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**Preliminary Plan for the Improvement of  
China's Population Census  
in the Year 2000**

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## **Preliminary Plan for the Improvement of China's Population Census in the Year 2000**

By the end of the century, each country is facing a new round of population census, which, unlike previous ones, has a great significance across the century. Firstly, the census is an historical review of human development for a hundred years, and will provide important basis for looking forward to the continued development of human-being in the next century. Secondly, with the development of modern information technology and the increase for the demand of census, a historical revolution will take place for the census methodology and technology. Besides, as for China, because this is the first population census in the country's transition from a planned economy to a market economy, both the results and the methodology of the census will exert significant impacts for the establishment of the socialist market economy in China and the realisation of the strategic goal of modernisation construction in China.

Four population censuses have been conducted in the People's Republic of China since 1953. The Chinese Government decided in 1980's that, beginning from the fourth population census in 1990, population census will be conducted every ten years, in the years ending with "0" . The fifth population census will be conducted in the year 2000.

Many successful experience has been gained in the previous four population censuses in China. Especially, the success of the third and the fourth population censuses has won common acclaims from experts both in China and from abroad. The successful experience are as follows in general: Firstly, each level of government has established strong census leading organizations in charge of the leadership and organizational work. Secondly, the whole society was mobilised extensively, including mobilising all walks of the society and the whole nation to participate and cooperate in the population census. Thirdly, modern management science was adopted to design and manage the huge social engineering system of population census. Fourthly, the quality of census data was regarded as the life-line of the census, and strict quality control and quality verification procedures were implemented, with every effort made to minimise the error of data in each phase of the census. Closely linked with the Chinese situation and the practical condition of economic development in China, all the experience is valuable to guarantee the success of population census in China.

There is no doubt that the previous successful experience is an important foundation for the conduct of China's population census in 2000. Nonetheless, we could not copy the previous methods and repeat them again for a population census at the turn of the century. This is because the economic system in China has changed, population situation has changed and the modern information technology has advanced by leaps and bounds. These changes and development will inevitably require the further improvement of census methodology and continuous innovation of technology. To conduct China's

population census in 2000, we must first adhere to the successful experience of the previous censuses, take into full consideration of China's situation and absorb the experiences from advanced practice of censuses in other countries. On the basis of these principles, the methodology for the census could be improved, making full use of new and advanced technologies which conform to the current national situation and national power in China. We could expect that the methodology and technology to be used in China's population census in 2000 will improve to reach a new stage compared with our past.

This article will make a brief presentation on the difference of methodology and technology between the population census of 2000 and previous ones, outlining what measures for improvements will be introduced and why such improvements are necessary.

## **I. Method of Field Enumeration**

Field enumeration refers to the procedure of filling the data of respondents into the census questionnaire. The methods adopted can be divided into two approaches in general. The first is filling the data of respondents into the census questionnaires by enumerators through asking questions, which can be called "enumerator approach". The second approach is to fill out the census questionnaire by one member of the household: normally by the head of the household, which can be call "household approach". Each kind of field enumeration has its own advantages and disadvantages. Which way will be adopted must depend on the situation of each country and the human and financial resources for the census.

The "enumerator approach" has been used in the previous four population censuses in China for the field enumeration. This method will also be used in the year 2000, which means enumerators will visit each household fill out census questionnaires. As China is still a developing country with a large agriculture population, and the proportion of illiterate population is as high as 12%, it will pose a great problem for the household to fill out forms by themselves. The "household approach" is not appropriate for the present stage.

Although the population census of 2000 in China will continue to use enumerators to fill out the questionnaires when visiting the households, there is still some improvements in practical operating procedures, such as the following:

1. *Use of geographic maps and consolidate the concept of census district* It is an effective way to draw geographic maps and consolidate the concept of census district so that there is no duplication and no missing in the population census. Although there is an amplified administrative management system in each level and household registration management system, the administrative management at the basic level is mainly the household registration and there is no clear demarcation of boundaries between some areas. With the establishment of market economy, the number of floating population has increased noticeably and there is big gap between the place of residence and the place of

household registration, resulting in many difficulties for the census. In 2000, we will use geographic maps that are drawn manually following the national standards and divide the census district into several blocks for every enumerator. The enumerators will conduct the field enumeration for all the permanent residents living within the census blocks according to their maps, not just the people whose household registration fall into the management of such administrative regions. This will be an important measure to guarantee the full coverage for the census in 2000. Besides, by manually drawing geographic maps for census blocks and districts, we could make a sound geographic foundation for the demographic geographic information system to be established in the future.

2. Modification of the time reference defining the permanent residents from one year to 6 months. The concept of permanent resident has been used in previous population censuses in China, that is, everybody should be enumerated in their permanent residence. Of course, many countries use the concept of *de facto* population, that is, each person will be enumerated at the place of staying on the day of the census. This approach is not applicable according the present situation in China. Because, if we use the *de facto* population, the time for enumeration must be as short as possible (for instance, the work must be completed in one day), in order to eliminate the influence coming from the floating population. In case the enumerator approach is used through interviews to households, the number of enumerators must be increased if we want to complete field enumeration in a short time frame, say 3 to 4 times of the currently estimated over 6 million. Obviously, this is beyond our financial resources and the capacity of organisation and management. Therefore we will keep on using the concept of permanent residence.

The criterion of time frame for permanent residence will be reduced from one year to 6 months. There is a traditional convention that the whole family will get together in Spring Festival in China. In particular, the peasants who work in cities will go home and stay there for 2-3 months. If one year is still used as the time reference, many of the peasants who have been staying in cities for years will probably have to be enumerated in rural area, and their status of occupation will remain as peasants. In such case, the development of tertiary industry in China since the reform and opening and the fact of increased movement of the population will be concealed.

## **II. Reference Time of the Census**

The reference time for the census is the reference time for the field enumeration in order to reflect the situation of the population at the same time. The selection of the reference time will directly affect the quality and the usability of data. Normally, when selecting the reference time we should take three factors into consideration, that is, the relative stability of the population with less movement, the suitability of weather for the field enumeration, and the usability of .

For all the four previous population censuses in China, 0 hours on the 1st of July was taken as the reference time, that is, 1st of July was the census day. For the 1% population sample survey in 1995, State Statistical Bureau changed the reference time to

0 hours, 1st of October. The practice has proved that it is feasible. It is therefore suggested that population census in 2000 should take 1st of October or one day in early October as the reference time. The main considerations are as follows:

1. The movement of the population in early October is not big and it is definitely not the peak of a year.

2. China has a vast territory and there is a big difference in the weather from north to south. From June to July, it is usually extremely hot all over the country, there is sometimes big storms and floods. Governments at all levels and the population are likely engaged in fighting the floods, dealing with emergency and disaster relief, thus the census-taking very difficult at that time. Then from November to March in the next year, many places in north part of China are very cold and in some area heavy snow would seal the mountain passes. So it is inconvenient for transportation and unfavourable for the census. In early October, the places with the lowest temperature are in northeast and Inner-Mongolia, about 4 to 12 symbol 176 \f "Symbol" \s 12°C, and those with highest are in Southern part of China, about 22 to 26symbol 176 \f "Symbol" \s 12°C. The precipitation is 10-15 mm in Northern area and 20-40mm in Southern area. The average temperature of the country in early April is about 1-2symbol 176 \f "Symbol" \s 12°C higher than in early October, with slightly more rains in southern area and less rains in northern area. In considering the weather conditions, both late April and early October are appropriate for the population census.

3. In view of the usability of the data, given the duration of stay for the permanent residents is set as 6 months, if we choose the reference time for the census from the last ten days in April, many peasants are likely to be enumerated in the rural areas, as they may have been back to the cities from their Spring Festival vacation (Spring Festival is usually in February) for less than six months. In this case, the census data can not reflect the present situation of the floating population. If the date is chosen in early October, the 6 months stay would mean from April to September, the contradiction can be avoided.

On the other hand, the choice of 1st of July as the reference time of the census has its obvious advantage in that the data from the census used directly as the mid-year figures, which is very convenient. However, with the development of modern demographic analysis techniques, it poses no difficulty to move the census data to any date in the year. The use of the census data would not be hampered in this aspect.

### **III. Census Items**

Appropriate design of the census items in the previous population censuses of China played important and fundamental role in the formulation of policies and plans of the government and in the development of demographic researches at that time. However, the number of items is regarded as inadequate, with their contents concentrating on the changes of re-production of the population. There was a lack of indicators that could reflect the economic activities of the population and the standards and qualities of

people's living, and the census of population is not incorporated with the housing census, which is unfavourable to the wide use of the census data.

The design of items for the population census in the year 2000 should follow the principles below:

*Principle of integrating demand with possibility* The design of census items should meet the request of the optimum combination between demand and input. The quality of census data would be destroyed or the census would be led to failure if only considering demand while neglecting the possibility of input. Unrealistic emphasis on input without considering demand will not only waste financial resources but also limit the use of census data.

*Principle of integrating government needs with social requirements* The design of census items must firstly meet the needs of scientific policy-making of the governments and administrative management. At the same time, efforts should be made to meet the requirements of scientific research institutions, enterprise and the society in general.

*Principle of integrating perspective uses with retrospective analysis* The selection of items should assure the comparison with historical data and with data of other countries. At the meantime, we should have a perspective view into the 21st century, taking into consideration the development in the next century and the requirement by the establishment of market economy in China.

*Principle of integrating scientific consideration with operational feasibility* While respecting the scientific judgement, the selection of census items should facilitate the field operation of enumerators.

Of the above mentioned principles, the first one is the basic and fundamental principle while the other three have the same importance and none of them can be neglected.

Guided by the above principles, the following aspects should be taken into account for the items of the population census in the year 2000.

## **1. Individual Items**

(1) *Basic conditions* It is composed of name, relationship with the head of the household, sex, date of birth, nationality and health conditions, etc.

These items are the basic contents related with the national conditions and national strength, from which, data can be derived on population size, age-sex structure, geographic distribution, household size and structure, size of ageing population and rate of population ageing, structure and geographic distribution of nationalities. The item on health conditions has never been included in the previous censuses. This item require several simple questions from the sociology point of view rather than from medical

viewpoint, such as: health, handicapped limbs, mentally handicapped, independent living. A rough estimation can be obtained for the handicapped population and it can furnish a sampling frame for future special surveys. Basic data can also be made available for the implementation of programmes on the care, service and medical facilities for the aged.

(2) *Migration status* It consists of place of household registration, birth place, permanent residence five years ago, reason of migration and duration of stay at the current residence.

Strictly speaking, migration refers to the behaviour of changing the residence place (or permanent residence place). This concept is strictly followed in conducting the population census in China.

Since there is a strict household registration system in China, people tend to confused the change of household registration with migration, resulting in misunderstanding of the concept. It is just like confusion between resident population and household registration population, a topic on which there is no common language and people get helpless when they start talking about migration.

We could look into how in China migration is mixed with the change of household registration in the real life. Migration can be divided into two categories in line with the status of household registration. The first category is characterised by the change of household registration. This can be further divided into two groups. One group is related with the change of job, attending schools and graduation assignment, demobilisation of servicemen, etc. This is a migration in real sense when change of household registration takes place with the change of permanent residence. Another group is the change of registration on purpose to pursuit certain benefits without changing permanent residence. Cases in point include sending children to better kindergartens or schools located in certain areas. This is not a real migration but only the move of household registration. This phenomenon normally happens within the boundary of current living cities, which is a small part of what has been called "separation between residence and household registration" (place of residence is not corresponding to the place of household registration). The second category is characterised by migration without change of household registration, i.e. although the place of household registration remains unchanged, the place of residence has already changed. People in this category are mainly rural peasants who go to cities and have relatively stable jobs there. They also include scientific and technical personnel attracted to the southeast coastal areas of China. People in this second category take a large share of the cases of "separation between residence and household registration". They are the real migrated population, but can not be reflected in the household registration system.

Since the migration and change of household registration frequently happens in practical life, we can not take a blind eye towards this phenomenon. Efforts should be made to add items related with such complicated conditions to the census, and then make clear the status of all migrations in order to serve for the scientific policy-making and researches. For this purpose, the items on migration of the population in the population

census in 2000 are designed, which can provide data on historical migration (birth place) of population in China, size and direction of migration in recent years, floating population as well as data on separation between residence and household registration.

(3) *Educational Attainment* It includes items on capability of reading and writing, educational level, completion of schooling, subjects of university education and adult education.

A criterion defining illiterates and literates, the capability of reading and writing was shown as a sub-item in the educational level in the past censuses. The disadvantage is that the education level was a question for people at the age of 6 and over, while the illiteracy was asked from the age of 15 and over. It tended to mislead people if these two items were combined together. Therefore it should be separated as an independent item. Data on educational level and subjects of education will enable us to have a complete reflection on the structure of the educated population and the distribution of specialised personnel. Data on completion of schooling is aimed at knowing about the change of phenomenon of drop-off from schools by young children and evaluating the results of nine-year compulsory education system. The adult education is a major component to develop the higher and secondary school education at the current stage in China. This item in the census is helpful to understand the current conditions and future development of regular education and adult education.

(4) *Economic Activity* It covers items such as availability of work in the last week, working hours, industry, occupation, non-work status, looking for jobs, distance to the place of work, transportation means, etc.

The economic activities of the population are crucial contents in population census, from which, basic questions could be answered about employment rate, unemployment rate, employment structure and labour force resources. With regard to the definitions of employment and unemployment, we use international standards which denote that the employment refers to "having paid work in the last week", and an unemployed person means "someone at the working age who has no paid work in the last week, but is willing to work at anytime if work is available, and has been actively looking for work over the past 30 days". Although such definitions are slightly different with definitions used in the previous population censuses, they are tested in the 1% population sample survey of 1995 and the annual sample surveys on population change since 1994. Cross tabulation of the above mentioned items could reflect detailed conditions on the size of employment of population, industrial and occupational distribution of employed population, size and rate of unemployment, and compositions of inactive population. The items on distance to work and transportation means are mainly to investigate the extra time and expenditure of employed persons for obtaining the income, which, in one way, reflects the living standard of people. They could also serve as basis for the city administration and planning as well as traffic management.

(5) *Marriage and Fertility* It consists of items on marital status, age at first marriage, children ever born, children surviving, time of the last child bearing and parity and sex of children ever born.

Marriage and fertility are necessary main content of the population reproduction. Compared with the previous population censuses, the time span of child bearing of women during the last 12 months is enlarged in the census of 2000 while keeping the original items of marriage and child-bearing history of women unchanged. The family planning policy is taken as the basic state policy in China and the task of controlling population growth is very arduous. There were some big fluctuations in the fertility in history and it has declined dramatically in recent years. Thus, data on the fertility of women is very important for government and demographic research. In addition, the year 2000 is a turning point of the century and the fertility data at this time is indispensable for the comparison with this century and the next century in terms of the tendency of population development. Meanwhile, the fertility history of women is the basic material in using the indirect estimation techniques of population and it is also one of important and stable indicators for evaluating the quality of census data.

## **2. Household Items**

The following items by household should be included in the population census of 2000:

(1) *Basic conditions* type and size of household, births and deaths, number of people registered in the household leaving the residence place over 6 months and annual income of the household.

(2) *Housing conditions* floor space of living, number of rooms, time of completion of building, construction material, facilities such as kitchen, toilet, water, electricity, fuel, bathing facility, source of housing, monthly rent (or expenditure on purchasing house), etc.;

(3) *Possession of durable consumer goods* television, refrigerator, washing machine, telephone, air conditioner, computer and car, etc.

In the previous population censuses in China, there were a few household items and their role was only limited to understanding the basic conditions of a household, and to the logical check with records on individual items. For instance, number of household members must be equal to the number of records reported by the household, and the number of births of the household must be equal to the sum of number of persons below one year of age and the number of persons in the total deaths of the household who were born during the past 12 months.

Great improvement will be made for the population census. Household is the basic unit for the living of human being, and it is also the starting point in the micro economic research on the individual case of economic activities of population. People's way and

quality of living and their consumption level are closely linked with the family members. Something should be added to the household item in order to reflect the people's living standard.

To include the housing items in the 2000 census is important and in fact very necessary. Firstly, the combination of population census with the housing census is a common practice in many countries, so the population censuses in other countries are all called population and housing census. The first question in population census is the number of total population. To ensure the accuracy of data on total population, the field enumeration must target at the living place of people - housing, since people needs to sleep in a house and only the house is a relative stable place of residence, otherwise there is no basis to enumerate everyone without omission. Secondly, the conditions of people's housing is one of important indicators measuring the level of well off in China and it is relevant to the realisation of the strategic goals of the second and third steps of Chinese modernisation programme. Thirdly, the housing items were already added into the urban area in the SSB's 1% population sample survey of 1995, which has been proven successful.

The durable consumer goods possessed by households as asked in the 2000 population census are not necessarily consumer goods essential for people's existence. Some of them are not yet popular in China and some are even not available in the families of vast rural areas. Nonetheless, with the development of market economy and rapid progress of modernisation programme in China, these products will become indispensable in people's living. These items together with the annual income of households will depict the living standards and consumption structure of the Chinese people in the turning point of the century, and they will have positive meaning on the government's macro-economic decision making, and on guiding the investment, production and better development of the market.

### **3. Mortality Items**

To understand the mortality of the population is the successful experience from the previous two censuses, and it will be kept in the 2000 census. The major items to be enumerated consist of basic data on name, sex, date of birth and nationality of the deceased people. Through this information, estimation can be derived on average life expectancy of Chinese people, infant mortality rate, size and structure of deceased population, which will have great significance on understanding the physical quality of population.

### **IV. Technique of Using Long Form and Short Form**

The items for the population census of year 2000 in China have increased and will result in richer information, which are indeed necessary for the development of market economy. According to the principle of "demand and possibility", will the census be able to accommodate so many items? If these items are applied to the entire population, the workload for the enumerators, and the financial and resource input will certainly rise

significantly. We can use the combination of long forms and short forms to meet the requirement of obtaining maximum amount of information with less increase in the input. The census questionnaire that will be filled by the total population will contain few items, which is called "short form", and a section of population will be selected proportionally to fill out questionnaire containing all the items, which is called "long form".

The combined use of long forms and short forms is a technique which has been adopted many times by most countries in the world, and many successful experiences have been accumulated in that field. While using that technique, care should be taken to solve the problems in the following three aspects.

*1. Determination of ultimate sampling unit for long forms* Whether the sampling unit is a enumeration district, a household or a person, will have different impact on the representation of the results from the long form. In the pilot of population census in 1990, we tried the long forms and short forms. Enumeration district was selected as sampling unit (the entire area of a rural village or urban resident's committee). The result was unsatisfactory because the size of the ultimate sampling unit was too large. As a result, the method of long and short forms was abandoned in the full census of 1990. If a person is used as a sampling unit, we will lose information on family structure. In this case, the ideal ultimate sampling unit to be used in population census in 2000 will be a household, and the sampling ratio can be set as 10% or 20%.

*2. Enhanced training and professional moral education for enumerators* The enumerators must work strictly in accordance with relevant regulations. They are not allowed to change sample households at their will, nor can they cast off tough households, or households which may affect the achievements in official career of local cadres, for example: households violating family planning regulations, households with only old singles, households with people not native to the locality, etc. At the same time, quality control and verification measures must be strengthened and to minimise the phenomenon of intended manipulation of census data.

*3. Identification of individuals in the collective households as sampling unit rather than the collective household as sampling unit* Most of the collective households in China are composed of university students, unmarried workers of enterprises, labours not native to the locality working in construction sites and catering services, and people who live in old folk's homes. The dimensions of such collective households are quite different. The characteristics of these people are very important to the population census. If the sample is selected by household, large biases will occur, and thus influencing the accuracy of data on educational attainment, economic activities and migration of the population. So, for collective households, the selection of sampling unit should not be the household. Instead, individuals in the collective households should be selected as samples according to the sampling ratio.

## **V. Data Entry**

Data entry is a procedure that converts the original data collected by enumerators into computer data files which can be read and processed by computers. With the development of modern computer techniques, there are plentiful measures for data entry of population census, the time required for data processing has been shortened, and the utilisation of data has been broadened. The population census technique has made big progress.

Data entry methods can be divided into manual keyboard entry, optical reading entry, scanner entry, etc. The adoption of certain approach will depend on factors such as availability of funds, time limits of entry operation and the quality of entry.

For China's population censuses in 1982 and 1990, manual keyboard entry was used, which was suitable for the social economic conditions and the development of computer technology. In 1990 census, we recruited 8,673 data entry operators who worked for eight months on 3,690 computers exclusively for data entry. The advantages of manual entry are that the requirement for the paper quality and printing technique is not high, and the demand on the handwriting on the enumeration forms is not strict. It is acceptable if the numbers are eligible for operators to recognise even if the handwriting on the forms is hasty and careless. But there are still many obvious disadvantages. First of all, much more data operators are needed and cost for the manual work increases. In a planned economy where cost for manual work is low, data operators could be found without money or with only small amount of money. This will not work in a market economy. Secondly, the period for data entry is long. Modern population census requires the census results to be provided to the users as soon as possible. Given the limits of funds, it is difficult for manual keyboard entry to shorten the period. Thirdly, manual keyboard entry relies on human eyes to identify the data and the data are entered through keyboard stroking by hands. So it is liable to processing errors and thus affecting the quality of census data. At the same time, manual entry makes management of entry work more difficult.

The advantages of entry through optical reading lay in the saving of man power, free of influence of human being, high accuracy and high speed of entry. Its disadvantages are: 1) requiring high quality paper and printing technology. If the quality of paper is dispersed unevenly, the paper is not hard enough or the precision of printing does not meet the requirement, the census questionnaires would not go through the machine. 2) the requirement for filling out numbers and making marks on the forms is strict. When marking, one must make it at the fixed position, and when filling out a number, one must write to the standard. Otherwise the machine will not be able to recognise the data on the census questionnaires.

After comprehensive comparison of the advantages and disadvantages between manual keyboard entry and optical entry, and considering the fact that the cost of labour force in China is increasing and that each level of government and all walks of life hope to get the results of the census as soon as possible, we think the data entry measures for the population census of 2000 in China must be improved, that is, we should use optical reading entry method instead of manual keyboard entry.

Optical reading entry can be divided into two categories: "optical mark reader" (OMR) and "optical character reader" (OCR).

OMR is a device to complete data entry through reading marked optical point. It is of high speed and no reading errors will occur. But for those items that must be presented by three or more digits figures, it is difficult for the enumerators to mark and they are liable to make mistakes. OCR is a device to complete data entry through reading numbers and letters. Although it is easy and clear for the enumerators to fill in the figures, the writing of the figures must conform to the standard. Other disadvantages of OCR is the relatively low speed and more reading errors. In order to give full play to the advantages of both types of optical entry, the population census of China in 2000 will use OMR and OCR technology simultaneously: OMR will be used for short forms and OCR for long forms.

The State Statistical Bureau of China has tested the OMR entry in a limited scope in some parts of districts among the 1% population sample survey in 1995 and the annual population change sample survey in 1997, and has accumulated some experience. OCR data entry was used in full scale in the national agriculture census in 1997. So the time is ripe for the optical reading entry technique to be used in the population census in 2000. Of course there are still some problems in technical details, in the organisation and management aspects that need to be further tested before the census to ensure the success of their full application in the census.

## **VI. Data Processing**

The data processing of modern population census is completed by computers and computers are getting smaller and smaller. Rich experience in programming was accumulated on the basis of data tabulation of 1982 and 1990 censuses in China, which can be utilised continuously for the 2000 year's census. Although the organisation and management modes of the data processing for previous censuses were very successful, they mainly relied on manual management. It is planned that network techniques will be introduced into the census of 2000 to set up an information system of Chinese population census.

The decentralised mode of data entry and data processing was adopted in the previous population censuses of China. In 1990, the data entry, check and tabulations for both counties and prefectures were undertaken in 380 prefecture population census offices; and then the data in floppy diskettes were reported to the provincial offices for further check and tabulation. Finally, provincial data were reported in tapes to the National Population Census Office for further check and tabulation of national tables. This mode of data processing is called "three-level and four-step data processing scheme".

It is quite necessary to have the decentralised data processing since China is a vast country with large population. Firstly, decentralised processing makes it possible to

shorten the time required for data processing, thus making tabulation results available rapidly to meet the requirements of census data by local governments. Secondly, the quality control in data processing can be guaranteed. If mistakes are found in the data entry and check, local census supervisors or even enumerators can be approached directly for reasons and possible corrections. The disadvantage is that this decentralised processing brings about more difficulties in organisation and management. Much training has to be done for the organisation and management personnel as well as technicians of data processing, and the technical personnel from the National Census Office has to be sent to various data processing centres to check the work and solve the problems. In addition, if data processing programmes need any updating, the management personnel and technicians from various data processing centre will have to be assembled together for training, or documents need to be distributed to guide their work.

With the development of techniques of computer network and communications, the data processing of population census can be improved effectively. The decentralised mode of data processing will be still adopted for the population census in China in 2000, but the network techniques will be fully utilised to improve the organisation and management. The information system of population census of China will be set up to link the population census offices at 380 prefectures and 31 provinces through the network to organise and manage the data entry and data processing. The system will take the responsibility of transmission of problem reporting, progress reports and data reports in the operation, updating data processing programmes and issuing work guidance from the National Population Census Office. This will not only reduce the working meetings and training of data processing, but also reduce the burden of organizational work. The data entry will be still done in the population census offices of 380 prefectures and the data will be transmitted to the provincial or national offices after checking, editing and correction. With the network management, the tabulation work at the levels of county, prefecture and province is simplified. Such tabulation can be undertaken at various levels as was in the past, or at the National Population Census Office and then the results can be transmitted to the local census offices through the network.

In fact, the population census information system can be used not only in the data processing stage, but also in the management and operation at various stages of the census, such as preparations, field enumeration and dissemination of census data.

## **VII. Data Dissemination**

Whether the data from population census can be fully utilised is also one of important indicators measuring the success of the census. The utilisation of census data in any country is closely linked with the social demand, the development of demographic research, ways and contents of data supply by the census agencies. The responsibility of census agencies is to spare no efforts to meet the user's needs and to furnish timely and accurate census data in a way convenient to users.

The data dissemination of previous population censuses in China was mainly through publications in paper form, which played its role at that time. With the

widespread application of computer and network technology and the increasing demand by market economy on the census data, the traditional mode of data dissemination is no longer capable of meeting the requests of the development and it needs to be constantly improved.

### **1. Application of Population Geographic Information System**

The population geographic information system combines the base map data base and population census data base together, and it is mainly used in two aspects in the population census. One is at the data gathering stage. Enumerators can define the area and houses within the area for which they are responsible in line with the "map of enumeration district" printed from the geographic information system, and then to conduct enumeration of the households and their members to avoid duplication and omission. The maps of enumeration districts are prepared in such a way that they do not overlap with each other and when assembled, they should cover the entire area of China without omission. Presently, we are not in a position to print out the enumeration district maps from the computer, and such maps will have to be drawn manually by enumerators for the field enumeration in the census of 2000. Another area for the application of the population geographic information system is at the stage of utilisation of census results. To match the census data with geographic maps can make the results more illustrative and more imaginative, and it can be widely used in the fields of demographic researches, city planning, socio-economic analysis, transportation, construction and domestic trade. What we have discussed about the application of population geographic information system in the 2000 year's population census refer to these aspects in particular.

The digitised base maps of large and medium sized cities will be obtained in collaboration with the national mapping agencies and some cities' mapping and planning departments, and the software of geographic information system is matched with the data of population census to complete the establishment of population geographic information system in these cities.

The population geographic information system is a new technique for the census in China and we are short of experience in promoting its utilisation across the nation. In addition, its usefulness in the rural areas has yet to be promoted. Therefore, this system will be set up only in large and medium cities for the coming population census to obtain the experience of establishment and application and to lay the foundation for the establishment of the national population geographic information system of China.

### **2. Application of Computer and Network Techniques**

In the past, the tabulated census data were printed as publications, which has demonstrated some disadvantages. For scientific and research institutions, published materials are too simple to meet their requirements, while for decision-making departments and users of the general public, they are too complicated to look for the information they need. Furthermore, this type of dissemination is lagging behind the current development of computer technology. The way of data dissemination should be

improved in the 2000 population census with large increase of the share of computer technology application to adapt the needs of users at various levels and to have a full play of census data.

First of all, the publications in paper form should be improved and the key and comprehensive data needed by a wide range of users should be published in figures, graphs and text forms, which should be simple and easy to be understood. Such publications aim at promoting wide utilisation of the census data, and enhancing the awareness of the knowledge of population census and population development. Secondly, detailed and highly professional data of the census are to be disseminated through magnetic media (diskettes and CD-ROM), and the network transmission techniques could be adopted for users. Special requests can be submitted by users through the Internet and the data will be tabulated to meet their needs.

### **VIII. Conclusion**

Through the above mentioned seven aspects, we have introduced the preliminary plan for improving the population census of China in the year 2000. It involves the main aspects of the census work such as enumeration methods, reference time, census items, long form and short form techniques, data entry, data processing and dissemination, which give a general picture of China's population census in 2000.

From the above discussion, it can be found that China will follow the basic ideas, principles and organisation patterns and continue the experience and practice which has been proved to be successful during the four previous population censuses. The main framework of the 2000 census will maintain the practice in the past censuses, which include, for instance, the establishment of a strong leading organisation, mobilisation of the whole society, application of modern management sciences, insisting on the data quality, as well as the census coverage, field enumeration approach, and data processing scheme. On the other hand, efforts are made, in line with the requirement of a market economy and integration with international standards, to improve the contents, techniques and methodology of the census. These include, for example, additional census items on housing and living standards, improved items on migration, economic activities and education, enhanced concept of area-based field operation, change of the reference time, use of long forms and short forms, application of optical data entry system and population geographical information system, and improved way of data dissemination. We can say that this census will represent a combination of China's traditional practice and internationally advanced experience.

At such a historical time when human beings come to the turn of the century, we will assume the responsibility of China's fifth national population census. Compared with the former censuses, this is the first census in China under market economic system, a census that links the two centuries, exploits new techniques and complies with the international practice, and also a census with great difficulties that were never encountered before. All of the four former censuses in China achieved success, and at each census some new progress was made. The market economy has brought us with

new challenges as well as new opportunities. It is anticipated that, under the strong leadership of the government and with the close cooperation from the people, by taking advantages of the successful practice of the previous censuses and foreign experience, the population census of China in the year 2000 will achieve its objectives, leaving a glorious page in the history of both China demographics and world population census.

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