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-G748

B. SECONDARY
Development--Taiwan

2. TITLE AND SUBTITLE
Summary report

3. AUTHOR(S)
(101) Sem.on Agr.Development,Taipei,1966; Chinese-Am.Joint Commission on Rural Reconstruction

4. DOCUMENT DATE
1967

5. NUMBER OF PAGES
112p.

6. ARC NUMBER
ARC 630.J74

7. REFERENCE ORGANIZATION NAME AND ADDRESS
USDA/ERS

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

9. ABSTRACT

10. CONTROL NUMBER
PN-RAB-122

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Meetings
Taiwan

13. PROJECT NUMBER

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

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

630
J74

Final

JUNE 19-29, 1966
TAIPEI, TAIWAN
THE REPUBLIC OF
CHINA

Return to
Ag. Div.
F. A. Tech.

SUMMARY REPORT OF SEMINAR ON AGRICULTURAL DEVELOPMENT

Sponsored by

The Joint Commission on Rural Reconstruction (JCRR), Taipei, Taiwan, and the Agency for International Development, Washington, D.C. in cooperation with the Government of The Republic of China

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CHINESE-AMERICAN

JOINT COMMISSION ON RURAL RECONSTRUCTION

SUMMARY REPORT

OF

SEMINAR ON AGRICULTURAL DEVELOPMENT

June 19-29, 1966

Taipei, Taiwan

The Republic of China

Sponsored by

The Joint Commission on Rural Reconstruction (JCRR), Taipei, Taiwan,

and The Agency for International Development, Washington, D. C.

in cooperation with The Government of The Republic of China

May 1967

Taipei, Taiwan

FOREWORD

This report provides a record of the subject matter covered in the Seminar on Agricultural Development held in Taipei, Taiwan, June 19-29, 1966. It has been compiled by Dr. Y. T. Wang, Chief, Rural Economics Division of the Sino-American Joint Commission on Rural Reconstruction in cooperation with the Seminar's Senior Consultants.

In setting up the Seminar no plans were made initially to compile a report of the Seminar papers and related discussions since it was recognized that this type of educational experience is of greatest value to the participating members. However, at the conclusion of the Seminar a number of those in attendance suggested that a summary of the material covered would serve as a useful reference source, not only for those present but also for other students interested in the question: How does agricultural progress take place in developing countries. Consequently, the Joint Commission on Rural Reconstruction, as one of the Seminar's co-sponsors, decided to publish this report as a contribution to the literature on the important subject of agricultural development, using the Taiwan province experience as a case study.

This report may be considered a complementary source of information to the several agricultural development surveys and studies discussed herein and listed under Section VIII of this report.

Gerald H. Huffman
USAID Representative to China
and JCRR Commissioner

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I. INTRODUCTON

Fifty-five representatives from seven Asian countries, staff members of the U.S. Agency for International Development (AID) Missions assigned to those countries plus AID staffs from Washington D. C., Afghanistan and India met in Taipei from June 20 to 29 for a Seminar on Agricultural Development. Also present were officials of the U.S. Department of Agriculture, representatives of the United Nations Food and Agriculture Organization and the Agricultural Development Council.

The seminar was sponsored by AID/Washington and the Joint Commission on Rural Reconstruction (JCRR) in cooperation with the Chinese Government.

Represented in the seminar officially were delegates and observers from China, Korea, Malaysia The Philippines, Thailand, Vietnam and Turkey. (See Section VII for a list of delegates, observers and other participants.)

What has happened on Taiwan to bring about a satisfactory rate of agricultural growth and how and why this growth rate has taken place was the central theme of study and discussion in the sessions following the opening of the seminar.

As Taiwan has steadily achieved high rates of agricultural growth in the postwar years, particularly since 1952, it was thought that its experience might be of some practical value to other Asian countries which are trying to develop their own agriculture. Therefore, the seminar was held to familiarize the participants with the achievements the Republic of China has made in agriculture in its island province of Taiwan and to consider how and to what extent Free China's accumulated knowledge and past experience might be applicable to other developing countries facing similar, if not identical, agricultural problems.

II. OPENING SESSION

Address on Agricultural Development

By

T. H. Shen, Chairman of JCRR

It is my great privilege and honor to declare this Seminar on Agricultural Development open. I extend my warm greetings and those of my colleagues of the Joint Commission on Rural Reconstruction to all of you from other countries who have come long distances to take part in the Seminar. We welcome you as our guests and friends with whom we have many points of interest in common. May you enjoy a pleasant stay in this country and I wish you every success in the work you are about to begin.

I also wish to express my deep gratitude and appreciation for the joint sponsorship of this Seminar by the Agency for International Development and to the officials of AID who have made the preliminary arrangements. I am gratified to see among us a number of specialists and representatives from renowned international agencies. To them I also extend our hearty welcome.

The role of agriculture in economic development has become increasingly important. Many developing countries have endeavored to develop their economies through rapid industrialization, and some have failed for a number of reasons. Their experience should teach us that, in formulating an economic development plan, due consideration must be given to the role of agriculture and agriculture should be allowed to play its proper part in the development process. The Republic of China has adopted a policy of balanced agricultural industrial economic growth in the development of the province of Taiwan.

On the island of Taiwan, agriculture is made up largely of small-scale farms depending upon family labor. The total area of Taiwan is 13,836 sq, miles and about two-thirds of it is covered by the Central Mountain Range which runs from north to south. From the mountains down to the plains, the different altitudes provide cold, temperate, sub-tropical and tropical climates, in which different crops can be grown. They offer many opportunities but also demand a high level of technology and intensive farming operations for the successful development of agriculture.

For half a century prior to 1954, Taiwan was a typical colony serving as an

important source of food for Japan and as a market of her industrial products. During this period farm production was more than doubled through agricultural research and demonstrations, development of irrigation, and use of chemical fertilizers.

However, world war II caused a deterioration in the irrigation system, a shortage of labor, lack of chemical fertilizers, and, consequently, a sharp decline in food and other agricultural production to the level of 1910.

In the fall of 1945, soon after the Chinese National Government took over the Province of Taiwan, it started the rehabilitation of agriculture and industry in order to increase production. After the war, Chinese administrators, engineers, and agriculturalists from the mainland and those originally working in Taiwan applied themselves to the task of rehabilitating and reconstructing the island with notable success. Hydraulic power plants, sugar mills, pineapple-canning factories, tea-processing plants, and fertilizer plants, which either had been bombed by Allied Forces or had suffered deterioration during the war, were restored by Chinese engineers. The irrigation systems and dikes for flood control were gradually repaired. The production of agricultural products thus steadily increased from 1946 to 1948. However, with the evacuation of large numbers of troops and civilians to Taiwan in 1949, crop production proved inadequate and acute shortages of commodities were felt. To cope with the situation, the government laid special emphasis on increasing food production, in order to foster industrial development later on. Consequently, agriculture was greatly improved and developed.

As a result of three successive Four-Year Economic Development Plans, production has been increasing in both agriculture and industry, with the latter forging ahead at a faster pace. The real gross national product increased from US$938 million in 1952 to US$2,266 million in 1964. During the same period total agricultural production in physical terms doubled. However, when expressed in percentages of the total net national domestic product, the value of agricultural products declined from 35.2 percent in 1952 to 25.5 percent in 1964, while industrial products, including construction, increased from 17.6 to 29.4 percent in this twelve-year period. The value of agricultural exports tripled from 1954 to 1965. Yet in percentages of Taiwan's total export, the agricultural exports declined from 93.0 percent in 1954 to 54.3 percent in 1965 while non-agricultural exports increased from 7.0 percent to 45.7 percent in the same years. Thus, Taiwan's economy has evolved from a predominantly agricultural to a mixed agricultural and industrial one.

As to agricultural production as a whole, under the three Four-Year Plans, the average annual growth rate of 1953-56 was 6.2 percent, 5.0 percent for 1957-60, 6.40 percent for 1961-64, and 8.7 percent for the year of 1965. These figures are based upon recently revised national income statistics.

I will not say more about Taiwan's agricultural progress of the past or review with you reasons for this progress because these points will be presented and discussed in detail during later sessions of this Seminar.

I want to conclude my remarks by stating that, while much agricultural progress has been made here on Taiwan, there is still an urgent need to further boost the output of farm crops, livestock, forestry and fisheries as our economy attains to a higher level of development. The agricultural sector continues to play an important role in the overall development of Taiwan's economy, in terms of providing adequate food and raw materials and contributing an agricultural surplus for capital formation.

For the years immediately ahead our agricultural objectives are: (1) to boost food production to meet the need of a growing population; (2) to step up and diversify agricultural exports; and (3) to develop the farm products processing industries, create more employment opportunities for the rural population, and better the farmers' living conditions.

To achieve these objectives we face a number of problems in production and also in the marketing of agricultural products. In this latter area we must make many improvements in our marketing procedures and in the coordination and streamlining of our marketing institutions in order to market higher quality products more efficiently - - both at home and abroad.

Also, in spite of the modest beginning we have made in easing the population pressure, we have still to provide added employment opportunities for an expanding labor force, and to provide an adequate food supply and improved diet for the growing population,

Economic development implies not only an increase in the amount of physical production and value of output, but also the readjustment of social and economic structures that are conducive to steady economic growth. For this reason, agriculture's contributions to economic development may be assessed from different angles. I am sure this is one of the questions you will discuss in the next few days.

Finally, I wish to express my hope that this Seminar will be a complete success and that those of you who have come from abroad will find your stay here both interesting and profitable.

Agriculture's Continuing Importance in Economic Development

By

Minister K. T. Li

The Ministry of Economic Affairs

The Republic of China

Mr. Chairman, Distinguished Guests and Delegates, Ladies and Gentlemen:

I feel greatly honored to be given this opportunity to address such a distinguished international gathering. On behalf of the government of the Republic of China, I extend to you our sincere greetings and hearty welcome. I wish also to thank the United States Agency for International Development and the United States Department of Agriculture for their enthusiastic support and assistance extended to this Seminar.

I understand from the sponsors of the Seminar that the main objective of the Seminar is to thoroughly examine the development of agriculture and its related industries in Taiwan, evolution of the supporting institutional framework, and the methods used to promote agricultural development. I was told also that on your agenda there are such topics as agriculture in 26 developing nations, country-by-country analysis of the agricultural sector, and other interesting subjects. We are extremely happy at this opportunity to be able to exchange our ideas and experiences with you during the next few days. I feel certain that we can all benefit from such an exchange and be wiser in our approach to agricultural development.

Agriculture's Importance to a Developing Economy: In Asian countries, agriculture today gives employment to from about 40 to 90 percent of the population, produces from about 30 to 60 percent of the national output, and supplies from about 35 to 98 percent of the national exports. The majority of the participating countries represented in this Seminar, while depending on agriculture as a major source of national income, and having the bulk of their population engaged in agriculture, are faced with the problem of low farm productivity. It is no coincidence that there is a common and active interest in the promotion of agricultural productivity in these countries.

I think there is general agreement that the development of agriculture is of very great importance in the economic development of a developing country. Increased productivity in agriculture and betterment of the life of

the farmer would inevitably have a far-reaching effect on the overall economic development of the country. The agricultural sector can provide not only foodstuffs and industrial raw materials, but also a ready domestic market for industrial products, a source of savings for investment in industry and a source of foreign exchange earnings. Once industry begins to grow and expand, it will be in a position to absorb the excess labor on the farms resulting from population growth or productivity improvement, and to supply more farm implements and fertilizers for the further increase of agricultural productivity. It can be seen that in the context of a developing economy with a predominant agricultural sector, agricultural development can frequently provide the driving force for overall economic growth.

Agricultural Growth No Longer as Difficult as It Once Was: In its report on "Changes in Agriculture in 26 Developing Nations, 1948-1963" the United States Department of Agriculture indicated that between 1948 and 1963, twelve out of the twenty-six countries achieved an increase in crop output of more than 4 percent a year. This sustained rate of growth surpassed those ever achieved by economically advanced nations during comparable periods of development. The successes of these countries in increasing their agricultural output enhance the possibility that developing countries generally can increase their per capita production of foods and fibers in the near future. Within certain limits, land, labor, improved seeds, fertilizers, human skills and other inputs can be substituted for each other in agricultural production. Such substitution possibilities help simplify the task of increasing agricultural output and productivity in the less-developed countries.

The Development Experience on Taiwan: We are happy, but not complacent, to note that agriculture in Taiwan has now grown sufficiently to be in a position to stimulate our industrial development. I feel that the progress in our economic development has provided a fairly good example of balanced growth between the industrial and agricultural sectors.

The success of agricultural development in Taiwan began with the launching of land reform, which has caught the attention of the world. The reform was carried out in three successive stages over a period of five years. After the land reform, large amounts of capital and labor were poured into agriculture to make possible sustained growth in agricultural productivity. The complementary role played by agriculture in industrial development has been very significant. Agriculture has always come to the aid of our industry

by providing industrial raw materials at low cost and in adequate quantities and by earning the much needed foreign exchange through exports. These invaluable contributions of agriculture have helped tremendously our industry in its growth and diversification. Indeed, agriculture has been the very foundation on which our entire economy is built.

With the successful implementation of the three Four-Year Economic Development Plans, agriculture in Taiwan has moved forward. Our agricultural output has nearly doubled in the last 12 years: its annual growth rate averages 5.8 percent. Agricultural productivity has risen by 4.8 percent a year, surpassing the annual population growth of 3.5 percent. The increase in production made it possible not only to feed our growing population and supply the agricultural processing industry with adequate raw materials, but also to continue to provide a surplus for export.

While on the subject of exports, I might just mention in passing that one of the chief reasons for last year's termination of United States economic aid to the Republic of China was the sharp increases in exports and in foreign exchange reserves in 1963 and 1964. But came 1965 and our sugar export receipts tumbled and were down by US$67 million or the equivalent of 14.5 percent of our total 1964 exports. Fortunately, other agricultural products came to our rescue and the decline was more than made up by increased exports of rice, bananas, canned asparagus, canned mushrooms, canned pineapples, and fresh vegetables, thanks to all the effort that has gone into the expansion and diversification of agriculture and its allied industries. It certainly has paid off!

China's Contribution to International Agricultural Development: Agricultural development can do much to promote international peace and the welfare of mankind even while it promotes the development of national economies. According to the Food and Agriculture Organization of the United Nations, about half of the people in the world are suffering from undernourishment or malnutrition. These under privileged people are found mostly in Southeast Asia, Africa and Latin America. Take the Far East, for instance. Even though (excluding the Chinese mainland) it accounts for about 39 percent of the world population, it produces only 16 percent of the world food.

Our government has sent more than 400 agriculturalists and technicians to a number of countries in these regions to demonstrate our farming methods and practices in an effort to help them increase their food production.

About 2,000 agriculturists from these areas have also come to Taiwan for observation and training purposes.

In earlier years our efforts and services to these countries were chiefly oriented toward the introduction and adaptation of the farming methods as they are practised on Taiwan. In Liberia, for example, our technicians have demonstrated over the past three years that average local yield of paddy could be upped six times with improved rice varieties from Taiwan, from 700 kg. to over 4,000 kg. per hectare.

More recently, our services have been reoriented, wherever feasible, toward the development of capabilities for increased national production in order to achieve eventual self-sufficiency in food. In other words, we would like to see our work in the cooperating countries carried beyond the demonstration stage into the whole area of agricultural development. This calls for not only increased physical inputs and better production techniques but also stream-lining of the institutional framework.

Let me cite Ivory Coast as a specific example. There we now have a team of 145, soon to be expanded to 160. They are helping the Ivory Coast Government and farmers to increase local farm production through the expansion of acreage, introduction of higher yielding varieties, improvement of cultural practices, and training of farmers and extension workers. Ivory Coast annually produces about 188,000 tons of rice, consumes 238,000 tons, and runs a deficit of about 50,000 tons. The government plans to eliminate this deficit and become self-sufficient by 1970. Our team hopes to do better and expects that an annual increase of 24,000 tons could be realized, thereby eliminating the deficit in perhaps about two years.

Need for International Cooperation: Indeed, an effective international program of cooperation can accomplish much toward bringing about an increase in agricultural productivity. If top agricultural experts of several countries can join and carry out research together, there will be a saving of time, money and manpower. The results, which a country would find difficult to achieve alone, could be made available for the use of all participating countries. The International Rice Research Institute in the Philippines is a successful example of a joint scheme, which benefits not just one nation but all nations. The Vegetable Research Center for Southeast Asia to be set in Taiwan with the assistance of AID Washington is another good example of international cooperation.

Through the exchange of improved seeds and breeding stock, a country

can effectively improve the quality and production of its crops and livestock. Recently we introduced from Australia some good breeds of dairy cattle and sheep to improve our milk and wool production. On the other hand, we are sending quantities of rice seeds of improved varieties to India to help that country increase its food production. These varieties have proved to be three times more productive than the native varieties. We are also planning to send technical personnel to Korea to help increase Korean soybean production, thereby enhancing the possibility of increased exports from Korea and of establishing a closer source of soybean supply for ourselves.

The development of agricultural exports can lead to fuller utilization of agricultural resources of a country and help the growth of its national economy. A thriving export trade can provide strong incentives to the farmers and bring about increases in production. It can enlarge the foreign exchange earnings of the country, provide more capital for agricultural improvements, raise the incomes of farmers and their purchasing power.

Since confusion and harmful competition are inevitable if all countries try to sell the same product, an international regulatory arrangement would be needed, whereby each country should be encouraged to export only those products which its agricultural conditions are best suited to produce, and which are lacking in other countries. Through close coordination and cooperation, we can achieve agricultural development in each country without duplication or waste of efforts, unhealthy and unnecessary competition. By geographic specialization, we can most efficiently utilize the total natural resources available in this area, thereby promoting the general welfare in the whole region.

This Seminar will provide an opportunity to participants to exchange freely and frankly information and knowledge of techniques on agricultural development so that they can share the valuable experience of each other. I hope that some of the problems encountered in the implementation of agricultural programs will be thoroughly discussed at the Seminar in order to bring them nearer to solution. I hope that ways and means to achieve close coordination between the agricultural and the industrial sectors will also be explored so that guidelines can be developed for the future.

I am sure, Mr. Chairman, that this Seminar, with the experts from seven countries and the assistance of advisers from USDA, AID/W and the Agricultural Development Council, will bring us very fruitful results in terms of a better understanding of the problems of agricltural development

and of its role in the promotion of overall economic growth.

Once again, I welcome you all to be here and hope you will have a pleasant and comfortable stay while in our country. May I also wish you success in your deliberations.

Thank you.

Purpose of the Asian Seminar on Agricultural Development

By

G. H. Huffman, USAID Representative to the

Republic of China

Friends:

On behalf of the United States Government, and more particularly, the Agency for International Development, it gives me pleasure to join Minister Li and Chairman Shen in their words of welcome to all of you who are present at the opening session of this important conference, and especially to the official delegates, observers and consultants who will be participating in the Seminar discussions throughout the next ten days.

The Agency for International Development - - AID - - is privileged to co-sponsor this conference with the Joint Commission on Rural Reconstruction and to work with JCRR and the host country Government - - The Government of the Republic of China - - in developing plans for and staging this international meeting here in Taiwan.

AID is also pleased to note that official delegates from six countries in addition to the Republic of China are in attendance, together with representatives from international organizations and Foundations. This sizeable number of country representatives indicates clearly that there is widespread interest in the subject matter with which this Seminar will deal. Since Taiwan's agricultural progress is to be given particular attention during the course of the Seminar program, the satisfactory attendance also suggests that Taiwan's spectacular agricultural achievements are recognized in other countries, and that there is much interest in learning more about "how" and "why" these accomplishments have taken place.

This Seminar, or conference, has been in preparation for several years. Back in October 1962. AID/Washington sent a circular airgram to all of its

field Missions on the subject "How Do Countries Increase Agricultural Production?" This communication included a statistical tabulation which showed that the average annual rate of increase in agricultural production over the period 1950 to 1959 in 40 countries varied from a negative rate in one case, to 8 percent at the other extreme. The statement went on to make a tentative analysis of the causes for the widespread variations in agricultural growth rates between countries in the same or different stages of agricultural development, and suggested that much more needed to be known about the complex of factors - - technological, economic, social, institutional and human - - which contribute to high rates of annual agricultural advancement in some countries, lesser rates in others.

This initial AID/Washington inquiry stimulated considerable interest in over 50 country AID Missions throughout Asia, Africa and South America, 31 of which indicated - - following discussions with appropriate country government officials - - that they would like to have their countries included in any AID-sponsored research which would add to an understanding of the conditions that must be present to achieve a high rate of agricultural production and productivity.

At about this time - - January 1963, to be exact - - AID's attention was drawn to an important conference of international agricultural experts, primarily Asian, held in Tokyo, Japan, and sponsored by the Food and Agriculture Organization of the United Nations. Prior to this conference a group of Japanese agricultural leaders, at the request of FAO, had completed a comprehensive survey of agricultural development in Japan covering the period 1878 to 1960. This survey described how Japanese agriculture had been modernized and made highly productive, and also how agricultural improvement has contributed greatly to national economic growth in Japan. The purpose of the FAO-sponsored conference was to discuss the Japanese survey or analysis, and to consider applications that the Japanese experience might have to the problems of agricultural development in other Asian countries. A report of the conclusions of this conference, entitled "Agricultural Development in Modern Japan and the Significance of the Japanese Experience to Other Countries", was presented at the World Food Congress held in Washington, D. C. in June 1963.

The converging of the two nearly simultaneous events which I have just referred to - - that is, the AID/Washington inquiry to its field Missions concerning the conditions necessary to achieve a high rate of agricultural

growth, and the FAO-sponsored case study of the Japanese experience - - resulted in the development by AID/Washington of a research project which the U. S. Department of Agriculture agreed to carry out under the general direction of its Economic Research Service.

It was decided that this project should be implemented in two phases - - A and B. Phase A was to consist of comparative analyses of changes in agricultural output and productivity in 26 less-developed countries over the period 1948-1963. Phase B was to consist of a limited number of country case studies similar to the Tokyo conference study, which would not only identify the conditions necessary for rapid agricultural development but also analyze and describe in depth how and why the necessary factors associated with agricultural growth had come into existence in particular developing countries whose agricultural sectors had made rapid progress.

It was the original intent of the AID/USDA research project to begin with the multi-country, Phase A, survey, to be followed by the Phase B, selected country, case studies. However, due to Taiwan's spectacular agricultural development over the past 15 years, AID/Washington, in April 1963, asked the Chinese Government and JCRR to undertake a case study of the Taiwan experience in collaboration with the Economic Research Service of the U. S. Department of Agriculture. The Chinese Government and JCRR agreed to the proposal, and the case study was begun about two years ago and completed late in 1965. I might add here, parenthetically, that since the Taiwan case study was initiated, other case studies have been undertaken and are in the process of completion in Greece, Nigeria, Mexico and Brazil. And early this year such an in-depth analysis was started in India, under the direction of Mr. William Hendrix, USDA, who is here today.

This brings us to this Seminar and its purpose. I have taken the time, at the risk of boring you, to review the chain of events leading up to the opening of this Seminar to indicate that the topics to be presented and discussed here over the next several days have been preceded by considerable preparatory work and effort on the part of a number of people.

The phase A, multi-country survey study has been completed and published, and it will be the first substantive topic to be taken up at this Seminar beginning this afternoon. Also the case study of Taiwan's agricultural progress has been completed, and it will be presented in two papers beginning this Wednesday morning - - one prepared by the U.S. Department of Agriculture, the other by JCRR.

A significant feature of Taiwan's agricultural development is that it has occurred under conditions similar to those of other Southeast Asian Nations where agricultural productivity and economic growth in general have been at a less rapid pace. It is our feeling that the factors underlying agricultural growth in Taiwan, a subtropical area of small farms, and an area under heavy population pressure, may, in some degree, be transferrable to other countries where similar circumstances seem to be inhibiting the desired rate of growth. Thus, the associated purposes of this Seminar are: (1) to become as intimately familiar as possible with what has happened here on Taiwan to bring about a satisfactory rate of agricultural growth, and more importantly, (2) to become familiar with how and why this growth rate has taken place. The ultimate purpose of the Seminar is to consider ways to make practical applications of the Taiwan experience in other countries; that is, the transferability features of the Taiwan success story.

Depending on how successful we are in achieving the purpose of this first conference, it is possible that similar conferences will be held later in other regions, using the Greece, Nigeria, Brazil, India and perhaps other country case studies as discussion materials.

In closing I would point out that this Seminar is being held at a most opportune time due to the almost universal re-assessment by policy makers, academic theoreticians and practitioners alike concerning the importance and place of agriculture in the development of developing country economies, this is to say, the contribution of agricultnre in providing (1) enough food to feed the growing population of the entire world; and (2) the importance of dynamic agricultural sectors in developing countries in establishing solid foundations on which to build modern industrial economies. With respect to the first point - - the production of an adequate food supply to keep abreast of the world's expanding population - - one seldom picks up a daily newspaper today which does not report the conclusions of some august group of experts that more effort must be made to step up agricultural food production to meet the needs of projected population increases, including the need for better balanced diets. FAO has put out several reports on this subject.

With respect to the second point - - the place of agriculture as a foundation for industrial development in developing countries - - in the two decades since World War II there has been a tendency in developing countries to attempt to achieve developed states by concentrating on industrial development and neglecting agriculture. This common policy is quite well described

in a speech made about a year ago by Walt Rostow, Chairman of the U.S. Department of State's Policy Planning Council. On this subject Mr. Rostow said:

"If one examines in general the pattern of Asian development in the last decade, it is clear that, despite many vicissitudes, a great deal of progress has been made in manufacturing industry.

"The argument for an overriding emphasis on industry in the first phase of industrialization was reinforced by a widespread sense that industry was the essence of modernization while the continued concentration on agriculture and agricultural exports was a sign of continued inferior or colonial status.

"There is no doubt that in the first generation of postwar development the importance of rural development to the total modernization of developing societies was underrated in many parts of Asia; and the doctrines and policies for rural development, applied both by many Asian nations themselves and by those providing external assistance, were inadequate. It was not fully understood within many developing nations that agriculture is not merely an essential source of food for a rapidly expanding and urbanizing population, which was bound to use a large part of whatever increase in income that occurred to improve its diet, but that, in addition to this basic role in supplying food, agriculture is a critical source of raw materials for industry itself and, properly exploited, an important source for the earning of additional foreign exchange. Finally - - and this is only now becoming fully understood - - mature industrialization requires much larger markets than the rather narrow urban markets which were sufficient to sustain the first phase of import substitution of consumer goods. The farmer is needed by urban industry not merely to supply food and raw materials and foreign exchange earnings - - he is also needed as a customer for industrial products, if industrial momentum is to be sustained and Asian industry is to move on from its import substitution phase to maturity."

Professor Rostow's thesis found its way into U.S. Government policy through President Johnson's recent foreign aid message to Congress in support of the 1967 fiscal year foreign aid program. In this message the President proposed that "the Agency for International Development increases its efforts in the field of agriculture." And for the coming fiscal year, AID proposes to increase its investments in agriculture by nearly one-third over 1966 and by more than one-half over 1965, to a total of $512 million.

In concert with this new emphasis in the oncoming year's U.S. foreign aid

program, President Johnson has proposed to the Congress a new Food for Freedom companion program to replace the Food for Peace, or P.L. 480 program. The new Food for Freedom program is expected to increase U.S. food aid shipments to fill the food gap while AID-recipient country agricultural output is being expanded. Part of the local currencies generated from these food sales will be re-invested in country agricultural development and food processing industries. So much for the new emphasis on agricultural development in my Government's 1967 foreign aid programs.

In my judgement, the Republic of China has followed for 15 to 20 years a balanced policy of agricultural/industrial development here on the Island Province of Taiwan as expounded by Professor Rostow. And the results speak for themselves in terms of the sustained satisfactory rates of agricultural growth and over-all economic development which Taiwan has enjoyed during the past 15 years.

As I understand the reasons for the Chinese Government policy of giving adequate attention to agriculture, they have been:

1. To promote and develop the production and productivity of the agricultural sector in order to produce most of the food requirements of the growing population so that scarce foreign exchange earnings could be used to import industrial equipment and raw materials;

2. To produce enough food to feed the people a well-balanced diet at reasonable prices, thereby contributing to a rising standard of living and contentment and moderating pressures for industrial wage rate rises exceeding productivity increases;

3. To bring about prosperity among the farmers who make up nearly half of the population, so that they would be in a position to buy the products of industry as industry develops;

4. To produce an increasing variety and quantity of special crops for exports, thus contributing greatly to foreign exchange earnings and reserves; and

5. To produce agricultural products for industrial processing, thereby stimulating an early step of industrialization.

Taiwan's satisfactory rate of over-all economic growth today, achieved with a great scarcity of economic resources except the abilities, skills, and industriousness of her people, bear out the wisdom of the Republic of China's

agricultural policies over the past two decades.

And finally, I would point up a very significant feature of China's over-all economic development policy. Conceptually and operationally, it has not been a policy of stressing agricultural sector or industrial sector development as though these two major sectors were competitors for resources in the process of economic growth. The policy has been to look upon agricultural and industrial development in a complementary and balanced sense, and with the astute recognition that in Taiwan, as in most developing areas, industrial development proceeds at a desired rate when it is based on the firm foundation of a prosperous and productive agricultural population and rural economic sector.

May I again, on behalf of AID, welcome all of you in attendance today and throughout the ten-day period of this Seminar. I know that your discussions and observations will be fruitful. While this Seminar is focused on Taiwan's development, you delegates from other countries also have many useful agricultural development experiences to relate which will make this Seminar a pooling of knowledge in the interests of helping all of the peoples of the seven countries officially represented here to live better and happier lives.

Thank you.

III. DISCUSSION SESSIONS

'opic A: Agriculture in 26 Developing Nations, 1948-1963 *

1. Paper presentation - Dr. William E. Hendrix

The main conclusions from a research study of agriculture in 26 developing ɔuntries were presented by Dr. William E. Hendrix to serve as a background gainst which to discuss the process of agricultural development in Taiwan nd the relevance of the Taiwan experience to other developing countries.

Objectives of the research were to show levels and changes since 1948 in gricultural output and productivity in the 26 countries and to identify and ssess the roles of major physical, economic, and social factors associated ·ith differences in these levels and changes.

Between 1948 and 1963, twelve of the 26 developing nations had compound ıtes of increase in crop output of more than 4 percent per year. These ıtes surpassed those achieved by now economically advanced nations during ɔmparable periods of time. The success of these 12 countries in increasing ıeir agricultural output enhances the possibility that under-developed countries ɜnerally can increase their per capita production of foods and fibers in the ɜar future.

The 12 countries differ greatly in many of the factors which influence ıeir agricultural production potentials; such as climate, rate of literacy, ıpply of land resources, the cultural pattern, and the governmental system.

Such diversity in these and other factors opens to question many popular ɜliefs about agricultural development patterns, potentials, and prospects in ıe world's newly developing nations. In contrast to the popular stereotype such nations as being highly stagnant, they indicate that agriculture in veral of the world's newly developing nations have become highly dynamic, pecially when viewed against their own past history instead of agriculture economically advanced nations such as West Germany, the Netherlands and .e United States.

More important, these successes open to question two important theories low agricultural production in newly developing countries that have long

* This research was carried out by the Economic Research Service, U.S. Department of Agriculture for the Agency for International Development. The results are presented in FAER No. 27 "Changes in Agriculture in 26 Developing Nations, 1948-1963."

been highly influential. One of these ascribes low productivity to unfavourable soils and climates in accord with the doctrine of geographic determinism. The other explains the persistence of low productivity in terms of a vicious circle of cause-effect relationships, one major form of the doctrine of economic determinism. In this "cause-effect circle" it is presumed that such ills as illiteracy, malnutrition, disease, and ignorance "cause" low output incomes, and that low output and incomes lead to these social ills, thereby creating a traditional low-income equilibrium from which there is little hope for escape apart from large-scale international income and wealth redistribution.

The factors associated with differences in rate of increase in agricultural output among the 26 countries form a rational, but highly variable, pattern that is somewhat in accord with the uniqueness of each country in its combination of human, land and capital resources, and technical possibilities, and in its institutional, social, and political features.

Rapid rates of increase in crop output, however, did not happen just as a consequence of normal economic and social processes in societies organized on a **laissez-faire** basis. Rather, they have been undergirded by aggressive group action, generally national in scope, directed specifically to improving agricultural production conditions.

2. Country situations

Delegates from each country prepared and presented reports on its development situations. The statements and discussions included a brief characterization of development trends in individual countries and in the region.

The main content was a summary of factors favoring and impeding development in the specific countries and region. Major development actions were outlined. The statements and discussion helped to focus the attention of the participants on specific conditions, based on the analysis contained in the report "Changes in Agriculture in 26 Developing Nations, 1948-1963." The analysis part of Appendix I (pp 126) of this report was the pattern followed in making country reports.

The presentations and discussion brought out many factors relating to development. Since many factors are involved in achieving increased agricultural production there is need for a careful study of the exact local situation before plans are made and action taken toward development.

Some illustrative variations in conditions are as follows:

a. **Man-land relationship**

In some countries or sections of countries, the available supply of land is already rather fully used. This situation makes it necessary to achieve increased output through increased yields or multiple cropping, and often through labor-intensive methods. Other countries and sections have sufficient land in relation to their population so they can readily realize increased production by putting more land area into production.

b. **Security conditions**

Presentations and discussion emphasized the importance of stability of the expectations of farmers and others resulting from government stability, and security of life and property. Lack of these conditions is a major obstacle to increased productivity, and sometimes entirely prevents it.

c. **Availability of trained and experienced personnel**

Some of the countries and areas represented indicated an acute shortage of research and extension personnel. The discussion emphasized that it takes a long time and is expensive to train the necessary personnel and for research and extension programs to result in actual increase of production.

d. **Credit conditions**

There already are relatively successful and growing agricultural credit programs in some countries. There has hardly been a beginning in improving credit oonditions in others.

e. **Availability of production supplies and adequacy of markets**

There is variation in these matters both between countries of different regions, and also between commodities. There is a tendency for supplies and markets to be most adequate for export crops and weakest for staple foodstuffs consumed near where they are produced. The discussion noted instances where private interests had provided adequate supplies of fertilizer, insecticides, and other production requisites. Direct action by government was not needed in these cases. Other instances were pointed out where further action by government or others was needed to increase the supply of fertilizer, simple tools and machinery, improved seed, other requirements, and especially to improve markets for products.

f. **Incentives**

The combination of market forces and government policy has resulted in variations in the incentives for increased output. Prices have fallen for

some export crops. Other commodity prices have been more stable. Some countries place heavy taxes on exported crops. This reduces incentives to produce. Other countries subsidize such inputs as irrigation, fertilizer, and improved seed, thus encouraging the adoption of output-increasing technology.

These items illustrate the variation in conditions. The presentations and discussion also included an enumeration of many action programs. Some of the more widespread programs include:

(1) Development of irrigation.
(2) Action to increase the use of fertilizers.
(3) Expansion of agricultural research and extension programs.
(4) Action to increase agricultural credit.
(5) Efforts to develop farmers' associations or cooperatives.
(6) Efforts to diversify agricultural output.
(7) Efforts to expand and improve roads and storage facilities in order to improve marketing conditions.

This summary has emphasized the existence of both variations and some relatively common factors in relation to development. If it were necessary to correct or improve each factor in order to realize increased production, this would be a formidable obstacle. This, however, is contrary to reason. The Taiwan case also provides a specific illustration that development can be realized where there are major resource limitations, such as a limited land base. The specific discussion of the actions and experience in the Province of Taiwan on the following days of the Seminar, including many briefings during the field tour, emphasized the attention paid to the conditions that existed.

3. Response - - Remarks by Dr. William E. Hendrix

The summary statements that have been presented by various delegations are exceedingly stimulating. They indicate that the development of policies and programs to modernize agriculture creates need for a tremendous amount of information about their economies in general. They suggest that the problem of increasing agricultural productivity is a many-faceted complex in terms of the number of relevant factors needs for planning integrated programs, and information requirements.

It was appropriate that presentation began with emphasis on one of the most basic conditions required for agricultural development that of achieving a high degree of security of life and property. Without this security of

expectations, little reliable planning could be achieved and any planning, in effect, would be meaningless.

A large number of factors were mentioned in various discussions. They can be categorized as follows:

a. **Resource bases at farm levels**: Land per capita and availability of improved technologies.

b. **Supporting services** required in the provision of factors, such as fertilizers and improved seeds, and of marketing, processing, transportation and storage. Infra-structure of roads, power and educational facilities, and information bases might be added.

The summary reports also include reference to educational levels. Considerable emphasis has been placed upon the need for improving extension and research.

Considerable emphasis has been placed on incentives as affected by prices, tenure relationships, taxes and other non-market directed factors which affect the distributions of income.

Public policies and programs, with adequate technical and administrative staffs were emphasized throughout. The need for coordination of policies and programs, improvements of administrative machineries, and improvements of planning at national, provincial, state and local levels were largely emphasized.

I shall not enumerate all of the factors falling under these general headings reported by the delegations. Such a list would be quite long. Furthermore if it were necessary to attack all these problems simultaneously, it is doubtful whether production increases could ever be achieved. We do indeed have difficult problems which require for their solution a tremendous amount of resources, planning and elaborate policies, programs and administrative machinery. But may not these factors be so related to one another that certain key ones can be used to achieve control in the direction needed for development of a much larger complex factor. If each factor is functionally independent of every other factor, progress will require policies and programs to deal with all facets of the development problem. On the other hand, if they are interrelated in a way that one factor can be manipulated so as to induce changes in other factors, agricultural progress then requires much simpler programs, much smaller amounts of resources from outside, and much less extensive and much less elaborate planning and

programs than would otherwise be needed.

The comments made by the Malaysian delegation in regard to adequacy of fertilizer supply is relevant here. There, the mechanism of free market prices appears to have worked to achieve needed increase in fertilizer supplies.

The conditions crucial to development differ from country to country. For example, security is much more crucial at the moment in Vietnam than in some other countries. In this and other respects each country is somewhat unique.

In conclusion, let me suggest that each delegation present look upon Taiwan's experience as a laboratory in which to examine possible solutions to the problems it has stated. Taiwan has in effect emerged successful in experimentation. The validity of its various policies is implicit in its successes, recognizing of course the need for adaptations in accord with the differing conditions of each country.

Topic B: Agricultural Development and Its Contributions to Economic Growth in Taiwan

1. Paper presentation - Dr. S. C. Hsieh

While Taiwan has been experiencing a rapid development of industry since its restoration to China after World war II, agriculture still constitutes the mainstay of its economy whether in terms of food and industrial raw material supply, population engaged in farming, income generated from agriculture, labor employment, or contributions of agricultural exports to total exports.

The objective of this study is twofold: to survey Taiwan's experience in agricultural development with special reference to the input-output relationship and productivity change in production, and to review specific aspects of the Taiwan experience in terms of the major sequences of institutional and organizational innovations and in relation to its economic growth as a whole. The experience of Taiwan shows how its agriculture under the traditional small farming system, has successfully advanced with its productivity greatly increased. Taiwan's rapid growth of agricultural productivity in the framework of a high population pressure and small-scale farming is of deep technical interest to the developing countries of Asia today. The central point of interest was in the adoption of capital saving techniques in the initial period, which made possible economic use of scarce capital in the development process. To be specific, maintaining the relatively constant

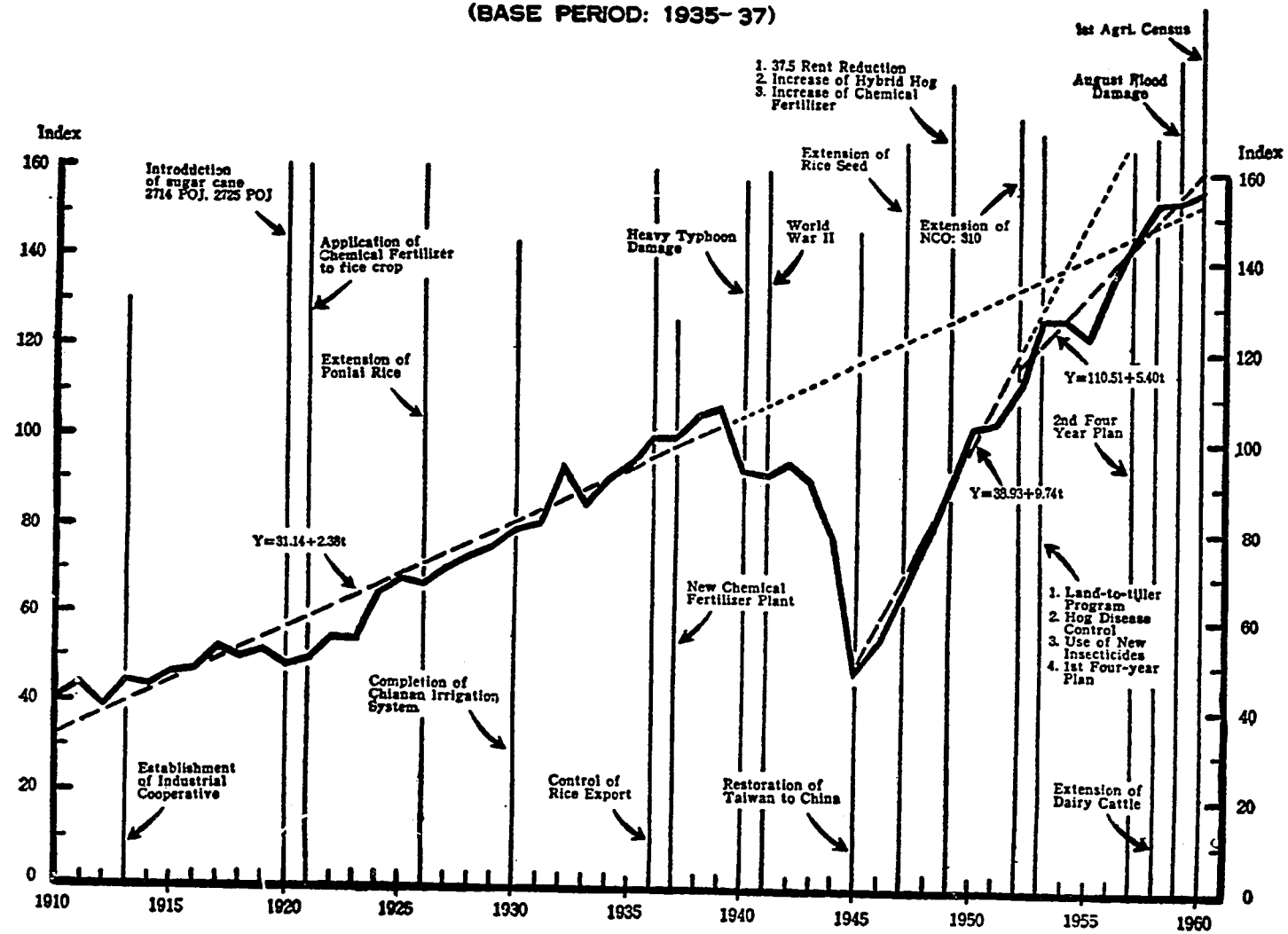
capital-output ratio and the high growth rate of labor productivity without a rapid increase in wage rates in the development process is the major cause contributing to the high growth rate of Taiwan's economy.

Broadly speaking, the whole period 1910-60 could be divided into four phases of development. The first phase covers the period from 1910 to 1939, representing an initial and continued development of agriculture under colonial conditions. The second phase extending from 1940 to 1945, was characterized by a downward trend of agricultural output due to war damage. The third phase covers the period from 1946 to 1952, in which efforts were made for the recovery and rehabilitation of agriculture after the war, The fourth phase represents further development of agricultural resources and technology since 1952. The annual growth rates of agricultural output in the different stages of development are shown as follows:

Table 1. Average Annual Growth Rate of Agricultural Output in Different Stages of Agricultural Development in Taiwan 1910-60

Stage of Development	Period	Average Annual Growth Rate of Agricultural Output	Average Annual Growth Rate of Total Population
Initial stage of agricultural development under Japanese colonial rule	1910-20	1.66%	1.31%
Continued development of agriculture under Japanese colonial rule	1920-39	4.19	2.40
Agricultural development under the impact of World War II	1939-45	-12.32	0.46
Recovery and rehabilitation after the war	1945-52	12.93%	4.93
Further development of agriculture	1952-60	3.98	3.61
Average of prewar period	1910-39	3.31	2.02
Average of postwar period	1945-60	8.06	4.17
Average of whole period	1910-60	2.67	2.40

FIGURE 1: INDEX OF AGGREGATE AGRICULTURAL OUTPUT IN TAIWAN
(BASE PERIOD: 1935-37)



With 1935-37 as the base period, the movement of the indices of aggregate agricultural output for the period 1910-60 is shown in Figure I.

Two factors affect the expansion of agricultural output: (1) increase of input factors in agricultural production and also their use in combination and (2) improvement and advancement of technology and transformation of agricultural organization. With the period 1911-15 as base, the index of aggregate input in agriculture in 1956-60 is 184, while that of aggregate output is 337. The trend of change of agricultural input categories in the period 1911-15 to 1956-60 is shown as follows:

Table 2. Indices of Agricultural Inputs in Taiwan

	Cultivated Land Area	Crop Area	Agricultural Workers	Labor Input	Working Capital	Fixed Capital	Aggregate Input
1911-15	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1916-20	105.64	107.35	97.32	111.56	130.94	109.55	109.46
1921-25	109.56	114.12	97.54	118.09	160.13	183.52	117.74
1926-30	115.88	121.82	102.87	125.82	225.90	319.07	132.29
1931-35	118.49	133.82	111.38	138.87	279.74	339.49	141.11
1936-40	123.67	141.21	119.01	144.62	324.92	309.97	150.46
1941-45	120.91	136.18	—	138.52	189.09	281.86	134.83
1946-50	123.20	159.78	143.60	141.38	163.68	268.33	134.55
1951-55	126.24	186.26	150.83	178.74	381.73	318.14	166.13
1956-60	126.52	195.43	149.42	198.44	511.66	389.86	184.19

The increase of working capital including mainly fertilizer and feed inputs is the most important strategic factor influencing the expansion of farm output. Innovation is featured primarily by the increased use of fertilizer which requires a relatively small capital outlay and permits application in variable quantities on small farms. Controlled irrigation as expressed in terms of fixed capital input and the increased labor input on the expanded crop area with diversified farming also contributed to the expansion of output. With relatively constant land area and significant increase of working capital in agriculture, the relative importance of the land resource in farm production has gradually decreased. The expansion of farm output in Taiwan was chiefly accomplished by the substitution of capital for land resource, i.e. to increase the capital/land ratio in agriculture for higher productivity of land. More capital inputs in agriculture and more intensive use of land usually call for more labor input. Changes in relative

prices of inputs over long periods of time will definitely influence the substitution between inputs within the limits of technical feasibility. The relative prices of farmer's producer's goods (soybean cakes) and interest rates advanced to a much greater extent than the wage rates and land rental rates. The price ratio between capital and labor was not favorable for the substitution of capital for labor. It is also necessary to increase the capital input in agriculture in order that more labor could be possibly and profitably applied in agriculture. Under Taiwan's conditions, it is favorable to adopt technical improvements, which require more intensive use of capital and labor for increasing land productivity and labor efficiency.

The productivity of input factors is measured in terms of output per unit of input. With 1935-37 as base, the indices of productivity of agricultural resources in Taiwan are shown in Table 3.

Table 3. Indices of Productivity of Agricultural Resources in Taiwan (1935-37=100)

Year	Productivity of Aggregate Resources	Land Productivity per Unit of Cultivated Area	Land Productivity per Unit of Crop Area	Labor Productivity per Farm Laborer	Labor Productivity per Manday	Capital Productivity
1911	67.90	54.89	63.91	53.51	63.50	162.78
1916	68.73	57.53	66.27	56.96	64.00	135.80
1921	67.75	57.55	66.27	61.10	64.50	121.31
1926	78.22	71.86	78.11	76.64	76.50	99.15
1931	88.93	84.64	89.35	86.31	89.50	98.58
1936	99.85	100.96	100.30	101.15	99.50	97.73
1941	94.37	90.60	88.46	87.34	89.00	111.08
1946	72.32	56.43	64.20	47.30	74.50	155.97
1951	100.75	101.18	80.18	80.44	87.50	117.05
1956	116.50	132.04	101.18	105.29	104.50	102.56
1960	125.35	150.33	110.06	116.69	110.53	102.84

Productivity is affected by such factors as technological and economic conditions of production and multiple-cropping index. The productivity of aggregate agricultural resources registered an increase of 84.60% during the period from 1911 to 1960. The slower growth of productivity before the war as compared with that after the war indicates less advanced technology and the lower multiple-cropping index in the former period. The growth of land

productivity was brought about by two factors: increase of multiple-cropping index and increase of unit yield. The increase of the productivity of aggregate resources during 1911-60 was mainly the result of the rapid growth of the productivity of cultivated land, which averaged 2.1% annually. The productivity of agricultural labor also averaged an increase of 1.6% per annum, despite an increase by about 50% of farm laborers from 1911 to 1960. This amply proves that by increasing land productivity in an area where labor is overabundant, labor productivity can still be raised. In fact, labor productivity equals the product of multiplying together capital intensity, capital productivity and average cultivated land per farm laborer. In the period after World War II, capital intensity in agriculture increased significantly, but the average cultivated land per farm laborer decreased. The main bottleneck in raising labor productivity was the low capital productivity and the dwindling average cultivated land per farm laborer. In order to further raise labor productivity and land productivity, it is necessary to increase the input of both fixed and working capital and to accelerate technical innovation in agricultural production.

2. Sub-group discussions

Report of Sub-group A:

A number of questions were raised during the discussions, which the author of the paper was requested to clarify. The questions were:

a. How reliable are the data given in the paper? It was considered that their reliability and accuracy had a great deal to do with conclusions drawn from them.

b. How were the various incomes, such as labor income, capital income, land income, etc. computed? Some understanding as to the methods used and assumptions made in preparing all these tables seemed to be necessary.

c. How were the prices or values of the various inputs and outputs determined?

d. The author mentioned that it took about twenty years between 1910 to 1930 for Taiwan to build the infrastructure for the takeoff in crop yield. This was considered to be a rather long time. Did Dr. Hsieh mean to say that other developing countries also had to wait for that long in order to begin to achieve yield increases?

e. Dr. Hsieh mentioned an increasing capital-land ratio for Taiwan, and he also mentioned capital-saving techniques. Are these two contradictory

to each other?

Report of Sub-group B:

Sub-group B discussed the experience of the Chinese government in the development of the agricultural sector during the period covered by Dr. Hsieh's study. The Chinese delegates, in reply to questions asked, made the following remarks:

a. In the early period agricultural development did not absorb capital from industry, but rather transferred resources to industry and other sectors of the economy. This was particularly true with the land reform program which was initiated and implemented with government assistance. Payments received by landlords as prices of the land sold to their former tenants were reinvested in industry in many cases. Generally, farmers' associations at the township level accept deposits from farmers and non-farmers alike, and the money is partly redeposited in the semi-government-operated Cooperative Bank of Taiwan which uses it to finance various economic development activities through loans. In the past decade, agriculture has actually supported substantially the growth of other sectors of the economy.

b. Farmers' responsiveness to the favorable price and demand changes, especially in foreign markets, has been an important contributing factor to the steady expansion of agricultural production in past years.

c. Bank credit, from both private and public institutions, has been increasingly available to farmers, notably in recent years. Loans at reasonable interest rates have helped farmers to improve their farms and increase production.

d. The Cooperative Bank, the Land Bank and farmers' associations all extend loans to farmers to enable them to buy the producer's goods needed in their farming operations. The farmers' associations also provide extension service to help farmers in their farm planning and teach them new farming knowledge and techniques.

e. For stabilizing the rice price, the government controls about 25 percent of the total production which is collected by, 1) barter for fertilizers through the facilities of the Provincial Food Bureau, 2) levy of land tax in kind, and 3) compulsory purchase. The rice thus collected is used mostly for distribution to the armed forces, government employees, and their dependents as rations. Government monopoly of the import and export of rice also has a stabilizing effect on the price, which in recent years has remained very

stable.

f. About the high efficiency of farm labor in Taiwan, it has a great deal to do with the price incentive which the government has helped to create through export promotion. The desire on the part of farmers to earn more profits prompts them to work hard so as to produce more. Another reason is the successful completion of the land reform program which turned tenants into owner-operators, thus enabling them to enjoy fully the fruits of their labor. The small size of farms in Taiwan also compels farmers to make intensive use of their land so as to survive, if for no other purposes.

Report of Sub-group C:

On the point of the influence of exports on the improvement and development of agriculture in Taiwan, it was agreed that such an influence was especially marked in the early stage when the economy was tied up with the Japanese economy.

The question of accuracy of the statistics was also raised, as the data presented in Figure 1 of the report were apparently collected during the Japanese occupation period. It was learned, however, that in Table 12 on the last page of the report, the data for 1955 were based on a five percent sample census while those for 1960 were obtained from a complete census; all data before 1955 were compiled by the the staff of the Taiwan Provincial Department of Agriculture and Forestry, who at one time had worked under the Japanese administration. The conclusion was that all available information, regardless of its origin, pointed to the rapid progress of Taiwan's agricultural development which has been achieved within the framework of a small farm system. This is of particular interest to developing countries in Asia.

Also discussed by the sub-group was the demand for improved inputs and technology, which, it was concluded, arose from farmers' own needs. When the extent of this demand was such as to have caused a high rate of growth, Taiwan has indeed moved into an advanced stage of agricultural development. The expansion of the demand was attributed in part to the well-coordinated efforts made by the agencies and organizations concerned at all levels.

The interest rate in Taiwan was considered rather high, though not to any serious degree. Because of the constantly rising price level, farmers sometimes would find it difficult to pay high interests on bank loans.

3. Response - Dr. S.C. Hsieh

Dr. Hsieh made the following statement in response to the questions brought up by the three sub-groups.

a. In making an economic research or study covering a period of half a century, there is bound to be the problem of quality, accuracy, continuity and uniformity of the statistical data used. During the colonial period, the Japanese maintained a continuous series of agricultural production statistics. Even after the war, comparatively reliable and comprehensive statistics have been kept. The reason is that in Taiwan the work for land registration and crop reporting is done regularly and thoroughly and on a small plot basis. In 1955 the first sample census was taken, and again in 1960 a complete agricultural census was conducted as a part of the FAO world-wide agricultural census program. The latter was considered a success by FAO advisors. There is no full assurance about the statistics from 1940 to 1945 and from 1946 to 1950 because of the confused war and postwar situations. However, as a matter of fact, in a study involving only a short period of time, accuracy of statistics is very important, but in the case of a time series study, the observation of trend is the main point.

b. Regarding the prices of output and value of inputs, they were constant prices in the base period of 1935-1937.

c. The infrastructure for agricultural development in Taiwan was not built up during 1910 to 1920; actually the period extended to 1930. For example, the Chianan irrigation system, which is the largest in Taiwan and benefits 150,000 hectares in the south, was not completed until 1930. And the high-yielding Ponlai rice variety was developed for farm-level extension and planting in 1925-1926. The fact is that many of the infrastructural constructions were started in 1910-1920. Statistics show that agricultural growth rate in Taiwan was 1.66 percent in 1910-1920, and 4.19 percent in 1920-1939, indicating that even during the period when the social infrastructure or basic foundation for agriculture was being built, agricultural output could still be increased. Generally, for increasing agricultual production three broad categories of things need to be done: agricultural base expansion, immediate output expansion, and public services for agriculture. In any country when efforts are started for agricultural development, heavy capital investments need to be made in the basic social infrastructure. At the same time, funds are required for raising output to meet immediate needs of the people, and for improving public services for agriculture, such as research,

education, extension, etc. Naturally it would be impossible to do everything at the same time. For sustained growth of agricultural output, however, the building up of the social infrastructure is of greater importance than immediate output expansion and agricultural services, as the latter will bring only limited yield increases without the help of a solid agricultural base. Developing countries today do not have to wait twenty years as Taiwan did in order to take off in agricultural yield, as they can benefit by the experiences of advanced countries and adopt with modifications the technology developed by them. In terms of some other factors, especially those connected with market expansion, the developing countries are rather in an unfavorable position, as they are late comers in the international market. At any rate, it should not be considered too long to take, say, ten years, to complete the basic social infrastructure in developing countries. To give an example, for a single irrigation project it usually requires several years from planning to completion.

d. There is not necessarily any conflict between the increase of capital-land ratio and the adoption of capital-saving techniques. In a small farm economy, to increase the productivity of the limited land resources calls for heavy capital investments, but the same result can be achieved by adopting techniques which require relatively small amount of capital but more labor. In the latter case, if the amount of capital input remains unchanged, the capital-output ratio will be low.

e. In Table 11 on Page 37, land income was computed on the basis of 37.5 percent of the value of the main crop yield, which landowners received as rental from tenant farmers after land reform. In Taiwan surveys on agricultural products are often made, in which per hectare labor requirements are calculated at the standard rates of, for example, 750 man-days for tobacco, 95 man-days for first rice crop and 100 man-days for second rice crop; and they provide information on capital requirements for major crops in terms of fertilizers, chemicals, hired labor, etc. It is on the basis of these kinds of information that labor income and capital income were computed as shown in Table 11. Labor income included the returns to farm operators who managed their own farms. The percentage of capital income declined after land reform because of the increase of labor income. If capital was provided by farmers themselves, capital income went back to them. In that case, farmers were also capital owners.

f. From 1950-1962, farmers in Taiwan were required to pay 25 percent

interest on loans. Even the interest rate of 18 percent under the Supervised Agricultural Credit Program was still high, compared with 6 to 10 percent in other countries. Generally speaking, during the process of agricultural development, Taiwan farmers have been paying comparatively high interest rates for the use of capital in agriculture. As to how low an interest rate would be reasonable, it is an open question. In many developing countries, capital is a scarce factor in economic development, while in others labor is the scarce factor. According to general economic principles, if capital supply is comparatively scarce, a high price has to be paid for the use of it. In that case, the development process will be slowed down since under the pressure of high interest rates it will be difficult to obtain financing for the construction of the social infrastructure. In Taiwan, this difficulty has been solved with the help of U.S. economic aid which, together with the funds provided by the government, has consolidated the infrastructure as a base for further development.

Topic C: Economic Development of Agriculture in Taiwan, 1885-1963

1. Paper presentation - Mr. Wade F. Gregory (based on the Spaeth paper)

I would like to make a brief statement as to why I am here on the program. As mentioned by Dr. Huffman, USDA is doing a research project for AID/Washington on factors associated with economic development. The phase I of this project was reported by Dr. Hendrix yesterday on agricultural development in 26 developing countries. The phase II project is to find further detail and to further test agricultural development in selected countries, and Taiwan (China) was one of the countries selected. This study was done by Dr. David H. Spaeth, who was on the USDA staff then, and in cooperation with Messrs. S.C. Hsieh and T.H. Lee.

Messrs. Hsieh's and Lee's report describes what had happened in terms of what was developed in agriculture in Taiwan, whereas Dr. Spaeth's report explains how and why these changes had occurred. I shall try to give some comments why these farmers moved to these performances and to higher and newer production functions.

This report is a complement to that of Hsieh and Lee. As you can see, it relies heavily on their materials. Several tables are identical to the materials we had discussed yesterday. This was done purposely because if anybody takes this report independently, we want him to have an idea of the changes which had taken place. So some of the materials from Hsieh's and Lee's

report were taken as an introductory statement in this report. I will limit my report today to the period after World War II because we are primarily interested in the things which happened then.

To the social scientist who seeks to explain the process of economic and agricultural development, Taiwan is a paradox. Against its limited resource endowment and high population pressure, Taiwan appears as a focal point of adversity - a place where one would least expect to find sustained economic development. But Taiwan has progressed. Over a period of 50 years, its economy has emerged from a relatively backward state - characteristic of Asia - to achieve a highly productive agriculture and rapidly expanding industrial capacity.

The study under discussion was initiated in the belief that an understanding of agricultural development in Taiwan holds important lessons that can be applied to the problems of modernizing agriculture in other underdeveloped regions of the world. In the part of the study I comment on, emphasis is placed on the organizational and institutional conditions followed for implementing and increasing motivation for progress.

The dominant feature of the physical environment for agricultural output in Taiwan is that the total land area available for cultivation has been relatively fixed. Therefore, it was necessary to resort to land-substitution methods to increase agricultural output. This was successfully accomplished as the result of increasing capital inputs and intensifying the use of land and labor. These changes did not just happen; they were the result of research and technological innovation.

Likewise, the adoption of improved practices did not just occur. They came about as the result of a deliberate strategy: First, improved practices had to be identified or developed, and secondly, farmers had to be willing to adopt improved practices. Action taken to achieve these ends can be summarized in the following manner: First, the best available technology was systematically sought out, demonstrated and put into use through persuasion and subsidy. Secondly, external or foreign technology was examined for those materials, breeds, implements, pesticides and practices which could be directly applied. Third, and simultaneously, other basic and adaptive research facilities were started and maintained to supply new technology on a continuing long-term basis.

The acceleration of basic and adaptive research was achieved by the introduction of a substantial number of agriculturists trained outside the

country.

The development of technology was conducted, supervised, and coordinated by the Government.

Technology was extensively demonstrated to a population responsive to money incentives.

Increased productivity involves changes in physiological input-output relations, changes in the level or combination of inputs, or improvements in the environment of the production process, all of which have been well described by Dr. Hsieh. However, to exploit all possible technical innovations, farmers had to be encouraged to do things differently than before. The adoption of new practices resulted from a shift in the value placed on traditional alternatives, and the acquisition of knowledge of other more technically advanced alternatives.

Motivation for the Taiwan farmer to produce came from the imperative to contribute to the needs of the household unit and the obligation of the head of the household to preserve and pass on to male heirs an increased accumulation of assets. Therefore, acknowledgement on the part of policy makers of societal beliefs and imperatives and recognition of their contribution toward an industrious rural population responsive to money incentives, created a favorable climate for the service organizations that were created to effectively introduce and adopt the improved practices.

Relation of Needs to Development Activity

The above few brief statements indicate the role of improved practices and technology-output increased as the kind and amount of inputs used changed. There is also evidence however of casualty in the fact that output increases followed statements of intent by the government to increase output. Therefore, the question of why output and productivity increased can be answered by the statement that the physiological requirements for increased output were recognized and understood by Government planners who intended that output should in fact increase.

Incentive Forces

Three sets of factors were operative in influencing farmers to adopt improved practices to meet the goals of increased output and productivity. The first was market demand, which acted as an incentive force in shifting farmer-values and, thus, farmer-action choices toward adopting those practices which resulted in increased agricultural output and production. Secondly,

the allocation of inputs to major crops was directly controlled by the Government. For example, supplies of essential inputs, such as water and fertilizer, were controlled by the Government and allotted to specific crops, such as rice and sugar, to encourage their increased output. The third factor was the use of subsidies, selective credit and tax programs. These, however, acted primarily through the market place in that the Government used the various tax, barter, and subsidy devices to manipulate and set prices. Since there was an effective land tax, even subsistence farmers had to sell some of their output in order to pay the tax.

While indirect control of major crops was also achieved by creating public or government-owned processing corporations, strategically placed allocations and non-market pressures were the prime mechanisms of control. This control was exercised in two ways: (1) The Government assumed control of all fertilizer supplies, and (2) fertilizer supplies were bartered for rice and thus the government gained control over the rice supplies.

The above programs, operating as economic incentives, encouraged farmers to adopt new technology and increase capital investments. An additional incentive to increase output resulted from farmer-tiller income increases associated with changes in the income distribution pattern which resulted from the land reform program.

Structural Changes

The facility with which the Government formed organizations to meet agricultural needs and carry out commitments to reach goals and expectations was an important factor in the development of Taiwan's agriculture. These organizations included farmers' associations, irrigation associations, crop associations for crops such as tobacco, sugarcane as well as for fishermen, and various forms of cooperation. It is probably safe to say that each individual involved in agricultural production belonged to at least one or more of these organizations. I shall not comment on these, but refer you to Dr. Hsieh's report. One question unanswered is why and how the government acquired the ability to form effective organizations.

One of the important structural changes had to do with the credit system. Traditionally, agricultural production credit was associated with the purchaser of the product, which led to restriction of producers' choice of whom to sell to. Before the farmers' associations were reorganized it was not uncommon for the landlord, money lender, and the purchaser to be the same

person. Buyers of farm products often advanced funds to producers in order to secure the product at harvest time. This practice was changed when effective credit organizations were placed under the farmer's control. In this situation, farmers could use their contract with processing factories to get production credit and thus draw on the financial resources of the community as well as the Central Bank for cooperatives. This system was strengthened by the initiation of the unified credit program by the Credit Division of JCRR. These changes and the institution of new credit agencies were not designed to do away with traditional money-lenders, but rather were used to encourage traditional money-lenders to change their practices through competition with the new credit agencies.

Another important structural change involved the settlement of land disputes. Prior to the 1952-56 period, committees set up to deal with land disputes were controlled by landlords. In 1952, a farm tenancy committee was created in each county, city, village, and township, which consisted of representatives elected by and from tenant farmers, owner-farmers, and landlords. With the creation of these committees, the landlords for the first time were not in the majority position in settling disputes.

The change in the judicial procedure operated through the Land Bureau's influence upon rental rates rather than through rearrangement of land tenancy. Expectation of an increased share of output, in turn, increased the amounts of labor and working capital that tenants were willing to apply to land.

The reorganization of farmers' associations had an additional impact on allocation in that through the association the owner-tiller was placed directly in policy-making position.

Another important change in the structure of agriculture during the 1952-54 period was the formation of an economic planning unit for agriculture within the framework of the National Government. This group brought together representatives from several agencies: people from top policy-making groups, heads of agencies instrumental in carrying out national plans, and those from the reporting units that gathered statistics on the performance of agriculture.

By reorganizing farmers' associations into a farmer-controlled link between the top planning groups and the farmer, it was possible to resolve many incompatibilities that developed among projects and to assess the realism of

targets set in the plans. The success of this system is attested to by the closeness with which actual production approached planned goals. For the period 1953-56 actual production for all of agriculture came within about one percent of the planned goal. Crop production failed meeting the goal by only about 2 percent while livestock and fishery production exceeded the goal. However, forest output missed the goal by 15 percent. By 1957-60 all agricultural production exceeded the planned goal by one percent, but forest output still failed to reach the goal by 11 percent.

One conclusion that can be drawn from the experience of the interrelated service systems in Taiwan's economic development is that an economy can function more effectively when the people affected combine in organizations to meet a common goal. This means that some person or subgroup must be able to recognize the scope of the needs and persuade others to join in the effort to meet them. Otherwise, it is necessary for some group or individual apart from those affected to identify these needs and to establish the required service systems of people and supporting facilities. The Taiwan experience illustrates both methods: where the people involved recognized their own needs and took corresponding action and where needs were recognized by someone outside the affected group. However, the organizations created by the government were the primary instruments of growth. Therefore, one of the principal observations to be derived from the experience with formation of organizations in Taiwan is that the political, social, and economic role of the farmer was not left to accidental arrangement. Organization was pervasive and was designed to align farmers' actions to national policy. Furthermore, where problems of organization or lack of technical skills became barriers to increased agricultural output, other organizations such as training classes for land tenure committees were formed to cope with the problem.

One of the notable features of the Taiwan experience was the ability to establish organizations rapidly and in such a manner that they were able to complete the tasks that were started.

Communications

If a government is to promote a successful program to increase agricultural production, there must be a line of communication from the government to the tiller with a bias-free channel back to the government so that the effect of its policies can be accurately evaluated. One effect of JCRR was to establish two-way extra-governmental communication lines which could inject new technology, determine needs at the local level, and channel funds to

strategic areas in development projects. JCRR acted as a catalyst with respect to the system of information and control in Taiwan. It participated in and supported reorganization and expansion of the structure of Taiwan's agriculture without becoming an integral part of government. By maintaining a policy of constant withdrawal from competition with new or existing governmental units, it remained beyond the reach of political manipulation.

Following World War II, an effective communication system between farmers and the government was provided through the Provincial Food Bureau when this agency set up the information system to control rice production and fertilizer distribution.

Allocative System

The market system and farmers' associations became flexible instruments to transmit demands to farmers and in this way assist them in efficiently allocating resources. The heart of the system was forward pricing determined by planners who had become skilled at estimating supply responses and whose estimates were linked to government policy with respect to foreign exchange needs and inflation control. The general policy was to maintain the greatest control over rice and sugar. Control of rice was achieved by linking to fertilizer supplies; through a barter program, control of sugar was through government ownership of manufacturing facilities. With crop plans established, orderly marketing procedures were then established for principal effort crops, The remaining domestic demand was left to market mechanisms, which were largely organized into a system of cooperative marketing.

Land Reform

The concept of land reform used in this study is that producers must somehow acquire the right to use land along with the right to the output from the land. These rights are the substance of what is meant by land tenure in this report. Land tenure, therefore, has to do with the stabilization of expectations, which in turn, are what motivate people to produce.

The land tenure reform after World War II was a move to stabilize and improve an increasingly difficult situation. Landlords were demanding fixed rents averaging 50 percent of the main crop in kind and rent payments in advance. Leases were short, and disputes arose, but the landlord as money-lender, buyer and community leader was generally in control of the situation.

The first step in the land reform program, was rent reduction and elimination of the worst abuses. These steps helped to reduce land values

while raising tenant income, which in turn encouraged and resulted in the voluntary sale of land to tenants by absentee landlords. The next step was the sale to tenants of public lands formerly held by the Japanese. These sales not only yielded revenues for subsequent reform activity, but demonstrated to the landlord and tenant the mechanism of transfer to be used in the Land-to-the-Tiller Program.

The Land-to-the-Tiller Program started with completing and updating a cadastral survey, land classification, and land registration. The next step restricted land-holdings to 3 hectares of paddy land or 6 of dry land.

The post World War II land reform was carried out to stabilize the rural power structure and to place it in the hands of a new group and to establish tillers as owners.

The land reform program in Taiwan had an immense impact not only because it changed basic property rights in a rural society, but also because a great number of people were directly involved in its implementation. By 1952, over 300,000 farm families had signed farm-lease contracts. A total of almost 600,000 qualified voters elected over 20,000 representatives in hamlet and village elections to establish farm-tenancy committees.

The relationship between land tenure reform and agricultural output in Taiwan was affected by the redistribution of income in favor of tillers which functioned as an incentive for tillers to increase output.

The postwar land reform was tightly linked to the reorganization of the farmers' associations. The Land-to-the-Tiller Program eliminated the absentee landlord as an intermediary in the rural communication process and placed the new literate tiller in direct contact with research facilities, government policy, and credit sources as a member of the farmer-controlled farmers' association. With marketing services both supplied and coordinated by the farmers' associations the tiller was placed in direct contact with the information necessary for him to increase output and with the materials and credit required along with a stable system of insurance and sales contracts. His change in status to that of owner and the accompanying redistribution of farm income in favor of the tiller supplied the motivation for him to produce more and to invest for future production.

Land reform, however, can also be disruptive. It is suggested therefore, that if the benefits of land reform are to be maximum, the reform program should proceed along predictable, well-publicized, and well-understood lines

to redefine the property rights of individuals. The major steps in the land reform program in Taiwan after World War II were completed over a 5-year period and were accompanied by an intensive publicity program during which each new move was explained and demonstrated. Firm control by a centralized government existed and was a necessary factor to carry out all parts of the program.

It should be pointed out that in Taiwan, land reform did not involve relocation of the tiller or substantial retraining to transform tillers into competent farm operators. When relocation of tillers is involved, even greater attention must be given to the types and routes of information and control that are needed.

This study of agricultural development in Taiwan has emphasized the roles and actions of people in planning and bringing about changes - - - physical and organizational - - - required for an increase in production and sustained growth of an agricultural economy.

In Taiwan, the major objectives of individual farmers were to provide basic necessities and to accumulate wealth. These values and objectives were encouraged to provide incentives for the individual farmer to make changes and to be receptive to the new technology necessary to implement changes.

The Government played a major role in Taiwan's agricultural growth by forming organizations, stabilizing rights through land reform, and seeking new technology to increase agricultural output. Methods of Government guidance and control of agriculture included the allocation of key inputs of fertilizer and water among major crops to secure the production of crops assigned highest priority, and the use of marketing mechanisms to influence farmer production by manipulation of prices through taxes, bartering and subsidies. Within this system of Government guidance and control, however, a high degree of decision-making was retained by the individual farmer. Government policies and programs were largely intended to align private with public objectives.

The changes made in Taiwan agriculture stimulated new sets of needs which, in turn, created new market demands to stimulate increased production. Domestic markets expanded both in terms of income and population; export markets were sought and action was taken to supply those markets. The requirements to meet old needs precipitated new needs, and the established

machinery for change was able to meet new needs and to sustain continued agricultural growth.

2. Sub-group Discussions:

Report from Sub-group A:

Consolidated Demonstration Program……Package deal:

On Taiwan, a program is usually tied up in one area. For example, application of fertilizer would be demonstrated in one area, and the introduction of best seeds in another, and still in another area pesticides would be demonstrated. This requires intensive work and heavy investment. But as a result of this type of demonstration, crop yields could increase up to 15-30%. In the first year of a program, about 15 spots or tracts of land are selected. Years later, another 15 are added for demonstration. It is true that as a result outputs are raised. While some farmers are considering adoption of more intensive work and more heavy investments that are needed, others are still in doubt as to the economic justification of such increased inputs. The economic returns have yet to be ascertained and only when the returns are clearly shown do most farmers take action. So far the program has not been underway long enough to make such ascertainment possible.

Subsidies: Some feel that if the prices are good to make a profit and the credit services are satisfactory, there will be no need for subsidies. And others feel that subsidies are necessary because it is hard to convince the farmers to make changes and to innovate. To get quick results, they think, subsidies are the answer.

Small farms: With the decreased sizes of farms, how can the farmers support themselves? Can they derive sufficient income from such small-size farms for survival or to keep on going? The answer to this question is: Even though the farm size may be small, the farmers are highly enterprising. They raise hogs and poultry. They plant mushrooms. And they make very intensive utilization of whatever land is available. And also they engage in sidelines, thereby increasing their non-farm income. Many of these high income enterprises do not demand much land, so that in spite of the size of the land, farmers can still support themselves.

Fragmentation of land: On Taiwan this caused much concern, but so far no legal measure has been taken. Lands of irregular shape are being rearranged for more efficient farming.

Report from Sub-group B:

Farmers' Share in Agricultural Development:

Do farmers receive their proper shares in the rapid rate of development in Taiwan? The visible uplifting of the living standards of the farmers and the improvement of their purchasing power of manufactured goods are proofs. Bicycles, radio sets, sewing machines, etc., have been widely used during the past decade. Bank deposits of farmers have shown a sharp rise. Evidence also has been found in the enrolment in the universities of the farmers' children as well as improvement in nutrition - better food in increasing quantity. The land reform has reduced the land rents, and productive incomes have been kept within farm families instead of going to the landowners.

Income of Per Capita Production: Could the income of per capita production reflect the income situation of the farmers? It would be difficult to visualize the real income situation of farmers by simply looking into the production figures. The problem is mainly due to the rapid price increase after the war. This makes it difficult to compare any data which deal in value terms.

Farm Pattern: A considerable number of farmers here own more than 10 and even up to 20 hectares of farm. Does this conform to the idea of the land reform that limits the ownership to three to six hectares? The explanation: the data may not be complete and therefore cannot show the change in the pattern. Besides, in mountain or less fertile areas, land supply could be larger. Also when prices go high and when farmers get good profit, they may want to buy new land and thus the old farm pattern may be changed. Under Taiwan's land reform program, the land acquired by the farmers was only land leased by landlords to tenants. If the landlords wished to operate their own farms, they would not be required to part with them.

Price Stability: How price stability is maintained in Taiwan? Stabilizers include the rice-fertilizer barter-system, land tax in kind, and compulsory purchase of rice by the government always at a price 20% lower than the free market price to accumulate a considerable quantity of rice. The government is able to resell the rice when the price is too high; it may withhold supply when the price goes down.

Rice Storage: The farmers' associations in Taiwan actually own the storage facilities which enable the Food Bureau to handle large quantities of rice. The Food Bureau operating on a business basis and is making money. Its function and financial position differ from those of similar organizations in other countries.

Pineapple Purchasing System: A conference is held once a year by owners of canneries and farmers in Taiwan to set the minimum purchasing price of pineapples. The farmers' associations buy the pineapples from farmers and distribute them to the canning factories. In case any dispute about the price arises, the associations will be able to solve the problem one way or another. This rate, however, does not apply to the fresh pineapple market.

Investment in Agriculture with Foreign Aid: Almost all of the JCRR expenditure has been financed by U.S. Aid.

Memberships of the Farmers' Associations: Some 90% of the farmers in Taiwan are members because the organization introduces new techniques and particularly offers them extension services. Fertilizer supply is not the incentive because FA membership is not a prerequisite to receiving the required amount of fertilizer.

Report from Sub-group C:

Decline in Capital Productivity: One of the compensating factors is the declining interest rate during the last 10 years. The interest rate of loans through the farmers' associations has fallen from 30% per annum of 12 years ago to about 15% now. The accessibility of the farmers to this institutional credit at such a favorable interest rate is responsible for roughly 80% of the volume of agricultural loans at the present time. The extent of private non-institutional high-interest credit has declined very rapidly, and it is not regarded as of great significance in the agricultural economy in Taiwan today.

Government Price Support: For sugar, its price is established in May each year. The planting season is from January to March. If there is a declining world price, the government may sustain some loss. If the world price goes up, the farmers sell sugar at a higher price. For rice, the government establishes a minimum price at the time of harvest, which, though not necessarily in accord with the market demand, has greatly helped stabilize the rice price. But in off season, there is a greater problem. When the price rises, it is often necessary for the government to dump rice on the market. This can be easily done as the government has large quantities of rice on hand kept for ready use in the storage facilities of the farmers' associations.

Land Reform: This is a prominent example of how farmers have been

brought in to share in decision-making in Taiwan, but it may not be realistic in other places. Particularly, there is the question whether the legislators among whom are a large number of landowners will be willing to adopt an effective land reform law in their countries.

Both India and the Philippines have good land reform laws. But there is not much use in having laws on paper unless they can be implemented. It is also relevant to determine whether a particular measure is appropriate in the particular stage of agricultural development of a country. The land reform in Taiwan was appropriate when implemented. Taiwan was ready for it because of the already well-developed infrastructure.

The rapid agricultural development in Taiwan from 1920 to 1940 indicated that land reform was not a prerequisite to productivity. Before the land reform, farmers in Taiwan already had the management skill, and landlords were just collecting land rent. Tenant farmers made their own decisions as to what crops to plant, how to use the inputs and how to carry out marketing and farm operations.

This means that tenant farmers in Taiwan differed from those of other countries where landlords made decisions on the use of fertilizers and seeds as well as on the crop pattern, while tenants just provide labor. In that case, the government might be in a very difficult position after land reform without efficient extension workers.

In Taiwan, tenants paid 50% of the yield as rental, which was reduced to 37.5% after the land reform. Many tenants have gradually become owners. The government needs only to strengthen the institutional credit. In fact, the institutional credit has increased tremendously through FAs and banks. The intensive extension educational program also has become more and more important.

Family Obligations in the Philippines: In a Philippine family, a member who is financially successful is socially obligated to share his assets and earnings with the less fortunate, perhaps less capable, members. Does this impair his incentive? Does this pull him down to the average? It seems it will make him work harder to uplift the living standard of the less fortunate family members. Perhaps the family tie is so strong in the Philippines and other Asian countries, that it helps capital development in the urban area where it is necessary to finance large enterprises to mobilize capital and management beyond the family.

Is this close family tie also a base for agricultural development? Take the Chinese family life and Chinese village ties for examples. The strong sense of community in rural China provides a base for agricultural development. However, in other countries there is considerable labor mobility and the village ties are not so strong as those in China.

So what is possible to build in China may not be possible to build in the villages of other countries. The sense of community development used to erroneously lead to the thinking, that people who live geographically together have the ties and the responsibility to build one program. The more homogeneous the rural area is, the easier it is to build a successful agricultural program.

Conclusions:

Common factors found during the Japanese occupation and at the present time have transcended the political differences and have made development so successful in Taiwan.

The per capita production in 1962 and that in 1963 were not very much higher than those in 1931-35 and 1936-40. The 1936-40 period during the Japanese occupation was practically the best production period in agriculture. At that time the population in Taiwan was only five million. It reached the 12 million mark in 1963, which means an increase more than double. So if the population had remained the same, the per capita production in that period would have been doubled. Up to 1962 and 1963, the per capita production of labor, in terms of constant dollar value, returned to that of the most prosperous time during the Japanese occupation.

Labor productivity is equal to land productivity times cultivated land area per capita. Land productivity in 1960 increased about 44% compared with the best period during the Japanese occupation. But the cultivated land per worker was less. The higher the land productivity is, the lower the land-labor ratio will be. Labor productivity only increased by 14% that year. This explains that the production of labor in the primary industry actually maintained about the same level as that in the most prosperous period, 1936-40.

3. Response Summary Remarks by Mr. Wade F. Gregory.

In the discussion of why and how Taiwan agricultural development occurred, several points emerged. The physical requirements, that is, changes in the kind and amount of inputs, needed for increased output and productivity

were recognized and understood by program and policy makers. This information in turn was effectively disseminated to and understood by farmer-tillers.

The accumulation and availability of this knowledge did not just occur haphazardly; rather, it was the result of a deliberate strategy. First, the best available technology presently known in Taiwan was systematically sought out, demonstrated and put into use. Secondly, external or foreign technology was examined to determine how it could be directly applied to breeds, implements, pesticides, and practices. Thirdly, and simultaneously with the above two actions, basic and adaptive research facilities were used and maintained to supply new technology on a continuing long-term basis.

Various factors were operative in influencing farmers to adopt improved practices. Some of these were: the mechanism of market demand which provided money incentives for farmers to adopt those practices that would result in increased output and productivity; the allocation of some inputs to major crops which allocation was controlled by the government for example, the fertilizer-rice barter system; the use of subsidies and a selective credit and tax program; and the creation of public or government processing corporations. An additional incentive to increase output resulted in the implementation of the land reform program, which had assured farmers of a larger share of any increased output.

The facility with which the government formed organizations to meet agricultural needs and carry out commitments to reach goals and fulfill expectations was an important factor in the development of Taiwan agriculture. There were many kinds of organizations and, in all probability, each person involved in agricultural production belonged to at least one or more of these organizations. One of the important aspects of the reorganized farmers' associations was to put owner-tillers directly in policy-making positions and provide the farmer with a link between him and top planning groups. In this way, it was possible to resolve many incompatibilities that had developed among projects and also made it possible to assess the realism of targets set in the plan.

One of the conclusions that can be drawn from the Taiwan case is that an economy can function more effectively when the people affected are combined in organization to attain a common goal. This means that some person or sub-group must be able to recognize needs and persuade others to join in the effort to meet them. Otherwise, it is necessary for some groups or individuals apart from those affected to identify these needs. In the

Taiwan case, both methods were followed: in some cases the people involved recognized their own needs and took corresponding action; and in other cases, needs were recognized by someone outside the affected group. One of the principal observations to be derived from the experience with formation of organizations in Taiwan is that the political, social, and economic role of the farmer was not left to accidental arrangement. Organization was pervasive and designed to align farmers' actions to national policy.

4. Summary of Follow-up Questions and Responses

Irrigation: Water is a major input in Taiwan's agricultural production. Actually it is not controlled by the government. It is very difficult to control water management. But how does Taiwan proceed on water management and water distribution? In the government, the Taiwan Provincial Water Conservancy Bureau (PWCB) is in charge of planning, investigating and designing of water development projects.

When there is a water project, the Bureau cannot just start the construction without the concurrence of the district irrigation association organized by farmers. The association has to sign an agreement for the construction of a specific irrigation project in the area. After the irrigation association members concur in the project, PWCB and its district construction offices scattered all over the island may start the construction. Fifty percent of the cost is paid by the government as subsidy, whereas the other 50 percent will be loans from JCRR or banking organizations.

After completion, it will be turned over to the district irrigation association for water management and distribution. The irrigation association will collect a special water fee from members to repay the 50 percent construction loan in five, seven or ten years. Besides the special fee for repayment of the loan, members of the irrigation association are to pay an ordinary water fee for the annual repair and maintenance and administrative expenses. The payment of ordinary water fee will continue for a rather long period. The district irrigation association, which is organized by farmers or water users, will take care of how, when, and how much of the water is distributed, under the technical supervision of PWCB.

There are also small irrigation units organized by villagers, who elect their chiefs. An irrigation association consists of three departments: finance, technique and construction. So, the water management and distribution are controlled by the farmers as a group, not by individuals or the government.

Land Tax: Land in Taiwan is classified into paddy land and dry land. There are 26 grades of land. For the paddy land, the tax is paid in rice. For dry land, farmers are required to pay as land tax sweet potatoes. But as it is too cumbersome to handle potatoes as a form of tax payment, the farmers actually pay in cash. The 26 grades of land pay different grades of tax. Rice farmers always grow rice for family consumption, for land tax payment and for bartering for fertilizer.

Pricing of Fertilizer: The pricing of chemical fertilizers worked out by the Food Bureau under the Taiwan Provincial Government (TPG), is based on the cost price of local fertilizers, that of imported fertilizers and handling charges. The cost price of imported chemical fertilizers is taken into consideration because it sometimes may be lower than that of local fertilizers, which being produced on a smaller scale are therefore less economical. Locally produced fertilizer also is more costly because it must pay interest charges and bear, through the rice-fertilizer barter system, part of the burden for military rice. The Food Bureau figures out the prices of various fertilizers and submits them to TPG for concurrence. TPG will consult with the Central Government agencies concerned to decide what price will be set for a certain fertilizer. Finally, the price scheme will be transmitted to the Provincial Assembly for approval.

Rice-fertilizer Barter System: This system was established in 1948. Its major functions are: (1) collecting an adequate amount of rice, (2) providing rice farmers with right kind of fertilizer, (3) controlling the rice price.

The barter ratio between fertilizer and rice is worked out by the Food Bureau according to the regular prices of paddy rice and fertilizer. For instance, at present the barter ratio between ammonium sulfate and paddy rice is 100:86. That means farmers may deliver 86 kgs. of Ponlai to the Food Bureau for 100 kgs. of ammonium sulfate.

When a farmer gets fertilizers from the Food Bureau, he has to pay 40% of the required amount as soon as the barter is made. The remaining 60%, which is repaid in kind after the harvest, is really a kind of rural credit extended to the farmer at a 3% interest for the whole season. He gets ammonium sulfate in February and makes the 60% repayment in July, August or September. This barter system enables the food authorities to collect about two thirds of the amount of rice required about 330,000 m/t. under the rice collection program.

Agricultural Pricing System: The provision of price incentives in Taiwan is designed to support and facilitate the implementation of agricultural programs in overall economic development. The general objectives of price policy include:

(1) Benefiting both producers and consumers;
(2) Achieving better use of agricultural resources; and
(3) Stabilizing the economy to a reasonable degree.

Incentives are necessary for increase of agricultural productivity. The best incentive to farmers is the realization of a rise in their farm income as a result of higher productivity. In highly industrialized countries, the government has actually established high supporting prices for farm products and shifted the burden of high prices to industry and other sectors of the economy. Taiwan, at this stage, has not yet been able to do so. The farm products in Taiwan cannot be sold at prices higher than free market prices. Hence the domestic market must be closely linked with the foreign market to permit adjustment in the internal market for both exports and imports. The linking of domestic processing of agricultural products with foreign market prices will effect or induce a more efficient use of agricultural resources.

Land in Taiwan is limited and how to use its land effectively depends on how the land can produce more effectively and get higher returns.

Farmers in Taiwan, with the help of marketing information, make changes in production to insure good markets abroad and to bring in higher returns. This way of producing is labor intensive and well adapted to climatic and soil conditions. However, no agricultural product entirely depends on foreign trade and the influence of the world price. For instance, rice is self-sufficient in Taiwan. There is no supporting price for it. The government is trying to hold down its level to about that of the international price. The government tries to stabilize the rice price throughout the year and rice imports and exports have enabled the food authorities to exercise effective supervision over the market so that there may always be plentiful supply of rice both before and after the harvest.

For cash crops, the marketing system may be illustrated by banana export. Prior to April 1963, farmers could get less than half from the export sales, and therefore were not very much interested in growing the crop. This situation had seriously impeded both production and export. After a

better marketing system was established that year to boost the banana growers' share to 70% of the consumer's dollar, the banana export increased four times in the same year and 1964. This year, it has gone up five to six times. In the years to come, further increases are expected. Banana export alone will earn more than $60 million.

For other cash crops, price incentives are also provided by the government to farmers through a similar institutional improvement. Farmers are provided with marketing information, technical know-how, and extension service. For example, the Taiwan Sugar Corporation pays the supporting price for sugar through their own profit. TSC has set up a stabilization fund whereby the profit earned in the good years when the world sugar price is high are used to offset any loss that may be sustained by the farmers in poorer years when the world sugar price is low. In this way sugar production is steadily maintained without being subject to price fluctuations on the world market.

Generally, the commodities included in the pricing system in Taiwan can be classified into three categories: (1) sugar; (2) tobacco; and (3) jute, pineapples and mushrooms.

For sugarcane the competitive price is offered, which guarantees farmers a better income than they can get by growing any other crops on their lands. For tobacco, the price is based upon the production cost. The Tobacco and Wine Monopoly Bureau keeps a close watch over the production costs of all tropical crops. As the tobacco acreage is controlled, the farmers usually like to grow more although it is hard to obtain a license. The Bureau has tried to set up a price without too much incentive. However, there are still high returns. Besides, tobacco is grown in winter time when farmers have surplus labor for production. In general, this price is a forward one based on the cost factor. The forward price of jute is set by a comparison between the prices of the imported and locally produced jute. The Taiwan Sugar Corporation and the Food Bureau which use jute bags for packing rice and sugar and are the end users of jute, have a big voice in setting its price. They argue that they suffer from high prices because of too much incentive given to the farmers.

The forward prices of these crops are set by various agencies concerned and finally approved by the government. Other forward prices are mostly related to exportable processed products such as pineapples, mushrooms, and asparagus, the prices of which the government does not dominate. They are the results of negotiations between processors and growers with the government

acting as a mediator. When farmers request a certain price for pineapples which the packers do not want to pay, or when the packers in the main harvesting season pay the price based on the forward price, the government comes in to mediate between them by setting a price to be accepted by both parties. In other words, the pineapple price, which is protected by the government, is a result of negotiations between growers and packers.

For mushrooms, the price is also set by negotiations between growers and packers. A uniform price is set for the whole production season, which is very short.

The asparagus price is negotiated between producers and processors. The government, too, only plays the role of a mediator.

Rice is the most important crop in Taiwan. Its value is about 37 percent of the total agricultural production. At present, there is no price support for it. In order to stabilize the rice price, the food authorities take the following measures:

(1) Preventing pre-harvest increase and post-harvest drop;

(2) Collecting rice through barter, tax, compulsory purchase and other minor measures to maintain an adequate buffer stock for market stabilization;

(3) Distributing rice to and disposing of rice by certain groups of consumers; and

(4) Monopolizing rice export and import.

The Food Bureau takes such marketing stabilization measures as the following:

(1) Removing the excessive supply of rice from the local market, particularly in the immediate months after harvest. To do this, the Food Bureau uses rice collection measures to remove the excessive rice. At present, it keeps 550,000 tons of rice annually in order to avoid an oversupply in the free market after harvest.

(2) Trying to purchase rice directly from the market at a certain level of price when there is an unusual booming harvest and the price is low. However, the Bureau has not done this in the past two years.

These two measures are taken to protect producers.

The measures the Food Bureau takes to protect consumers are:

(1) Distributing rice rations directly to certain sections of the population,

including the armed forces, government employees and their immediate dependents, etc.

(2) Dumping rice on the market for rice traders to resell it to consumers when there are excessive price fluctuations in the market. In doing this, the price at which the Food Bureau sells is about 5 to 10% below the market price.

(3) Monopolizing the import and export of rice. If there is an excessive rice supply in the market, it can be exported to Japan and other countries. Last year, 260,000 tons of polished rice was exported to Japan. When a crop failure happened in 1959, Taiwan imported 100,000 m/t from Thailand to provide the local market with an adequate rice supply.

Taking 1956 as a base year to compare the rice price with those of the other commodities, it is 5% to 9% above the general price index excluding those of consumer's goods such as textile and many other necessities. The rice price is still high because of the recent rapid industrialization.

Government Leadership: As Government leadership is a key factor in the development of a country, the Chinese Government has assumed its share of the responsibility for encouraging private initiative. With governmental blessing and guidance, private industries in Taiwan have played a fairly important role in its economic development. In the early 1950's, the percentage of production by private industries was very low. But now, after a dozen years of development, they have taken on more importance. Their share of production growth has been more than that of any other sector.

Private Sector: Government guidance has been given through four four-year plans beginning 1952. In the development of these plans, the Provincial Farmers' Association, the Irrigation Association and some other farmers' organizations have participated very actively from the beginning in formulating goals and projections.

What role does the private sector play? Rice import and export is under the administration of the Food Bureau; sugar, in the hands of the Sugar Corporation; and fertilizer import and distribution, a strictly government concern. But the export of bananas, pineapples, tea, citrus, mushrooms, etc. is purely the private sector's business. Practically all agricultural and food processing industries are handled by the private sector, with the exception of sugar. As to import, allocation, distribution and sales of agricultural chemicals, they are also handled by the private sector.

Freedom in Planting: Except tobacco, to plant which farmers have to obtain permission from the Tobacco and Wine Monopoly Bureau, which collects the crop at a fixed price, all other crops can be grown in any amounts and sold domestically through marketing associations. The government gives guidance in planning for irrigation development, import of fertilizers and improvement of social infrastructure. All marketing facilities are handled by farmers' associations and marketing cooperatives. The private sector still plays an important role in agricultural development.

Human Factor: Indications are in abundance of good performance with intelligence, skills and diligence on the part of Taiwan farmers with a spirit of self-help. All these human qualities have been developed through the economic or social infrastructure. Taiwan enjoys the advantage of having laid this foundation of the agricultural sector at a much earlier stage than other developing countries of this region. These qualities deserve close attention, especially in view of the fact that much has been written about the characteristics of the tropical people, describing them as lazy and indolent and unwilling to make too much exertion due to the climatic condition and an easy way of life. Now the evidence shows that agricultural growth can be accelerated with the human factor as an important driving force and that people can be motivated to make greater efforts to accumulate wealth besides merely satisfying their animal wants.

This is, indeed, one of the cultural traits of the Chinese family system, under which the wealth accumulated by one generation is passed on to another. But how can such a trait be developed? Regardless of where people live or in what cultural situation they find themselves, most of them, if given the opportunity, would prefer to have a better life, to have their children better educated and more material possessions, if they knew how to get them. It is a matter of hopes and expections. Let people know they can expect to have more material rewards, higher education, and leisure and recreation, if they will only work a little harder or rearrange their organizational procedures. In other words, by accepting improved practices, they know for sure they can benefit by it. Then they will begin to look to the future and want to do things differently and have a different way of life. They will accumulate wealth and save, from which capital investment comes. Induce people and lead them to expect that they can share in the increased output. If this expection is aroused, people will want to accumulate wealth which will enable them to enjoy more material comforts and have a better life in all other respects.

Topic D: Rural Improvement and Political Development:

The JCRR Model.

Introductory Remarks by the Session Chairman

The Chairman announced that after a successful and enjoyable 4-day field trip, the seminar was in session again. During the trip, they visited irrigation associations, reservoirs, township offices, agricultural improvement stations, rural health stations, provincial, county and township farmers' associations, and the Provincial Government. They were all impressed with what they had seen. On behalf of the delegates, the Chairman thanked all those who have arranged such a successful program, making it possible for them to see the efficient establishment of the government agricultural plans, policies, technical know-how which are transmitted to farmers to the grass-roots level. They also understand that Taiwan farmers through their own associations can express their views to the Government in response to government plans and policies or take part in mapping out programs. This shows that the Government meets the true and felt needs of the people.

The Chairman announced that it was a great honor to have Dr. Y. S. Tsiang, Commissioner of JCRR, to lead the discussion on "Rural Improvement and Political Development: The JCRR Model." He told the delegates that Commissioner Tsiang received his Ph. D. degree from the University of Minnesota, was selected as an Eisenhower Fellow in 1962, and is now serving as Deputy Convener of the Production Committee of CIECD and Convener of the Banana Production and Marketing Committee of the Foreign Exchange and Trade Commission. The Chairman felt confident that Dr. Tsiang will enlighten us on the JCRR and its role in the development of the rural and political fields.

1. Paper Presentation - Dr. Y.S. Tsiang

Dr. Tsiang expressed his pleasure at being asked to serve as the discussion leader for this session on "Rural Improvement and Political Development: The JCRR Model."

Dr. Tsiang stated he was using two reports as reference material for this discussion. One was the report written by Dr. John Montgomery, Professor Rufus Hughes and Mr. Raymond Davis as a result of their study of the JCRR organization and programs under an AID assignment. The survey was carried out in 1963 and the report released in 1964. The other was a report on the subject of "The Joint Commission on Rural Reconstruction"

prepared by Dr. Tsiang in 1964 for a seminar sponsored by the Massachusetts Institute of Technology.

Dr. Tsiang began his report with the historical background of JCRR. During the war years, the Chinese Communists took advantage of the poverty and poor living conditions of the Chinese peasants and started a so-called "agrarian reform" which fooled a great many of people. China was then in the midst of ideological confusion, economic chaos, political and social unrest, and suffering military reverses. It was felt by some Chinese that agriculture would be the key to the solution of social and economic problems. The Chinese Government made a proposal to the U.S. Government for technical cooperation in agriculture. As a result a mission was formally established in 1947. The Mission was composed of 23 members, 10 Americans and 13 Chinese. It made an overall survey of China including Taiwan Province. The findings of the Mission contributed to the passing of the China Aid Bill in 1948. On October 1, 1948, the Sino-American Joint Commission on Rural Reconstruction was established in Nanking. This organization was authorized to formulate and carry out a coordinated program for rural development and rural reconstruction. It was composed of five commissioners, three Chinese and two Americans, appointed by the Presidents of the two governments, respectively. Ten percent of the total U.S. economic aid to China was earmarked to JCRR for rural development.

Dr. Tsiang illustrated his talk with slides.

a. The Joint Commission formulated five objectives in its infancy with slight modifications in later years.

(1) To increase production of crops, livestock, forestry, and fisheries.

(2) To improve the living conditions of rural people.

(3) To develop the potentiality of rural people for the rehabilitation of their own communities.

(4) To support and strengthen governmental agencies and farmers' organizations in their services to agriculture.

(5) To encourage and develop rural leadership.

b. It laid down basic principles governing JCRR's projects as follows:

(1) There must be a felt need for the JCRR services and activities on the part of rural people.

(2) There must be fair distribution of accrued benefits.

(3) There must be some sponsoring agency qualified to utilize effec-

tively the JCRR assistance.

(4) There should be demonstration of feasibility of any particular project or activity, following which the project or activity should be susceptible to rapid and broad expansion.

(5) There must be frequent field inspections by JCRR experts.

c. Organization of JCRR:

The JCRR organization was designed to encourage direct contact with the rural people and it was organized according to subject matter fields. In 1949 there were only four divisions. At present there are nine divisions. The number of divisions was increased to 11 at one time. Then as the respective programs were completed, the Land Division, the Agricultural Extension Division, and the Farmers' Organization Division were abolished. Later a Farmers' Service Division was formed. In 1960 an Agricultural Credit Division was established because of the expanded unified credit program. The number of staff members as of this date is 173, of whom 94 are technical and 79 are supporting and administrative personnel. Of 94 technical personnel, 70 have been educated or trained in the United States and 10 in other countries. In other words, about 74% of its technical staff has received American education or training.

d. JCRR allocation of money for major categories from 1950-1965

For most projects, sponsoring agencies are required to contribute matching funds. During the 16 years of JCRR's operation, sponsoring agencies have contributed about 49% of the total project funds for those activities JCRR has supported. It is JCRR's policy to remit JCRR funds directly to the end-use agency by installments. An individual contract is signed for each JCRR project.

JCRR was established in 1948 at Nanking. The JCRR commissioners made extensive trips throughout the whole of China, including Taiwan, to find out the felt needs of the people. Water, fertilizers and seeds seemed to be the three most important items needed badly by farmers at the time. The Joint Commission started with a program on crop improvement and irrigation and gradually extended its activities to other fields including land reform, farmers' organizations, livestock, fisheries, rural health and agricultural credit. Unfortunately, its operations on the mainland of China lasted only for about 10 months. During that period a total of 209 projects were carried out with total expenditures amounting to US$3.5 million equivalent in local

currency. The 209 projects benefited 5 to 6 million people. The role played by the Joint Commission is and has been that of a catalytic agent providing technical and some financial assistance. JCRR has been able to stimulate improvements in agricultural policies and implementation methods to motivate difficult projects and to generate self-help among the local people. More than 96% of all JCRR-supported projects have been sponsored by officially recognized agencies and organizations, private and public.

The Joint Commission moved from Mainland China to Taiwan in Octobe 1949. Although less ravaged than the Mainland, Taiwan was also suffering from the aftermath of the war. The situation was rather complicated in the immediate postwar years. The island was drained of its trained personnel. In accordance with JCRR's primary objectives, programs for the increase of agricultural production, land reclamation, land reform and improvement and strengthening of rural health activities were carried out including the reorganization of farmers' associations to convert them into true organizations of the farmers.

In this connection, Dr Tsiang called attention to the Tsaotun FA which was visited by the Seminar members a few days ago. The Tsaotun FA was established in 1910. (Most of the FAs were established 50 years ago). During the Japanese occupation, they were controlled by the Japanese Colonial Government and made to perform the function of collecting rice and other activities for it. With the end of the Japanese rule after the war, those FAs fell into the control of certain groups for their private interests. JCRR, the Provincial Department of Agriculture and Forestry, and the Provincial Farmers' Association worked together to draw up a set of FA laws including regulations and other relevant articles for the reorganization of the associations into bona fide associations of the farmers. JCRR invited Dr. W.A. Anderson, formerly Professor of Cornell University, to spend four months in Taiwan to study the farmers' associations and advise on how to reorganize them. The FAs have since been reorganized. They have become organizations which serve the interest of farmers.

In recent years, many basic survey projects were carried out as area survey of land capability and use, marginal land survey, social and economic survey of rural Taiwan, agricultural census, etc. In the 16 years of its operation on Taiwan, JCRR has approved a total of 6,382 projects which were carried out by sponsoring agencies at various levels. In support of these projects, JCRR has spent a total of NT$4 billion.

From the year 1950 to 1965, a total of NT$4,049,995,000 and US$7,106,400 was spent. Of this amount, two-thirds of the funds were used as grants-in-aid and one-third in the form of loans. The average for each year is NT$230,000,000 and US$440,000. Since 1963 JCRR has been emphasizing loans instead of outright grants. In 1965 and 1966, fifty percent of JCRR funds were disbursed in the form of loans and the other 50% in that of grants-in-aid. In 1963, the Joint Commission reexamined its production objectives and, after identifying the key problem areas, set forth three basic production goals on which later programs have been focused.

1. To increase food production at the average rate of 4.5% per annum for the next five years in order to meet the increasing demands of the growing population.

2. To increase the export of agricultural products and processed agricultural products at the average rate of 6.5% to 7% per annum in order to maintain a favorable international trade balance.

3. To increase the supply of raw materials for industrial processing use.

These basic goals have guided all our work since 1963. Through the efforts of our farmers, government agencies, and private organizations as well as JCRR staff members, we have been able to exceed the targets set for the last two years.

e. JCRR relationship with U.S. and Chinese Government Agencies.

JCRR works in all directions which is something quite different from the normal way of operation of agencies in other U.S. Aid recipient countries. The professional staff of JCRR, commissioners and specialists, do not work exclusively with counterparts of various government agencies. JCRR commissioners and specialists work horizontally with all government agencies and vertically with various agencies such as the township offices, the FAs and farmers. JCRR is responsible to AID and is jurisdictionally under the Executive Yuan. Under CIECD, there is a Production Committee of which Dr. Tsiang is concurrently Deputy Convener for Agriculture. Mr. W.M. Ho, Chief of the JCRR Office of Planning and Programming, is concurrently Executive Secretary of the Committee.

In the Ministry of Economic Affairs, there is an Agricultural Consulting Office headed by Mr. S.M. Yeh, who is a senior economist of JCRR. Mr. Yeh has been serving as a liaison officer between the Ministry and JCRR.

f. Agricultural research and experiment organizations in Taiwan.

Realizing the importance of research especially when we have reached a new level of agricultural development, support to this activity has become one of our major interests. JCRR has been trying to help strengthen the facilities and work of various research institutions and experiment stations. There are about 1,000 research workers in these research and experiment stations.

To raise the level of the agricultural workers in government agencies in Taiwan, young technicians have been sent abroad for advanced training in various technical fields and the program is continuing.

g. JCRR's contribution in the international technical cooperation program of the government of the Republic of China.

What has been achieved in agriculture in the Republic of China is being shared with the developing countries of the world. Taiwan's multiple-cropping system will likely be the future pattern for crop production in the tropical and subtropical countries except for plantation crops such as rubber, coffee, and coconut. The special features of Taiwan's agriculture such as the small scale and extensive farming with manual labor may particularly be favored by farmers of these countries.

In 1959 the Joint Commission signed an agreement with the Vietnamese Ministry of Agriculture to send a technichnical team to Vietnam. As of this date, 72 Chinese agricultural personnel are working in Vietnam. We have just completed an agreement for renewal of the contract starting July 9, 1966, under which the total number of technical staff of the team will be increased to 80.

Besides, the Joint Commission has also helped the Chinese Government in selecting and training agricultural personnel, especially young agriculturists, and sending them to African countries.

h. Sino-African technical cooperation.

More than 300 Chinese agricultural technicians are working in 18 countries in Africa. Seven seminars have been conducted in Taiwan for a total of 308 young agriculturists from 28 African countries, some of which have no diplomatic relations with the Republic of China. They have been trained on how to grow rice and other crops, especially upland crops and vegetables. We have also been developing international agricultural cooperation programs with other Southeast Asian countries.

i. The role of JCRR after the termination of U.S. Aid.

U.S. Aid to China was discontinued as of July 1, 1965. But through an exchange of notes between the U.S. and Chinese Governments, it was agreed that JCRR would continue as in the past to serve as the institution concerned with giving direction and impetus to the development of the nation's agriculture and economy. JCRR will continue to plan and implement specific programs and projects designed to support the development of new agricultural products to stimulate increased agricultural productivity and trade and to strengthen the rural society. JCRR is to function as follows:

(1) As an advisor to CIECD in matters pertaining to rural development aspects of overall economic planning.

(2) As an agricultural development programming agency.

(3) As an agency of international agricultural technical cooperation.

(4) As an advisory body on agricultural development.

In other words, JCRR will work with government agencies by advising the Prime Minister's Office, the Ministry of Economic Affairs and other relevant government agencies on agriculture and agricultural trade policies and the solution of various problems.

JCRR is a joint organization and the advantages of jointness can be listed as follows:

(1) It can be benefited by the hybridization of ideas and the introduction of viewpoints of professionals from U.S. and aid-recipient countries. Americans and Chinese working in JCRR may have different views but, through open discussions, the differences can be ironed out and a satisfactory solution found to form an integrated decision. The late Dr. Chiang Monlin, JCRR former Chairman, once put it this way, the Chinese members could see the problems as through a microscope while the American members could see them through a telescope. Through friendly discussions in JCRR meetings, problems can be examined more thoroughly than can any one party working all by itself.

(2) There is a high degree of flexibility. The organizational structure of JCRR is flexible. The Commission has the power to approve any project and the allocation of funds within the total budget as authorized by AID in the years before July 1, 1965 by the Prime Minister since then. Within the total budget allocated to JCRR, the Commission has full authority to use and shift funds from one category in the budget to another without asking for prior approval by any other agency.

(3) JCRR is least subject to political pressure or to the pressure of vested interest groups. Americans and Chinese can see and review the problems more objectively.

(4) JCRR helps the sponsoring agencies minimize political involvement and apply their meager resources to the most useful undertakings.

(5) JCRR has direct working access to lower levels of public and private agencies by working both vertically and horizontally with all agencies concerned.

(6) JCRR has a high degree of continuity of policy and programs.

JCRR has been operating for 16 years with continuity in policy and programs regardless of changes in the American technicians and commissioners. Although American staff members have come and gone when their tours of duty ended, changes in direction have reflected primarily the changing needs of the country and not individual whims of the staff.

(7) American technicians can work more effectively through colleagues sharing their interest in program adjustment.

(8) The joint organization can offer relatively high salaries to attract highly competent personnel to its service. On the other hand, JCRR has lost about 20 highly trained technicians in the past six or seven years because many international agencies offer much higher pay. However, we have also succeeded in recruiting new technicians from abroad.

(9) The joint organization gives development administrators greater access to top government officials having more influence on decisions than is true in the "Aid" situations. Commissioners of JCRR have greater access to top government officials.

(10) The U.S. Aid could reach the roots of the local community through jointness and sponsoring agency approach.

There are four pre-conditions for this type of joint operation on the part of U.S. Aid-recipient countries:

(1) The people of the U.S. Aid-recipient country must be friendly to the United States. They should have a thorough understanding of Americans and of the American approach.

(2) There must be readiness and determination on the part of the government to develop a good program, such as land reform or other large-scale programs.

(3) There must be a suitable environment in which economic and technical decisions will not be affected by political considerations.

(4) There must be absence of direct competition with other agencies.

On the part of the U.S. Government, a long-term commitment and wholehearted support from the United States is necessary.

As to whether the JCRR type of organization and JCRR program activities and their implementation methods are transferable to other countries, Dr. Tsiang said both yes and no. No, because similar favorable conditions are lacking in other countries and package transplanting is impossible. Yes, because in certain fields the JCRR experience may be transferable to a few countries which have a common or unified purpose. At the MIT Seminar held in Massachusetts in 1964, it was agreed that a JCRR-type of organization may be set up in Thailand after a certain reservoir construction work is completed. A "TVA" type of organization is applicable, but the organization had better be a joint one rather than a government agency because it might be more effective in making use of U.S. aid in that new area. It seems difficult to have a JCRR-type of organization at the national government level in any aid-recipient country for lack of similar favorable conditions. As regards the JCRR-type of program, the following activities and ways and means of implementation are transferable with some modifications:

(1) Organization of farmers at the grass-roots level such as farmers' associations. It is believed that farmers' associations could be transplanted especially in developing countries where there is lack of good managers, as single-purpose cooperatives require a great number of managers. As the success or a failure of an organization depends largely on management personnel, it is better to have a multiple-purpose cooperative association. Farmers' organizaton at the grass-roots level can be transferred.

(2) Rice cultural methods.

(3) Multiple-cropping system for tropical or subtropical countries.

(4) Management of small farms.

Dr. Tsiang concluded by saying that he was offering these ideas as a basis for discussion and hoped those present would give their own views and comments.

As once remarked by Dr. Chiang Monlin, "It is easy to build a reputation, but hard to keep it." Now is the time for us to consider how to maintain this reputation. Dr. Tsiang invited advice and suggestions so that

we can do as a good job in the future as we have done in the past, or even a better one.

2. Summary of follow-up questions and responses.

It seems that the common problem in the developing countries is the increase of productivity. With the rapid increase of population, the problem is going to reach critical proportions. What does JCRR have by way of methodology in developing problems of agricultural productivity in any place where there is the problem of low productivity? What is the method of approach of JCRR that is transferable to another country? What is in this approach that is applicable for the U. N., the U. S., etc.? We are evolving some very basic principles through this approach to increase productivity.

As to the method of increasing agricultural productivity, we must first find out the felt needs of the people. Through three months' efforts by the JCRR commissioners in early years, we found that people needed most urgently water and fertilizer, so that the early programs of JCRR were to undertake irrigation projects in Hunan Province. One half of its expenditures on Mainland China was for irrigation and fertilizers-organic manures and chemical fertilizers. The third item was seeds. On Taiwan, we invited the late Dr. H. H. Love of Cornell University, an authority on crops to spend six months here to advise us on how to develop a rice seed multiplication system, which later laid the foundation for increased rice production on Taiwan. That system has been in use in the past 15 years. These are the basic methods we have adopted to increase agricultural productivity. In addition, the farmers' associations have been a vital channel through which the results of research and experiments are brought to the farmers. This is one of the unique features we have. The number of agricultural personnel at the national level is very small but at the grass-roots level is large. Our base for agricultural work is at the grass-roots. This is another factor contributing to agricultural development.

We found out that the felt needs of farmers were water and seeds. By water is meant not only irrigation but also flood control. We talked to local leaders and farmers about flood control, irrigation and seeds. Next we began to tackle the technological problem and to organize the farmers' organization, technology and the farmers' needs must be combined together. When the farmers see that we are really trying to help them, they will be willing to be organized and to accept our advice, which must be technically sound and economically profitable. We gradually expand the scope of our

activities to include other needs of the farmers. The most important incentive is cash income. The crops the farmers raise must be able to fetch adequate and reasonable prices in comparison with other crops.

Every country represented at this Seminar has a special structure of agricultural organization and related institutions. In the Republic of China in Taiwan, JCRR, over the years, has worked out a special cooperative relationship with the Chinese government agencies and agricultural organizations at all levels. The JCRR technicians, as specialists in their chosen fields, are in continuous touch with their counterparts. These two sets of specialists get together and talk with farmers to learn what are the local problems and to determine what actions would help to further increase productivity. Then they come up with a project. The evolution of a project may take 4-5 months. It generally originates in one division of JCRR. If it concerns more than one division, the other divisions have to be consulted. Only with the concurrence of all the divisions concerned is the project finally submitted to the Joint Commission for consideration and approval. The three Commissioners review the projects in terms of its feasibility and relation to overall JCRR and country goals. This is how JCRR projects are developed. Altogether about 200 projects come before the JCRR Commissioners every year covering every aspect of rural development.

Financial support for the projects comes from JCRR in the form of grants or loans and from sponsoring agencies in the form of matching funds. The JCRR contribution comes from the AID program which allocates to JCRR so much money each year to be used by the Joint Commission as it sees fit. In authorizing specific projects, JCRR follows the general guidelines and criteria for the successive 4-Year Plans of the Chinese Government.

Do you feel that such a free-wheeling body is more effective in making a breakthrough in increasing agricultural productivity than a normal structural organization in a government? One has to be very careful about an organization which is free-wheeling and free from manifold regulations. The extent to which a flexible organization works depends upon the capability of its leadership and the confidence that the two governments in the case of JCRR has in this leadership. JCRR is a rather unique organization that has developed and obtained the confidence of the people and the Chinese Government over the years.

The farmers' associations seem to be a vital element in this whole business. In the comments made it has been brought up that under the Japanese rule,

these organizations were dominated by the government and later when the Japanese withdrew, they were largely, or many of them at least, in the hands of various vested interest groups. We would like to know just how these organizations were redirected, can you tell us how these were made to really represent the rural people and how the rural leadership was encouraged to emerge so that they could really represent the farmers and become an essential group through which some of these things could evolve? According to the General Manager of the Provincial Farmers' Association, there are four levels of that organization. The Provincial Farmers' Association is a federation of lower-level associations; then come county, township associations and small agricultural units (SAU), which constitute the basic units of the farmers' associations. There are altogether some 5,000 SAUs on this Island. All units are composed of bona fide farmers. Through the small agricultural units the farmers elect member-representatives to the associations at the next higher level. The new FA law provides for another category of membership, namely, associate members, who are principals of agricultural schools, or farmers who spend only half of their time on farming or receive half of their income from farming and the other half from other occupations. They are not regular members and do not have voting rights. The law requires that the FAs be controlled only by farmers. It is an organization of the farmer, by the farmer and for the farmer.

If the history of an organization over a period of time shows that it has been pretty much dominated from the top down by certain vested interest groups and has not in fact become representative of the people, will it be something more than what it is now?

When the farmers' associations hold elections, the government sends officials to supervise them. The officers of FAs after being elected, are given a course of training to prepare them for the performance of their duties. All the training is conducted at an FA personnel training institute. Newly elected general managers are trained for 1-2 weeks. The accountants, section chiefs, SAU chiefs and board of directors have also to receive training.

Would JCRR have some part in stimulating this sort of thing, or is this just automatically done?

JCRR staff members participate very actively in those training courses. Also JCRR has provided funds for training ever since it was established. In fact, JCRR is the initiator of this program.

JCRR helps set up this training institute. It helps finance it. It is felt very strongly that two of the key groups that have had to be educated are the boards of directors and supervisors, because they, as representatives of the farmers, make policy decisions and direct the actions of the management group. Since the responsibility for operating their own associations falls upon the board of directors, such topics as what should be their role, how far should they go in setting policy, what things they should turn over to management, and how should the directors function as representatives of farmer members in carrying on and strengthening their own organizations are considered in the training programs for these directors.

Are they actually farmers or not?

Those whose income is less than 50% from farming are associate members and have no right to be elected. The FA leaders must be bona fide farmers.

When was the change made in the requirement of who could be members of the board of directors?

In 1953 JCRR invited Mr. Anderson of Cornell to serve as short-term consultant for six months and a committee was organized to study his recommendations. The reorganization of FAs followed the Land Reform Program. The plan was to let farmers direct their own associations which formerly had been in the hands of non-farmers and landlords. Actually, the farmers have converted the colonial type of political direction into a democratic organization of the people, by the people and for the people.

One has the feeling that this arrangement or development, this whole process, is one of the vital elements. You are able to get people to plan from the grass roots. On this basis you build your marketing system and your credit structure.

The delegate from Thailand asked to have more information about the relationship between JCRR and CIECD. How well are these two organizations coordinated? Are there any conflicts in working out programs for agricultural development?

CIECD is very well staffed. It is in charge of overall economic development, planning and programming. In the agricultural field, JCRR helps CIECD in planning and in programming. CIECD makes local studies of various programs, especially industrial development and social and educational development. As it does not have an agricultural staff, JCRR helps it to make long-range plans and programs for agriculture. A JCRR Chinese

Commissioner is Deputy Convener of the CIECD Production Committee headed by the Vice Chairman of CIECD, Mr. K. T. Li, who is concurrently Minister of Economic Affairs. Industry and agriculture are just like two wings of an airplane, which must be balanced. It is our policy that agricultural and industrial development should buttress and complement each other. Further agricultural development will depend upon industrial development. So, there is no conflict at all.

Actually there is little opportunity for conflict. JCRR agricultural technicians are in charge of agricultural planning, while CIECD takes charge of overall planning for industry, transportation, education, etc. When it comes to the agricultural processing industry, JCRR and CIECD get together to see what is going to be done and which organization is to have primary responsibility for a given project.

It is our understanding from what has been said this morning that JCRR has full authority to review project proposals. Does JCRR ordinarily get involved in extensive feasibility studies of this nature, or are they ordinarily taken care of during the planning stage?

For a number of projects which require economic studies, we will have members from the Office of Planning and Programming, Agricultural Credit Division, Controller's Office and Rural Economics Division to evaluate their economic feasibilities. All projects must be reviewed by specialists in related fields, in conformity with JCRR program policy and on the basis of economic and technical feasibility.

Also our Rural Economics Division makes evaluation of the soundness of many projects. There are many small projects in JCRR's program ranging from several hundred thousand NT dollars to NT$3,000,000-14,000,000. The extent of a technical and economic feasibility study depends upon the size of any particular project.

Topic E: Planning and Programming for Agricultural Development in Taiwan

The Chairman announced that Mr. W. M. Ho, Chief of the Office of Planning and Programming of JCRR, will be the discussion leader on the topic of "Planning and Programming for Agricultural Development in Taiwan." Mr. Ho has been engaged in the agricultural planning work in Taiwan for more than ten years. He is concurrently Advisor to the Ministry of Economic Affairs and Executive-Secretary of the Agricultural Production Committee of the Council for International Economic Cooperation and Development.

Mr. Ho has attended several international conferences.

1. Introductory Remarks - Mr. W.M. Ho

Mr. Ho said that he felt honored to serve as the discussion leader of this session on the topic of "Planning and Programming for Agricultural Development in Taiwan." He described the overall agricultural plans and economic development plans. In Taiwan there have been launched four successive 4-Year Plans. The first one was started in 1953 and the Island is in the midst of the 4th one (1965-1968). This Plan was prepared by CIECD in cooperation with various agencies concerned and approved by the Executive Yuan. It includes various sectors such as agriculture, industry, transportation and communication, internal and external. Under the 4th 4-Year Plan, four objectives are set forth for the national economic development of the Republic of China.

a. To establish an economic system according to Dr. Sun Yat-sen's Principle of People's Livelihood, which stresses the equitable distribution of income and promotion of social welfare.

b. To push economic modernization from a predominantly agricultural to an industrial economy.

c. To maintain a rapid rate of growth under a stable economy.

d. To raise the living standards of the people.

In this plan, it is indicated that the determining factors of economic development in Taiwan include manpower services, natural resources, capital accumulation, the process of economic development and its present situation. In this plan, a micro projection has been drawn up. A 7% annual economic growth rate is set, in which 11% in compound rate is for the industrial sector, 4% in compound rate for the agricultural sector and 8% for other sectors including services. The total fund required to implement this four-year plan is about NT$100 billion of which about one eighth is for the agricultural sector.

The full text of the agricultural sector of the 4th 4-Year Plan is formulated by the Agricultural Production Committee, CIECD. This Agricultural Production Committee has a long history under different names. Whatever its name, it always performs the designated duties in connection with various activities of our agricultural plan. In 1964, it was called the Agricultural Planning and Coordination Committee (APCC) of the Ministry of Economic Affairs headed by JCRR Commissioner Y.S. Tsiang. Before 1963 Dr. T.H.

Shen, the then Commissioner and now Chairman of JCRR, was Convener of this APCC. There was a Committee D of the Economic Stabilization Board which performed the same functions with Dr. Shen serving as its Convener and Dr. S.C. Hsieh its Executive Secretary in the period before the activation of APCC. Since 1963 Mr. Ho succeeded Dr. Hsieh as Executive Secretary. The members of these committees consist of almost all the key personnel in Taiwan agricultural circles, such as Commissioner of the Provincial Department of Agriculture and Forestry, Directors of the Food Bureau, Forestry Bureau, and Fishery Bureau, head of the Department of Agriculture and Forestry of the Ministry of Economic Affairs, Deputy General Manager of the Taiwan Sugar Corporation and JCRR division chiefs. The secretariat is housed in the JCRR Building.

The Office of Planning and Programming of JCRR serves as the secretariat of the Production Committee, and technical consulting office of the Ministry of Economic Affairs. The overall national agricultural plan is coordinated by JCRR through different organizational set-ups. Actually, the formulation of the overall agricultural plan is assisted by JCRR which also provides services or assistance to implement this plan.

What is the legal status of CIECD and JCRR in this overall plan?

In the Exchange of Notes between the Chinese and American Governments regarding the Sino-American Fund for Economic and Social Development, it is provided that the functions of CIECD will be mainly those of a planning agency. CIECD will determine and study the wide range of problems associated with further economic and social development in the Republic of China. JCRR will serve as advisor to CIECD in matters pertaining to rural development aspects and overall economic planning. This is the relationship between JCRR and CIECD and between JCRR and Chinese Government in agricultural planning.

To formulate the agricultural sector of the 4th 4-Year Plan, eight working groups were organized under the Agricultural Production Committee, CIECD to deal, respectively, with food crops, special crops, forestry, livestock, fisheries, water and land resources, economic analysis, and manpower. The working groups consisted of more than 100 members, including specialists in agronomy, horticulture, livestock, forestry, and fisheries, college professors, representatives of farmers' associations, foreign advisors, and directors of different agricultural agencies. They all took part in drafting the plan and discussing the potentiality of production and marketing. In general, the

planning work was largely based on the long-range development projection which provided a guideline to insure a minimum degree of consistency between various sections, fields, and aspects of agriculture in the formulation of future plans. In order to integrate and harmonize all sectors, fields, and aspects of the plan, a coordinated planning scheme was adopted for use by all working groups. Sectoral plans for various categories in agriculture and regional plans for areas with different production conditions together with a set of supporting measures were worked out within the framework of this planning scheme.

There is lateral coordination among the agencies engaged in agricultural resources development, production and marketing of farm products, research, extension, financing and administration. As the Agricultural Production Committee has heads of the relevant agencies as its members, it can easily achieve coordination of this nature. In addition, there is also linear operational coordination among the government agencies, agricultural enterprises and farmers' organizations from the top to the grass-roots level.

Apart from the coordination of programs and integration of projects among various organizations, regional coordination and integration are necessary so that any program or project would help and support the administrative set-up at different levels as well as the farmers concerned. For this purpose, the overall production goals have to be broken down to regional goals with the participation of local governments, so they would not feel that the projects and goals of the plan are forced upon them from on high. Before implementing the annual plans provincial and county conferences would be held with the participation of the local agricultural officers and local extension workers who would be called upon to express their opinions and make suggestions concerning the regional goals and plans for that particular region. If objections were raised to the proposed goals or plans either for inadequate incentive, institutional problems, shortage of credit, or lack of fertilizer or other farm requisites, and if, for these reasons, the participants would want to have the goals and plans cut down or revised, we would try to help them solve their problems and persuade them to accept our original proposal without any substantial change. This is the general pattern for setting our production goals from the top level down to the grassroots. The county meetings are usually conducted by county governments with the help and advice of PDAF and JCRR technicians. They are followed by township meetings. Then all these regional goals are put together in order to make sure that they agree with the overall production goals.

Occasionally, we have to modify the plans somewhat owing to changes in trade pattern or in the marketing structure, or as a result of market fluctuations. For example, the 4th 4-Year Plan, which started in 1965, originally did not include asparagus. But a change has to be made in the plan this year, as asparagus is fast becoming a promising crop with good prospects for farmers in Taiwan to grow. In the 2nd and 3rd 4-Year Plans, we had originally set a production goal for cotton. But when it was found that cotton would not be economically and technically suitable for extension, it was dropped from the 3rd 4-Year Plan. Another case is wheat. Some of us thought that since we have to import 250,000 to 300,000 m/t of wheat every year, why cannot we increase our wheat production? However, our economists have found that the cost of production of wheat here is rather high when compared with those countries which have large-sized farms and use mechanized methods for wheat production. It is not economical for us to produce more wheat, especially from the viewpoint of comparative advantage in trade. For these reasons, we are cutting down the wheat acreage in the middle of the second 4-Year Plan. These examples show that our plan is by no means rigid and is flexible enough to permit of necessary adjustments.

In drafting the plan, we took care to make certain development projections, especially those factors relating to future agricultural development such as the trend of population growth, the growth rate of agriculture and its relation to the gross national product, the farmers' incomes, savings and investment. These projections were necessary to the drafting of the overall plan. Through lengthy discussions, special targets and production goals based on the projection of population and other factors would be set for domestic food production. The food production goal was fixed at the rate of 3 to 3.5% of population growth plus the income elasticity for food consumption. The food production goal was 4.5 to 5% annually during past years. The goals for the production of export crops were set on the basis of their marketing potentials, the surplus situation, price competition and the prospects for competition in the world market. Goals were also set for the supply of industrial raw materials, such as jute, tobacco, sugarcane, etc.

When we set up agricultural production goals, we must get down to various aspects of agriculture. Our planning work for the first aspect is called sectoral plans which are formulated on a "product by product" basis and undergo different procedures, such as demand projection, indications of marketing potential, physical input, technical feasibilities, and marketing

systems, including processing, handling, etc.

The second aspect of our agricultural planning is regional planning. The region is classified into irrigation districts embracing various river basins, forest districts, watershed areas, tidal lands, slopelands, etc. The planning requires resources development (including irrigation and reclamation) and resources conservation and protection (such as soil conservation, flood control, etc.) as well as resources utilization (meaning land survey by regional patterns).

The third is the planning of supporting measures on research, training and farmers' service, in order to obtain the necessary information on credit, land tenure, farm report, marketing, and other statistical data.

Mr. Ho requested the participants to consult his paper on "Planning and Programming for Agricultural Development in Taiwan" for detailed information on the planning scheme. A short paper on "Banana Export Promotion Program," also prepared by Mr. Ho and distributed to the participants, illustrated the pattern of Taiwan's agricultural planning and programming. Mr. Ho mentioned that we generally review the marketing potential before we start banana export promotion. Also, we have to review the production potentials. If there is a good market, efforts will be made to catch up with the marketing demand. Mr. Ho considered that we have made some notable achievements, as in the case of bananas, by adopting this method of planning and programming.

Mr. Ho invited questions.

2. Summary of Follow-up Questions and Responses

It was understood that the economic development in Taiwan is working towards the goal of industrialization. In going ahead with industrialization, it would still be necessary to develop agriculture. What would be the agricultural position in the future economic development of Taiwan?

In connection with industrialization and agricultural development, is any attention paid to the interrelationships between the agricultural and industrial sectors? In setting specific targets and production goals for boosting the domestic production, products for export, and the supply of industrial raw materials, some consideration must be given to the relationship between industry and agriculture.

The decreasing weight of agriculture in economic growth is what we have expected. The trend of Taiwan's economic development is from a

predominantly agricultural to an agricultural-industry mixed economy, and finally to industrialization. This point has been emphasized by both Chairman T.H. Shen and Minister K.T. Li in their opening speeches.

The absolute volume of Taiwan's agricultural production has been increasing in the last few years, but its percentage in GNP is declining. We hope the trend will continue and will drop from 28 to 20 or 18 or 15% as the agricultural contribution to the gross national product in the coming years. We hope the absolute volume for agricultural section will be increasing. Efforts should be concentrated on attaining a higher agricultural growth but we do not expect the agricultural sector to yield too large a share of our national income.

Regarding the interrelationship between agriculture and industry, it may be pointed out that the Agricultural Production Committee and the Industrial Committee are sister committees. They hold meetings on industry and agriculture separately, but one committee usually invites the key personnel of the other committee to participate in its meetings because the two have so many things interrelated. A close interrelationship exists not only between agriculture and industry but also among transportation, trade, financing, education, etc. We give due attention to this very important question of inter-relationships.

Under the Sino-American Development Fund, the portion to be used by CIECD for industrial development is from 80 to 85% a year, and that to be used by JCRR for agricultural development is somewhere between 15 and 20%.

In the early years the emphasis on agricultural development was placed on food production and later shifted to cash crops, export crops, and then industry. The first phase of industrial development was closely related to agriculture. We began by giving the highest priority to power development in 1950-1956. The next highest priority was given to the production of fertilizers for agriculture and to the food processing industry using agricultural products as raw materials. Agriculture and industry are so interrelated that agricultural products sometimes become industrial inputs and industrial outputs such as fertilizers, pesticides, and farm implements in turn, become agricultural inputs. In a word, there is a very close interrelationship between agricultural and industrial development.

Topic F: Transferability and Applicability of Taiwan's Development and Significance for Other Countries.

1. Introductory remarks - Dr. S.C. Hsieh and Mr. Wade F. Gregory

Dr. Hsieh

When Mr. T.H. Lee and myself started our study about two years ago, we had the benefit of a visit of the late Dr. John M. Brewster of USDA. He, Mr. Lee and myself had some discussion about the transferability and applicability of Taiwan's experiences to other Southeast Asian countries. This is the reason for the development of Chapter IX of our report "The Unique Aspects of Taiwan's Agricultural Development." I would like to briefly introduce the main ideas of that Chapter. On Page 100 we tried to develop two concepts which would be useful in the evaluation of the applicability of Taiwan achievements to other Asian countries.

> "First, the achievements add up to expanding the power of society to supply its members with increasing quantities of goods and services, a process commonly called economic development. Put in another way, such development is the growing capacity of a people to carry on an increasingly successful conquest of nature. Second, this conquest centers in two fundamentally distinct components. One is technological - the increasingly productive technologies, the hardware, knowledge and related skills that increase people's capacity for manipulating physical forces and materials - transforming resources into outputs. The other component of economic development is organizational - the re-grouping of people under new rules (structures) of mutually helpful behaviors that enable them to generate and put to widespread use the increasingly productive technologies."

This is to put the productive technologies into use. Then on Page 101 we mentioned several points:

> "First, Taiwan has met the requirements of both components within the context of rates of population growth which are approximately as rapid as those of other countries in Southeast Asia. This means that Taiwan's record disproves the commonly held generalization that decelerating currently rapid rates of population growth is a necessary pre-condition for accelerating economic development in the various countries of Southeast Asia."

Some people may say we need to reduce the rate of population growth to 1%, as only when we can attain high achievements in economic development. However, in Taiwan we had a high rate of growth of 3.5%, yet we have been able to achieve a 7-8% overall economic growth rate or 4-5% agricultural growth rate.

"Second, Taiwan has also met the organization requirements of increasingly productive technologies within the framework of small farm sizes which approximately coincides with the framework of most of the other countries in Southeast Asia. This fact disproves the widespread generalization that wholesale reorganization of farms into substantially larger sizes is a pre-condition of very substantial increase in total farm output for years to come."

Another generalization in agricultural development is that before we can enlarge our farm size, we can still achieve rapid agricultural growth through mechanical farming. But Taiwan's experience gives the lie to this generalization. Even though we have small farms, we have been able to achieve a 5% growth rate. So, the assertion that "reorganization of farms into substantially larger size is a pre-condition of very substantial increase in total farm output for years to come" is not necessarily true under the conditions in Taiwan.

On Page 102 we mentioned another feature:

"A third feature of the Taiwan record bears upon its significance for other developing countries. This feature is the fact that economic development in Taiwan has maintained a close interrelationship between agricultural and non-agricultural sectors. In our analysis of agricultural development and economic growth, we found that the early stage of the economy was absolutely based on agriculture. Food processing and chemicals were the main industries in the initial stage. Most of the resources needed for these industries came from agriculture. Two advantages were derived from the close interrelationship between agriculture and non-agriculture. First, capital-saving techniques led to high efficiency of capital, or low capital-output ratio. Secondly, successful advance in agricultural exports was achieved by low production cost with cheap labor wage."

Then on Page 103 the first paragraph says:

"The most strategic component of the island's economic development has not been the capacity of its people to generate new farm and non-farm technologies, but their capacity to construct new organizational rules for linking together their economic behaviors so as to more effectively help each other create and put to widespread use the improved technologies which in turn increase their power to manipulate their physical and biological environment more in line with their needs and

aspirations."

When we talk about agricultural development many people put emphasis on new technology and new inputs, but here in Taiwan agricultural development is not only based on the capacity of the people to farm, but what is more important is our capacity to organize rural people to adopt new production techniques.

In the last paragraph of Page 104, we pointed out:

"Economic development is thus far more than a mere technological or physical transformation of inputs into increasing output; it is more fundamentally an organizational transformation of old ways of life and work into new rules of interpersonal behaviors....."

Then there is this on Page 105:

"In reference to this distinctly humanistic (cultural) requirement of economic development, two observations bear on the transferability of the Taiwan record. First, for centuries Chinese traditions have inculcated the strong feeling that household heads owe it to their ancestors to work as diligently as they can so as to achieve the means necessary for rearing their children well, and in this way pass on the family line from generation to generation. Second, there is in Taiwan a progress-oriented stable government. By this we mean a government with the technical capacity and resolution to use its power and leadership capabilities in continually transforming old rules of interpersonal behaviors into new ones that enable Taiwan people to be more effective in assisting one another in creating and putting to widespread use increasingly productive technologies."

Here, the emphasis is on the widespread use of technology. In many countries technologies already exist, but there are difficulties in making their use widespread.

In the next paragraph we arrive at three final conclusions:

"Three final conclusions emerge from the foregoing observations. First, Taiwan's distinctive record in increasing agricultural productivity has been accomplished within a framework of small farms and rapid rates of population growth, both of which are similar to those of other countries in Southeast Asia. Second, when viewed solely from the standpoint of the technological requirement of economic development, these facts suggest a ready easy transfer of the Taiwan experience to many other countries. Third, this suggestion, however, is subject to severe qualifications when

the Taiwan record is viewed from the standpoint of the organizational requirement of the technological component of progress."

When the human, institutional and organizational factors are considered, the transferability and applicability of Taiwan experience to other countries is subject to modifications.

Mr. Gregory:

We assume that you now know the details of Taiwan agricultural development, and this afternoon and tomorrow we will discuss what part of the Taiwan experience, if any, is transferable to your particular countries or to this region. The nature of my comments that have been drawn together rather hurriedly is going to be rather general. While I will make limited reference to specific parts of the Taiwan situation, I will primarily comment on a few general principles or essentials that appear to me to have been primarily responsible for the rapid increases in Taiwan agricultural development.

The first that I want to comment on is technology. Here I want to emphasize that it was not the actual physical transfer of improved seed varieties, fertilizers or planting schedules, that was important; rather it was the development of a procedure that made adapted improved practices available to Taiwan farmers. Each country and each region has to work out these details for its own soil and climatic conditions. How did this come about in Taiwan? I am sure the question you want to ask is how can I make sure that there is an improved body of knowledge, and improved practices that can be made available to the farmers of my country or area. As I mentioned in my opening statement last week, there was the deliberate strategy here in Taiwan to make sure that there was an improved body of technology. First, they sought out the best technology they could find. This came from existing experiment stations and better farms; they sorted out the best practices available and in use. Secondly, they left the island and went to foreign sources. They did not just stick to this latitude. We have seen some of the experiment stations where they are testing varieties from many places. So they sought improved varieties and practices on a world-wide scale and brought them back and tried to adapt them to local conditions. Thirdly, and simultaneously they looked ahead and set up basic and adaptive research to be sure of a continuous flow of improved technology. We see evidence of this now.

There is a question whether or not Taiwan has reached the peak of its development. It was mentioned that by teaching farmers improved techniques

through intensive demonstrations, rice yield could be increased by 25% this year. So this is a continuous process. How did Taiwan insure that improved technology would be available? Again I mention that the development of technology was conducted, supervised and coordinated by the government, also that the farmers in Taiwan were receptive to new ideas. Not only is there a body of new knowledge constantly being developed and improved by experiment stations, but farmers are willing to apply the new knowledge to increase their income. These traits were recognized, and demonstrations by the extension service capitalized on this. Farmers were informed, and the new methods were communicated to farmers who desired to use them. In this way, the new technology was accepted.

There was a third component, while Taiwan was not short of manpower, they needed and received particular types of technical assistance which helped in the development of improved practices. It was not a wholesale type of technical assistance but rather limited specific technical assistance in the critical areas ne[illegible].

Then we need to add a fourth component. There has been a big inflow of trained manpower from the mainland people, who are now part of the highly trained scientific staff in Taiwan. When you consider the size of the island in relation to the number of trained technicians here, I think Taiwan is in a favorable situation with respect to the kinds of people needed to develop the new, improved technology.

In addition to developing constructive new improved practices, national goals were developed, which found acceptance at the local level. I think it is less important whether a goal was developed at the top and accepted at the lower level or whether developed at the grassroots level and passed up to become national policy. Which way it happened is less important than the fact that there was a set of goals, accepted at both the highest level as well as the lowest level. How to get this common set of goals is a problem that needs to be solved for the country as a whole as well as for several areas within a country. One of the essentials is that the grassroots and policy-making group have to accept the same set of goals. After establishing goals, Taiwan set about to develop a program to implement them. One of the reasons why Taiwan is successful is that when they developed a goal and a program to achieve this goal, they were able to carry it through and the goal was achieved. Taiwan seems to have started out with successful programs and farmers knew that when a program was developed that in fact

would be concluded.

Another thing is the flexibility of the marketing system to handle the output. The farmers increased the output, and as they could market it, they could count on it at the time they planted it. We have discussed ways how this was achieved. I would like to emphasize that the farmers, when adopting improved practices - put in 2-3 crops a year, used more fertilizers, improved irrigation, etc., he knew he could in fact market the increased output that would result from the adoption of improved practices. How did this come about? There was an effective communication between the top policy-makers and lower levels down to the individual farmers. They communicated the policy, knew what they could expect from farmers; and farmers knew what the programs and the goals were.

There was also a national will to develop. You can identify some of the reasons. One is the existing strong will to develop and develop very rapidly the agricultural sector in Taiwan. Out of this need to develop has come the institutional setup which has been developed in the form of national or executing agencies. There is a great interlocking of people with various funds to bring together their efforts and concentrate on common problems. I would guess that the technology and production techniques were not developed randomly. Many of the scientists in the United States first have a particular interest, and take up a research project, and spend their time. Research is not done this way in Taiwan. Rather, the scientists here recognize the common needs and common limitations, and then they try to solve the problems, not randomly but by a deliberate planning process. When Mr. Ho was reporting this morning, I could not help thinking of his illustrations of the banana export promotion program. He has an excellent illustration of the procedures that have been followed in Taiwan.

The first is market potential, to recognize the possibility of a market potential. We have heard that Taiwan's agriculture has become more productive than their domestic needs can take care of, and one of the limiting factors now is how they can sell on the export market their increased output. So, there is now a group of people who are responsible for recognizing and developing the market potential.

Another thing is to review the production possibility of bananas in Taiwan. Taiwan farmers are diligent and intelligent, and they know how to apply improved techniques on new crops to bring higher income and they are willing to work to earn this income. The farmers' associations spread

out these new techniques. Then the problems of producing bananas for export were identified, and it was found that under the existing situation, farmers would make profit by increasing production at the present price under the present marketing system. Out of this review came a program for action. It was recommended that private exporters should share the export market with farmers' groups on a 50-50 basis. Here a recommendation was made and an action was taken. Out of the result of this action the income from bananas increased and farmers responded by producing more bananas. In addition to modifying marketing procedures they adjusted the banana price to take care of the seasonal demands and from this they collected funds to carry on banana improvement work.

I do not think we want to transfer the particular details of how the banana export situation developed but we might want to transfer the procedures that were taken: first to recognize the market potential and study the problems involved, and then to decide a course of action, and finally to carry the program through.

You will find this kind of things repeated over and over again in the Taiwan development picture. In every program the same principles were followed. Sometimes they worked with and through farmers' associations and private enterprise. In each case there was sufficient flexibility for the development of an effective organization. In all of these programs you can detect the strong hand of government as a guiding force. In the concluding chapter of Dr. Hsieh's report, the following statement is made: "The Taiwan record clearly would have been impossible except for a stable government guided by a strong commitment to use its power in meeting the organizational requirements of technological advance."

All through this Seminar there has been discussion, and interpretation of just what is meant by when reference is made to government control or government programs. The government was there behind the scene. There also have been strong farmers' associations which usually made the right moves. Dependence was also placed on individual and private enterprise but within a framework that promoted the goals for agriculture and economic development. We know that as in the case of the banana program, the farmers, or their organized groups could rely on the government when individuals or a small group did not work on and carry out their part of the programs to achieve the national goal that the society has agreed upon should be taken. The people by and large are well trained, disciplined,

cooperative, and hard-working. They were informed of the alternatives and understood what would happen from alternative courses of action. If they followed one course they would benefit, or if they followed another they would be penalized through not sharing in the benefits. They also had an established system of reliance on private enterprise and production incentives for carrying out production activities.

Now again to quote Dr. Hsieh, there was not only the government but also an island of people guided by a long heritage of self obligations to be as productive as they can for the sake of improving their income and status positions of their families from generation to generation."

Now I don't know how you transfer these factors: a group of intelligent and hardworking and receptive people; a strong, progressive, steady government and a tradition of individual farm operation and private industry. If you do not have these things, to what extent is the Taiwan experience possible in your country without them? We need to ask the question, what we do if we do not have these highly important ingredients of the Taiwan situation? That concludes my remarks except for one thing.

I would like to take two minutes to comment on land reform. There has been lots of discussion on land reform. As I reflected around the world, land reform here is a very successful example. I think there are some countries in this region which are interested in land reform. I would say that land reform is quite different there than it was in Taiwan. Many things that would occur in any other countries of the world will not be similar to what occurred here. I would not say what occurred here is similar to some of the countries in Latin America, the Far East and the Near East. For one thing there was very little or no movement of tiller operators. There was just paper transfer of titles. The actual tiller of soil went on after the land reform just as before. Tillers in Taiwan are willing to adopt improved practices, but this is a minor change compared with the many changes involved in land reform as it has been proposed in many other countries. Second, there was a large trained manpower in Taiwan at the individual tiller's level and also at the administrative level. The tillers were the decision-making people before the land reform whereas for many countries few tillers have been decision-makers, and then after the reform they are supposed to suddenly become the decision makers. Thirdly, there was a dynamic agricultural economy and vigorous activity for its implementation under way in Taiwan. This made change much easier because change has

already taken place. I suggest that where we have relatively stable economy and a stable agriculture, the revolution of land reform is more difficult than if you have a dynamic vigorous agriculture. The last point I want to mention is that there was a strong progressive government here that could come out with a plan and policy for land reform and, in fact, could see to it that the plans and policies were carried out.

2. Plenary discussion

During the discussion, various opinions were expressed on the important question of whether Taiwan's experiences could be transferred to and applied in other Asian countries. Other problems about agricultural development in general were also discussed. The views are summarized as follows:

a. Pure biology of production (physical combinations of fertilizers, seed, disease control, water, etc.) is not truly transferable from one area to another. Each area has to do its own adaptive or basic research to develop improved practices which are applicable in that area. Taiwan farmers respond rapidly to money incentive, but in other countries profit may not be an incentive. Even if farmers have the incentive to adopt new practices, it has to be made sure that the inputs are there at the right time and the right place and in the right quantities in order to have increased production.

There is also the problem of marketing. It is learned that in Korea there is a barley surplus this year. It is doubtful whether farmers there still have the incentive to grow barley next year. This is another necessary ingredient for agricultural transformation. It should be considered how these things can be tied together so that they do not interfere with other programs for economic development. It seems that each country has to work out an integrated program, taking into account the wishes of the farmers, feasible at all levels.

b. The importance of human factors is evident. It is the inclusiveness of Taiwan incentives that is interesting. In Taiwan, the incentives touched all farmers. In some other countries, if there is a program, its coverage and implementation is such that the result benefits only a small number of people. Here in Taiwan they put a program through. If it benefited the farmers, all the farmers participated in order to share the benefit; if it was disadvantageous to participate, they did not participate.

c. There is the question of how far public interest should reach and extend [illegible] the agricultural sector. It seems that in Taiwan the government puts agriculture in a very high place in terms of public interest by giving it a

prominent position in national policy and assigning to it available resources necessary to bring about progress. The government of a few other countries had the opposite attitude. They talked of agricultural development a lot, but they were reluctant to put up the resources to achieve the purposes they desired.

d. The Chinese Government devoted about 21 percent, and later 18 percent, of its annual budget to agricultural investment in the past 15 years. It is understood that many other countries also had about the same percentage of their budgets given to the agricultural sector, indicating that they paid equal attention to agricultural development so far as budgetary provision was concerned. The difference seems to lie in the manner in which the money was spent. This, again, is a question touching on human, organizational and institutional factors.

Economic Development seems to be still a premature science. We have to know the various factors affecting agricultural growth and the interrelations between these factors and how they work under different conditions before a pattern can be defined. The transferability and applicability of the Taiwan experience to other countries, therefore, are subject to many limitations.

It was found that basically farmers in every country were willing to make investments and increase production if it was profitable for them to do so. Yet in some areas farmers were successful and in other areas they did not do so well. This might have to do with the development potentials in addition to human factors.

e. From the standpoint of farmers, there are some questions which seem to be of importance. Do farmers all really know that improvement is possible? And is the improvement program technically really sound and workable? In many cases farmers were told to do certain things, but the results did not prove satisfactory. They followed a lot of suggestions that were offered, but they did not come out very well. So they got tired. Again, does the program really produce a result that farmers are able to get the essential inputs needed at the right time for the right crop in the right package and at the right price? There have been cases in which farmers got their fertilizers six months too late and the improved seeds came after the planting season. Another question: Can the increased output of farmers be sold at the proper price? For the success of a program, answers to these questions must be satisfactorily provided.

f. Broadly, the various aspects of the Taiwan experience could be

considered transferable so far as Malaysia is concerned. For developing countries, a strong institutional machinery made up of good colleges, research institutes, experiment stations, etc. is necessary for bringing about agricultural improvements. Most of the countries in Southeast Asia have already had such a machinery. Part of the answer to the question of transferability of the Taiwan experience to other countries with similar conditions of small farms could be found in the statement on Page 104 of Dr. Hsieh's report: "Economic development……is fundamentally an organizational transformation of old ways of life and work into new rules of interpersonal behaviors." It is interpersonal behaviors that show the kind of success achieved in Taiwan, for much of Taiwan's success has been due to the people's ability to organize themselves into groups and organizations in their common desire to improve themselves. The fundamentals of the actual operations of these farmers' organizations in Taiwan could be applied in other countries, e.g., Malaysia, which desire to have similar organizations established.

On Page 105 of Dr. Hsieh's report it is stated that: "For centuries Chinese traditions have inculcated the strong feeling that household heads owe it to their ancestors to work as diligently as they can, and in this way pass on the family line from generation to generation." This posterity-centered motive of Taiwan farmers to improve themselves or accumulate wealth has been an important contributing factor to the increase of production. Elsewhere in Asia farmers have much the same basic subconscious feeling about their occupation, which only needs guidance and cultivation to become a strong driving force in agricultural development.

The role of agricultural technicians in Taiwan's agricultural development has also been an important one. The ratio of one trained technician to 74 hectares of land is very high compared with other countries in the region. Developing countries, in planning for the development of their agriculture, should take into consideration the necessity of improving their vocational agricultural education. This is another human factor that must not be overlooked.

g. The question of transferability seems to be a matter of adoption and how much adaptation is necessary.

It is believed that the Taiwan experience has disproved four theories which, though not universally agreed upon, are often cited in statements about economic development. One is that in order for economic development to take place, a country must be industrialized and must concentrate its

resources on industrialization. Another is that investment and other efforts in agriculture have a low payoff because in a developing country the farmers are traditionally backward and it is difficult to get new skills to so many individual farmers. The third theory is that if the results of economic development are to extend to the countryside we will experience what is called economic instability, because the rural people will then develop desires and needs which are beyond our ability to meet and the result is economic instability. The fourth theory is that agricultural development is disadvantageous in that the terms of trade in the world are constantly working against countries producing primary goods and agricultural goods.

The experiences of Taiwan, however, have demonstrated these general principles to be untrue. Firstly, in the economy of Taiwan, agriculture has always been emphasized, and it has supported industrial development and contributed to the rapid and successful growth of the economy as a whole. Secondly, even though Taiwan has a large farm population, good organization aided by technology has made it possible to achieve a big payoff from the agricultural sector and, indeed, to achieve results with less capital input and to enjoy a very favorable capital-output ratio. On the third point about economic instability caused by rising expectations, the Taiwan case indicates that social stability and rural prosperity in general have been achieved by promoting economic development at the grassroots level. Finally, instead of suffering from having agricultural exports, Taiwan's economy has been greatly strengthened by them. If a country chooses exports carefully, the terms of trade will be in its favor indeed.

3. Sub-group discussions

Report of sub-group A:

About Taiwan's land reform, it was agreed that group programming and the committed way in which the program was carried through might be transferable. The reform consisted of three phases, i.e., rent reduction, sale of public lands, and the Land-to-the-Tiller Program. But it is the idea of group planning and commitment to carry out the plans, rather than the specific actions of the three phases, that can be transferred.

Another successful feature that might be transferable is the need for much labor and pains in the preparation of the program before it was launched. Once the program was worked out, it was seriously enforced and the people concerned had their heart in it because they knew what good it would do them.

The next question discussed was the role of JCRR. It was considered that some of its unique features could be transferred and adapted to the situations in other countries. The majority held the view that the extraordinary joint status of JCRR and the freedom it enjoys have a lot to do with its success. This feature is transferable where there is political stability and the government is strong enough. The JCRR success was also attributed to a combination of technical assistance and dedication of the local people. The specialists do not jump to conclusions, but plan their work on the basis of farmers' felt needs, and together they endeavor to satisfy these needs. This work-togetherness could be adopted in other countries on a much smaller scale and on a project-by-project basis. It is not really too important whether there is an organization similar to JCRR or not. A significant fact about the Taiwan experience is that farmers themselves have been given a greater role and greater voice in agricultural development, and JCRR has helped in establishing that trend.

The thoroughness or carefulness with which JCRR selects its projects is another transferable feature. By taking into consideration such factors as technical and economic feasibility, capability, of the cooperative effort, the integrity of the sponsoring agency, etc. in developing a project, it is assured of success in bringing about the desired results.

Report of sub-group B:

It was the concensus of the group that Taiwan's experience could be transferred to other countries with some modification in institutional structures. As there is lacking the mechanism of transfer, the possibility of transplanting the farmers' organizational setups in Taiwan to other countries was discussed.

The group put up two recommendations:

a. There should be a continued informal exchange of personnel within this region, e.g., sending farmers and extension workers to Taiwan for training or observation as has been done by a number of countries.

b. A regional organization should be developed for the exchange of ideas so that one country could benefit by the experiences of others. In the past the trend has been for some countries to send their personnel to developed countries like England, Denmark and the United States which have conditions not quite similar to those in this region. Better results might be obtained if the personnel were sent to study in countries within the region.

Report of sub-group C:

The opinion voiced by Sub-group C was that the Taiwan experience strongly suggests that the bottlenecks of resource limitations, limited economic motivations, and other factors that are so often posed as explanations for the lack of progress are in large part myths - myths that are themselves greater impediments to progress than are resource limitations.

The group urged caution, however, to avoid the dangerous pitfall of using the details of operations in Taiwan's experiences as sure-fire formulas or cook book recipes, for the agricultural development of the respective countries of interest.

Transfer of the particular farm production methods, the particular forms of organization, the particular administrative procedures, and even the particular staffing practices that were so successful in Taiwan will likely meet with highly varying degrees of success in other countries - in some with moderate success, in other with little or none.

What is most transferable in the Taiwan experience is the basic methodology undergirding the process of Taiwan's progress.

This methodology has been composed of several components, all somewhat interrelated operations, in what can be called problem-solving activity.

Its first step consisted of the sensing of a great need to increase agricultural output coupled with well-grounded faith in the possibility of constructively resolving Taiwan's agricultural production problem as well as faith of leadership in their own intelligence and in that of their people to bring methods of modern science to bear in meeting the technical, the resource and the organizational requirements of development.

The second step consisted of careful stock-taking and analysis to identify possible output-increasing methods applicable at farm levels, careful consideration of the requirements of these methods for capital, skills, infrastructure features, etc., and careful re-evaluation of them in light of the amounts of capital, skills, etc., then available.

The third major step in Taiwan methodology, once alternatives were chosen which offered good promise of increasing productivity, was that of developing organizations, administrative procedures, and staff patterns tailored to the needs of the chosen output-increasing alternatives.

Finally, as chosen alternatives or initial hypotheses have been implemented and as Taiwan has moved along on what can be called a development continuum, new problems and new opportunities have emerged requiring

further analysis and further adaptation in organizational structures to better tailor them to the newly evolving conditions.

JCRR has contributed importantly to resolving this need for continuing analyses of potentials and for continuing adaptation of programs. Continuing problem identification and problem-solving activity is basic to sustained agricultural progress.

The elements entering into Taiwan success have been legion and often complex. But key ingredients that perhaps can be transferred and used in other development situations are the determination of its leadership and the careful and intelligent analysis of the nation's potentials and of the basic requirements for their realization. Its leaders have not talked farmers into growing new crops and then left to chance the development on their part of technical competence, markets, availability of essential production requisites. Instead they have been highly sensitive to the complex requirements for the successful adoption of what at first glance might have seemed to be very simple production innovations.

Analysis (not for analysis' sake) conducted with a deep sense of urgency and extended as required for the needs at hand has been ever an ingredient of Taiwan successful experience.

Taiwan's leaders have sought to mobilize and to use as effectively as possible their land, capital and labor. They have recognized the interests, the intelligence and the energy potential of the rank and file of farm people as one of the nation's most important economic development resources. Land reform and farmers' associations have been tried with signal success as instruments for more fully involving farmers in agricultural planning and implementation.

Taiwan's policies have also been directed to using the profit motives of business firms as a development resource.

In conclusion, there are many things that we have learned from Taiwan's experiences. But we will be asking for too much of the Taiwan experience if we go back and attempt to use it as a substitute for careful investigation and analysis of the agricultural development potentials and requirements of our own respective countries or as a substitute for the thought and judgement demanded by the peculiarities of the resource situations, cultural features and political realities of our own respective nations. China's contribution to us lies as fully as anything else in the stimulation to thought that we have found

in this Seminar and in this action-packed and truly progress-oriented nation. Its people challenge us to serious thought about the problems of our countries - - thought demanding the very best in energies and intelligence of which we are capable. They have demonstrated that no matter where we now are with respect to resources and technology, progress is attainable if there is a national will shared by leaders and people of our nations and if we use wisdom in analyzing our potentials and in implementing progress.

The Chinese story here gives us new hope. You challenge us as we go back to our respective countries to engage in hard thought and investigation of our agricultural production potentials and of the requirements for their realization. As we so look at our problems we will continue to look back upon your experiences for the light they give us on the ideas and hypotheses emerging in our analyses of the development needs of our own respective nations.

4. Responses

Remarks by Mr. Gregory:

It seems to me that things from Taiwan's experience which are useful to us in agricultural development are much the same as summarized by Dr. Hendrix in his report. Taiwan's experience, from the very individual tiller up to high officials of government, approaches the problem in terms of solving a particular situation. They recognize needs and these in various ways. They are set up in terms of how they could achieve the ends. This is called problem solving. They recognize the problem, and work out the solution, the acceptable solution. They develop a program and they evaluate this program. Then they distribute the rewards for the success of the program. I have emphasized that rewards are positive and negative. Distribution of rewards were widespread and broad enough so that they covered the total population concerned with the program. All these were carried out in responsive and combined group action, regardless of whether done by the government, a body of private individual farmers or businessmen. I think it is important that most of the programs were developed, executed and evaluated by some kind of group action. Then, in the framework of Taiwan's development, to what extent can other countries that do not have the same unique characteristics of Taiwan, apply this same framework of problem solving? Taiwan was fortunate that overall national purposes and needs were recognized - the common needs. For the majority of people living in Taiwan, there was a need for them to work together to solve their common problems. This is

definitely an advantage. The people of Taiwan respected their government and knew what the government and other group activities could do. They recognized both the positive and negative aspects of what the government could do. The individual tillers have been decision-makers for a long time, and have gone through a process of change by innovations. They have been problem-solvers and are used to working together and seeking joint efforts to solve common problems. This is not common in some other countries, not having the same experience to a certain extent. I also consider the fact that there is a large number of trained technicians. The ratio of the number of people relevant to the job to be done is favorable in Taiwan. The lesson of Taiwan may not be easy to a country that does not have the same favorable atmosphere for bringing about agricultural development.

Remarks by Dr. S. C. Hsieh:

I took part in the sub-group C discussion this morning. The conclusions were excellently summarized by Dr. Hendrix. Some of my points have already been integrated over there. I would like to offer a few supplementary remarks.

For your consideration, I would like to mention the problems of proper mixture of farmers' participation in agricultural planning, government role in agricultural development, and the role of private profit-seeking firms in agricultural development.

When we talk about the government's role in agricultural planning, most people will see this need. When the government regulates, controls, and guides in agricultural development with farmers' participation in planning and implementation, problems are reduced. In a developing country, the role of private industry normally is not recognized by the general public. Yet we have achieved a proper degree of farmers' participation in agricultural planning or involvement of individual farmers in planning for agricultural development. The individual farmers, particularly small farmers, actually can have their voices heard and their views accepted at the national level. This is why the government is able to develop a coordinated and well-balanced agricultural plan which can be implemented down to the farm level.

In the economic planning of most Asian countries, the private firm sector is not much emphasized as an important component of the economic operation. In our 4-year agricultural plans, the government continued to play an active and important role, while the private firms or organizations also came up to help agricultural development. Our rice exports, fertilizer imports, fertilizer

distribution, and sugar exports are in the hands of the government. But our other exports such as bananas, pineapples, citrus, and mushrooms are handled by private profit-seeking firms. Provision of insecticides is also in the hands of the private sector with some government regulation and guidance. So, in Taiwan's experience the proper mixture of farmer's participation in planning, government role and the role of the private sector were emphasized.

A comparison of agriculture in Taiwan and that in other countries such as Malaysia, the Philippines and Thailand will show the part played by the commercial sector in agricultural development like the sugar industry in the Philippines and rubber in Malaysia. There are quite advanced in terms of capital use, yield level, land use and farm management, but the subsistence food sector has problems regarding technology, capital use and farm management. In Taiwan we also have plantation crops such as sugarcanes, pineapples and tea. These crops are not like plantation crops in other countries where they are tended mostly by hired labor. Here all the plantation crops are actually integrated in the small farm system and under the care of the same operators. Therefore, for technical improvement, plantation crops and other subsistence food crops will benefit mutually since they are under the same operation and management that of the small farm operators. This is why farmers grow as many as 8 or 9 crops on the same farm. You will see no dualism in Taiwan agriculture as in other Asian countries. The nature of dualism has some relevance to the transferability and applicability of Taiwan's experience to other countries, particularly Thailand, the Philippines, and Malaysia where there is dualism in agriculture.

Another point is the transferability of the JCRR model to other countries. My personal view is that the question of whether there are similar setups in other countries is not important. After all JCRR is merely an approach to problem-solving. As long as we have a highly efficient organization, regardless of whether it is the department of agriculture or any other kind of setup, we can proceed with agricultural development. The joint nature of such an organization has its advantages. In view of the political and social conditions in other countries in the region, this kind of approach can be transferred—identification of problems through team-work and a joint approach. Normally an individual technician who comes to the rural area to identify a problem is from his own discipline. But to form a group for problem identification, at least we need to include people from 5 to 6 disciplines. With this team approach, we can make problem identification more realistic. After the problems are identified, the next step is project

development, and finally coordination and field implementation.

Concerning time-spacing or sequence of the projects, this is also a very important matter. Fifteen years ago our projects mainly dealt with flood control, irrigation development, technical improvements and identification of technical and economic potentials. They were for attaining the physical goals of production in agriculture. Five years later, we paid more attention to economic and financial aspects of agricultural development. This part of Taiwan's experience seems to be useful to other developing countries.

My last point concerns the methods of agricultural financing. Agricultural planners tend to ask for more money, more budget for agricultural development. Because of the unfavorable terms of trade and other problems, the rate of returns to capital in agriculture in many cases is comparatively low. When we get loans or grants to finance agricultural projects, we need to figure out the economic value of the projects and how agricultural capital investment can pay off. With improved technology and efficient organizations, we can develop agricultural projects to pay off themselves. In Taiwan's experience, all the agricultural projects (except those for flood control and irrigation development which were subsidized either fully or partly) developed and implemented in the past years have been able to pay off by themselves.

Remarks by Mr. Gregory:

I would like to comment on problem-solving. It seems that for overall problem-solving the top level plans the detailed operation. When we talk about problem-solving in the increase of rice output, we want to have an adequate, cheap supply of food. This is the problem that planners addressed themselves to in Taiwan. It should be pointed out that we cannot solve the rice problem if we forget all the other problems related to it: the rice export tax, for instance, which is a part of the overall problem. In Taiwan, there are interlocking groups of different people, consumers and farmers and the need for government revenues, the need for reasonable prices - all these are planned together by individual groups. At some point in time, before programs were finally released or put into operation, there was discussion and communication between these groups. Rice barter was not just to get fertilizer into use. It was also to assure an adequate supply of cheap rice. We talk about problem-solving, and we make sure that we identify central problems rather than break them down into sub-problems. This means to achieve large ends. It is the duty of different groups to work together to solve some conflicts that might develop as each of the different means is being worked out to

achieve the final ends.

5. Further discussion

a. The success of the work for economic development in Taiwan was considered to have been due to the adoption of the right policies and strategy in the right sequence. The first step was stabilization. In the early postwar period, because of the military situation and the great inflow of people from the mainland, there was a very serious shortage of food. The initial emphasis was laid on stabilization which was followed by increase of farm production. This was again followed by heavy investment in the infrastructure-communications, power, etc, which was followed by the establishment of light industries and finally by the improvement of the investment climate to attract private investors and provide incentives for private capital.

b. Taiwan's agricultural development has been based on small farms and intensive use of land. This situation will continue. In the past, the farming techniques adopted in Taiwan were capital-saving and labor-saving. In the future, Taiwan needs to adopt both capital and labor-using technology. A study based on Taiwan's experience in the past shows that one-third of the output expansion in agriculture was due to more input, and the remaining two thirds of the output due to the shifting of the production function. This means there will be a high production curve. Now because of technological innovations, we are moving upward and can produce more. As long as scientific development continues, agricultural production in Taiwan will never reach a peak. Even though our land is limited, our output is not necessarily limited. Taiwan sooner or later will face the law of diminishing returns in agriculture. However, the law of diminishing returns is valid under the assumption of constant technological factors. If technology is not constant, maybe we can delay the operation of the law of diminishing returns in agriculture.

Three fourths of the island is covered by mountains and hills, and our mountain resources have not been fully exploited. It is our plan for the next 10 years to utilize these resources. As an example, of the total value of livestock production on the island, about 94% comes from the plains. Comparing our condition with that of New Zealand where more than 90% is from mountains, we have vast opportunities to increase livestock production together with forestry development. This is one of the big areas we are going to exploit in the next 10 or 15 years. There are also great potentials in the field of fisheries. Fisheries production in Taiwan actually has been

increasing more rapidly than crops, livestock and forestry because the sea is unlimited.

c. There are two things about land development in this Asian region. One is the intensification of production on land, which requires general improvements in the physical condition of land itself. Big investments are made for irrigation improvements, land consolidation and various physical improvements with respect not only to the land but also to the water resources, which in effect put the land in the condition to deliver its own potential. This kind of development of land requires input for physical improvement. Considering that we are faced with a population explosion which is creating demand for food within a very short time, the economic development planners and budget control people could take a hard look at the economic end of this situation in getting ready for the future. The other thing which is relevant to the situation is the increasingly heavy population pressure and food demand upon all available land resources. Inevitably we are going to face a need for more regional specialization of crop production. As rice production calls for favorable climatic conditions and application of the technology of improved varieties, fertilization and other items, which require capital investment, not every piece of land can be used to grow rice. It means that a shift in land use in some areas would be necessary so that the land resources could be utilized more economically and profitably.

d. During the Seminar, we have been dealing with the problems of increasing agricultural productivity and production without giving much attention to the marketing of agricultural products. In Thailand, their problems lie not so much in increasing production as in marketing. In fact, rice is the major product in Thailand and they have difficulty in marketing it. It is hoped that in the efforts of different countries to increase productivity and production, they will come to the point of marketing, and consider how a sort of marketing system can be developed in the region, whereby one country can import from another country not only agricultural products but also other products. In this way, we may be able to accelerate agricultural growth as well as economic development.

e. The work of FAO/ECAFE is much related to this discussion. ECAFE is currently studying regional implications of agricultural development in this region.

About the national agricultural development plans in the region, in many

cases the country wanted to know what effects its plans, which were aimed at self-sufficiency, would have on the international trend. This raises an important question - the effects of regional planning of agriculture in member countries. Therefore, in our study of national agricultural development the major commodities in inter-regional trade are emphasized. The FAO headquarters, particularly the economic analysis division, is currently undertaking among other things a study of national agricultural development plans and a number of case studies on agricultural development, with the purpose of indicating the production, consumption and trade in agriculture attainable in developing countries around 1957 and 1985. If the economic and social objectives of these countries are to be realized, the study will provide a picture of the need for agricultural production necessary in the achievement of these targets and also a basis for establishing development policies and measures. Similarly, if we try to develop some sound long-term projects for agricultural exports as an international frame for developing countries in their national planning, and also to make possible that more concise priority be given to agriculture, it is worthwhile to have this kind of seminar held once every one or two years in the future.

f. It is understood that the study of the Taiwan experience is the beginning of a series of studies to be done, and that the next step is to make some more intensive studies. Such studies could best be made at seminars like this. With the experience and information we get from Taiwan, we may take a look at the experiences of other countries and move along with the exchange of information on planning in carrying out the programs in countries which are represented here.

IV. CLOSING SESSION

Remarks by G. H. Huffman

Since it has not been possible for me to attend the Seminar sessions regularly, I am not in a position to make any remarks concerning the value of this conference. However, my impressions are that all of you have found the Seminar's formal presentations and the discussion sessions most useful. At least, speaking on behalf of the co-sponsors - - JCRR and A.I.D. - - I hope that this is the case. As you official delegates return to your home countries and resume your positions of official responsibility, I am certain that you will look back upon this experience as valuable and contributory in helping you to further strengthen your respective countries' agricultural development programs.

Perhaps the main value of this Seminar has not been to understand more clearly the myriad of complex and detailed arrangements and inputs which have contributed so much to Taiwan's agricultural progress, but to gain a better perspective of the broad or general conditions necessary to bring about agricultural develpment. And I would expect that this Seminar has also helped all of you to see more clearly how to proceed with the essential analyses and approaches that must be made in identifying the necessary conditions for development in your respective countries so that more precise and refined efforts can be made to strengthen those which are ineffective.

And now, I would like to take this opportunity, on behalf of A.I.D., to thank the Chinese delegates and observers, the Chinese Government, and the Chinese people for all that has been done to make this Seminar successful. I would also like to thank the Seminar preparatory committee, headed by Dr. Y. T. Wang, for its untiring efforts during the past four to five weeks to make the conference useful and interesting. I believe all of you delegates and other participants will agree, the general arrangements for the Seminar have been well planned and carried through.

Further, I would like to express appreciation to Dr. S. C. Hsieh, Mr. Wade Gregory and Dr. William E. Hendrix, who have served as consultants and contributors to the Seminar.

Finally and by no means last, I want compliment the Governments of the participating countries for sending highly qualified delegations, the A.I.D. Missions for sending appropriate staff members, and the ECAFE/FAO organi-

zation and the Agricultural Development Council for sending most capable representatives to participate in and contribute to the discussions.

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Following Dr. Huffman's remarks the chief officer of each country and organization represented at the Seminar made a statement expressing his country's (or organization's) appreciation to the Government of the Republic of China, to AID/Washington and to JCRR for sponsoring the Seminar.

On a motion made by one of the Seminar delegates it was agreed unanimously that similar conferences should be held every two or three years alternatively in the countries of the East Asian region.

The Seminar then adjourned.

V. AGENDA

All plenary sessions of the Seminar were held in the JCRR Auditorium, and the group discussions in the Auditorium and Rooms 313 and 410, of the JCRR Building.

June 19 (Sun.)	Arrival	
June 20 (Mon.)		
9:00-10:00	Registration	
10:00-12:00	Opening address:	D. T. H. Shen, Chairman of JCRR
	Addresses:	Minister K. T. Li, Ministry of Economic Affairs, China. Dr. G. H. Huffman, USAID Representative, China, and Commissioner of JCRR
14:30-17:30	Topic:	Agriculture in 26 Developing Nations, 1948-1963
	Chairman:	Chief delegate of the Republic of China
	Discussion leader:	W. E. Hendrix, Agricultural Economist, Economic Research Service, U. S. Department of Agriculture. Leader of a joint project for study of Indian Agricultural Development, New Delhi, India
	(Recess: 16:15-16:30)	
18:00-20:00		Reception by Minister K. T. Li, Ministry of Economic Affairs, China
	Place:	Grand Hotel
June 21 (Tues.)		
9:00-10:30		Work session for country delegates
	(Recess: 10:30-10:45)	
10:45-12:00	Topic:	Presentation of results from work session on country situations
	Chairman:	Chief delegate of the Republic of Korea
14:30-15:30	Topic:	Presentation of results from work session on country situations (continued)
	(Recess: 15:30-15:45)	
15:45-17:30	Topic:	Plenary discussion of country situations
	Chairman:	Chief delegate of the Republic of Korea

	Discussion leader:	W. E. Hendrix
Evening		Free
June 22 (Wed.)		
9:00-12:00	Topic:	Discussion of report: "Agricultural Development and Its Contributions to Economic Growth in Taiwan"
	Chairman:	Chief delegate of the Federation of Malaysia
	Discussion leader:	S. C. Hsieh, Visiting professor of Agricultural Economics, College of Agriculture, University of the Philippines. Former Secretary-General, JCRR
	(Recess: 10:30-10:45)	
14:30-16:15	Topic:	Sub-groups meet to discuss report
	(Recess: 16:15-16:30)	
16:30-17:30	Topic:	Plenary session - Sub-groups summary report of discussions
	Chairman:	Chief delegate of the Federation of Malaysia
	Discussion leader:	S. C. Hsieh
18:30-20:00		Reception by G. H. Huffman, USAID Representative, China
	Place:	94 Sung Chiang Road, Taipei
June 23 (Thur.)		
9:00-12:00	Topic:	Discussion of report: "Economic Development of Agriculture in Taiwan, 1885-1963"
	Chairman:	Chief delegate of the Republic of the Philippines
	Discussion leader:	Wade F. Gregory, Chief. Economic Development Branch, Economic Research Service, U.S. Department of Agriculture, Washington, D. C.
	(Recess: 10:30-10:45)	
14:30-16:15	Topic:	Sub-groups meet to discuss report
	(Recess: 16:15-16:30)	

16:30-17:30	Topic:	Plenary session - Sub-groups summary report of discussions
	Chairman:	Chief delegate of the Republic of the Philippines
	Discussion leader:	Wade F. Gregory
Evening		Free
June 24-27 (Fri.-Mon.)		Field trip (See Separate itinerary)
June 28 (Tues.)		
9:00-10:45	Topic:	Discussion of report: "Rural Improvement and Political Development. The JCRR Model"
	Chairman:	Chief delegate of the Kingdom of Thailand
	Discussion leader:	Y. S. Tsiang, Commissioner of JCRR
	(Recess: 10:45-11:00)	
11:00-12:00	Topic:	Discussion of report: "Planning and Programming for Agricultural Development in Taiwan"
	Chairman:	Chief delegate of the Kingdom of Thailand
	Discussion leader:	W. M. Ho, Chief, Office of Planning and Programming, JCRR
14:30-17:30	Topic:	General discussion of Taiwan's development and significance for other countries
	Chairman:	Chief delegate of the Republic of Turkey
	Discussion leader:	S. C. Hsieh and Wade F. Gregory
	(Recess: 16:15-16:30)	
19:00-21:00		Dinner by JCRR
	Place:	Room 313, JCRR Building
21:00-22:30		Chinese Opera
	Place:	National Taiwan Arts Center
June 29 (Wed.)		
9:00-10:00		Courtesy call on Vice President of The Republic of China at the Executive Yuan.

10:10-12:00	Topic:	Sub-groups meet to discuss Taiwan's development and significance for other countries
	(Recess: 10:30-10:45)	
14:30-16:30	Topic:	Plenary session - Sub-groups summary report of discussions
	Chairman:	Chief delegate of the Republic of Vietnam
	Discussion leader:	S. C. Hsieh and Wade F. Gregory
	(Recess: 16:30-16:45)	
16:45-17:30	Topic:	Closing session of Seminar

VI. FIELD TRIP TO NORTHERN AND CENTRAL TAIWAN

(June 24-27, 1966)

June 24, 1966 **(Fri.)**

8:00	Leave Taipei for Taoyuan
8:40-10:00	Visit Taoyuan Agricultural Vocational School
10:10-11:30	Visit Taoyuan Irrigation Association:
	(1) Organization and operation
	(2) Rotational irrigation system
11:30-12:10	Taoyuan to Shihmen
12:10-13:30	Lunch at Shihmen
13:30-14:10	Visit Shihmen Reservoir
14:10-15:45	Shihmen to Miaoli
15:45-17:30	Visit Miaoli Township:
	(1) Township Government
	(2) Rural health improvement and cottage industry in Chiasheng village
17:30-19:00	Miaoll to Taichung
	Stay at Taichung Railway Hotel
19:30-21:00	Reception by Commissioner Y. T. Chang of Provincial Department of Agriculure and Forestry
	Place: Provincial Information Office

June 25 **(Sat.)**

8:00	Leave hotel
8:10-10:50	Visit Taichung District Agricultural Improvement Station:
	(1) Improved methods of rice culture
	(2) Multiple-cropping system
	(3) Extension education
	(4) Seed certification
11:00-11:40	Visit Taichung City South District Health Station
12:00-13:50	Lunch
14:00-15:00	Visit Taiwan provincial Farmers' Association to study the organization and operations of farmers' associations
15:00-15:35	Provincial Farmers' Association to Tsaotun
15:35-17:00	Visit Tsaotun Township Farmers' Association:
	(1) Credit

(2) Extension (integrated demonstration of cultural practices, as an example)
(3) Warehousing
(4) Fertilizer distribution
(5) Other activities

17:10-18:30 Tsaotun to Taichung
Stay at Taichung Railway Hotel

June 26 (Sun.)

9:00-12:00 From Taichung to Sun-Moon-Lake
Visit Wei Chuan Food Processing Factory

14:00-17:00 Boating and visiting the aboriginal village across the lake.
Stay at Evergreen Hotel/Sun-Moon-Lake Hotel

June 27 (Mon.)

7:00 Breakfast

8:00-9:25 Sun-Moon-Lake to Chunghsing Village

9:25-11:30
(1) Call on Taiwan Provincial Government
(2) Receive briefing on Provincial Administration
(3) Visit Government Information Center
(4) Study the role of Provincial Department of Agriculture and Forestry

11:30-12:00 Chunghsing Village to Taichung

12:10-14:00 Lunch at Taichung Railway Hotel

14:00-14:40 Taichung to Lungching

14:40-17:00 Visit Lungching Township:
(1) Land consolidation
(2) Intensive village development
(3) Farm families

17:00-17:40 Lungching to Taichung

18:00-19:00 Dinner at Taichung Railway Hotel

19:34-22:20 Taichung to Taipei (by Tourist train)

VII. LIST OF PARTICIPANTS

	Organization	Addres
Korea		
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VIII. DOCUMENTS AND PAPERS DISTRIBUTED TO PARTICIPANTS

Seminar materials:

1. Changes in Agriculture in 26 Developing Nations, 1948 to 1963, by ERS/USDA. 1965.
2. Agricultural Development and its Contributions to Economic Growth in Taiwan, by S. C. Hsieh and T. H. Lee. Economic Digest Series: No. 17, JCRR, 1966.
3. Economic Development of Agriculture in Taiwan. Prepared by ERS/USDA based on Dr. David H. Spaeth's report. Mimeographed, 1966,
4. Rural Improvement and Political Development: The JCRR Model, by John D. Montgomery, Rufus B. Hughes, Jr. and Raymond H. Davis, AID/W. Mimeographed, 1964.
5. Planning and Programming for Agricultural Development in Taiwan, by W. M. Ho.
6. Banana Export Promotion Program, by W. M. Ho.

Others:

1. Getting Agriculture Moving, by A.T. Mosher, The Agricultural Department Council, New York, U.S.A.
2. A Report on the Joint Commission on Rural Reconstruction, by Yien-si Tsiang, 1964.
3. Land Reform and Its Impact on Economic and Social Progress in Taiwan, by Yen-tien Chang. National Taiwan University, Taipei Taiwan, 1965.
4. Farmers' Associations and their Contributions Toward Agricultural and Rural Development in Taiwan, by Min-hsioh. Kwoh, FAO, UN, 1966.
5. JCRR General Report XV, by the Joint Commission on Rural Reconstruction, Taipei, Taiwan, Republic of China.