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An Analysis of the Activities of Agricultural Credit Corporation in Jordan

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AN ANALYSIS OF THE ACTIVITIES OF THE AGRICULTURAL CREDIT CORPORATION IN JORDAN

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INTRODUCTION

Since 1950, the Hashemite Kingdom of Jordan includes the area currently called East Jordan (previously called the Hashemite Kingdom of Transjordan) and West Jordan, or the parts of Palestine held by the Arabs following the Arab-Israeli War in 1948.

At the beginning of 1965, the estimated population was 1,915,000 people.[1] The annual rate of increase was 3 percent. The distribution of population is largely determined by the rainfall pattern. One and a half million of the total population or 80 percent is designated as rural.[2]

The country consists of 37,300 square miles of land bounded on the south and east by Saudi Arabia, on the north by Syria, northeast by Iraq, and on the west by occupied Palestine.

Eighty-seven percent of the total land is classified as "built-on, waste, or other." There are about 2.5 million acres of arable land, of which two-fifths is left fallow every year.[3] The average per capita availability of the land cropped does not exceed 1½ acres annually. The presently irrigated area is estimated at 100,000 acres. Irrigation has led to increasing development of highly specialized and large scale vegetable and fruit farming under modern methods. But since most of the

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[1] H. H. Tegeler, Jordan's Agricultural Economy in Brief, p. 1.

[2] H. H. Tegeler, Agriculture of West Asia, Table 5, p. 45.

[3] Tegeler, op. cit., p. 4.

cultivated land is dry farmed, extensive farming practices are most common. Rainfall will undoubtedly continue to control agricultural production in the non-irrigated areas of the nation. Rainfall, the significant element of Jordan's climate and upon which the success of dry farming depends, is erratic in timing and amount. The normal range is roughly from 8 to 18 inches.[1] The country is subject to periods of extreme drought.

Dry farm wheat and barley occupy more than one-half the total cultivated area of the country. In 1963, a year of severe drought, output of dry farmed crops declined considerably as compared to the good rainfall year of 1961. Table 1 shows fluctuation in volume of production from one year to another.

Table 1. Total production of wheat, barley, and corn in Jordan, 1961 and 1963

Crop	Unit	1961	1963
Wheat	1000 metric tons	138	76
Barley	1000 metric tons	82	24
Corn	1000 metric tons	5	1

Source: H. H. Tegeler, Jordan's Agricultural Economy in Brief, Table 1, p. 6.

[1] Ibid., p. 4.

Wheat production dropped 58 percent in 1963 compared with 1961 production, while barley dropped 65 percent, and corn 75 percent. This decrease was mainly the effect of drought.

Nearly all farmers live in villages rather than on the land worked. Excessive fragmentation of farm land has occurred. A single farm usually consists of two or three parcels, each of which may lie at some distance from the others making it more difficult to farm efficiently. Larger holdings often consist of more than a dozen parcels. There are over 92,000 farms, most of which are owner-operated. Size of holding varies regionally and tends to be small in the more fertile sections of the land. An estimated 85 percent of all farms are less than 25 acres in size.

Crop production per acre is low compared to the United States. Table 2 shows the average production per acre over a 10-year period between 1955-1965 for both wheat and barley.

Table 2. Average yield of wheat and barley per acre in Jordan and United States, 1955-1965 (10-year period)

Country	Unit	Wheat	Barley
Jordan	bushels	8.6	8.8
United States	bushels	23.2	31.2

Source: H. H. Tegeler, Agriculture of West Asia, Table 11 and 12, pp 49-50.

In the United States, wheat production per acre is 2.5 times that of Jordan, while for barley it is about 4.0 times. This may be attributed

to several conditions: (1) rain fluctuation, and (2) limited use of chemical aids to production (fertilizers and pesticides) because of a) ignorance (due to illiteracy) on the part of the average farmer of the value of chemical aids in increasing output, b) lack of training in proper application, and c) absence of capital or credit.

The Jordanian gross national product was $415 million in 1964 (in 1962 dollars) of which an estimated 35 percent was derived from agriculture. National average per capita income was less than $225 per year; per capita income from agriculture was believed to be considerably under the median figure.[1]

Light plows drawn by oxen, mules, or donkeys; sickles and other traditional farm implements are still in wide use. However, there has been progress in recent years toward mechanized farming. The number of tractors in operation increased from an average of 130 in 1949-1952 to 1,500 in 1963.[2]

The country has a deficit in total and agricultural trade. In 1964, agricultural imports were valued at $35 million, roughly 33 percent of the value of imports of all commodities. Grains, fats, oils, dairy products, sugar, and supplementary quantities of fruits and nuts were the principal farm products imported.

Major agricultural exports amounted to less than $6 million in 1964, which was about 30 percent of the value of all Jordanian exports. Bulk of agricultural exports are mainly tomatoes, other fresh vegetables, and fruits.

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[1] H. H. Tegeler, Jordan's Agricultural Economy in Brief, p. 3.

[2] Ibid., p. 5.

Summary of Jordan's Agricultural Problems

Jordan's national agricultural programs are oriented toward increased output of crop and livestock products. Problems that these programs are designed to overcome are:

1. Excessive fragmentation of farm land.
2. High transportation costs.
3. Inadequate marketing facilities.
4. Low quality of farm products and lack of standardization.
5. Primitive methods of cultivation with the illiteracy of the farmer as a major problem in altering them.
6. Scarcity of seasonal credit by which the farmer might improve his farm output.[1]
7. Fluctuating rainfall and small irrigated area.

Agricultural Credit Problems in Underdeveloped Countries

Agriculture is characteristically the main occupation followed in underdeveloped countries, therefore, plans for economic development may reasonably be expected to start with agricultural development. New machines, new methods, and new materials all may be combined to increase production per acre, per animal, and per man hour of labor. Increased productivity of land and livestock is the result of added capital in the form of improved seed, feed, and breeding livestock; more and better fertilizers, insecticides, herbicides, and other agricultural chemicals; and more and better power, machinery, and equipment.[2]

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[1] Ibid., p. 5.

[2] W. G. Murray and A. G. Nelson, Agricultural Finance, p. 6.

There are many ways a farmer may obtain the major part of the capital which he uses in the business. Among these saving, renting, and borrowing are appropriate means. Owing to the small size of holdings, low productivity and accompanying low incomes, voluntary saving would be at best very difficult. Renting does not represent a net increase in capital but a mere transfer of capital from one individual to another. It is not unusual, therefore, to find that a large proportion of farmers manage from one harvest to another only by borrowing. Credit is often made available under such circumstances by landlords and money lenders who charge interest rates as high as 50 percent per annum.[1] Since agricultural investments do not average 50 percent net returns, the farmer will never be able to repay the loans from agricultural income. This may and often does result in the loss by the farmer of his property. It seems to be a fact, also, that the situation is made worse because payments are often required and made in product at harvest time when prices are low. Many farmers find that at the end of the harvest period there is not enough of their production left to feed their families through the next winter. This situation leads to low diet level (2,200 calories per capita per day in Jordan compared to 3,190 calories in United States),[2] high incidence of disease, and low productivity of labor (Jordanian farmer is only one-third to one-fourth as efficient a producer as the United States farmer.)[3]

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[1] H. H. Tegeler, Jordan's Agricultural Economy in Brief, p. 5.

[2] H. H. Tegeler, Agriculture of West Asia, Table 40, p. 73.

[3] Ibid., p. 7.

Another source of agricultural credit that seems generally to exist is the commercial banks. The interest rate charged is not as high as the landlord's or money lender's, because their lending tends to be selective to minimize the risk and uncertainty of agriculture production, and they are not a large source of agricultural credit. For example, in Jordan in 1965 they extended loan funds to only 3 percent of the total farmers borrowers.

In addition to the high interest rate commonly charged, no guidance in credit use is given to the illiterate farmers. The main interest of the creditors seems to be to get their money back. Making loanable funds available to farmers may not be the main tool in agricultural development. Counseling and guidance on how to profitably use credit may be equally important. Improper use of credit may lead to financial ruin of the farmer. "While credit properly used is a powerful tool contributing to success, it is equally powerful tool leading to financial ruin when improperly used."[1]

Private lenders could be an alternative source of credit to farmers, but they are advancing funds at high interest rate. Commercial banks, although charging lower interest rates, are not making available adequate funds to all farmers. No guidance is provided by any of those lenders. To achieve agriculture development effectively by use of credit as one of the tools, the government may need to step in to provide both credit and guidance to its farmers, because, generally, it has many methods available to raise these funds and make them available to farmers at interest rates low enough to give the farmers a chance to use, benefit

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[1] W. G. Murray and A. G. Nelson, Agricultural Finance, p. 13.

from, and eventually repay them. In addition, it more likely can provide the needed technical staff to furnish guidance on credit use where other creditors may have difficulty. Above all, the main concern of the government would be the benefit and welfare of the farmer. "There is an increased tendency in underdeveloped countries to suppose that economic development may be assured by government actions."[1]

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[1] S. Enke, Economics for Development, p. 7.

OBJECTIVES OF THE STUDY

Credit could be used by a government as a tool for helping to overcome such agricultural problems as those previously mentioned in an underdeveloped country through establishing an agricultural credit agency to provide the funds needed by farmers. Variation of such a procedure has been used in many countries.

The objectives of this study were to:

1. Review the recent establishment and development of agricultural credit facilities in Jordan.

2. Review and appraise the activities of the Agricultural Credit Corporation in relation to a proposed model agency.

3. Make recommendations for improvements in the facilities, functioning, and services of the Agricultural Credit Corporation by making comparisons with the model agricultural credit agency.

AGRICULTURAL CREDIT IN JORDAN

Before 1960, there were three agricultural credit agencies (government sponsored) operating in Jordan. These were: (1) Agricultural Bank, (2) Village Loan Scheme, and (3) Agricultural Cooperatives.[1]

Agricultural Bank

Prior to World War I, the Agricultural Bank was a part of the Ottoman Government. At the end of that war, the Princedom of Transjordan was established. All the Bank branches became a part of this Princedom. These branches had been administered by a general administration since April, 1922.

In 1934, all the branches were cancelled and the extension of loans was centralized in the general administration. In 1953, after establishing the Kingdom, branches were opened on both sides of the river.

The Government originally set aside a part of the real estate taxes to provide loan funds. By 1959-1960, that capital fund had accumulated to $2,500,000.

The Bank extended loan funds to farmers to buy seeds, livestock, farm machinery, plant trees, and improve land. The interest rate ranged from 6 to 9 percent per annum.

Most of the loans extended by that Bank failed in achieving their purposes, because no guidance was given to farmers borrowers in using

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[1] A. R. Amad, "Agricultural Credit Corporation," p. 4.

the loan funds obtained, and many farmers did not spend the loan funds for the intended loan purposes.

Village Loan Scheme

The Village Loan Scheme started in 1952. Its main objective was to help farmers living on the Arab-Israeli borders. These farmers had lost most of their lands and other assets during the Arab-Israeli War in 1948.

The Village Loan Scheme program extended loans to farmers to develop the land, plant trees, purchase pumps, engines, pipes, livestock, and farm machinery.

The interest rate was 4 percent per annum. The Village Loan Scheme loan funds accumulated to $6 million by 1960.

Agricultural Cooperatives

Credit to agricultural cooperatives started in 1952 when the Cooperative Construction Department was established. The Development Board, a government institution, extended loan funds to cooperatives through the Cooperative Construction Department at 4 percent interest per annum. These cooperatives, on the other hand, made loans to their members at 7 percent interest rate. The loans obtained were used to buy seeds, fertilizers, livestock, and improve the land.

The Cooperative Construction Department was replaced by the Central Union of the Cooperative Societies. The loan funds accumulated by this program amounted to $1 million by 1959-1960.

Agricultural Credit Corporation

The Agricultural Credit Corporation was established to replace the three previous government credit agencies mentioned. The reasons for establishing it were: (1) The three agricultural credit agencies that were operating in the Kingdom before 1960 were functioning independently of each other. In many cases, there was a degree of overlapping in their operations. (2) Many of the loans extended to farmers were not spent for the intended purposes. (3) Money lenders, who extend loans to farmers at a very high interest rate, were still the major source of credit to farmers.[1]

The Agricultural Credit Corporation[2] started its operations in 1960, but the act establishing the Corporation was not passed by Parliament until 1963.[3] It has a legal entity, financial, and administrative independence. It can accept deposits, borrow money, and perform any other functions which credit institutions and banks usually perform. It has an authorized capital of seven million Dinars.

In making loans, the Agricultural Credit Corporation tries to accomplish two goals. These were: (1) To improve agricultural level and production to meet the demand of the people and provide for the needs of a growing population. (2) To increase agriculture production and raise the income level of the farmers through extension of loans to ensure

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[1] A. R. Amad, "Agriculture Credit Corporation," p. 7.

[2] Referred to generally in the following pages as A.C.C.

[3] A.C.C., "Act 12, 1963," pp. 1-16.

the industrialization of agricultural practices and the use of improved seeds, fertilizers, and by placing more land under irrigation.[1]

[1] A.C.C., "Agricultural Credit in Jordan," p. 3.

SUGGESTED MODEL GOVERNMENT SPONSORED AGRICULTURAL CREDIT AGENCY

Statistical data available on the activities of the A.C.C. are confined to what the borrowers have accomplished through loan funds. There is no data on the effect of those accomplishments on the productivity and income of the farmer which allows a quantitative statistical type analysis. Therefore, a model government credit agency, that would be capable of operating efficiently and effectively, will be proposed. The organization, loan extension, and operations of the A.C.C. will then be described and analyzed in relation to the operating procedure of the proposed model agency. On the basis of this analysis, weaknesses will be pointed out and recommendations for improvements of the functioning, facilities, and services of the Corporation will be suggested.

Statement of Objectives of a Model Agency

If the government stepped into the agricultural credit field, it might provide credit and guidance by establishing an agricultural credit agency. If such an agency is established, it should have objectives well defined. A proposed general outline of the organization, objectives, and procedures of a model agency follows.

The main objective of the credit agency should be to raise the standard of living and productivity of the farmers, thus aiding in the economic development of the country. A reasonable listing of the requirements to accomplish such an objective would include the following:

A. The agency should be organized in a way to assure the extension of credit adequately as to the amount and use of loan funds. If there is no institution conducting any research pertaining to credit use, then the agency should have a research department or personnel to conduct research on subjects related to the use of credit and methods and practices that increase productivity of the farmer. The results of this research would help the field officers in determining the amount of loans to be extended for each enterprise, in allocating the funds among different enterprises in the country, and the farmers as they apply the new discoveries to their farming and increase their productivity.

B. The agency should have enough funds available to meet the total need of farmers. The credit needed should be measured by the total profitability of its use within the natural and economic limitations of the farmers. In addition to this, consideration must be given to make funds available at the time of need without unnecessary delay. The second consideration is a matter of organization and operation of the agency, while the first is the concern of the government of how funds might be obtained. The government could employ any one or all of the following four main ways to raise funds. (1) The government could allocate a certain amount of its annual revenue to be used by the agency. (2) The agency could sell bonds to the public. The people would likely have more confidence in these bonds than other commercial bonds, because they are backed by the government. (3) The agency could borrow from international institutions such as the International Bank for Reconstruction and Development, or the Agency for International Development. These institutions usually lend to governments. Since the credit agency would be government sponsored, it could have access to loanable funds from

such sources. (4) Commercial banks could be a fourth source of loanable funds for the agency. The banks in an underdeveloped country may not be willing to extend credit to many farmers because of risk and uncertainty of agriculture production, but may be willing to sign an agreement with an agency of government. By agreement, the agency could insure the repayment of all loans extended to farmers by the banks. The loaning and collection would appropriately be done by the agency. If a borrower failed to pay the principal and interest due, the agency would pay it to the bank and take appropriate measures to collect from the delinquent borrower.

C. Regardless of the alternative chosen by government to make credit available, the loanable funds should help the farmer in three ways:

1. To overcome natural factors that affect the farmer's production such as fluctuating rainfall--the effort could be made to turn more dry-land into irrigation land and reduce the dependence upon rainfall. The funds could enable the farmer to dig wells and install all necessary irrigation equipment. Where erosion was a problem in an underdeveloped country, funds could be used to build terraces, contours, and plant forest trees to minimize the effects of this problem.

2. To meet all his financial needs for his operations. Seasonal operation funds provided by the agency could be used to buy fertilizers, improved seeds, insecticides, and to pay hired labor and machinery. Working capital loans could be used to buy new or additional machinery, equipment, and livestock. Fixed capital would provide funds for some buildings on or off his farm for his own use, for livestock, and for machinery and equipment. In many cases, funds would be needed to buy additional land or for a beginning farm unit.

3. To free him from debts of high interest and short repayment periods. As mentioned previously, the farmer is often indebted to money lenders at high interest rates. In many places, he is also in debt to machinery and equipment dealers who charge a high interest rate with a short repayment period. A proposed government agency would refinance such debts to give the farmer longer periods of repayment at lower interest rate.

D. The agency should be organized in a way to extend credit with a minimum of trouble and complications. Improper organization results in what is generally known as "red tape." Delays in loans processing, investigation, approval, and closing must be minimized. There seems to be a tendency in government agencies to resist delegation of authority which results in delayed and unnecessary activities. If the agency failed to provide the funds at the right time, the farmer could be forced to obtain loans from money lenders at high interest rates. The advantage of money lenders, from the farmer's point of view, is making loans in a very short time with a minimum of trouble, once he accepts a loan application. As the agency sets its rules and regulations, it would emphasize a procedure that would allow the farmer to obtain loans in a short time and without complications consistent with the safeguarding of the agency's loan funds.

E. Sufficient control must be provided to assure that the funds would be used for the purposes for which they were allocated with the best application method employed. Adequate follow-up and supervision should also be provided to overcome the difficulties that arise because of illiteracy among farmers. This could be done through use of a procedure called supervised credit. The farmer in an underdeveloped

country, generally speaking, is illiterate. He may not know the new methods of farming, the importance of fertilizers and insecticides in increasing his productivity. He may obtain loans but spend them for unproductive purposes. A government sponsored credit agency would assume the responsibility of not only extending credit but of supervising the expenditure of the loan funds as well as teaching the farmer how to use them best. Supervision could be furnished by the agency's personnel through these steps:

1. Develop a farm plan for each borrower to guide the year's operations; analyze the needs, problems, and resources of the farm. The plan would spell out how the funds are to be used and for what purposes.

2. The agency's personnel would visit the farmer, now and then, to provide him with technical advice in carrying any adjustments and practices laid out in the farm plan.

3. The personnel would work also as an extension agent in carrying all new discoveries and improvements in practices in the field of agriculture to the farmer.

Three general results could be expected from such supervision: a) the loan funds would be used for the purposes for which they were allocated, b) the farmer would adopt new practices in a shorter period of time, and c) the farmer would discover the weak points in his enterprise through the analysis of the farm plan at the end of the year made by the farmer with the help of the agency's personnel. The weaknesses discovered would either be solved or avoided in next year's plan.

The agency should have personnel in the field who are in permanent contact with farmers. These personnel or field officers should be used to transfer all new information in the field of agriculture to these

farmers. This new information would be obtained by the officers from government or private experiment stations, scientific and agricultural periodicals, and from research conducted by the personnel of the agency.

The agency could reach the farmers also through broadcasting. The agency can organize a daily, weekly, or twice a week program to be broadcasted. The program would contain new methods, new materials to be applied in farming, and informative of the kind of services the agency would make available to farmers.

F. The agency should employ the use of economic tools in rationing the use of its funds on the farm level, selecting borrowers, and determining the amount of funds each should have. To get the most out of credit use to agriculture, rationing should not be based on political or favoritism basis. The allocation of loanable funds between different areas in a country could be based on past loaning and future expectation of demand for loanable funds in each. There would be flexibility in transferring funds from areas where there is less demand for funds to areas where the demand is increasing. If a country like Jordan is taken as an example, it would be divided according to type of farming based on climatic and geographical conditions. There are three main types: the irrigated areas in the Jordan Valley, the dry farming mountainous areas, and the semi-arid dry farming areas bordering the desert. The problem of how funds will be allocated among different enterprises in each area on an economic basis will be discussed later.

G. The agency should employ a measuring tool that could be used to obtain quantitative data on the effects of loan funds use on the productivity and income of the farmer. One tool that could be used is the farm plan discussed later. When the agency starts its operations,

estimated production and income of the borrowers could be recorded in the farm plan after being verified by the field personnel. At the end of the year, actual yields and income would be compared with the estimated, and the net result of the credit use could be known. Using data obtained, the progress and value of the credit program could be measured.

ORGANIZATION AND OPERATION OF THE AGRICULTURAL CREDIT CORPORATION

The A.C.C. has a Board of Directors consisting of four government and five non-government members.[1] A director-general, appointed by the Council of Ministers, implements the policies established by the Board and is responsible for all matters relating to the Corporation which are not expressly vested in the Board.

Loan Activities

The Corporation has two loan committees.[2] These are the Central Loan Committee and the District Loan Committee.

The Central Loan Committee

This Committee, with its headquarters in the head office, consists of the director-general, assistant deputy director-general, the head of the Loan Department, and a representative of the farmers appointed by the Board from a panel submitted by the director-general. The Committee studies all loan applications received from the branches and gives its recommendations on each.

The District Loan Committee

This Committee has its headquarters in the branch office. It consists of the branch director, the senior officer of the Ministry of Agriculture, and a representative of the farmers appointed by the Board

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[1] A.C.C., "Act 12," Article 8, p. 3.

[2] Ibid., Article 29, Part III, p. 4.

from a panel submitted by the director-general. The Committee studies all applications submitted by the credit supervisor and gives its recommendation on each.

Loan Department

The Loan Department studies all loan applications that are sent from all the branches, gives its approval, and may limit the amounts to be loaned on each application. All loans that do not exceed $1,500 are sent to the director-general for his final approval. Loans that exceed this amount are sent to the Board of Directors.

Execution and Supervision Department

This Department supervises the execution of all projects completed through the loan funds. The personnel of the Department visit the projects under construction as a double check to make sure that the work is done properly.

Accounting Department

The two main duties of this Department are to pay the salaries of all personnel and keep records of the budget. To facilitate the operations of this Department, the A.C.C. bought two electronic calculators to be used in all necessary work related to accounting.

Correspondence and Personnel Department

This Department consists of a head, an assistant, some clerks and typists. The main duty of this Department is to take care of all correspondence between the head office and the branches of the Corporation.

Research and Statistical Department

This Department was established in 1965. The main duty of this Department is to collect statistical data from all the branches on amounts of loans extended as well as the enterprises completed through loan funds. The Department disseminates statistical information on the A.C.C. operations to all institutions.[1]

Branches

Branches are located according to the political division of the country. There are 14 branches at present. Each branch has a director, a credit supervisor, a treasurer, clerks, and a money collector. The branch-director is responsible to the director-general. His duties consist of implementing policies of the A.C.C. issued by the Board of Directors and the director-general.

The credit supervisor's main duty is to study all loan applications, supervise the projects, and help the farmers with their problems concerning these projects. He is a member of the Inspection Committee which inspects and appraises the security (real estate). The treasurer keeps records of the expenditure of all loan funds, while the clerks keep records of repayments and correspondence. The money collector visits the borrowers in their villages or farms to collect loans due, Figure 1.

Analysis of loan activities

A credit agency must extend credit adequately as to amount and use. There are two types of information needed on an applicant and his enterprise to arrive at a justifiable decision concerning a loan application.

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[1] A.C.C., Annual Report, 1965, p. 11.

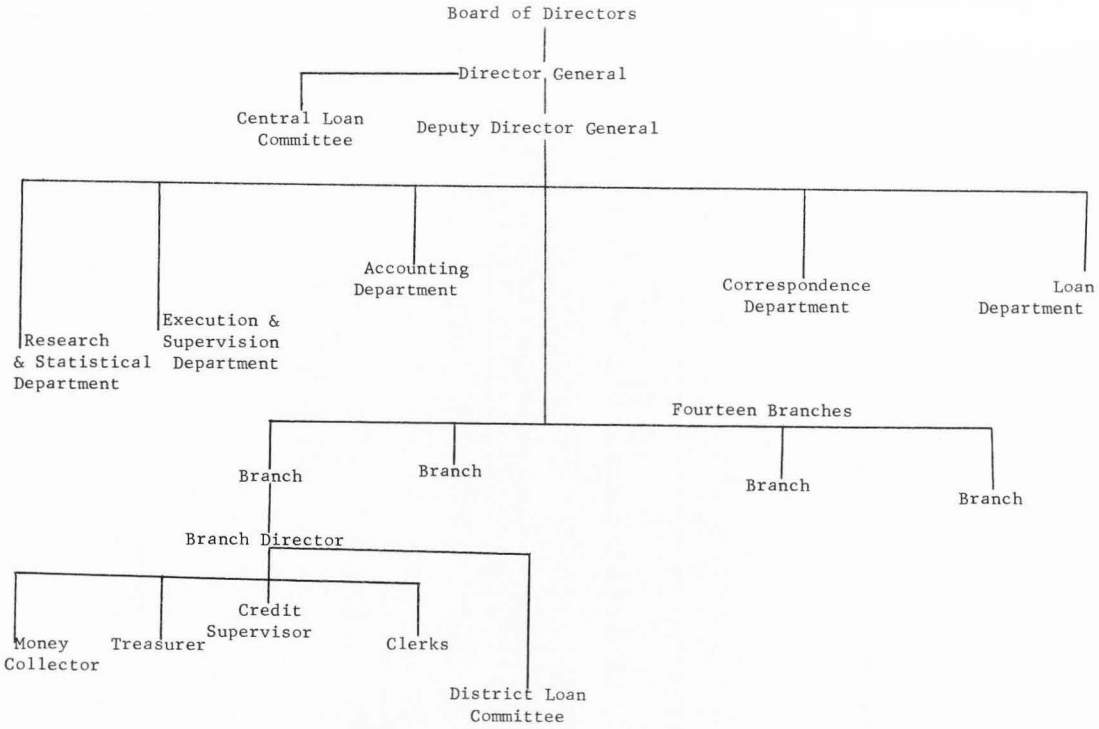

Figure 1. Organization of Agricultural Credit Corporation

The first is personal and can be collected and exchanged by the individuals discussing the loan applications. The second is economic information obtained from research and experiments which should be conducted by the personnel in the Corporation if there is no other institution undertaking this job.

The credit supervisor is not a member of the District Loan Committee. He submits to this Committee an inspection report containing a description of the farm and what the applicant plans to do with the loan funds. The Committee studies the report and gives its recommendations.

Since the credit supervisor discusses all planned enterprises with the applicant and inspects the farm, he knows about the subject more than anyone in the branch. Therefore, the credit supervisor's participation in the Committee may help in reaching a more justifiable decision on the application.

The farmer-member in the Committee is appointed by the Board of Directors from a panel submitted by the director-general. Since this member has a vote in deciding loan extension, it is important that he should be a competent farmer. The credit supervisor knows most of the farmers in his area more than the director-general. It may be better that he nominates the farmers to this Committee.

The credit supervisor may not be able to collect all information concerning the applicant's credit rating and honesty. The farmer-member in the Committee may not know all the farmers in the district. Applicant's cooperation, credit rating, and honesty are important in the success of the loan use. It is essential that these characteristics be known to the credit supervisor as well as to the Committee members. If more than one farmer is appointed on this Committee from different areas in the

district, more information can be collected on an applicant which will help in extending credit more adequately.

The Research and Statistical Department collects and disseminates data on the loans and projects completed through loan funds. Without analysis of this data, there may be no information on the effects of the loans use on the farmer's income and productivity, which is supposed to be the main objective of the Corporation. Analysis of the data may also help in revealing the weak points of the farm operations as well as loan procedures of the Corporation.

The Research Department needs to conduct research and experiments to help in extending credit adequately. The research may study matters related to how to allocate the Corporation's loanable funds among different enterprises, how much to loan each borrower for each enterprise, and how to select borrowers. The results of this research will help in outlining the procedures of loan making in the Corporation.

Sources of Funds

The loanable funds of the three credit agencies operating in Jordan before 1960 were transferred to the A.C.C. At that time, those funds amounted to $9,500,000 and were used in the initial A.C.C. operations. When the funds were loaned up, the Corporation started borrowing from the World Bank for Reconstruction and Development. The Bank lends the Corporation sufficient funds annually to satisfy the credit demand of the Jordanian farmers.

Analysis of sources of funds

If for some reason the World Bank stops or reduces its lending

activities, the A.C.C. could use two other available sources. The first source is selling bonds in the market. The second is the Commercial Banks. The A.C.C. could sign an agreement with those banks insuring all their agricultural loans extended through the Corporation. Both sources could make more funds available to agriculture.

Types of Loans Extended

The Corporation started its operations in 1960. It extended three types of loans based on a time classification. These types were: (1) short-term loans, (2) medium-term loans, and (3) long-term loans.

The law constituting the Agricultural Credit Corporation was not enacted by Parliament until 1963. This law transferred the extension of short-term loans from the Corporation to the Central Union of the Cooperative Societies--a semi-government credit agency which extends loans only to cooperative members.[1]

The loans provided to farmers from all credit sources during 1965 are shown in Table 3.

The A.C.C. extended 42 percent of the loan funds for farmers during 1965, while the C.U.C.S. provided 27 percent, and the Banks 31 percent only. Since the loan funds extended to Cooperative members through the C.U.C.S. is borrowed from the A.C.C., the A.C.C. has actually provided 69 percent of the loan funds.

At the same time, the percentage of borrowers who received services from the A.C.C. was 14 percent, from the C.U.C.S. was 83 percent, and from the Commercial Banks 3 percent only. The low percentage of borrowers

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[1]This institution will be referred to later as C.U.C.S.

served by the A.C.C. may be attributed to the policy of the Corporation in extending only medium and long-term loans. However, the A.C.C. is still the main source of credit to farmers.

Table 3. Amounts of loans provided by all agricultural credit sources in Jordan, 1965

Source	Amount in J.D.'s	Number of borrowers
Agricultural Credit Corporation	953,400	2,721
Central Union of Cooperative Societies	633,700	15,914
Commercial Banks	690,160	336
Total	2,277,260	18,971

Source: Department of Statistics, Statistical Yearbook, 1965. Table 77, pp. 136-137.

Table 4 shows the difference in the amount of loans extended by the A.C.C. when it was loaning the three types of loans; namely, short, medium, and long-term.

The year 1961 was a year of severe drought. The need for short-term credit was high, amounting to about 50.7 percent of the total loans, while that extended by the C.U.C.S. was about 9.7 percent only. The year 1962 was a good crop year, and the short-term loans fell about 37 percent from the previous year and amounted to 13.4 percent of the total extended by the A.C.C., whereas, it was 7.5 percent for the C.U.C.S.

Table 4. Amount of loans extended by A.C.C. and the C.U.C.S. between 1960-1964 (by loan type)

Type of loan	1960-1961	1961-1962	1962-1963	1963-1964
Short-term by A.C.C.	232171[a]	63450[a]	49379[a]	--
Short-term by C.U.C.S.	44643	35766	176495	90959
Medium and long-term by A.C.C.	157596	367160	458710	590705
Total	434410	466376	684584	681664

[a]Amount in Jordan Diners.
Source: A.C.C., Annual Report, 1963-1964, p. 32.

The A.C.C. stopped extension of short-term loans at the beginning of 1963, which was a severe year. The short-term loans dropped to 7.2 percent, while those of the C.U.S.U. increased to 25 percent.

The A.C.C. is serving a great number of farmers in Jordan. Table 5 shows the number of farmers served by the Corporation during the first four years of its operations.

Table 5. Number of borrowers served by the A.C.C. over the period 1960-1964

Year	Total no. of borrowers (at end of each year)
1960-1961	99,202
1961-1962	115,184
1962-1963	110,226
1963-1964	111,386

Source: A.C.C., Annual Report, 1963-1964, p. 83.

The rural population of Jordan is estimated at 1.5 million.[1] If it is assumed that each farmer's family constitutes five persons, then there would be about 300,000 families. If it is assumed that there is one adult farmer in each family, then there would be 300,000 farmers. In 1964, the number of farmers served by the Corporation was 111,386 or about 37 percent of the total Jordanian farmers.

There is inadequate data on construction, purchases, and other agriculture activities undertaken by the total farmers in Jordan during the year 1965. The only data available is concerned with agricultural machinery and equipment purchased during that year. Table 6 shows the amount of machinery bought by all farmers and the part bought through A.C.C. loan funds.

Table 6. Total number of agricultural equipment purchased by Jordanian farmers and the number purchased through A.C.C. loan funds in 1965

Type of equipment	Total purchased	Purchased thru A.C.C.
Tractor	310	60
Combines	53	17
Disc drillers and cultivators	228	97

Source: Department of Statistics, Statistical Yearbook, 1965, Table 74, p. 134.

[1] H. H. Tegeler, Jordan Agriculture Economy in Brief, p. 5.

The percentage of tractors purchased through A.C.C. was 19 percent, whereas that of combines was 32 percent and 42 percent for disc drillers and cultivators. The rest was purchased through other sources such as commercial banks, equipment dealers, or money lenders. Usually, interest rate on loans from these sources is very high, up to 50 percent, and on short-term repayment period.[1]

Purposes of loans extended

Medium-term loans not exceeding 10 years are extended by the Corporation for the purchase of agricultural machinery and equipment necessary for land development; purchase and planting of trees; development of poultry and dairy farms; minor irrigation projects including purchase of engines, pumps, and other equipment; reclamation of land, including terracing and subsoiling; and construction of irrigation canals and reservoirs.[2]

The Corporation extends long-term loans not exceeding 20 years for the construction of buildings necessary for the dwelling of the farmer, the storage of his machinery and crops, and barns for his animals, on condition that it is built on farms;[3] major irrigation projects which involve six farmers or more; and purchase of land by small or landless farmers.

Analysis of type and purpose of loans

A government credit agency should meet all the financial needs of

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[1] Ibid., p. 5.

[2] A.C.C., "Act No. 12," 1963, Article 13, p. 6.

[3] A.C.C., "Circular No. 28," Article 19, p. 8.

farmers for their seasonal operations and to acquire working and fixed capital. It should provide funds, also, to help farmers overcome some of the natural factors as well as free them from their high interest debts.

The Corporation does not extend short-term loans. This has been transferred to the Central Union of the Cooperative Societies which provides loans to cooperative members only. In 1965, the number of Cooperative members in Jordan was 15,914. This is a small number compared to non-member farmers. Non-cooperative members, who need loan funds for their seasonal operations, cannot get them from A.C.C. or Central Union. This limits the extension of credit adequately to all farmers. The farmers obtain these loans from money lenders, equipment dealers, and agricultural suppliers at high cost. This will eliminate most of the profits to farmers obtained from the use of resources such as fertilizers, and as a result, will discourage farmers from applying or using these resources.

To encourage the application of new materials in agriculture and increase the productivity and income of the farmers, the Corporation should provide credit needed for seasonal operations at low cost.

The percentage of machinery and equipment purchased through A.C.C. loan funds did not exceed 19 percent for tractors, 32 percent for combines, and 42 percent for cultivators of the total purchased by farmers in 1965. The rest was purchased through dealers, commercial banks, or money lenders at high cost and short-repayment periods. Many farmers, unable to meet the payments due to high cost and short period, lose their equipment to lenders or are forced to sell it to other farmers at a low price. Since machinery and equipment are important in increasing the

productivity of the farmer and his land, it is very important that he keeps using them. The A.C.C. should provide the needed machinery and equipment where it is profitable for the farmer to own them. This can be decided by the use of such tools as partial budget or break-even method discussed later. If the ownership was not justifiable, the applicant should be advised to hire the piece of machinery or equipment.

Rainfall fluctuation in Jordan affects production to a great extent. Comparing a good rainfall year of 1961 to the severe year of 1963, wheat production dropped 58 percent in 1963 due to drought. Turning more land to irrigation is one of the solutions to this problem. The two main sources for irrigation water in Jordan are surface water from the Jordan River and small creeks that flow here and there and underground water. The A.C.C. is providing loans for irrigation projects that include installing irrigation equipment, but does not include loans to drill wells to get underground water. There may be many places where this water is available, but the farmers do not have the funds to drill wells. To turn more land into irrigation, where underground water is available while surface water is not, the A.C.C. should provide loan funds to farmers for this purpose.

Operation Procedure

When a farmer wants to apply for a loan, he comes to the branch in his district. He sits with the credit supervisor and discusses what he aims to accomplish with the loan. The supervisor, with the help of the farmer, completes the application form.[1] A certificate of registration

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[1] A.C.C., "Circular No. 42," pp. 1-16.

of the fixed asset and a farm plat, supplied by the farmer, are attached to the application. If the loan is for irrigation projects, a report from the National Resources Authority showing all the required information about the well-deepness, water availability, and adequacy for irrigation is also attached to the application form. Then the applicant signs the application.

The application is sent to the Land Registry to determine whether or not any prior claim against the real estate exists, and if so to whom. If the applicant is in debt to the Corporation or if he has any principal and interest due, it will be shown on the application.

If the application is for projects other than irrigation, dairy or poultry, the Inspection Committee is established by order of the branch director. Otherwise, the application is sent to the head office for establishing this Committee. The Committee consists of the credit supervisor, the registrar of land, and a representative of the Ministry of Agriculture.

After the Inspection Committee is established, it inspects and appraises the security, studies the need for and importance of the project, and gives its recommendation. The application with the Inspection Committee recommendations is submitted to the District Loan Committee for consideration. The application with the Inspection Committee and the District Loan Committee recommendations are sent to the head office for final approval.

Personnel in the head office study the whole file and send their decision to the branch. If the loan is approved, a check for the whole amount of the loan is sent back with the approval. The applicant is called to the office and signs the promissory note in the presence of

two witnesses. The property is mortgaged in the Land Registry Department. First installment, usually equal to one-third of the total loan, is paid to the borrower. The rest is paid afterwards as work on the project progresses.

One or two weeks later, the credit supervisor visits the borrower to inspect what he has accomplished and to advise with him on the items of the enterprise. If the supervisor finds that the borrower has not yet started, he sends the borrower a 20-day notice. When the period elapses, the supervisor visits him again. If the borrower still has not started and there were no reasonable reasons for this delay, the supervisor recommends the cancellation of the loan and the repayment of the first loan installment.

If the farmer started, the supervisor visits him now and then to make sure that the project is done properly. When the borrower spends the first installment, the supervisor recommends the payment of the second loan installment. After the farmer completes the project, the supervisor writes a report to the director-general recommending the payment of the last loan installment. On the basis of the report, the director-general approves this payment and the loan file is closed.

If the farmer wishes to reallocate some of the loan funds from one item to another, he needs the approval of the director-general. The supervisor visits the farm, discusses the proposed changes with the borrower, and gives his recommendations. The director-general gives his decisions depending basically on these recommendations.

Analysis of operation procedure

The government credit agency should extend credit with the least

of trouble and red tape. The field officers should have a greater say in credit extension as they know the conditions surrounding each loan application more than officers far away from the field.

Sufficient control must be provided to assure that the funds will be used for the purposes it was allocated as well as advise the farmer on the whole farm business.

If the application is for irrigation or livestock, it is sent to the director-general to establish the Inspection Committee. The director-general orders the establishment of this Committee and sends the application back. The Committee consists of the credit supervisor, registrar of land, and a representative of the Ministry of Agriculture in the district. Since the branch director knows the regulations underlying the establishment of the Committee, he should be given authority to order its establishment, and the Committee can go ahead with the inspection without delay caused by waiting for the director-general's approval.

Many borrowers, while proceeding with their projects, need to reallocate some of the funds to other purposes. The credit supervisor discusses the proposed changes with the borrower. If they benefit the borrower, then he writes a report to the director-general recommending the changes. On the basis of this report, the director-general gives his final decision. Since the final decision is based on the supervisor's recommendations, the authority of change approval should be transferred to the supervisor, and the borrower can go ahead with the changes without waiting for the director's approval.

The last loan installment is not paid until the whole project is completed. This procedure is followed to insure the completion of the enterprise. Usually, the farmer borrows the money from other sources at

high interest rate to buy material and hire labor needed for the last part of the project. This results in additional costs and complications to the borrower. To avoid this, the last installment could be paid to the borrower when two-thirds of the project is completed. If the borrower does not complete the project, the supervisor could serve him a notice. If the borrower still does not complete it, then the loan could be cancelled and the borrower is asked to repay the last installment only, since he has already spent two-thirds of the loan funds on the project.

The District Loan Committee and the supervisor have no loan approval authority. All loan applications are sent to the head office for final approval. The personnel in the head office are far from the field and are not able to visualize the conditions clearly. This may result in an unreasonable or opposing decision to the recommendations of the credit supervisor or the District Loan Committee. To avoid this, the field officers should be given more authority in loan approval.

When the enterprise is completed, the loan file is closed and the supervision stops with that particular borrower. In addition, the supervisor, during completion of the enterprise, confines his supervision to the items of the project only. The success of the farm business depends on the success of all enterprises. There may be some weaknesses in enterprises not related to the loaned project that the borrower is not aware of and needs advice on. The supervisor should study other enterprises on the farm and try to advise the borrower as to how to operate them better. An organized farm plan should be set for each borrower to guide him in all his annual farm operations. At the end of each year, an analysis of this plan will reveal the improvements and weak points in

the farm business. When the loaned project is completed, the supervision should be continued so that the supervisor would keep in touch with the borrower to see how he is progressing and to help in finding solutions to his problems.

Basis for Issuing Loans

There are some general and specific requirements that a farmer must meet before he can obtain a loan from the A.C.C. Specific requirements differ according to different enterprises and purposes for which the loan funds are to be used.

A. General requirements. The applicant must be a farmer except in cases of land development. Many non-farmers own lands and can obtain loans only for terracing, subsoiling, or planting trees. The amount of loan or loans a farmer can obtain should not exceed 60 percent of the appraised value of the security.[1] There should not be any principal or interest due from the applicant at the time of applying for a loan.

B. Specific requirements. The specific requirements a farmer must meet are discussed below in relation to different projects or enterprises.

1. Machinery. A farmer must have enough cultivable land.[2]
2. Livestock (dairy and poultry).
   a) The applicant should have sufficient experience in matters relating to dairy and poultry production.
3. Sheep
   a) The applicant should be experienced in sheep raising.

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[1] A.C.C., "Circular No. 42," Article 28, p. 11.

[2] Ibid., Article 9, p. 3.

b) He must have a suitable shed and sufficient water and fodder.[1]

4. Irrigation. An applicant for a loan to buy engines and pumps for irrigation purposes should present a certificate from the National Resources Authority, a government agency responsible for all matters relating to the natural resources in Jordan. The certificate shows the availability and adequacy of the underground water for irrigation.

Analysis of basis for issuing loans

A credit agency must use economic principles and methods to allocate the uses of its funds, select borrowers, and determine the size of each loan if it expects good results from its funds' use. It may not be wise to leave these decisions to the personal judgment of the loan approval officers.

The most important bases that the A.C.C. uses to extend loans to applicants are that the applicant should be experienced, he should not be in debt or if he has any debts there should not be any installments due, and all his debts do not exceed 60 percent of the security.

There are no provisions for studying the condition and needs of the farm, justification for loan fund use such as whether to buy or hire a piece of machinery, to add more cows, and if the amount of the loan is enough to be profitable. In addition to that, some of the personnel decisions are based on their own judgments; for example, "A farmer applying for a loan to buy a tractor should have enough cultivable land." There is no minimum or maximum limitation to the size of the land or to its soil type. "Enough cultivable land" has to be decided by the credit

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[1] Ibid., Article 15, p. 5.

supervisor without the use of any economic tools. The farmer may be better off if he hired the machinery than own it. Another farmer may decide to increase the size of his enterprise or to change from one enterprise completely to another. Still another farmer may be debating where to use loanable funds on his farm to get highest returns.

There are no economic principles or methods used by the credit supervisor or the Research Department to find the answer to these problems. To extend credit more adequately, the A.C.C. should use economic principles and methods. The more standard economic tools that have been used in more advanced economies, where problems of agricultural development through credit use have been attacked, include the following:

Farm planning approach. The farm plan is developed for every loan by the farmer with the help of the personnel in the agency. The plan includes a current financial statement, crop and livestock enterprises to be conducted, an outline of improved practices to be adopted, a budget, and amounts of debts to be paid. This information is used as a means of testing the financial soundness of the proposed operations. It enables the farmer to use income and credit to good advantage in carrying his farm operations and improve the chances that the debt will be paid. In addition, the plan will help the personnel in extending effective supervisory assistance. The plan reflects the most important areas where the farmer needs assistance. From the financial statement analysis, the relation between assets, liabilities, and net worth shows the solvency of the borrower and helps establish his risk bearing ability. The risk tends to decrease as owner equity (net worth) in a business increases.[1]

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[1] W. G. Murray and A. G. Nelson, Agricultural Finance, p. 12.

Income statement analysis will help in evaluating the repayment ability of the borrower. By estimating his receipts and expenses during the year, the personnel will be able to know if the farmer has the ability to pay his debts. At the end of the year, actual crop and livestock production, actual gross and net income are recorded on the same plan. If delinquency occurred, analysis of the plan will show the weaknesses of the farm operations which may be solved or is avoided in next year's planning. The personnel in the agency must be well trained in setting and analyzing the farm plans.

The farm plan constitutes different information in different tables. Table A is the financial statement of the applicant. It shows all his assets and liabilities which helps in knowing the applicant's financial standing. Tables B and C show the estimated crop and livestock production and receipts for the current year based on last year's production. At the end of the year, actual production and receipts are recorded on the same table for comparison with last year's. Table D contains a list of all practices and purchases to be made by the borrower. This helps the farmer in planning his operations and expenditures of the loan funds, and helps the agency personnel in his supervision of the farm operations. Table E shows all family and farm expenses for last and current year for comparison and for calculating the net income. Table F is a summary showing gross income, total expenses, net income, and expected debt payments. This table summarizes the effect of the application and use of new farming methods and loan funds.

FARM PLAN

Name_____ Age_____ Village_____ Branch_____

No. of dependents_____ Total Don. owned_____ Total irrigated_____

Total Don. rented_____ Total dry _____

Table A. Financial statement as of_____, 19____

ASSETS			LIABILITIES	
Property owned	Donums	Val. J.D.	Debts owed	Unpaid bal. J.D.
Real estate	XXXX	XXXXXXX	Liens on land & bldgs.	
Land				
Buildings	XXXX			
Total	XXXX			
Livestock	No.		Total	
Sheep			All other debts	
Goats				
Horses				
Donkeys				
Camels			Total	
Cows			Taxes on real estate	
Others				
			Total all debts	
Total	XXXX		Summary	
Machinery	XXXX		Total property owned 1	
Tractor			Total all debts 2	
Other mach. & equip.	XXXX		Net worth (1-2)	
Total				
Feed on hand	Kgs.			
Total				
Seed				
Total				
Cash on hand	XXXX			
Accounts collectible	XXXX			
	XXXX			
	XXXX			
Total prop. owned	XXXX			

Table B. Crop production and sale from_____ 19___ to_____ 19___

Crop	Donum	Estimated yield/Don. Kgs.	Actual yield/Don. Kgs.	Operators share	Estimated amt. of sale	Actual amount of sale	Estimated receipts J.D.	Actual receipts J.D.
Total		XXXXXXXXXX	XXXXXXXXXX					

Table C. Livestock and by-products sale from_____ 19___ to_____ 19___

Kind of livestock	Number of animals	Estimated production/ animal Kgs.	Actual production/ animal Kgs.	Estimated total products Kgs.	Actual total products Kgs.	Estimated sale Kgs.	Actual sale Kgs.	J.D. estimated receipts	J.D. actual receipts
Milk prod. Eggs (hens)		No.	No.	No.	No.	No.	No.		
Total livestock & by-products									
Total livestock & crop sale (Tables B & C)									

Table D. Improved practices

Include all improvements and purchases to be made by borrower through loans and personal sources	When to do it	Source of funds		Actual accomplishments
		Credit J.D.	Personal J.D.	

Table E. Family and farm expenses

Item	Current year J.D.	Last year J.D.
Estimated family living expenses		
Feed		
Seed		
Fertilizer		
Spray and dust		
Gas and oil		
Machinery repair		
Machinery hire		
Hired labor		
Transportation expenses		
Farm repairs		
Irrigation expenses		
Rent		
Interest		
Others		
Total		

Table F. Summary

No.	Item	Current year J.D.	Last year J.D.
1	Total income from crops, livestock (Tables B and C)		
2	Off farm income		
3	Total income (1 and 2)		
4	Total family and farm expenses (Table E)		
5	Net income (3 and 4)		
*6	Principal payments on operating expenses this year		
*7	Principal payments on capital goods this year		
8	Other debt payments besides the agency		
9			
10			
11			
12	Total debt payments (6 to 11)		
13	Cash carry over (5 minus 12)		

*Payments on delinquencies should be planned in lines 6 and 7, if funds available.

I agree to follow this plan and discuss any changes necessary with the supervisor.

Date_____ Borrower_____

Date_____ Credit Supervisor_____

Note: A copy of this plan should be handed to the farmer.

Break-even method. The break-even approach is employed to help the officers in the agency determine an economic justification for some kinds of financing such as the number of acres a farmer should own to justify the purchase of a piece of machinery or equipment.

To determine the break-even point, total annual fixed cost and operating costs per acre are calculated. Knowing the cost per acre on custom work basis, a procedure might be as follows:

Assumptions:

1. Rate of interest at 5 percent per annum.
2. No taxes or insurance on machinery.
3. Life span of machinery 10 years--no salvage value.
4. Custom rate is $4.50 per acre.

Objective:

What is the least number of acres a farmer should own to justify the purchase of a $6,000 tractor.

Solution:[1]

Fixed cost - annual	$
Depreciation	600
Interest[2]	165
Estimated repairs	150
Total annual fixed costs	$915
Estimated variable costs (per acre):	
Fuel and lubricants	$0.09
Supplies	1.00
Labor	.43
Variable tractor costs	.22
	$1.74

[1] All data in the solution is hypothetical.

[2] Interest calculated by summing all interest paid on unpaid balance during the 10 years, then dividing by 10 to get average.

Formula used is:

$$\frac{\text{Annual fixed cost}}{\text{Custom rate/acre--operating cost/acre}} = \text{No. of acres.}^{1}$$

$$\frac{914}{4.5 - 1.74} = 331 \text{ acres approximately.}$$

If the farmer in an underdeveloped country pays taxes and insurance on their machinery, then these would be added to the annual fixed cost. Collection of data, calculations, and analysis of the costs could be conducted by the research personnel of the agency. The results could be used as a basis for extension of loans on machinery and equipment.

If the volume of one farm was insufficient to justify the ownership of a given piece of equipment, joint ownership could be used as a means of acquiring machinery through loans. Two or more farmers could apply for a loan and the agency would prepare an agreement to be signed by the applicants to define the conditions of use of the equipment and how the partnership would operate. A copy of such an agreement would be kept with the agency.

To show the picture more clearly, another example is given of what would be the cost of the operation on an ownership basis.

Assumptions:

1. The farmer has 200 acres.
2. He does not pay taxes or insurance.
3. His variable costs per acre are $1.74.
4. He has a tractor worth $6,000.
5. Custom rate per acre is $4.50.

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[1] E. N. Castle and M. H. Becker, Farm Business Management, p. 341.

Total annual fixed costs would be $915
Total variable cost at $1.74 per acre = 200 x $1.74 = $348
Total costs = $915 + $348 = $1,263
Cost per acre = $\frac{\$1,263}{200}$ = $6.31.

Since the custom rate is only $4.50, it would be more profitable for the farmer to hire the services of a custom operator and his machine.

Marginal analysis. Marginal analysis is a method of analysis used as an aid in economic decisions. It is concerned with added or marginal returns from a unit of produce associated with a use of an added unit of input such as fertilizers, seed, and water. This analysis can be used to answer the following two questions: (1) How would a farmer allocate his unlimited resources to maximize profit? Similarly, how would a credit manager allocate his unlimited loanable funds to maximize farmer's profit? (2) How would a farmer allocate his limited resources to get greatest returns? By the same token, how would a credit manager allocate his limited loanable funds to achieve greatest returns to the farmers consistent with safeguarding the funds of the agency?

One way to study the two conditions would be to analyze how a farmer would allocate his resources if they are limited or unlimited. By the same token, how would a credit manager allocate his funds in both conditions. The principle of diminishing returns would be used when resources are unlimited. When resources or funds are limited, the principle of equi-marginal returns is used. A discussion of how each is used follows:

The principle of diminishing returns. The law of diminishing returns may be stated as follows: When one resource is held constant in fixed amount, the amount added to total product by combining varying amounts

of a variable resource must eventually decline.[1] This law holds true almost universally for production elements added to a single acre of land or animal. Seed, fertilizer, irrigation water, labor, and feed follow the diminishing productivity.

This principle may be used to help the farm or credit manager in deciding how much of each resource may be used to maximize profits when resources and funds are unlimited. The following will show how a farm and credit manager may arrive at the required amount of resource or funds to use for each variable resource to achieve maximum profit.

1. How much variable resource should a farmer apply to a fixed resource, everything else remaining constant, to have greatest profit?

As a general rule, it may be said that under diminishing returns, it is profitable to increase level of production as long as the added or marginal return is greater than the added or marginal cost, i.e., add variable resource to a fixed resource as long as marginal return is greater than marginal cost.[2] Table 7 illustrates the principle and the point of greatest profit.

The price of fertilizer and corn would play an important role in deciding the most profitable level of fertilizer application. When fertilizer costs 14 cents per pound and corn sells for $1.30 per bushel, the most profitable level would be with the application of 30 pounds per acre of fertilizer and a yield of 66 bushels. At this level, the added or marginal return is $2.60 while the added or marginal cost is $1.40 with a net addition of $1.20 to returns ($2.60 minus $1.40). If more

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[1] E. O. Heady and H. R. Jensen, Farm Management Economics, p. 55.

[2] Ibid., p. 56.

fertilizer is added (40 pounds), then the added returns are $1.30 while the added cost is $1.40 with a loss of 10 cents ($1.40 minus $1.30).

Table 7. Comparison of added returns with added cost to decide most profitable yield per acre for corn (best amount of variable resource to use with a fixed resource)

Quantity of fert. (lbs.)	Total yield /acre (bu.)	Added quantity of fert. (lbs.)	Added or marginal yield (bu.)	Cost of added fert. with price of fert. 14¢/lb.	10¢/lb.	Value of added yield with price/bu. corn $1.30	$0.65
0	52	--	--	--	--	--	--
10	60	10	8	$1.40	$1.00	$10.40	$5.20
20	64	10	4	1.40	1.00	5.20	2.60
30	66	10	2	1.40	1.00	2.60	1.30
40	67	10	1	1.40	1.00	1.30	0.65

Source: E. O. Heady and H. R. Jensen, Farm Management Economics, Table 4-3, p. 56.

If the price of fertilizer or corn remains constant, as was assumed before, then the most profitable application of fertilizer would be 30 pounds per acre. If the price of fertilizer and/or corn does change, then the same procedure is used with different price levels, and the most profitable application of fertilizer would be different from the first case, but would be where the marginal cost and marginal return are in general as near equal as possible, and the difference is slightly positive in favor of returns over costs.

The same principle applies to uses and applications of other resources. With the same procedure, a farmer may determine the most profitable level of any variable resource use.

2. How would a credit agency decide how much to loan to a farmer for each investment to get the highest returns if loanable funds are unlimited?

The officers in the agency could conduct experiments on selected average farms in different areas of the country to determine the amount of resources (fertilizer, irrigation water, feed) that could be used in each enterprise under given price-cost relationships to give the highest profit. The added cost (added returns principle) could be used to arrive at the results. Data obtained would be tabulated and disseminated to all personnel to serve as a general guide in loaning activities, recognizing that each farm would differ somewhat. They could determine the amount to be loaned, for example, on the bases of data that would show about 30 pounds of fertilizer per acre would be a profitable application.

Equi-marginal returns principle. The principle of equi-marginal returns means that the last dollar spent on an enterprise or fixed stock of resources will yield a marginal return equal to the last dollar earned from all other enterprises or from its fixed factors.[1] Profits will be greatest if each unit of resources is used where it will add the most to total return. The question is how would a farmer allocate his limited funds and resources among different enterprises to get highest returns. The following example shows how this would be done by the application of the principle.

Suppose a farmer has only $9,000 available funds. He wants to know how to allocate this capital among the different enterprises to get highest returns. The first step would be to develop a partial budget for

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[1] E. N. Castle and M. H. Becker, Farm Business Management, p. 57.

each enterprise with a specific amount of investment. He gets expected net returns from each enterprise. Table 8 shows how a farmer can get a partial budget for a livestock enterprise. (The same procedure may be followed in developing a partial budget for any kind of enterprises.)

Table 8. Partial farm enterprise budget (livestock)--operating costs and returns

Dairy enterprise (milk) $500 investment	Per unit				Enterprise	
	Unit cow	Quantity lbs.	Price $	Amount $	Quantity lbs.	Amount $
Receipts						
Primary product sold						
Primary product used						
By-products value						
Miscellaneous						
Total						
Expenses						
Feed						
Bedding						
Medicine						
Electricity & utility						
Machinery						
Livestock purch.						
Interest on operating money						
Hired labor						
Miscellaneous						
Total variable cost						
Net return to fixed inputs						

Net returns may be obtained in the same way for different enterprises with different amounts of investment. Table 9 may be constructed. The principle of equi-marginal return may be used to choose the enterprises that give the highest returns.

Table 9. Added or marginal returns from using different amounts of investments in different enterprises

Investments	Expected net returns, excluding interest on borrowed capital, per $500 invested in				
	Machinery	Fertilizer	Livestock	Drainage	Buildings
1st $500	$655	$750	$628	$600	$610
2nd $500	625	650	610	575	585
3rd $500	600	550	590	535	528
4th $500	570	515	565	480	390
5th $500	534	480	535	380	290
6th $500	515	400	505	130	140

Source: E. O. Heady and R. H. Jensen, Farm Management Economics, Tables 19-4, p. 597.

To get the highest returns, he would use the first $500 in fertilizer, the second $500 in machinery, the third in fertilizer, the fourth in livestock, and continue to place additional investments where they will bring highest returns until he has invested $2,500 in machinery, $1,500 in fertilizer, $2,500 in livestock, $1,500 in drainage, and $1,000 in buildings. In each segment of the business, investment is extended to the point where added returns about equal in all alternative uses.

Another example will show how a farmer with $4,000 in capital may allocate the funds between different livestock enterprises to get the highest returns. The same procedure is followed as in the example above. A partial budget is developed for each enterprise and net returns are obtained for different amounts of investments. A table is constructed from the information obtained in the partial budget. The principle of equi-marginal returns is used to allocate the funds among different enterprises to get the highest returns. Table 10 shows the added returns from using different amounts of investment for three livestock enterprises.

Table 10. Added or marginal returns from using different amounts of capital for three livestock enterprises

Investments	Addition to income from last $1,000 in		
	Hogs	Poultry	Milk cows
$1,000	$1,300	$1,500	$1,400
2,000	1,300	1,250	1,100
3,000	1,200	1,090	1,050
4,000	1,200	1,090	1,050
Total returns from $4,000 capital	$5,000	$4,930	$4,600

Source: Heady and Jensen, Farm Management Economics, Table 4-10, p. 78.

If the principle of equi-marginal returns is applied, added or marginal returns for each enterprise from each addition of investment may be compared. The first $1,000 of the $4,000 may be invested in poultry because it grosses $1,500. The second $1,000 would be invested in dairy

because it adds $1,400 to gross returns. The third and fourth $1,000 additions would go to hogs, since they both return $1,300. Under the equi-marginal principle, $4,000 has been used and $5,500 added to gross income with a profit of $1,500. In other words, one-fourth of the funds are invested in poultry, one-fourth in cows, and one-half in hogs. If total returns were used as a basis for allocating the funds, then the total investment of $4,000 will go to hogs because they add $5,000 to gross income with a profit of $1,000 only.

Now the question would be: How could a credit agency allocate its limited loanable funds among different enterprises to get the greatest returns to farmers?

The same equi-marginal returns principle would be used to allocate the limited funds among enterprises in each area of the country on the farm level. The technical personnel in the agency could conduct a research and experiments in each area separately. The major enterprises adapted to each area would be studied as to the returns of each enterprise from an additional amount of investment. The research would be conducted on average farms selected in each area. Partial budgets would be developed for each enterprise with different investments. The results would be recorded in tables constructed as the one below. If the irrigated area is under study, the major enterprises (irrigation, livestock, machinery) are analyzed to determine the returns from additional investment.

When the net returns on each additional investment in each enterprise are obtained, the principle of equi-marginal returns is used to allocate the funds among enterprises. The enterprise that gives the highest returns from each additional investment will be chosen as the one to allocate funds to it. If it was found that the best allocation is in

investing one-half of the funds in irrigation, one-fourth in livestock, and one-fourth in machinery, then the agency would allocate all of its funds in the irrigated area on this basis. Research and experimentation would be conducted in the same procedure in other areas to determine how to allocate the funds for each area among the highest returns enterprises.

Table 11. Added or marginal returns from using additional amounts of loanable funds in the irrigated areas

Investment (loanable funds)	Returns from additional investments in		
	Irrigation	Livestock	Machinery
1st $1,000			
2nd $1,000			
3rd $1,000			
4th $1,000			
5th $1,000			

Partial budget method. The partial budget may be used to decide whether an addition to an enterprise is profitable or not. If a farmer is debating whether to add a piece of equipment to his machinery or extra milking cows to his herd, he may use this method to determine whether the addition will add to farm income. Suppose the farmer wants to add cows to his herd. To find out if it would pay him to buy the cows, he may set up the following partial budget:

1. Additional costs:

   Annual fixed cost of cows (depreciation, interest, etc.)
   Variable cost (labor, feed, etc.)

2. Reduced returns.

3. Total added costs and reduced returns.

4. Additional returns (sale of milk, calf).

5. Reduced costs.

6. Total added returns and reduced costs.

7. Net change in farm income (6 minus 3).

If the net change in farm income is positive, it would be profitable to add the few cows. The same method and procedure could be used for the study of addition of any resource on the farm.

In addition to the economic tools used, the A.C.C. should provide supervision to teach farmers new methods of farming and apply the results obtained from research. Most Jordanian farmers are illiterate and are still using old farming methods. The credit supervisors, who are working directly with these farmers, could be the best media for transferring new ideas and methods to farmers along with funds. The A.C.C. has to train the supervisors, not only in the field of agricultural finance, but also in the field of education. If that was done, the A.C.C. would have helped the farmer to increase his productivity by providing loanable funds at low cost on an economic basis and providing the farmer with free education in the new methods and techniques of farming.

Another way, but may be less effective in educating the farmer, would be through news-media. Since most farmers are illiterate, the only way to reach them is through broadcasting. An educational program, sponsored by the A.C.C., could be broadcasted. It would include new methods of farming, market information, new discoveries in the field of agriculture, and different services provided by the Corporation.

SUMMARY

Underdeveloped countries have some common agricultural problems. The most important facing these countries are low income, low productivity, and illiteracy of the farmer. Their governments are expected to take a large part in solving some of the problems. One of the tools used by a government is credit at low cost provided through a government credit agency. The main objectives of such an agency would be to increase the productivity and income of the farmer by providing loans as well as education in farming. The agency needs to have enough available funds when the farmer needs them. The loans will be used to meet the financial needs of the farmer as to his seasonal operations and for acquiring capital. Supervision is needed to make sure that the loan funds are used in the right place and to educate the farmer in new methods and techniques of farming. The agency has to use economic principles and methods in deciding on matters such as allocation of funds among different enterprises, selection of borrowers, and providing the profitable size of loan funds. If there is no institution in the country conducting any research pertaining to credit use, then the agency itself should step in and conduct this kind of research. The results would be used by the personnel in their loaning decisions.

A government credit agency called the Agricultural Credit Corporation was established in Jordan in 1960 to provide loans to farmers. It has a Board of Directors, a director-general, a Central and a District Loan Committee, and branches distributed all over the country.

An officer called a credit supervisor is quartered in each branch to study, analyze, and supervise loans. The District Loan Committee helps the supervisor in his work, while the Central Loan Committee has a loan approval authority.

The Corporation extends two types of loans based on time classification: medium and long-term loans. The extension of the short-term loan is confined to a semi-government agency called the Central Union of the Cooperative Societies, which gives loans to cooperative members only. The Corporation has recently established a Research Department to collect and dissiminate data on its activities.

Farmers applying for loans from the Corporation must meet certain requirements. The most important are that he should be experienced in the enterprise to be established, he should not be delinquent, and the amount of loan or loans that he obtained from the Corporation should not exceed 60 percent of the appraised value of the security. There are no economic tools used by the Corporation's personnel as a basis for extension of loans. Such tools as farm planning approach, break-even method, marginal analysis, and partial budget method should be employed by the personnel in their decision making.

Rainfall plays a vital role in agricultural production. The Corporation should provide loans for drilling wells which are important in increasing irrigated land and raise its productivity. Supervision should not be confined to enterprises established through loan funds only, but should be extended to all farm enterprises and operations. Field officers should be given more authority in loan approval and expenditure.

CONCLUSION

The three government credit agencies operating in Jordan before 1960 were not serving farmers and agriculture adequately. The Agricultural Credit Corporation was established to replace these institutions and overcome the difficulties faced by them. The study revealed that the Corporation has not yet fulfilled the objectives for which it was established. There are some deficiencies and gaps in its operations and loan servicing that should be changed or added to allow better service to Jordanian farmers.

The organization of the Corporation is not properly organized to serve farmers adequately. The District Loan Committee does not have sufficient members to act properly. The Research Department is limited in its functions and does not have any plans for conducting any research in credit use that helps the officers in loan extension.

Although the Corporation is extending loan funds for many uses, it does not provide production credit, leaving the farmers at the mercy of the private lenders. In addition, it is not extending funds for other needed areas, such as drilling wells which increases the irrigated area and productivity of land. Thus, private lenders are still a big source of credit for farmers at high cost.

The operation procedure is characterized by centralizing the loan approval authority in the hands of the high ranking officers. There are many steps, which cause unnecessary delay in loan closing and expenditure, that needs revision. This delay discourages farmers in applying for loans from the Corporation. Although supervision is employed by the

Corporation, it is limited in area and time. Supervision is confined to loaned projects and is discontinued once the project is completed. This limits the benefits of supervision to farmers.

The loan approving decision is based on the personal judgment of the officers. The requirements a farmer must meet before obtaining a loan is not based on economic needs and conditions of the farm. This results in many failures and delinquency among borrowers. Better tools for loan making decisions are urgently needed. Experience of credit agencies in other countries definitely make such tools available. The Corporation could service the farmers better if it adopts the suggestions mentioned in this study. The financial and administrative independence of the Corporation makes this adoption possible.

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