within the same land class the higher the net income.

14. Hired man labor were highest for farms in the Upland Field Crops Region. They tended to decrease as the land became less productive and as the intensity of use decreased as reflected in land class.

15. Large farms hired more labor and were more efficient in the use of labor than small farms.

49. An Economic Study of Land Use in Yunlin and Chiayi Hsien, Taiwan

雲林、嘉義縣土地利用之經濟研究

Sponsor: The Asia Association
合作機關：美國亞洲協會
Author: Shison C. Lee
作　者：李慶薰
Accomplished Data: 1963
完成日期：民國 52 年

Purposes of Study:

1. To make maps of agricultural regions and economic land classes for Yunlin and Chiayi Hsien.
2. To determine the present agricultural regions based on land use patterns, natural features, and land area per family or per person.
3. To make a farm management study in Yunlin and Chiayi Hsien by agricultural regions and economic land classes.
4. To explore those factors related to the intensity of land use in Yunlin and Chiayi Hsien, and analyze their interrelationships.
5. To examine the relationship between the economic land classes and farm income and the related factors.
6. To study the factors affecting the farm income in Yunlin and Chiayi Hsien.
7. To make recommendations for changes in land use in the studied area based upon the findings of the study.

Methods of the Study:

Methods and procedures used in this study were as follows:

1. Determining agricultural regions.
   a. Printing maps showing village boundaries for Yunlin and Chiayi Hsien to be used in recording the available data.
   b. Studying natural features, land use patterns and land area per person or per family to determine agricultural regions.

2. Classifying economic land classes within each agricultural region.
   a. Collecting information concerning land use at the village level from various township offices.
   b. Classifying preliminary economic land classes by making use of the data collected.
   c. Using aerial photos to make interpretations of land use and review preliminary economic classification. Then make corrections in the preliminary economic land classification map through field review.

3. Making a farm management survey stratified by agricultural regions and economic land classes.
   a. Selecting sample villages and sample farm households by stratified, random sampling.
   b. Interviewing farmers on land use, income, expenses, investment and other economic and sociological characteristics relative to the economic study of land use.
   c. Calculating and analyzing data collected from the farm management survey.
   d. Summarizing the results of the study by agricultural regions and economic land classes.

4. Drawing conclusions and making interpretations and recommendations for improving land use in the studied area.

Summary and Conclusions:

"An Economic Study of Land Use in Yunlin and Chiayi
Hsien, Taiwan" was started in August, 1962 by Shison C. Lee, Director of the Institute, with the assistance of Y. H. Yu, instructor, C. H. Lin and H. J. Hsia, research assistants.

Data concerning the natural features, type of farming, rural sociology, as well as materials in map form were surveyed and collected by staff members and students of the Institute. Agricultural land were classified into regions within which economic land classes were further demarcated.

It has been found that there are mainly two ways adoptable to increase crop production in Taiwan, they are: (1) the increase of tillable land, and (2) the increase of crop yields per unit of land. Both ways are closely related to the use of land. The land endowed by nature are not homogeneous, they vary from place to place and from time to time. The present use of land is the result of a long period of experimentation by farmers in an attempt to find the most profitable use of land of different characteristics. Land classification study is to be advocated in order to achieve a sound use of land in Yunlin and Chiayi Hsien, and to contribute to the maximum welfare of people in the present and future.

Yunlin and Chiayi Hsien as a whole is a well-drained area. The high mountains and the rolling hills are drained by the Chu-shuei chi, Hu-wei chi, Hu-weichi, Pei-kang chi, Po-tse chi, and Pa-chang chi and their branches. About 68 per cent of its inhabitants are farmers. The agriculture of this area has been highly developed. The principal agricultural products of rice, sweet potato, and sugarcane. Peanut, vegetable, soybean, wheat, corn, tobacco and lungyen are also being produced. The farming system in Yunlin and Chiayi Hsien is somewhat complex, but a great part of the western plain is controlled under the 3-year rotation system of Chia-nan great canal, which is known not only on the whole island but also in Eastern Asia, though the water supplied by this rotation system is not enough to irrigate the whole area in spite of the network of this canal. The results of this study can be summarized as follows:

1. Because of the complexity of land use in this area, other than the usual 4 types of farming regions classified in the
central part of Taiwan, one more region may be added to demarcate the land use in Yunlin and Chiayi Hsien. Thus the land in these two hsiens were classified into five agricultural regions, namely: the Rice, Rotational, Upland Field Crops, Upland Trees and Forest Regions.

2. Productivity of land varies from place to place. Economic land classes were classified to show the variation in productivity or income producing ability within each agricultural region. Only some land in the Rice Region were rated as Land Class 1 which is the most intensively used land and shows evidence of the highest income potential. Land that located in the Rotational Irrigation area were quite homogeneous in their productivities. All land in the Rotational Region were classified as Land Class 2, 3 and 4 with none of the land falls in the class of 1 and 5. Some of the land in the Upland Field Crops Region were quite intensively used and were classified as 2 and 3 but most of them belong to classes 4 and 5. Upland Tree Region is comparatively less intensively used area, thus neither Land Class 1 nor Land Class 2 falls in this region. The Forest Region was not classified in this study because on transportation facility was available to check its intensity of use.

3. Generally speaking, within the same farming area, due to the limited rainfall during the growing season, the irrigated land can be used much more intensively than the nonirrigated. The development of underground water for some relatively level land and the improvement of existing irrigation systems would undoubtedly increase the productivity of land.

4. Sample farms reported an average value of capital investment per farm of about N.T.$190,000 N.T.$173,000, N.T.$167,000 N.T.$170,000 for the Rice, Rotational, Upland Field Crops, and Upland Tree Region, respectively. The greater part of the capital investment was in land and buildings which accounted for about 97% of the total. Farm equipment work animals, and livestock made up the rest. This fact indicates that farmers have very little assets other than real estate and
are in need of more current assets including machinery for the improvement of their operations.

5. Chemical fertilizers constituted about 42, 35, 36, and 29 percent of the total direct (cash) production expenses for the Rice, Rotational, Upland Field Crops, and Upland Tree Regions, respectively. The farmer's urgent desire is to lower the barter prices of fertilizers by the government, so that their production costs would be reduced, and more fertilizers could be used. The use of more fertilizers will have a significant effect on the increase of agricultural production, thus it will raise the farmers' income.

6. With the small size of farm, farm labor cannot be fully utilized in the productive work around the year. It is suggested that dairy enterprise be introduced to farmers especially in the Upland Regions. Dairy cows will not only make labor distribution of farmers more even but also will improve nutrition for farmers and raise the farm income. The manure by-products of dairy cows will make the land more fertile and increase crop yields. In promoting the dairy enterprise, government farm programs should help farmers set up milk processing plants and organize the milk marketing cooperative associations.

7. The highest income is earned, on the average, by families who operate large farms on the best land. Therefore: (1) the area of farm should be increased wherever possible, (2) families with small farms should be encouraged to seek off-farm employments.

8. Farm income is not a very encouraging measure to farmers in this study area. The negative figures on less productive land within all regions imply that farms in those land classes were operating at a loss if the products consumed on farms are not included in the calculation. However, the variations of farm income among land classes and size of farms are consistent. Farm income tends to increase as the land improves.

9. For all income measures, their percentages relative to fixed capital were highest for farms in the Upland Field Crops.
Region followed by the Rotational Region. This difference in percentage of income relative to fixed capital among agricultural regions appears to be caused by the relative importance of farm privileges between the Rice and Non-Rice Regions. Therefore, it seems reasonable to conclude that farms which plant more cash crops or fruits tend to have higher percentage of income relative to fixed capital than those which plant mostly rice crop. However, family income, including off-farm income but not farm privileges, which averaged 7 per cent for all regions, appears to be more closely related to capital than to any other income measure.

50. An Economic Study of Land Use in Miaoli and Hsinchu, Taiwan
苗栗、新竹縣土地利用之經濟研究

Sponsor: The Asia Association
合作機構：美國亞洲協會
Author: Shison C. Lee
作者：李慶薰
Accomplished Date: 1964
完成日期：民國 53 年

Purpose of Study:

1. To determine the present agricultural regions based on land use patterns, natural features, and land area per family or per person.
2. To subclassify the agricultural regions by economic land classes, based on the intensity of use to which the land is adapted.
3. To make maps of agricultural regions and economic land classes for Miaoli and Hsinchu Hsien.
4. To make a farm management study in Miaoli and Hsinchu Hsien by agricultural regions and economic land classes.