AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
BATCH # 20

1. SUBJECT CLASSIFICATION

A. PRIMARY
Agriculture AE30-0000-0000

B. SECONDARY
Development

2. TITLE AND SUBTITLE
Foundations for agrarian development

3. AUTHOR(S)
Parker,F.W.; Hendrix,W.E.

4. DOCUMENT DATE
1963]

5. NUMBER OF PAGES
35p.

6. ARC NUMBER
ARC NEA338.1.P239

7. REFERENCE ORGANIZATION NAME AND ADDRESS
USDA/ERS

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*
(Presented at CENTO Rural Development Sym.,Tehran)

9. ABSTRACT

10. CONTROL NUMBER
PN-RAB-120

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Economic development
Factor analysis

13. PROJECT NUMBER

14. CONTRACT NUMBER
PASA RA-2-00 Res.

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

NEP
338.1
P239

FOUNDATIONS FOR AGRARIAN DEVELOPMENT

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Prepared for delivery before the
Rural Development Symposium,
Central Treaty Organization Countries,
Tehran, Iran
September 25, 1963

A.I.D.
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Room 1656 NS

FOUNDATIONS FOR AGRARIAN DEVELOPMENT

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ABSTRACT

The paper briefly summarizes the recent record and future needs for agricultural production in CENTO countries. It then examines recent agricultural growth patterns in selected countries with respect to eight factors that seem to be highly important to agricultural development. These include four conditioning factors relating to land tenure, the price of farm products, availability of markets, and supply of consumer goods and four production factors including informational services, supplies of production requisites, credit facilities, and investments in development of land resources, particularly irrigation and land reclamation. Recent development patterns in the United States, Japan, Taiwan, Greece and Mexico, countries with good records in increasing agricultural production, reveals that all eight factors have been highly or moderately favorable in recent years. In contrast, the record in three less successful countries, Chile, Spain, and India, reveals that until very recently most of these factors have been unfavorable and the others only moderately favorable.

Governments of developing countries have a major role in creating conditions favorable to development, including establishment of the administrative machinery and staff needed to implement agricultural progress.

FOUNDATIONS FOR AGRARIAN DEVELOPMENT

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The role and importance of agricultural and rural development as a part of balanced national economic development is better recognized today than only a few years ago. This has resulted from an improved understanding of the development process; retarded economic development in several countries due to lack of progress in the agricultural sector; and several instances of successful economic development in which the agricultural sector has played an important role. This conference and the development plans of Turkey, Iran and Pakistan indicate a clear recognition of the role and importance of agriculture. We may, therefore, briefly consider the magnitude of the agricultural problem before discussing means for its solution.

The basic objective of the agricultural sector is a suitable rate of increase in output and productivity. Data on recent and desired rates of increase in production in the three countries is summarized in Table 1. The average annual rate of increase for recent years has varied from 2.0 percent in Turkey and Pakistan to 2.4 percent in Iran. We estimate that at the present level of agricultural self-sufficiency these rates need to be increased to about 4.5 percent in all three countries. The magnitude of the task is clearly evident. Now we need to understand the means of achieving these considerable goals. What are the foundation stones for agrarian development?

Table 1. Recent record and future needs for agricultural production in CENTO countries

Item	Turkey	Iran	Pakistan
Annual rate [1] of increase in agricultural production, 1952-1962	2.0	2.4	2.0
Annual rate of increase in population, 1953-1960	2.1	2.9	2.3
Annual rate of increase in agricultural production per capita .	-0.1	-0.5	-0.1
U. N. projections on annual rate of increase in population to 1970 . . .	2.3	2.5	2.2
Desired annual rate of increase in per capita incomes, 1960-1970	3.0	3.0	3.0
Income elasticity of demand for agricultural products	0.7	0.7	0.7
Required agricultural output in 1970 per unit of output in 1960 . . .	1.56	1.59	1.54
Required annual rate of increase in agricultural production [2]	4.4	4.6	4.3

1/ All rates of change referred to in this table are annual compound rates.

2/ This is the required rate compounded annually assuming no change in agricultural self-sufficiency. It is based upon the UN population projections.

The U. S. Department of Agriculture is conducting for the Agency for International Development a study of the factors associated with differences and changes in agricultural production in less developed countries. We hope to be able to identify the reasons for the differences among countries in the rate of increased production which range from zero

to ten percent per year. Earlier studies and the initial results of the current investigation indicate there are at least eight important factors to consider in building a foundation for agrarian development. Four of these factors affect production mainly through their effects upon farmers' incentives. We call these motivational or conditioning factors. The other four affect production mainly through their effects upon the supply of production services and requisites and we call these production factors. We shall discuss these factors and then undertake to further assess their importance by examining the record of agricultural development in several countries.

Common Elements in a Good Foundation

Our studies of agricultural development in a large number of countries, developed and underdeveloped, indicate that the degree to which these eight factors are well developed in a program largely explains the difference in rate of progress. When all factors are well developed, the factors interact with and strengthen each other in ways that make for a rapid rate of progress. If some are poorly developed, progress is retarded.

Conditioning Factors: It seems essential that governments help to create conditions, economic and social, that cause farmers to exert greater efforts for production. The conditions should make the farmers respond for their own selfish reasons, a desire for more of this world's goods and better living for their family. There are at least four such major underlying factors: land tenure, the price of farm products, good

markets and an adequate supply of consumer goods. These are factors largely beyond the control of farmers as individuals or organized groups, yet they have a profound effect on the efforts farmers make to achieve greater production. Let us consider each of the four factors.

A system of land tenure that provides cultivators large security of expectations on long-term farm improvements, such as is commonly done under owner-operatorship, seems to afford the maximum incentive for good farming and increased production.

Stable prices for farm products that are high enough to provide a good return for labor and capital is a powerful incentive for production. The prices must be effective at the farm level.

Good markets, within reach of the farmer, are another essential feature of conditions for production. They help draw producers into a money economy and make them responsive to market and national requirements.

The fourth conditioning factor is an accessible supply of consumer goods for better living. They help create wants and a willingness to work and invest in order to increase production and income.

There are undoubtably other conditioning factors such as the level of taxation and educational opportunities, but the four cited are the major ones and serve to illustrate the thesis of this paper.

Production Factors: The successful development of conditioning factors, however, is not adequate for maintaining the desired rate of increased production. The conditioning factors should be accompanied by four production factors or services, i.e., information, a supply of

production requisites, credit, and investments in the development of natural resources. Governments have a major responsibility for these factors but may have the assistance of private industry including farmers or farmer cooperatives.

Information on improved methods of production, marketing and other aspects of farming is obtained by research and passed on to farmers in adult education and technical and management assistance programs. A basic responsibility of all governments is the development of effective research and extension services dedicated to solving farm problems and giving the solutions to farmers.

Productive farming requires an ample readily available supply of good seed, fertilizer, pesticides, implements and other production requisites. In the more developed countries these materials are usually supplied by private industry, government corporations operating much like private industry or farmer cooperatives. In the developing countries the sources of supply of some of these services may be initially developed by the government.

A third essential production requirement is credit for farm operations and improvements. Production credit associated with farm plans and some supervision has stimulated production in many countries and under a wide range of conditions.

Finally, substantial investments commonly made by governments and farmers need to be made for the development of natural resources, primarily for irrigation, bringing additional land into agricultural

use, and facilities for transport and communications. The need for such investments varies widely from country to country, and often the return is low compared to investments for production on existing farms.

Our observations from past and current studies indicate these conditioning and production factors are important in agricultural programs designed to achieve a sustained annual increase in production of more than 3.0 percent per year. Let us, therefore, accept this as a hypothesis and test it by examining its validity in both developed and underdeveloped, successful and not so successful countries, and in relation to varying rates of progress in a country at different periods of time.

Before undertaking this examination, however, we remind you that AID and USDA are in the early stages of a project that will test the validity of the foregoing hypothesis in about twenty-five countries. In another year or two our understanding of these matters should be far better than it is now. Nevertheless, the evidence presented here seems to provide a sound basis for emphasizing the importance of the four conditioning and four production factors.

Analysis of Good Development

Two industrial countries, the United States and Japan, and three predominantly agricultural countries, Taiwan, Mexico and Greece, have been selected for examination as cases of rather good agricultural development. The rates of increase in agricultural production in the five countries in recent years are summarized in Table 2. They afford

Table 2. Average annual compound rate of change in total and per capita agricultural production and in population in the United States, Japan, Taiwan, Greece and Mexico, 1952 to 1962

	United States	Japan	Taiwan	Greece	Mexico
	Percent	Percent	Percent	Percent	Percent
Total agricultural production	1.7 1/	5.3	4.0	4.0	5.0
Population	1.7	1.0	3.4	0.9	2.5
Per capita agricultural production	0	4.3	0.6	3.1	2.5

1/ Production has been restricted because of lack of markets.

a contrast with the data for the CENTO countries and we are concerned with reasons for the differences. A comparison of the data for Japan and Greece with that for Taiwan and Mexico affords a striking demonstration of the importance of the population factor.

Other data afford an opportunity to examine the rate of agricultural development in four of these countries over a period of fifty or more years. In none of the four countries has the rate of increase in agricultural production been uniform over the entire period. We will first consider changes in production in relation to the conditioning and production factors noted above. The influence of each of these factors in recent years will then be considered and summarized for each of the five countries.

United States: Farm output and crop yields in the U. S. from 1870 to 1962 are shown in Figure 1. It indicates a rather steady increase in farm output from an index number of 23 in 1870 to 130 in 1962. Between 1870 and 1930 most of the increase in output, from an index of 23 to 72 or at an annual compound rate of 1.9 percent per year, came from an extension of the area under crops. From 1930 to 1940, there was a decrease in acreage but production increased from an index of 72 to 82, or an average of 1.0 percent per annum. Since 1940, the acreage in crops has continued to decline, from an index of 97 in 1940 to 89 in 1962. Production, however, has increased by 58 percent, which increase has come from a rapid increase in crop yields.

The extension of the agricultural area in the United States took place under the Homestead Act of 1862, and was based on the owner-operated family farm. Universal education, agricultural research and extension, transportation and marketing were steadily improved to support agricultural development. Important problems of this period were periodic over-supply of agricultural commodities and unstable prices. Such factors apparently discouraged farmers in making the investments required to increase crop yields.

Government measures, including assured minimum prices, taken in the 1930's and the market demands of the war and post-war periods created the conditions that caused farmers to make the investments and take the other steps required to increase crop yields in the 1940-60 period. This resulted in a 55 percent increase in production per acre from 1940 to 1962, as shown in Figure 1.

None of the CENTO or other developing countries have the opportunity of increasing farm output through an extension of the area under crops comparable to that which took place in the United States in the 1870/1920 period. These countries, therefore, must rely on increasing crop yields on existing areas. It is for this reason that the greatest significance of U. S. experience lies in a study of the conditioning and production factors that have been in operation and proven so effective in the last twenty years. As will be indicated later all conditioning and production factors have been relatively favorable in the United States during the last twenty-five years.

Japan: The record of Japan in agricultural production and development is unique for Asia and has few equals in the world. It is summarized in a recent paper, "Agricultural Development in Modern Japan," from which Figure 2 was prepared. The figure shows total farm output and yields for an 80-year period. During that period total production increased almost three-fold and yields more than doubled. Production increased at a rate of 2.3 percent per year from 1880 to the first World War and dropped to 1.0 percent in the inter-war period. These rates are about the same as those of the United States for the same periods. After World War II the rate increased to 5.3 percent.

The Japanese Government maintained conditioning and production factors rather favorable for agricultural production except during the inter-war period. It supported general education, agricultural research and extension, credit and marketing facilities and industry provided production requisite and consumer goods. In the inter-war period, increased attention was given to the development of agriculture in Manchuria, Korea, and Taiwan and conditions became less favorable in Japan proper. In the post-war period there has been an effective land reform program and other conditioning and production factors have been favorable.

Most of Japan's increase in crop production has involved substantial increases in operating capital but relatively small increases in long-term capital. The labor force in agriculture has been almost constant during the eighty-year period but is now declining. Likewise, the average size of farms has been almost constant, 1.0 hectare in 1880 and 0.8 hectare in 1962.

The excellent analysis of Japan's agricultural development cited above and its significance for other Asian countries was presented at the World Food Congress, June 14-18, 1963. It merits careful study as it not only indicates the measures taken to develop agriculture but shows the interrelationship of agricultural and industrial development.

Taiwan: In many ways, Taiwan is of larger interest than Japan as an example of modern agricultural progress. For in contrast to Japan's more temperate climate, Taiwan has a subtropical monsoon climate much more like that of the Philippines, Thailand, and other South Asian countries. Taiwan also started much later than did Japan to improve its agriculture. Too, like most of the newly developing countries, it still has mainly an agrarian economy with agriculture accounting for about two-thirds of its national income and 90 percent of its exports and providing employment of more than half of its people.

Taiwan agricultural output, as indicated in Figure 3, has increased at a phenomenal rate since the initial stage of its agricultural development under Japanese colonial rule dating from about 1910. For more than 40 years Taiwan has increased its agricultural production at an annual compound rate of about 5 percent per annum except for a short period during and immediately after World War II.

Beginning early in the twentieth century, there were completed in Taiwan, in steady succession, several major projects each of which contributed immeasurably to increasing the country's subsequent agricultural output. One of the very first of these was a complete and accurate

cadastral land survey that was initially useful in resolving landlord-tenancy difficulties and in providing the basis for the levying of land taxes, and which since the War has been extensively used to implement far-reaching land tenure reforms. Other projects of importance included the building of a good public system of transport and communications; sanitation and disease control; the development of irrigation systems; education; and the organization of farmer associations.

The early improvement of Taiwan's agriculture, instead of awaiting new research conducted in Taiwan, was based upon the existing fund of knowledge of improved techniques imported from other countries and fitted with minor adaptations to the case at hand. To overcome the handicap of inertia and ignorance, a well-organized program was initiated to supervise the use of new techniques and to coordinate this supervision with judicious but never extravagant uses of capital. An important input consisted of the administrative framework through which technical improvements were introduced.

After the restoration of Taiwan to the Republic of China in 1945, its agriculture underwent rapid rehabilitation and recovery from the damages and downwards trends of World War II. Agricultural output reached the prewar level by 1951 and has continued to show a remarkable rate of increase to 1962.

In this recent period Taiwan has been in an especially favorable position with respect to all of the conditions that we have enumerated as essential to increasing agricultural productivity. Particularly

noteworthy among factors contributing to its performance have been (1) a far-reaching land reform program to give incentives to cultivators through regulating and limiting rental rates and selling public lands and purchasing and re-selling large private holdings to tillers of the land; (2) extensive rehabilitation and expansion of irrigation facilities; (3) increased import and use of chemical fertilizers; and (4) introduction of improved and new technology in agricultural production.

Mexico: Mexico is one of the few Latin American countries that has achieved a satisfactory rate of increase in its agricultural production. For the last 25 years, as shown in Figure 4, its agricultural production has been increasing at an annual compound rate of close to 5 percent per annum. This compares with the country's total population growth in the last decade of 2.8 percent. Hence, despite a high rate of population growth, Mexico has been able to increase its per capita consumption of food while increasing agricultural exports to obtain foreign exchange. This record has been achieved despite the fact that Mexico's increases in agricultural production have been very unevenly distributed among its regions and classes of farmers. It has made its largest gains in its northern states where its agriculture is most like that of the Southwestern United States. All parts of Mexico, however, still have large subsistence sectors in which little progress has yet been made.

Most students date Mexico's entry into the ranks of modern nations back to 1911. It was not until the period 1920 to 1933, however, that Mexico got well underway in the laying of its development foundations.

It undertook, at first on a moderate scale, a significant land reform program aimed at giving tillers of the soil control and management over the land they till. The government also started a program to improve the education of its people and began public investments in irrigation projects, roads and in improving its agricultural credit facilities. These and other important reform measures were pursued with increased vigor beginning in 1934. National programs have continued to include the expansion of credit to agriculture; the distribution of land; and the improvement of the rural infrastructure, especially roads, dams and schools.

In 1940, with the assistance of the Rockefeller Foundation, Mexico began to expand its agricultural research program. It has developed and is steadily improving its agricultural extension service. It has as an adjunct to its farm extension work a Rural Home Improvement Program. The Federal Extension Service carries on a cooperative program with the nine States of Mexico having similar services. For many years, the government has also maintained a National School of Agriculture, to supplement the program of several other agricultural schools also at the University level.

The Government also supports programs to increase the supply and to distribute improved seeds and plants and takes an active part in promotion of the country's fertilizer industry.

Government action to regulate and to stabilize prices for agricultural products was begun some twenty-five years ago. The policy of

guaranteed prices provides financial insurance to the country's agricultural producers and functions as an important incentive to farmers to increase their production.

As Mexico has been improving its agricultural economy, the increasing output of nonfarm goods and services has helped to provide its farm people with a larger supply of consumption goods to furnish them larger incentives to increase their farming efficiency.

In brief summary, Mexico in recent decades has been busily engaged in building what we believe are good foundations for increasing its agricultural production in ways that help to strengthen the country's general economy.

Greece: For many years prior to 1950, Greece was so victimized by invading armies and internal strife that it had little opportunity to develop either its agriculture or industry. During the past decade, however, the country's agricultural production increased at an average compound rate of 4.0 percent per year. With a population growth rate of only 0.9 percent per year, this represented a gain on a per capita basis at the annual compound rate of 3.1 percent, a rate sufficient to double the country's per capita agricultural production in 23 years.

The record of Greece and Mexico in increasing agricultural production since 1950 is very important for the economic development aspirations of other underdeveloped countries. For these experiences illustrate the rapidity with which underdeveloped countries can now increase their agricultural production as a result of the world's large

accumulation of knowledge of improved farming techniques. They show that given the incentives and the other conditions favorable to development this store of technical knowledge makes it possible for underdeveloped countries to increase their agricultural production at rates much greater than was technically possible when countries like the United States, England, Germany, and Japan first set out to increase their output per acre of land.

Key factors in Greece's recent development have been an effective agricultural extension program emphasizing closely working with farmers on the land; strong farmers' cooperatives working closely with the government to provide a wide range of services from land reclamation and irrigation projects to credit and marketing assistance; price stabilization measures; and where needed redistribution of land to provide owner operatorship.

It is true that in laying its development foundation, Greece received a large amount of outside economic and technical assistance. This kind of assistance, however, is still being offered through international organizations and through the government and private agencies of the higher income countries to all developing countries.

Summary: We have briefly reviewed the course of agricultural development in the United States, Japan, Taiwan and Mexico for periods of more than fifty years. Differences in the rate of increase in production were partially explained by conditioning and production factors. The four countries and Greece have had a high rate of increase in

production and productivity in the last ten years. Let us now attempt to relate this to each of the eight factors mentioned in this paper.

Time does not permit a detailed analysis for each country. Furthermore, data for some of the countries are incomplete. The USDA-AID study is still in its early stages. The situation as indicated by current data is summarized in Table 3. It indicates for each of the five countries whether each of the conditioning and production factors has been favorable, moderately favorable or unfavorable, At this stage the figures indicated are essentially informed judgments. Research, however, should develop more quantitative measurements. When more data are available it may be possible to score each factor on a scale of five but for the present we have limited the scale to three.

Table 3. Tentative rating of conditioning and production factors for agricultural production in five countries, 1952-1962[1/]

Factors	U.S.	Japan	Taiwan	Mexico	Greece
Conditioning:					
Land tenure	1	1	1	1	1
Farm prices	1	1	2	1	1
Markets	2	1	1	1	1
Consumer goods	1	1	2	2	2
Production:					
Knowledge	1	1	1	2	1
Requisites	1	1	1	1	2
Credit	1	1	1	2	2
Investment[2/]	1	1	1	2	2

1/ The ratings of 1, 2 and 3 are used to mean favorable, moderately favorable and unfavorable, respectively.

2/ This relates to investment in developing land resources.

Table 3 indicates that in all five countries, four or more of the factors have been favorable and none have been unfavorable during the last decade. In Japan all of the factors have been favorable, which accounts for the rapid progress made in a country with such limited land resources. All of the factors for development have been favorable in the United States, except for markets large enough to fully utilize the country's rapidly increasing production capacity.

Analysis of Slow Development

Three countries, Chile, Spain, and India have been selected as examples of countries that have been slow in increasing their agricultural production. The rates of increase in agricultural production in these three countries in recent years are summarized in Table 4. They afford a contrast with the five countries described above as well as interesting comparisons with the CENTO countries. Comparison of Spain with the other two countries, Chile and India, as well as with Japan and Greece, further emphasizes the importance of the population factor.

All three countries have recently begun to lay what we believe are good foundations for improving their agriculture. Their record during the past decade, however, reflects more their former situation with respect to the conditions of successful development rather than benefits of the improvements that have recently been made. We will consider their recent progress in relation to the conditioning and production factors noted above, but will take account of recent improvements in these conditions.

Table 4. Average annual compound rate of change in total and per capita agricultural production and in population growth, Chile, Spain and India 1952-1962

Item	Chile	Spain	India
	Percent	Percent	Percent
Total agricultural production	1.9	2.0	3.0
Population	1.8	0.9	2.0
Per capita agricultural production	0.1	1.1	1.0

Chile: Compared with Asian countries, Chile has an abundance of land and other natural resources relative to the size of its population. Yet Chile is a country with low per capita incomes and widespread poverty in both its agriculture and nonfarm economy. With an average daily food intake estimated at 2,610 calories per person in 1958, the Chilean people are reasonably well fed. Yet available information indicates that relative to its population, Chile's agricultural production has been declining at times during the last decade, with per capita production increasing since 1952 at an annual compound rate of only 0.1 percent.

With respect to the conditions characterizing successful agricultural development, Chile is deficient on several important counts. Like most of the other Latin American countries, large concentrations of land ownership are a dominant characteristic of Chilean agriculture. In 1955, farms exceeding 1,000 hectares comprised less than 3 percent of total farms but account for 41 percent of arable land and 80 percent of total farm land. Farms with less than 20 hectares make up 65 percent of the farms but only 2 percent of the land.

Like most other countries with large concentrations of land onwerships, Chile has invested very little in the education and development of its human resources. It has begun a program of agricultural research concentrating on production of forage crops and cereals and on agricultural engineering problems. It also has an agricultural extension service. Yet it is estimated that only about 20,000 out of a total of around 150,000 farmers in the country are being reached through this program.

Inadequate agricultural credit facilities limit the capacities of the country's smaller farmers to expand their agricultural operations.

Until 1955, price and marketing controls were designed to combat inflation instead of for increasing incentives. Hence, producer prices have been lower than they would otherwise have been. These lower prices have kept producers from expanding their production as rapidly as they would otherwise have done.

The Chilean government recognizes the major weaknesses in the country's agricultural organization, policies and program. Since 1955, it has placed increasing emphasis upon increasing agricultural production. To this end, it is attempting to strengthen agricultural credit and educational services, to expand irrigation facilities, to improve tenure conditions.

Chile, like many other Latin American countries, is in the enviable position of being able to increase its agricultural production by changes in land use from highly extensive to more intensive systems of farming.

The fuller realization of these potentials, however, will likely require major adjustments in the national agricultural program.

Spain: Spain's economy experienced over a long extended time widespread dislocation of war. Its agricultural production, unlike that in most other west European countries, was slow in recovering from its wartime disruption. It has begun to make progress, but in the decade 1952 to 1962, its rate of increase in production on a compound annual basis has been only 2.0 percent per year. Only a low rate of population growth (0.9 percent per year) has made it possible for Spain with this slow rate of growth to increase its per capita agricultural production at the rate it has during the last decade, 1.1 percent per year on an annual compound basis.

In its land tenure patterns, Spain is more favorably situated for increasing its agricultural output than are most underdeveloped countries. About two-thirds of the farmland is operated by the farm owner and his family. A large proportion of these are small by western standards, with more than 25 percent having fewer than 5 hectares. Many of the country's smaller farms, however, operate under relatively primitive conditions and have near subsistence income levels.

The country's large food shortages following the war gave rise to intensive government intervention designed to control prices at consumer levels. This militated against providing producers the price incentives needed to stimulate increased agricultural production. The inhibiting influence of the country's price controls has been an important factor retarding the recovery of Spanish agriculture.

Spain has begun to improve its educational system, including the expansion of primary and elementary education. That its rural areas receive a fair share of these expanded facilities is of concern to its rural leaders, suggesting that heretofore, inadequate provisions have been made for education in the country's rural areas. The country now has facilities for technical agricultural research and extension activities. Its extension service, however, was established less than ten years ago, and both research and extension service facilities need to be greatly expanded. Spain's agriculture suffered from a lack of adequate supplies of machinery, fertilizers and other production requisites. These shortages resulted in large part from the country's very complete and elaborate system of foreign trade and foreign exchange controls, imposing high tariffs on imports of major production requisites and inhibiting investments of foreign capital in building up the country's agricultural service industries.

The government has recently begun to improve its agricultural credit system. The fact remains, however, that the limited availability of credit and limited supplies of production requisites are major obstacles to increasing the country's agricultural production.

The government has placed 450,000 hectares of land under irrigation in the last 20 years, and 140,000 in the last three years.

Spain has a sufficiently favorable balance of human and physical resources to achieve a relatively high level of production and income per capita. But because of centuries of neglect of land, inefficient

cultivation, and inequitable treatment of its peasants, it is a country of widespread poverty and low levels of living.

India: In the last ten years India has increased agricultural output at an average annual compound rate of 3.0 percent per year and per capita production at 1.0 percent per year. This cannot be considered satisfactory in view of the current low level of nutrition--2,100 calories per capita per day; the increasing rate of growth in population; the agricultural potential; and the need for agricultural savings and exports to help finance national development. The Government of India and most students of Indian development agree that total agricultural output should increase 5.0 to 6.0 percent per year, twice the rate for 1952-62, and only slightly higher than the rates suggested for the three CENTO countries (Table 1).

When India initiated its development program in 1951, the services and requisites available to agriculture generally were poor. The development plans have given attention to land reform, and the four production factors, knowledge, requisites, credit and public investments in irrigation and reclamation. There is much more to be done to make the four production factors really effective to farmers in all areas. The current level of information, requisites, credit, and markets are quite low according to the standards of Japan, Europe or North America. The improvement in the last ten years has been substantial. For example, by the end of the Second Five Year Plan, the area under irrigation was 18.5 million acres more than it was in 1951. The use of chemical

fertilizers had increased by 384 percent, or by an additional 193,000 tons of nutrients. The volume of credit from agricultural cooperatives was increased from 229 to 2,000 million rupees. The community development program, initiated in 1952, was serving 368,000 villages with a population of 204 million people. This had required the training of about 35,000 village level workers together with the development of a staff of some 25,000 specialists and supervisors. The need for advanced training in agriculture was partially met by increasing the number of students entering agricultural and veterinary colleges from 1,700 in 1950-51 to 6,150 in 1960-61.

The view is often expressed that India has not given adequate consideration to some of the conditioning factors that are required to stimulate greater efforts by farmers. The primary weakness is believed to be in the price and markets for agricultural commodities.

In recent years, India's agriculture has been characterized by large year to year price fluctuations giving rise to large price uncertainty as well as by a generally low level of prices to producers. Prices to producers have been depressed by the government's policy of attempting to maintain stable and relatively favorable prices to consumers without adequate compensation for rising prices paid by farmers for production requisites. These conditions, coupled with claims of the suppliers of credit and middlemen upon the country's agricultural production, have greatly lowered the incentives to producers to increase their efforts and to adopt the practices that are needed to achieve a substantial increase in their volume of production.

Summary: The situation in Chile, Spain and India with respect to the four conditioning and four production factors that we believe are essential parts of a good development foundation is summarized in Table 5. In most of these factors, the three countries stand in sharp contrast to the five successful countries reviewed above.

Table 5. Tentative rating of conditioning and production factors for agricultural production in three countries, 1952 - 1962 1/

Factors	Chile	Spain	India
Conditioning:			
Land tenure	3	1	2
Farm prices	2	3	3
Markets	1	2	2
Consumer goods	2	2	2
Production:			
Knowledge	3	3	3
Requisites	2	2	2
Credit	3	3	3
Investment 2/	3	2	2

1/ The ratings of 1, 2 and 3 are used to mean that the conditions are favorable, moderately favorable and unfavorable, respectively.

2/ This relates to investment in developing land resources.

Discussion

The analysis presented in this paper provides a framework that may be used to assess the strong and weak points of an agricultural development program. The eight factors used may be redefined or increased to ten or more and might be grouped differently without materially altering the basic thesis of the paper. Such changes, doubtless should be made as the general thesis is examined and tested in different countries.

The paper indicates, but has not emphasized, the role of governments. It is a major role and in some countries, both old and new, the slow rate of agricultural development may be attributed to the inadequacy of the government. The effective role of government in agricultural development is shown in Japan and Taiwan. A major problem of governments of many of the developing countries is to develop the administrative machinery and staff required to implement programs of agricultural credit, price stabilization and the many other parts of economic development programs. Building adequate administrative machinery and developing the staff is often a very essential part of the development process.

SUMMARY

The eleven countries considered in this paper represent a wide range of cultures, climates, and stages of economic development. All of them, however, have assigned the individual farmer an important role in the national agricultural and economic development plan. None of the countries are placing reliance on collective or state farms. Since the individual free and independent farmer has such an important role in all of the countries, it is logical to believe that each country can learn something useful from the experience of others. The factors that have led free farmers in some countries to increase production probably will do so in other countries.

We have suggested and briefly considered the influence of four conditioning and four production factors. The evidence seems to be that when all of the eight factors are favorable, agricultural production

increases rapidly in developed and less developed countries alike. If one or more of the factors are quite unfavorable, production may increase slowly. The need for a well balanced program of agricultural development is indicated.

The four production factors have generally received more attention than the conditioning factors, at least until recent years. Since World War I, but especially since the economic depression of the 1930's and World War II, all governments of the more developed countries have taken various steps, land reform, price stabilization and market control to make conditions favorable for the farmer to work and invest to increase agricultural production. Some of the developing countries have taken similar action, but many have given more attention to the production factors than to the conditioning factors. Likewise, the various technical and economic assistance agencies, at least initially, placed more emphasis on the production factors. The imbalance is being corrected in many countries with good results as illustrated in some of the countries we have considered.

In closing, let us remind you that the views and data presented in this paper are being subjected to rather rigorous examination in our AID-USDA research project on agricultural productivity. The first phase of the project will be a comparative analysis of data for about twenty-five countries. The second phase will involve more detailed studies in possibly ten or twelve countries. If the results of the study were available, we might have to modify some of the statements in this paper. On the other hand, we might have more evidence to support the views expressed.

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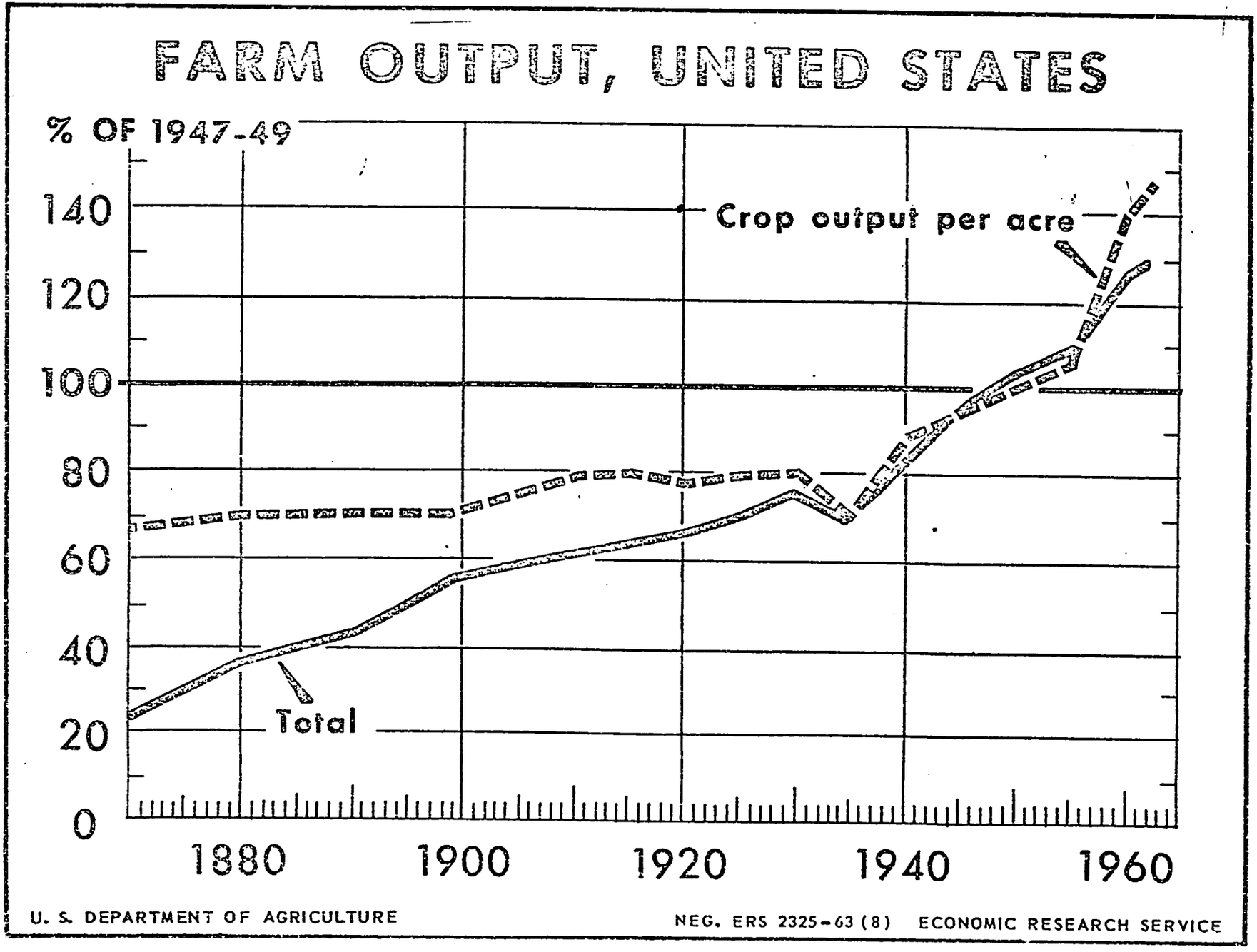
FARM OUTPUT, UNITED STATES
% OF 1947-49
140
120
100
80
60
40
20
0
Crop output per acre
Total
1880
1900
1920
1940
1960
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2325-63 (8)
ECONOMIC RESEARCH SERVICE

Figure 1

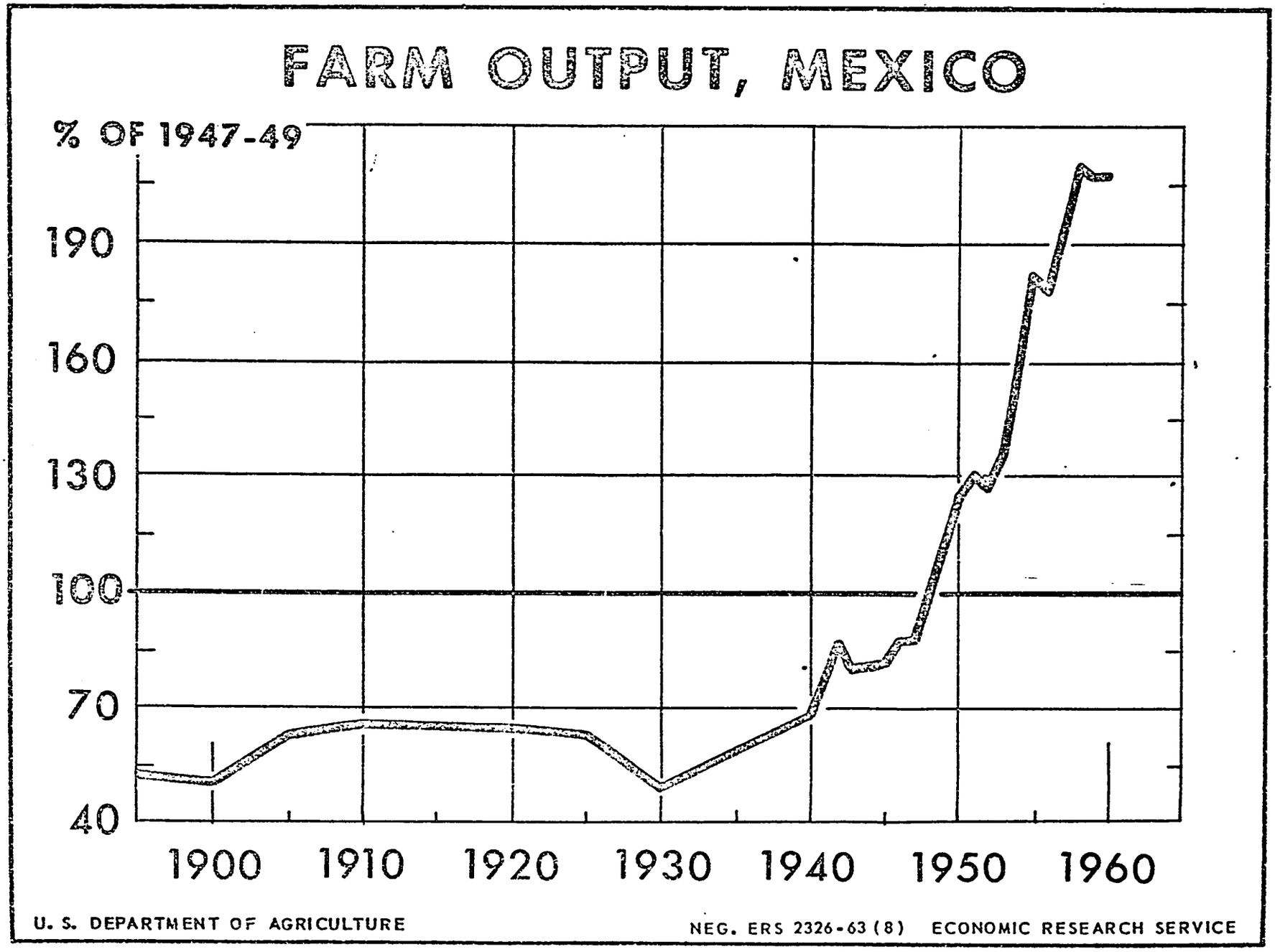
FARM OUTPUT, MEXICO
% OF 1947-49
190
160
130
100
70
40
1900
1910
1920
1930
1940
1950
1960
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2326-63 (8)
ECONOMIC RESEARCH SERVICE

Figure 2-4

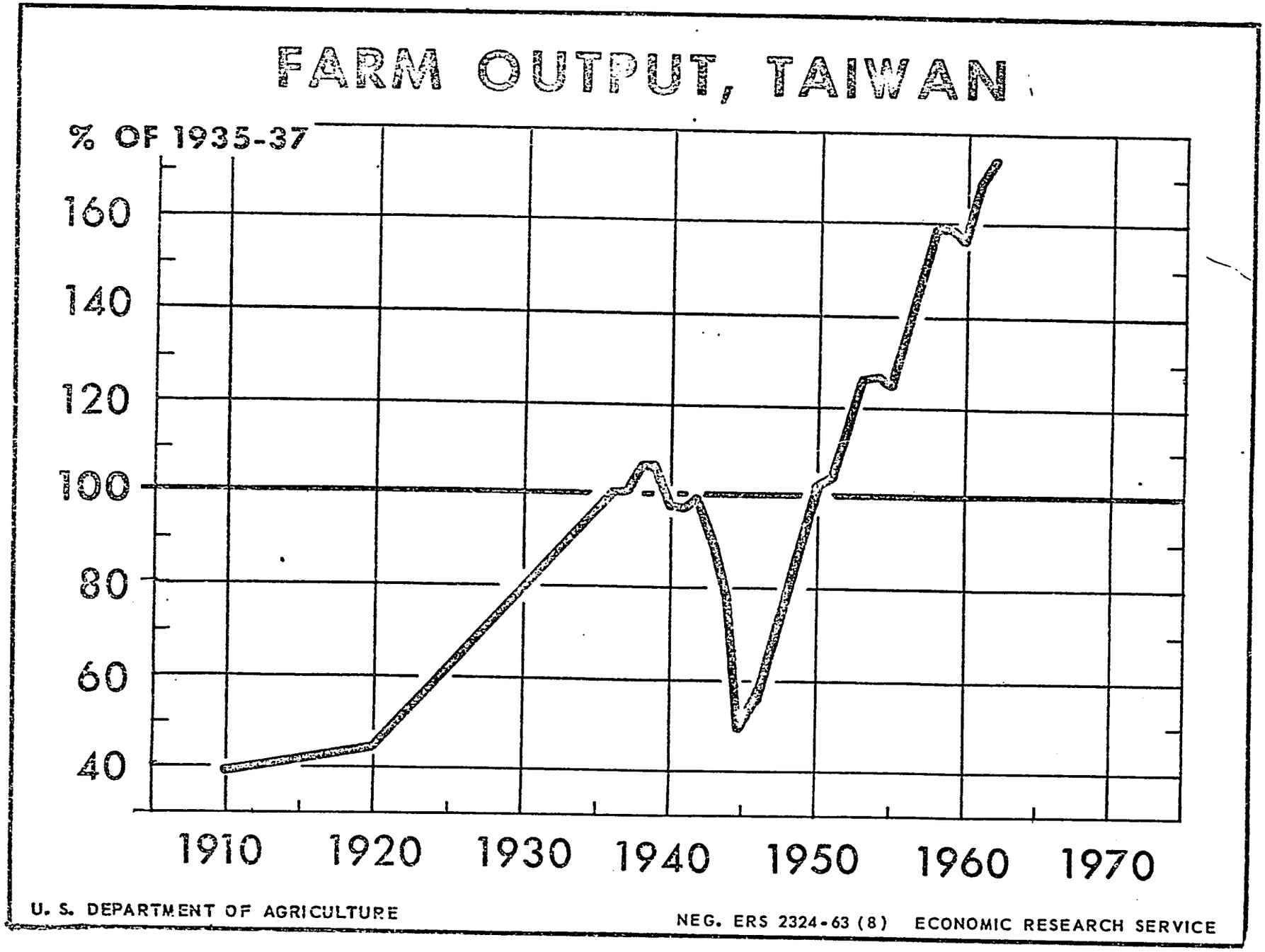
FARM OUTPUT, TAIWAN
% OF 1935-37
160
140
120
100
80
60
40
1910
1920
1930
1940
1950
1960
1970
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 2324-63 (8)
ECONOMIC RESEARCH SERVICE

Figure 3

AGRICULTURAL OUTPUT AND LABOR FORCE, JAPAN

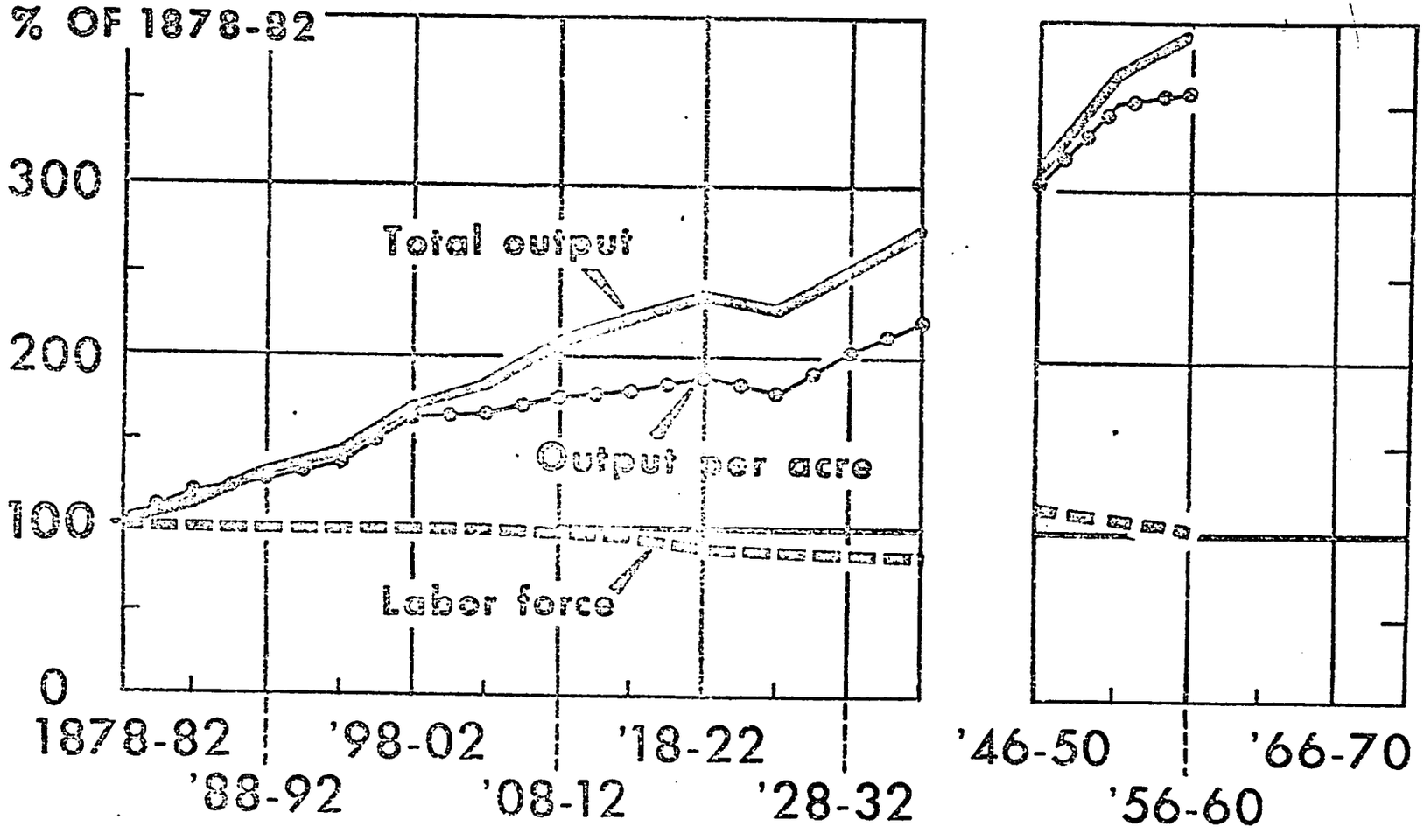

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Figure 4. 2.