

Statistical Training by the South Pacific Commission

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1. History and background

The South Pacific Commission (SPC) has been providing statistical training to its 22 island member countries for 18 years. In 1972 the first training course (on Trade Statistics) was held in Fiji. A total of 18 such "Specialised" training courses have been conducted throughout the Pacific by the SPC. Over 300 people have participated on these courses, with participants coming from 20 of the 22 member countries of the SPC. The range of topics covered by these courses includes trade statistics, national accounts, agricultural statistics, employment statistics, household surveys, data analysis and interpretation, forecasting, and statistical microcomputing. These are rather specific topics and they provide necessary advanced training in both the theoretical and practical aspects of these important statistical fields. However, they do not provide advanced training in mathematical statistics, which is adequately provided by universities in Australia, New Zealand, the USA, Asia, and by other training institutions such as the UN Statistical Institute for Asia and the Pacific in Tokyo. In any case the need for such advanced training is fairly limited, especially in the smaller countries of the Pacific.

On the other hand, it quickly became apparent that there was a considerable demand (and an even greater need) for more general, basic statistical training. In recognition of this need, a basic Statistical Operations and Procedures (SOAP) course was introduced in 1977. Forty-two basic SOAP courses have been conducted since 1977, training over 800 participants. These courses have been held in 16 of the 22 member countries of the SPC.

The course is held "in-country" (i.e. only people from the country in which the course is being held participate), and runs for six weeks in the mornings only. This allows participants to return to their workplace in the afternoons so that they do not get seriously behind with their official duties - which is particularly important in the smaller island countries where there is often no-one else to carry out the participant's duties whilst they are on training. It also means that the course can be run by one person, whereas two people would be needed if the course was run on a full-time basis.

The course is based on a set of lecture notes which currently comprise the following modules.

- Module 1 Principles and Methods of Statistics
 1. Principles and methods of statistics
 2. Statistics and their uses
 3. Official statistics and the role of the National Statistics Office
 4. Statistical standards

- Module 2 Data Collection
 1. Determining statistical requirements
 2. Designing a statistical collection
 3. Questionnaire design
 4. Sampling
 5. Data collection from administrative records
 6. Data collection using a self completed questionnaire, including mail surveys
 7. Data collection by field work

- Module 3 Data Processing and Statistical Presentation
 1. Data processing principles and operations
 2. Mechanical aids for data processing-computers
 3. Basic computation techniques
 4. Tabular presentation
 5. Statistical diagrams
 6. Textual presentation and publication

Exercises and home assignments are used to monitor progress and reinforce the lecture material. Also, a course project is an integral and essential component of the course.

The underlying aim of the basic SOAP course is to provide participants with a basic understanding of why statistics are important and an overview of how to collect and use statistics. As the various topics suggest, the course is non-technical and only a very basic level of arithmetic is required.

A major effort is made to include training in basic numeracy as an essential (if unstated) part of the course. This basic numeracy component of the course is introduced in a number of ways. In countries where a local newspaper is published every day, it is usually possible to find one or more articles each day involving tables, graphs and other basic statistical materials which could then be discussed on the course. Alternatively, some data can be taken from the country's statistical publications and discussed by the participants. This method has the added advantage of making participants (many of whom do not work in the statistics office) more aware of what information is available about their country, and how it can be used in their place of work.

Considerable emphasis is placed on developing basic skills. Since an understanding of percentages is vital to so much statistical work, considerable time is often spent on short exercises involving percentages. Other basic concepts which are important to statistical work and are often found to be deficient are the use of simple pocket

calculators, the significance of digits, and the rounding of numbers. The proficiency of participants in each of these areas varies markedly from course to course, but each is addressed where an inadequate level is exhibited.

In 1981 it was recognised that a need existed for a more advanced general statistical course. To meet this need more lecture notes for an intermediate SOAP course were developed and this now consists of:

- Module 4 Introductory Statistical Methods
 - 1. Terminology and definitions
 - 2. Frequency distributions
 - 3. Graphical presentation
 - 4. Measures of location
 - 5. Measures of dispersion or spread

- Module 5 Statistical Methods
 - 1. Index numbers
 - 2. Analysis involving two variables
 - 3. Analysis of time series

Furthermore, a special topic(s) of interest to the host country (that the course director is capable of presenting) is also included in the course. As for the basic SOAP course, exercises and home assignments are used to monitor progress and reinforce the lecture material. Also, a course project is an integral and essential component of the intermediate SOAP course. Eleven intermediate SOAP courses have been conducted since 1981, training over 200 participants. These courses have been held in 10 of the 22 member countries of the SPC, either in-country or on a subregional basis (i.e. persons from many countries participate on the course). The course runs for four weeks full-time and the basic SOAP course is considered a desirable prerequisite.

Although the intermediate course requires considerably more mathematical skills than the basic course, it would not be considered "advanced" by most statisticians. In fact, the basic and intermediate SOAP courses are often used as a useful screening technique for the selection of Pacific Island statistical staff for more advanced training, for example by the UN Statistical Institute for Asia and the Pacific, or the University of the South Pacific. Such training represents a substantial investment for Pacific Island statistical offices, involving the loss of a capable officer for at least six months. It is obviously desirable to have a clear indication of the likely success of such training for the officer, and successful completion of the SOAP courses provides such an indication.

The topics covered by Module 4 (Introductory Statistical Methods) are very suitable for this level of course, but the value of the material in Module 5 (Statistical Methods) is less clear. Certainly Topic 1, covering Index numbers, is of vital importance for the work of a statistics office, but the value of a detailed understanding of how to carry out a regression or time series analysis (Topics 2 and 3) is questionable. It has been suggested that the coverage of these more mathematically advanced topics could be best left to the academic institutions, or to training institutions like SIAP. A topic used frequently by practising statisticians (but rarely covered adequately in basic mathematics or statistics courses) is the calculation of growth rates. A statistics office is usually expected to present annual rates of population growth or annual rates of inflation.

Learning the steps involved in making the necessary calculations for these growth rates provides a necessary practical tool that participants will regularly utilise in their work. Furthermore, it is a useful exercise in the efficient use of calculators and it also helps to reinforce the participants' understanding of percentages. It is proposed to include such a section in the intermediate SOAP course notes in the next review.

It is very important that participants be fully numerate. Individual countries are requested to nominate persons for these courses but sometimes nominees have been found to be unsuitable. The administering of a simple test to assess which nominations are suitable has been proposed. However, due to the distance, communication, and timing difficulties often experienced with these courses, this is not really practical. One area where SPC does have influence is in the choosing of the host country for a subregional course; here it is important to stage the course in a country where there are likely to be sufficient local participants with the right background to benefit from attendance at the course.

Both the basic and intermediate SOAP courses include a practical project, and course assessments by participants have often emphasised its value in helping to reinforce their understanding of the material. The resource of 20 persons for up to a week is rarely available in most Pacific Island statistical offices, and such a resource should be used to produce something of considerable value to the host country.

In the early years nearly all the basic SOAP courses were conducted by the SPC Statistical Training Officer. This arrangement had both advantages and disadvantages. The major advantage was that the Training Officer soon became familiar with any particular problems there might be in running training courses in the Pacific, and would adapt the course methodology accordingly. The disadvantage of having a full-time Training Officer was that the high demand for courses meant a fairly difficult lifestyle for the Training Officer, who was required to be away from home for the majority of the year. The SPC found it difficult to recruit suitable Training Officers who were prepared to accept this kind of lifestyle. As a result, the post was sometimes vacant for substantial periods.

To obviate this problem the SPC now uses consultants, provided mainly by the statistics offices in Australia and New Zealand. Whilst the use of outside consultants does help to inject a depth and variety of experience into the SOAP training programme, there are some problems. Although briefing procedures are in place consultants may still be surprised by the very different environment that the Pacific presents. However, consultants have always been positive about their experience and this is shown by the usual request by consultants to be considered for similar consultancies in the future. The SPC has not been disappointed with any consultants engaged from Australia or New Zealand. In fact, a very positive benefit from the SPC's perspective is the excellent depth and quality of course reports provided by these consultants, generally far exceeding those produced by previous SPC Training Officers. These are completed on the consultant's return to their home country in their own time. This reflects the professionalism and enthusiasm these consultants bring to the SPC training courses.

2. Challenges and difficulties

The biggest difficulty encountered in providing statistical training to the SPC

member countries can be summed up in one word - diversity. The countries vary remarkably with regard to size, culture, history, political stability, educational background, language, geographic dispersion, and level of development. All of these factors contribute to the difficulties of providing statistical training in the Pacific region, but also pose a stimulating challenge to overcome, or at least minimise, their effect. Each factor deserves to be addressed individually, but space permits only brief comments.

(i) *Size:* The area served by the SPC covers an area in excess of 30 million square kilometres (i.e. more than six times the size of continental Europe). Of this total area, only 550,000 square kilometres (i.e. less than two percent) is land. This necessarily means that a considerable amount of air travel is required, which makes the provision of training very expensive (particularly for subregional courses).

The individual countries vary dramatically in population size. Apart from Pitcairn (population 100, which does not receive training), the populations range from 3.5 million (PNG) to 1600 (Tokelau). Such diverse population sizes create difficult decisions about how to allocate a limited training budget. The SPC has no set policy on this issue but tries to service all requests as best it can.

The size of some of the small islands also places considerable strains on consultants. The SPC receives generous support from the Australian Bureau of Statistics and the New Zealand Department of Statistics, who often release staff to direct the courses. Most of these consultants have had little experience at providing training and this is a difficult enough task in familiar surroundings for the inexperienced. To be sent off to a far-flung Pacific island which can run out of basic supplies such as soap, shavers, umbrellas (essential in the tropics), etc. can be quite depressing and directly affect the performance of the consultant.

(ii) *Culture:* The South Pacific can be partitioned into three areas; Melanesian, Micronesian and Polynesian. The cultural differences between these groups are very stark, but even within these groups the individual countries are very proud of their traditions and customs. Although a full description of South Pacific cultures is beyond this paper, some examples may be illuminating:

(a) In Australia and New Zealand dogs are kept as family pets and often referred to as "man's best friend". In some parts of the Pacific, dog is considered a culinary delicacy. The thought of eating something which could have been your cute and cuddly pet back home can be quite disturbing to some consultants.

(b) The Pacific is generally a very religious area and in some countries religion is incorporated into the law. Sometimes consultants become a little too enthusiastic and work on a Sunday, which in some countries is strictly forbidden by law. The attendance of church services is sometimes simply assumed and one consultant has been asked on arrival in one country: "Which church service do you wish to attend, Catholic or Presbyterian?" without first being asked if they were religious!

(c) The pastime of "betel nut chewing" can be a surprising practice to some consultants. Betel nut chewing involves sprinkling a "betel nut" with a white substance, wrapping it in a green leaf, and then chewing it.

The result is a blood red, liquid residue which is spat on the ground or some suitable receptacle (e.g. an office rubbish container).

(iii) *History and educational background:* The history of the Pacific is both long and diverse. Much of this history has been handed down from generation to generation with little documentary evidence. This makes a distinction between myths and true history very difficult. Nevertheless, the modern history of the Pacific islands (i.e. this century) is well documented and is very relevant to statistical training.

During the twentieth century most Pacific islands have been colonised or ruled by an external country. Australia, New Zealand, England, France, Germany, the United States, Spain and Japan have all played a significant part in Pacific history. Some Pacific islands are still ruled from external countries, many have gained independence (most in the past fifteen years), while one, the Kingdom of Tonga, has retained its independence throughout the centuries. Most countries were colonised by a single country (e.g. PNG by Australia, Fiji by England, Western Samoa by Germany), Vanuatu had the distinction of being jointly colonised (by England and France), while the Micronesian countries have experienced five different colonial administrations in the past 100 years.

The colonisation of the Pacific by a wide variety of countries has led to differing educational systems and standards throughout the Pacific. The level of arithmetic and mathematical skill varies remarkably, making the development of a uniform training package very difficult indeed. As an example of the difficulties which a poor educational background can create, one consultant engaged to conduct an intermediate SOAP course, arriving on the first day of the course, distributed a basic arithmetic test. Imagine his concern when only one of the twelve participants answered the question " $3^2 = ?$ " correctly. Upon learning that most participants had never encountered the "squared" concept, the consultant concluded that the sessions on standard deviation were going to be considerably more difficult than envisaged!

Apart from the three French Pacific territories, the people of the SPC member countries can generally speak English. However, for most Pacific Islanders English is a second language, with most of their day-to-day conversation conducted in their own native language. The combination of this fact with a consultant's Australian or New Zealand accent can be very detrimental to participant comprehension. Consultants may not identify this comprehension difficulty for quite some time (if at all), since the Pacific Island people are shy towards authority figures and Europeans. If they are having difficulty understanding the consultant they would rarely ever say so and may deny it even when asked, out of respect to the consultant.

(iv) *Political and geographic factors:* The political climate varies in the Pacific, both from country to country and over time. Upheavals have been seen in recent years in PNG, New Caledonia, and Fiji. The political status of many countries (the American and French territories in particular) are currently being peacefully negotiated. Although political instability rarely threatens the safety of visitors, consultants can be difficult to recruit due to exaggerated or misleading media reports in their home countries.

The large distances between Pacific islands and the infrequent (and sometimes unreliable) airline services around the Pacific cause problems in communication and transportation. The main problem is the cost of transporting consultants (and participants, for subregional courses) to training venues, and the cost of overseas phone calls,

faxes, etc. Timeliness is another concern, with training materials sometimes taking months to be transported from one island to another. Also, a consultant engaged to conduct a four-week training course will often be away from his/her base for five weeks due to the irregularity of air services around the Pacific.

However, some of the smaller, more isolated Pacific countries have very poor infrastructure. For example, the consultant can find him/herself stranded at the airport due to there being no taxi or public transport service. Accommodation can also be a problem, with standards often falling well below those considered acceptable in developed countries (for example, a course had to be cancelled this year due to the only accommodation on the island being destroyed by a cyclone). Health services and general hygiene can be a concern with drinking water needing to be purchased in some countries.

As for actually running the course, there can be any number of difficulties. The actual venue of classroom is often cramped and hot, creating discomfort for consultant and participants alike. Basic support such as photocopying and typing assistance can be slow or non-existent. Basic teaching aids such as overhead projectors are usually available but can be difficult to locate when required.

3. Conclusion

The experience of being a statistical trainer in the Pacific can be accurately described as unique. To satisfy the diverse needs of the developing island nations of the Pacific requires considerable resourcefulness and ingenuity. Consultants need to be very flexible and have the ability to quickly assess the capabilities of course participants and adjust their presentation accordingly.

The need for statistical training in the Pacific is certainly substantial. However, statistical training competes with many other needs for scarce funding and resources. Unfortunately, the benefits of statistical training are not as obvious or immediate as the benefits of providing such facilities as adequate sanitation or better roads. Nevertheless, the Pacific island nations do regard statistical training as important. As a profession, we statistical trainers should welcome the challenges posed within the region and strive to assist the Pacific island nations overcome these challenges.