

Experiences and Challenges: Review and Comparisons on China's

Censuses

Dr. Zhiquan Xu
Department of Rural Survey
National Bureau of Statistics
57 Yuetan Nanjie
Beijing (100826) China
xuzq@stats.gov.cn

Abstract

China has established agricultural census system in 1995: it was conducted decennially by the year ending at 6. In 1996, with the help of Food and Agricultural Organization (FAO), government of Italy, and other countries and international organizations, China conducted the First Agricultural Census successfully. The Second Agricultural Census has accomplished data collection, data processing and mostly works in 2006, and currently is in the processing of data evaluation. Census achievements will be published in succession in the near future.

Some successful experiences of integrating these two Censuses with Chinese characteristics have acquired mainly include: consummated legal basis and making census regulations; census covering two aspects which involves agriculture and rural development, based on the requirements of national economy development for next decade, regulating and programming census indicator; government organizing and mobilizing costs of all resources; covering extensive data resources by door-to-door interview, administrative records, spatial information and so on; OCR for census forms, and fast accomplishment on data processing; strictly PES by multi-levels; systemic development and application on census results, and etc.

We are also faced with some rigorous challenges: contents of census is too extensive, lack of systematical and integrated indicators which would influence the application of data; huge number of enumerators and supervisors, recruitment of qualified enumerators becomes more difficult along with young labors moving out of countryside, and high quality trainings have some extent of difficulties; coordination with Population Census required to be resolved urgently.

Suggestions for question settlement are: regulating census objects, establishing census indicator system of agricultural indicator as main part, rural development indicator as an assistant; cutting down numbers of enumerators and supervisors in large extent, recruiting qualified local enumerators, reducing training costs and improving local working qualities; coordinating relations with Population Census, increasing working

efficiency and decreasing costs, and considering combination with Population Census in some aspects.

1. Introduction

1.1 Agriculture still has been playing an important role in economic activities although China has achieved rapid development in recent 30 years. Nearly 60 percent of the population lives in the rural areas, and 55 percent of them make a living with agriculture. Agriculture occupies 12 percent in GDP.

1.2 From early 1950s to the end of 1970s of last century, China's agricultural products operation units were production teams, statistical data was reported by production team level by level, which was called complete report system. Since reform and opening to the outside world, agricultural products operation units have changed from 5 million production teams to 200 million rural households, in order to adapt this great change, we built agriculture statistical system through integrating conventional sampling surveys with periodic censuses.

1.3 Agricultural census system was built in 1995: it was conducted decennially and in the year ending as 6. Food and Agricultural Organization (FAO), Government of Italy and Government of China, objecting on the implementation of the First Agriculture Census and cooperating on the projects, had impelled the building of China's agriculture census system and the implementation of the First Census in 1996.

1.4 The Second Agricultural Census started in 2005. Through two years preparation, the field survey had been finished in the first quarter of 2007, the data processing will be accomplished in the second and third quarter, and currently, data evaluation and main achievements publication are in processing. In 2008, the achievements will be published and promulgated, and a series of domestic and international seminars will be held in 2009.

1.5 China's two censuses are a process of unceasing exploration and innovation by continuous studying and using the advanced international experience according to its own national conditions. Some successful experience we have achieved, and some challenges we should be faced. For the limited space, this article only gives some ways on cause of actions with Chinese characteristics, problems came across, and speculations for it, and hoping for sharing and discussing with every expert.

1.6 The structure of this article is: firstly to introduce some census experiences with Chinese characteristics; secondly to point out the challenges we are facing; thirdly to discuss our speculations and suggestions; and at last to present a brief conclusion.

2. Main Experiences of Agricultural Census

The experiences of China's agricultural census are quintessence of international experience and innovation under the restriction of national conditions. on the basis of the First Agricultural Census, the Second Census has been improved and innovated. the experiences might only be appropriate for China's real conditions, with the limitation of the spread areas or potentials.

2.1 *Regulations on National Agricultural Census*

2.1.1 China's *Statistics Law* has still not formulated agricultural census in detail at present. The State Council regulated the period, basis contents, organization, funds, propaganda and mobilization, and others concerning agricultural census in 1994.

2.1.2 In 2006, State Council promulgated *Regulations on Agricultural Census*, normalized agricultural census in the form of administrative law. This regulation includes: general provisions, respondents, coverage and contents, organization and conduct of the agricultural census, data processing and quality control, data publication, administration and development of the data, commendation and penalty, and so on, totally 7 chapters and 42 items.

2.1.3 *Regulations on Agricultural Census* provides legal basis for all census activities, and has significant meaning for improving agricultural census legislation, accomplishing census task, ensuring census quality, normalizing census at all circles. It is also a legal basis for mobilizing all social resources.

2.2 Agriculture and rural development as the basic contents of census.

2.2.1 Indicators of agricultural census include: mark of HOLDING, agricultural labor forces, farm lands, agricultural machineries, livestock, crops, water conservancy and irrigation, forestry and fishery and so on. Comparing with project of the World Census of Agriculture (WCA) of FAO and experiences of other countries, China's census was more concisely.

2.2.2 Indicators of rural development include: community environment, public facilities, social services facilities, business facilities, environmental protection, township and village administrative management situation, and so on. These indicators are more detailed than most of the other countries.

2.2.3 Indicators related to farmers include: basic features of rural population, education status, labor mobility and employment, social security, resident situation, source and quality of drinking water, traffic vehicles, communication facilities, income source and so on. Those data are more particular than most of the other countries.

2.2.4 Census indicators are adjusted according to the development process of national economy and the changes of statistical system. As the World Millennium Development

Goals proposed, building fairly well-off and harmonious society, establishing new countryside and other goals made by Chinese government have taken a great change on the requirements of agricultural census data. The Second Census has increased in number of data on rural development and farmers' living quality.

2.2.5 Along with the establishment of China's economic census system and publishing of new standard industrial classification, the coverage of census has been adjusted correspondingly. The township enterprise content of the First Census classified as economic census, agricultural services indicators was added into the Second Census.

2.2.6 The Census covered the rural areas as the scope, and including agricultural production operations in urban areas. According to Chinese standard industrial classification, the Census is not only including planting and animal husbandry, but also basic indicators of forestry and fishery. We had introduced our experiences of listing rural development indicators into Census at the International Seminar held by OECD in Paris in 2002. Program of 2010 World Census of Agriculture published by FAO recognized the efforts done by a number of countries in broaden the scope of the census.

2.3 Various collection methods for Census forms and data.

2.3.1 Census forms include households census form, farm land census form, village census form, township census form, unit census form and farmers' income and expenditure census form. Of which, households form is the main part of the Census, which covers 200 million households of the whole country, other forms are assistant forms for reflecting a certain aspect of "San Nong".

2.3.2 With the experiences of the other countries, households form is filled in by enumerators' door-to-door interview. After finishing preparation works such as drawing chart for census districts, recognizing census respondents, and programming summary forms, seven million enumerators in the nationwide interview the respondents one by one and door-to-door for filing in the forms. This is the major task for them. Enumerators should be patient and careful for the interview and survey, to ensure the Census quality due to low educational level of the farmers with the small agricultural operational scales, and without accounting in rural areas.

2.3.3 Census instructors are responsible for interview and filling in census forms of villages, townships and units. The numbers are much less than 200 million of rural households, the Census instructors have completed financial accounting system, and much easier to obtain survey data.

2.3.4 Census form on farm lands is filled by Ministry of National Land and Resources of China. China has a great population with shortage of farm lands, therefore, governments at all levels would like to acquire the status of farm lands in decade

through out the Census, especially about cultivated land areas and structure changes. In addition, due to the different measure units used by the all regions, measurement tools behind and some of their own interests to consider, most farmers unable or unwilling clearly to say the operating agricultural land area.

2.3.5 Since 1980s of last century, Ministry of National Land and Resources of China have in charge of the use of satellite images and aerial photos measurement, integrating with field survey, inspected various land acreage and status of structure changes. The First Agricultural Census made a valuable exploration on these basic materials. In the Second Census, the data on acreage of cultivated lands, garden plot, timberlands, grasslands, fishing aquaculture and other lands by villages and townships are filled in and reported by Ministry of National Land and Resources. It has an important meaning on census methods for saving costs, ensuring data quality, and meets the data needs.

2.3.6 Detailed materials about income and expenditure of 200 thousand farmers have been collected in Census. These households are national sampling survey households, poverty monitoring households, and self-selection sampling survey households selected by all provinces in conventional statistics. These households have detailed records on domestic income and expenditure of their daily life, which are more detailed and accurately, and become the supplement of Census achievements.

2.4 Census is organized and coordinated directly by the government.

2.4.1 The Government leaders served as the Group Leader; the principles of related government departments act as the member of Leading Group. In the Second Agricultural Census, Mr. Hui Liangyu, Vice Premier, served as Group Leader of the Second Agricultural Censes Leading Group of State Council. Ministry of Agriculture, Ministry of Finance, National Development and Reform Commission and other 24 ministries as the member of Leading Group, the Commissioner of NBS served as the Vice Group Leader. Governments at all levels of provinces, cities, counties and villages build their own Leading Groups according to the model of Central Committee.

2.4.2 The Office of Agricultural Census Leading Group was established in NBS. Deputy Commissioner assigned on agricultural statistics serves as Director of the Office. The Office members are composed by the relegated General-Directors of the member units of Leading Group and departments of NBS. Census Office is responsible for specific implementation of census.

2.4.3 Agricultural Census Office transfers technicians from Department of Rural Survey of NBS and related departments into some groups to be responsible for organization and coordination, program design, publication and mobilization, training and field survey, data processing, achievement development and other concerning works of Census. The structure of Census Offices at all level of provinces, cities and

counties are similar with the above.

2.4.4 Leading Group of Census and its Office are a comprehensive organization of cross-industrial and inter-departmental coordinating body. It plays an irreplaceable role in the aspects of raising funds, recruitment, publication and mobilization, solving contradiction between demand and supply of Census data, supervising and inspecting implement of all the works and so on.

2.5 Depending on large number of enumerators and supervisors to fulfill the data collection. In fact, the total number of allocated enumerators and supervisors is almost 7 million people.

2.5.1 The requirements of recruiting enumerators: educational degree above junior high school; high responsibility, willing for Census work; familiar with local situation; high honesty in the mass; and with a healthy body. In fact, enumerators and supervisors in all regions are mainly occupied by carders, retirees, teachers and other personnel of townships, administrative villages and villager groups.

2.5.2 Qualified training for enumerators. Census handbooks and training CDs are published and produced in a unified way by the country. Organization model of the training is: the country is responsible for the province, province for the county, county for the administrative village in succession. Trainings at the levels of province and county pay more attention on the instructors. As a result, it will take much longer with more detailed explanation, and arrange some discussions and practical activities.

2.5.3 More detailed training organized in the county below. Firstly, separated training for enumerators and supervisors. Secondly, training is divided into two stages: door-to-door interview, and preparation works before it, such as drawing chart, recognizing respondents and etc. Thirdly, integrating explanation in the class with the experiment of field interview, and discuss and disabuse the questions raised.

2.6 By the means of optical character recognition technique to accomplishing work of data processing with a quick speed.

2.6.1 It is a tough task for China on the work of census data entry due to a small scale and huge amount of the agricultural households. In 1996 of the First Census, optical character recognition technique (OCR) was firstly adopted nationwide instead of traditional manual entry, and made a success. In the Second Census, this method is continuous to be used, and has been further improved on the organization of input, collocation of equipment, development of software and so on.

2.6.2 Comparing with manual entry, the apparent superiority of OCR is fast speed. In the First Census, it took 10 months on all entry works cause of backward facilities, short of organization experience and other reasons. In the Second Census, from the

beginning of April to the end of June, it only took 3 months for all entry works under the condition of comprehensive improvement at all aspects, which included 230 million households, 390 thousand of agricultural production and services units, 650 thousand of administrative villages and 39 thousand of towns.

2.6.3 The second apparent superiority of OCR is high quality, because the identification ability of machine is more advanced than manual entry. From the results of post-enumeration survey, the errors of entry nearly close to zero in many regions. The third superiority is economical labor cost, especially in developed areas due to the fast growth of labor cost in recent years.

2.6.4 In the meantime, OCR required higher demands on the design of census form, quality of form paper, printing technology, quality of filling form, as well as the condition of the transport and storage for the form. Those aspects increase the cost of OCR.

2.7 Three aspects for post-enumeration survey (PES), comprehensively grasping census quality.

2.7.1 PES on door-to-door interview is an independently on-scene survey work performed after census registration. PES Group is composed by related principles and business backbones of Census Office at the country and province level with about 100 persons, they go to all provinces and perform door-to-door interview again on nationwide random samplings of 110 counties, 330 census districts and 20 thousand of households. They will register again for the concerning important contents, and compare the results of census and sampling survey, so as to evaluate the integrality of Agricultural Census' coverage and veracity of census contents.

2.7.2 PES on farm lands is performed by 13 working groups composed by National Agricultural Census Office, Ministry of National Land and Resources, and NBS, respectively going to all provinces to make a field verification on the selected samples which including the land categories, areas and variations of 90 counties, 900 census districts, and 9000 spot maps.

2.7.3 PES on data processing aims at inspecting and evaluating integrality and veracity of national agricultural census data in the course of data processing. Which includes two parts: the one is random inspection on the quality of OCR data, collated once more by selecting samples in the districts, and calculated the renewable mistake in the data entry phase. The other is in the form of questionnaire to reflect working conditions and courses of data processing, in order to analyze the data quality. Data processing after spot checks on the quality of the whole country deal with 123 Census districts of 64 counties, and it is conducted in all provinces by working groups composed by National Agricultural Census Office.

2.8 Comprehensive development and application on census achievements.

2.8.1 Census data are provided for governments and domestic and international users, promulgated and displayed by grouped data collection, database and other forms of census communiqué after data processing, and quality evaluating and compiling.

2.8.2 Development of agricultural census materials aims to the agricultural census and making the best use of its achievements to develop a deep and systematical analysis and research on the problem of “San Nong”. Which mainly includes three aspects: the first one is basic status of national situation and power; the second one is important matters concerned by the government; the third one is improvement and innovation of agricultural statistical survey system in the new period.

2.8.3 Inviting domestic and international experts to participate in the development of census achievements. Domestic experts mainly include those that work in the governments, universities, research institutes and society, etc., we invited them in various ways to analyze and research for the subjects of development and application of agricultural census data, the research achievements are promulgated by the means of seminars, specific reports, publication of books and other forms.

2.8.4 We invite international experts to discuss and publish research achievements in the form of international seminar. In the later period of the First Census, we held *Seminar on Achievements of China Agricultural Census* in Beijing on September 2000. 99 experts coming from 17 countries attended this meeting and discussed on 12 subjects. We will hold international seminar on the Second Agricultural Census in a proper time, analyze and research on the new achievements of Census at the meeting, which welcome to the all experts.

3. Challenges of Agricultural Census

3.1 The census contents go to extremely abroad; the systematical and integrated poor indicators influence the use of data.

3.1.1 Firstly, a great number of census indicators increased. In the Second Census, as well as the period of China's new rural construction in the very first year, the rural development and farmers living message are strongly in demand. Comparing with the First Census, the indicators in rural households' census forms and time-taking for door-to-door interview are doubled, and that of village census forms and unit forms also had a large number of rising.

3.1.2 Secondly, although there is an abundance of increasing of indicators of rural development and farmers' livelihood, but still not systematically enough. Simultaneously, the problems of lack of agricultural indicators, and inadequate systematically and integrality uncovered in the First Census, such as the detailed data

about productive input, livestock features, agricultural machinery status, forestry and fishery manufacturing, and etc., still had not been improved, which had influenced the use of data, especially on analysis and research of agricultural development tendency.

3.1.3 Finally, the unified census indicators could not meet the requirements of all regions due to imbalanced socio-economic development. Developed regions required more on the data of Census, such as Shanghai, Beijing, Zhejiang, and other developed regions increasing the detailed rural development indicators; Gansu and other developing regions adding a large amount of agricultural production indicators; a few of the developing regions figured that the detailed Census data was not quite necessary for them.

3.2 A large scale of enumerators and supervisors caused difficulties on recruitment of qualified enumerators, trainings and costs.

3.2.1 The way that accomplishing interview and inspection within a short period completed with a large scale of enumerators was brought in the later of last century. This was caused by: One, adapting to the management system of administrative villages and villagers' groups system. Two, based on the village collectivities could acquire agricultural taxes and other incomes, compulsory peasant labor system was maturity, enumerators were some kind of semi-compulsory labors, and their expenditures did not need government spending. Three, farmers were less free flow, and resource of qualified enumerators could be guaranteed.

3.2.2 The basic conditions of the total areas had great changes related to the Second Census. After reform of agricultural taxes, village collectivity had lost tax fee and other resources of incomes, compulsory peasant labor system did not exist in practice, and villages could not bear the costs of recruiting large number of enumerators. During the period of census, come by the associated efforts of all levels governments, basically resolved the allowance problems of the enumerators, but in the developing regions, the allowance was still much lower, and even difficult to pay for enumerators in part of poverty regions.

3.2.3 In the meanwhile, the resources of qualified enumerators appeared problems in some regions. In recent years, lots of farmers went to towns for jobs, which caused serious shortage of educational young farmers in the rural areas. In some regions enumerators were much elder, lower education level, eyesight, and with some problems of the health, so that some regions even had to borrow government employees to be the enumerators.

3.2.4 Large number of enumerators required much more training costs. In order to reduce costs, the training hours and contents had to cut down in some regions, which directly influenced training qualities. In the mean time, the problems of large scale of the training course and rough conditions still existed.

3.3 The coordination problem with the Population Census.

3.3.1 In the regulations of China's census, Population Census conducted in the year ending as 0, and Agricultural Census conducted in the year ending as 6. This interval of time was too long too being a separate activity which should have closely relations of both, and this caused repetition on indicators, wasting of resources, low efficiency and difficult to exert its cooperative effectiveness.

3.3.2 It is obvious duplication on indicators in both Censuses. In order to systematically analyze and make use of census results, the First Agricultural Census listed the population features above 7 years old into the census indicators; the Second Agricultural Census is not only survey on the population features of all rural households, such as relations of rural households, gender, age, place of registered permanent residence, educational level, job, employment method and others, but also carry through an overall survey on housing situation of rural households, such as acreage, structure, value, status of use and others. This not only raised workload, but also possibly made a contradiction with Population Census on the census results, and influenced the use of census materials.

3.3.3 In rural areas, enumeration districts of these two Censuses are the same, enumerators and supervisors of both are always to be a same one. There also has iterative preparation works, such as recognize of census respondents, preparation of directories, map-drawing of enumeration districts, publicize and mobilize on census respondents and etc... And also contents of training on enumerators and supervisors have some extent of repetition.

4. Contemplation and Suggestions

4.1 Regulating census objects, building up agricultural census indicator system that the agricultural indicator as main part and rural development indicator as the supplement. China's Agricultural Census will still adopt the form of door-to-door interview on data collection by enumerators in anticipation. As a result, there is no fear of extending access time, the comparatively way is to adjust the purpose of the survey.

4.1.1 The Second Agricultural Census aims to mastering the basic situation on agriculture, countryside and farmers. This object is too broadly. Although the indicators surged by a large margin, but still not systemic and comprehensive enough, and influence the deep analysis and wide use of data. The aim of the Census could be regulated as: mainly aiming to collection of agricultural production and structural indicator, assisting on collection of rural development indicator.

4.1.2 Approved by the international experiences, agricultural indicator in Census could not only indicate agricultural production status at the census year or census period, but

also describe the changes regulation of agricultural structure, and development tendencies. Emphasis on improving comprehensive indicators on agricultural structure, detailed indicators on livestock features, agricultural population features and agricultural costs.

4.1.3 Those indicators that about rural areas and farmers should be integrated, the indicators of Populations Census such as population, housing, labor transfer and others should not be reduplicate surveyed (the coordination between Agricultural Census and Population Census will be discussed enter into detail in Chapter 43); The indicators that about households' social security, living condition, produce sales income and so on should be changed into conventional households sampling survey; The indicators about agricultural development, agricultural infrastructures, social services, and course of urbanization should be reflected mainly by census forms of administrative villages and townships.

4.2 Enumerators and supervisors should be cut down in a large extent. Recruit qualified field enumerators for reduce training costs and improve locale working qualities. One or two enumerators might be allocate in each administrative village (one in small village, two in big village), and arrange one million enumerators in 670 thousand of national wide administrative villages. One supervisor is allocated for each administrative village and the total number of them in the whole country is 1.67 million persons, reducing three-quarters as of present.

4.2.1 Under the background of educational young labor forces flow to the urban areas, by the method of cutting down numbers of enumerators and supervisors in large extent, relieve tense contradictions on human resources effectively, guaranteed to recruit higher educational level, good health, familiar with local situations, and conscientious locale enumerators.

4.2.2 Cutting down numbers of enumerators and supervisors in large extent for reducing training costs. According to the all kinds of cost of 100 yuan per day, 3 days for per enumerator, the training fees will be cut down approximately of 1.5 billion yuan throughout the country. Decreasing of the training persons will reduce the scale of the training course; the organization task will be more in detail, and advance the training quality efficiency.

4.2.3 The average household for each enumerator increased from 40 to 230 with totally one million enumerators, and 230 million farmers, the period of door-to-door registration could be extended from 15 days at present to 50 or 60 days. The increasing workload could help the enumerators practice their interviews and registrations work more proficient, have unified criteria on dealing with all kinds of problems, which could improve the interview quality effectively.

4.2.4 Although the workload of enumerators increased, and extend the employed

period, but through the implementation of standardized contracts, and according to the rational criteria by performing normative to pay the wages to the enumerators, they might accomplish the Census' task perfectly.

4.3 Coordinating relations with Population Census for improving efficiency and reducing costs. We suggested that to implement Agricultural Census combining with Population Census in some aspects, i.e. establish unified organization system, design different census forms; performing propaganda and mobilization, unified recruiting and training enumerators and supervisors; unified recognizing census respondents, and listing their records respectively in population and agricultural census; unifying drawings of census districts and door-to-door interviews, adding agricultural census forms for agricultural census respondents; census forms of administrative villages and townships that mainly reflecting rural development indicators should be filled in by independent interview; unified data processing; publishing census results; developing and applying achievements respectively.

4.3.1 At present, China has more than 1.3 billion people, most of them live in rural areas, and most of them have agricultural production activities among 360 million rural households. Therefore, China's Agricultural Census involves majority of population and households, and that is minority in developed countries. From this aspect, China has not developed into the history of independent conduct of agricultural census, which could be taken into consider at the time of minority of agricultural population.

4.3.2 China's Agricultural Census costs too much due to large number of census respondents, it will have a significant meaning on saving costs and improving supply of census outlays by combing both Censuses. The merger of both censuses implementation would relieve the financial burden of governments, especially effectively in developing areas, and increased the census efficiency.

4.3.3 According to the current national census system, there are four large Censuses decennially. With the combination of Agricultural Census and Population Census, it will effectively reduce the frequencies of all kinds of censuses; lighten the burden of leading, coordinating, and promotion tasks afford by the governments at all levels; relief the burden of the increasing organizations and staff due to the Census for the government statistical system. Reduce the frequency of the census could lighten the burden of the respondents.

5. Conclusion

The experiences of China's Agricultural Census have three characteristics: firstly, the experiences of China's agricultural census are quintessence of international experience and innovation under the restriction of national conditions. The experiences might only be appropriate for China's real conditions, with the limitation of the spread areas or

potentials. Secondly, this experience mainly focus on the organization aspect in the Census, most has challengingly is the organization work of Census, due to object quantities of China's Census is huge. Thirdly, these experiences also belongs to the exploratory, the mature experiences will have to depend upon the long-term accumulation from the future Censuses.

By reviewing and comparing with those two Censuses, we faced to many challenges. In the project design aspect, main questions are show as the excessive goals of Census, excessive requests, excessive cover scope of the target, and lack of system. In the organization aspect, the cost rise, qualified census enumerator is insufficient; engagement does not arrive with the Population Census, and so on. These questions reduce the Census efficiency, and affect the coordination effect of statistics.

How to solve the above problems? The author proposed own ponder and suggestion, establishing census indicator system of agricultural indicator as main part, rural development indicator as an assistant; massively reduces the enumerator and supervisor quantities of the Census, lengthens their working period; merger and implementation with the Population Census effectively.

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