14

Policies of Land Input and Supply Period

THE RESOURCE of lowest supply elasticity for aggregate agricultural uses is land. The commercial farm problem of supply against demand stems, in the short-run and intermediate period, more from low elasticity and mobility for this resource than others of agriculture. Low labor mobility more particularly causes the chronically low-income or poverty problem of the industry, although it also is part of the longer-run commercial problem wherein farm incomes lag behind nonfarm incomes. Our statement refers to the immediate or direct effect of low factor supply elasticities on income of farm strata. Even as labor displays considerable elasticity in movement to nonfarm employment opportunities in the short run, use of land input does not respond so readily. Pressure is strong for it to remain committed to agriculture in previous magnitude for the industry as a whole and even greatly for aggregates of crops which are close substitutes as resources and foods. Hence, it is true that while magnitude of labor transfer has been large since 1940, aggregate land input has remained much more nearly at previous levels for major grain and fiber crops.

With further advance in technology, and with capital representing it serving partly as substitute for labor and partly as greater input against given land area, output has not only been maintained but has increased at rate exceeding demand growth. As explained previously, this process has been possible because of the organization of agriculture in pattern of small producing units with a great amount of underemployed labor and some underemployed capital. Farm operators and their labor have been able to leave agriculture, with the particular producing unit absorbed by a neighboring farmer. The land has remained in production, typically in the same crops over the short run, operated by the neighbor with his previous supply of labor and machine capital, or with only small increments, amounts smaller than withdrawn by the operator who left the industry.

Underemployment and the particular organization of agriculture have provided a large amount of slack in the industry, so that much labor could be withdrawn without diminution in output. (As indicated in Chapters 4 and 5, the greater managerial inputs and capital of remaining farmers have actually allowed supply to increase as labor of farm operators has declined.) Sufficient withdrawal of labor would cause diminution in output, either in eventually causing employment of land to decline or in causing shift to crops with lower labor requirements. For particular crop, the situation is that illustrated in Figure 14.1 where curves y_1 and y_2 are isoquants indicating combinations of labor and land inputs which will

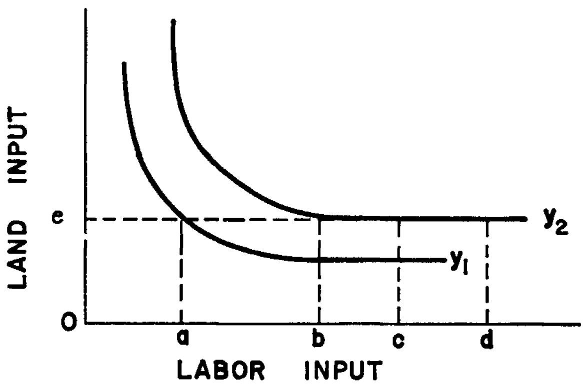

Fig. 14.1. Possibilities in Reorganization of Agriculture.

produce the specified levels of output in a region *or* for the industry. A given amount of land and labor, *oe* and *od* respectively, has been committed to agriculture. Consequently, output level represented by the isoquant y_2 has been attained.

Now, as some farmers leave the industry and their farms are taken over by remaining operators with underemployed labor, input of labor declines to *oc* but land remains at *oe*. Output can be retained at y_2 level, however, because of the particular structure of agriculture allowing the above rearrangement of resource inputs. The aggregate production function, under its particular institutional organization and with original labor input withdrawn in "lump sum" manner from individual producing units, is characterized by a portion of the isoquants with supplementary relationship between land and labor in the sense that the marginal rate of substitution between the two resources is zero. Zero rate of substitution extends back to *ob* input of labor. If labor resource declines below this level, land input remaining constant at *oe* level, output will then decline. For example, if labor input declined to *oa*, while land is held constant at *oe*, output will fall from y_2 to y_1 level.

In major U.S. grain regions, decline of labor has been mainly over a segment such as that between *b* and *d* on isoquant y_2. It has not been great enough itself, considering possibilities in reorganizing the structure of agriculture, to cause output to decline, with capital input in various forms remaining constant or increasing with new technology. Given further substitutability of capital for labor, and further extent for reorganizing agriculture as above, labor input can decline considerably more before it becomes a technical complement with land and capital, thus causing output to decline or be effectively restrained. As long as the land input remains essentially constant, output can be maintained, or even increased, with new technology.

The process of adjustment illustrated in Figure 14.1 is one which can increase the physical productivity of labor. With output at y_2 level, initial "gross physical product" per unit of labor is y_2/od. After withdrawal by *cd* it is y_2/oc. If, however, farmers who remain are able to use different forms of capital or technology to increase output against inelastic demand, the "gross value productivity" of labor will increase less rapidly, and not at all if output increases at sufficient rate. Labor input must decline by an amount which restrains output sufficiently to allow an increase in its marginal value productively, or to the extent that labor input is small in proportion to other factors, thus increasing the per unit value of product imputable to it.

Response elasticity of land to decline in commodity price is low for several reasons: In aggregate of agriculture the proportion of land needed for home and industrial sites and for public uses such as roads and airports is extremely small. At particular locations, the supply of land for these purposes is very limited and the price of the factor rises accordingly, with land also shifting readily to these uses with higher value returns. Yet demand from this source is so small that it has negligible impact on price of land in remote locations.

Given the magnitude of land supply, relative to demand for it in nonfarm uses over the nation as a whole, the reservation price of land in farm uses is practically zero. In respect to crops such as wheat, corn and cotton, the reservation price of land relative to supply of the resource for these uses is at the level of much lower alternatives such as grass and timber. Land will remain in agricultural production as long as the value of product forthcoming covers the short-run reservation prices of labor and capital which serve as its technical complements. Reservation prices for the latter resources are low for short periods but increase with time as the variables associated with labor mobility become more operative and as capital becomes used up or worn out (with its supply price then being based on outside industry and competition for resources, rather than on capital stocks on farms).

In the short run, then, land is able to command higher rents, as a result of surpluses and depressed price and with labor and capital accepting returns lower than in the general market, than over the longer run as supply elasticity of labor and capital increases. With lower rents, the value of land would be less and the problem of "level of resource returns" could be solved through restructuring of land prices. This is the general shakedown or adjustment which would be expected with "market-free" prices, following an abrupt change such as rapid increase in technology or removal of support prices or marketing quotas. Landowners must bear the cost of a decline in asset values or capital loss over the longer run, although this is not necessary in the short run as labor and capital remain committed to agriculture at levels of return lower than their long-run reservation prices. (Landowners also possess labor and capital, except under rented farms.)

This type of adjustment, with imputed return and land prices being at lower level as an avenue in solving the problem of "level of resource returns," does not, of course, obviate, the forces leading to transfer of labor out of agriculture. Decline in commodity price means directly a reduction in income for persons who own land, with the reduction continuing as a portion of asset values is thus melted away. Hence, remaining capital and labor of some families provide income low enough that they are encouraged to migrate. Thus in absence of inflation or scale returns allowing larger imputation to land under larger farming units, the direction leads to restoration of returns to labor and capital at a level more comparable to long-run alternatives in other industries. Compensation policies which modify prices, through price supports and quota systems, retard this decline in resource values and incomes, thus substituting "market management" for "open market" in solving the problem of "level of resource return."

Persistence of resources to remain in agriculture at low short-run returns pushes heavily on product supply, thus depressing family incomes. The problem is most severe for labor. But it also is important in respect to the short-run allocation of land among different agricultural crops or between farm products and nonfood services. Still, however, labor and land are linked economically, and the existence of excess labor in agriculture certainly has the effect of holding land to more intensive uses and in restraining its shift from surplus commodities. Contrawise, prices and tax structures for land, which are not geared to the services which the consuming society prefers from it, are also important in determining its employment pattern and the requirements or employment of labor as its technical complement. Policy or market mechanisms which cause a reallocation of land from surplus grain or cotton production to less intensive products such as grass, forestry and recreation also must alter the demand for labor in particular soils regions. It is, therefore, impossible to separate entirely the demand and allocative needs for land from that for the labor and capital resources which serve as either technical complements or substitutes with it.

However, the long-run needs of, and the problems in, diverting land employment differ greatly from those of labor. Relative to the needs and challenges in economic growth before the nation, land does not have the spatial opportunities of labor. Need or eventual demand in respect to labor is especially that of geographic and occupational migration, if economic development is to take place optimally and in manners which are consistent with development of potential capacities of people and with greatest opportunities in welfare increase of all persons. Opportunities in occupational shifts are much more limited for land and even then are geographically fixed. Hence, the means and alternatives for adjusting land and labor inputs do, at some point, part ways.

Public investment to bring about labor shifts over the long run, and in a manner consistent with fullest opportunity for youth, can best rest on such mechanisms as improved educational guidance, employment payments for transfer costs and market information facilities. Those for land, while affected by those for labor, must be of quite a different nature. The values of American society allow the institution of ownership in land, but not labor. Labor and individual, the motivating unit in our economy, are inseparable, and means which are publicly acceptable for adapting services of land are not similarly acceptable for labor.

Along with acceptance of ownership in land but not in labor, American society has been willing to offer a price for letting land remain idle. The "basic creeds" of American society likely prevent use of payments directly to agricultural labor for remaining idle, as a means for reducing or shifting farm output. In the 1950's emphasis of economists was on the relative surplus of labor in American agriculture, without parallel emphasis on the relative surplus of land inputs for particular products or aggregate output. The conventional remedy for solving the farm problem has thus been to "reduce the size of the agricultural labor force." Yet, in the short-run, reduction in the labor force places no important restraint on output because of the reorganizational opportunities already discussed. Migration of labor from agriculture does not simultaneously cause land inputs to shrink, or even to shift among alternatives. Remaining operators who use a richer mix of capital with land taken over from those who leave, typically obtain an even greater output from it. Past programs aimed at production control have focused on the land resource. They have been successful only in proving that the policy mechanisms employed for these purposes so far are ineffective in restraining output to any important degree. A maze of programs has been used which simultaneously subsidize improvements of land to (1) increase current production at the expense of the future, (2) pay farmers for withholding land from current production and (3) conserve the services of land for future periods. These programs are justified to the public partly or entirely under the heading of conservation, perhaps as a means of capitalizing on the favorable attitude, towards improving the intertemporal allocation of basic natural resources, which prevails in U.S. society.

While some features of land and labor resources committed to particular uses in agriculture are separable, problems in product output which stem from them have common elements in the realm of factor supply. To understand better the mechanisms most readily acceptable and of greatest effectiveness in adapting use of both resources, we must recognize the phenomena relating to supply and substitutability of either the resources or their services.

EFFECTIVE SUPPLY OF LAND

Technological improvement has had an important impact in increasing the effective supply of land over the last several decades. Physical stock of land has not increased but capital substitutes for it have been developed and have declined in relative price. This tendency of natural resources to become relatively less important in production is one outstanding trend of economic growth, although the process often is substitution of natural resource at one location or in one form for that in another location or form. The least advanced of societies rest their production mostly on natural resources. The more advanced societies are at the opposite extreme, not in the sense of lack of importance in natural endowment, but in the extent to which capital and labor are embodied in product relative to nature's materials.

The substitution process becomes effective as technical science uncovers the rates of substitution between the factors and as supply prices favor the substitution. This has indeed been the process of agriculture, with the supply price of phosphates, potash and nitrogen from concentrated deposits and sources serving to substitute for conventional agricultural land, other innovations of crop production serving similarly. The United States can, with modern techniques, produce the 1910 level of food output with a much smaller land input than at that date. It could meet the nation's demand for feed and food grains, cotton, vegetables and fruit with considerably fewer acres than were actually used as the nation's economy moved towards 1965. This is a salutary development and one which less advanced nations would like to attain, namely, knowledge that the effective supply of land has been increased so that its relative and real price at the margin has declined and the uncertainty of food shortage does not prevail for the normal planning period of society.

Each new form of capital or innovation which increases yield when used on given land serves as a substitute for land. This point has been illustrated in equation (2.24) and in Table 7.7 for fertilizer, but the same outcome holds true for improved seed, insecticides, irrigation and other technologies. The same effect is realized in livestock improvement which increases marginal rates of transformation of feed, the products of land, into food commodities.

As a nation, we have had specific and designed policy to develop knowledge of substitutes for land. Public expenditures in technological research for agriculture have dominantly been those related to materials or resources to increase yield per acre of land and per unit of livestock feed, both serving as effective substitutes for land. Then, with the passage of time and the improvement of markets and production functions in fabricating inputs, nonfarm capital inputs for agriculture have declined in real costs, encouraging further and indirectly their substitution for land (as well as for labor). The data on relative prices of factors in Table 2.10 emphasize this point, as well as does analysis in Chapters 5 and 7. It has not been development of technical knowledge per se, causing substitution of capital for agricultural land. Rapid increase in use of land substitutes has not "just happened," but has taken place because they have been priced favorably. The potential effect in substituting capital innovations for land has been encouraged also by policy which bolsters prices of farm commodities against the price of inputs which increase per acre output and thus substitute for land.

As we extend technological knowledge thus, we both increase the possible product from a given land area and raise the rate at which aggregate capital (due largely to its new forms representing innovation) substitutes for land. The long-run tendency for this substitution to occur is illustrated in the decline in farm land prices relative to the prices of farm products and relative to the price of other inputs.

Given a fixed supply of land, one would expect, apart from the offsetting forces mentioned here, population growth to cause land price to rise relatively. The same would be less true for inputs such as fertilizer, machinery and other items which might more nearly have a constant supply price (in contrast to land which would have a steeply rising supply price if we tried to increase it in aggregate). Yet relative to farm product prices, the real price of land has declined by almost 20 percent since 1910 (but since 1935–39, as indicated in Table 2.10, it has increased.) This decline emphasizes the relative increase in the "effective" supply of land services since the earlier period.[1] The real price (i.e. price of resource relative to price of farm products) of fertilizer has declined even more, or by around 35 percent, a development which has itself encouraged the substitution of fertilizer for land. In contrast, the real prices of farm labor, farm machinery and farm supplies in general have increased since 1910. The decline in real price of fertilizer has taken place not because it has been reduced in relative importance in the production proc-

[1] Land prices increased somewhat between 1910 and 1914. However, using the base period 1910–14=100, the index of farm real estate prices went up to only 227 over the period 1950–59 while farm product prices went up to 254.

ess (the opposite has held true) but because of technical improvement and competition in the fertilizer industry. The decline in real price has caused it to be "demanded" in larger quantities. In contrast, however, land is not used in larger quantities (its stock is fairly well limited) and has declined in relative price because other resources have increasingly substituted for it, thus increasing its effective supply against national food demand.

The product of agriculture is becoming less a function of the services of land and labor and more the product of the services of capital items representing improved technology. If we could measure the physical services of resources, we would now find each unit of farm output to embody a smaller portion of land and labor and a larger proportion of capital. The proportion of inputs represented by land has not declined as much as for labor in physical terms because of the restrained and inelastic supply function for land in aggregate. It appears in the data of Table 7.6, and over the broad sweep of time, that the proportion of value of inputs attributable to land was no more and probably less in the 1950's than in the decade before 1915. (Support price and subsidy programs emphasizing land undoubtedly increased the value of product imputed to it in the later period.)[2]

Using the data underlying Table 7.6, it appears that real rent to land in 1956–60, in constant dollars, may have been as much as 10 percent less than in the period 1910–14. The capacity of agriculture to produce is less limited by agricultural land area restraint and depends more on other sections of the economy. Capacity has been added through development and expansion of the industries which furnish the agricultural inputs substituting for land. This situation will continue, likely being accentuated by chemical and biological developments in prospect. While agricultural output once had an effective restraint defined by land area or a spatial limit, this is no longer true. Agriculture now is more similar to industries such as filling stations, department stores and others where space or area is not the major restraining force on output.

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[2] For other indications of this same tendency, see Earl O. Heady, "Changes in Income Distribution with Special Reference to Technological Change," *Jour. Farm Econ.*, Vol. 24; T. W. Schultz, *General View of Natural Resources in Economic Growth*, paper for Conference on Natural Resources and Economic Growth, Mimeo. 1960; and J. R. Bellerby, *Agriculture and Industry, Relative Income*, Macmillan, London, 1956, pp. 295–98.

Some fluctuation has taken place in relative shares for resources, with computation and imputations based on either values of inputs or prices of factors. The definite clear-cut changes are for the decline in labor's relative share and the increase in capital's relative share, with the latter clearly coming at the expense of the former. Capital has much less replaced land in a physical sense, but relative to what would have happened in rents of land in absence of technical development and land substitutes, the change has been tremendous in holding down the relative value contribution of land, with apparently some decline, and certainly no increase, in its value contribution, with growth of population and food demand against land supply of extremely low aggregate supply elasticity. The figures we quote above exclude that portion of rent related to real estate and similar capital attachments of land.

The manner in which resource substitution takes place in "gross form" is again illustrated in Table 14.1. The shifts indicated cause the results of history to correspond closely with the models outlined in Chapter 7 and further indicate that forces of development are causing crop production to be centered more in the concentrated and intensive areas. As the data indicate, the substitution has taken place in all major farm areas. Output has increased and labor has declined in all areas. Fertilizer inputs, along with capital representing other techniques, a major substitute for land, have increased greatly, restrained only somewhat in the "older using areas." Over the 20-year period, land in crops decreased in four of

TABLE 14.1

PERCENT CHANGE IN OUTPUT AND SELECTED INPUTS BY FARMING REGIONS, 1939–60 (CHANGES ARE POSITIVE UNLESS INDICATED BY NEGATIVE SIGN)

Region	Total Output	Cropland Used for Crops	Plant Nutrients	Man-Hours of Labor
	(Increase or decrease—in percent)*			
Northeast	42	−21	106	−49
Lake States	52	− 3	1,379	−46
Cornbelt	59	8	1,146	−48
Northern Plains	136	6	6,780	−46
Appalachian	33	8	179	−49
Southeast	58	−34	164	−57
Delta	35	−25	339	−61
Southern Plains	60	−17	1,500	−55
Mountain	79	38	1,642	−39
Pacific	75	11	747	−56

Source: USDA Stat. Bul. No. 233, Revised September, 1961.
* Based on averages between the two periods, 1939–41 and 1959–60.

the regions and increased in four. However, even in the latter, fertilizer and other new technological capital still serve as substitutes for land in this sense: Level of output increased by a much greater proportion than land, and the original output could be produced with less of both labor and land. As well as illustrating the general substitution process, the data also indicate that land supply *for particular uses* does have an important extent of supply elasticity over an extended period and is not unrelated to labor input. The great difficulty comes, of course, in the short period when land tends to stick to its conventional uses.

We have a definite public policy for developing knowledge of resources which substitute for land, as well as for labor, in agricultural prediction —the systematic and effective public investment represented by the land-grant colleges and the USDA. This is wise policy and one to be selected by nations faced with population growth and inability to develop perfect predictions of future population and resource substitution possibilities. Even if they could develop perfect prediction, the need for increasing knowledge of potential substitutes at lower costs would be preferable in extent that these (1) lessen the constraint of conventional natural resources on supply and price of commodities and thus facilitate economic growth, (2) better explain the mathematical limit to which increase in food output can be pushed against fixed land supply and (3) insure against uncertainties of food supply and price in future time. But to the extent that this policy causes land supply to be burdened against food and resource demand at the present, and to have impact of causing short-run loss to land owners and cultivators, planned programs to facilitate shift in use of land to socially preferred activities are just as important as policy which leads to knowledges of land substitutes.

At the minimum, as effective supply of land is extended against current demands for food, policy of education and information should be initiated which aids in conversion of resource employment. At the maximum, policy would provide compensation to (1) cover loss in capital value of land and (2) labor training and transfer required to allow restoration of real income and assets to previous levels. In the sense of minimum policy based on Pareto optima and the compensation principle, there are two general choices: (1) providing compensation to cover loss in asset values and in transfer of resources to employment where real welfare is as great as formerly or (2) extending the time span over which the effects of resource substitutes are expressed and slowing down the rate at which shift in use of resources is made. Price support, land withdrawal and related policies of the previous decade have contributed to both, with the greatest effect perhaps being that of "buying time" in order that change was not turned loose on agriculture faster than families and resource structure of the industry could absorb it, or faster than allowed by the creation of nonfarm employment opportunities and public facilities required for efficient migration.

Agriculture would be in a much better income situation, under technical change and factor pricing which encourages substitution of capital for land, if occupational employment opportunity for land were as broad under economic growth as that for labor. If (1) production functions existed requiring large land inputs and (2) demand for nonfarm goods were of high income elasticity under economic growth, land-substituting effects of new technology would be quickly absorbed and income depression in agriculture would be spared. Demand for land in nonfarm uses would draw the resource away from agriculture, thus restraining supply of farm products. This process would, as is already true in selected local areas, cause land price to be raised in competition with farming (and draw some "fire" from agriculturists because of this fact).

Alarmists already point to the amount of land withdrawn year after year from agricultural uses for airports, highways, factory sites and residential areas. This fear is not economically well based. Jubilation, rather than anxiety, should meet this reallocation of the land resource from food and fiber products to other goods and services demanded by a society growing progressively in income and wealth. The reasons are numerous: First, withdrawal of land from production of food and fiber can help diminish the magnitude of the farm problem by curtailing output (but only slightly so because of the small input/output or transformation ratio involved in nonfarm uses of land). Second, these shifts in land use characterize economic progress. As noted elsewhere in this book, income elasticities of demand for food are low. But in contrast, income elasticities are extremely high for the land products and services mentioned above. Through land prices in the open market, consumers are indicating that marginal utility from services of land is greatest when some of this resource is shifted from food production. Through the voting mechanism, they voice a similar opinion as appropriations are provided for airports, roads and parks. Obviously, there is no "higher use" for land than this in a mature and wealthy society whose anxieties stem not from lack of food but from transportation snarls, shorter work weeks, congested living conditions, and related phenomena. For the benefit of the conservation devotee, land will indeed be preserved for the millennium if it is covered with a dome of concrete for these currently "higher uses."

RELATIVE SUPPLY OF LAND FOR DIFFERENT USES

Land is not in surplus supply in the sense that some of it must go unemployed. It is in surplus position mainly in the sense that the input sticking to the conventional mix of crops is too great. Supply of land adapted to feed grains, wheat and cotton has been effectively increased by development and supply prices of substitute resources. With demand inelastic and increasing much more slowly than increase in effective land supply, the tendency has been too great for the same amount of soil resources to remain allocated to these crops. With greater supply elasticity of land for these uses, and with greater mobility of land among major crop aggregates, supply price of crops such as grains and cotton would increase, with an accompanying decline in the supply price of crops to which land transfers.

What are the crops with somewhat higher demand elasticities under economic growth to which land might be reallocated, if its use were to be consistent with relative supplies and prices of resources and relative demands for commodities? We have already seen from the broad tentative model outlined in Chapter 7 that land would shift from these uses over a large expanse of the Southeast, the Lake States cut-over regions and the areas margined to annual cropping in the Great Plains. These are broad regions of adjustment, but smaller areas within broader regions of low supply functions would also be affected. Regions which are predominant and with deepest comparative advantage in feed grains, wheat and cotton (with shift westward) would remain devoted to these enterprises, but with the local variations mentioned.

Then to which crops could this land and its complementary resources be shifted? In terms of economic growth and prospective income elasticities of demand, shift would undoubtedly be in these directions over time and as guided by the open market. One product of land which has a high income elasticity of demand under economic growth is recreation. The nation is short on recreation land and it will be relatively even more so in the future as population and income grow further and as transportation facilities and mobility continue to increase. Unfortunately, however, land best adapted to recreation products is not always that which has been wedded deeply in agriculture.

Another land use yielding products with relatively high income elasticities is forestry, for lumber and paper products. It is one that needs current planning for the greater population 40 to 50 years hence. Estimates suggest that not only will demand for forest products grow at greater rate than that for food products, but also that the real supply price is likely to rise unless more land and new plants are developed.[8] But because of time and discounting, forestry is an alternative that has little income attraction for individual farmers.

Another major alternative use for land withdrawn on a regional basis is forage and grazing. Demand elasticity most often is predicted to be considerably higher for beef than for pork or wheat. Yet even here a period of five years and upward is required before productive stands of native grass can be obtained on wheat lands and the collection of assets represented in grazing can produce an income. While there are direct costs involved in seeding and stocking lands diverted from grains, a major cost is the income that is foregone in the waiting period, and another is the income reduction in shifting from wheat under price support to grass-based farming.

The major problems of transferring land to commodities not in great surplus (and the reasons why supply elasticity of land to these surplus crops is low) are (1) the capital investment required in the transformation and waiting period and (2) the much greater thinning of population required over quite broad farming regions if agriculture is to be converted to these less intensive patterns. The low mobility and supply elasticity of labor relative to the magnitude of shift required is, at this juncture, important in causing short-run supply elasticity of land to be low for conventional crops. With shift in land resources concentrated much more than labor in particular areas and to specific crops (some labor from all segments of agriculture has been transferring out, even though concentration is greatest at particular locations), the income, investment and community problems are intensified at these locations. Too, while it may be less serious for forestry in length of transformation period involved and continuous growth in demand, the transfer promises to shift some of the problem of relative abundance in land resources to commodities previously less troubled with weight of output on price and factor returns.

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[8] USDA Forest Service, *Timber Resources for America's Future*, Forest Resource Report No. 14, Washington, D.C., 1958.

Magnitude of Shift Involved

The magnitude of shift in land resource required to bring "approximate general equilibrium" in sense of factor returns in agriculture depends on many variables including: nonfarm resource returns and amount of labor drawn out of agriculture; future price of capital and extent to which it grows as a land substitute; whether land shifts in terms of optimality as expressed by its productivity in different uses, or as an average overall land quality; and other quantities relating to supply prices of resources and commodities. But the fact that too much land has remained committed to crops such as feed grains, wheat and cotton appears well established. The extent of overage in estimates depends on whether projected withdrawal involves land at its margin of productivity for particular uses or as an average of all land devoted to these uses.

We find the estimates varying widely in respect to method of transfer and quality of soil to include the following. Schnittker estimated 59.3 million acres, (including 28.6 million for wheat, 5.0 million for cotton and 28.7 million spread over the country in 1960 contracts of the conservation reserve) necessary to maintain prices at 1959–60 levels.[4] Johnson's figures, based on land average of productivity, projects up to 43.7 million surplus acres of land for wheat and feed grain in 1965, with about 19 million remaining under conservation reserve contracts of 1960.[5] Bottum estimates a surplus of 42.5 million acres of marginal land.[6]

The models illustrated in Chapter 7 indicate that 40 million acres at 1954 demand and technology level, with production allocated to regions for most economic attainment of discrete demand level and 10 million acres added for cotton, could have been released from feed grains, wheat and cotton. The models incorporating soybeans and cotton and considering technological improvements extend the "surplus" land for these crops to a "round" 60 million acres. The amount of "overage" in land input is a function of level of commodity price and resource return to be attained, however, as well as of method in diverting land. Estimates by Heady and Paulsen indicate, with 1960 factor costs, these amounts of land withdrawal for feed grains and wheat under varying price goals to be attained and methods of restraint: (1) For prices of $1.00 for corn and $1.15 for wheat: 26.8 million if the same proportion of land is withdrawn in all regions; 36.3 million acres if as much as 50 percent withdrawal of cropland is allowed in areas of highest per unit production

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[4] *Economic Policies for Agriculture in the 1960's Implication of Four Selected Alternatives*, Joint Committee, Congress of the United States, Washington, D.C., 1960.

[5] *Agricultural Outlook for the 1960's*, 38th National Outlook Conference, Mimeo, Washington, D.C., 1960.

[6] A. C. Egbert and L. C. Dumenil, "Identification, of Nature, Magnitude and Physical Areas of Potential Supply-Demand Imbalance," In *Dynamics of Land Use—Needed Adjustments*, Iowa State University Center for Agricultural and Economic Adjustment, Iowa State University Press, Ames, 1961.

costs. (2) For prices of $1.30 for corn and $1.50 for wheat: 51.8 million acres if the same proportion of land is withdrawn in all areas; 62.5 million acres with the 50 percent restraint per region.[7] At 1960 time, an additional 5 to 12 million acres of cotton would have to be added to these figures, depending on the method of withdrawal and the price level to be achieved.

Rogers and Barton provide two sets of land "demand or requirement" figures for the year 1975, supposing a population of 230 million.[8] Their estimates are illustrated in Figure 14.2 and are based on use of only that technical knowledge existing at the present. Under their "attainable"

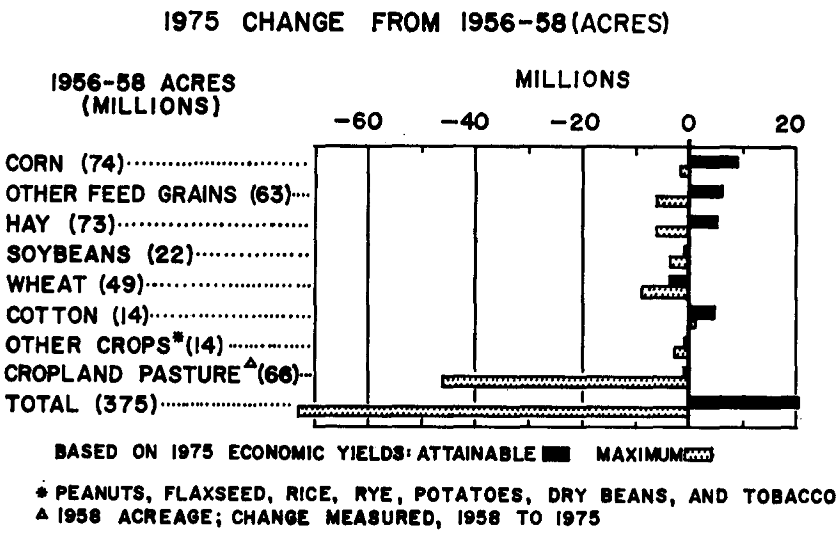

Fig. 14.2 Change in Acreage Required from 1956-58 to 1975 with 230 Million U.S. Population. (Source: Rogers and Barton, *ibid.*)

estimates, an assumption of practical use of present known technology and assuming capital and management limitations, total land required would exceed the amount actually used for crops in 1956–58 by 20 million acres. This land could come from various sources, including land in the conservation and other "reserves" in the early 1960's, pasture suitable for plowing, etc. In fact, if public land development went ahead at about the rates of the past, 30 million acres would be added to total cropland by 1975 through this means.[9] Under their "maximum" yield,

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[7] "Retire the Excess Capacity? How much? Where? And at What Cost?" *Iowa Farm Sci.*, May, 1961. Also see *U.S. News and World Report*, May 30, 1960, pp. 104–6.

[8] O. R. Rogers, and G. T. Barton, *Our Farm Production Potential, 1975*, USDA Agr. Info. Bul. 233.

[9] H. H. Wooten and J. R. Anderson, *Agricultural Land Resources of the United States*, USDA Agr. Info. Bul. No. 140.

supposing presently known practice were used to their full profitability or economic level, land requirements would decline to 26 million acres fewer than the amount used in the period 1956–58. The latter level is economic and not a physical level of practice use. Physical potentials would allow an even greater reduction, against 1975 projected food demand. It is most likely, and even certain, that technology will increase up to 1975. Under increase in technology, Rogers and Barton's figures thus could be extended to a later date such as 1985 or 1990. (Without new technical knowledge by 1990, food prices would increase to levels drawing more resources into agriculture and allowing food demand to be met.) The most recent estimates of the USDA indicate that food demands of 1980 can be met with a shift of 51 million acres from cropland, as compared to land use in 1959.[10]

SUPPLY POTENTIAL

The time may come when agriculture will have greater difficulty in keeping the food supply function abreast of the demand function. This point in time will be one favorable to farm producers, causing the real price of food and rents of land to rise. Technical scientists are not willing to say that a mathematical limit is lacking in the rate at which technical capital can be transformed into food on a given land area.

Numerous uncertainties exist in this realm of supply and demand, including the possibility of artificial photosynthesis, chemical derivation of foods, medical findings relating to effects of livestock products (food products with high input/output ratio especially for land) on life span and heart disease, possibilities in world population growth and related demand possibilities. With these uncertainties, it is therefore prudent that society press forward in further development of knowledge lessening the uncertainty of upper limits in food production possibilities and in developing substitutes in the food production processes. This knowledge may have large payoff in 75 years in terms of real price of food to consumers. Even though this be true, however, distribution of gains and losses between consumers two generations hence and contemporary producers is not unimportant.

What is needed is policy allowing this generation of households to provide a hedge against real food prices of extremely high level in future time for a later generation, themselves gaining from lower supply price of food at the present, without causing welfare sacrifice by this generation of producers. The threat is not starvation, even with a much larger population, since the necessary mix of calories and basic food nutrients can be attained by change in diet to embrace foods with cheaper resource costs than those currently used.

The challenge under economic growth is to keep the real price of food, in mix of foods consumers prefer at high income level, from soaring to

[10] G. A. Selke *et al.*, *A Land and Water Policy*, The Land and Water Policy Committee, USDA Mimeo., Jan., 1962.

extremely high level in real price. This is not, as pointed out in earlier chapters, the threat during the 1960's or 1970's in the United States.[11] The supply of land is large enough that, given important magnitude of food demand increase, more could readily be shifted to crops which produce greater calories per acre. This shift could be accomplished with no, or very little, rise in supply price of food, considering that in 1961 nearly 30 million acres were idled under the 1956 Conservation Reserve Act while an equivalent acreage was idled in soil-building crops. And at this very time, surpluses were still being generated and added to government stocks.

The country also has well over 100 million acres of grassland and 105 million acres of woodland quite well adapted to cropping.[12] Fortunately we have more land which can and should be shifted into such uses as forestry and grazing. This total of land with little demand in crop production for the present, plus added technical knowledge and productive power from inputs furnished from nonfarm sources, provides a "contingency reserve" which can be drawn on, with the inputs shifted to crops and supply augmentation, should food demand increase to high levels. Obviously, then, policy is needed to guarantee safeguard in land resources and growth in production potential for future generations, in extent that the current generation attaches positive utility to future food supplies. But often, depression of current income and capital assets, resulting from pressure of food supply on demand as technical improvement increases production of resources with low short-run supply elasticity, causes part of this potential productive power to be lost through soil erosion arising from intensive cropping.

POLICIES OF LAND AND INPUT

National policy to restrict output has had major emphasis on land since 1930. This was the emphasis in the Agricultural Adjustment Act of 1933, the Conservation Reserve Act of 1956, the Feed Grain Act of 1961 and other production control programs enacted between and after these dates. Why has supply control had focus on the land input? There are several reasons. From the standpoint of practicality, identification of input withdrawn, although not its effect on production, is much easier for land than for labor or capital. It is difficult to imagine that an ac-

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[11] For further summary of the short-run and long-run outlook in food production potential, see Johnson, *op. cit.;* Glen T. Barton and Rex F. Daly, "Prospects for Agriculture in a Growing Economy," In *Problems and Policies of American Agriculture*, Iowa State University Center for Agricultural and Economic Adjustment, Iowa State University Press, Ames, 1959; *A 50-Year Look Ahead at U.S. Agriculture*, USDA Mimeo., 1959; and R. P. Christensen *et al.*, *Production Prospects for Wheat, Feed and Livestock*, USDA, ARS 43–115 and Rogers and Barton, *loc. cit.*

[12] *Cf.* "A 50-Year Look Ahead at U.S. Agriculture," *Food*, 1959 Yearbook of Agriculture, pp. 10–15; and *Water Resources Activities of the United States*, Committee on National Water Resources ,United States Senate Committee Print No. 12.

counting system could be set up to effectuate actual withdrawal of labor, when it can be substituted among time periods and is typically underemployed on farms. To identify any control or lessening of capital inputs, especially when it can take so many specific forms, would be equally difficult. In contrast, land is generally fully employed in some crop over a production season, has little substitutability between two time periods and is represented by particular units on each farm. Quantitatively, too, it is easier to establish historic base in land input, than for input of labor and capital or output in most products.

Control resting on land has political acceptability in the sense that it allows various sorts of "logrolling" procedure wherein trades can be made between geographic and commodity groups, but often with the effect of cancel in the control expected. (Logrolling does not, however, cancel trades to allow welfare increase. The latter may be augmented as intensity is expressed in the manner of Chapter 9.) At the farm level, the individual operator favors land input quota to output quota under the expectation that he can profitably substitute capital and labor for land, thus restoring or surpassing original output. On the regional level, commodity groups expect to substitute other crops for the one under control, thus restoring full employment of land resource where cross-compliance is not imposed. Control resting on land also has appeal in the sense that it can be placed under the label of conservation, thus capitalizing on the relatively high value which American society attaches to this end. The above is the general umbrella under which mass "production control" of agriculture has been attempted. Noteworthily, however, it has been unsuccessful, failing even to lessen output to the extent of growth from technological advance. It has been unsuccessful in reducing output because the loopholes and substitutabilities which lead to its great political acceptability also lead to its failure. Even under this wide range of substitutions, land withdrawal could effectively lessen supply—but only if initiated on a larger scale than over the three decades in experimentation.

Land withdrawal or control programs can have various intermediate ends. One can be to restrict inputs and lessen output to increase total revenue under inelastic commodity demand. Under this end, procedure can rest on compulsory or voluntary participation. Voluntary participation, with agricultural production vested in millions of producers, must rest on compensation. Otherwise, those who withdraw land to restrict price and improve income will sacrifice in return for gain to those who do not participate. If the end per se is production control, the extent of participation and the amount of payments to any producer who supplies his land to "disposal activity" should not be limited. If greatest possible production control from given treasury outlay is the end, resulting in greatest increment in price and income from remaining product in the market, land withdrawal should be allowed to come in a pattern which provides a unit of supply decrease at lowest cost. It should make no difference whether the producer supplying production control has large or small volume or receives large or meager payment. This fact is, however, often confounded with other intermediate ends of policy such as equity in income distribution and compensation to redress income position of producers who have had loss incident to gain of consumers. Consequently, payments have sometimes been limited, in order that they would be more equally distributed among producers, the production control end being largely dissipated in the process. Or, in terms of distribution of gains and losses, to prevent sacrifice of nonfarm persons in rural areas, upper restraint has been placed on land withdrawal on particular farms and regions to retard population outflow. Attempt to mix the ends to which diminution of land input might contribute, plus the loopholes provided to increase political acceptability, complicates attainment of production control as a means of attaining a higher income and of diverting a greater proportion of national income to farm producers.

Distribution of Costs and Gains From Input Reduction

Where compliance is compulsory, without direct or other payment to farmers who supply production control, the distribution and extent of participation among producers do make a great deal of difference. If some contribute only a small proportion and others a large portion to land withdrawal and supply control, the former gains in large extent and the latter in small extent from reduced market supply and higher price of commodity. But even under compulsory control, with each reducing land input by some constant proportion, the amount of production control supplied is not proportional to diminution in land input. Supply control proportional to land withdrawal, with all farmers diminishing land input by, say, 15 percent, would occur only if all factors of production were technical complements and constant returns to scale prevailed. In the widespread absence of these conditions and with production functions of individual farms which differ greatly in substitutability and output elasticity of resources, complete equity in contribution to and gain from compulsory control is difficult to attain. It would, however, be more difficult for other inputs which might be controlled. For example, control of fuel and machine inputs would hardly be restrictive on a tobacco farm but it would be exceedingly so on a Kansas wheat farm where it serves more limitationally with land. Restriction of fertilizer inputs would have less impact for a Great Plains wheat or sorghum producer who uses little or none of this resource than for a Cornbelt farmer who includes more of it in his resource mix for crops. It would have less impact, however, for the Cornbelt farmer than for the Southeast farmer where often a greater proportion of output is imputable to fertilizer than to land.

The method of input reduction thus does have important bearing on equity in the manner by which costs and gains of production control are distributed among producers. Even for a given resource, whether land, fertilizer or other, with input diminution by equal proportions among producers, the gain from control is much less relative to the cost for a producer using a large amount of resource under conditions of declining elasticity than for a farmer using less of the resource.

This point can be illustrated simply by supposing two farms have identical production function as in (14.1) where Y is output and X is input. The elasticity of production for (14.1) is the quantity in (14.2), indicating an elasticity of less than 1.0.

$$Y = 10X - .05X^2 \tag{14.1}$$

$$E = (10 - .1X)(10 - .05X)^{-1} \tag{14.2}$$

Now suppose that the input/output price ratio is 2.0, denoting that 80 input units will maximize profits under unlimited capital and correct price expectations. Suppose that one farmer (large) uses 80 units and has the corresponding output of 480. Another farmer (small) has limited capital and can purchase only 40 units of resource and has a corresponding output of 320.

Next, suppose that a program to lessen output through reduction of input is initiated, with resource to be reduced by 20 percent. The large farmer uses 64 units of input and has output, from (14.1), of 435.2. The small farmer uses 32 units and has output of 268.8. While both have reduced input by 20 percent, output has declined by only 9.3 percent for the large operator but 16 percent for the small farmer. This is a fairly obvious result from the elasticity equation and the fact that marginal productivity of the 80th input unit is only 2, while that of the 40th input is 6. Obviously, then, the cost of and gain from input reduction is not even the same for two farmers with identical production functions, producing the same crop without differential opportunity in substituting one resource or commodity for another. Under this condition of elasticity, the large farmer gains more, supposing reduced output increases price and income, relative to his cost in input reduction than does the small farmer. In fact, production control to restore a *previous level* of income can cause this *given level* to be distributed differently among farmers than the same previous amount established and distributed in the market.

In our case, suppose that income has declined from level of a previous time, with all farmers sacrificing in income. If input control restores income to its previous level, the large farmer will have more revenue than previously while the small farmer will have less. (Output quotas would have the same effect: A given percentage reduction in output would allow the "large" producer to decrease inputs by a greater percentage than the "small" producer. Hence, with both gaining the same proportionate increase in total revenue, the "large" producer would gain a greater percentage increase in net income than the "small" producer.)[13]

A linear homogeneous production function would result in gains proportional to costs for all producers and output reduction proportional to input reduction. In general, however, this is not the case because farmers have different amounts of capital and are at different levels in elasticity of output in respect to input. In simple terms, a farmer who is "in the trough of per unit costs" will generally have a smaller reduction in income from output diminution than one who is "high on the negative sloped portion of the cost curve," with a larger percentage increase in per unit costs as he reduces output. (See later discussion of Figure 14.3, page 542). Too, increasing marginal productivity, causing output reduction to be in smaller percentage than input reduction, is encountered even in control resting on land inputs because each farmer tends to withdraw acres in lowest order of productivity. (Also, see the discussion in Chapter 7.)

Even in simple concept of the farm production function, differentials in productivity and elasticity of resources cause unequal incidence of input control. However, we also have differential gain related to groups of farmers who largely buy feed grains, with opposite income effect from production control and increased prices, as compared to farmers who specialize in feed grain production and control.[14] Too, differential cost and gain arise where some farmers are, in equivalent, on the upward sloping portion of Figure 11.3 while others are "over the peak" and on the negative sloped portion (or some are at the point of tangence and some are above it even on the negatively sloped portion of the production possibility curve) for programs which allow substitution of a crop such as forage for another such as corn.

The problem of equity in distribution of gains and losses from reduction of land inputs is an important consideration in compulsory control programs. Within the farm sector per se, voluntary programs (where the pricing system is used to obtain desired level of land input and commodity output reduction) more nearly guarantee Pareto-better income conditions and equity in distribution in costs and benefits. In allowing the producer to exercise his own individual choice in "selling his production franchise," they also provide as much freedom—the much discussed goal of policy—as an unfettered market. No producer need join up unless he computes the gains from payments to be sufficiently greater than income and freedom foregone in placing land in disposal. But a voluntary pro-

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[13] In the example used for (14.1) and (14.2), for example, a reduction in output by 20 percent reduces the "large" farmer to 384 and the "small" producer to 256. The inputs consistent with these outputs, from equation (14.1), are 51.8 and 30.1 respectively. Against the original inputs of 80 and 40, these represent input reductions of 35.3 and 24.8 percent respectively for "large" and "small" producers.

[14] But conversely, if output has increased rapidly and prices have decreased greatly (decline in total revenue) from progress, livestock producers will have gained at cost to grain producers.

gram with supply of land for withdrawal based on the pricing system will always have greater treasury costs to society than a program based on compulsion, which attains the same level of output reduction and price increase. Under compulsory program, the greater cost of food, supposing demand to be inelastic and output to be reduced, is borne by consumers only. For the same output reduction, under voluntary land retirement by pricing mechanism, consumers must pay the same cost, but the treasury cost of compensating participants also is involved.

If control of output through land withdrawal is given as an end, then society must make a choice in terms of (1) gain of greater freedom for farmers under voluntary control or (2) gain of smaller treasury outlay under compulsory retirement. There is, in addition, the equity problem mentioned above in allocating total reduction on a compulsory basis. This is a problem which applies equally to market orders or quotas and to compulsory land retirement. At the outset of a quota system, it is necessary to allocate the aggregate restraint among producers. As illustrated for equation (14.1), the cost of input reduction is greater relative to the gain from market price improvement for the producer with fewer resources and/or higher elasticity of production, whether this be because of capital applied to a given production function or because farmers use altogether different production functions or techniques, with quite different output response. In addition to the reasons mentioned in Chapter 12, this also is a factor causing market orders and quotas to have greater acceptance in the area of great homogeneity in production function and farming scale, and much less acceptance over the greater area where resources, techniques and factor productivity are much more heterogeneous and where wider differentials of gains exist in relation to costs of output control by individual producers.

Productivity Effect and Goals Attained

Land input reduction has no effect in lifting marginal physical productivity of labor—the "live" resource of surplus supply in agriculture—since about the same amount of the latter is used on a smaller amount of the former, particularly under fractional reduction in area of each farm. It is expected to and does, however, greatly lift the productivity of land remaining in production. In theory the reason is apparent. If we start with a production function such as that in (5.14) and hold a first resource at constant level while a second is decreased in magnitude, marginal physical productivity of the former will increase while that of the latter will decline. In a practical sense, especially where only portion of the land of each farm is withdrawn, use of the same amount of capital and the family labor on fewer acres will lower marginal and average productivity of these resources. But if funds previously used for fuel and other operating costs of land withdrawn are shifted to remaining acres, in the form of fertilizer and improved seed, land productivity will increase. This appears to be a strong force causing improvement of technology under land retirement as a portion of farms.

While labor is the resource of concentration in academic discussions of low productivity, production control programs of this type ordinarily do not have the goal of attaining resource equilibrium in the framework of the competitive model. Instead, they take plant and resources as given, and inquire how return to them might be increased in the manner of production and price management such as that employed in the steel, petroleum and other industries where surplus capacity typically exists and some resources are unemployed and of low productivity. Hence, production control programs aimed at this specific end must, given the objective, be evaluated in terms of other short-run criteria such as: how effectively they attain the conditions employed by these nonfarm industries; the cost of the control and price improvement attained; and degree of equity in the distribution of gains and losses from control.

The above are questions and phenomena just as amenable to economic analysis, given the particular intermediate end, as are the stability conditions of a competitive model. They involve application of exactly the same set of economic principles, alternatives for refinement in mathematical analysis, of concepts in minima and maxima, in application of institutional approaches, and in general "general stylishness of analysis" or "professional leaning." In terms of contribution to national economic growth, detailed analysis to bring the competitive stability or equilibrium conditions to agriculture, or to econometric prediction of relationships leading to it, has much less promise than analysis, rough or refined, designed to: lessen psychological and sociological barriers to greater productivity of the massive U.S. nonfarm labor force; lessen excesses in application of monopoly power; remove the many market imperfections which pace the national rate of economic growth below its potential; assess the social cost of advertising, an outlay larger than the net income of agriculture, in its purely offsetting effect; erase the poverty blight and low worker motivation in widespread section of cities and farms, with no unique cause in agriculture; better mesh employment opportunities for older persons with their potential in productivity—to mention only a few of many alternatives.

Progress and economic growth are generally preferred goals for agriculture as for the rest of the economy. But, as further detailed in Chapter 10, the marginal productivity of analysis to this end with extreme refinement for agriculture can be low relatively when great voids exist in analysis of equal intensity for other broad areas of extreme potential in furthering growth. Fortunately, however, policy means are available which allow both economic progress of the agricultural industry and growth in opportunity for development of individual capacities and abilities for those farm persons who have brightest prospects in a developing nonfarm economy; with simultaneous attainment in agriculture of the following conditions already attained by other industries: short-run price stability, competition and freedom, and equity of costs and benefits from policy results. It is less the lack of mechanisms—and more the political power struggle, conflict in group interest along the contract curve, and indecision over relative weight to be attached to different goals—which prevents adoption of a subset of policy elements. These would bring about simultaneous accomplishment of this particular end complex. There are of course, both complementary and competitive ends among this lot. But again the task is, selecting b_3 in Figure 8.1 as the production possibilities facing the community in respect to competitive goals or ends and the a_i lines as community indifference curves, to specify the optimum combination of ends by finding tangency point of an a_i curve and b_3.

This task is not simple for an individual confronted with only his private production possibilities and preference map. It is decidedly more complex for "aggregate individual" represented by the nation. Just as the individual often must experiment, and even find himself torn with conflict in decision and faced with error, so does the community feel its way slowly and in a wandering route. But over time it does move in these directions, not infrequently making choices in which it estimates gain to one group to exceed loss to another—in discrete choices where compensation is impossible or is purposely absent. No society can ever do otherwise.

Other Comparisons and Optimality in Mixed Strategy

Choice in respect to policy can be, and must be, among many intermediate ends which are far removed from the ultimate ends of life, liberty and happiness. Choice of production control method can be evaluated directly in terms of: minimization of costs in attaining a given level of output reduction and its accompanying price or income improvement; maximization of output control and income improvement from given program outlays; minimization of extent to which production policy is apparent to the public; maximization of extent to which producer control of output and price parallels that of other major industries; equity in the distribution of costs and gains of output control within agriculture alone, or between households of agriculture and other households in rural communities; maximization of economic progress while attaining specified level of supply restraint and price support; maximization of the intrafarm, interfarm and interregional, and even interindustry, efficiency in resource allocation within the constraint of attaining a particular output and price level; and others. Marketing quotas which are negotiable are more efficient than compulsory land withdrawal over all farms and regions in the latter or "constrained" sense of efficiency. Quotas allow transfer of production among farms and regions to locations of lowest input/output or cost coefficients. Similarly, voluntary land withdrawal operated as *supply phenomena through the pricing mechanism* is more efficient than compulsory withdrawal in causing output to be withdrawn where its supply price is lowest (or, conversely, where the supply price of commodities is greatest in relation to consumer location). While voluntary land retiral is a more costly mechanism to taxpayers than marketing quotas or compulsory land withdrawal where the same output and price goals are attained, it has greater "within agriculture equity" in the sense that only those need participate who assess gain to be greater than cost. It avoids the problems of equity within agriculture stemming from differentials in production functions and elasticities such as those discussed for equation (14.1). Yet, concentrating in particular localities where participation is free in the market sense denoted above, it brings questions of equity in gain and loss distribution between farm and nonfarm households. With solid blocks of farmers participating and moving from the community, under prices guaranteeing gain to them, merchants of the concentrated area are faced with loss. Yet merchants in other communities, where participation does not occur but farmers gain income from a smaller aggregate output and a higher national price, can sell a greater volume of goods and services and realize a welfare gain. Other comparisons could be made among control methods in terms of the various criteria outlined at the outset of this paragraph.

Existence of these different ends to which production control (or various degrees of it with one extreme being in market-free price and production) relate and have impact on different groups causes no pure strategy to be optimal in the policy game. Instead, a mixed strategy involving different methods of production control in use at the same time becomes more nearly and practically so. Undoubtedly, it is the need for choice and mixed strategy that has caused U.S. agriculture to have in existence at the same time: compulsory acreage control on tobacco; nonnegotiable marketing orders for fruit and vegetables; output quotas for sugar; marketable output quotas for milk (cows); voluntary land retirement through a semi-price mechanism for cropland in general under the conservation reserve; and pure freedom of the market for other producers. It is likely that this mixed strategy will have quantitative proof of optimality in historic perspective. It also is very likely that mixed strategy will be continued, but with a change in proportion to allow greater simultaneous attainment of price stability, farmer gain from contribution to progress, freedom in choice of alternative and economic progress itself. One necessary condition for simultaneous attainment of these conditions is, of course, that the control effort must be great enough to actually accomplish the control end. Another is that "marketability" and mobility of control restraints must be increased, in effect increasing the *marketable characteristics* of an institution devised to "lessen the impact of other characteristics of the market," or of *providing market competition for a control mechanism* which has been created to "lessen certain other competitive aspects of the farm commodity market."

Compulsory Land Withdrawal and Market Quotas

Output quotas and land retirement on a compulsory basis are similar in the initial equity supposition that costs or sacrifices to attain production control can be proportional to the gains from it. We have reviewed reasons why equity is not always easily attained in input or output quota levied by the same proportion on all producers. Between quotas and compulsory land retirement, equity in gross income gains and costs probably tips in favor of quotas in the sense that a quantity restraint is allocated to each producer without a method to circumvent control and redistribute or contort the planned pattern of gains. In compulsory land retirement, this is less so. If an operator has had practices or inputs per acre below the conventional optimum (i.e., marginal product of resources such as fertilizer and improved seed greater than the input/output price ratio), he can lessen the cost to himself (through output foregone) by extending his use of capital resources per acre—if he has access to financing. The farmer who has, by this criterion, been in an efficient position cannot do so profitably, except to the extent that price of commodity is increased by the control program.[15]

Under quotas, if total output is reduced by a given percentage to obtain a specified goal of price and revenue increase, then each farmer reducing output by this proportion realizes the same proportionate share of gross market revenue gain, if he produces his allotted quota. (See previous discussion, however, of net income effect.) Previous output is, of course, much more difficult to establish than previous land input, not only because of "counting difficulties" but also because of variance in year-to-year quantities relating to stochastic variables such as weather. An extremely difficult (if not impossible) quantity to determine, identify and police would be output quotas on feed grain where some farmers only sell it, some raise and feed it and some do both. An exactly equitable and enforceable output quota system may be impossible for such a commodity. This is the reason why market orders have had main application to more perishable commodities moving directly to market as consumer goods and lacking in "hideability" through storage and feeding.

In the pure sense of social costs and efficient resource use, marketing quotas have flexibility lacking in compulsory land or input quotas. Given a restraint on marketing, the farmer can produce his quota in least-cost method. In Figure 14.3, for example, the farm with a market quota in quantity represented by product isoquant q_1 could use the proportion of land and fertilizer represented by os_2 and of_1 respectively. However, a farmer restricted on land attaining the same output, would use os_1 of land and of_2 of fertilizer. With slope of the budget line representing the price ratio of fertilizer and land services, the market quota system would allow attainment of the isoquant at lower cost than the land retraction method. This is obviously the case for tobacco quotas. The same total output could be obtained at lower cost under a market quota than under the

[15] For equation 14.1, supposing inputs denoted by x to be those used per acre on land, the operator with 80 initial inputs per acre has less opportunity to circumvent production control through land withdrawal than the one with 40 inputs per acre, should the latter be able to obtain funds to increase inputs per acre on remaining land. However, if production control lowers the price ratio below the 2 of the initial situation of the text, the large operator could profitably use more inputs, if allowed.

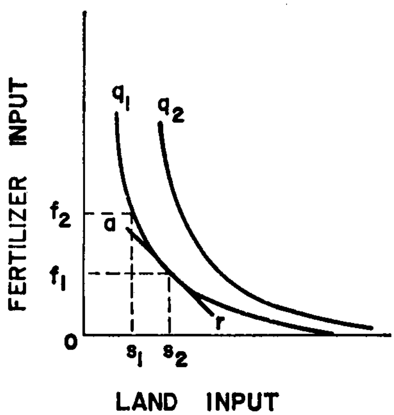


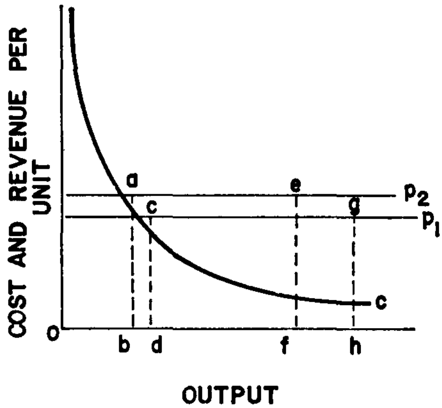
Fig. 14.3. Costs in Control.

present acreage restraint system. With acreage restraint serving as the means to bolstered price through output control and with consumer demand growing, farmers fertilize land very heavily. The result is a very low marginal productivity of the fertilizer input. Under output quotas, the same marketings of tobacco would undoubtedly be produced from more acres, fertilized at lower levels. Too, tobacco might become more highly mechanized, lowering the labor and total costs of producing a given quantity marketed. Mechanization of the tobacco harvest is possible, but results in some waste per acre. This nonmarketable waste would be easily allowed under an output quota where more acres could be produced at lower yield per acre. But with acreage restraint and ability to market the full output per acre, there is premium on hand methods which save all of the yield for market. In general, quantity quotas to attain given market supply would encourage more extensive farming, allowing (1) fuller employment of land which is in "excess" and can't be transferred to other industries and (2) lessening social costs in capital represented by fertilizer and similar inputs—materials using resources which have allocation possibilities to other products and services of the economy.

As in the comparison of voluntary and compulsory land retirement, quotas do have promise of net income gain proportionately greater for large than for small producers, even where the production function is linear but fixed costs are involved. The point is illustrated further in Figure 14.4. (We did not consider the effect of fixed costs in our example of equation 14.1.) The cost curve of main relevance in farming approaches curve *C*, being composed, within the season, of constant variable unit costs per acre for seed, fuel, fertilizer and similar inputs and declining unit costs of fixed resources such as machinery. Approaching the mathematical limit of constant variable costs per acre, the total cost per unit declines less with greater output, or increases less with smaller output, for large as compared to small volumes. (It can, of course, turn up in conventional U shape, but most farmers operate under the above conditions, given a curve eventually turning to positive slope. Here, we have not imputed costs to labor and investment capital of the farmer, thus allowing a margin between per unit price and cost.)

Now suppose two farmers, one with volume of *oh* and one with *od*. Both are given a quota 20 percent reduced—to *of* for the former and *ob* for the latter—from the original level. Price increases, from similar market quantity adjustment by the industry, from p_1 to p_2 level. Both farmers gain a gross revenue increment in proportion to their 20 percent reduction from their original output. But the gain in net income is much greater for the large producer, because reduction in output increases costs by a much smaller amount than for the smaller producer, whereas price increases by the same amount for each. (In our particular example,

Fig. 14.4. Scale and Benefit.



the small producer even has reduced net revenue; he sells less output at about the same profit margin.) With fixed costs in fixed machine investment, the small producer may have a short-run increment in income above fixed costs, but fail to do so when he must replace machines which provide the "within year" fixed costs.

Impact on Land Values

Output quotas which are not negotiable apart from the land have the same theoretical effect as compulsory land retirement or input quotas in respect to effect on land value. The effect of returns from production control on land values, as measured in application to tobacco, was mentioned in Chapter 12. (The effect is the same in milk markets where the quota is tied to cows.) Here we wish to indicate a differential impact on resource values when output quotas are marketable apart from land resource. The expected effect is for the benefits of restrained supply and improved price to be capitalized into output quota, rather than being capitalized into land value.

TABLE 14.2

PROGRAMMING MATRICES ILLUSTRATING EFFECT OF CONTROL METHODS ON RESOURCE USE, INCOME AND ASSET VALUES

Activities in the "Program"*	Quantity†	Net Price (c_j) $20 P_1	$23 P_2	0 P_3	0 P_4	0 P_5
1. Land (P_3)	100	1	1	1	0	—
2. Capital (P_4)	$2,100	20	25	0	1	—
3. P_1	80	1	0	5	−.2	—
4. P_2	20	0	1	−4	.2	—
5. $z_j - c_j$	$2,060	0	0	8	.6	—
6. Land (P_3)	100	1	1	1	0	0
7. Capital (P_4)	$2,100	20	25	0	1	0
8. Acreage quota (P_5)	80	1	1	0	0	1
9. P_3	20	0	0	1	0	− 1
10. P_4	$ 100	−5	0	−25	−24	−25
11. P_2	80	1	1	0	0	1
12. $z_j - c_j$	$2,392	9.9	0	0	0	29.9
13. Land (P_3)	100	1	1	1	0	0
14. Capital (P_4)	$2,100	20	25	0	1	0
15. Quantity quota (P_5)	3,840	40	48	0	0	1
16. P_3	4	0	−.2	1	0	−.025
17. P_4	$ 180	0	1	0	1	−.5
18. P_1	96	1	1.2	0	0	.025
19. $z_j - c_j$	$2,496	0	1.3	0	0	.65

* Activities at nonzero level.
† Quantity of nonzero level activities in the first column.

The difference can be illustrated by a simple linear programming example in Table 14.2.[16] We use the method to show the channeling of quantities through the production framework of a single producer, not expecting it to represent an aggregate industry, but with outcomes which do spill over with weakened effect into the industry. In the top of the table, we suppose two limiting resources, land (P_3) and capital (P_4) as indicated on lines 1 and 2. Two crop enterprises, P_1 and P_2, can be grown, the second being only a more intensive activity of the first, with the coefficients indicated in the respective columns. Net return per acre is respectively $20 and $23, with the annual cash costs of $20 and $25 on the capital row. The "optimum program" is indicated on lines 3 and 4

[16] See Earl O. Heady and Wilfred V. Candler, *Linear Programming Methods*, Iowa State University Press, Ames, 1959, Chaps. 1–4. The usual computational procedures have been used in arriving at solutions. Lines 1 and 2 provide programming situation without control and lines 3 to 5 provide its optimum solution; lines 6 to 8 provide situation with acreage control and lines 9 to 12 its optimum solution; lines 13 to 15 provide situation with output quota and lines 16 to 19 its solution. There is no P_5 activity for the first two situations, but, for the last two, P_5 serves successfully for land and output quota.

with 80 acres (units) of P_1 enterprise and 20 of P_2, land and capital being exhausted to provide a "net income before fixed costs" of $2,060 (line 5). Here, the imputed per year values of resources, before taxes and related costs, are shown in the dual solution on the $z_j - c_j$ row under P_4 (land) and P_5 (capital). They are respectively $8 and $.6. If the farmer had another unit of land, he could add $8 to net income (before taxes and other fixed costs). Another unit of capital would similarly increase his net income by $.6.

Now suppose compulsory acreage control is initiated. It requires a 20 percent reduction, or 80 acres are allowed to be planted as indicated by the added row (P_5) in the new matrix over lines 6 to 8 and the added column for its "disposal" (P_5). The "optimum" program is now indicated on lines 9 to 12, where we suppose a 30 percent net price boost, so that P_1 has c_j value of $26 and P_2 has c_j value of $29.9. The program changes to include 80 acres (line 11) of the more intensive enterprise, P_2, and none of the less intensive enterprise, P_1. Twenty acres of land (line 9) and $100 of capital (line 10) are left unused and "net before fixed costs" increases to $2,392. But now additional capital has no imputed value to the farmer (the zero in the "dual solution" under column P_4 on the $z_j - c_j$ row). Land per se has no imputed value within his year's farm operation (zero under P_3 on the $z_j - c_j$ row). However, a quota acre has an imputed value or price of $29.9 per acre ($P_5$ column on line 12), far more than land alone in the "free market" of the initial situation. It has this value because of the higher commodity price and the fact that quota per se restricts ability to gain a portion of this added revenue. Obviously, of course, if acre quota cannot be separated from land, this fact would cause the increment to be capitalized into the land with which each unit of quota is associated.[17]

Now suppose a market quota program establishes the same output as under the acreage control program above. (Also suppose that P_1 yields 40 bushels per unit or acre while P_2 yields 48 bushels.) With the prices as above ($26 for P_1 and $29.9 for P_2), with the quota row now having the associated disposal column indicated under P_5, we have the programming opportunities indicated over lines 13 to 15. The "optimum program" from this matrix is included in lines 16 to 19. In contrast to that of lines 9 to 12 with acreage quota, it now includes 96 acres of P_1, the less intensive crop activity, using all but 4 acres (line 17) of land. (Capital valued at $80 is saved in comparison of line 17 with line 19.) This is a lower cost method of attaining the 3,840 output level, and "net before fixed costs" increases to $2,496 as the quantity on the $z_j - c_j$ line (19). With output

[17] If land were allowed to shift to another, but lower valued, marketable product, the dual or imputed value of land would approximate this level. Without this alternative but the anticipation that quotas will eventually be terminated, land would take on some value under these expectations. We could develop and apply a programming model under these possibilities, with the resulting imputed, but lower, shadow prices or "duals" for land noted. However, we do not do so, for both this and the quota case, because the outcome would be apparent and we wish to keep the example simple.

quota limiting marketing and with land not serving as restraint, a unit of market quota has an imputed value (line 19) of 65 cents (in column P_5) while land has zero (in column P_4) imputed value. This outcome would be expected under marketing quotas which restrict output considerably short of land productive capacity.

Our example is extreme, within the bounds of a single producing unit. However, a quota serving as tighter restraint than land would generally take value away from the latter.[18] We would expect a negotiable marketing quota to take on value and land prices to decrease, nearer to "next closest alternative," with the quota having imputed value based on the farm purchasing it rather than the farm selling it.

Divorcing capital value of income from land in the manner of quotas would generally serve as incentive to increased labor mobility. This would be true more so than for compulsory acreage control since the tie among asset value, farm and individual then is loosened. The individual can sell his output quota and have money for transfer. He can also do so in selling land and its attached quota. But with output quota, he can sell its asset value while he moves and retains farm ownership as a "contingency measure"—a measure not possible under capitalized value of land quota. Further, output quota on unproductive land (and many low income farmers are on less productive land) would have greater market value than acreage quota. The quota could be transferred geographically to more productive farms and regions, with its asset value determined accordingly. This opportunity would, in fact, cause long-run concentration of output in regions with greatest comparative advantage. But with acreage quota attached to specific farm and location, its asset value is tied to the lower level of productivity at the less productive location since only neighboring farms can utilize it.

METHODS IN LAND CONTROL

Numerous different patterns of control of land input have been used or are possible, each having differential impact in equity of benefit and cost of control, and in treasury cost of the program if it is on a voluntary basis of producers supplying idle land at various schedules of price. Each method involves a different acreage to attain a given level of output control. The level of price and income improvement to be attained also has important bearing on the program cost and the acreage involved, supposing a given level of production control in any case. In the Iowa study cited earlier, these differences in annual program or treasury costs were obtained, supposing a voluntary program where individual farmers supply their land to the "idle activity," at a price just making it profitable for them to do so: (1) For prices of $1 for corn and $1.15 for wheat: 488 million dollars with the same proportion of land retired on all farms and regions; 352 million dollars with as much as 50 percent withdrawal allowed in high cost production regions. (2) For prices of $1.30 for corn

[18] See footnote above.

and $1.50 for wheat: 1,526 million dollars with the same proportion of land retired on all farms and regions; 1,403 million dollars with the 50 percent restraint by regions. These figures apply only to feed grain and wheat and do not include administrative costs.[19]

Over Regions and Farms

The main type of input, and thus output, control attempted between 1933 and 1960 was shift of a portion of the land on millions of farms over all relevant regions. This method has advantage in equity to nonfarm persons in rural communities (even if equity is assumed among farmers by voluntary retirement through payments guaranteeing against negative outcomes) since few farmers are led to leave the community and income increment to farmers may have "multiplier effect" to all merchants. In contrast, land withdrawal concentrated by regions encourages farmers to migrate, especially if withdrawal of entire farms is allowed. Hence, merchants and other service suppliers in the particular regions may sacrifice while those of "other" regions gain (supposing control to be effective and giving higher income farmers in "other" regions).

The "dispersed" method is less one forcing "drastic" change on an entire community. On the debit side, it costs more than a "concentrated" system because more productive soils, taken out of production with the least productive, have lower per bushel costs and greater profit per acre, land costs excluded, thus requiring greater payment for the farmer to forego production and cropping income. Also, the farmer withdrawing only a part of his land cannot reduce costs by as great a proportion as the farmer who "retires" all of his land inputs. Therefore, his supply price in providing "idled land" is greater. Output control through partial land input withdrawal allows the farmer to use more labor and capital on remaining acres, thus substituting for land and partially nullifying the output control effort. Too, surplus labor may be held on farms to receive payment of land withdrawal (although the actual effect may be weak against draw of outside employment opportunity). Finally, as soon as the program is lifted, retired land tends to move right back into production with all acres continuing under cultivation.

A similar approach is to allow or require entire farms to be withdrawn from production, with the restraint that they be spread somewhat proportionately *over all regions*. This method has the equity advantage mentioned above. It lowers program costs (supply price of participation) somewhat because all farm costs, except taxes and similar outlays, can be terminated on the "whole farm" basis. While it does not allow retirement concentration in the least productive areas, it allows the least productive farms in all regions to be withdrawn, lowering program costs below that of the "partial farm" method and allowing more labor to

[19] Net social costs would not be of these magnitudes because labor and capital would migrate to industries and location where they have greater value productivity. The regional model (A) explained in Chapter 7 is predicted to free, along with the land (if it went unused) labor amounting to 29 million man days and capital inputs of .5 billion dollars for wheat and feed grain.

migrate. The "whole farm" approach to input contraction and output control has a major advantage in this respect, if the criterion is that of greater labor migration from farms: The individual need not stay on his farm to realize payment, and he can boost income from off-farm employment. Encouraged to do so particularly are older farmers near retirement (who will generally stay in the community) and young operators. "Partial farm retirement" does not always lead to increased cohesion of labor to land, however. Evidence was that small cotton allotments in the Mississippi Delta were divided among the same number of sharecroppers in the first year but were consolidated to fewer families in later years.[20] Also, with partial farm retirement, use of machinery and labor is less efficient and operators are pressed to buy or rent additional acreage to offset this, thus pushing another farmer out of the industry.

Finally, the "whole farm" method does not allow substitution of labor and capital for land, as in the case where only part of the land is removed from production. If driven to zero input, land serves limitationally with labor and capital and no output is forthcoming. With "withdrawn" farms scattered among those farms remaining in operation, cessation of the control program will encourage the former to be incorporated into the cropping process of the latter. In a region where the whole land area becomes covered with grass and trees, with no croppers present, the tendency to put land back under the plow is much less, except when demand jumps to suddenly cover higher supply price of food. (The liquidation of storage, transportation and other facilities to service grain production aids the process when reduction is concentrated over regions.)

With land withdrawal allowed and encouraged on a "whole farm" and "whole region" basis, supply price to attain a given level of output control is lower than for opposite land reduction methods because of the reasons mentioned above. Also, for reasons already cited, the method serves as a greater catalyst to labor and capital outflow, as a limitational restraint in substitution of labor and capital for land, and in greater permanence of effect. It also is a method consistent with the shift in resource use which would be guided through the market by relative preferences of consumers and supplies of factors. In this sense, too, it stands to allow greatest contribution to furthered national economic growth, guiding labor and capital resources from regions where they are least productive in agriculture. Conservation also tends to be promoted since the least productive farmers and least productive lands have a rough correspondence to locations where water and wind erosion are most severe and the supply price for land input control is roughly lowest.

Land input reduction will not restrict commodity supply unless it is on a large enough scale and "has teeth in it." The 30 million acres in the

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[20] See J. R. Motheral, "Impact of Current Natural Policy on Southern Agriculture," Proceedings, Southern Agricultural Workers, 1957; and E. L. Baum and Earl O. Heady, "Effects of Policy on Labor Mobility," *South. Econ. Jour.*, Vol. 25.

soil bank up to 1960 lead to trivial output control, not even offsetting growth in supply due to technical advance, because so much of it was largely derelict land or pasturage and acreage with low output. Even if all of the mountainsides in the nation were put in a "soil bank," supply of crops would not be restrained.

Under other types of land withdrawal programs, farmers were allowed to substitute one crop for another. For livestock and feeds, the alternatives were those outlined under the discussion of marginal rates of substitution in Chapter 11. Land inputs must "in fact" be withdrawn from production if output control is to be achieved, rather than simply be reallocated among crops which serve as substitute resources in livestock production or as substitute commodities for consumers. Where two commodities are concerned and one is put under acreage control while the other is not, both having inelastic demands, some gain in income from land can be attained by allowing shift from one crop to another—if production circumstances are favorable. The possibility is illustrated in Figure 14.5.

With an inelastic demand for both commodities, a total revenue surface exists as defined by the isoquants $r_1 \cdots r_m$, with maximum revenue attained when the level and mix of output for the two crops is that represented at point r_m. Suppose, however, that the short-run supply of factors provides the production possibility curve represented by *AC*. Given "approximate equilibrium" under this set of commodity supplies and the market demand structure or revenue surface, the level and mix

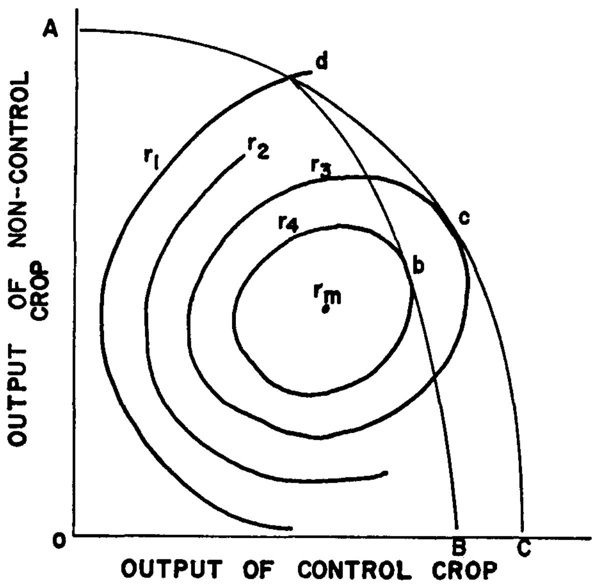

Fig. 14.5. Production Possibilities Under Control.

of crops is that indicated at point c with tangency of curves AC and r_3.

Now production control is initiated, withdrawing land from the "control" crop, but with no cross-compliance requirements preventing its shift to the noncontrol crop. The expected recombination is at point d, with less of the former and more of the latter crop. While land cannot be reallocated back to the control crop, labor and capital can be. Hence, a new production possibility curve arises, with a segment having lower marginal rates of substitution of control for noncontrol crops than formerly. It is AB, diverging at point d which defines the maximum amount of land which can be allocated to the control crop. But given the particular revenue surface, the revenue-maximizing combination is that indicated at b, with tangency of r_4 and AB. For the particular configuration of the curves, output of the control crop now far exceeds its expected production. (Ordinarily, we would expect the latter combination to fall somewhere between the proportions represented by c and d.) The control program has caused the crop mix to be forced to a higher revenue level, even though allowing one crop to be substituted for the other, if the particular competitive structure and factor supply inelasticity have held it to a lower level over "the revenue hill." (Optimally, for maximum revenue gain to aggregate of producers, the combination r_m would be selected under the supply control program.)

REGIONAL ADJUSTMENT AND EQUITY

Numerous reasons have been cited, indicating causes of change in the relative economic advantage of agriculture among regions. These include: differential rates of change in technology similarly altering supply functions and production possibilities, demand for labor outside of agriculture, and "unevenness" of population and economic growth by regions. The latter changes differentially (1) the derived demand for commodities in different farm regions, (2) the reward of resources transferring from farm activity and (3) related phenomena. But even if all variables on the side of commodity and resource demand outside of agriculture changed by the same proportion for all regions, differential regional improvement in technology and national supply which outpaces growth in demand would still cause shifts in the pattern of resource specialization among regions. With technical development and supply growth exceeding demand growth in agriculture, resources are "freed" from farming at different rates among agricultural regions, some regions sinking into even deeper specialization of the commodity complex and others shifting to less intensive production and requiring a greater outflow of labor resources.

The case is illustrated in Figure 14.6 with a single commodity. (The same general outcome prevails for two commodities with differential change in production possibility curves or for shift between "intensive" and "extensive" enterprises.) In Figure 14.6 region A has supply functions S_a and S_a' and region B has functions S_b and S_b' respectively before and after technical change. Total supply before and after change is S_t

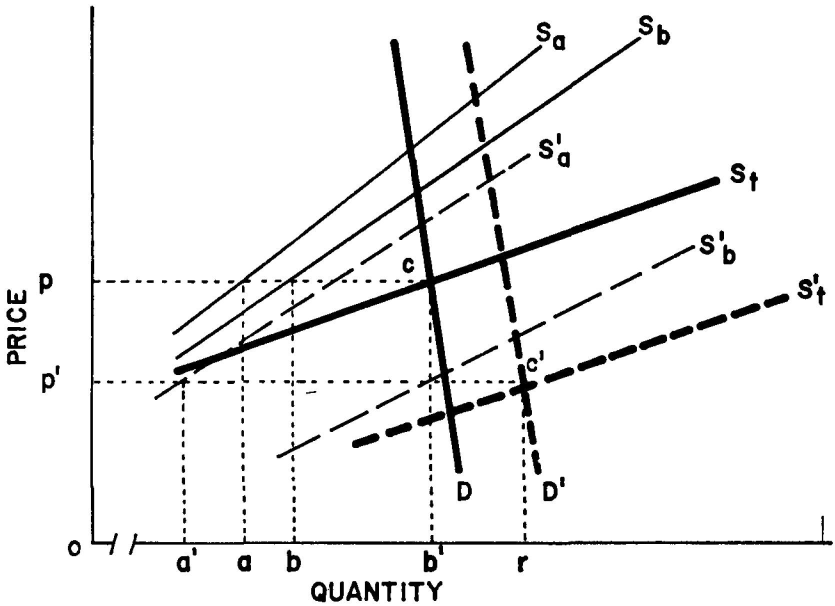

Fig. 14.6. Differential Changes Among Regions.

and S_t' respectively. With the total demand D before the change and D' after change (with differentials not subtracted for location and transport costs as a step in simplicity), we find that region A decreases output by aa' amount while region B increases output by bb' as price falls by pp'. Even without an increase in the marginal rate of transformation, region A will use fewer resources, but more so as the rate of transformation increases. Region B will use more resources if the rate of increase in average productivity is less than bb'/ob, but fewer resources if the increase in resource productivity exceeds this proportion. If production is to conform to factor prices, consumer demand and the state of technology, it is obvious that farming intensity will necessarily decline in the one region, but much less so, or even increase, in the other. This is, of course, the situation in U.S. agriculture, and while land is in surplus stock if applied to the conventional mix of products, it is not in excess supply (i.e., as a discrete number of acres not required) if diverted to less intensive uses in part. But as illustrated in the figure, although shift ordinarily is from "more" to "less" intensive products, land can remain fully employed with fewer resources applied to it.[21]

The distribution of gains from technical change and progress through the pricing mechanism obviously cannot be in positive quantity to every

[21] The equivalent of Figure 14.6 for n products and m regions would be represented with nm supply functions and n demand functions in both production situations (leaving aside nonfarm competing products in demand). Solution then would be in terms of inverting the coefficient matrix and solving simultaneously for all prices and quantities, with production within regions allowed to shift completely among products.

person and region. Certainly in the short run, we cannot even be certain that the aggregate effect is positive-sum, with gain of utility to producers in region B more than offsetting loss to those in region A, or that the gain to consumers, in the smaller outlay ($orc'p'$) for the larger food quantity (or) as against the larger outlay ($ob'cp$) for a smaller quantity (ob'), is positive-sum in utility against loss to all farmers from this change. Numerous types of supply and price policies can be used in an attempt to guarantee Pareto-better position to all three groups. However, policies will have difficulty in holding the pattern of production to a historic form. Nonnegotiable and compulsory *output quotas* defining an upper-restraint could hold production in proportions of historic pattern. But they could not do so similarly for resources where technological change alters transformation rates differentially among regions. Resources such as labor may still move out of all regions, but by a much greater proportion in some than in others. Income to resources will still be depressed more in the first (A) than the second (B), or income may increase for the latter and decline for the former.

Given permanent change in relative regional advantage, there thus is little reason to attempt "prevention of shifts for all time" when regional supply and production possibility curves "change for all time." It is impossible, even if for no other reason than that resource returns will still differ and resources will be motivated differentially among regions to supply their services to farm and nonfarm activity demand. More nearly, the problem (in light of the "upstream" duel against factor prices and demand, and against varying endowments by nature which cause differential productivity effects from new technology) is to allow and encourage progress in this sense, but with policy to guarantee positive-sum utility or income effect between consumers and farm producers. On the one hand, minimum policy may be that which restrains the rate of change so that it does not land with crash effect on regions of less advantage, but still allows change to take place. At maximum, it would provide compensation, allowing change but providing redress to those suffering loss, either or both through (1) monetary assistance and (2) aid in move to nonfarm employment where income of the individual could be lifted above the previous level.

Regional Shifts

At the turn of the 1960's, control and price support programs had been so long in effect, factor prices and productivities had changed so greatly and demand alteration had been so great that the policy-inspired equilibrium of agriculture departed considerably from that consistent with current production possibilities, consumer demands and national challenges. The problem then, as now, was to (1) restore a more consistent equilibrium, (2) further progress and (3) increase equity in distribution of gains from this process. (See the discussion of equation (7.9) and Figures 7.4 to 7.7.) Land in the conventional mix allocation to crop was surplus as mentioned above.

Numerous methods exist, in such situations, for bringing about equilibrium among regions more consistent with consumer demand and relative factor supplies and prices. Free markets is one. Turned loose in an unfettered manner, prices would cause a price "shakedown" with little immediate effect on production, but with more of the shifts illustrated in Table 14.1 taking place over time. Negotiable output quotas would accomplish the same, but over a longer time because of the period required for a market in them to develop, and because a decision period would be required for farmers in regions of low advantage to sell them without income sacrifice. Free market prices would have immediate price impact; marketable quotas would not. Free market prices would cause land in regions of low advantage to shift in concentrated manner because of the large *income penalty* imposed on producers. Marketable quotas would encourage the same, with land withdrawn from crop production in manner concentrated to low advantage areas, because of the *gain in income or the asset increase* in sale of quotas to more productive regions where they have greater value.

The third means for withdrawing surplus land from production in a manner consistent with regional comparative advantage, is voluntary land retirement with control or shift supplied in response to a price thus offered. The main "snag" in the free market approach is the problem of gains and losses discussed previously. This has special impact in the sense that while the imbalance of agriculture was a "product" of the entire industry and of historic policy, the brunt of costs in eliminating it would fall on nonfarm persons in those regions forced to shift from feed grains, wheat, cotton and similar crops to trees and grass. The free market approach has main loss burden for both farm and non-farm producers in rural areas of lowest comparative advantage; negotiable quotas has main long-run burden on nonfarm persons in the same areas. The main "snag" in negotiable output quotas is the initial problem in equitable allocation of total marketings back to producers, freedom in farm decision being allowed by actual broadening of the functions of the market to allow purchase and sale of these quantities. But the free market mechanism has this same equity problem on a very broad basis among regions.

But voluntary land retirement, with this resource supplied to "disposal activity" in response to price or demand offered by public policy, also has its "snag"—the cost of the program, an amount which can be sizeable as indicated previously. Yet the method is one for averting (1) inequity in spread of losses from overcoming imbalance suddenly through market-free prices and (2) difficulty in attaining complete equity in initial distribution of marketable quotas. On a voluntary basis of land retirement and supply control covering whole farms, individuals can evaluate their position, thus supplying land to these purposes only under a guarantee of welfare gain. Under an appropriate price schedule, land would be supplied in a manner concentrating its withdrawal from crops in the least productive areas. This pattern was partly reflected in participation through the 1956 Conservation Reserve Act. By 1960 the conservation reserve embraced 35 percent of all cropland in New Mexico, 12 percent in Colorado, 13 percent in South Carolina, 12 percent in Georgia, 10 percent in the Dakotas, 2.6 percent in Iowa, 1.5 percent in California and 6.2 percent for the nation.

The methods used in voluntary supply of land to crop withdrawal also could be various, as outlined in Chapter 7. Direct land purchase by the federal government was used in the 1930's, with some land still so managed. Others of the methods mentioned previously also could be used. But, until demand grew sufficiently, shift of grain land to grazing would push the income problems of crop farmers over onto ranchers; supply of grazing activities would be increased. Hence, all marketable use of land might be prevented in the short run, but with land eventually shifted to uses with greater prospect in demand. Methods employed could allow farmers to handle the land and the managerial problems in shifting it to trees or grass. But for many farmers a sizeable increment in capital investment would be required for seeding and/or stocking land. Shift from wheat to grass, a long drop in income, involves a large amount of capital for (1) more land to provide an adequate unit, (2) funds to stock and utilize grass and (3) to replace income foregone over the 5 to 8 years required for the shift.

Hence, a special credit program should be included in the "action bundle" to provide farmers with assets for making the shift. Two quantities are important in making such a program successful, namely, the rental rate and the time period. The annual rental rate should be high enough to make participation profitable on sufficient scale. The program should substitute for other price-support and income-supplementing mechanisms. At the end of a designated period, for example, prices could be turned loose in the market, aside from the stability programs discussed previously (but without throwing current surplus stocks on the market, should such exist). The amount of land so withdrawn would be expected to lift prices over aggregate agriculture from a depressed level and accomplish price goals in this manner. Economic progress would thus be greatly encouraged for areas remaining in production, a fact to be recognized in the amount of land withdrawn. Progress also would be encouraged in the sense that shift to extensive levels of capital and labor use in particular regions would feed labor out to other sectors, providing that employment opportunity exists.

The annual payment for rental of land or purchase of rights to produce specific crops should compensate for the shift to the alternative land use. Thus for land shifted from wheat to grass the rental or "rights purchase" rate would approximate the return from wheat during the first years, when income would approach zero because seedings were being established. It would be lowered as grazing was initiated. At the very minimum, contracts should be for 10 years or the period necessary in light of supply-demand conditions. A recommended rental period for wheat areas shifting to grass would be 20 years, in order to provide a planning horizon that favors participation and offsets the portion of capital value not represented by capitalization of support prices and subsidies. In either case, rental contracts could carry a renewal clause, allowing an option for extending the period at rates equal to those at the outset, adjusted upward in proportion to changes in the general price level. (Where rights were purchased, they could be held in the hands of the public as long as it so desires.) A credit program would be necessary and would serve as a technical complement to the rental or "rights" schemes, in providing funds for land conversion, livestock purchase, and other necessary investments. But it, along with the compensation method, would need to be so administered as to encourage and facilitate combination of farms into units of economic size for the new pattern of agriculture.

Community Equity and Costs

Voluntary land retirement so concentrated by region could be entirely equitable to farmers, participation being required only if individuals so selected. Farmers in other regions would lose no freedom, but would gain from higher price. But the problem of equity does fall, as explained above, on persons of rural areas. Equity would not be complete, unless appropriate aid is extended over nonfarm people of rural communities so affected. Here is the point where "complete social policy" rather than "just farm policy" must be involved as explained in Chapter 10. The numerous elements outlined in other chapters need to be incorporated in this "broader policy mix" and include the aspects of education, guidance, compensation, community development and others discussed in Chapter 12, with focus on human resources and their opportunity and welfare under economic growth.

Target date in the future should be set up to shift surplus cropland and regear agriculture by broad regions as suggested above and in Chapter 7. To accomplish it in a single year, even if under purely voluntary and complete "supply price" compensation, would cause change too drastic to be digested by particular communities where it concentrates. Hence, it could better be attained in step-by-step fashion, with announced completion data starting from a temporary program which restrained output over all areas.

Is the burden of cost too great under a voluntary program? The answer depends on the comparison. The U.S. public outlays for price and income support from 1930 to 1960 would have allowed purchase of all cropland necessary, with funds left over, and a problem which continues would have been earlier terminated. The data in Table 14.3 indicate that if the 8.1 billion dollar loss by the Commodity Credit Corporation alone had been used to purchase land, it would have allowed purchase of 81.5 million acres of land at $100 per acre. Land averaging quite high in productivity could have been purchased easily at this price, over the period. Perhaps a better comparison would have been realized costs of government programs. Using the 17.8 billion dollars largely for price support and 3.5 billion of that for conservation, since at least this portion was equally a subsidy to agriculture (and the remainder was for improvement of land which might also have been purchased), the total is 21.3 billion

TABLE 14.3

REALIZED COST OF U.S. AGRICULTURAL PROGRAMS AND REALIZED LOSS OF COMMODITY CREDIT OPERATIONS, 1956–60 AND TOTAL 1933–60
(Million Dollars)

Item	1956	1957	1958	1959	1933–60*
Realized costs of programs					
Primarily price support	1,461	2,714	2,655	2,028	17,753
Primarily conservation	301	406	494	579	7,001
Credit and related	49	59	57	70	1,619
Research and education	212	232	257	301	3,242
School lunch and donations	39	49	56	43	822
Total above†	2,585	4,059	4,044	3,542	34,183
Realized losses of CCC					
Price support programs	981	1,301	1,023	891	7,298
Commodity export programs	67	147	101	132	851
Total above	1,048	1,448	1,124	1,031	8,149

Source: *Subsidy and Subsidy-like Programs of the U.S. Government*, Joint Economic Committee, 86th Session 1960. Excludes 540 million for the Farm Credit Administration and 4,246 million for wartime consumer subsidies on agricultural commodities.

* 1933–59 for realized losses and 1933–60 for CCC losses.

† Rounding may cause total to differ from sum of elements above.

dollars. Hence, 213 million acres could have been purchased at $100 per acre, or 106.5 million acres at $200 per acre. Obviously, enough land could have been purchased, at prices lower than these, to accomplish the adjustment goal mentioned above. Purchase of fewer acres and outlay smaller than 21.3 billion dollars would have done so. Funds left over could have been invested in the broader social policy needs discussed previously. (The realized cost comparison may provide better comparison since the public would own the land under purchase or control it under rental. Hence, it could have realized offsetting revenue and capital value in appreciation of these assets—under inflation, growing trees or grazing fees.)

The program would, of course, exceed costs of a policy in marketable quotas, allowed to transfer among regions and to concentrate at points of greatest comparative advantage. Under quotas, exchange could take place in the manner explained for Figure 8.1. Producer in area of comparative advantage could exchange money for quota with producer in area of low advantage. The exchange could take place only in the case where both persons judge themselves to be made better off, with Pareto optima assured. Problem of equity in distributing gain ex poste to establishment of the system would not arise. Ex ante, however, the problem of equity in distribution of given quota among producers would. Also, although farmers in regions of low advantage could sell their quotas to those in regions of greatest advantage, with the former migrating and realizing gain accordingly, merchants and others servicing the area would still sacrifice (while merchants in the comparative advantage areas could gain), thus leaving the same problem as voluntary land retirement and free-market prices where compensation is not provided nonfarm people. But in this case, as in the other, the same minimum and maximum compensation alternatives exist for nonfarm people in rural areas.

Increasing the Functions of the Pricing System Through Policy

Programs do exist, then, which promise a workable degree of equity in distribution of program gains and which also can catalyze economic progress and aid interregional adjustment of agriculture. Which program is preferable depends on the wisdom, value and equity orientation of the people involved and their willingness to appropriate funds in sufficient magnitude. Equity considerations probably require not a "single type of program" but one with a strategy mix which guarantees equity or positive-sum result over all broad groups affected. Otherwise, as suggested in Chapter 9, the program is likely to be rejected by the public (as in argument of business people in rural areas against the conservation reserve land retirement method). We say "broad or major groups" because no reorganization is possible which provides equity in the sense of welfare gain to absolutely every person in every group. Only society can make judgments of programs which are assessed to guarantee positive-sum result in group utility where it is certain that some individuals or small groups will sacrifice. If all groups concerned predict positive-sum utility outcome to result from free-market prices, the alternative should be selected just as would any other method which attains this end.

The problem of policy is not to lessen the function of the pricing mechanism, but to make the pricing system work better in attaining progress and increase in aggregate utility of the national society. The best hope for any large and complex society is to use the pricing system where positive-sum and/or equity in Pareto-better outcome is assured. Where it alone does not guarantee these conditions, policy is needed to "shore it up," to bring about attainment of these conditions but still to allow maximum effectiveness of the pricing mechanism in maintaining an open economy which responds to the individual preference of its sovereign consumers, or to the aggregate desires of the community in public purposes. The other two programs, voluntary land retirement and marketable quotas, outlined above for regearing production to modern economic structure, do not do away with the pricing mechanism, but only add more functions for it to perform. In this case, then, does not policy have positive-sum effect in increasing the functions of the market and price mechanisms? Programs such as land retirement, diverting greater supply of land to uses other than commodities deemed in surplus, would be used to turn commodities loose in the markets. Commodities would be priced in a manner to let consumers better guide the relative allocation of resource; with the condition that the supply function would be restrained to a desirable extent by decrease in spatial extent of the farm plant. Prices free in this type of market could differ not at all in function and level from those operating in a free market where the supply of new technology might have been less. Would not both then be "free use of prices"? Had the public not "gone around the market" so greatly in socializing research and education, the supply of technology and the supply of commodities both would be less. Price would be higher accordingly. But this restraint would be undesirable and we would have a much smaller contingency reserve of knowledge and food. We prefer not to restrain research, education and knowledge, but to restrain supply by keeping standby production plant in the manner of regional adjustment mentioned above.

CONSERVATION PAYMENTS

U.S. society appropriated more than 7 billion dollars for soil conservation programs over the period 1933–59. In general, these appropriations, to the extent that they were truly for conservation, provide for greater future consumption at the expense of that in the present period. Funds allocated for conservation purposes mean greater taxes and smaller consumption of autos, clothing or other commodities of the present; or smaller consumption of other public services for which current tax dollars might also be used. Not all of these expenditures under the heading of soil conservation actually qualify as increasing conservation services, however. Soil conservation is an "acceptable label" for subsidies. Production control and price boosting programs have had a tendency to be put under this cloak. For example, the land input reducing program of the 1950's was designated as the 1956 Conservation Reserve Act.

Of the 1933–59 conservation outlays indicated in Table 14.3, nearly 75 percent went for monetary payments to farmers through the Agricultural Conservation Program. The payments were made to farmers who used more labor and capital inputs which were conveniently identified as "conservation practices." Viewing the relationships in equations (4.23) through (4.26), it is obvious that any policy which lowers the price of a factor should increase output. But the problem of true conservation is to increase supply in a future period with sacrifice of supply in the present period. The effect of perhaps the largest portion of soil conservation payments has been that of increasing production in the present period. The same analysis and statement can be applied to other conservation investments such as the technical assistance of the Soil Conservation Service.

Monetary and technical assistance (one provides money to the farmer for purchase of an input and the other furnishes him a physical input) can be used for true conservation or for boosting current production. Investment is made in true conservation activities if the practices are such as those which retard erosion and prevent salination of soils, so that they will be available in future time periods. But other investment under these programs simply cause greater inputs to be used currently on soils without a conservation problem. Monetary and technical assistance is provided, under the label of conservation, in California to improve efficiency of irrigation systems on level land, in Minnesota for draining land which is so flat that it accumulates water, in Illinois for fertilizing and liming land of zero slope, in Nebraska and Wyoming for putting down wells and developing irrigation systems, in Kansas and Texas for use of deep tillage and other yield improvement practices on flat land and for other output-increasing investments the nation over. Much of this investment has no relationship to preservation of future land productivity. Hence, total public expenditures for conservation could both (1) conserve more land for future purposes and (2) lessen pressure to increase output in the current period, if they were allocated differently.

Some of these investments are even the negative of conservation: If a parcel of wet land in Minnesota is not drained this year, it will still be there in 50 years (with more top soil deposited on it) and fewer of the initial soil nutrient supplies will be exhausted. Development of irrigation on Great Plains soils increases the rate at which phosphates and potash can be used from the soil—to increase present production at the expense of future production. Subsidy of irrigation wells in some localities increases water resources withdrawn at the present time, but lowers the water table and decreases production possible from it in a future period.

In addition to the above programs of developmental nature which have main effect in increasing contemporary supply of farm products, other programs do so similarly. Programs (involving more than a half billion dollars) leading to development of land for irrigation under the Bureau of Reclamation did so in the above period. Hence, in addition to the more passive investments in research and education, we make investments directly in inputs, or subsidize their costs, to increase output at the present. On the same farm, the nation has long made conflicting investments: one paying the farmer to curtail land and other inputs as a means of reducing output, and another paying him to use more inputs on remaining land to increase output. Here the ends and investments are pure contradiction.

More conservation could be attained with given public outlays, with reduced impetus to current output, or current conservation attainment could be had with smaller outlay, if conservation funds were allocated differently. Most importantly, distinction should be made between those investments which have a main effect of shoving the supply function of the current period to the right and those which shift only the supply function of future periods to the right. The optimum arrangement would be, considering current problems of production capacity and producer-consumer equity, investments which push current supply function to the left and future supply function to the right. Numerous such investment opportunities do exist (except major effort becomes confounded between investment in acreage and output quotas to restrain supply, and in conservation-labeled programs to augment it).

Perhaps the major opportunity, however, is in investments which are neutral in respect to supply function of the present period and retain the supply function of the future—safeguarding against the leftward movement in the future. This criterion should be used: Inputs used in one period which increase the supply function of the same period are *con-*

ventional inputs and should not qualify for conservation subsidy. In other words, the input can be used in the current period or future period, the effect on supply being the same in either. However, input which is required in this period to increase (or maintain) the supply function of future periods is a *conservation input* and should have the full public outlay for conservation. Investment thus must be made in terms of the nature of the production function in relation to the supply function. Programs which simply use subsidy to lower the factor/product price ratio and cause the farmer to use more of conventional inputs (those already in use), in order to drive the marginal productivity of the factor to lower level, are best labeled "production" or "supply increasing." Those which subsidize cost of a factor not in use, because its discounted factor/product price ratio has been higher than the marginal productivity of the factor in terms of its stream of outputs over future periods, but should be in use, are those for which conservation payments should be used. We have explained these concepts in detail elsewhere but will summarize essential relationships as they further distinguish between investments which increase the current supply function and those which augment or protect the future supply function of food.[22]

Without a criterion such as that mentioned above in respect to supply functions of different periods, there is no limit to the number of inputs which might be subsidized to increase supply or output in the current period. In the discussion which follows, conservation practices (resources) are only those which prevent diminution of output in the future from given resource inputs (retention of a given production function over time.)

In terms of our criteria, efficiency in the use of limited annual conservation appropriations is denoted by allocations which minimize the potential diminution of future production when given resources are applied to the land and which do not have focus on increasing present output. Irrigation, drainage, and weed control are not practices which are generally necessary to prevent a diminution in future production. If irrigation is not developed or improved on a tract of land now, there is nothing to preclude its initiation at a future date with an equivalent increase in production. A legume or grass crop used to prevent erosion or permanent deterioration in soil structure is related to production in the future. However, where these crops are used simply to boost short-run production of subsequent grain crops on level soil types, they hardly qualify for public subsidy if the objective is the maintenance of future productivity. Payments for liming materials and inorganic fertilizers for grasses and legumes on level land with the principal effect of increasing short-run yield and supply fall in a similar category. Subsidization of practices with no effect in preventing diminution of future production represents an inefficient use of public resources allocated for conservation

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[22] Earl O. Heady, *Economics of Agricultural Production and Resource Use*, Prentice-Hall, New York, 1952, Chap. 26; and Iowa Agr. Exp. Sta. Bul. 382.

purposes (when processes which do lessen future production are taking place).

A similar analysis can be applied to SCS technical assistance. The first soil-conservation districts were generally formed in areas with the greatest erosion hazard and hence where a true conservation problem existed. Furthermore, a greater proportion of the SCS technical assistance is probably allocated to conservation practices (as defined here) than is true for monetary assistance. As the number of soil-conservation districts has expanded, however, the erosion hazards have generally been less critical, and a portion of technical assistance has been devoted to developing irrigation systems, drainage districts, and the like. Certainly the SCS technical assistance used for irrigation, improved rotations on level land, or drainage developments (where these are of a nonconservation nature) could better be employed where permanent deterioration of the soil is taking place. They would thus relate to conserving the production function for food and in restraining its supply price in future time period, rather than in causing current supply functions to shift to the right and lowering present food supply price.

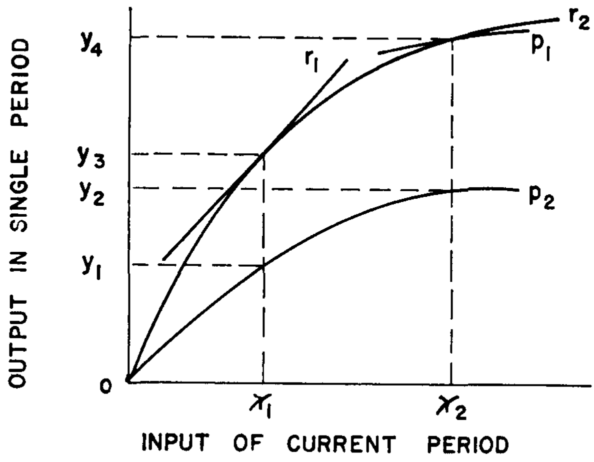

Fig. 14.7. Conservation Inputs.

Under our definition here, soil conservation refers to retention of a given production function over time to increase the conservation input which is necessary if conventional inputs are to have the same marginal productivity in a future as in the present time period. Hence, in Figure 14.7, inputs which increase output along a given production function, P_1, are conventional inputs. Increase from ox_1 to ox_2 along production function P_1 simply increases output of current period from oy_3 to oy_4. Subsidy of input has the effect of lessening the slope of factor/product price ratio line from r_1 to r_2, and in increasing the profitability of inputs which increase output at the present. In contrast, conservation inputs are those which are technical complements to retention of marginal resource productivity of conventional inputs at a level in the future production period equal to that of the present period. Hence, they prevent a drop from production function as from P_1 to P_2. For example, without conservation input, production from ox_1 input would drop from oy_3 to oy_4. Or, if the conservation input were not provided, extention of input to ox_2 would increase output to only oy_2, rather than to oy_4. Without question, much of the subsidy in the form of technical and monetary assistance of federal programs has gone into traverse of curve P_1, rather than in preventing fall from this function to P_2.

Given the current tendency of the supply function to shift more rapidly than demand, and with inability to predict demand magnitude a hundred years hence, it is preferable to invest in inputs which retain or extend the supply function of the future, rather than those which augment the current supply for food. The 7 billion dollars invested in conservation over the period 1932–39 alone would have allowed the public to purchase 70 million acres at $100 per acre, or 35 million at $200 per acre. Had this land been purchased and put to grass or trees, two important intermediate goals of policy could have been attained simultaneously: supply function of the current period could have been shifted to the left and supply function of the future could have been much better shifted to the right. Supply price of food in contemporary period could have been increased and that of future period could have been lowered. The latter is the purpose of conservation: to lower the supply price of resources and commodities in the future period.

Largely, however, the effects of conservation programs from 1940 to 1960, in increasing supply function of the present period, outweighed effects in lowering supply price in future periods. This is not necessary, however. The investment in purchase of 70 million acres with the 7 billion dollars in conservation outlays over the period 1933–60, plus 178 million acres which could have been purchased at $100 per acre (or 89 million acres at $200 per acre) from realized costs of price supports (Table 14.3), would have readily accomplished these two goals. Of course, it would not have been necessary to go this far, nor entirely to have sacrificed current supply to have attained future supply. We mention the quantities only to indicate the production possibilities in goal attainment which have existed from given public outlays in previous decades, and to re-emphasize the need for more permanent withdrawal of land inputs under an environment where current supply price of farm commodities is too low, and total input of resources in agriculture is too great to be consistent with desired level of farm returns, national income and economic progress.

It is likely that the above approach was not used in respect to a more efficient allocation of investment between food supply functions and farm commodity prices of current and future periods because (1) the public had insufficient knowledge of the basic supply and conservation problems of agriculture and of the inconsistencies in different policy means and ends, (2) political and interest groups pressed to keep programs oriented in particular directions and towards the present and (3) large-scale land conservation programs would have given rise to problems of equity between (1) nonfarm persons in rural areas (and farmers) of this generation and (2) general consumers of future generations. However, the actual public outlay from 1940 to 1960 would have allowed redress of such losses and attainment of general equity; or it would have allowed development of general social policy to assure positive-sum outcome from more effective integration of food supply in current and future periods.

POLICIES OF EQUITY AND PRICE

As mentioned previously in this chapter, policies can be developed to increase the number of functions which the pricing and market mechanism perform. These policies can bring equity in distribution of gains and losses from progress and desired economic reorganization, whereas some strata otherwise bear sacrifices posing negative-sum utility outcomes. They can help to erase major inefficiencies of the economic system which have accumulated from the past. They are public policies, designed and initiated by man who is master of the state and the institutions and mechanisms which function within it, in contrast to societies where man is the subject of the state and the mechanisms, market or otherwise, which operate within it and under its sponsorship. Marketable quotas increase the functions to be performed by the market, as also is true of voluntary land retirement supplied in response to a price offered for this purpose. The main policy problems are those of equity in distribution of gains and losses from policy or market impact. Under quotas, the problem is equity in initial distribution of aggregate market restraint; under the free market, it is a problem of equity in the distribution of gains and losses from ongoing variables in growth which cause opportunities and returns for some to grow, but for others to decay, as change takes place in technology and consumer preferences.

Restated, a major task of policy is to assure equity in the distribution of gains from progress. With attainment of this goal, there is no basis for further policy to restrain progress, in case measurement of progress embraces the complete range of goods, services and cultural attributes with positive utility to all consumers. Policy which goes beyond this general goal, to try to maintain a regional and resource pattern of agriculture drawn from the past, is inconsistent not only with progress but also with solution of basic problems of agriculture. As mentioned in Chapter 11, the "return of the evil" is certain in this sense: Policy which increases income at the present cannot remove the causes of low income and resource returns for the future where low relative factor supply elasticity is the basis. Surplus resources will remain, with transfer income capitalized into asset values and low return to future labor, unless the causes per se of low factor supply elasticity are removed.