

LAND UTILIZATION IN CHINA

中國土地利用

STATISTICS

統計資料



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# LAND UTILIZATION IN CHINA

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## STATISTICS

統計資料

A STUDY OF 16,786 FARMS IN 168 LOCALITIES,  
AND 38,256 FARM FAMILIES, IN TWENTY-TWO  
PROVINCES IN CHINA, 1929-1933

中國22省, 168地區, 16,786田場  
及38,256農家之研究 (1929-1933)



BY

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# LAND UTILIZATION IN CHINA

## 中國土地利用

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其他協助機關及人士均於本編序言中一併誌謝



## 序 言

統計資料為中國土地利用之第三編，得單獨應用，或與本論及地圖參用，其刊行目的在供各調查地區及一般從事研究工作而欲以不同方法分析該資料者之參考。

本調查起原，方法與範圍，及應致謝者之姓名，另詳第一編本論。

初，民國十五年太平洋國際學會在檀香山召開年會，美國農部農業經濟科貝克博士 (Dr. O. E. BAKER) 倡議研究中國土地利用，嗣乃在華盛頓草創研究計劃，十七年冬，太平洋國際學會研究股幹事康德利夫博士 (Dr. J. B. CONDLIFFE) 來華觀光，偕中國分會總幹事陳立廷先生參觀金陵大學，對於農業經濟系工作，頗相推許，比即委託本系擬具土地利用調查計劃，旋本系慎擬計劃，呈奉太平洋國際學會中國分會轉呈檀香山總會，提交美國社會科學研究委員會，介紹於洛氏基金董事委員會，申請資助，故研究費用，終以洛氏所出居多，高誼隆情，至堪感戴。

此項工作，乃太平洋國際學會中國研究事業之一部分，由金陵大學農學院農業經濟系負責主持之。

本書印費，由三機關分任，計太平洋國際學會中國分會捐助美金式千五百元，全國經濟委員會國幣貳萬元，中央銀行國幣壹萬五千元，而後兩機關所以出資刊印地圖集與統計資料者，則財政部長孔慶之博士勸募之力也。

楊君錦崇，助編統計，以底於成，工作清繁，不辭勞苦，彈盡可破。

本編章次，異於本論，祇以編訂先後，各有不同，一章既畢，所歸鉛字，即須再治，未遑久待。

地區排列，以八大農區為準，每項之地區數目，平均數，或其他統計數字，悉附每區，小麥地帶 (該地帶所有地區)，水稻地帶 (該地帶所有地區)，及全國 (本調查所有地區) 之後。

如某表某地無某項材料，或有之而不用者，刪其地名，用名篇。

本論各附註所載表次，常指統計資料與本論有附註者同名之某章而言。

### 名 詞 定 義

年齡 (Age) 除特別註明外，悉依西法計算，係指最近一次生日之年齡而言。中國年齡，惟視生日與新年之間係而定，無論生日，究在何時，每過新年，輒增一歲。故本表咸自中國年齡中減去一歲，俾與西洋各國相同，中國豐稔年在三歲或三歲以下者，恆以 (周) 計，不滿一歲者 (西法) 以月計，週者，一歲也。本青年齡依西法計算，而月份則依陰曆，中國習慣，除夕產兒 (午夜十二時前)，翌日即呼二歲。

家畜單位 (Animal Unit) 以每一黃牛為一標準單位，其他家畜皆視其食量，及所產量之多寡，化為家畜單位之倍數或分數，例如，豬五口，水牛一頭三之二，馬一匹，雞一頭，雞一頭，雞一隻，皆等於一家畜單位。

平均數 (Average) 即算術平均數，乃變數每一數值均能影響之計算數，本調查平均數大都以地區為單位，即將各地區之平均數再行平均之，此蓋因各地區農藝方式迥殊不同耳。

豆 (Bean) 即黃豆，惟各報告者，祇名之曰「豆」。

作物面積 (Crop Area) 即指田場中專種作物之土地面積而言。

作物公頃 (Crop Hectare) 乃同一年內同一地上所種各種作物之總公頃數，中國通行複種制，故一公頃之作物面積，常等於兩作物公頃，或尤過之。

作物指數 (Crop Index) 計算任何地區作物指數之法，係將各種作物一年間所佔之面積，一一乘該地區內各該作物之通常產量，所得總產額復以各該作物在全國之通常平均產量除之，則該地區各作物所得指數之和，即等於總產額依全國通常平均產量計算時所需之總面積，復以該地區生產各作物實需之面積除之，而以一〇〇乘其商數，即得該地區之作物指數。

例如甲地區棉花，稻米，小麥，黃豆等通常產量所需之土地面積為六〇公頃，而全國通常平均產量所需面積為九〇公頃，則該地區之作物產量指數為一五〇 (即  $60 \div 90 = 150$ )，又如某地區小米每公頃產量為一三三担，全國小米平均產量為一一九担，依其指數應為一〇九，是地區每年祇有一次播作，每公頃產量為二六公担，而全國平均產量為三三·七，則其指數為七七，故各地區作

物指數可以表明該地區某種作物之產量與全國平均產量多寡之比較，苟非各地區之作物種類不同，則不能比較其總產額絕對之數量。

幣制 (Currency) 除特別註明外，均以國幣元為單位，元銀每百 (上海) 兌換美金之平均率如下：

年份	兌換率
一九二九	美金四一·五一 (元)
一九三〇	二九·九〇
一九三一	二二·一四
一九三二	二一·四九
一九三三	二二·〇五
一九三四	二三·九一

家 (Family) 者指所有同居共食之親屬而言，或為大家庭包括場主與其妻之近親，如地主之兄弟，兄弟媳，姪男女，場主父母與雇工之屬；或為小家庭，祇場主夫妻及其子女。

田場 (Farm) 者包舉場主所耕或所管之全部土地，本調查中，田場乃場主及其家屬維持生活之唯一來源。

綠豆 (Green (Mung) Bean) 之學名為 *Phaseolus Aureus*。

戶 (Household) 者指所有同居共食之人而言，非親屬如雇工等，亦在其內。

縣 (Hsien) 者，乃一政治區域，與歐西之縣 (County) 同，每縣必有一城，與歐西縣治相似，冠以縣名，即縣政府之中心，本調查之 [縣] 均指全縣，非獨縣城而已，特別註明者，不在此例。

主要作物 (Important Crops) 即佔有全部調查地區作物公頃額百分之或一以上之作物。

人工等數 (Man-equivalent) 者，以一人在十二個月工作之等數計算人工數目之法也。此名詞在本調查中，不適用於田場工作，亦適用於一切副業，如某人家有副業，田場工作，及休閒時間，即以副業及田場工作所佔時間之比例，除其人工等數，例如一年間某人工田場工作時間為六月，副業四月，休閒時間二月，則該人工等數十分之六係田場工作，十分之四係副業，至於其休閒時間，假定係由該二種工作，各依時間之久暫所分給者，故田場工作，原可撥派七·二月，副業亦可撥派四·八月，農務工作之純粹屬於家事性質者，絕不計入，其田場及副業之月數須乘以〇·八，農務工作月數須乘以〇·五，雇工工作之月數，皆計入家庭勞工之人工等數中，以十二除總月數，即得人工等數，每田場之人工等數常係指田場工作而言。

平均數 (Mean) 即算術平均數。

中數 (Median) 即變數之各種數值依其大小順次排列時最中間之一數值，中數之中數乃各地區平均數之中數。

衆數 (Mode) 即變數數值中最常見之一數。

場主 (Operator) 即管理田場與通常參與等作之農人。

自耕農 (Owner) 即耕種已有田場之場主。

牛 (Oxen) 即中國之黃牛，凡母牛，閹牛及未閹牛皆屬之。

半自耕農 (Part Owner) 即業種已有及租種田地之場主。

大豆 (Soybean) 除特別標明外，概指黃豆而言。

符號 (Symbols)：

○ 指該問題之答案等於零。

— 該問題不適用，或答案未詳。

\* 為便利計，數目大小者不載入表內，均以星號表示之，其數目常小於一，十表示有此項情形。

佃農 (Tenant) 者祇有租種田地之場主。

本調查所用之度量衡制 (Weights and Measures) 係英國公制，國民政府最近頒布萬國公制為標準制，各地度量衡制並異殊多，為便於比較起見，已將各項材料折合標準制，計表內，各地區無須互相比較，故仍依當地原制，各地度量單位等數見第十二章第二表。

民國二十六年三月一日

調查總主任 卜凱



## PREFACE

This Statistical volume is the third volume of *Land Utilization in China* and may be used independently or in conjunction with the other two volumes, *Land Utilization in China and Land Utilization in China—Atlas*. It is published as a reference work for use in the localities surveyed and for research workers who wish to analyze the data in ways other than those presented in the first volume, *Land Utilization in China*.

Full details about the origin, method and scope of the study and acknowledgments are given in the first volume, *Land Utilization in China*.

The idea of a study of land utilization in China was first suggested by Dr. O. E. Baker of the Division of Agricultural Economics, United States Department of Agriculture at the Conference of the Institute of Pacific Relations held in Honolulu in 1926. A project was drawn up which called for the study of China's land utilization in Washington, D.C. Later, when Dr. J. B. Condliffe, Research Secretary of the Institute of Pacific Relations, visited China in the winter of 1928, he and Dr. L. T. Chen, Secretary of the China Council of the Institute, visited the University of Nanking. They were favorably impressed with the work of the Department of Agricultural Economics and asked the Department to submit a project on land utilization. A carefully planned study was presented. It was approved by the China Council and later by the International Research Committee of the Institute of Pacific Relations which appropriated from funds given by the Rockefeller Foundation a series of grants for the next five years. Grateful acknowledgment is extended the Institute of Pacific Relations for granting such a large proportion of its research funds to this study.

The project was administered by the Department of Agricultural Economics of the College of Agriculture and Forestry, the University of Nanking, as an integral part of the research program of the China Council of the Institute of Pacific Relations.

Besides the funds provided by the Institute, contributions to cover expenses of publication have been made by the National Economic Council (Yuan 20,000) and the Central Bank of China (Yuan 15,000). Deep appreciation is expressed to His Excellency Dr. H. H. Kung for his assistance in enlisting the support of the latter two organizations for the publication of the Atlas and the Statistical volumes.

In the preparation of this Statistical volume, special recognition is given Mr. Ming-tsung Yang who has assisted in the tedious process of preparing this large amount of data for publication.

The arrangement of the chapters is not in the order of the text for the simple reason that their completion was not in that order and type had to be melted down as each chapter was finished. Table numbers begin with each chapter.

The localities are arranged by the eight agricultural Areas. The number of localities studied for each item, and the averages, or other statistical measures, are printed after the name of each Area, and also for the Wheat Region (for all localities in the Wheat Region), for the Rice Region (for all the localities in the Rice Region) and for China (for all localities in the study).

In some tables where information does not apply, or exist, the names of the places have been omitted in order to save space.

References to the table numbers in the first volume, *Land Utilization in China*, always refer to the chapter in the Statistical volume with the same title as the chapter where the reference is made.

### DEFINITION OF TERMS

*Age* refers to age last birthday according to Western methods of computation, unless otherwise indicated. Ages in China depend on the relation of the time of birth to the Chinese New Year. A year is added to a person's age on each New Year's day rather than on the birthday itself. In this table one year has been subtracted from the Chinese age, thus making the data equivalent to age at last birthday as obtained in Western countries. A Chinese child of three years or under may have its age given in terms of "chow" (粥) or, if under one year (Western), in months. The term "chow" is equivalent to one year. An infant born on New Year's Eve (before 12 midnight) is two years old the next day.

An *animal unit* is estimated by taking the ox as a unit. Other animals are reduced to animal units by considering an equal amount of feed eaten and manure produced as being equivalent to one unit. Thus five hogs, two-thirds of a water-buffalo, one horse, one mule, two donkeys, or 100 chickens, equal an animal unit.

*Average* is the mean, or arithmetic average, and is a calculated number affected by every value of a variable. Averages are computed for the most part by localities, that is, by average of averages, because the type of farming varies with the locality; for this reason the locality is the unit taken.

*Beans* are usually soybeans although the reporters only gave the general term "beans."

*Crop area* represents the land area devoted to cultivated crops.

*Crop hectare* refers to the number of hectares of different crops raised in one year on the same land. Since double cropping is often practised, one hectare of crop area may be equivalent to two or more hectares.

*Crop index*: in constructing the crop index of any locality the areas of the different crops grown during the year are multiplied by the most frequent yields of each crop in that locality. The production so obtained is in each case divided by the average most frequent yield of that crop in China. The total of the results for the different crops in that locality is the area that would be required, at average most frequent yields in China, to yield the given production. This area is divided by the area actually required to produce the crops in the locality, and the result is multiplied by 100 to give the crop index for the locality.

For instance, if 60 hectares of crops in locality "A" produce at locality A's most frequent yield the amounts of cotton, rice, wheat, soybeans, etc., which would require 90 hectares at average most frequent yields of all China, then 150 is the index of crop yield for the locality ( $\frac{90}{60} \times 100 = 150$ ).

For example, a locality growing only millet and having 15 quintals per hectare as its most frequent yield would have an index of 109, since the average most frequent yield of millet for China is only 11.9 quintals. A locality growing only a single crop of rice and producing 26 quintals, per hectare as its most frequent yield would have an index of only 77, since the average most frequent yield of rice for China is 33.7 quintals. The figure for any locality shows, therefore, whether its yields are higher or lower than the average for China for the crops it grows, but it does not enable a direct comparison of absolute amounts of production except between localities growing the same crops.

The currency in which values are given is Chinese silver currency (silver dollars, or yuan) unless otherwise indicated. The average bank exchange rate (Shanghai) of one hundred U.S. dollars into Chinese silver currency was as follows:—

Year	Rate	Year	Rate
1929 ... ..	US\$41.51	1932 ... ..	US\$21.49
1930 ... ..	29.90	1933 ... ..	26.05
1931 ... ..	22.14	1934 ... ..	33.91

*Family* is a term used to include all relatives living and eating together. It may be either the larger family, which includes near relatives of the operator and his wife, such as operator's brothers, brothers' wives and children, and operator's parents, employees, and so forth, or it may be the family consisting only of husband, wife, and their children.

A *farm* includes all the land worked or managed by one operator. In these studies the farm is the primary source of support for the operator and his family.

The *green (mung) bean* is botanically known as *Phaseolus aureus*. A *household* consists of all persons living and eating together, including non-relatives, such as hired laborers.

A *hsien* is a political division corresponding to a county. Each hsien has a city, like a county seat, which bears the name of the hsien and is a center of government for the hsien. Throughout this study the hsien names refer to the hsien rather than to the hsien city, unless the latter is so specified.

*Important crops* are crops occupying one per cent or more of the crop area in all the localities studied.

*Man-equivalent* measures the number of workers in terms of the equivalent of one person doing the work for a period of twelve months. The term in this study was used not only to apply to farm work but also to subsidiary work. If a person works only six months on the farm but does no other work he is considered as giving a full year to farm work. If a person has subsidiary work, farm work and idle time, the man-equivalent is divided between subsidiary work and farm work in proportion to the time occupied on each. For example, a man doing farm work six months of the year, subsidiary work four months and who is idle two months is computed as six-tenths of a man-equivalent for farm work and four-tenths for subsidiary work. It is assumed that his idle time is supported by his two occupations in proportion to their respective lengths of time. Therefore, 7.2 months may be allocated to farm work and 4.8 months to subsidiary work. In the case of farm and women the time spent in purely domestic work is not counted at all and the months of farm or subsidiary work are multiplied by 0.8, while the months of farm children's labor are multiplied by 0.5. The months of hired labor are added to the man-equivalent of family labor and the man-equivalent is found by dividing the total months by twelve. Man-equivalent per farm always refers to farm work only.

*Mean* is synonymous with the arithmetic average.

*Median* is the mid-most, or central, value of a variable when the values are arranged in order of magnitude. Medians of medians are used for median by localities.

*Mode* is the value of a variable that occurs with the greatest frequency.

*Operator* refers to the farmer who manages the farm and who usually participates in the manual labor.

The *owner* is an operator who works his own land.

*Oxen* refer to the "yellow cow," the literal translation from the Chinese. The female cow as well as the castrated and non-castrated animals are included in the term oxen.

A *part owner* is an operator who works his own land and rented land.

*Soybeans* are the yellow soybeans unless otherwise designated.

#### Symbols:

- 0 The answer to the question is zero.
- The question does not apply, or the answer is unknown.
- For convenience of publication very small amounts have not been recorded in some tables, and such cases are indicated with a star. Usually the amount is less than unity.
- † Signifies that the item occurs.

A *tenant* is an operator who works rented land only.

The system of weights and measures used in this study is the metric system. The National Government of China has recently adopted a system based upon fractional units of the metric system. The variations in local weights and measures are so great that for comparative purposes it is absolutely necessary to have the data put into some standard system. In a few tables where comparisons between localities are not made the local system has been kept. The equivalents of the local weights and measures are shown in table 2 of Chapter XII, "Sources of information."

JOHN LOSSING BUCK,  
Director of the Survey.

MARCH 1, 1937.







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# CHAPTER I.—CLIMATE

## ACCESSIBLE WEATHER DATA

The data concerning Chinese climate are notoriously inadequate and fragmentary in distribution. The number of meteorological stations in each province is shown in table 7. The list of stations (table 8) is chiefly composed from the following nine sources of data which are in print and accessible to the enquirer.

### NINE SOURCES OF WEATHER DATA

- (1) "La Temperature en Chine" (pub. 1918, data to end of 1916), *Observatory of Sincawei, Shanghai*, contains a great variety of data for each day of the year and monthly and annual means for each of 100 stations. Data for some stations go back to the seventies and eighties; for others they cover two or three years for reliable conclusions. Some of the calculations need re-checking. This big work and source 7 are the only readily accessible sources for temperature work.
- (2) "Etude sur la pluie en Chine" (pub. 1928, data to 1924 or 1925, or occasionally, 1926, according to station), *Observatory of Sincawei, Shanghai*. "Atlas: distribution de la pluie en Chine" pub. 1928; many maps and charts illustrating above. Period of years covered, and therefore reliability of the means, varies greatly for the 178 effective stations involved. It gives the number of days of rain and total rainfall for each month, with heaviest day's fall in each year, and with monthly, seasonal, and annual means, some variability co-efficients and much other material and maps.
- (3) The North China River Commission has in its possession an important compilation of data month by month for about 70 rainfall stations. It includes the work of the Chihli River Commission which has passed under various controls. It is at present responsible to the National Economic Council, Nanking. An investigator personally applying there is generously allowed to borrow this blue-printed data.
- (4) Report of Commission on the Hwai River and Grand Canal area 整理淮閘閘閘報告 (民國十八年八月建設委員會編製商務印書館印) Published by National Reconstruction Bureau 1929 and printed and sold by the Commercial Press. In Chinese only. Unfortunately only the monthly and annual means for rainfall are given, but the years covered are indicated. For some of the stations probably the data were not complete for those years as for instance, study of the same original data producing some of the means printed in source 8 suggests. The information is found in table 19 of the Report; and map 9 shows the location of the 40 stations covered.
- As sources 3 and 4 are later compilations, they are valuable for certain stations as supplementing data covering an insufficient period in source 2. The concluding date of the data used in source 4 varies from 1924 to 1927 for most of the stations though for some it is not even as late as 1924. For more than half of the data in source 3 the concluding date is 1929 and a good deal of the remainder runs to as late as 1926-28.
- (5) Yangtze River Commission Reports (1924-1932), Nanking. These cover 21 rainfall stations (most of them important as being far inland in the west), though there are not seven years data for some of the stations. The fourth report gives 1924 and 1925 monthly data, the fifth report gives 1926 data in diagrams only (tables 125 seq.) and the sixth and seventh reports (combined) cover 1927 (p. 22 of 6th) and 1928 with means 1924-1928 (p. 27 of 7th). The eighth report gives 1929 and means 1924-1929 (p. 27 of 8th). The ninth report, 1930 and 24-30 means. The tenth and eleventh reports for 1931-32 give means for 1924-1932. As alternatives to those bulky reports, which contain much other quite different material, blue-print sheets covering most or all of this rainfall data are sometimes available. A limited amount of this material is most generously supplied free to investigators from the Commission's Office.
- (6) *Revue Mensuelle de l'Observatoire de Sincawei, Shanghai* (82 per year, 12 numbers each), also valuable as supplementing source 2, especially as the stations involved are nearly all different from those covered by sources 3-5. Rainfall totals for about 70 stations are given for each month. No monthly means are given as in the excellent work of source 1 until 1932.
- (7) "Observations Météorologiques faites à les stations des chemins de fer Chinois de l'Est (Mandchourie du Nord) et d'Oussouri". Obtainable from the Meteorological section of the Chinese Eastern Railway at Harbin. Report covering 1909-13, pub. 1914. Of the issues of 1915-17 each covers the previous year (and a little further accumulated material) 1919, 1921 and 1922 cover 1917, 1918 and 1919. Two issues in 1923 cover 1920 and 1921. The above are in Russian and French; the following in Russian and Esperanto. Two issues in 1929 cover 1922-26, and 1927-28 respectively.
- Twenty stations are involved, the data for 14 stations beginning in 1909 (though five of these, in Siberia, appear only in 1920) and for the remainder in 1914 or 1916. A wide range of information about pressure, winds, humidity, temperature, frosts, and precipitation is fully and carefully given.
- (8) Reports of the Chinese-Foreign Yunnan Relief Committee, 12 Jinke Road, Shanghai. Obtainable free by investigators. That published during 1929 covers May 1926-Dec. 1928 (means only). The 1929 and 1930 rainfall reports were each published early in 1930 and 1931. About 25 stations are included, many of them the same as those of source 4, the rainfall data of which are thus continued.
- The fundamental climatic work for the present publication was based chiefly on sources 1 to 8, completed November 1931 and published in November 1932 and March 1933. Access to the MSS. of source 9 was kindly granted in 1935.

\* Sources 1 and 2 (1931) volume on "The Winds and Upper air currents along the China Coast and in the Yangtze Valley".



## 第一章 氣候

### 現有之氣候記錄之來源

關於中國氣候之記錄，因區域劃分無常，故不甚適用，是為吾人所共知。各省氣象所數目業已於第七頁中載明。所列各所，大多由下列九種來源之記錄中搜集而得，茲一舉出，以資參証。

### 氣候記錄之九種來源

- (1) "La Temperature en Chine" (Pub. 1918, data to end of 1916).  
上海徐家匯天文台。  
其中包括一百所每年每月每日不同之氣溫記錄。有數所之記錄，皆始於 1870 或 1890 年間。其他則包括之年代太少。結論或不可靠。一部份之計算，須要複算。此項偉大工作及材料第七頁為吾人研究中國氣溫方面唯一可靠之材料。
- (2) "Etude sur la pluie en Chine" (Pub. 1928, data to 1924 or 1925, or occasionally 1926, according to station) 上海徐家匯天文台 "Atlas: distribution de la pluie en Chine" Pub. 1928 其中曾有不少圖表及註釋。包括之年代亦復不短。是故所有之一七八所之平均數，變化極大。每月雨量及降雨日數 每年雨量最多之日期。每年每季每月之平均雨量，相關係數之計算，以及其他材料及圖表，均極豐富。
- (3) 華北水利委員會現有極完全之材料。係將七十所按月之記錄，編纂而得。此會原名直隸水利委員會。已有多年之歷史。故一部份工作，係早年完成者。然今已改隸全國經濟委員會矣。是以全國經濟委員會之調查員，得向其借用此項記錄材料。
- (4) 導淮委員會報告。  
其中只有包括之年限，及每年每月之平均雨量，並無每日之記錄。有數所之記錄，並非按年完全皆有。例如用此項報告之記錄，即可算出材料第八中之平均數字。此材料可於該報告中第十九表查出。同時第九圖表示報告中四十個氣象所之分佈地點。
- (5) 及 (4) 均為較近之材料。故其記錄，很可用以補充材料第二之記錄年份不足之數所。材料第 (4) 各所記錄之計算年度，自 1924 至 1927 不等。惟一部份均在 1924 年以後。材料第 (3) 過半數記錄之計算年度，均為 1929，其餘多在 1926-1928 之間。
- (6) 揚子江水利委員會報告 (1924-1932)。  
此報告係包括 21 所 (其中重要之所，多位於我國西部內地) 然有數所之記錄，尚不滿七年。其第四圖表，關於 1924 與 1925 年之每月記錄，及第五次報告，關於 1926 年之記錄。均係圖表式 (Table 125 seq) 第六次與第七次合併之報告，包括 1927 (p. 22 6th) 與 1928 年，以及自 1924 至 1928 (p. 27 of 7th) 年之平均數。第八次報告 1929 及 1924 至 1929 之平均記錄。第九次報告 1930 年及 1924 至 1930 之平均記錄。第十及第十一次報告 1931 至 1932 及 1924 至 1932 之平均。如吾人需要一較簡明而內容更豐富之材料，則 Blue Print Sheet 當可用以代此。蓋彼已完全包括所有之記錄也。此會雖免費供給材料與該委員會之調查員，然所取費用，甚為有限。
- (7) Revue Mensuelle de l'Observatoire de Sincawei, Shanghai (Years 1925-1930).  
亦可用以補充材料第 (2)，特以其中包括之各數，與全圖材料第 3-5 者不同。約有七十所。每月雨量之總計，在 1932 年以前，並無與材料第 (1) 中之每月平均詳細記錄。
- (8) Observations Météorologiques faites à les stations des chemins de fer Chinois de l'Est (Mandchourie du Nord) et d'Oussouri. 此項材料，可由哈爾濱中東鐵路附近調候所索得其中包括自 1909-13 之報告。1914 出版。  
凡自 1915-1917 年開出者，每刊均含有上一年之材料 (及少許累積之材料)。1919, 1921 與 1922 則包含 1917, 1918 與 1919, 1923 年有兩刊包含 1920 與 1921，上述各刊，均係俄文及法文。1929 年之兩刊，包含 1922, 1926 1928 包含 1927，此數刊即為俄文與世界語。其包括二十所內有十四所成立於 1909 年 (其中在西伯利亞之五所 1920 年始成立) 其餘則成立於 1914 或 1916 年關於風量，風向，濕度，霜降，及雨量，搜集材料之範圍頗廣，且記錄亦詳細而完全。
- (9) 中國華洋義賑會報告。  
此項報告調查員均得取用。在 1929 年公佈者，包括一九二六年五月至一九二八年十二月 (凡有平均數) 之記錄。一九二九及一九三〇年之雨量報告，均已分刊於 1930 及 1931 公佈。其包括廿五所。此廿五所中，多數均與材料第 (4) 相同。是故其雨量記錄，可與材料第 (4) 中之記錄相連讀。  
吾人現今發表之氣候方面之統計，大部份係根據上述一至八之材料。此項工作，皆始於一九三一年十一月，而自一九三二年十一月及一九三三年三月，皆有出版。  
材料第九至一九三五年始准採用。



(9) "The Chinese Rainfall," *Coching Chu, Institute of Meteorology, National Research Institute, Nanking*. 中央研究院氣象所。

This source gives average monthly and annual means and highest and lowest annual precipitation for over 350 stations, 103 of which are new stations not covered by other sources. These are chiefly for 1930 to 1933 only, and the positions of most of these new stations, chiefly in Shantung and Chekiang, are shown in atlas maps for supplementary rainfall stations, 18a and 18b.

The notes to tables 1, 6, and 8 show additions made to other data, or data available from this source, but not always used in actual averages given in the tables, particularly if averages already calculated from previous sources were based on many years of data. But the existence of such available data is noted in tables 1, 6, and 8. In other cases the means from source 9 and the number of years' data used in calculating the mean are given in table 6, notes.

This source, in calculating means, has not used any available month's data unless data for every other month of that year were available, but such rejected months are still shown in the tables of source 9. See especially note 1 to table 8.

The maps in source 9 showing mean monthly and mean annual rainfall are based on 120 stations and on the eleven years 1922-32 only in order to have comparable years, but even some of these data are not used owing to the editor's objection to including any of a year's data when one month is missing.

The most useful of the new stations in areas not represented by the older established meteorological stations are given in footnote (f) to table 6.

Source 1 also included 13 stations in Korea, Formosa and a hundred or so miles off the Fukien coast not listed in table 8. Those who wish to study neighbouring climatic influences to the East and North of China will also find ample data in Japanese and Russian Imperial publications (all in Sreawei Library). These publications also include a few stations in China (e.g. Shai Peiping and places in Manchuria), but as such data are apparently paralleled for the same or neighbouring stations in the nine sets of data listed, and have only been referred to occasionally in this investigation for special minor points, the publications are not listed.

As to the first sources of the original data, most current publications, especially periodicals, do not consider necessary to give any indication, nor is the copying or calculating always accurately done. But sources 1 and 2 carefully indicate their authorities in a preface list for source 1, and better for each station in source 2. Some of the other publications (e.g. sources 3 and 5) also indicate their authorities, though usually, when they do so, less clearly. Apart from the mass of steady customs records, nearly all on the coast and along the Yangtze River, the largest group supplying data is that of Roman Catholic missionaries, working with scrupulous care and often continuing their observations under circumstances of considerable danger and anxiety. Gaps in the data sometimes indicate the breaking of the instruments by war, or a bandit raid. Other missionaries in still other distant or inland stations have supplied further figures, as have a very few educational institutions. Still other data come from the Chinese Eastern Railway, the South Manchurian Railway (probably more could be got by personal application at Mukden), and a few commercial enterprises such as the mining administration at Tangshan.

Other agencies, whose collected results are embodied in source 2, are the "Board of Conservancy works of Kwantung" (23 stations usually for 1918-26) and the "Commission for the improvement of the river system of Chihli" (up to 1925, see notes on source 3). To the Government meteorological agency we are indebted for rain and temperature records for part of a year each from Tihwa and Turfan in Mongolia and 74 years of Peiping temperature. In the regular bulletin *Synopsis* data issued by the Pei-Chi-Ko Observatory, Nanking, barometric and other information for about 20 to 25 places in China is given, but not the rain and temperature data of the kind used by our present enquiry. Other most interesting North-western temperature data are included in the meteorological sections of Sven Hedin's "Scientific results of a journey in Central Asia 1899-1902" (in German, Stockholm, Swedish General Staff, or London, Dulau & Co., 37 Soho Sq.) Most of these records are unusable for our purpose, because taken at different places and heights every day, and because at the few fixed stations too short a period is covered. But, apart from the results for Jangi-kol, Temirlik, Tcharklik (6, 5, and 4 months respectively), Nerchinsk, Petrowski (16 and 14 mos.), Urga and Chita (one year each) there is also listed in table 5, Spring Wheat Area under the rough caption of Sining, combined monthly means for one journey in Nov. (37° N. 97° E., W. of Koko-Nor to Sining) Des. (Sining altitude varied from about 3,000 to 1,200 meters. Nineteen sheets from the end of the Vol. V, pt. 1 and 2, are mean temperatures for various other stations in Sinkiang, Outer Mongolia, neighbouring parts of Siberia and India, etc. as Kashgar, Tashkent, Irkutsk and Kuluk, Mondy, Sibsagar (34° 40' E. 26° 55' N.).

Table 8 looks impressive, but closer examination will show how few years the data for some stations cover, and inserting them on a map reveals the wide areas without facts of rainfall or of temperature. The system of romanization used by sources 2, 5, and 8, which is in general that of the Post Office, has been followed. The French and Russian forms of sources 1, 6, and 7 have been changed into it, and romanizing of the Chinese characters of sources 3 and 4 has, as closely as possible, been done on the same system. We are not responsible for the grammar of the title of source 7, which has been copied as it stands. The British General Staff map has been usually followed for locations. Sheets 34 (China 5-1), 23 (Manchuria 4-6) and 22 (Mongolia 4-5-1) are obtainable from E. Stanford Ltd., 12 Long Acre W. C., London; or from Kelly & Walsh, Shanghai, for about the same price in dollars as shown in shillings above. When latitude and longitude figures given in some of the following publications indicate a different location, it may be that they were inaccurately calculated or read off another and probably less accurate map. However, one feels no certainty of exact placing of some stations, especially the smaller ones in Hopeh and in the Hwai basin.

(9) 中國之雨量 南京中央研究院氣象所出版。

此項材料有三百五十餘所。每年與每月之平均雨量。及一年中最多與最少雨量之記錄。其中有一百〇三所並未包含在此材料中。大半均為一九三〇至一九三三年間成立者。且大半位於山東及浙江兩省。可參看補遺氣象所之地圖冊 18a 與 18b。第一及第八表之附注中有關於其他記錄之補註。但計算各表現在之年平均數有時未曾應用。因平均數係從前數種材料計算而得者。則已有多年之記錄為其根據也。但此種有用之記錄仍存在於第一及第八表。

此外由第 9 種材料算出之平均數。及計算是項平均數用若干年之記錄均載於第六表之附注中。

材料第 9 計算每年平均數時。如有一月之記錄不適用。則其他各月之記錄全不採用。但於各表中。凡足與被棄之月份。仍照數列入。可參看第八表附注。

材料第 7 中表示每年與每月之平均雨量。此係根據一百二十個十一個年份 1922-1932 之記錄作成。採用此年數者。蓋所以便於自相比較也。但某年如遺漏一月編輯者即不採用此年份。故是項記錄中仍有不少未曾採用也。凡各處原先無新氣象所者。均列於第六表附注 (b)。

凡各處原先無新氣象所者。均列於第六表附注 (b)。

材料第 1 亦包括高麗。台灣及福建諸島一帶之二十三個氣象所但均未列入第八表。凡欲研究中國所受東亞及北亞區域之影響。均可於日俄兩國之出版中求得豐富之材料 (此兩書均在津海關圖書館內)。其中亦包括中國數所 (即山西西北及滿洲數處) 但因其記錄與上述九種材料之記錄性質相同。惟解釋時須注意各點時需要參照此書未列入上述諸項材料以內。

關於第一個記錄之最初材料。多係各報刊布。特別是定期刊布但須刊布並未將其來源明。係抄錄。抑係計算是故未必確無誤也。但材料第 1 與第 2 則將各所記錄之考據詳列於首頁。其他出版物 (如材料第 3 與第 5) 亦曾載明考據源頭或有不詳詳。除大部份係海關記錄外。其餘長江沿岸之記錄材料大多由羅馬天主教之傳教士供給。彼等極為負責。即在相當危險與不安定之時期之下。彼等仍繼續其詳細之記錄。即或記錄中有間斷之處。乃因兵災與砲火使儀器損壞無法記錄其他處於險惡之氣象所。亦多由傳教士供給記錄。因該地少有教育機關也。此外中東鐵路。南滿鐵路 (如以個人資格請求或能於滿洲獲得較多之記錄) 以及少量之商業機關如唐山礦務管理處均曾供給記錄。

其他代辦機關所獲之記錄。已包括在材料第 2 者。為廣東河委員會 (自 1918-1926 有廿三所) 及護理河委員會 (其記錄止於 1925 參看材料第 1)。兩處之工作。蒙古之吐蕃 (Turan) 及新疆之迪化 (Tihwa) 一部份時間之雨量與氣溫記錄與北平七年半之氣溫記錄均係政府測候機關所供給。是項記錄載於南京北極閣天文台出版之定期刊 "Synoptic data" 上。此刊包括中國廿五個不同地點之氣象等氣象材料。但其雨量及氣溫記錄。與吾人現今所討論者不同。所有極有趣之西北氣溫記錄可於 Sven Hedin 氏所著 Scientific results of a journey in Central Asia 中見之 (in German, Stockholm, Swedish General Staff or London, Dulau & Co., 37 Soho Sq.)。此類記錄因工作之地點不一致。每日工作情形之極度不同。以及有數所包括之年限太短。故對吾人不多適用。但除 Jangi Kol, Temirlik 及差底等處 (六個月。五個月與四個月)。Nerchinsk, Petrowski (十六個月十四個月) 庫倫與赤塔各一年) 之記錄外。夏夏一帶寒暑表有三個月之總平均數。十一月 (自南甯至青海之西北 37 度東 97 度) 十二月 (自南甯至成都及藏番屬) 正月 (自蘇北至南) 已列入第五表。其高度自三千至一千二百公尺不等。Vol. V, pt. 1 與 2 中最後十九頁均係新疆外蒙古。西北利亞與印度鄰近地帶等。如疏附。Tashkent, 伊爾庫次克。及 Kuluk, 查道。Sibsagar (東 94 度 40 分。北 26 度 55 分) 等地各所之平均氣溫記錄。

第八表表列甚佳。但吾人仔細觀察。即可知其各所記錄。包括年代之短致使地圖之一大部份。無氣溫及雨量之記錄。材料第 2 第 5 及第 8 所載之羅馬制 (Romanization) 係郵政普通採用之一種制度。材料第 1 第 6 及第 7 之注釋。業已改或此制。材料第 3 第 4 之中文。亦已同樣改寫羅馬字。對於材料第 7 之名稱。文法上無錯誤。吾人概不負責。當編圖時。所用之地圖係 British General Staff Map 第 34 張 (S. China) 第 23 張 (4-6 滿洲) 及第 22 張 (4-5。蒙古) 可於下列各處 E. Stanford Ltd. 12 Long Acre W. C. London 或 Kelly & Walsh, Shanghai 以同樣價格購得 (用銀洋)。

如下列各節中發現有以羅漢字代表地名者。乃表示一種特別之地點。其計算或不精確。或此係由一不甚準確之地圖上抄來者。當然對於任何一所在地圖上之真正位置無人能知。惟尤以河北與河南流域之各小所為然。



TABLE 1. PRECIPITATION 第一表 雨量

Number of station 站號	Name of rainfall station 各站名稱	Number of years of data 記錄年數	Mean rainfall by months to nearest millimeter (25.4 mm. = one inch) for conversion to inches see table 4 每月平均雨量 (25.4 公厘等於一英寸) 公厘化英寸見第四表												Mean rainfall by seasons (in) 各季平均雨量				Annual totals 全年雨量總計			Greatest rainfall recorded in 24 hours 二十四小時內之最高雨量		Neighbouring stations not in this table (in inches) 未列入本表內之鄰近各站雨量		
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Winter Dec.-Feb.	Spring Mar.-May	Summer June-Aug.	Fall Sept.-Nov.	Mean	Max.	Min.	公厘	日	站名		
			一月	二月	三月	四月	五月	六月	七月	八月	九月	十月	十一月	十二月	全年	全年	全年	全年	平均	最高	最低	公厘	日	站名		
Spring Wheat Area 春麥區																										
T10	Taihuo	代河	8	5	1	3	18	24	38	114	76	30	7	3	4	10	45	228	40	323	440	—	70	127	dC2, G37	
T12	Huyuan	淮源	4	4	3	8	23	37	40	102	67	34	13	9	4	11	68	209	56	344	485	219	63	218	dC2, G37	
T13	Taiyuan	太原	7	1	4	7	13	40	42	102	83	36	22	5	2	7	60	227	61	335	516	225	129	8	T16, R 14	
C6	Yangchaping	楊家平	5	2	2	10	18	30	76	212	173	35	10	8	4	8	58	459	83	578	1000	435	120	18	G17, G51, 25, G37C5	
C1	Houli	侯家	4	2	7	10	17	46	158	107	28	8	8	4	10	34	311	44	399	625	249	121	127	dC2, G37		
C4	Sweater	西園寺	18	3	3	9	10	53	56	91	53	38	18	7	4	10	72	200	63	345	918	163	123	30	dC3, G37	
C2	Kajon	家園	102	3	2	5	6	33	46	124	79	28	12	3	3	8	44	249	43	344	544	133	103	107	Dino	
V4	Kueichang	歸化城	101	2	4	6	7	28	37	67	113	60	18	5	2	8	41	237	83	369	444	225	56	129	dC3, G37	
V2	Sarai	賽拉	102	2	4	8	8	23	45	98	74	52	14	3	5	11	30	217	69	336	434	170	137	136	—	
Average (excluding G1)																										
Winter Wheat-millet Area 冬麥小麥區																										
A7	Sun	孫家	8	10	8	16	45	51	60	83	128	38	29	8	10	28	112	280	85	505	764	295	136	510	dC3, T15	
P16	Shenow	申家	6	5	3	14	21	37	57	103	101	67	39	5	4	12	92	264	100	467	674	187	87	2	T13	
T4	Lun	倫家	7	9	7	11	31	31	42	49	177	88	51	17	5	7	23	84	314	73	494	675	392	66	317	T13
T3	Lianchow	連家	4	3	1	10	16	36	34	125	84	40	13	11	7	7	67	264	64	381	468	300	69	117	dC2	
T3	Pingtingchow	平定城	6	4	5	5	8	23	47	159	124	54	20	7	5	14	36	330	81	461	613	—	64	127	dC3, T11	
T6	Pingno	平定	10	4	4	10	29	28	31	83	80	42	13	8	6	14	67	194	63	338	515	202	92	218	dC1, T11	
T12	Taiyuan	太原	10	6	3	7	15	27	47	114	89	62	15	8	6	12	40	250	59	370	468	285	54	157	T11	
T10	Sinchow	新定	10	2	3	11	20	26	46	148	108	40	11	8	4	9	7	300	59	427	501	285	88	8	—	
Average (excluding G1)																										
Winter Wheat-kaoliang Area 冬麥高粱區																										
M26	Sachin	沙家	109	20	26	26	34	33	103	237	164	61	22	14	17	63	93	504	97	758	—	—	122	317	AlxH4, 24	
M29	Tanghai	唐海	77	16	19	24	41	44	121	201	104	139	11	15	20	55	109	426	165	755	—	—	—	—	—	
M2	Chow	周家	77	54	48	36	31	39	49	209	107	37	24	16	12	143	136	348	77	704	—	431	80	—		
M9	Koushangchi	口上村	97	4	27	58	92	53	47	126	135	29	28	14	60	112	203	308	71	694	891	533	—	—		
A10	Nanhuichow	南河村	32	10	21	31	50	2	53	132	161	14	29	7	20	31	552	100	370	170	170	170	170	170	—	
M6	Huachow	華家	132	18	28	29	37	26	68	158	125	76	40	18	19	65	92	351	134	642	794	350	—	—		
A17	Yinchow	銀家	109	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	—	
A12	Pocho	坡家	77	34	30	38	33	59	104	219	105	71	21	21	7	11	107	106	235	49	—	—	—	—	—	
P4	Chowchiao	周家	77	54	48	36	31	39	49	209	107	37	24	16	12	143	136	348	77	704	—	431	80	—		
P20	Sinchow	新定	7	20	11	21	30	2	53	132	161	14	29	7	16	47	79	366	50	536	700	—	60	—	—	
F1	Changkai	長家	47	8	16	12	32	37	31	239	72	42	8	2	2	26	80	344	52	502	—	—	—	—	—	
F10	Kailang	凱家	8	16	15	15	27	24	40	197	154	34	24	10	41	66	391	68	566	1120	351	95	—	—		
F14	Ming	明家	3	27	20	34	89	42	106	59	179	25	31	3	48	15	44	66	391	68	566	1120	351	95	—	
U16	Talinguo	塔家	359	11	10	20	38	41	85	156	147	84	33	21	16	36	99	388	137	661	1359	367	167	—	—	
U14	Promitory S.E.	塔家	381	10	11	20	40	45	78	164	152	81	32	34	17	38	105	394	146	683	1135	360	189	187	—	
U1	Chesoo	查家	381	11	17	26	33	33	60	156	164	46	25	19	17	41	76	386	118	620	977	361	259	286	—	
A11	Pocho	坡家	5	20	10	15	17	27	45	173	334	82	29	11	11	61	33	82	330	82	380	—	—	—	—	
P24	Weliwei	魏家	7	11	6	7	29	33	63	202	103	64	24	15	1	18	69	358	65	302	647	300	179	—	—	
G29	Tien	田家	7	19	10	15	13	10	61	145	78	12	11	11	1	45	71	161	87	501	867	122	108	—	—	
G24	Shuneh	申家	6	3	15	26	30	29	261	118	16	14	12	1	1	45	71	161	87	501	867	122	108	—	—	
U10	Lingning	寧家	11	19	6	7	14	20	45	150	117	25	12	11	6	31	41	312	48	432	704	190	154	177	—	
U11	Lokoo	洛家	11	11	7	11	11	22	46	162	120	28	20	10	18	30	328	58	455	871	253	109	187	—	—	
U12	Tien	田家	7	10	11	18	42	84	235	156	69	15	8	5	22	71	146	92	581	1021	348	165	167	—	—	
G30	Sinchow	新定	8	7	5	10	16	20	55	144	119	23	5	8	5	18	46	318	36	418	575	312	117	256	—	—
G127	Huoh-shing	霍家	5	0	6	8	15	20	51	158	151	31	14	0	6	43	360	45	454	563	335	80	227	—	—	
G9, 2 Hsien-Chung																										
G22	Paoing	堡家	7	7	3	7	15	21	30	202	152	29	11	8	2	12	43	393	48	496	664	283	248	127	—	—
G18	Hsienchen	咸家	351	4	12	43	12	43	12	129	129	38	8	9	4	11	41	53	468	28	270	150	231	17	—	—
G38	Tientsin	天津	351	4	2	10	17	27	64	174	133	48	16	10	3	9	53	371	74	509	796	283	124	6	—	—
G23	Paoing	堡家	7	19	28	9	22	73	264	152	60	19	7	10	1	52	469	86	637	1084	168	225	297	—	—	—
G46	Yuen	袁家	16	6	0	3	19	21	50	201	197	32	14	4	6	12	43	338	50	643	746	300	109	118	—	—
G5	Chingwang	程家	7	3	3	16	16	61	71	193	188	80	27	14	2	45	81	384	82	592	—	—	—	—	—	
Average (excluding G1)																										
Yangtze Rice-wheat Area 稻子小麥																										
B1	Hangchow	杭家	14	62	85	137	146	111	249	152	176	135	107	82	60	207	793	576	324	1501	2159	1043	129	146	—	—
M22	Shanghai	上海	40	63	85	137	146	111	249	152	176	135	107	82	60	207	793	576	324	1501	2159	1043	129	146	—	—
M16	Nanking	南京	9	23	55	59	62	75	163	174	147	125	22	36	32	90	196	484	163	953	1391	631	131	218	—	—
M4	Tientsin	天津	77	19	28	9	22	73	264	152	60	19	7	10	1	52	469	86	637	1084	168	225	297	—	—	—
M3	Chinkiangso	清江浦	127	17	38	29	52	54	120	184	192	147	24	26	19	74	136	496	197	902	—	—	—	—	—	
A13	Peking	平家	391	44	74	92	92	92	176	281	265	79	63	70	64	23	178	465	277	1684	1822	1400	111	219	—	—
M11	Pengpu	滎家	11-127	13	29	42	56	43	133	159	95	54	35	24	29	74	141	387	113	1153	852	253	58	—	—	
A14	Tongchen	桐城	9	22	53	33	33	113	136	169	169	104	19	19	19	104	149	467	97	1193	1080	318	194	—	—	
A14	Tongchen	桐城	9	22	53	33	112	142	289	180	164	114	112	98	24	101	402	632	324	1458	2348	1027	—	—	—	
A1	Anking	安家	2	20	32	62	168	101	323	435	49	96	35	22	55	107	331	507	153	1078	—	—	—	—	—	
A9	Lun	倫家	6	71	55	39	59	81	107	155	163	11	10	37	182	224	416	48	968	—	—	—	—	—	—	
A12	Huochienchi	火家	35	33	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	—	—
H1	Hankow	漢家	441	45	46	96	152	166	243	181	97	52	82	48	27	121	414	521	203	1280	2106	756	220	226	—	—
H2	Hankow	漢家	441	45	4																					



