which calls for augmentation of resources in an industry is more universally popular and gives rise to discord less than policy which assumes an outflow or restrained quantity of resources in an industry. The reasons are evident. Under conditions causing the former to be appropriate, firms already in the industry are relatively profitable and new opportunities exist for resources, particularly human, which wish to enter the industry. But policy which assumes a restraint or outflow of resources, particularly labor, provides the opposite. Early agricultural development policies best corresponded with the former. Recent compensation and related policies more nearly have to assume the latter condition.

Other Agricultural Developmental Policies

Given the early setting in stage of national economic development, demand growth and elasticity regime, agricultural policy continued to reach towards the "favored developmental direction." With full settlement of public lands and continued population growth, the initial policy (land supply and price) for agriculture was "closed out." The

second one (public supply and pricing of knowledge) was not yet moving ahead rapidly. Too, with full settlement of land supply attainment of the spatial restraint for agriculture, price of land increased greatly. And while this provided continued capital gain for established operators, it gave rise to large capital requirements for those who wished to purchase land and begin operations. It was only natural then, that a "next step" in policy was also developmental in character and was aimed at the supply and price of capital.

By 1912, the price and terms of agricultural credit were the concern of all three major political parties. This concern led to the Federal Farm Loan Act of 1916, giving rise to the Federal Land Bank system with the principal purposes of lower interest rates, longer terms for repayment and greater opportunity of farm purchase by tenants. It was supplemented with the creation of the Federal Intermediate Credit Banks in 1923. Agricultural development policy was extended further through credit supply and pricing by the Farm Credit Administration and Production Credit Administration in 1933, the Resettlement Administration in 1935, the Farm Security Administration in 1937, the Farmers Home Administration in 1946 and others directed at public impact in factor markets.

The major goal of all these policy elements was lower prices or greater supply of credit. The purpose was to increase the farmer's income through lowering credit costs and extending his capital by lessening the restraints on its supply. Effectively, public credit mechanisms also qualify as developmental policies. They are equivalent to reducing P_x or increasing X in equations (1.1) through (1.5). Hence, expectation is that they will increase supply, Q_s in (1.4), for the firm and for the industry. In respect to the firm, the immediate end is increase of income through greater output or lower factor cost. For the industry, aggregate increase in supply can cause revenue to increase only if demand elasticity is greater than unity.

Many other agricultural developmental policies have been tried by American society. Their results have sometimes been less general, with application to particular localities. Included in this category are the professional services of the Soil Conservation Service (SCS) and the monetary assistance of the Production and Marketing Administration (PMA, but subsequently ACS and ASC), both established in the early 1930's; and the Bureau of Reclamation established in 1902 with major purpose of large-scale water storage and irrigation development for arid lands. These policies also have led to lower costs and greater supply of particular resources for the agricultural production process.

Minor programs of the same general category, but recognized more directly as supply increasing policies, have included labor procurement and housing, subsidization of fertilizer production and pricing through tax allowances, and others of less importance. Also falling in the general category of agricultural developmental policy, in partial extent, have been public aid for farm-to-market roads, rural electrification and tele-

phones. While these policy elements provide important communication and consumer services, they also provide services for the production process.

THE SHIFT TO AGRICULTURAL COMPENSATION POLICIES

The United States was never without a major policy for agriculture. It did not remain aloof from functions performed by the market in other economic sectors. In early history, it emphasized agricultural development policies. It acquired and distributed land resources under administered prices. It built plants to produce and distribute new technology, allowing new technical knowledge to become a "near" free good to farmers. It created institutions to obtain credit and supply it to farmers at administered price levels. The primary purpose of these developmental policies was to increase income by allowing the individual farmer to acquire resources at lower prices and augment their productivity.

In aggregative effect, these policies are consistent with greater income to the agricultural industry in the proper setting of economic development; namely, a rapidly growing population and national income, high price and income elasticities for food. Supplementing this favorable domestic demand situation over the first century and half of the nation was a receptive world market which readily absorbed farm product supply exceeding U.S. requirements. A favorable exchange situation existed over part of the period because of the nation's debtor position. With interest payments, immigrant remittances abroad, etc., exports could exceed imports. Rates of industrial development and population growth in Europe, in conjunction with this exchange situation, provided a fairly stable market outlet, absorbing large quantities of U.S. farm products and placing a lower restraint on price levels.

But this setting cannot continue forever under growth of national economies which is rapid and continuous. A stage finally is attained where level of consumer income allows approach of satiation of physical desire for food. Forward press on the resource development and supply side of agriculture then can become inconsistent with greater aggregate farm income.[6] This stage of national economic development was clearly being approached by the early 1920's, and to an extent even in previous decades. Too, only then was the second major agricultural development policy, public production of improved technology, beginning its large social payoff in greater farm productivity and lower supply price of food. The rate of population increase, with greater restraints on

[6] This condition can also arise in the opposite case where national economic development is extremely tardy, unemployment is great, per capita income is low, and export markets are lacking. Rapid increase in agricultural output then also promises to depress income.

immigration, was much lower than over the previous century. Demand growth no longer paced agricultural supply growth. Conditions during World War I and the few years preceding it had been a "golden period" for American agriculture (being exceeded only by the similar period, 1940–50). After World War I, the high elasticity of the foreign market also was dampened. The United States became a creditor nation and European countries were less able to purchase farm products from interest payments and dividends on foreign investment. Growth of U.S. industry also lessened demand for European manufactured goods from abroad. Exchange for purchase of U.S. farm products was diminished accordingly.

Turn to Agricultural Compensation Policies

In addition to a slackening in demand, farmers were caught in the 1920's with high priced land and large debts. The latter, high land values and large debts, typically was proposed as the basis for the depressed situation of agriculture. While high land values and large debts gave rise to difficulty, they did not represent the basic problem facing agriculture. The industry had come to the end of an era in national economic development. The variables underlying demand growth were not of previous magnitudes. Consumers now had relatively favorable incomes and were well fed. Food demand elasticities fell to smaller magnitudes and continued development of agriculture caused supply to increase faster than demand.

Farmers did identify this change in economic environment. They turned towards policies based on concepts of compensation and self help. Large national cooperatives for major commodities were created, in hopes that demand could be expanded through promotion and quality control of farm products. Also it was hoped that price could be improved through more orderly marketing and market management or supply control. The emphasis in these efforts was now opposite the agricultural developmental policies of the previous century. In effect, emphasis over the previous century had been in enlarging the magnitude of π, X and b and in decreasing the magnitude of P_x in (1.1) through (1.4); all with predicted effect of greater output. The new turn was in lessening Q_s in (1.4); equivalent to decreasing π, X and b (but not effectively attempted at the time) and in expanding c and e in the demand equation of (1.3).

In previous decades, farmers had organized their own cooperatives as a means of breaking grain and other market monopolies. Now, however, interest arose in using cooperatives—allowing orderly marketing—to obtain possible price and income gains under monopoly supply procedures. These self-help attempts based on large-scale commodity cooperatives were generally unsuccessful. Farmers were too great in number, too widely dispersed and produced commodities serving too greatly as substitutes for each other. Also, farmers were not easily organized into

a voluntary group which could control marketings. Most planned commodity marketing organizations never really got under way and others proved of short life.

Inability of self-administered agricultural programs to increase demand and restrict supply caused farmers to look to the public for mechanisms and institutions which would overcome the inherent difficulties of voluntary organization. Not all farmers, then as now, favored turning to government for organizational aid and power, or in use of monopoly approaches. Yet major sentiment evidently favored this direction and the general approach was incorporated in major policy elements initiated in the late 1920's and after. With an extreme shrinkage in the terms of trade between agriculture and the rest of the economy in the 1920's, Congress passed, and President Coolidge vetoed, the McNary-Haugen two-price plan in both 1927 and 1928. Under it, domestic sales of major crops would have been restricted to amounts bringing the world price plus domestic tariff. The remainder of supply was to be sold in world market.

While it did not pass, the plan and the philosophy underlying it provided foundation and precedent for legislation and policy which followed. The Agricultural Marketing Act of 1929 was then passed, creating the Federal Farm Board; a first and formal step towards public compensation policy for agriculture. This act provided for lessening speculation, preventing inefficient and wasteful methods of distribution, aiding organizations of producers for unity of effort in marketing, creating producer-owned cooperatives and aiding in the control of surpluses. Some public action in price support loans and acquisition of commodities was initiated. But with the economic crash which followed in 1929, this legislation was small and ineffective. Even had the depression not followed immediately, the Agricultural Marketing Act alone probably could not have contained the coming explosion in agricultural productivity and supply.

The activities of the Federal Farm Board were a break from the past in the sense that focus was now shifted from developmental to compensation policies. It served as precedent to policies which followed. Legislation which followed in this same mold included the Agricultural Adjustment Act of 1933. It provided a more formal mold from which subsequent policy departed but little. The AAA, as it became known, provided directly for supply reduction and control, for direct monetary compensation or income transfers to farmers and for nonrecourse loans serving as price supports. These were major policy elements, serving even into the decade of the 1960's. Not only were methods provided for restraining inputs, reducing X in (1.5), but also for lessening output, reducing Q_s in (1.4). Farmers were paid a cash price to "deliver up" supply of idle land, to reduce hog farrowings and to plow up cotton and other crops. They also were paid cash for hogs and cattle which were killed.

While these steps were oriented to compensation policy, they were

not without secondary effects as developmental policy. For example, price supports above market levels act on supply in the manner of increasing P in (1.4) and themselves serve as motivation for greater output. Adding to the complexity, an increase in commodity price has the effect of causing reduction in foreign sales, a market with greater price elasticity than the domestic market.

Largely, at the time, the AAA was looked upon as relief or emergency legislation, just as were PWA, NRA and other efforts to divert income and purchasing power into households and to raise the economy from the trough of depression and unemployment. The competitive nature, inelastic factor supply and proportionately large fixed costs of agriculture kept it producing at full speed during the depression. It did not need "pump priming" to bring about full employment of its resources. In contrast, unemployment of the nation's labor force ran as high as 15 million and industrial firms and sectors idled major portions of their plants to meet demand shrinkage and aid in price maintenance. The AAA, in major part and like other agencies, was looked upon as temporary measure to combat a short-run adversary.

An economic wisdom began to prevail, prior to World War II, that national economies attain maturity and may prevail in a state of equilibrium with a large degree of unemployment. An agricultural economic wisdom also prevailed; namely, that depression of price and income in agriculture were largely a function of national depression; that restoration of full employment and consumer incomes would return a favorable demand situation to agriculture. With intensive monetary and fiscal policy, as well as more direct emergency measures, the nation lifted itself from pure economic prostration during the late 1930's, although full employment was still far away. Then World War II broke out, providing full employment and a new demand situation for agriculture. Employment and growth in the national economy were maintained at high levels in the post-war period. Farming was highly profitable.

Starting in the early 1950's, however, the paths of national economic development and prosperity and agriculture parted ways in respect to relative magnitude of incomes. National and per capita income grew, but farm returns sagged. Temporary foreign demand for food ended. Agricultural supply had increased greatly during the war and post-war years, due to previous and ongoing public investments in developmental policies through the agricultural colleges and the USDA, growing developmental contributions of the private industry, the stimuli of war and favorable price relations, and the favorable capital position of agriculture. But it was obvious that solution to the basic commercial farm problem was no longer through the national economy, in full employment and further growth. The demand environment which had been consistent with public developmental policy for agriculture and farm income growth in the century and a half prior to 1920 had ended, at least temporarily.

Agricultural policy returned emphasis to the molds of the 1930's; to

mechanisms which assumed temporary conditions to be overcome. Much legislation still existed, allowing activation of compensation-type policies used mainly in the decade prior to the war. The Commodity Credit Corporation, created in 1933, provided for price-support loans and for purchase and sale of commodities to stabilize and support prices. The 1934 Sugar Act, amendments to the AAA and its successor and the Soil Conservation Act of 1936 served for similar purpose. The Federal Surplus Commodities Corporation established in 1936 and providing for food subsidies and surplus purchase and disposal, the National School Lunch Act, and the Food Stamp Plan, all enacted with precedent in the 1930's and with emphasis on demand expansion were continued or amended during the 1940's and 1950's. This entire set of policy means, generally created in the 1930's, were again focused on agriculture as the 1950's gave rise to farm prices and incomes which not only shrank from their post-war highs, but continued to do so as national and per capita incomes grew to new highs.

The means employed into the 1960's also were those for which precedent was supplied in legislative action of the 1930's. Some of the measures, such as price supports, had been used during the war years as a method of increasing supply. They were used in the post-war surplus period as a method of supporting income; a use highly inconsistent with the supply conditions of the period. Other direct actions to lessen supply or increase demand and price also were initiated in post-war years. The 1954 Act allowed the Secretary of Agriculture to use compensatory payments for wool, augmenting the effective price and income of wool growers but allowing the commodity to compete freely in world markets. The original AAA allowed federal subsidy of export of farm products. This outlet, on market scale, was extended in the 1930's under the Jones-Connally Cattle Act, the Jones-Costigan Sugar Act and the Soil Conservation and Domestic Allotment Act of 1936.

But the truly large efforts in this direction came after the war, under particular provisions of the United Nations Relief and Rehabilitation Program, the Economic Security Administration and the Mutual Security Agency. While not all of these efforts correctly fall under farm policy, the latter became more the emphasis under later foreign-aid programs, especially Public Law 480. Policy began placing great emphasis on improving domestic producer price by shipping supplies to foreign countries where they might restrain prices. Potatoes were purchased and destroyed under the Steagell Amendment in 1946 and 1948. Other commodities were purchased similarly to lessen market supply and bolster prices. The Research and Marketing Act of 1949 was directed towards market and demand improvement. Acreage control and marketing quotas were reenacted. The 1956 Conservation Reserve Act serving for land withdrawal and a modification of earlier supply control methods, rested on direct cash payments for holding resources out of production.

In the swing from focus on developmental policies to compensation policies, power to manipulate variables which might lessen supply or in-

crease demand were not left alone in the hands of public agencies. Bargaining or price setting power also was placed in farm producers' hands through enabling legislation. Precedents for federal marketing orders were provided in the original AAA of 1933 and several states followed with legislation providing for market orders. Federal legislation allowed quantity and quality control of product, with consequent price affects, for selected commodities. An extension, under the 1937 Agricultural Marketing Act, provides for minimum prices to producers of fluid milk. Hence, precedent in federal and state legislation was provided to place market or bargaining power, of the nature possessed by firms and labor unions in other industries, in the hands of farm producers.

POLICY TRANSITION

Post-war policy elements have fallen largely in the compensation vector. Initially, these elements were established to "live out" the emergency of the 1930's. They have not solved the basic problem of a commercial agriculture in a wealthy and expanding economy—at least for most major commodities. Supply has continued to grow, aided by public developmental policy and improved resources and resource prices by the private sector, at rates faster than domestic demand increase. Consumers have continued to gain in lower real price of food and in resources freed to produce nonfarm commodities. In general, the policies of the 1940's and 1950's have not yet solved the problem of progress in agriculture; namely, a distribution of positive gains over the consumer sector and costs or sacrifices over the farm sector which guarantees positive-sum welfare gains for the entire community. While they have provided compensation and put income into the hands of commercial farm families, they have done little in solving the poverty problem of agriculture. The most that can be said of policy since 1930 is that farmers and the public have partially come to recognize that a new problem setting exists in national economic development. Change in philosophy and emphasis is illustrated in shift between policy focusing mainly on agricultural development and that directed to agricultural compensation.

The policy transition has been one of variables manipulated, rather than one of direct government participation or intervention in market mechanisms in one period but not in the other. The magnitude of government compensation policy, whether measured in number of legislative acts, public agencies, expenditures or manpower employed in implementation, has been much larger in recent decades than developmental policy in early decades.[7] Yet it has been no more purposeful, or successful in terms of farmer economic interest, than early agricultural develop-

[7] This is not true in the relative sense of national income and wealth if we compare the value of public land distributed to farmers at particular prices in the first century and a half against the direct monetary costs of policies in the last three decades.

mental policy. In both cases, private firms and actions within and surrounding agriculture have dominated the decisions and resource use of the industry. Policies in both periods altered the decision-making environment, but no more so in the recent than in earlier decades.

SUMMARY

We have summarized the economic setting in which modern policy for agriculture must be formulated. The nation has always had a definite policy for agriculture. It has relied on market forces as the major variables in allocating resources and affecting decisions in both early and recent times. Yet, over its entire history, the American public has had policy which manipulated variables affecting the pricing of resources and products and the supply of and demand for both.

In early periods, American society was almost synonymous with agricultural society and what was best for one was clearly best for the other, in both the short run and the long run. National and per capita income were low and consumers in general were most intent on greater fulfillment of biologically based desires—food, shelter and escape from epidemic. This environment placed great premium on agricultural products relative to other commodities.

As industrialization developed, as income grew and as population doubled and trebled in short spans of time, the market had great absorptive power for agricultural products. In this situation, agricultural development policies for agriculture were ideal as means of attaining greater income. Society acted accordingly. It acquired, distributed and priced land; not through the market, but through its own institutions and at administered and purposeful prices. Resources could be drawn into agriculture and supply could be increased, with farm families with recipient of economic gain through (1) opportunity to produce their own food, (2) commercialization and sale in an expanding market and (3) capital gains, from title to land, through the feedback from national economic growth. Favorable export markets and exchange balances, with some continued public distribution and pricing of land to farmers, continued this favorable situation for agricultural developmental policy beyond the Civil War. As a second stage in agricultural developmental policy, the American public set up further socialized facilities; to produce new technology, to increase capital supply and to affect the pricing and supply of these resources.

But at another stage in economic growth, with the transition point coming around 1920, the nation had progressed to a point where agricultural developmental policy was no longer sufficient for gain to aggregate agriculture simultaneously with benefit to consuming society. The marginal urgency of commodities to fill primary or biological needs and their marginal rate of substitution for commodities filling secondary or psychological needs, had declined greatly. Demand elasticities fell low and demand growth no longer paced supply. It was then that American

society turned to agricultural compensation policies to lessen supply, increase demand and to support commodity prices and income.

The compensation policies initiated in the 1930's and extended to the 1960's were those with origin in deep depression. Their reemployment had the same implicit assumption as at the outset: emergency to get by a temporary situation. But the farm problem which has existed for more than three decades, with war period excepted, is not one of short-run nature. It will not be solved with patch-work compensation policy held over from the last major depression, or by developmental policy which projects the economic structure of the past century into the next two decades. While they have eased the income recession for agriculture, recent compensation policies have added little to solution of the more basic problems which are long run in character. The basic problem of recent decades, a period of affluence in a wealthy society, has been accompanied by large-scale secondary ones: mammoth surpluses and high treasury costs of policy. The total agricultural policy mix, including developmental policy to increase supply and compensation policy to restrict supply and effect compensation payments, hardly recognizes that the era has changed. Yet the more general environment of economic and social policy has itself changed. While much of agricultural policy has been oriented to short-run relief and emergency, American society evidently does not view this structure as that of positive policy. Industry, labor and professional sectors view positive policy as that of long-run nature which encourages economic growth and the avoidance of major depression; rather than that which might overcome major short-run fluctuation once they have occurred. Business and labor prefer growing investment and employment opportunity, not relief in the form of small government orders and unemployment compensation during recession. A wealthy society such as the United States should be able to afford this positive long-run policy, though it is of even greater importance in less wealthy countries.

Agricultural policy needs to be converted to this longer-run horizon in an economic development framework. It should be consistent with the economic horizon ahead, rather than with the developmental environment of 1910 and the depression environment of 1930. Perhaps the difficulty with farm policy is that it has concentrated too much upon agriculture as a society or economic sector apart from general society. Agriculture is held in fixational image as an isolated sector of the hinterlands with a peculiar set of goals and values. Accordingly, action programs have not brought it abreast of the stability, price and bargaining institutions which are now traditional for other economic sectors. Research and education have too much supposed that its resources must be headed uniquely back into the industry. They have not quite realized that farm children as members of general society may prefer to be treated accordingly, with training which allows them to take advantage of the major growth sectors in an economy of affluence.

The Fundamental Policy Question

Agriculture has, through development, contributed greatly to the national economy. For a short period, agricultural development meant absorption of resources and expansion of output to feed a growing population and to keep the real price of food reasonable. Later, agricultural development meant release of labor resources to the industrial economy. The major contribution of agriculture in recent decades has been production of food in abundance at low real price to consumers. Demand elasticities have been driven low and greater output has shrunk revenue to agriculture.

This nonsymmetrical distribution of gains from farm progress poses the basic policy problem of agriculture: How can agriculture continue to contribute to national economic growth and consumer welfare without being penalized in income for doing so? This is the basic policy question which must be answered for agriculture during the '60's and '70's. Society prefers growth and economic stability, with the former desired as an end in its own right but also as a means to the latter. In growth so inspired, and also spurred through international challenges and humanitarian appeal, how can agriculture continue to contribute, yet retain some reward for its contribution to national economic progress? How can human resources in agriculture, in both commercial and low-income sectors, be given greater opportunity in the further national economic growth in prospect? These are questions which we wish to examine in later chapters.