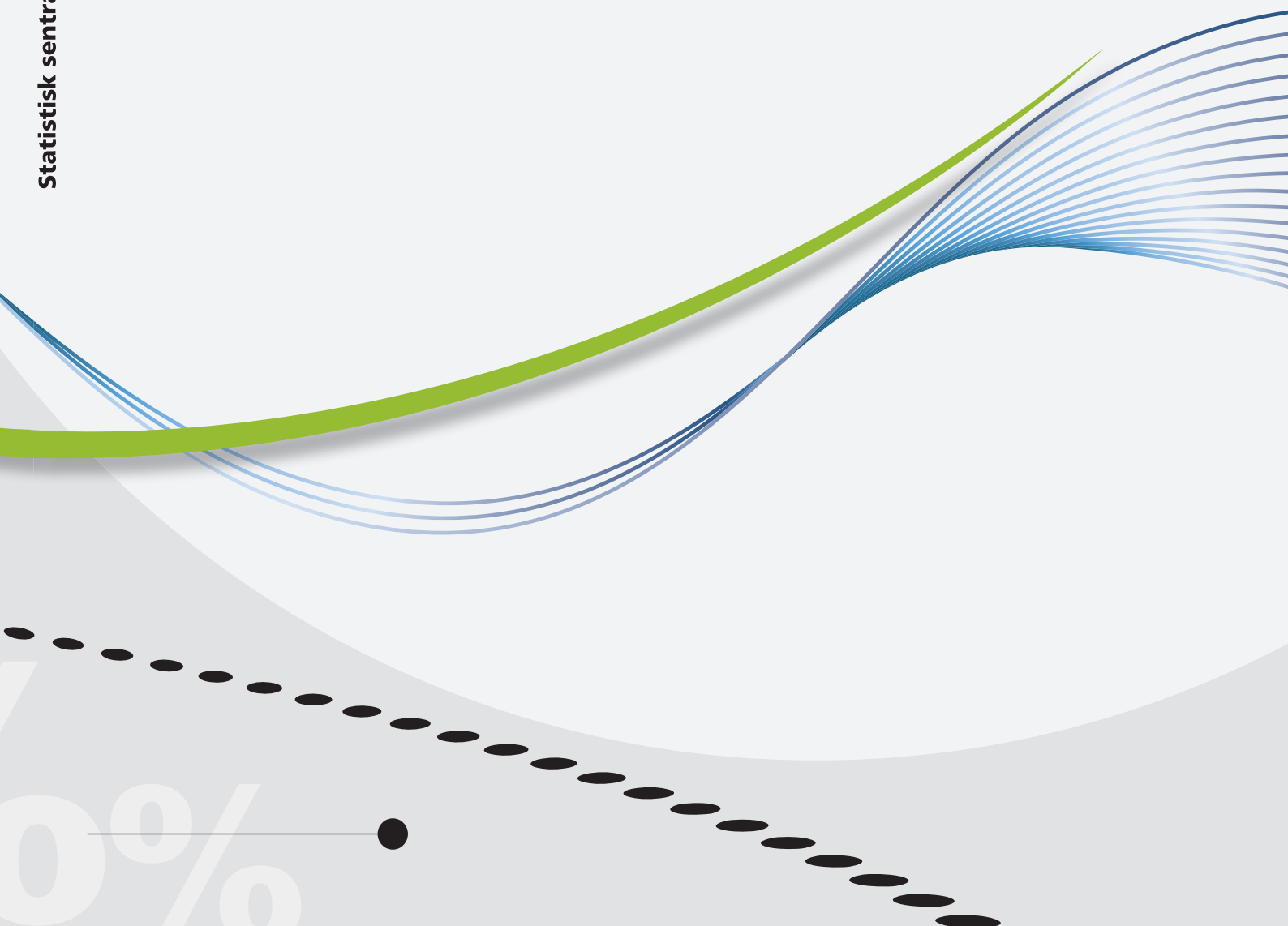




Dag Roll-Hansen

In-house training in statistical organisations

Some issues to consider and suggestions for courses



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Preface

Statistics Norway cooperate with sister organisations in transitional and developing countries. The aim of the cooperation is to create high quality statistics.

Making statistics is a handcraft, based on a theoretical foundation. Statistics can be seen as a building: The way it is constructed has similarities to other buildings, yet each building is adapted to fit the environment and its purpose. When we make statistics, we learn from those who have gone before us, using their knowledge and experiences to make statistics adapted to its context and purpose.

This document is aiming to summarise some issues to consider when planning to give training in making statistics. And maybe most important: It gives references to where training material can be found. The aim is to direct the reader to relevant material produced by core organisations in the area, sharing their knowledge as a common good. Among the main recourses are the World Bank's Virtual Statistical System, SADC Course in Statistics developed by the University of Reading (UK) and material made available from the UN Statistics Division.

Many experts in different areas have contributed to this document. Among them are Dr. Ib Thomsen, Mr. Jan Erik Kristiansen, Mr. Håvard Sjølie, Mr. Lars Carlsson, Mr Geir Øvensen, Mr Kai Andresen, Ms. Anne Abelsæth, Mr. Tom Andersen Langer, Mr. Bjørn K. G. Wold, Mr Per Schøning, Ms. Ingvild Maanum Møller, Mr. Hans Kristian Østereng, Mr Øyvinn Kleven and Mr. Stein Opdahl.

Thanks to you all.

Abstract

The quality of a National Statistical Institute (NSI) to a large degree depends on the performance of the employees. Hence, making sure the staff has adequate skills is crucial. Training can improve the performance and productivity of the staff and ensure that they have the relevant skills.

The need for training must be identified based on existing competence in the NSI. An important aspect in building the right competence is to find out what the different employees are good at and like doing that is important for the organisation.

The difference between what competences you have and what you need is what you ought to focus on achieving. To find out what is needed, a gap-analysis and a competence mapping by surveys may be conducted. Standardising the production process also will make it easier to identify what competence is needed.

The course organisation consists of several elements. Trainers must be identified, as well as training facilities and last but not least: the course participants. It is important to find a way to motivate the trainers, find out when in the work-cycle to do the training and how to make sure that new skills can be used immediately.

The management must be an integrated part of the process. Without management ownership of the training process, it is not likely to succeed. The management also has an understanding both of the existing competence in the organisation and of what the needs of tomorrow will be.

A training centre is a crosscutting task, and may be best administered under a department of administration. The directors of the different departments may give input on what courses they need. The management should prioritise the suggestions for building competence according to plans and budget limitations.

The gain of successful training can be found on two levels, both on the personal and the organisational. For the individual more competence may give increased responsibility, more interesting work, higher salary and a future career. The organisation will be less vulnerable, have increased efficiency and higher productivity. When the staff has the right skills, it will be easier to get the job done. We will suggest four training programs to cover important areas in NSIs: Training new employees, training of statisticians (intermediate level), training and certification of senior statisticians and training of users.

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1. Introduction

The skills needed in a NSI are a mixture of practical and theoretical knowledge. This is rarely found at universities. Educating staff by in-house training is often cost-effective. This document will point to some issues to consider when planning and organising in-house training and suggest courses to be held.

Expenditure on staff accounts for a dominant fraction of the budget in a statistical agency. In a sample of offices representing a broad array of sizes and stages of development, salaries accounted for approximately 70 per cent of the total budget¹. Therefore, training employees to meet their maximum potential is important.

Training must do two things. First it must move your attitude. Second the skills you gain can only be seen in your work. If work has not changed, then training has done nothing. And remember, the knowledge you gain is not yours. You have to pass it on to others.

Chairperson of the National
Bureau of Statistics of South
Sudan

Having the necessary competence is crucial to any NSI. It can be built through various kinds of training. The need for training must be identified based on existing competence within the NSI. To work in a statistical institute you need a combination of practical and theoretical skills that you often can not learn through formal education. Training staff to have the right skills hence is often a challenge. This is why NSIs often turn to in-house training to give their staff the training needed. Effective training may be particularly important when hiring new employees or when the tasks or the technology at hand are changing.

In-house training is often a cost effective way of organising training. There are several reasons for this:

- training can be scheduled at your convenience
- training is more focused, consistent and relevant to your needs
- travelling and accommodation costs are reduced

Training courses may be designed and carried out by the NSI's own employees, national experts or foreign experts. Internet-based training courses should also be considered.

¹Handbook of Statistical Organisation, Third Edition: The Operation and Organisation of a Statistical Agency; http://unstats.un.org/unsd/publication/SeriesF/SeriesF_88E.pdf

2. Identifying training needs

An analysis of training needs will identify gaps between the skills the organisation needs and the skills the employees already have. It involves gathering information to identify areas where the employees could improve their performance. Further it is important to define the kind of knowledge to look for when taking on new employees. To collect this information employee surveys, management observations, user comments, meetings, inspections and tests can be used.

An analysis of training needs can help clarify the objectives in training the staff. This is valuable for ensuring that money is spent on training that will help the NSI to achieve its objectives.

The IT systems used in the organisation will influence the training needed. The choice of systems and tools to be used, ought to be based on an analysis of which will serve the organisation the best.

To carry out an analysis of training needs, we need to²:

1. Analyse our organisation's goals and the skills and tools required to meet these goals.
2. Determine what information or training employees will need to be effective in their job.
3. Evaluate who should be trained and how best to motivate them for training.
4. Establish how employees will best accept and integrate training and how they learn the best
5. Evaluate the training in place and decide what your NSI can and can not provide in the way of in-house training, funding and time.
6. Assess which trainers or consultants can fill these gaps.
7. Take a decision on which training best fits the needs of the organisation.

It is important to assess lack of skills at all levels of the organisation, including all levels of management. This will send a signal to the organisation that everyone may need to improve; and that admitting that you need to develop your competence is not a problem.

The choice of training will also depend on what the employees need to learn and the number of employees that are to be trained. For example, seminars are a useful way to give information to a large audience, while smaller workshops allow people to participate, e.g. to practise solving practical problems.

The training needs identified ought to be made public in a course catalogue. The main purpose of it is to enable both leaders and staff to plan and prioritise their training needs. Making a list and a schedule requires an administrative effort the first time it is done, but the next time it will be easier.

The course catalogue may be made short and it may be long. Making an extensive catalogue, including a wide range of courses may be a bottle-neck.

² Based on www.businesslink.gov.uk

Striving to make the catalogue complete may take attention away from starting courses. Seen in this light, a possibility is to see an extensive catalogue as a menu to choose from, rather than an actual overview of courses to be conducted in the near future.

Now we will look into three tools to identify training needs: Standardising the production process, gap analysis and mapping competence with a survey. These tools may be used separately or in combination.

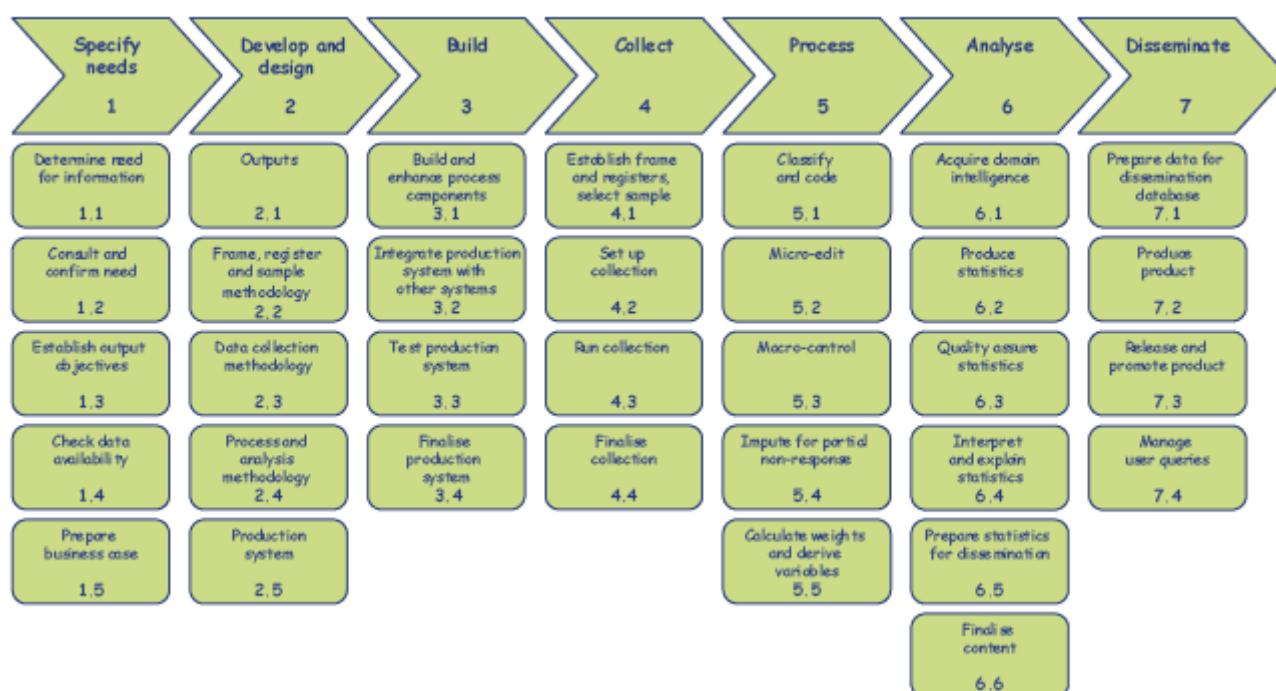
2.1. Standardising the statistical production process

Many NSIs are now working to standardise their production procedures. The main goal of doing this is to implement standardised systems and working procedures throughout the organisation. If everyone uses the same tools and techniques it will be easier to maintain the technical systems, train staff and it will help reduce the cost of software. Statistics New Zealand has done influential work in this context, but the approach is also used by several other NSIs, among them Statistics Netherlands, Statistics Sweden and Statistics Norway.

The below diagram is pointing to the main areas of a statistical production process and areas it can be subdivided in. This figure may be a useful starting point when evaluating what competence is needed in a NSI³.

³ http://www.ssb.no/english/subjects/00/90/doc_200817_en/doc_200817_en.pdf

Figure 1: Statistics Norway's Business Process Model



In addition to the tasks identified in figure 1, three issues concerning all parts of the production process will have to be addressed:

1. Development of the architecture within methodology and IT
2. Quality Management
3. Project Management

Important areas in the statistical production process at your NSI ought to feed into an analysis of training needs. These are the areas where you must secure sufficient competence.

2.2. Gap-analysis of training needs

Plans are made for which activities an organisation is to engage in. Which financial resources are available is decided in the budget process. A plan should also be made for having people with the right skills at the right time.

Here we present a way to identify competence needs, through identifying the gap between what the employees know and what they ought to know in different fields. The fields must be identified based on the statistical production process in the NSI and the major tasks to be done, taken from the Master plan or another document outlining the major achievements to be made. The major tasks must be divided into smaller tasks that can be assigned to a single person or a team.

Tasks	What kind of knowledge do we need?	What do we have?	How can we get what we lack?	Who?	When?
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3

The main idea of a gap-analysis is to fill in information on what competence we have, what we need and how we can get what we lack in different areas. It is also open for names and time frames. A sustainable approach to administer this form may be to have it filled in by the executing line organisation. Keep in mind that this comes in addition to ordinary planning of activities and budgeting.

A major task may e.g. be to conduct a survey. The tasks that are to be considered when planning for human resources must however be more specific. They must include making a questionnaire, design a sample and plan for field work. And so on.

Identify the main activities of the part of the NSI you manage

The major tasks to be done are usually given in the Master plan, or on a lower level – is derived from the plan. We should identify the tasks to be done within a period. It may e.g. be to prepare new computers for use, set them up in a network, and keep them operational and virus-free. The reference period should be either the financial year or a major event that will take place, e.g. a survey or a project.

What knowledge do we need?

The first point is to identify what kind of knowledge and skills does a group need to solve its tasks. It may be need for e.g. subject matter, IT, administrative, social and language skills. In addition, also include the need for back-up-systems, descriptions of routines and tasks, organisation of work, project groups etc.

What do we have?

Here existing competence today should be identified, including all kinds of relevant skills. The difference between what we need and what we have shows us the competence we lack, our competence gap. If we e.g. need to set up new computers but have no one that can do it, this is our competence gap. This is the basic idea behind a gap analysis.

How can we get what we need?

Here the idea is to find ways to fill the gap. In addition to give courses it may be relevant to organise work in a way that leads to sharing of knowledge (e.g. job rotation), organising internal or external courses or workshops, recruiting new employees with the needed skills and establishing and documenting standardised work procedures. Other possibilities that can be considered are to change to a tool or work mode that is known in the organisation or buying a service from outside.

Who?

Then it is time to start thinking of whom to fill the gap and make a plan to fill it. If training is the appropriate way to fill the gap, we must find out where

the needed training is available, when it ought to be done and make a proposition for whom to take part in training.

When?

As far as possible training should be given close to the time the new skills are to be used. The management must prioritise the suggestions for training according to plans, priorities and budget constraints.

2.3. Mapping competence with a survey

A survey mapping the existing competence in the institution may be implemented as part of a baseline study to identify training needs. This ought to be aimed at identifying existing competence, need for competence development and maybe also potential teachers. A questionnaire developed at the Southern Sudan Centre for Census, Surveys and Evaluation (SSCCSE) is mapping competence at the level of the individual employee is given as an appendix to this document (appendix A). It identifies the formal education of the employees, as well as asking them to evaluate their own skills and needs for further training. Evaluation of organisational competence may also be based on the PARIS21 Statistical Capacity Building Indicators⁴.

A mapping of existing competence and skills and need for additional training is important for three reasons: First it will make it possible to establish a baseline of existing competence. What is the knowledge base at the NSI today? Secondly it will be useful for identifying and prioritising courses to be given. In what areas do we lack competence and which should be prioritised? Thirdly it may be used to identify potential trainers.

But be aware: Initiating a competence mapping creates expectations. Do not have your staff participate in such an exercise if you do not have the resources to or for other reasons do not intend to train them. Broken expectations may in many cases be worse than having no expectations at all.

The areas prioritised by the management, the needs identified by the gap analysis and the results of the competence survey should all be part of the decision process when planning in-house training. This both applies for making the list of courses to be conducted and planning for when they should be given. Now we have looked into different tools to identify training needs. The next chapter will look at how to organise training.

⁴Statistical Capacity Building Indicators, PARIS21 Task Team, <http://paris21.org/documents/1084.pdf>

3. Organising training

In this chapter we will draw attention to organisation of training, related to the trainers, the trainees and the training itself. The chapter discusses the length of training, resources for in-house training and strategic choices regarding the organisational setup.

3.1. The trainers

It is important to draw on existing skills in the NSI when developing a training programme. If we have competent people to teach Microsoft programs or statistical packages in one part of the organisation, their competence ought to be spread to other parts of the NSI. We should also consider if different kinds of related knowledge can be combined in one course. It might e.g. be useful to combine aspects of analysis of data *and* dissemination of results in a course on report writing.

For in-house training to be effective, the best is to have the appropriate expertise within the organisation. When possible, internal trainers ought to be used: It will strengthen the learning potential of the organisation and build confidence among the trainers. If no one has the expertise, it must be brought in from outside the organisation. This can be done by having an external consultant first conduct the course with the help from an internal assistant teacher. If help is brought from outside it is important to have a plan to build competence in your own organisation, to have someone to teach the course when it is to be repeated. Hence, it is important to have one of the employees cooperate with the external teacher in preparing the course and to be acting as an assistant teacher. When the course is repeated, the assistant teacher will take responsibility for the course. When the assistant becomes the main teacher, he or she takes on a new assistant.

When choosing which employees will teach the course, make sure that they both have the ability to teach effectively and are interested in doing so. An advantage using an existing employee to become a trainer is that he or she already has experience in the field and knowledge of the work of your statistical agency.

An in-house trainer may need guidance in⁵:

1. Presentation and speaking skills
2. Creating interest
3. Dealing with difficult students
4. Teaching techniques
5. Course and session design/planning skills
6. Evaluation, monitoring and feedback skills
7. Measuring the effectiveness of training
8. Setting up support for employees after training
9. Conducting training needs analyses

A manual to assist teachers in statistics in these issues is developed in support of the European Statistical Training Programme⁶.

⁵ Based on www.businesslink.gov.uk

⁶ http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp_insite/insite_docs/estat/89DC91CDE8573F34E0440003BA9321FE

The in-house trainer ought to be a specialist in his or her area. It may be a good idea for management to sit down with the trainer to identify what content should be included in the course. One should be motivated to act as a teacher, in order to encourage the employees to acquire skills and pass them on to their colleagues.

3.2. The training and the trainees

The need for training will vary between the employees, but some needs are more general than others. Training in basic analysis in statistical packages like SPSS, SAS and Stata, and computer programs like the Microsoft Office-programs are examples courses that are often useful for a producer of statistics. Even though many employees have a thorough theoretical education, it is often a challenge to apply the theoretical knowledge in their day-to-day work.

It is also necessary to make the employees use the newly acquired skills from training at once they return from the course. Otherwise the knowledge will be forgotten and the training will be wasted. Conducting the courses in-house will facilitate the timing of the courses in relation to tasks to be solved. Suggestions for courses and curriculums will be presented later in this document.

3.3. The length of the training: Short, medium and long term

It is important to educate the staff to the right level. This implies capacity building of short, medium and long term.

Short term courses are often aimed at supplying additional competence in a limited field. Giving the staff insight in practical approaches to solve tasks is often best done by having them attend relatively short courses related to their tasks. The knowledge needed is often based on sharing experience on practical production of statistics and working routines.

Courses or workshops focusing on training of trainers have often proven to be effective. An example of this is when staff from local statistical offices go to the NSI headquarter to learn, later to teach their colleagues in the local office. How many employees that need to be trained, the complexity of the issue and the prior education of the employees ought to be taken into account when considering to decentralise training this way.

Study trips often give inspiration and ideas and may make it easier to discover own weaknesses.

To develop and produce statistics, specialists are needed. Competence building of medium and long term must be initiated to build specialists. This is appropriate when the needed competence is viewed as particularly important, or may be seen as an investment in valued colleagues.

The costs of scholarships, fees, travel and accommodation is a challenge for most NSIs, particularly related to long term training. An additional challenge is that long term training takes an employee out of production for

a substantial amount of time. A plan must be made to fill the gap of the employee in training.

After the education is completed the employee will often be more attractive for other organisations to employ. Long term training often is given in exchange for a commitment to work in the organisation for a given period of time after the training is completed.

The length of a training period should be based on an assessment of all the above mentioned aspects.

3.4. Distance learning

Organisations that do not have the necessary skills in-house may find that distance learning courses are more suitable to fit their needs. There are different types of distance learning methods including correspondence courses and e-learning courses.

Distance learning courses:

1. Allow employees to complete training while remaining in employment.
2. Can be completed at a time to suit the organisation and the employees.
3. Are cheaper than externally provided courses.
4. Are available for a wide range of topics.
5. Offer recognised qualifications from entry level diplomas and certificates to post-graduate degrees.

A major advantage using e-learning is that it allows people to enhance their qualifications without taking time off or even leaving the workplace. Employees can study part-time using courses delivered online and achieve recognised university qualifications

Note that providers of new machines and systems often offer free or cheap training on how to use them.

3.5. Training the “untrainables”

No one is untrainable. It will always be possible to make a person function better in his or her job through training or other human resource development measures.

Some will always be better qualified, smarter more motivated or more creative than others. In most cases it will be easier to train these, in the sense that they will be more receptive to new knowledge. Never the less, most skills and employee characteristics can be modified and improved by training. Some employee characteristics are however difficult to change. Most personality traits are generally relatively stable. This also goes for intelligence and attitudes. The best way of ensuring these qualities is through recruitment. They may be difficult to develop at a later stage. The most important of these characteristics is probably the inner motivation of a person to do a good job. The other skills and characteristics we need for an NSI can be build or improved by training, on the job training or having autonomy and responsibility.

Our aim with training should be to bring everyone to a higher level than they were before the training started. It is always important to adjust the training to the prerequisites of your employees, and not only educate the employees that already have the most education and that we assume are the ones easiest to train. No one is untrainable.

3.6. On the job training

Training on the job generally is the most efficient and cost-effective type of training. Efforts ought to be made to increase knowledge sharing between senior and junior staff, and a better foundation shall be created for knowledge sharing between various areas within the organisation. Learning for most employees comes from this kind of training.

In our department everyone have to rotate. Everyone should know what everyone is doing. There is a lot of cooperation in the economic department. What happens in one section, everyone knows. People know more or less what everyone is doing.

Acting Deputy Director in a Department of Economic Statistics

More formalised on the job training often include:

Job shadowing involves one person showing another all the aspects of a particular job and can cover a lot of topics. It is suitable e.g. for training new employees as part of the introduction process.

Coaching involves regular reviews of an employee's progress. It is typically carried out by line leaders who advise employees on how to improve their performance. It provides employees with feedback and can be used to introduce new tasks or responsibilities.

Mentoring is typically used for employees at senior management and chief executive level and is a personal way to coach and advise senior staff. The role is best carried out by someone other than a line manager, possibly someone from outside of the organisation, who has the skills and experience to guide the employee and suggest practical solutions.

Passing on training involves one employee participating in external training and returning to pass on their knowledge to other employees. It helps to keep costs down but is more suitable for more general skills such as IT.

Knowledge banks, e.g. reference books or a CD-Rom library, intranet and handbooks are an effective way of providing basic information that employees can access at their convenience. They are a way of giving information on office procedures and how to do basic tasks.

3.7. Resources for in-house training

For in-house training to be effective, it is necessary to ensure that the appropriate expertise and resources exist in-house or can be recruited from outside. We will have to dedicate the necessary resources to the training programme. These include management time, an experienced trainer, the administrative effort, training or course materials, computers, a room to do the training and maybe also travelling, accommodation and refreshments. Training will also require employees to be away from their posts while they learn.

In order to ensure a sustainable system of training, it is essential that the in-house training includes a system of rewarding teachers. A well established system in some countries is to pay the teachers a reasonable allowance (such as \$100) for each original lesson and a reduced allowance when the lesson is repeated. The allowance should only be paid when the teacher presents a note with training materials used for storage and re-use by the in-house training archive. If used by other teachers, the original teacher should receive a reduced allowance as well. This may motivate the employees to acquire skills and pass them on to their colleagues.

3.8. Evaluating training

Evaluating the effectiveness of training gives us an opportunity to improve future training. Below we will look at some ways to find out if training has worked.

Ask employees whether the training was relevant and appropriate. Relevant questions may be if the training was relevant to their job and their level of expertise, how they will put their learning into action. They can also be asked to give feedback on the training method, like what worked and what could be improved. Training assessment or evaluation forms may prove useful here.

Tests can be given to course participants to evaluate what they have learned from the course. Consider testing the participants before and after the training to get a picture of the improvement of skills from taking the course. An alternative approach is to evaluate a product that is made during the course, e.g. an analysis or a report.

Monitor improvements in the performance of the statistical production process, or other organisational targets to be improved by the training. Try to measure indicators like the number of finalised publications, hits on the internet, number of errors, production costs, user complaints, absenteeism, staff turnover and quality improvements. Assess whether or not improvements can be contributed to the training.

Performance appraisals and development talks between the employee and his immediate supervisor can be used to review the impact of the training on the employee's performance. To be able to make an employee perform good, the employer has to know his abilities, what knowledge he needs and what motivates him to do a good job. The employee needs to know what is expected of him and to be assisted in achieving the goals that are set.

It is often difficult to have high validity in training evaluations. To make a good evaluation we ought to collect comparable data both prior to the training and after the training. We also have to be able to make an argument that changes are related to the training given.

In evaluation terms the observations of the pre- and post-training data would be given by an O. The intervention – in this case the training – is denoted by an X. If we measure before training, do the training and then measure again after training, the evaluation design could be described as:

O X O

This design will give us a reasonably good impression of whether or not the training has had any effect. The basic idea is to measure if the observations before and after the training has occurred, are significantly different. Adding and measuring more observations or interventions will make the validity of our evaluation design stronger.

3.9. Organisational setup and tasks

The in-house training can be organised in several ways. We will mention three alternative approaches to the organisational setup:

1. Constitute a special unit within the NSI.
2. Give the responsibility to a couple of persons within a supporting section, for example in a Human Resource unit, who is working part time with training and part time with other tasks.
3. Constitute a cross-division committee, with one person, placed in a supporting section like documentation and dissemination, responsible for leading and maintaining the committee. The committee should include persons with responsibility for employees.

There are advantages and disadvantages with all alternatives. The first will assure manpower dedicated to the task, but may have a challenge in becoming sufficiently integrated with the rest of the NSI. For the second it may initially be easier to find the resources, but the staff may not be able to prioritise the in-house training over other tasks. The third may secure that all parts of the NSI are represented, but may lead to dilution of responsibility.

The responsibilities and task of the in-house training organisation would be:

1. Identify training needs. This should be done both for the needs of the NSI and the individual employees.
2. Prioritise the training needs and develop a training plan.
3. Inform all the employees of training possibilities well ahead of time.
4. Develop routines for selecting participants for obligatory training.
5. Develop routines for applying to voluntary training, as well as routines for selecting among the applicants.
6. Identify the right person or institution to conduct the training.
7. Organise the training.
8. Evaluate the training.

In-house training is a powerful way to develop human resources and ensure the continued competence of the NSI staff. It may be useful to concentrate courses to a time that is normally relatively quiet. If such a time period, at e.g. two months can be identified, it will make it easier for the staff to set aside time for training, without conflicting with other tasks of the NSI. It is also important for the management to allow employees to spend time for training.

Giving the staff insight in practical approaches to solve tasks is often best done by having them attend relatively short courses related to their tasks. The knowledge needed is often based on sharing experience on practical production of statistics and working routines. Such training could be given by a training centre. The centre could do training both in the headquarters and in regional offices where such exists. Hence, portable equipment may be an advantage. At first, the main priority of the centre should be to give internal training. Gradually it may take on other tasks like supplying training for other institutions and library services.

3.10. Course frequency

Competence is not static. Using it keeps it vital and develops it. Often refreshing it is necessary to be updated on new developments in a field, to be reminded of what you already know or as a way of motivating or rewarding employees.

The golden rule for how often a course ought to be given is this: The course must be repeated before the number of people competent in the area is becoming critically low. This is of course often difficult to predict, in particular for NSIs with a high staff turnover. Other events are easier to plan for, like what surveys are to be done in the near future. When deciding on frequency of courses it should also be considered that new employees should have the possibility to start working effectively as soon as possible.

3.11. Suggestions for courses

The most important issue when planning an in-house training centre is making the list of courses. It should be made available well in advance and distributed widely. This enables both managers and potential participants to plan and prioritise their training needs. Making such a schedule requires an administrative effort the first time it is done, but following years the work load will be reduced considerably.

The kind of training that ought to be prioritised will vary between different NSIs, and the topics that needs to be addressed ought to be identified before setting up a training plan. As the tasks to be performed by a NSI are more or less the same across the world, we have identified some topics that usually will be relevant. These are specified in the remainder of the document, starting with chapter 4.

The suggested curriculum is based on the in-house training conducted in Statistics Norway⁷, the United Nations Statistical Institute for Asia and the Pacific⁸ (UNSIAP), the Southern Africa Development Community (SADC) training package⁹, experiences from working with sister organisations to develop in-house training and other experiences with training as part of development cooperation in Statistics Norway¹⁰. On-line material from other sources will also be pointed to. Statistics Norway can be of assistance in providing material for the suggested training.

3.12. Online training material

The Virtual Statistical System (VSS)¹¹ is a learning tool for statistical capacity building. It is developed by the World Bank in cooperation with the African Development Bank, Development Gateway Foundation and PARIS21. The system contains three main elements: The first is activities that are part of the statistical production process, like management, information and communication technology, surveys and dissemination. The second is themes, i.e. subject-matter topics like social and demographic statistics and economic statistics. The third is e-learning courses developed by the World Bank alone. The VSS provide e-learning material on many areas relevant for National Statistical Institutes¹².

1. Management of statistical systems and organisations
2. Labour statistics and survey design
3. Justice, crime, and security statistics
4. Geographical information systems (GIS)
5. Agriculture statistics
6. Project management
7. Business statistics
8. Quality assurance for census
9. System of national accounts
10. Government finance statistics

So far the Virtual Statistical System only offer material for self study, but will later be expanded with the possibility for users to participate actively through preparing exercises and participating in online forums.

The UNECE library of training materials on statistics is a place to find and share training materials on statistics. Most of the materials have been developed by national and international statistical agencies¹³.

The United Nations Statistical Institute for Asia and the Pacific (UNSIAP) is devoted to the rapid worldwide dissemination, Asia and the Pacific

⁷ www.ssb.no/en/int

⁸ www.unsiap.or.jp

⁹ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/> The material is developed by the University of Reading, UK, for the Southern Africa Development Community Secretariat with support from European Union.

¹⁰ www.ssb.no/en/int/

¹¹ <https://www.virtualstatisticalsystem.org/>

¹² <http://vle.worldbank.org/moodle/course/view.php?id=476>

¹³ <http://www.tinyurl.com/unece>

Region in particular, of its statistical resources to its stakeholders. Selected resources are included in an e-library¹⁴.

An on-line introduction to statistics has been developed by the Rice University and the University of Houston. It is called "Online Statistics: An Interactive Multimedia Course of Study is an introductory-level statistics book"¹⁵. The course is however more focused towards theoretical statistics, than the practical application needed in a national Statistical Institute.

A wide range of United Nations publications on Statistics and Statistical Methods are available from the web-pages of the UN Statistics Division¹⁶. There you can also find many of them in different languages. A number of them are available in Arabic, Chinese, English, French, Russian and Spanish. Of the more general handbooks the handbook on Household Sample Surveys in Developing and Transition Countries¹⁷, may be particularly useful. It presents the "state of the art" on several core aspects of conducting household surveys in developing and transition countries. It includes sample design, survey implementation, non-sampling errors, survey costs, and analysis of survey data. The main objective of this handbook is to assist national survey statisticians to design household surveys in an efficient and reliable manner, and to allow users to make greater use of survey generated data. Practical guidelines to survey sample design, data processing and analysis of large-scale household surveys can also be found in the handbook Designing Household Survey Samples: Practical Guidelines¹⁸.

The Department of Statistics at the University of South Africa (UNISA) offers distance education in statistics¹⁹. As does the e-learning site of the Statistical Services Centre of the University of Reading in the UK²⁰.

The German non-profit organisation Internationale Weiterbildung und Entwicklung (InWent) offers several e-learning courses related to analysis of data on specific subject matter areas like climate change, gender mainstreaming, health issues and poverty analysis²¹. Some courses are offered with an on-line tutor others as self study²². Inwent is partially based on the former Munich Centre.

There also are initiatives to supply scientific journals to developing countries²³. These may make valuable contributions to the knowledge base of National Statistical Institutes, both on and off line.

¹⁴ http://www.unsiap.or.jp/ematerial/ematerial_other/index.php

¹⁵ <http://onlinestatbook.com/>

¹⁶ <http://unstats.un.org/unsd/pubs/gesgrid.asp>

¹⁷ <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=349>

¹⁸ <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=398>

¹⁹ <http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=224>

²⁰ <http://www.statistics-training.org/>

²¹ <https://gc21shop.inwent.org/en/home/>

²² http://www.inwent.org/capacity_building/index.php.en

²³ <http://www.tandf.co.uk/journals/developingworld.asp>

Good places to start: The World Bank Virtual Statistical System and the SADC Course in Statistics. The Virtual Statistical System (VSS) is an important tool, facilitating exchange of ideas, offers e-learning and contains knowledge on many levels and fields.

Another comprehensive training package is developed by the University of Reading, UK, for the Southern Africa Development Community (SADC) Secretariat with support from European Union²⁴. It is available on-line and contains training material on most courses suggested in the following. It gives different entry points for students on different levels; basic, intermediate and high. The package can be used both for self-training and training courses using teaching material from the package.

To make the employees able to focus on course content rather than use of the package, they ought to be introduced to the following features of the package:

1. Background of the SADC package
2. Structure of the SADC package
3. Material for trainers
4. Navigation in the package
5. Video lectures and demonstrations
6. How to copy documents/ change view format

Basic knowledge of MS-Word, Excel and PowerPoint is also necessary to use the SADC-package.

²⁴ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/>

4. Training for new employees: The basic level

Objective

It is important to receive new employees in a way that makes them understand the organisation, the statistical process, their tasks and that integrates them socially as fast as possible. The suggested program for new employees should be a course informing newly required staff how the different parts of organisation works and learn them some basic concepts and key tasks in making statistics. This also helps people to get to know each other and facilitates a rapid integration of new employees in the organisation.

All employees of a National Statistical Institute (NSI) also ought to know the principles of the statistical system; the role of the NSI and its relation to other producers and users of statistics. To safeguard the reputation of a NSI and to build a cooperate identity, all employees should know the concept of confidentiality and basics of statistical laws and regulations.

Core topics

Organisational and administrative issues

- Presentation of the NSI – an overview of the organisation and the National Statistical System
- Confidentiality and data security: The concepts, rules and routines
- Presentation of the statistical production process; A Business process model
- Systematic quality improvements, total quality management
- Team work and the NSI team spirit
- Who to ask and what to do about sick leave, leave of absence, salaries and other administrative issues?

Introduction to statistical methodology

- Why use sampling?
- The uncertainty of results

Introduction to survey design

New employees should be given an introduction to the statistical production process.

- Planning data collection
- In the field
- Data processing

Introduction to social and economic statistics

This training element aims to give new employees a basic understanding of the relevant concepts. It should give basic knowledge in the field and concepts with focus on what is produced in the NSI through lectures with exercises.

- Presentation of social and economic statistics in general. What is it and why is it important?
- Agriculture statistics.
- Demography and social statistics.
- Structural and short term economic statistics.

Basic IT literacy

Today, most tasks at an NSI requires some kind of IT skills. The Microsoft Office products or equivalent free-ware is widely used. Having skills in using them and in general file management is important. New employees should be given an introduction to:

- Word
- Excel
- PowerPoint
- Windows Explorer
- The web browser used

Analysis and dissemination of data: A short introduction

Analysis of different kinds of data and use of statistical packages, interpretation and analysis reflects a core activity of any NSI:

- Data from different sources: survey and administrative data
- Introduction to the statistical package in use: Making tables in e.g. SPSS, SAS or Stata
- Introduction to tabulation, analysis and report writing

The relation to data providers and users

- User orientation, user requests and user needs
- The relation to respondents and other suppliers of data
- International cooperation

The idea behind training for new staff is to supply training relevant for all. More specific courses aimed at improving skills that are not relevant for all new employees, ought to be given as part off the ordinary in-house training program.

Training material available on the web

The United Nations Handbook of Statistical Organization²⁵ addresses many issues related to how a National Statistical System works, focusing particularly on the National Statistical Institute. Hence it may be a useful reference both on how a NSI works, and on how it ought to work. It also addresses the relationship to the users of statistics. The last version of the handbook is the 3rd edition from 2003. It is available in Arabic, Chinese, English, French and Spanish. The 2nd edition from 1980 is also available in Russian.

The Virtual Statistical System (VSS) contains materiel that can be used in training for new employees. Under the headline Management of statistical systems²⁶ you can find material on e.g. the statistical system, the production process, quality management, dissemination and the relation to users. The VSS also have material on several topics that ought to be introduced to newcomers, like survey design, social and economic statistics including agriculture statistics²⁷. Material can also be found under activities and themes on the VSS main page²⁸.

²⁵ <http://unstats.un.org/unsd/dnss/hb/default.aspx>

²⁶ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3684>

²⁷ <http://vle.worldbank.org/moodle/course/view.php?id=476>

²⁸ <https://www.virtualstatisticalsystem.org/>

A comprehensive course in statistics is developed by the University of Reading, UK, for the Southern Africa Development Community²⁹. The basic level of this course provides an overview of statistics as a subject, and its application within the National Statistical System (NSS). It also gives an introduction to the statistical production process; data collection, how to organise data for analysis, how to produce and present simple tables and graphs and reporting. The course give sufficient materiel to cover most of the topics suggested for a training program for new employees, except personnel administrative issues, like e.g. employment status or rules regulating leave of absence.

Statistics Portugal has developed a web-site at providing both teachers and pupils with training material for the study of statistics³⁰. Even though the site is aimed at secondary education, it gives a useful overview of the development of statistics, basic statistical concepts and survey design. The web site can be useful for new employees without statistical training. The web pages are available in Portuguese and English.

Learning resources for introductory training can also be found on the web site of Statistics Canada³¹. It is available in French and English. An overview of texts and exercises is given in the section called “Statistics: Power from Data!”³²

Distance education or e-learning

Statistics Finland had developed a self administered e-learning course in statistics³³. It gives a basic introduction to statistical thinking: To understand and interpret statistical information and to explain the basic statistical concepts. The introductory part of the e-learning course called “How to read and use Statistics” is applicable for training programs for new employees. The e-course is available in English, Swedish and Finish.

An on-line introduction to statistics³⁴ is developed by the Rice University and the University of Houston. It is called “Online Statistics: An Interactive Multimedia Course of Study is an introductory-level statistics book”. The material is presented both as a standard textbook and as a multimedia presentation, including questions for the student to test his or her skills. The first chapter is sufficient for an introductory training.

²⁹ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/>

³⁰ <http://www.alea.pt/english/>

³¹ <http://www.statcan.gc.ca/edu/index-eng.htm>

³² <http://www.statcan.gc.ca/edu/power-pouvoir/toc-tdm/5214718-eng.htm>

³³ http://www.stat.fi/tup/verkkokoulu/index_en.html

³⁴ <http://onlinestatbook.com/>

5. The statistical production process

Key elements from training of statisticians are presented below. Some of the courses can also be used to fill the competence requirements in certification for senior statistician. Certification as a senior statistician is however only approved after application and is seen in relation to other education, relevant experience and professional contributions in the field.

5.1. Planning and design of surveys

Objective

This course is focusing on issues particularly relevant for planning and organising surveys. A NSI should always have a slight overcapacity on planning and designing surveys. Problems caused by poor planning and survey design often are expensive or impossible to correct. The course is preferably to be conducted in front of a period were surveys are to be planned.

Core topics

- Stakeholders: User contact
- Planning resources: Time and costs
- Making a detailed project plan
- Team building
- Survey design
- Management by objectives

Designing surveys: Course outline

The aim is to give basic knowledge in what a survey is, and how to design a survey in real life and to have more employees qualified to plan surveys.

- What is a survey?
- Key elements to be considered when designing a survey.
- Common steps in the process of carrying out a survey.
- Key elements that help in deciding the size of the sample of a survey.

Types and sources of errors in statistical data: Course outline

The aim is to give basic knowledge about factors to be considered when conducting surveys and to make more employees aware of critical factors in survey work.

- Usual errors in data collected through surveys and censuses.
- Identify the two types of errors in statistical data.
- Identify the sources of the two types of errors.
- Propose methods of minimizing or reducing the incidence of errors in statistical data.
- Provide the necessary information to users and producers of statistics on the quality and limitations of survey data.

Resources and training material

A comprehensive description of survey design, cost control, implementation and non-sampling errors can be found in the UN handbook on “Household Sample Surveys in Developing and Transition Countries³⁵”. The publication is available in Arabic, Chinese, English, Russian, French and Spanish.

³⁵ http://unstats.un.org/unsd/publication/seriesf/Seriesf_96e.pdf

The Southern Africa Development Community (SADC) Course in Statistics³⁶ has a lecture on designing surveys as part of their intermediate level (Module II Session 8).

The Virtual Statistical System (VSS) has e-learning material on different aspects of project management³⁷, planning³⁸ and survey design³⁹. Material can also be found under the activity Survey the VSS web-site⁴⁰.

The UN Statistical Institute for Asia and the Pacific (UNSIAP) has also made material on planning and design of surveys available on the Internet⁴¹.

5.2. Questionnaire design and testing

Objective

Understanding how a questionnaire works and, the ability to construct a good questionnaire and planning of the field work is very important to get data of high quality. Qualitative research techniques are essential to improve survey instruments. These include cognitive interviewing techniques, focus groups and analysing of quantitative information.

It is an advantage to give the courses as part of the preparation for a survey, e.g. in the beginning of preparing a questionnaire for a specific survey.

Core topics

- The user input to the questionnaire
- The respondent perspective
- Formulation of questions and answers
- Comparability
- The cognitive process of answering a question
- Expert appraisal
- Focus groups
- Cognitive interviews

Testing and improving survey questionnaires. Course outline

- Costs, comparability and other issues to consider when designing a questionnaire
- Conducting user workshops
- Focus groups
- Cognitive interviewing
- Pilot tests
- Involving subject matter experts

Resources and training material

The SADC Course in Statistics has a lecture on designing questionnaires as part of their intermediate level (Module II Session 9, 10 and 11). A more comprehensive overview of elements to be considered regarding design and

³⁶ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/>

³⁷ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4349>

³⁸ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3684>

³⁹ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3698>

⁴⁰ https://www.virtualstatisticalsystem.org/activities/activity/5-surveys/?no_cache=1&cHash=2dc4b079674bc3e78c7e490b7415bc9d

⁴¹ http://www.unsiap.or.jp/ematerial/ematerial_other/Survey_Planning.php

testing of questionnaires is given as part of the Learning Resources provided by Statistics Canada⁴². The World Bank Institute of Distance Learning has developed material on testing questionnaires⁴³ as part of the VSS. You can also find e-learning material on questionnaire design in general at the VSS web-page⁴⁴. More material is available under the VSS activity section on methodology for household surveys⁴⁵.

UNSIAP have given out material on questionnaire design⁴⁶. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) argue for testing⁴⁷ and have made a presentation available suggesting how to do it⁴⁸. An article addressing how to do Cognitive Interviewing⁴⁹ by Gordon B. Willis may be addressed to get input on how to do it.

5.3. Data collection

Objective

Survey organisation and field work is important both to the quality of the end results and the costs of the survey. Hence it is important to have a sufficient number of staff trained in planning and executing the field work.

The courses ought to be given as part of the preparation for a survey, e.g. in the beginning of preparing a questionnaire for a specific survey.

Core topics

- Planning the data collection (must be related to the survey design module)
- Procurement of equipment
- Recruitment of staff
- Training of trainers/training of enumerators and supervisors
- Interview techniques
- Survey administration
- Logistics of personnel, questionnaires and equipment
- Supervision and quality assurance

The role of the enumerator: Course outlines

The aim of the course is to give enumerators, supervisors and staff working with them knowledge about desirable characteristics and behaviours of a good enumerator. The ones in charge of field work must be trained in⁵⁰:

⁴² <http://www.statcan.gc.ca/edu/power-pouvoir/ch2/questionnaires/5214775-eng.htm#a9>

⁴³ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3720>

⁴⁴ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4436>

⁴⁵ https://www.virtualstatisticalsystem.org/activities/activity/51-household-surveys/?no_cache=1&cHash=99b3d1011cb42acf332fadb3aae14986

⁴⁶ http://www.unsiap.or.jp/ematerial/ematerial_other/QuestionnaireDesign.php

⁴⁷ <http://www.unescap.org/stat/disability/pre-pilot-training/background-note-on-cognitive-testing.pdf>

⁴⁸ <http://www.unescap.org/stat/disability/pre-pilot-training/cognitive-interviewing-questionnaire.pdf>

⁴⁹ <http://appliedresearch.cancer.gov/areas/cognitive/interview.pdf>

⁵⁰ Handbook of Household Surveys (Revised edition), Department of International Economic and Social Affairs, Statistics Office, United Nations 1984, http://unstats.un.org/unsd/publication/SeriesF/SeriesF_31E.pdf

- Recruitment and training of field staff
- Conducting listings of households or other field counts necessary for sampling
- Controlling the field material
- Conducting, monitoring and controlling the data collection
- Conducting evaluation studies

Interviewers ought to receive the following training⁵¹:

- The general principles of opinion and social research
- Ethical requirements, including respondent safeguards and data protection issues
- Interviewer skills and other relevant techniques
- The use of computers as far as relevant
- Interview role playing and trial interviews (or other forms of data collection methods)

In addition, field workers must be informed on a range of practical issues. Among these are: How to travel, where to spend the night, how to administer and send in questionnaires, calculation of daily allowance, salary and payment.

The interviewers must also have knowledge on motivating respondents to answer and not to influence their answers.

The interviewer ought to be accompanied to be evaluated on his or hers first day at work. Feedback should be given to improve performance. If this is not possible, the forms from the first interviews he or she conducts must be reviewed thoroughly.

During the training it is important to facilitate dialogue between the trainer and the trainees, to make it easy clarify doubts and create a good learning environment.

The number of people you train should take into account that some probably will leave before the survey is finalised.

Resources and training material

The SADC Course in Statistics, Module I1 Sessions 4 and 5⁵², addresses data gathering, with a special emphasis on challenges related to sampling. UNSIAP also presents material on how to conduct field operations, on the web⁵³. Some general material on data collection can be found on the VSS pages on agricultural statistics⁵⁴ and quality assurance for census⁵⁵. Material can also be found under the activity “Survey” at the VSS web-site⁵⁶.

⁵¹ Based on the International Standard ISO 20252 on Market, opinion and social research – Vocabulary and service requirements (first edition, 2006-04-01)

⁵² <http://www.reading.ac.uk/SSC/media/sadc-training-pack/02%20Intermediate%20Level/Module%2011/Module%2011%20Session%2004&05/Module%2011%20Session%2004&05.htm>

⁵³ http://www.unsiap.or.jp/ematerial/ematerial_other/FieldOperation.php

⁵⁴ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4348>

⁵⁵ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4363>

⁵⁶ https://www.virtualstatisticalsystem.org/activities/activity/5-surveys/?no_cache=1&cHash=2dc4b079674bc3e78c7e490b7415bc9d

5.4. Cartography, GPS and GIS I-II

Objective

GIS-system and cartography is particularly important in when updating maps in relation to a census or a large survey, when coordinates are to be established, areas to be measured or when statistics are to be presented in maps.

Core topics: Level I

- Maps and images as an abstraction of the reality (projection, scale, symbols, legend and orientation).
- Types and sources of maps and images.
- Understanding of coordinates (degrees, decimal degrees and UTM) UTM/decimal degree conversion.
- Use of GPS (setup, waypoints, tracking, go-to, area calculation and downloading of data to PC).
- Mapping and area measurement with compass and measuring tape.
- Sketch mapping with GPS support.

Core topics Level II

- What is GIS?
- Digital maps and images (vector- and raster data).
- Introduction to the GIS software (ARC GIS).
- Introduction to presentation of statistics on maps.
- Introduction to digitalisation of hardcopy maps and images (ARC GIS).
- Introduction to use of way points in combination with digital maps (ARC GIS).
- Introduction to GIS analysis (ARC GIS).

Using GPS: Course outline

The aim is to make staff able to participate in field work operations where GPS is used *and* train supervisors in use of GPS prior to enumerator courses. Practical training on the following issues should be considered:

- Obtain position coordinates
- Use GPS for area measurement
- Use GPS for own orientation
- Saving and reviewing own movements
- Interpret error messages

Demonstration with hands-on exercises is essential to make sure the participants can handle the equipment.

Resources and training material

The UN Handbook on Geographic Information Systems Digital Mapping⁵⁷ provides technical and methodological information to facilitate the choice of suitable tools and procedures by countries in mapping activities.

The VSS has e-learning material on GIS, on the basic principles, on how to introduce GIS in a sustainable manner and also on insight in the application⁵⁸.

The Uganda Bureau of Statistics and Statistics Norway staff jointly conducted fieldwork in Uganda 2003 experimenting with simple handheld

⁵⁷ <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=237>

⁵⁸ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3697>

Geographical Positioning System (GPS) tools for determination of agricultural holding areas and geo-referencing of holdings. A short report is summarising the experiences⁵⁹.

5.5. Statistical theory and sampling methods

Objective

Understanding of basic concepts of statistical theory is necessary to draw a sample from a population. Adequate sampling is essential to keep control of the uncertainty in the results and to control the costs of the field work.

Introduction to sampling

The aim is to give basic knowledge about factors to be considered when designing and drawing a probability sample and give more employees a better understanding of the factors affecting sampling designs.

- Statistical variation
- Basic sampling concepts such as
 - Sampling unit
 - Study population
 - Stratification
 - Multistage sampling
 - Systematic sampling
- The main elements to consider when deciding on a sample size
- How the objectives of a study drive the decisions about the sampling design.

Core topics

- Probability vs. non-probability sampling
 - Distributions
 - Statistical uncertainty
- Sampling Design/Multi-stage sampling:
 - Lists and area based sampling frames
 - Population Listing
 - Enumeration areas
 - Design effect
- Weighting and estimation
- Survey errors and survey costs
 - Survey Bias
 - Estimating Sampling Errors

Resources and training material

The SADC training course gives an introduction to sampling in Module II Session 2⁶⁰. A higher level course Sampling Concepts in Survey Work is given in on Module H6⁶¹.

The United Nations Statistics Division in the Department of Economic and Social Affairs has produced a handbook in household survey sampling called “Designing Household Survey Samples: Practical Guidelines⁶²”. A lot

⁵⁹ http://www.ssb.no/emner/10/90/rapp_200529/rapp_200529

⁶⁰ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/02%20Intermediate%20Level/Module%20I1/Module%20I1%20Session%2002/Module%20I1%20Session%202.htm>

⁶¹ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/03%20Higher%20Level/Module%20H6/Module%20H6.htm>

⁶² http://unstats.un.org/unsd/publication/seriesf/Seriesf_98e.pdf

of useful information also can be found in the handbook on Household Sample Surveys in Developing and Transition Countries⁶³. It presents the best practises on several aspects of conducting household surveys in developing and transition countries, including sample design, survey implementation, non-sampling errors, survey costs, and analysis of survey data. The publications are available in Arabic, Chinese, English, French, Russian and Spanish.

E-learning material on sample design⁶⁴ and estimation and weighting⁶⁵ is available at the VSS web-page. Material is also available under the VSS activity section under “Registers, Frames and Censuses”⁶⁶ and “Methods”⁶⁷.

Statistics Canada has also made material on sampling available on their website for learning recourses⁶⁸.

5.6. Data processing

Objective

The data processing has traditionally involved a lot of manual labour, as well as several possible sources of errors. Today it is possible to rationalise the process through optical scanning, unfortunately not eliminating the possibility of introducing errors. Statistical packages (e.g. SAS, SPSS and Stata) can be used for data cleaning and file processing. The objective of this course is to guide the participants through the production process starting with a questionnaire, ending with a final data file.

The best timing for the course is in front of an actual data processing, allowing the participants to use their newly acquired skills.

Core topics

- Scanning (optical character recognition, OCR) and on-screen verification
- Key punching
- Raw data file storage
- Automated data cleaning and editing using statistical packages
- Sources of errors
- Treatment of non-response
- Classification systems and coding
- Merging, matching and aggregating data files
- To finalise a data file and store it

⁶³ http://unstats.un.org/unsd/publication/seriesf/Seriesf_96e.pdf

⁶⁴ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3700>

⁶⁵ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3695>

⁶⁶ https://www.virtualstatisticalsystem.org/activities/activity/4-registers-and-frames/?no_cache=1&cHash=2f8eaabf5b3734ad8bf3383cd172ffcb

⁶⁷ https://www.virtualstatisticalsystem.org/activities/activity/6-methods/?no_cache=1&cHash=294fed04ee032597eda06b7d534fe7de

⁶⁸ <http://www.statcan.gc.ca/edu/power-pouvoir/toc-tdm/5214718-eng.htm>

Recommended practice for data editing: Course outline

All data contains errors. The aim of this module is to reduce the number of errors to an acceptable level, e.g. a level that will not influence the results to a substantial degree:

- Editing and correcting data in the field
- Editing and correcting during data entry
- What to look for
- Low hanging fruits: Correcting errors automatically
- Time and resources for editing data

Scanning questionnaires: Course outline

Introduction to scanning:

- Situations where scanning is preferable
- General introduction to the scanning software
- Physical organisation of the scanning room
- How to effectively organise a scanning operations
- Quality checks and corrections
- Output from the scanning system

Basic scanning operations using Eyes and Hands. Course outline

- Repeat overview of the scanning software
- Verify forms (effect of different filters)

Advanced scanning operations. Course outline

- Repeat basic scanning operations
- Independent programming of questionnaires
- Able to design quality checks and assess test operations
- Able to solve most upcoming scanning problems on the spot
- Able to re-organise scanning operations if needed
- Adjust verification procedures during a scanning operation
- Export/import procedures to Windows Notepad and SPSS/SAS/Stata
- Correct errors in export/ import procedures

Basic handling of data. Course outline

What happens to data once they have been collected? This topic includes the organisation of simple datasets for analysis and the basic ideas of producing good tables and graphs.

- Structure a simple data set in a format that is suitable for statistical processing
- Code, sort, filter and rearrange data
- Maximise data quality
- Archive a data set ensuring that all relevant information is included
- basic concepts such as population, sample and summary statistics
- Improve poorly constructed tables and graphs

Organising data. Course outline

Organising and keeping track of data is an important task in a NSI. To manage data ought to be learned by working through simple datasets in a way that are transferable to more complex situations.

- Carry out data management tasks, from data entry to archiving, for a simple data set.
- Identify data structures and the way they are reflected in datasets.
- Build basic data entry forms and be aware of the importance of careful design of data entry processes to reduce errors.
- Write data quality assessments.

Resources and training material

Statistics Canada has made material on data processing available on their website for learning recourses⁶⁹. Many aspects of data processing are addressed in Module I2: Organising Data⁷⁰ in the SADC Course in Statistics.

E-learning material on processing of data can be found on the VSS webpage⁷¹ and ⁷². The topic is also covered as part of project management for statistical surveys⁷³ in the VSS.

5.7. Statistical analysis

Different statistical packages can be used in training sessions for statistical analysis. A NSI ought to choose one to build capacity in. Stata, SAS and SPSS all are excellent programs that can provide powerful statistical analysis. Below, SPSS is used as an example, but the same courses can be given using both Stata and SAS. Training ought to be given as lectures with exercises.

Composite indices: Course outline

The aim is to give basic knowledge on composite indices to better understand how they are produced, and can be used (or misused). The participants should be able to compute simple composite indices.

Examples of composite indices, and discussions about:

- When to use them
- The Simple Additive Index
- Using weights
- Critical reading of composite indices
- Presenting composite indices

Practical training in how to:

- Create indicator variables from columns of data
- Understand how to categorise data in Excel into groups
- Appreciate complexities of working with larger datasets and how to deal with awkward problems when they arise

Regression analysis in SPSS. Course outline

How to perform ordinary regression analysis (ordinary least squares (OLS)) in SPSS.

⁶⁹ <http://www.statcan.gc.ca/edu/power-pouvoir/toc-tdm/5214718-eng.htm>

⁷⁰ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/02%20Intermediate%20Level/Module%20I2/Module%20I2.htm>

⁷¹ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3717>

⁷² <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4385>

⁷³ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4349>

- Prepare data for an OLS
- Repeat the meaning of a simple linear regression model
- Perform bivariate and multivariate regressions in SPSS
- Interaction between variables and other non-linear components
- Interpret the results
- Interpret error messages

Logistic regression analysis in SPSS. Course outline

How to perform logistic regression analysis in SPSS, used for categorical dependent variables.

- Prepare data for logistic regression
- Repeat the meaning of a simple linear regression model
- Repeat the meaning of a logistic regression model
- Perform logistic regressions in SPSS
- Interpret the results
- Interpret error messages

Time series analysis: Course outline

How to analyse data collected over time. This is usable for all monitoring data, and other information collected regularly.

- Produce and assess descriptive time series analyses
- Explain the meaning of the components of time series data
- Analyse and report on seasonal and trend components of time series
- Learn the how time series data are used in practice

Estimation and variance computation in SPSS. Course outline:

The aim is to be able to estimate population totals and variance in SPSS.

Understanding:

- The meaning of a confidence interval
- The role of the t-distribution in computing a confidence interval for the population mean
- The assumptions underlying confidence intervals

Practical training in how to:

- Calculate a confidence interval for the population mean using sample data
- Calculate a confidence interval for the population mean using sample data from two step sampling designs

Resources and training material

Material on analysing data is given in Section E in the UN handbook on “Household Sample Surveys in Developing and Transition Countries⁷⁴”. The publication is available in Arabic, Chinese, English, French and Spanish.

Many aspects of data processing are addressed in Module I3: Analysing Data⁷⁵ in the SADC Course in Statistics.

Distance education or e-learning

The Statistical Service Centre at the University of Reading in the United Kingdom has an e-learning site⁷⁶ that offers e-learning courses on analysing data. The

⁷⁴ http://unstats.un.org/unsd/publication/seriesf/Seriesf_96e.pdf

⁷⁵ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/02%20Intermediate%20Level/Module%2013/Module%2013.htm>

courses are aiming to enable the participants to analyse and do research on data on different levels.

The German non-profit organisation Internationale Weiterbildung und Entwicklung (InWent) offers several e-learning courses⁷⁷ related to analysis of data on specific subject matter areas.

5.8. Making statistics based on administrative registers

Objective

Administrative registers may be a rich source of data to make statistics. If administrative records on e.g. babies being born or children going to school exist in an electronic format, it can be a valuable source of statistics. If such registers contain relevant variables and are of a sufficient quality, they can provide policy relevant information also for local levels of public administration.

Course outline

- Who are registered? Coverage and definitional challenges
- Challenges in the process of registration: Over counting and undercounting
- Aggregating information from lower administrative units
- Updating and maintaining registers
- Using registers to make statistics
- Combining sources of information: Merging with different registers

If we have the possibility to match the information in one register with information from other registers, our possibilities for providing information for evidence based policy making will expand dramatically.

Resources and training material

Training material on administrative data sources can be found on the UNECE Website⁷⁸. A Review of best practices with focus on population and social statistics in the Nordic countries is available in Russian⁷⁹ and English⁸⁰.

The handbooks of the United Nations Statistics Division⁸¹ contain several books on the topic. Among them are the handbook on Collection of Fertility and Mortality Data⁸² and the Handbook on Training in Civil Registration and Vital Statistics Systems⁸³.

In September 2010 a course on use of Administrative Registers in Production of Statistics was held in Statistics Norway's offices in Oslo. It was organised in cooperation with, and with financial support from the European Free Trade Association (EFTA). The course material is available from Statistics Norway's website⁸⁴.

⁷⁶ <http://www.statistics-training.org/>

⁷⁷ <https://gc21shop.inwent.org/en/home/>

⁷⁸ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Administrative+data+sources>

⁷⁹ http://www.unece.org/stats/publications/Register_based_statistics_in_Nordic_countries_Russian.pdf

⁸⁰ http://www.unece.org/stats/publications/Register_based_statistics_in_Nordic_countries.pdf

⁸¹ <http://unstats.un.org/unsd/pubs/gesgrid.asp>

⁸² <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=325>

⁸³ <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=279>

⁸⁴ http://www.ssb.no/omssb/kurs_seminar/efta_2010/

5.9. Report writing and dissemination

Objective

Statistics gives a numerical description of society by means of numbers put together in tables or graphs. The purpose of placing numbers together in this way is to compare them in order to uncover differences, correlations and trends. The objective of this course is to give practical advice on how to write reports in a way that encourages and enables the user to interpret the statistics in a sound manner. The course is aimed at all parts of the organisation that are presenting statistics to a wider audience.

Core topics

- User-friendly analysis
- Tables and graphs
- Writing from the perspective of the reader
- Presenting statistics on the web

Assessing data critically: Course outline

The aim is to learn approaches be more critical towards presented statistics and make more employees able to write and perform quality control of reports.

- Apply basic techniques for error detection
- Ask relevant questions that allow for the explanation or correction of discrepancies

Making good graphs and tables: Course outline

The aim is to give basic knowledge about factors to be considered when producing graphics and tables and practice making tables and graphs. The course is for staff who will produce graphs and tables, or even those who want to be more conscious readers of reports with graphs and tables.

- Assess whether a table has been produced using good practice.
- Assess whether a graph has been produced using good practice.
- Improve tables and graphs that do not meet good practice standards.
- Produce the improved tables and graphs.

Resources and material

A guide for dissemination of statistics has been published by Paris 21. It is available in English, French, Arabic and Russian language⁸⁵.

Useful information can also be found in the UNECE library of training materials on statistics⁸⁶. There you can find several presentations on the subject, in particular the useful guides “Making Data Meaningful”, part I and II. Both are available in Russian and English, part I is also available in Spanish.

Material on dissemination can be found in the e-learning part of the VSS⁸⁷, as well as in the activity section⁸⁸.

⁸⁵ http://www.ssb.no/english/int/pres_stat_en/

⁸⁶ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Communication+and+dissemination+of+statistics>

⁸⁷ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3685>

⁸⁸ https://www.virtualstatisticalsystem.org/activities/activity/8-dissemination/?no_cache=1&cHash=d53e7e6bf4618a2a8b1d8d21516e22dc

Skills on presenting statistical results can also be gained through the online SADC training course⁸⁹. The course focuses on designing reports taking into account to whom the information is targeted and what is the purpose of the report. Other forms of dissemination, e.g. through PowerPoint presentations and the Web are also addressed.

5.10. Documentation and metadata

Objective

The aim is to make the participants able to document surveys in order to be able to have sufficient information about the survey and to be able to reproduce both the survey and the results disseminated from it.

Course outline

- Archiving
- Statistical metadata: Definitions and basic concepts
- Statistical metadata: Classifications, variables and other type of metadata
- Use of metadata
- International metadata standards

Resources and training material

The Microdata Management Toolkit is developed by the World Bank Data Group in cooperation with Nesstar, a company owned by the Norwegian Social Science Data Services,

for the International Household Survey Network. It aims to promote the adoption of international standards and best practices for microdata documentation, dissemination and preservation. The tool kit is downloadable from the Web page of the International Household Survey Network⁹⁰.

OECD had published a Data and Metadata Reporting and Presentation Handbook⁹¹. It provides a reference set of international guidelines and recommendations for the reporting and presentation of statistical data and metadata. The Handbook was made for short-term economic statistics, but many of the recommendations presented are also relevant for annual (structural) statistics and for social and population statistics. Useful material on can also be found in the UNECE library of training materials on statistics⁹².

⁸⁹ <http://www.reading.ac.uk/ssc/n/SADC%20DVD/02%20Intermediate%20Level/Module%2014/Module%2014.htm>

⁹⁰ <http://ihsn.org/home/index.php?q=tools/toolkit>

⁹¹ <http://www.oecd.org/dataoecd/46/17/37671574.pdf>

⁹² <http://www1.unece.org/stat/platform/display/TRAINSTATS/Metadata>

5.11. Confidentiality

Objective

The aim is first to make the participants aware of moral and legal issues related the handling of personal information in statistical data sets. Second, it relates to disclosure control and methods to make data anonymous.

Course outline

- Legal and moral issues regarding confidentiality
- Protecting personal information in micro data
- Avoiding to reveal personal information in tables

Resources and training material

The UN Handbook of Statistical Organization, Third Edition: The Operation and Organization of a Statistical Agency⁹³ deals with the fundamentals of national systems of official statistics, among them confidentiality and disclosure. Confidentiality and disclosure control is treated in the VSS⁹⁴. Statistics Canada also shed light on the topic as part of their Learning Resources⁹⁵.

5.12. Seasonal adjustment

Objective

Many topics of interest to national statistical institutes vary between seasons. One obvious example is the agricultural production, which again influence people's standard of living. Levels of poverty and hunger often are lower after the crop is harvested. If we look into a topic were we may expect seasonal variation to occur and the field work does not cover a whole year, using seasonal adjustment should be considered.

Course outline

- What determines seasonal adjustment?
- Why seasonal adjustments
- Calendar effects and its components
- Calendar adjustments
- Overview of seasonal adjustments methods and software
- Validation of seasonal adjustment
- International guidelines on seasonal adjustments

Resources and training material

The training recourses gathered by the United Nations Economic Commission for Europe (UNECE) treat seasonal adjustment in relation to short term economic statistics⁹⁶.

An introduction to seasonal adjustment can be found at the website of Statistics Norway⁹⁷. It also gives references to other websites with information about seasonal adjustment.

⁹³ <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=295>

⁹⁴ https://www.virtualstatisticalsystem.org/themes/theme/46-confidentiality-and-disclosure-protection/?no_cache=1&cHash=4133a6a7e1ff5068ee2e4711eb465264

⁹⁵ <http://www.statcan.gc.ca/edu/power-pouvoir/ch7/5214810-eng.htm>

⁹⁶ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Short-term+economic+statistics>

⁹⁷ http://www.ssb.no/english/metadata/methods/seasonal_adjustment.pdf

6. Economic statistics

6.1. National accounts, Gross domestic product and it's inputs

Objective

Establishing and maintaining a national account is considered an important task for most NSIs. A national account is a multifaceted task, heavily relying on the availability and quality of relevant statistics. The content of the courses will depend on the level of development of the economic statistics. It is an advantage to start the National Accounts work by developing a balanced set of production accounts providing the Gross Domestic Product (GDP). The main issue here is to provide primary statistics of sufficient quality. Statistics on agriculture will play an important role in the economics of developing countries. This must be reflected in the production accounts used.

For NSIs with more advanced systems, the focus may be given to software solutions, as they may facilitate solving common problems, e.g. deflation. As adequate systems exist, it is time to advance to sector accounts, balance of payments accounts and satellite accounts.

Core topics

- Gross domestic product (calculated by production, expenditure and income)
- Establishing production accounts for main economic areas
- Supply and use tables
- Classification systems (e.g. CPC, ISIC, COICOP, COPNI and COFOG)
- Concepts and definitions
- Sector dimension
- Prices and volumes
- Input-output tables
- Sector accounts
- Balance of payments
- Satellite accounts
- Macroeconomic analysis and policy-making/decision-taking

Scope

The training is extensive, and it is necessary to have several economic statistics and national account specialists in order to run a National account in a sustainable manner. It may be necessary to combine in-house training with other training modalities in order to achieve this goal. The development of GDP and National accounts must be tied to practical work, as theoretical lectures may be difficult to relate to the practical implementation of the system. The most basic courses also ought to include internal data providers for the National account.

Resources and training material

The United Nations Economic Commission for Europe (UNECE) has gathered a lot of material on National accounting⁹⁸. Training material on many of the relevant concepts can be found under module H4 in the SADC Course in Statistics, called *Economic Concepts and Principles for*

⁹⁸ <http://www1.unece.org/stat/platform/display/TRAINSTATS/National+Accounts>

Statisticians and module H5: *Index Numbers and Economic Statistics*⁹⁹. Both basic and advanced e-learning material on national accounts can be found as part of the VSS¹⁰⁰. There you can also find more on business statistics and government finance statistics. Several topics on economic statistics are treated as themes in the VSS¹⁰¹.

The basic concepts and structures of National Accounts are given in the UNSD handbook *National Accounts: A Practical Introduction*¹⁰². It is printed in Arabic, Chinese, French, Russian and Spanish, in addition to English. The UN also publishes several other handbooks to illuminate different areas of the field of national accounting¹⁰³. An introduction to National Accounts can be found at the web pages of Statistics Finland¹⁰⁴. Material is also available from the Statistical Institute for Asia and the Pacific (SIAP)¹⁰⁵.

The United Nations Statistical Department (UNSD) gives a lot of documentation on national accounts and its input on their web-page on economic statistics¹⁰⁶

6.2. Economic indices

Objective

Price and production indices are key indicators of the economic development of any nation. The objective here is to create the sufficient competence to make high-quality indices.

Consumer price indices (CPI): Course outline

To give knowledge about consumer price indices (CPI) in general. To learn about how the CPI is produced at the NSI.

Introduction to the CPI:

- Consumer price indices and their uses
- Key issues relating to coverage
- Sources of data and methods of data collection
- Introduction to the internationally recommended classification of expenditure by purpose
- Production of CPI in the NSI

Making the CPI:

- Planning for CPI
- Creating a basket
- Collecting prices
- Calculating weights
- Purchasing Power Parities (PPP)

⁹⁹ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/03%20Higher%20Level/Higher%20Level.htm>

¹⁰⁰ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3683>

¹⁰¹ https://www.virtualstatisticalsystem.org/themes/theme/2-economics/?no_cache=1&cHash=6f16f586fc03db2d98de53e17d8fa98d

¹⁰² <http://unstats.un.org/unsd/pubs/gesgrid.asp?id=311>

¹⁰³ <http://unstats.un.org/unsd/pubs/gesgrid.asp?mysearch=National+account>

¹⁰⁴ http://www.stat.fi/tup/verkkokoulu/data/talt/index_en.html

¹⁰⁵ http://www.unsiap.or.jp/ematerial/ematerial_other/National_Accounts.php

¹⁰⁶ http://unstats.un.org/unsd/economic_main.htm

- CPI Estimates

Production price indices (PPI): Course outline

The suggested course will focus on:

- Consumer price indices and their uses
- Key issues relating to coverage
- The sources of data and methods of data collection
- The internationally recommended classification of expenditure by purpose

Index of industrial production (IIP): Course outline

The suggested course will focus on:

- Imputation of prices that are missing
- Replacing one item with another
- Constructing a quantity index such as the Index of Industrial Production

The courses ought to be given as lectures with exercises.

Resources and training material

Module H5 in the SADC Course in Statistics¹⁰⁷ aims to provide a good understanding of the data requirements to produce common index numbers. A short introduction to what an index is, is also given by Statistics Finland¹⁰⁸. More can be found on the UNECE web page on price indices¹⁰⁹.

6.3. Business register

The training is to establish and maintain a sufficient knowledge base for a business information register.

Business information register concepts: Course outline

The aim is to give the participants knowledge about key concepts and make them able to put them into practice.

- Why business registers are important
- Challenges in compiling a register of businesses
- The key statistical units used
- Then key points in a register for businesses

Lectures with exercises.

Business information register operation: Course outline

The aim is to give the participants knowledge of the Business information register (BIR) database system; how to operate, maintain it and use the register

¹⁰⁷ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/03%20Higher%20Level/Module%20H5/Module%20H5.htm>

¹⁰⁸ http://www.stat.fi/tup/verkkokoulu/data/ind/01/index_en.html

¹⁰⁹ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Price+indices>

BIR content and coverage

- BIR database system
- BIR database management (updating and maintenance)
- Use of BIR

Lectures, Case study, Hands-on computer with exercises, Group assignments

Resources and training material

Material on business registers and activities in the field can be found at the UNECE web-pages¹¹⁰. Business registers are treated as an activity in the VSS¹¹¹ and e-learning material is also made available¹¹².

6.4. Foreign trade statistics

The aim is to give the participants knowledge about trade statistics in general: Content, concepts and the production process.

Course outline:

- Trade statistics in general
- Presentation of the NSI's trade statistics. What is it, and why is it important?
- Content and concepts used in trade statistics
- Presentation of Eurotrace
- The production process
- Reports

Resources and training material

Please address the web-pages of the United Nations Statistics Division for more material on trade statistics¹¹³ and ¹¹⁴. More on Eurotrace can be found on the Eurostat web-pages¹¹⁵.

6.5. Agricultural statistics

Agricultural production is the core of the economy for many developing countries. The aim of training in agricultural production is to enable staff to produce quality statistics on the topic. This includes both the structure of the agricultural production in a country and annual agricultural activities.

Course outline: The structure of agriculture in a country

- Agricultural holding by distribution
- Size
- Tenure
- Land use
- Means of production
- Labour force

¹¹⁰ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Business+registers>

¹¹¹ https://www.virtualstatisticalsystem.org/activities/activity/41-business-registers/?no_cache=1&cHash=d310720a3a01502d6188c2fdf56a4393

¹¹² <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4350>

¹¹³ <http://unstats.un.org/unsd/pubs/gesgrid.asp?class=trade>

¹¹⁴ <http://unstats.un.org/unsd/trade/default.htm>

¹¹⁵ http://epp.eurostat.ec.europa.eu/portal/page/portal/international_statistical_cooperation/thematic_activities/statistics_by_subject/foreign_trade_eurotrace_software

Course outline: Annual agricultural activities

- Crop and livestock production
- Trade and prices of agricultural products
- Labour

Resources and training material

The World Bank Institute of Distance learning has developed an e-learning course on developing agricultural statistics as part of the Virtual Statistical System¹¹⁶. An introduction to agriculture statistics is also made available through the World Bank¹¹⁷

The Food and Agriculture Organization of the United Nations (FAO) Statistics division supports member countries develop statistical systems¹¹⁸. Statistics Norway also cooperates with National Statistical Institutes in building agricultural statistics. The National Census of Agriculture and Livestock 2006/07¹¹⁹ in Malawi is a result of a cooperation between the National Statistical Institute of Malawi and Statistics Norway. Uganda Bureau of Statistics and Statistics Norway cooperated on the use of GPS equipment for area measurement¹²⁰.

¹¹⁶ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4348>

¹¹⁷ http://siteresources.worldbank.org/SCBEXTERNAL/Resources/Introduction_to_Agriculture_Statistics.pdf

¹¹⁸ <http://www.fao.org/economic/ess/en/>

¹¹⁹ http://www.nso.malawi.net/index.php?option=com_content&view=article&id=47%3Anational-census-of-agriculture-and-livestock-200607-main-report&catid=5&Itemid=3

¹²⁰ http://www.ssb.no/emner/10/90/rapp_200529/rapp_200529

7. Demography and social statistics

7.1. The Millennium Development Goals

The Millennium Development Goals (MDGs)¹²¹ was launched in 2000. They rapidly became the authoritative framework for measuring social and environmental progress in developing countries. The MDGs are now the main benchmarks in terms of development efforts by governments in developing countries, by donor countries and by the UN and other multilateral organisations.

A list of indicators has been agreed upon in order to measure the goals. This list was most recently updated and expanded in the end of 2007.

Data from national and international sources are unfortunately often found to be different. Please read more on this on the web-pages of the United Nations Statistics Division¹²² and Statistics Norway¹²³.

Modelling poverty and hunger

Two central elements of the Millennium Development Goals are measuring the extent to which people are suffering from poverty and hunger. These measures are generally complex to measure. The indicators can however be estimated by data that can be collected cost-effectively. The Food and Agriculture Organization of the United Nations (FAO)¹²⁴ has developed a way to estimate the extent of hunger in cooperation with Statistics Norway¹²⁵. Statistics Norway has also developed a methodology to estimate changes in the poverty situation. Statistics Norway can assist in both estimation of hunger and of poverty.

Resources and training material

The Virtual Statistical System treats the Millennium Development Goals (MDG)¹²⁶ as a theme. More on in activities and indicators related to the MDGs can be read on the UNECE web-page¹²⁷. The handbook on “Indicators for Monitoring the Millennium Development Goals-Definitions, Rationale, Concepts and Sources”¹²⁸ provides guidance on the definitions, rationale, concepts and sources of data for each of the indicators that are being used to monitor the goals and targets.

¹²¹ <http://www.un.org/millenniumgoals/>

¹²² <http://unstats.un.org/unsd/mdg/Labs>

¹²³ http://www.ssb.no/en/int/dev_goals.html

¹²⁴ <http://www.fao.org/>

¹²⁵ http://www.ssb.no/en/int/mod_poverty.html

¹²⁶ https://www.virtualstatisticalsystem.org/themes/theme/37-millennium-development-goals-indicators/?no_cache=1&cHash=8facfe606d8051b9d54a4d6b8fff6be7

¹²⁷ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Indicators+related+to+the+Millennium+Development+Goals+%28MDGs%29>

¹²⁸ http://unstats.un.org/unsd/publication/seriesf/Seriesf_95E.pdf

7.2. Demography statistics: Concepts and methods

Objective

The suggested topics for courses are aimed at supplying sufficient knowledge of demographic issues. It may be necessary to combine in-house training with other training modalities in order to obtain the necessary competence.

Core topics

- Framework of demographic statistics
- Population census
- Fertility and mortality
- Migration
- Population dynamics
- Life tables
- Nuptiality
- Estimation of demographic measures
- Population projections
- Spatial population distribution
- Computer software packages for demographic analysis

Resources and training material

Many handbooks on demography statistics can be found on the web-page of the United Nations Statistics Division¹²⁹ and ¹³⁰. A central publication on demography is the “The Handbook on the Collection of Fertility and Mortality Data”¹³¹. It provides detailed information on available sources and methods to obtain these data and may be used to decide what combination of data sources will best suit national conditions to derive fertility and mortality indicators.

Demographic statistics is treated as a theme at the VSS web-page¹³² and many topics are covered there. Training material can also be found in module I5: Basic Demography and Epidemiology in the SADC training course in statistics¹³³. A brief introduction can be found at the web-pages of Statistics Finland¹³⁴

7.3. Social statistics and Censuses: Concepts and methods

Objective

The suggested course is aimed at supplying sufficient knowledge of social statistics and censuses issues. It is necessary to have several specialists in social statistics in a NSI. It may be necessary to combine in-house training with other training modalities in order to achieve this goal.

¹²⁹ <http://unstats.un.org/unsd/pubs/gesgrid.asp?mysearch=demographic+population>

¹³⁰ <http://unstats.un.org/unsd/demographic/standmeth/handbooks/default.htm>

¹³¹ http://unstats.un.org/unsd/publication/SeriesF/SeriesF_92E.pdf

¹³² https://www.virtualstatisticalsystem.org/themes/theme/1-social-and-demographic-statistics/?no_cache=1&cHash=f847730bc03a554f7e94de887285c915

¹³³ <http://www.reading.ac.uk/SSC/media/sadc-training-pack/02%20Intermediate%20Level/Module%2015/Module%2015.htm>

¹³⁴ http://www.stat.fi/tup/verkkokoulu/data/vt/index_en.html

Core topics

- Framework of Social Statistics
- Millennium Development Goal (MDG) Indicators
- Household Characteristics
- Health Statistics
- Education Statistics
- Disability Statistics
- Time Use Statistics
- Labour Force Statistics
- Gender Statistics

Resources and training material

Social statistics is a theme in the VSS¹³⁵. Many topics are covered there. In the e-learning section¹³⁶ material on justice, crime, security and labour statistics are available.

More on in activities and indicators related to the Censuses can be found on the UNECE web-page¹³⁷. The United Nations Statistics Division has several handbooks on social statistics¹³⁸, e.g. a handbook on time-use-statistics, the “Guide to Producing Statistics on Time Use: Measuring Paid and Unpaid Work¹³⁹” gives an overview of different approaches in the design of time-use surveys. It also reviews methods and practices in collecting, processing and disseminating time-use statistics through compilation of country experiences.

The International Household Survey Network and the World Bank Group have jointly developed a microdata management toolkit¹⁴⁰ in cooperation with Nesstar¹⁴¹. It is well suited to handle and store datasets, including metadata. It is also a well suited tool for disseminating social statistics and metadata on the web and on CD-ROMs.

¹³⁵ https://www.virtualstatisticalsystem.org/themes/theme/1-social-and-demographic-statistics/?no_cache=1&cHash=f847730bc03a554f7e94de887285c915

¹³⁶ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3683>

¹³⁷ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Population+and+housing+censuses>

¹³⁸ <http://unstats.un.org/unsd/pubs/gesgrid.asp?mysearch=social+indicators>

¹³⁹ http://unstats.un.org/unsd/publication/SeriesF/SeriesF_93E.pdf

¹⁴⁰ <http://www.surveynetwork.org/home/index.php?q=tools/toolkit>

¹⁴¹ <http://www.nesstar.com/>

8. General topics

8.1. Language courses

Objective

Some employees need to improve their qualifications in speaking, reading and writing a language. Language courses are particularly important when the work language on the NSI is not the mother tongue for many staff members.

Core topics

- Speaking
- Writing
- Language in meetings
- Language in report writing

Resources and training material

The British Council, The United Kingdom's international organisation for cultural relations and educational opportunities, offers web courses for learning English¹⁴². The broadcaster BBC also has made Internet training material available on the web¹⁴³.

8.2. Project management

Objective

Project management is planning, organising and managing resources to bring about the successful completion of specific project goals and objectives.

Core topics

- Defining tasks
- Planning and budgeting
- Project planning tools
- Result based management (RBM)
- Recruiting and motivating
- Constraints, challenges and opportunities
- Managing quality
- Workshops

Additional topics for IT projects

IT projects often require even stricter planning, documentation and follow-up than other projects in order to be successful. Special focus should be had on these projects.

- IT project methodologies
- Writing of requirement specifications and other documentation required for IT projects
- How to administer software testing

Efficient workshops: Course outline

¹⁴² <http://learnenglish.britishcouncil.org/en/>

¹⁴³ <http://www.bbc.co.uk/worldservice/learningenglish/>

The aim is to give input for how to improve workshops and make more employees able plan and run good workshops. Training should be given through lectures and practical exercises.

- Workshop planning
- Pre-workshop checklist
- Effective workshop agendas
- Effective presentations
- Outputs
- Workshop follow-up

Resources and training material

The World Bank Institute of Distance learning has developed an e-learning course on project management as part of the Virtual Statistical System¹⁴⁴. Statistics Norway gives advice on planning and implementation of projects in National Statistical Offices¹⁴⁵.

8.3. IT literacy: File management, Windows and Microsoft Office

Objective

The Microsoft Office products like Word, Excel and PowerPoint – or equivalent free-ware - is widely used in NSIs. Many employees however lack the ability to use the programs in an efficient manner. Courses in these software packages should be given frequently in the beginning, and less frequently as the demand is reduced.

Core topics

- Windows
- File management and storage
- Word
- Excel
- PowerPoint

Using Windows: Course outline

The participants should be enabled to understand and to adapt the Windows work environment. Demonstration with hands-on exercises

Practical training in how to:

- Understand the Window desktop and its icons.
- Use the mouse and other features of the Windows user interface.
- Adapt the windows work environment according to preferences.

¹⁴⁴ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4349>

¹⁴⁵ <http://www.ssb.no/english/int/>

Using Windows Explorer: Course outline

The participants should be enabled to understand and to adapt the Windows Explorer work environment. Demonstration with hands-on exercises.

Practical training in how to:

- Adapt the Windows Explorer work environment according to preferences
- Create and delete folders
- Move, copy and delete files
- Sort files by name, type or date
- Use the Recycle Bin

Efficient storage and management of electronic files: Course outline

The participant will learn how to organise own work in an effective and secure manner. This will increase efficiency and avoid loss of data.

Demonstration with hands-on exercises

Practical training in how to:

- Organise project files into a hierarchy of folders
- Give suitable names to project files, and set up file descriptions
- Backup project files regularly

Using Excel: Course outline

The course participants learn how to conduct Excel operations on different levels.

Introduction to Excel. Practical training in how to:

- Identify objects in a workbook
- Selecting cells in a worksheet
- Handle “paste” and “paste special” features
- Linking information across worksheets

Data manipulation in Excel. Learn how to manipulate data in Excel.

Practical training in:

- Efficiently structure your data
- Create and protect master copies of you data
- Create duplicate working copies
- Sort your data for easier checking
- Select subsets (filtering)
- Name cell ranges

Performing advanced calculations in Excel. Practical training in:

- Do basic calculations in the formula bar.
- Use Excel to do arithmetics and comparisons using cell addresses
- Use Excel to do arithmetics and comparisons using column names
- Use Excels inbuilt functions

Produce good tables in Excel I. Practical training in:

- Produce a frequency table by hand and using Excel pivot tables
- Produce a table with counts, proportions & percentages
- Hide, re-order and merge categories in a table
- Display tables with an appropriate format, and with or without the margins

Produce good graphs in Excel II: Understand the terminology used to identify different parts of a chart, recognise parallels between tables and charts and decide which type of graph is appropriate for displaying the information effectively. Practical training in:

- Produce graphs from summaries and raw data
- Improve a chart by choosing the right type, arrangement and formatting

Using MS-Word: Course outlines

The course participants learn how to conduct MS-Word operations on different levels.

Introduction to Word. Practical training in how to:

- Open and close documents
- Copy, cut and paste text
- Basic formatting
- Using styles
- Insert page numbers

Formatting documents in Word. Practical training in:

- Most important toolbars
- Checking spelling and grammar
- Changing views
- Formatting text and using copy format brush
- Use of Headers and footers
- Use of bullets and numbers
- Page brakes
- Advanced find, search and replace

Working with objects in Word. Practical training in how to:

- Inserting and working with tables in MS-Word
- Assess page lay-outs
- Create text boxes and other auto shapes, use of lines and connectors to construct diagrams
- Paste pictures and MS-Office objects (e.g. Excel charts)
- Create table of content
- Numbering of objects, cross-references
- Updating fields
- Using the “track changes” facility

Using MS-PowerPoint: Course outlines

The course participants learn how to conduct MS-PowerPoint operations on different levels.

Introduction to PowerPoint. Practical training in how to:

- Open and close documents
- Write simple text slides
- Copy, cut and paste text and slides (also from other files)
- Use the slide sorter and other formats, including “notes” area
- Basic text formatting
- Changing layout and background

Formatting and working with objects in PowerPoint. Learn how to:

- Assess different slide lay-outs

- Create text boxes and other auto shapes, use of lines and connectors to construct diagrams
- Paste pictures and MS-Office objects (e.g. Excel charts)
- Create tables in PowerPoint
- Printing options in PowerPoint

Advanced PowerPoint presentations. Practical training in how to:

- Plan and design slide shows
- Hide and unhide slides
- When to use animation
- Choose between, and use animation schemes
- Use of custom animation for sequential presentation of diagrams, graphs and text
- Use of action buttons and linking presentations

Resources and training material

Microsoft offer free training material for the Office products from 2010, 2007 and 2003. Training material on programs like Word, Excel, PowerPoint and Access is available online¹⁴⁶.

8.4. Use of statistical packages, interpretation and analysis

Objective

Many employees need to be able to analyse data using statistical packages (e.g. SPSS, SAS and Stata), but are lacking sufficient skills in operating the relevant program. The need for this kind of competence is particularly important when a survey is conducted and the results are to be analysed. The courses should be given on both beginners and advanced level, as well as on more specific subjects, as need may be.

The training should be conducted as close to the finalisation of the data files as possible. This will make their knowledge fresh, when they start working on the data. If possible, preliminary data from the survey should be used in the training. If not dummy datasets, having the same variables and values as in the real one, ought to be used in the training. The course should be conducted frequently in the beginning, and less frequently as more people have learned using the tool.

The course outline has been made using SPSS as an example. Similar outlines can be made using SAS, Stata or other analytical tools.

Core topics

- Making tables
- Estimating results and uncertainty
- Interpret the results of statistical analysis
- Poverty and food security estimates

Using SPSS: Course outline

Introduction to SPSS. Practical training in how to:

- Basic knowledge of SPSS work environment (“settings”)

¹⁴⁶ <http://office.microsoft.com/en-us/support/training-FX101782702.aspx>

- Use of dialogue boxes and pasting syntax
- Open (or import), and save (or export) datasets in SPSS
- Using the help system in SPSS

Data manipulation in SPSS. Practical training in how to:

Introductory

- Rename and create new variables
- Conditions and selections
- Add data sets together
- Sort data sets
- Interpret the relevant error messages
- Use the syntax reference manual

Intermediate

- Match data sets (including duplicate checks)
- Aggregate cases
- Transpose cases to variables
- Transpose variables to cases
- List variables and data
- Interpret the relevant error messages
- Create and run syntax files by pasting commands
- Link syntax and data files with “document” command

Advanced

- Use functions
- Text instead of code (string variables)
- Handle arrays
- Use loops
- Interpret error messages
- Work with SPSS syntax files, mainly generated by typing SPSS commands directly

Descriptive statistics in SPSS. Practical training in how to:

- Frequencies
- Descriptive statistics
- Cross tabulation
- Sort data sets
- Sense of error messages

Basic tables in SPSS. Practical training in how to:

- Assess and define the measurement level of a variable
- Introduction to the SPSS table builder (“ctables”)
- Use the table builder to create simple tables
- Add totals and summary statistics
- Control direction of percentages
- Interpret error messages
- Create and run syntax files by pasting commands

Advanced tables in SPSS. Practical training in how to:

- Produce stacked and nested tables
- Add multiple totals and sub-totals
- Use other summary statistics than percentages
- Make table formats as desired
- Use the Output Management System (OMS)

- Create html files
- Handle Multiple Response sets
- Create similar tables by copying and editing directly on the syntax

Using macros in SPSS. Practical training in how to:

- Understand the structure of a SPSS macro
- Defining variable sets with macros
- Macros for joining files (e.g. from Eyes and Hands)
- Macros for generating automatic file paths
- Macros in regressions
- Interpret error messages/ debug macros

Using matrices in SPSS. Practical training in how to:

- Identify situations where matrix computations must be used
- Understand the SPSS matrix module
- Using matrices in regressions
- Matrices used in computing poverty probabilities
- Interpret matrix error messages/ debug matrix programs

Resources and training material

Most software suppliers have training material available on-line. Statistics Norway can be consulted regarding training and courses and material on using SPSS and SAS in National Statistical Offices.

8.5. IT-support, development and infrastructure

Objective

Having a smoothly working IT-system is crucial to any modern NSI. Below some central topics are presented.

Advanced network setup and administration

Advanced network setup and administration (incl. e.g. local area network, configuration management, security, satellite dishes and wireless networks) is important for creating an operational communication system for a NSI headquarter, local offices and cooperating partners and users outside.

Server maintenance

Server maintenance is important to create a sustainable back-up system and system for data storage.

Database management

Database management is important for administering data-sets in a proper manner. Documentation and storage of data are important issues in this context.

Web design and administration

The Internet is an important communication channel for any statistical organisation, especially for dissemination purposes.

IT development

The IT systems not only have to be running, but also to be developed and maintained. Hence, knowledge on SQL and database design is essential, as well as programming in the relevant tools.

System development methodology

Points to success factors in a project; the essential documentation to be written, responsibility charts, organisation of programs and project organisation.

Resources and training material

Several activities related to information and communication technology is discussed at the VSS web-page¹⁴⁷.

8.6. Administrative support

Objective

The administrative staff at the NSI needs basic skills in handling financial issues and documentation to make the organisation run smoothly.

To be able to handle financial issues you both have to be able to communicate a clear and strong message, and to have the necessary skills in accounting and financial management. There is also a need for closer networking amongst the different levels of accountant services to build up a stronger professional environment, less vulnerable for interference from other leaders and less vulnerable for intransparency. Documenting the activity in the NSI and archiving central documents is also an important part of the administrative support.

Core topics

- Technical accounting
- Financial management
- Communication
- Documentation and archiving

8.7. Search and find on the Internet

A lot of information relevant for NSIs is available on the Internet; Definitions, scientific reports, nomenclatures, software and all kinds of guidelines. This information ought to be utilised more. A lot of it is available for free.

Core topics

- Searching the web: Important sites and search engines
- Evaluate the quality of the information

¹⁴⁷ https://www.virtualstatisticalsystem.org/activities/activity/3-ict/?no_cache=1&cHash=e5912af5eb5dab0885b6a572160c0071

Virus protection

The aim is to avoid being obstructed by viruses and spam/junk mail in the daily work.

- Use the Internet without exposing the computer to viruses
- Run antivirus software and check for viruses
- Update the antivirus software
- Filter out spam at individual work stations
- Avoid virus contamination from memory sticks

8.8. Quality management*Objective*

The management is in charge of making sure that statistics of sufficient quality is produced. The objective of the course in quality is to suggest ways to facilitate these tasks. The work on improving processes is the key to improving quality of statistics as well as the effectiveness of statistical organisations.

Core topics

- Total quality management
- System development methodology
- Cooperating with other government institutions, NGSs and donors

Quality assurance: Course outline

The aim is to give basic knowledge about quality work, and being trained in principles and techniques useful for quality work. The course should include both lectures and practical exercises. It should give knowledge and ability to explain the term Quality and the principles behind systematic quality work, as well as its application on the statistical production:

- Continuous improvement
- Statistical variation in quality
- Product and process mapping
- Quality reports
- Quality guidance

Resources and training material

The VSS has made e-learning material on quality management available¹⁴⁸. Training material in quality process given for censuses¹⁴⁹. Eurostat has made important work on standardisation and building quality in statistics. Material is available through their web-site¹⁵⁰.

The Business Process Model of Statistics Norway is available at the Internet¹⁵¹. A paper by Mr. Hans Viggo Sæbø on measurement of process variables within the framework of quality assessment presented at the ISI Conference in 2007 is also available on-line¹⁵².

¹⁴⁸ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3709>

¹⁴⁹ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=4477>

¹⁵⁰ http://epp.eurostat.ec.europa.eu/portal/page/portal/quality/quality_reporting

¹⁵¹ http://www.ssb.no/english/subjects/00/90/doc_200817_en/doc_200817_en.pdf

¹⁵² <http://www.statssa.gov.za/isi2009/ScientificProgramme/IPMS/0886.pdf>

8.9. Human recourse development and management

Objective

Managing an NSI is a complex task. The management is in charge of building teams, motivating employees, solving conflicts and other human resource management and development issues. The objective of the course is to suggest ways to facilitate these tasks. The key task of a leader is to bring out the best in his or her staff. More than solving tasks by themselves leaders should help others perform. The art of managing people is not inherent in managers, but a skill to be discussed, practised and learned.

Core topics

- Motivating employees
- Delegating tasks
- Team work
- Development talks
- Solving conflicts
- Leadership styles
- Leadership roles

The aim is to give basic knowledge about developing and managing human recourses. The course should include both lectures and practical work based on leaders own experiences. The course should be conducted as a workshop, allowing the participants to develop their own solutions to the challenges they face.

Resources and training material

Several aspects of human resources development, training and management in Statistical Offices were illuminated at a workshop hosted by The United Nations Economic Commission for Europe (UNECE) in September 2010¹⁵³. The United Nations Statistics Division's Handbook of Statistical Organization among other issues gives principles for organisation and management of national statistical offices¹⁵⁴. More on management and development of human resources can be found in the VSS¹⁵⁵.

Statistics Norway gives training in human recourse development and management for middle managers and administrative personnel.

8.10. Ad hoc training

In addition to the programs specified above, additional training probably will be needed. Urgent needs may arise, that necessitates specific training in different fields. These needs may be caused by new technological developments or strategic choices by the management. An example of this can be the need for training arising from introducing a new analytic tool or introducing new ways to present data on through the Internet. Training needs may also be caused by upcoming problems, like when work is hindered by severe virus attacks. When planning for training, one should set aside resources for training needs that we do not yet know.

¹⁵³ <http://live.unece.org/stats/documents/2010.09.hrm.html>

¹⁵⁴ <http://unstats.un.org/unsd/dnss/HB/>

¹⁵⁵ https://www.virtualstatisticalsystem.org/themes/theme/54-management-and-development-of-human-resources/?no_cache=1&cHash=a5295919926b8fec861b117ffd0a7558

9. Certification of senior statisticians

Objective: Developing professionalism

It is important for an NSI to encourage competent colleagues to develop. It is important to encourage staff to become leading professionals within their fields of official statistics. Hence, it is important to reward development of professionalism, the same way becoming a leader is rewarded.

The over all aim of training senior statisticians is to improve the quality of statistics produced by building on colleagues with a thorough knowledge of:

1. The statistical system; the legal ground, statistical methodology, standards, data security and user needs.
2. The statistical production process; data gathering, data processing, analysis and dissemination.

In addition to focus on strengthening these competencies within the NSI, developing senior statistician training builds a career path for professionals in the field. Training can either be given in-house, or in cooperation with a university, either nearby or through distance learning courses. To develop highly skilled professionals, both are probably needed. Professional experience is also an important part of being a senior statistician. To be considered for being certified as a senior statistician, an employee should have at least five years of experience from the NSI.

Relevant training must be supplied by the NSI, either through in-house training or training organised by training centres or universities. Distance training may be an advantage in order to keep the employee in work while taking education.

Colleagues who consider themselves to have the sufficient skills should have the possibility to apply for being certified as a senior statistician.

The certification system

A system for certification of senior statisticians can be established in the following way: Colleagues may apply for being upgraded to senior statisticians. The applicants will supply the following information:

- An application pointing out why he or she should be upgraded.
- A resume (curriculum vitae), describing present and past tasks.
- Reports, articles and other work the applicant have produced either alone or in cooperation with others. If more people have been involved, the applicant ought to describe the division of labour.

The qualifications of the applicant should be evaluated by a committee, consisting of people with relevant qualifications. The committee may be appointed by the Director General. At least one of the committee members should come from outside the NSI. The committee should evaluate all applicants individually and give each of them a justification for its decision. The committee may gather additional information about the applicants if needed. In addition to the documents mentioned above, the immediate supervisor is asked by the committee to give a statement about the applicant.

The responsibility for certifying senior statisticians also may rest with the Ministry in charge of the NSI. This may make it easier to upgrade the

position and salary of the senior statistician. The responsibility for certification also may rest entirely or be done in cooperation with a university. This emphasises the scientific aspect of the certification, also making it possible to include a certificate or a diploma as part of the system.

The required competencies...

In general formal education on at least lower grade university level ought to be required. Further a part of the grade should be within relevant fields of statistical methodology (e.g. half a years study). In addition skills and experience in using different methods must be documented. This applies both for statistical methods and other methods relevant for developing statistics. Methods for production and analysis of official statistics ought to be emphasised. The following competences in using statistical methods ought to be considered as relevant.

...in methods for:

- Planning of surveys or other kinds of data gathering
- Questionnaire design
- Data collection
- Cartography
- Use of administrative registers
- Planning and development of statistical systems
- Evaluating data quality, uncertainty and errors related to sampling and problems associated with registers (if applicable)
- Evaluating different sources of errors
- Measuring uncertainty, e.g. through standard errors and confidence intervals
- Statistical methods in statistical analysis
- Documentation, metadata and dissemination

...in official statistics. Skills and experience in:

- Planning and production of statistics
- Analysis and dissemination of statistics
- The fundamentals of official statistics, including the legal framework, standards, confidentiality and systematic quality improvements
- Project work
- Several areas, including international cooperation

The applicant must have thorough knowledge of the relevant methods in their field. Further, interpersonal skills like contributing to team work and assisting colleagues should be rewarded. The same is the case for efficiency, accuracy and innovation in building statistics.

Acknowledging the senior statistician

Being certified as a senior statistician should be seen as a title of honour. It is however crucial that the reward is not only a title, but that it also shows that the NSI values the colleague and his or her contribution through an increased salary and an upgraded position. Hence, the senior statistician certification system must be linked to the system of grades and salary used in the NSI.

10. User seminars

Objective

The overall focus or goal of disseminating statistics should be user-friendliness, meaning that it should be easy to find, easy to *use* and easy to understand. This means that producers of statistics must make a selection between all the possible numbers and publish the most relevant, interesting and important and to make their comparison as easy, meaningful and informative as possible. In short, to help the users utilize the statistics in an informative way. Measures should be taken to ensure that statistics are usable for making policy based on evidence. To be used, statistics must be perceived as useful.

The orientation towards users has two main elements: *First*, it relates to cooperation with users in identifying what information to collect and how to process it. The aim is to cooperate on collecting data that are relevant for policy making, in regard to the choice of topic, definitions used and when the statistics are made public. We want the topics we choose to be relevant for the diction makers in the sense that it enables them to formulate an evidence based policy. We want to use definitions that are applicable for targeted policy interventions and that are comparable over time and internationally. Finally we want the statistics to be made accessible to policy makers and the general public at a point in time when it can have the best impact. This e.g. means that policy makers should have as new data as possible in front of the annual planning process.

Second, it aims at training users in understanding and making the best use of statistics. This includes illuminating both the limitations and the possibilities in statistics used for evidence based planning. The overall focus of statistical dissemination should be user-friendliness, meaning that statistics should be easy to find, easy to use *and* easy to understand. This is not always easy to achieve. Hence, it is often a need to educate representatives from important user groups in how to find, interpret and use statistics. It may be useful to train government officials in finding policy relevant information and using it, and to train journalists in finding and using statistics.

Identifying data to collect: Core topics

- What statistics is needed for evidence based policy?
- Definitions and questions
- Identifying change over time
- Making international comparisons possible

Making use of statistics: Core topics

- Where do I find the statistics?
- What does it mean?
- Comparing numbers
- Uncertainty
- Figures, tables and graphs

Summing up: It is useful to conduct two types of user seminars. First the users ought to be included in defining the questions we are trying to answer by statistics. Second, users should be given the opportunity to learn about the interpretation and use of statistics, including its limitations. More on use and users of statistics can be found in the Virtual Statistical System¹⁵⁶ and ¹⁵⁷.

¹⁵⁶ https://www.virtualstatisticalsystem.org/activities/activity/9-use-of-statistics/?no_cache=1&cHash=f1c16a02f933e119b5af8ebc4e798cd3

¹⁵⁷ <http://vle.worldbank.org/moodle/course/view.php?id=476&page=3719>

11. Future challenges

This document has addressed some issues related to in-house training; identifying training needs, organisation of training and suggesting core training elements. It will end by mentioning three challenges that ought to receive more attention in the future.

Building commitment

The better we train staff, the more attractive they get to other organisations and the more possibilities they have for alternative employment. At the same time employees that feel that their organisation give them something – like training, interesting tasks or a higher salary – are likely to be loyal to their organisation. They not only feel obliged to work hard, but they also *want* to give something back to the organisation. This commitment is a potential not realised in most national statistical institutes.

Training material

A lot of training material is available. The Southern Africa Development Community (SADC) package¹⁵⁸ on statistical training contains a substantial amount of training material. The Virtual Statistical System (VSS)¹⁵⁹ contains material for e-learning¹⁶⁰. The United Nations Economic Commission for Europe (UNECE) has gathered a lot of training material on their web-site¹⁶¹. The African Group on Statistical Training and Human Resources (*AGROST*) is also planned to be a source of training material. Statistics Norway can supply material on most of the topics described. Still, a lot of training material seems to be under-utilized. Training material ought to be shared as a common good, not losing value when being used by others.

Motivation to teach

Sharing knowledge is in some cultures not considered to be a good strategy for success in an organisation. If you give away your knowledge, someone else may be wiser than you and may reach further than you. This is counterproductive from an organisational point of view. In order to make competent staff train their colleagues, they must see it as a beneficial thing to do. Some important motivators for teaching are commitment and obligation to the organisation, status and financial incentives. These are tools we must use.

¹⁵⁸ <http://www.reading.ac.uk/ssc/media/sadc-training-pack/index.htm>

¹⁵⁹ <https://www.virtualstatisticalsystem.org/>

¹⁶⁰ <http://vle.worldbank.org/moodle/course/view.php?id=476>

¹⁶¹ <http://www1.unece.org/stat/platform/display/TRAINSTATS/Welcome+to+the+library+of+training+materials+on+statistics;jsessionid=8CB16FDB0425473050595DF52B85FF2F>

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Section B. Continued

code	topic	Is this topic relevant for your current area of work? If no, skip to next line If yes, check the rest of this line	Current own skills						Own need for more training						If high need for training (priority 5-6) specify further on topics for training (in writing/key words)
			low skill -----> high skill						low priority---->high priority						
Subject matter															
09	Statistical theory	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Sampling theory	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	Demography	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	Economic statistics	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	Social statistics	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	Accounting & Budgeting	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	Management & Planning	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	IT (technical)	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17	Survey planning	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18	Questionnaire & Manual design	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19	Data entry	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20	Data cleaning	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21	Data base/data storage	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
22	Data tabulation	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23	Report writing & dissemination	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
24	Web site dissemination	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
25	Advanced data analysis	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
26	Formal English Language	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
27	Formal Arabic language	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28	Other specify:	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
29	Other specify:	No <input type="checkbox"/> ↓ Yes <input type="checkbox"/> →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Section C. Resource persons for training courses

+

Provided that internal training courses will be arranged, please list codes (see section B) for topics that you find that you could contribute as a lecturer alone or together with a team with the purpose to train SSCSE colleagues and possibly also invited external staff

topic	Code from B	Comments, ideas, for further discussion, training course design etc.

Appendix B: Checklist for setting up in-house training

There are several tips¹⁶² that can help make your in-house training more relevant and effective in catering for your organisation's needs. Make sure you:

1. analyse your organisation's needs - consider if any parts of it would benefit from improvement and how training can contribute to this
2. get the employees involved by asking them which types of training would improve their productivity
3. plan the training carefully
4. involve senior members of staff in identifying training needs or materials specific to the organisation
5. set training objectives that are specific, measurable, achievable, realistic and time-based
6. keep training objectives in line with wider organisational goals
7. choose your trainer carefully, whether you select an existing employee or hire someone specifically for training
8. draw up personal development plans for each employee - treat training as a continual process
9. train employees who are keen to learn first, and allow them to demonstrate the benefits to more sceptical staff
10. evaluate training by asking for feedback from employees, e.g. via questionnaires
11. analyse questionnaire results in order to improve training the next time around

Bear in mind that training may not solve all your problems - if an employee consistently fails to carry out their duties correctly, they may be in the wrong job.

¹⁶² The list is based on www.businesslink.gov.uk

Appendix C: Course evaluation form from Statistics Norway



Statistisk sentralbyrå
Statistics Norway

Course evaluation of _____

1: Please state your general impression of the lecture:

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2: Do you think that the duration of the lecture was;

too brief
 appropriate
 too long

Comments:

3: How do you consider the professional content?

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

4: How do you consider the lecturer's ability to communicate the message?

(Ability to enthuse, create dialogue, pedagogical capacity, use of examples and technical facilities)

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments or advice for the lecturer(s):

5: How do you evaluate the preparation of the exercises?

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:



Statistisk sentralbyrå
Statistics Norway

6: How do you consider the course material being handed out?

(Relevance, ability to engage, adjustment to level, contribution to network creation)

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

7: How do you evaluate the relevance of the course with regard to your work?

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

8: To which degree do you consider the localities suitable for this course?

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

9: How do you consider the functionality of the technical equipment?

Very bad	Bad	Neither good nor bad	Good	Very good
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

10: How did you like the marketing of the course and where did you learn about it?

(Through the SSB Intranet, your superior, otherwise?)

Comments:

11: Do you have any advice with regard to a future course of this kind?

Comments:

Thank you!

Please return to:

Appendix D: Course

Evaluation Form, NSC Kyrgyzstan, English Version Workshop Evaluation Form

Please help us to assess the value of this Workshop by completing this questionnaire.

Title of Workshop:

A practical approach to Human Resources Development (HRD).

Trainer: Dag Roll-Hansen

**Venue: The Conference Hall
November 2011**

Date: 17. to 18

- 1] Please tick a box in the table below to indicate your rating of each factor where 1 is very poor and 5 is very good.

	1 Very poor	2	3	4	5 Very good
Did you find the Workshop interesting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the part on in-house training useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the part on communication useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the part on delegation useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the part on motivation useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were you able to participate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were the handouts useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the content easy to understand?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the trainer responsive to your learning needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What is your over-all rating of the trainers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please rate the training room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 2] If the Workshop did not meet your expectations, please explain why.
- 3] What were the best things about the Workshop?
- 4] What about the workshop, if anything, would you change for the future?
- 5] What new skills have you learnt that you think you will be able to put into practice?

Thank you for completing this form. Please hand it in to the facilitators or return it to the Human Recourse Unit.

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