

## Short Presentations

### **The Current Situation and Future Development Priorities of China's Statistical Education**

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The Chinese government attaches great importance to statistical education. In the social and economic development of China, the central government requires the State Statistical Bureau to be the mainstay of social and economic information, the key body of national consultancy and supervision, and the centre of national economic accounting. In the State Statistical Bureau's document "Report on Strengthening Statistical Work and Bringing the Role of Statistical Supervision into Full Play", approved and transmitted by the State Council in 1989, the functions of information, consultancy, and supervision of statistical work were further clarified. Corresponding to these three functions of China's statistical work, it is necessary to carry out moral education and vocational training to statistical personnel in the following aspects.

- (i) Training on occupational laws and regulations in order to educate statistical personnel to be devoted to their duties, seek truth from the facts, expose problems, and uphold the objectiveness and accuracy of statistical data.
- (ii) Vocational training on the indicator system of statistical reports and forms, survey designs and data collection.
- (iii) Integrated training in data processing and analysis. Statisticians are required to understand basic theories of economics and statistics and to be familiar with government decision-making procedures and their bases.
- (iv) Training on application of modern computing tools for processing and tabulating data and extending the data analysis by classification in different levels.

In brief, the social and economic development demands a massive force of statisticians possessing knowledge and skills of professional posts of various levels and structures.

To provide support to the statistical undertakings, since the founding of the People's Republic of China, the statistical organs, personnel, and resources have all been reinforced. The staff of those statistical organs above county level were 20,547 by the year 1965, and have reached 60,000 at present. Governmental statistical organs - statistical bureaux - were set up at the county, prefecture (city), and provincial levels, and divisions and sections were established under each statistical bureau.

Since the founding of New China, there has been rapid development in statistical education.

(i) *Establishment of statistical schools:* The State Statistical Bureau (SSB) was set up in October 1952. At that time most of the staff were non-professional personnel. In accordance with the needs of training on basic knowledge, five statistical schools under the jurisdiction of the SSB were established. Owing to the nationwide streamlined administration, the five statistical schools were suspended in succession since there were difficulties in distribution of the graduates.

With the implementation of the policy of giving priority to economic reconstruction, from 1976 Sichuan School and Xian Statistical School were reestablished successively. And with the support of the SSB, Xian Statistical School has now developed into an institution of higher learning. In addition, some statistical secondary schools at the provincial level were established. Currently there are 130 institutions of higher learning with statistical specialty in the reference departments, and 18,400 students enrolled, 340 statistical secondary schools with 31,077 students enrolled, and 165 vocational high schools with statistics as their specialties and 13,500 students enrolled.

(ii) *Reinforcement of in-service training of the statistical personnel:* China has a massive force of 2 million statistical personnel distributed in governmental organs, enterprises and undertakings at various levels. Among them, some 9% are university and college graduates. Even taking those technical secondary schools into account, the percentage only reaches 30%. Of 60,000 statisticians in government organs above the county level, 25% are university or college graduates, the other 75% are secondary school graduates. Therefore in-service training is badly needed. The following is a list of what we have conducted in the in-service training, with each level taking responsibility for its own work.

- (a) TV program and correspondence education: These are effective when professional personnel are badly needed and there is a shortage in teaching facilities and finance. After several years' effort, more than 60,000 participants have achieved their graduation diploma of higher learning, and over 50,000 have achieved the equivalent professional certificates in the field of statistics. And there are 17,000 students enrolled in statistics departments at universities and 43,000 students enrolled in technical secondary schools.
- (b) Full-time in-service training on specific courses of statistics: 630 participants have graduated.
- (c) Various short-term statistical training courses in connection with the issues of practical work: So far 401 courses have been accomplished with 7,188 participants having attended the courses.
- (d) Widespread introduction to and training on statistical indicators, coverage and methodology.
- (e) Engaging 126 experts from foreign countries and other organs, 36 training courses have been conducted, 1,522 participants have attended the courses. In addition, 355 persons have been trained abroad.
- (f) Intensive training in foreign languages: So far 304 persons have received this training, of which 252 have studied English, 32 Japanese, 19 French and 1 German.

(iii) *Formulating the standards of specified knowledge for professional posts at various levels and conducting training on professional knowledge:* It is clearly stipulated in China's Statistical Law that "Statistical personnel should possess such technical knowledge as is necessary for carrying out statistical tasks. Vocational studies should be organised for those statistical personnel lacking technical knowledge".

The SSB has decided to carry out the training in professional knowledge for four professional posts - statistical staff, assistant statisticians, statisticians and senior statisticians - by stages and in groups.

The SSB and the Ministry of Personnel of PRC have jointly conducted the qualification tests within the SSB and its affiliated organisations at statistical staff level. Certificates of qualification will be issued to those who have passed the tests to show their ability to work in the field of statistics or to work as a statistical staff member. Thereafter, if there are vacancies of statistical posts, besides the graduates of higher learning institutions distributed by the government, only those who have qualification certificates of statistical staff can be recruited on a competitive basis. Only after the training in professional knowledge and the examination and assessment of qualification, can the professional titles of assistant statistician, statistician and senior statistician be achieved.

## **The Uses of Government Statistical Offices in Statistical Education - Some Hong Kong Examples**

Teresa K Y Ng - Hong Kong

In Hong Kong, the Census and Statistics Department is responsible for all local statistical matters. This Department is organised into four operational divisions, namely, the Economic "A" Division, the Economic "B" Division, the Social Division, and the General Division. Among the 1,611 persons working under the Government Statistical Service, 525 of them are statistical professionals. 322 of these statistical staff are working in the Census and Statistics Department, and the remaining 203 are associated with other government departments.

The Economic "A" Division, with 54 statistical staff, mainly deals with trade statistics and price indexes, and undertakes the Household Expenditure Survey; whereas the Economic "B" Division, with 114 statistical staff, is mainly responsible for conducting economic surveys on industrial production, building and construction, transport and services, and compiling national income estimates. The Social Division, with 70 statistical staff, deals with demographic, labour, and other social statistics. It plans and executes population census and conducts social surveys. The General Division, with 73 statistical staff, deals with manpower statistics, employment and earnings statistics, and wages and labour costs statistics. It also provides electronic data processing support for the Department, organises training activities, handles publication matters, and provides statistical services to other government departments.

Besides offering professional advice and assistance on all aspects of statistical activities within the government, the Census Department also supplies statistics

information through library services and publications, provides resources in statistical training courses (local and overseas), provides support for professional societies, and provides summer employment and office visits for students.

We now provide three examples of Census Department participation in education.

(i) *"Hong Kong Statistics for Business"*: A course on "Hong Kong Statistics for Business" has been organised by the Census and Statistics Department, in collaboration with the Department of Extra-mural Studies of the University of Hong Kong. Such a statistics course is offered once a year, in eight weekly sessions of two hours each. It is an integrated series of lectures/seminars, each on a specific type of official statistics. For this year's course the following topics are included:

- (1) Labour, price and wage statistics: personnel management and manpower planning.
- (2) Population and income statistics: research and marketing.
- (3) Manufacturing and construction industries, distribution trades and services statistics: comparing profitability and performance, evaluating local market size and assessing extent and nature of competition.
- (4) Trade statistics: market research, trade promotion, and end-use goods analysis and forecasting.
- (5) National accounts statistics: estimates of Gross Domestic Product and its components.
- (6) Monetary statistics: analysis and applications.
- (7) Economic statistics: analysis and applications.
- (8) Panel discussion: overview of official statistics and their uses in business and administration.

The speakers are statisticians from the Census and Statistics Department and economists from the Government Secretariat.

The main objective of this course is to promote the use of official statistics. It is designed to put managers, administrators, and planners in closer touch with the statistical data available in Hong Kong.

During the lectures/seminars, speakers would strive to introduce the statistical data and their sources, to show how such statistical data may be applied in business and administration, and what the limitations are. At the same time, feedback from the participants may help the Census and Statistics Department to plan and improve its future services.

Based on the experience gained from running this course, the possibility of conducting a similar course entitled "Social and Economic Statistics" by the Census and Statistics Department, jointly with the Department of Applied Mathematics of the City Polytechnic of Hong Kong, is being actively pursued. This would be a video training course designed for the City Polytechnic students majoring in Applied Statistics and the Student Statistical Officers employed by the Census and Statistics Department.

(ii) *Summer students' employment*: Each summer, the Census and Statistics Department recruits quite a number of student helpers for a period of one to three months. The Department provides them with training facilities and techniques on data

processing.

The student helpers usually assist in various survey operations such as collection, editing, and simple tabulation of data. Some of them get involved in the development of statistical systems. All these give the students a very good opportunity to gain hands-on experience in the operation of a survey. In addition, they can get a better understanding of the statistical system of the government, and the availability of official statistics.

(iii) *Statistical project competition for secondary school students:* As part of the continuing effort to motivate public awareness of statistics, the Hong Kong Statistical Society organises a statistical project competition for secondary school students annually. The objectives of the competition are:

- (a) to promote students' interest in statistical methods;
- (b) to provide an opportunity for students to apply their statistical knowledge to real situations; and
- (c) to encourage students to understand the community in a scientific manner through the use of statistics.

The competition is fully supported by the Census and Statistics Department in various aspects. Firstly, the Commissioner for Census and Statistics agrees to be one of the patrons for the competition. Secondly, the organising committee is formed with three members from the Census and Statistics Department and two members from the Polytechnic. Thirdly, the statisticians of the Census and Statistics Department play an important role in the adjudication process. Contestants are separated into two sections, the Junior Section and the Senior Section, according to their level of study. In carrying out the project, contestants are required to choose a topic for study directly related to Hong Kong community, for example, Hong Kong economy, population, education, housing, transport, medical services, tourism, etc. Furthermore, they have to use particular data set(s) relevant to their study in the project. For the Junior Section, data sets to be used are restricted to those available in official publications of the Hong Kong Government. Data obtained from other sources are prohibited. For the Senior Section, the theme of study may focus on school issues in addition to community matters. Contestants may use self-collected data. But from past years' experience, most of the contestants still prefer to use secondary data. Thus, before assessing the relevance of data, exploitation of data, accuracy in handling data, appropriateness of the selected methods of analysis, presentation and conclusions, and powers of communication, the adjudicators should first verify that the student's project is based on official data. Hence, a special adjudication panel is formed with 16 members; half of them are statisticians from the Census and Statistics Department and the other half are lecturers from local tertiary institutions.

## Training Facilities for Statistical Personnel in India

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The Indian statistical system is decentralised, with responsibility divided between the Centre and the State Government. There is further division of responsibility by subjects at the central and state levels, among different central ministries, and among state government departments respectively. At the national level, the Central Statistical Organisation (CSO) is responsible for coordination of statistics and likewise each Directorate of Economics and Statistics (DES) in the states/union territories is responsible for coordination at the state level. Training comes under the purview of both CSO and DES's.

Postgraduate courses in statistics have been introduced in as many as 59 universities and undergraduate courses in statistics in 65 universities. In addition, statistics is usually one of the papers in the postgraduate and undergraduate courses in mathematics, economics, and commerce. These graduates are the main source of recruitment as statistical personnel in the government. Training programmes are conducted by the government to provide adequate in-service training for personnel employed at different jobs, namely, collection, processing, analysis, and dissemination of data at national, state, and sub-state levels. The responsibility for organising training programmes is shared between CSO and DES's. For senior and middle-level statistical personnel, CSO is responsible for organising the training programmes, while DES's discharge this responsibility for primary-level statistical personnel.

(i) *Programme for Indian Statistical Service (ISS) officers:* The ISS was constituted in 1964 and the direct recruits entered in the central government departments in 1968. Recruitment to the ISS is made in the lowest grade through an annual competitive examination which, among other things, tests the proficiency of candidates in statistical methods. The ISS direct recruits undergo training for a period of two years, three-quarters of which is devoted to professional training in statistics and related methodology and its application in official statistics. Some important features of training are: twenty weeks' training in different departments of the government and general administration; eight weeks' special attachment to a statistical office for on-the-job training; foundational course of seventeen weeks' duration covering public administration, political theory and Constitution of India, planning and economic policy, Indian history and culture and law; a thirteen-week course on electronic data processing and six weeks training in field operations at the National Sample Survey Organisation.

For those who are appointed to the ISS on promotion, an in-service training programme of seven weeks' duration is arranged. The objective is to provide a refresher course in statistics and to acquaint them with the latest developments in this field as well as in the area of official statistics including electronic data processing.

Specialised and refresher courses of one or two weeks' duration are conducted for in-service ISS officers at different stages of their career. Generally, four courses on topics of current interest are conducted in a year.

(ii) *Senior and Junior Certificate courses:* The Senior Certificate Course in Statistics (SCCS) is a regular course conducted by CSO. It is intended for professional statisticians who, in their direction and supervisory capacity, need to keep themselves abreast with the latest developments in the various fields of official statistics for broader appreciation of planning and administration. This course, of eight weeks' duration, is divided into three independent parts; the first, lasting three weeks, is a general course in official statistics with emphasis on latest developments, gaps in data, and the programme for improvement of the statistical system. The second part, also of three weeks' duration, deals with a comprehensive treatment of national and regional accounts, while the third is of two weeks' duration on a specialised topic in the line of work of the officers.

The Junior Certificate Course in Statistics (JCCS) is meant for junior-level officers and is of forty weeks' duration. It has the objective of preparing statistical personnel to take up supervisory jobs in statistical departments. This course is also offered in three parts. The first part, which is conducted at the Indian Statistical Institute, Calcutta, is spread over twenty weeks, during which trainees are put through a basic course in mathematics, economics, descriptive statistics, sample surveys, design of experiments, and introduction to data processing. The second part relates to official statistics and extends over a period of eight weeks. This covers sources and methods of collection of data in various fields of official statistics. The third part has two modules, each of six weeks' duration. The first module is on electronic data processing and the second module is a specialised training in the topic of participants' choice.

For both SCCS and JCCS courses an officer can be nominated to undergo any one of three parts or any of the two parts or the entire course.

(iii) *Courses for ISEC and ISI:* The International Statistical Education Centre (ISEC) Calcutta offers a regular course of ten months' duration for nominees of countries of Asia and Africa. As a part of this course, the CSO arranges a course on official statistics for a period of six weeks. The programme consists of two parts. The first part, which is spread over four weeks, imparts information about the scope, content, and sources of official statistics and methods of data collection. The second part provides specialised training for two weeks in one of the subjects of participants' choice.

A course on Official Statistics is also offered for M.Stat students of the Indian Statistical Institute (ISI). The objective of this four-week course is to provide an orientation on official statistics to students who, on obtaining their degree, would be seeking a career in government or private organisations where a knowledge of this subject would be useful.

(iv) *Programme for primary level officers:* Several of the DES's are conducting courses for primary level statistical personnel. The duration varies from one to sixteen weeks. There is no uniformity in the course curriculum. Efforts are being made to standardise the courses by suggesting model courses for adoption by DES's. Lack of permanent faculty, inadequate classrooms and hostels are some of the problems faced by DES's in conducting the courses. Regional training programmes are advocated to make optimum use of the available resources with DES's. But heterogeneity of the qualifications of statistical personnel and the language are some of the bottlenecks which come in the way of organising such programmes.

(v) *Other training programmes:*

(a) *Electronic Data Processing:* With the increasing use of computers in statistical offices, training programmes are organised by the Computer Centre of the Department of Statistics for statistical personnel in the government. The duration varies from six to thirteen weeks.

(b) *National Sample Survey Organisation (NSSO):* The NSSO regularly organises training programmes for their supervisory and field staff engaged in the collection of data. These programmes are conducted by five zonal training centres. The Data Processing Division of NSSO also organises a training-cum-workshop on processing of survey data for the personnel engaged on this job.

(c) *United Nations National Household Survey Capability Programme (UN-NHSCP):* Under the UN-NHSCP, CSO, in collaboration with ESCAP, has organised courses on Sampling and Household Survey Methodology (SHSM) and on Electronic Data Processing (EDP) for nominees of the ESCAP region. This programme, initiated in 1982, is going to conclude in 1990. Six courses each on SHSM and on EDP have been conducted. Under the same programme, a three-week course on SHSM for trainers was arranged in 1989 and it is proposed to organise a course of the same duration on EDP for the trainers during November-December 1990.

(d) *Courses conducted on specialised topics by other institutions:* There are a number of institutions such as The Institute of Applied Manpower Research, New Delhi, The International Institute of Population Sciences, Bombay, and The Indian Agricultural Statistics Research Institute, New Delhi, who conduct courses on specialised topics.

In conclusion, Indian experience shows that formal education in statistics in the universities does not fully prepare the personnel to take up statistical jobs. The statistical personnel have to be imparted in-service training of varying durations which has to be job-oriented. It has also been realised that there is a need for a Training Institute at the national as well as state level to take care of the training needs of statistical personnel. The Institute *inter-alia* would lay standards, prepare training manuals, and periodically review the training programmes and affect improvements.

**Note**

The views expressed are those of the authors and not necessarily of the organisation to which they belong.



## Statistical Education and Training in Indonesia Organised by CBS

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The *Central Bureau of Statistics* (CBS) is a non-departmental body directly under the President (Statistics Act No 7/1960). This set-up guarantees the independence of the CBS in producing statistical data.

The national statistical system in Indonesia is broadly centralised.

Nowadays the CBS employs close to 11,000 persons throughout the country, of which about 1,900 are stationed in the headquarters in Jakarta.

The *Statistical Training and Education Centre* (STEC) has to plan, execute, implement, and coordinate all the training and education of CBS employees, and assist other agencies to train their statistical personnel. Broadly speaking, the training programme falls under three categories: undergraduate and graduate programme, general statistical training, and training on supporting subjects.

(i) *Undergraduate and graduate programmes:* The educational programme of STEC provides undergraduate and graduate programmes to produce statisticians to meet the needs of middle-level staff in CBS and statistical units of other government agencies. An undergraduate programme is provided at the Academy of Statistics. It was established in 1958 and from its beginnings until today the Academy is under the management and supervision of CBS.

As the oldest institution in Indonesia in statistical education with a three-year course in statistics, the Academy has produced 1,076 graduates, 853 of whom are now working with CBS, while the rest (223 undergraduates) are with other government agencies. Since STEC has no graduate programme in statistics, the need for higher qualified personnel is met by sending the Academy graduates to local or foreign universities for further studies.

Lectures in the Academy of Statistics are mainly presented by the senior staff of the CBS. This arrangement enables the Academy to provide students not only statistical theory, but also statistical practice in survey operations.

For reasons of space, details of the curriculum of the Academy of Statistics, as of the further courses described below, cannot be included here, but are available from the authors.

(ii) *Elementary statistical training:* Historically, statistical training in CBS is even older than the Academy of Statistics, dating back to the early fifties. Statistical training is given to field staff, supervisors, and technical staff in charge of survey design, data collection, processing, and analysis of data.

The training on basic knowledge of statistics is mainly made available for the statistical fieldworkers (Mantri Statistik in the Kecamatan/Sub-District), and statistical staff who are responsible for data collection in the field.

Mantri Statistik are the permanent field staff of CBS in each Sub-District who coordinate census operations in that area, and at the same time, collect data for all kinds of statistical surveys. The basic educational background of Mantri Statistik is high school. They have to take elementary statistical training as the minimum requirement

before they can fully be assigned as permanent field staff. In practice, however, due to the turnover of permanent field staff, the elementary statistical training by STEC is a never-ending activity.

The length of this course is about 35 working days, and mainly emphasises the field operation element of statistical activities.

Because of cost constraints on the limited trainers available, instead of having training centres in all the 27 provinces, the CBS has so far six centres concentrated in the largest provinces to which other provinces send their participants.

(iii) *Intermediate statistical training:* The main objective of this training is to improve capability in using statistical techniques related to the processing, presentation, and analysis of data. The participants are technical staff, from Central Office as well as regional offices, and they should be a high school graduate with a minimum of two years' work experience.

The training is carried out at the STEC in Jakarta for about one month.

(iv) *Advanced statistical training:* This training is designed for those who have attended Intermediate Statistical Training, or for staff who are university graduates who have majored in non-statistical subjects.

The participants are mostly heads of the statistical offices at district and municipal level. The training period is five weeks. This training concentrates on statistical theory which is important for data analysis, data management, sampling theory, and National Statistical System.

(v) *In-country training,* sponsored by donor/international bodies allows for courses of a specialised character, which cannot be included in the existing academic programmes.

For example, with financial assistance from the Institute of Social Studies (Netherlands), CBS has conducted a number of courses during the last two years. These included courses on National/Regional Accounts, on Economic Indicators, and on Sampling Methods.

(vi) *Special subject courses:* There is a pressing recent need for courses on special subjects to increase the expertise of the technical staff on subjects pertaining to National/Regional Accounts, Population Studies, Socio-Economic Analysis, Computer Programming and Operation, etc.

The main difference between these courses and the in-country training is that the latter is organised on an ad hoc basis, providing tailor-made training. With in-country training there is also the possibility of including participants from outside the CBS.

(vii) *Concluding remarks:* CBS needs staff with sufficient background in statistics. To rely on outside training institutions to supply staff seems to be too slow, and not enough suitable staff are available.

This past experience has led the CBS to create its own training institute to fill the middle-level staff. The policy in having its own STEC is not just to train new recruits, but also to train the existing staff in CBS, to increase their theoretical background and the statistical capability for better work.

To get additional staff (new recruits) is quite difficult and a very slow matter in Indonesian bureaucracy. On the other hand, the majority of the existing staff of CBS are high school graduates, and furnish a potential supply for further enhancement and expansion of their capability through the Academy of Statistics and other academic courses rendered by the STEC.

Nowadays, the core of the middle-level technical staff of CBS, in the headquarters as well as regional offices, are graduates from the Academy of Statistics, while the lower-level staff are being given statistical training by the STEC.

One visible and important result of the CBS policy on statistical training is that most of the technical staff, in any level, are talking with the same language, because in one way or another they have undergone statistical training at the same institute, i.e. STEC. This also creates a more favourable working environment, because they communicate easily using the same language.