Training Junior Statistical Staff in Asian and Pacific Developing Countries

I P David and T A Mijares - Manila, Philippines

1. Introduction

In this paper we limit ourselves to junior staff in the official statistics services of developing countries in the ESCAP region. Junior staff in the Asian countries refers to new recruits and relative newcomers with 1-3 years' experience in the statistics office. Their main duties would be assisting in the collection and processing of data and publication of results. They do not yet have substantive supervisory duties. In general, they hold bachelor's degrees. They are distinguished from intermediate or middle-level staff who have longer service, supervisory duties and/or master's degrees. There are some exceptions, such as in Indonesia, Lao PDR, Bhutan and Maldives, where some junior staff have formal training up to the secondary school level only.

In the Pacific island countries, junior staff generally have secondary school level education only or its equivalent, namely below secondary level but with longer experience or some non-formal statistics training. Statistics staff with bachelor's degrees normally occupy middle and senior-level positions. This very different situation poses special problems and requires approaches to training quite distinct from those in the Asian countries. It is brought about by special conditions (to be discussed in more detail later), many of which are related to the comparative disadvantage of smallness and isolation of these island countries.

We are concerned here with junior staff who are on the regular payroll of statistics offices, not with contractual staff, such as enumerators, who are hired temporarily as the need arises.

2. Training junior staff in Asian countries

2.1 *Training needs*

(i) Regardless of their college background, it is important to quickly expose junior staff, especially new recruits, to:

(a) Office functions and the interrelationships among units in the organisation. This is to emphasise the importance of their work in relation to others' - how their performance would affect that of others, in the same way that others' work would impact on their own. For example, if the collection unit puts out bad data, the processing unit cannot improve on them and make the data items good; conversely delays in processing reduce the value and usefulness of statistics.

(b) Statistical operations and management. The activities undertaken from planning to completion of censuses and surveys, including laying down clear objectives and definitions of terms and concepts; design and construction of instruments like sampling frames, questionnaires, operation manuals and control forms; sample selection, data collection and supervision; and data processing including aspects of data cleaning, screening, validation, imputation, and tabulation. The relationships of these operations with errors in the resulting estimates, particularly non-sampling errors, is another very important topic that needs to be emphasised.

(ii) Junior staff should have a broad training in *general statistics*, one that prepares them to move up the statistical ladder where they may assume higher responsibilities requiring knowledge of different subject matter. An example is SIAP's six-month general statistics course, which usually covers elementary statistical principles, statistical operations and sample surveys, demography and social statistics, economic statistics and national accounts, agricultural statistics, statistical computing and field exercise in survey work. Ideally, there should be different modules depending on the background of the trainee: a junior staff member with an undergraduate statistics degree may skip the basic statistical principles to spend more time with the other topics, while one with an economics or social science background should have more time for the mainstream statistical concepts.

(iii) Statistical work is becoming inconceivable without the use of computers: from designing questionnaires for eliciting the required information and speeding up data entry, to processing systems all the way up to publication of results. Unless the staff member is assigned to the computing centre, chances are his unit will be working in a microcomputer environment - or will soon be - and he will be only vaguely aware of a mainframe database system link. Junior statisticians should be provided with an overview of the basic concepts and terminology of computing in a statistical environment. Emphasis should be given to microcomputing systems for data entry, screening and validation, tabulation, graphics, and desktop publishing. An introduction to database systems as a tool for effective management of huge masses of historical and administrative data should be given also. ESCAP's publications, *Fundamentals of Computer Processing for Statisticians* (1987) and *Statistical Software Packages for Processing Censuses and Surveys* (1988), are good references for such training courses.

The UN *Manual on Training of Statistical Personnel at the Primary and Intermediate Levels* (1963) was revised recently at the recommendation of an ESCAP/SIAP Expert Group Meeting on Statistical Education and Training held at Bangkok in 1987. The outcome, *Manual on Training of Statisticians* (ESCAP, 1988) is specifically for junior and middle-level statisticians in government. It recommends five courses which can be covered in six full-time weeks or, alternatively, 12 weeks on a half-time basis.

The manual can serve as an excellent guide for developing and conducting such courses. However, we would recommend the following changes/enhancements. Firstly, it still appears outdated in some parts, notably where computerised processing is discussed, where it still talks about data entry by punched cards. We suggest that the approach to data processing be microcomputer-based or, if possible, computer-assisted.

Secondly, we suggest that a topic on database management system fundamentals should be included. Many surveys or series of surveys are interrelated and are part of a bigger system. Also the approach to presentation and dissemination of results should be brought up-to-date, e.g. desktop publishing, including the production of print quality reports with integrated graphics. Likewise, the production of statistics from massive administrative records is more realistically approached through organising the latter in a computerised database system.

2.2 *Regional/international training*

The leading regional statistical training centres for government statisticians are the ISEC (India) and SIAP (Japan). These two centres accept applicants from all countries in the ESCAP region, subject only to availability of funding and slots, which are usually 30 a year in the beginning courses for junior staff. The SIAP General Course lasts six months, while a similar course at ISEC is for nine months. There are other training opportunities which are more limited, either because the donor is inhibited from operating in some countries, or the nature of the assistance limits it to one country (i.e. bilateral) or to member countries only (i.e. multilateral, as in the case of ADB and Commonwealth Secretariat). The ESCAP publication, *Sources of Statistical Training In and Outside the ESCAP Region* (1980), provides a comprehensive list of training institutions.

International training centres are more costly to maintain relative to national centres. Developing countries cannot, on their own, afford to send statistical staff for training abroad. Hence, the amount of foreign training is, and will continue to be, limited by the magnitude of bilateral and multilateral assistance available for this purpose. SIAP, for example, has had 2450 participants to its various training programmes during 1970-1986 (Mijares, 1987); the number would be hardly enough for the needs of one large country, say Indonesia or Bangladesh.

There is also the language problem in training courses with international participants. English is the medium of instruction in training centres in the ESCAP region, where the 30 participants in a course usually represent 20-25 countries. There was one participant in SIAP who carried English/Russian and Russian/native country dictionaries; he studied by translating the English lessons to Russian, then to his native language.

The language problem is encountered also in designing and conducting field exercises, e.g. Japanese and Indian respondents to a survey will have problems with English. In general, simulating individual country-relevant field operations would be more difficult with international training courses.

Aside from language, the heterogeneity of academic and practical backgrounds of internationally recruited participants can be a hindrance to the effective conduct of a course. For instance, the view has been expressed in a number of meetings that, owing to their lower academic preparations, trainees from the South Pacific Islands should not

be mixed with Asian trainees.

2.3 *Training at the national level*

The same ESCAP/SIAP Expert Group Meeting mentioned above noted that statistical training activities being undertaken in the countries of the region were not adequate to meet the growing needs for trained statistical manpower. One recommendation of the meeting was to make concerted efforts, at the national as well as international level, to enhance the existing statistical training facilities.

As far as national facilities are concerned, these range from nil in some countries like Bhutan, Lao PDR, Myanmar, Nepal and Viet Nam, to highly developed as in the case of India. Aside from ad-hoc training programmes made possible by externally sourced financial assistance, the first group of countries relies almost entirely on foreign training which is funded also by multilateral or bilateral assistance programmes. On the other extreme there is India, through whose facilities have passed many trainees from third world countries. In between, there are countries in the region which, through their own resources, have developed modest internal training capabilities. The case of Indonesia and the Philippines, which have followed different paths toward training junior statistical staff, will be presented briefly here, as they more likely provide insights for the other countries.

Official statistics work in Indonesia, which has a highly centralised statistical system, is concentrated in the Central Bureau of Statistics which has 11,000 regular staff. Of the 420 new staff recruited annually, only about 10 percent hold bachelor's degrees (mostly from CBS's own academy); the remaining 90 percent are high school graduates. To date, only six universities in the country have undergraduate programmes in statistics and their combined annual output of about 180 graduates mostly go to the private sector. These numbers give a fair picture of the great need in this country of 180 million for more statistical training opportunities.

Details of the CBS training programme are given in the accompanying paper by Sugito and Sukayat. Impressive as they are, the training capabilities are still inadequate relative to CBS's needs even when external training opportunities are factored in, particularly since statistical training opportunities elsewhere in Indonesia are severely limited. Thus, for many of the high school graduates entering the statistical service, the only recourse would be to learn on-the-job, slowly.

Like Indonesia, the Philippines initially received UN assistance to develop statistics and the statistical system. However, instead of locating an academy in the statistical office, a statistical centre was established in the state university in 1955, manned initially by UN experts, (i) to train graduate students who would eventually be the centre's first generation of trainers, and (ii) to provide non-formal training for government statistical staff. There was also hope that the centre would develop into a regional statistical training centre. Today, the University of the Philippines Statistical Centre has expanded (i) to include degree programmes leading to bachelors, masters and doctorate levels. However, it had less success with (ii) partly because of a shift in emphasis toward formal education, such that residual resources for non-formal training were not able to keep pace with the growing demand from an expanding statistical system.

Unlike Indonesia, the Philippines has a very decentralised statistical system. Its parts reacted with varying success to their training needs as opportunities for training

outside the system began to lag behind demand. The National (Census and) Statistics Office, which is responsible for general-purpose statistics, established an in-house training programme in 1972, whereby around 30 new university graduates were chosen annually through competitive tests. These were required to undergo six months of intensive training covering many of the topics recommended in Section 2.1. The trainers came from among senior staff of NSO, other statistical agencies, and universities. Those who successfully completed the programme were placed in positions one to two steps higher than the usual entry level for new staff. Later, the programme evolved into a degree-oriented curriculum, when NSO struck an agreement wih a nearby university to jointly develop a Master in Applied Statistics programme. New NSO recruits typically are hired at the beginning of summer and are required to enrol in 2-3 courses. Senior NSO staff are given affiliate faculty appointments by the university.

The other parts of the Philippine Statistical System have not been as innovative nor successful in providing adequate training to their junior staff. The agricultural statistics subsystem, for example, has relied almost entirely on foreign training, which was relatively scarce to begin with. (The allocation of statistical resources in both national and international agencies has been observed to be biased in favour of non-agricultural statistics; see, for example, David (1989).) The same can be said of statistical units in the other ministries, e.g. education, health, labour. This unevenness in training opportunities is to a large extent mirrored by the unequal quality of the statistical output of these agencies. A Statistical Research and Training Centre was recently established in the coordinating arm of the statistical system to provide short-term training in priority areas, including statistical microcomputing.

Important differences between the Indonesian and Philippine settings need to be taken into account if lessons are to be learned or training models are to be patterned after either country's experience. Indonesia's centralised statistical system and the fact that incoming junior staff are mostly high school graduates, may have been major factors in the decision to set up the statistical training facilities in CBS; on the other hand, the Philippines' highly decentralised system plus the fact that new recruits are college graduates, may have made a university an attractive site for a statistical training centre. The Indonesian approach proved viable in the long-term and it is remarkable that 9 out of 11 trainees remain in CBS (although this practice of staying on the job is true in the entire government service). The Philippine approach was not as successful and the situation was aggravated by a two-pronged brain drain of government statisticians to (i) other government offices in the country, and (ii) abroad. (i) happens universally, though in varying degrees among countries, the root cause being the low status of statisticians in the government service compared to other civil servants with comparable training (see, for example, Sahib (1987) and Mijares (1989)). (ii) is very serious in the Philippines and the statistical service is no exception, especially statistical computing personnel; there is a pun aimed specifically at NSO trainees: "Join the National Statistics Office and see the world!"

2.4 *Further comments and recommendations*

While the contribution of regional/international training centres has been important and should be increased, the national training facilities will continue to be the dominant source of training opportunities for junior staff. The enhancement of the

capabilities of these two sources should be promoted in a complementary manner. For instance, the international centres could give greater emphasis on developing training materials, training of trainers, advanced courses and EDP training, and in the process be more effective instruments towards improving national statistical training capabilities. The international centres could also play a pivotal role in increasing the number of country courses by providing, on a non-reimbursable basis, training materials and resource persons whose expertise is not available in the country. Leaving the basic courses for junior staff to the national training centres could be a long-term development target.

3. Training junior staff in the Pacific Island countries

Island countries in the Pacific do not have, and cannot be expected to build, viable in-house statistical training capabilities. The probable exceptions are Fiji and Papua New Guinea - but perhaps not for long, regrettably, as the statistical services of these countries have been deteriorating in recent years. An ESCAP mission went to Fiji in the mid-1980s to find ways to shore up its statistical system. Papua New Guinea continues to rely on expatriate staff to keep things going in its statistics office. Thus, if these trends persist, it would not be an overstatement to say that the Pacific Island countries would be completely dependent on external assistance for their statistical training needs.

Statistical offices in these island states are small, ranging from one to just under 100. Regardless of size, however, a statistical office has to have a minimum number of functional positions, such as that of a head, data collection and processing unit(s), a publications staff, etc. It is also required to produce a minimum set of statistics on several key areas, e.g. population and demography, production, overseas trade, prices, etc. This leads to a dilemma - that of a staff with a relatively low level of education being made to perform multiple functions which require high levels of administrative and technical abilities.

Training is problematic, too. There may not be enough numbers to support in-country courses. When they are done, they have to be stretched through half-day sessions so that the statistics office will not be deserted for the courses' duration. Moreover, the really small statistics offices hesitate to send staff for foreign training even for short periods, as the trainee's work is either stopped or it is parcelled out to the remaining precious few. The flipside of this problem is just as undesirable, which is that of seeing the same faces in foreign-funded meetings, seminars, workshops, and training courses. Pacific islands' trainees likewise tend to have difficulties when mixed with their better-prepared Asian counterparts, particularly in numeracy skills. Foreign trained statistics personnel also often move to more glamorous positions, such as in the planning office, finance ministry, or central bank, thereby making the statistics office weaker than before.

The underdeveloped government infrastructure in the subregion is sometimes ascribed to the fact that these countries had gained independence fairly recently. This relatively fresh link with previous colonial masters plus the limited opportunities in an island, make emigration a serious problem in these countries. The statistical offices, which have low status in the government hierarchy to begin with, also suffer from this

form of brain drain, in addition to the loss of senior staff to the more prestigious ministries.

3.1 *Fundamental statistical development questions*

Given the many formidable institutional and structural handicaps such as those above, are there viable approaches to statistical development in general, and training junior statistics staff in particular, in the Pacific island countries? Can statistical capability be developed and sustained so that the system can continuously produce the basic statistics required by the government to satisfy its own and the public's information needs, e.g. population, vital and social statistics, etc.? Can capability be raised higher to the point that the statistical system can sustain the production of statistics on external trade, balance of payments, national accounts and similar data series needed by the country in dealing with the outside world including the international aid agencies?

To rephrase these questions, can secondary school graduates be trained to successfully plan, implement and analyse surveys, and learn statistical methods and economic concepts required to estimate complex statistics like national accounts? If so, how could the training be done? If not, what options are open for the countries and international agencies which still need the statistics?

The goal here is sustainable capability, not one-time production of the required statistics. The latter can be done by posting expatriate personnel to perform the specific task, while the former implies institution building through manpower training and the provision of material and financial resources on a regular basis.

Partial answers could be gleaned from the activities of international agencies in the subregion.

3.2 *Statistical training assistance by aid agencies*

The major player here is the South Pacific Commission (Noumea, New Caledonia). SPC's training programme is described in a recent paper by its statistician (Doyle, 1987) and in the accompanying ICOTS paper by Doyle and Brown (1991). There are two (basic and intermediate) series of generalised courses on Statistical Operations and Procedures (SOAP). The basic course, which has been run 33 times between 1977-1986, is conducted in the mornings only for six weeks. The intermediate course which lasts for one full-time month, has been conducted an average of once a year since 1981. The target trainees for the latter include middle-level statistics staff and super- visors of statistical units in user agencies. These two courses are the rough equivalent of the SIAP General Course, except that they cover less ground and are run at a lower level, e.g. the basic course includes exercises in arithmetic skills.

SPC also conducts, less frequently, specialised courses in socio-economic statistics such as overseas trade, agriculture, labour force, national accounts, and balance of payments. The last course, on overseas trade, was conducted in 1984.

The SPC member countries have expressed great appreciation for these courses, especially the basic SOAP course. These courses are run more cost-effectively (e.g. compared to sending trainees to SIAP) because of lower travel costs and per diems for participants, and because SPC is able time and again to request assistance from Australia, New Zealand and the Commonwealth Fund for Technical Cooperation

(CFTC), among others. However, one major barrier in running more of the intermediate SOAP and similar more advanced courses remains, which is the low mathematical background of prospective participants.

ESCAP organises on a more or less ad-hoc basis, courses, workshops, and seminars for the Pacific subregion. Its regional advisers visit countries to give advice on specific projects and, hopefully, impart some training function in the process. However, for this service to be of better use, there must be in the country someone who understood and could implement the advice after the expert leaves; this is not always the case in the Pacific island countries.

Some bilateral and multilateral donors follow other modes of assistance. Granting scholarships for university education is expensive, but the successful returnees often fill senior positions in the statistics office; hence the long-term pay-off may be high. Posting of expatriate staff (UK, CFTC, IMF) or outposting of local staff (from Australia or New Zealand) can result in extremely effective on-the-job training of local staff.

The ADB is a newcomer in the subregion, where it now has 10 developing member countries (DMCs). It began providing statistical technical assistance to some of its South Pacific DMCs in 1984, the main object of which was institutional development. The results of the projects were mixed. National accounts series and the supporting survey systems were set up in all six DMCs. The question is continuity. The prospects look bright in two DMCs where there is active government support for the projects; in one, a UN volunteer is continuing the ADB consultant's work while the local counterpart staff was sent abroad for further training, and in the second there is a capable middle-level local staff who has taken over the job. The outlook is promising in two others, though it is too early to pass judgement. The project is still going on in a fifth DMC. In the sixth DMC, the authorities rejected the results of the consultant's 2.5 years of painstaking work as being too high, in favour of the quick and dirty guesstimates of another multinational agency's mission that was in the country for less than one month.

The ADB also funded another technical assistance project, with SPC as executing agency, which supported the conduct of five sub-regional training courses on overseas trade; household surveys; data analysis, interpretation, and presentation; statistical microcomputing; and consumer price indexes.

3.3 *Recommendations*

Some years back, an old Pacific hand told one of the authors that the institution building approach to statistical development does not work, so that each time you need some statistics you just have to go in and do the work yourself. The experience with the ADB projects tells us that, while this may be true with some Pacific countries, it is not so with many others. More precisely, the truth about this conjecture is not absolute, but in varying shades. Thus, we suggest that aid agencies and users of Pacific countries' statistics consider seriously a recommendation of the 7th SPC Regional Conference of Statisticians, held in the Cook Islands in 1987, to choose a regional agency in the Pacific and establish in it a statistical programme which would assume major responsibility not only for the training needs of the subregion, but also for producing the more complex statistics (e.g. national accounts) of those countries that do

not - and will not likely develop - the capability to do so.

All on-the-job training and most other types of training should be micro-computer-oriented. Projects, such as sample surveys and national accounts estimation, should be planned, implemented, and documented extensively using word processing, database, spreadsheet and possibly general-purpose survey analysis packages. This approach increases the likelihood that the local counterparts could continue the activities when the expatriate staff leaves.

The microcomputer offers a most appropriate data processing technology for small countries. In fact, it may be argued that minis and mainframe computers are inappropriate in the subregion. One of the two statistical offices currently using minis has approached the ADB for assistance to enable it to shift completely to micros.

Compared with censuses and surveys, the use of administrative records as sources of statistics is less technically demanding and should therefore be emphasised. The volume of the records, however, requires automated processing. The output of statistical offices in the subregion could be raised significantly by more training courses on micro-computing and the use of administrative records for statistical purposes.

Acknowledgement and Disclaimer

The authors thank Soetjipto Wirosardjono for some of the information mentioned in the paper. The views expressed here are those of the authors and not necessarily those of the Asian Development Bank.

References

David, I P (1989) *The State of Agricultural Statistics in Southeast Asia.* Selected Topics Meeting paper, 47th Session of the ISI, Paris.

Doyle, B (1987) *Statistical Training Services Provided by the South Pacific Commission.* Paper presented at the ESCAP/SIAP Expert Group Meeting on Statistical Education and Training, Bangkok.

Doyle, B and Brown, G (1991) Statistical training by the South Pacific Commission. *Proceedings of the Third International Conference on Teaching Statistics* (Vol 2). Dunedin, New Zealand.

Mijares, T A (1987) *Recent SIAP Surveys of Statistical Training Needs.* Paper presented at the ESCAP/SIAP Expert Group Meeting on Statistical Education and Training, Bangkok.

Mijares, T A (1989) *Human Resources Development for Statistical Services.* Paper presented at the ESCAP/SIAP Seminar on Managing Statistical Services in the 1990s, Bangkok.

Sahib, M A (1987) Development of statistical capability within official statistical agencies in the ESCAP region. *Proceedings of the 46th Session of the International Statistical Institute.* ISI, Tokyo.

Sugito, S and Sukayat, D (1991) Statistical education and training in Indonesia organised by CBS. *Proceedings of the Third International Conference on Teaching Statistics* (Vol 2). Dunedin, New Zealand.