



Progress with the South African Innovation Survey 2005 (as at 31 March, 2006)

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1. Background

CeSTII was commissioned by the Department of Science & Technology (DST) to conduct the first official South African Innovation Survey, as part of DST's effort to establish a baseline set of S&T indicators for monitoring, reporting on, and fine tuning the national system of innovation (NSI). CeSTII also conducts the annual National Survey of Research and Experimental Development (R&D) and the two surveys will complement one another. The aim is to build a national database of R&D and innovation data compliant with international best practice for preparation of indicators and reports. South Africa can only be taken seriously in science and technology (S&T) if we produce regular and reliable survey based data on Innovation & R&D to report on the development of the NSI. We now regularly submit R&D data to the OECD for publication in the biannual *Main Science and Technology Indicators* (MSTI) where South African data can be compared with those for all OECD countries. Data from other non-OECD member countries including Argentina, China, Russia and Slovenia also appear in the MSTI.

The broader objectives of the survey are to:

- produce a set of internationally comparable data and indicators for providing insights into the patterns of innovation in the mining, manufacturing and services sectors in South Africa
- collect information on the sources and resources for innovation in enterprises
- provide an indication of the extent of public funding for innovation activities that is taken up by enterprises
- draw national and international comparisons of innovation intensity
- obtain an understanding of the importance of R&D and non-R&D based innovation in different sectors

The current survey is aligned to the fourth round of the European Community Innovation Survey (CIS4) and CeSTII has worked closely with the OECD and Eurostat in this regard.

2. Set-up and methodology

The survey team

Currently the survey team consists of a Survey Call Centre (SCC) with six operators, all CeSTII researchers, a Survey Manager responsible for logistics and managing the SCC, and the CeSTII Director who directs and manages the project.

Survey design

The survey design is informed by Eurostat guidelines and the structure of the Statistics South Africa business register and in a nutshell comprises of:

- a random stratified sample (by sector and size of enterprise) drawn from the business registry database of Statistics South Africa
- a postal survey with at least two telephonic and two written correspondences
- a non-response survey if the response rate is below 70%
- the extrapolation of results to the target population based on the weighted sample.

Business registry

Eurostat and the OECD Oslo Manual strongly recommend the use of the most up-to-date official national business register for innovation surveys in order that countries follow standard procedures and that the results are thus comparable. Because of the Memorandum of Understanding regarding official science and technology statistics between DST and StatsSA CeSTII was the first outside body permitted to make use of the StatsSA business register. Once we had specified the sample required and submitted our methodology for the survey, StatsSA drew down the specified sample of 3087 enterprises from the August 2004 business register. The first part of 2005 was mainly dedicated to confirming the accuracy of details contained in the random sample. About 47% of the entries in the sample had inaccurate contact details (referred to as untraceables). During the start up phase of the Survey Call Centre we dedicated time to cleaning the database through phone calls and Internet searches and cross checks in

various directories and commercial business databases, In this way we have managed to reduce the untraceables to 13% of the database. Once the impact of the untraceables has been determined, we will request StatsSA to recommend an appropriate statistical treatment.

The target population comprises the total population of enterprises of four size classes at the two digit SIC level of industrial sectors from the StatsSA Business Register. The following industries are included in the target population:

- mining and quarrying
- manufacturing
- electricity, gas and water supply
- wholesale and retail trade
- transport, storage and communication
- financial intermediation
- computer and related activities
- research and development
- architectural and engineering activities
- technical testing and analysis

Software and databases

The registry and survey database have both been designed in MSAccess by an in-house programmers and are located on a dedicated HSRC server for security reasons. MSAccess was chosen for its flexibility and convenience in a new survey of this nature. Once the survey has been completed, the data will be processed using the special SAS program as supplied by Eurostat for use with CIS4. All final data will be migrated to Oracle for secure long-term storage.

Logging system

The in-house programmer has also designed an interactive logging and monitoring system. The SCC operators, researchers and survey managers all have restricted access to the system.

All enterprises in the register have their contact details and prior interactions recorded in the database and can be individually tracked via their survey ID number or name. The

final survey data are also captured on this system. At any given time it is possible to see how many questionnaires have been received, what the status is of each entity and which questionnaires have been verified and captured.

The system also generates individual and managerial reports concerning dispatch and receipts, questionnaire status, entities that still require follow-up and records of all interactions by the SCC operators. These reports are valuable for monitoring and planning purposes.

Questionnaire design

The questionnaire design was based on the standard CIS4 questionnaire provided by Eurostat and informed by a stakeholders' workshop held in Pretoria in March 2005, organised by DST and the National Advisory Council on Innovation (NACI). This was followed by two series of pilot surveys focused on eliminating problematic wording and ambiguity and uncovering any South African specific problems with the CIS4 basic questionnaire. The final questionnaire is still strictly comparable with that of CIS4 to allow for international comparisons.

After several draft questionnaires, a high quality questionnaire and Question and Answer or frequently asked questions (FAQ) booklet was developed. Each potential respondent received a FAQ booklet with the questionnaire. The purpose of the booklet was to preempt and provide answers to respondents' most general queries. The FAQ booklet is also used by the SCC operators when assisting respondents telephonically. It covers general questions about the survey, questions around the types of innovations, examples of innovations and contact details of SCC staff. An electronic version of the booklet is also available.

Dissemination/ Postage

A first dispatch of ± 2600 survey questionnaire packs was made at the end of August 2005. Each pack contained: A letter from the Knowledge Systems Executive Director explaining our role and the purpose of the survey; an open letter from the Minister of Science and Technology inviting respondents to participate; an article on innovation from the *Economist*, a specially designed promotional ruler, a return envelope (addressed and

prepaid), a survey questionnaire and a FAQ booklet. A month later a further batch of ± 450 remaining surveys were dispatched to the “untraceable” entities.

During January 2006 ±1500 survey packs were resent as a reminder to all respondents with whom no contact could yet be established or who had displayed a lack of interest. The due date for return of completed questionnaires was 24 March 2006. Enterprises have thus received at least two written correspondences and two telephonic reminders as recommended by Eurostat in the CIS4 methodology guidelines.

All respondents received a printed version of the survey, which is then followed-up by the electronic version when relevant. Some sectors appear to prefer the electronic version. Where possible an electronic version of the questionnaire is forwarded to enterprises where no telephonic contact can be established.

3. Survey Call Centre

The SCC was established to enable the survey to try and achieve the very high ideal required return rate of 70%. Six contract operators are employed in the centre. Their responsibilities include:

- the dispatch of survey packs
- reminder and follow-up contacts with potential respondents
- the recording of all interactions with respondents
- accurate collection of data, in accordance with certain set targets
- verification of questionnaire data and follow-ups on incomplete questionnaires
- data capturing
- assisting with queries regarding the completion of the questionnaire
- contributing to project reports and meetings
- general administration

Prior to the launch of the survey, the various sectors were assigned to each of the SCC operators, comprising approximately 500 enterprises each, to manage with the assistance of the CeSTII researchers.

A SCC Standard Script has also been designed and is utilised during interactions with respondents. The script assists the SCC operators to think on their feet, offer immediate assistance and ensure uniformity in the approach and manner of contact with respondents. The script contains standard responses and additional information on the collection of sample registry information, assistance with the actual questionnaire, the handling of follow-up calls and appendices listing examples of innovation.

The SCC operators have been through a number of in-house training sessions focusing on innovation and the interpretation of the questionnaire. In the weekly SCC meeting operators discuss any challenging interactions experienced in the preceding week, thereby promoting continuous learning and teamwork. All SCC operators attend the weekly CeSTII project meetings and provide short presentations on their progress and possible difficulties with their sectors.

The Survey Call Centre is an important development in CeSTII and is proving to be an essential component of conducting surveys. Contracting work to an outside call centre did not appear to be appropriate given the confidentiality of information contained in the databases. All CeSTII members and contractors sign a standard confidentiality agreement as required by Statistics South Africa.

4. Respondent interaction

About a third of entities appear to be willing to participate, once the correct person in the enterprise has been targeted, and they have had contact with the persuasive SCC staff and gained a better understanding of the purpose and nature of the survey. This requires a great deal of effort, as there is a large amount of resistance to surveys such as the R&D and Innovation Survey that require the completion of detailed and fairly complicated questionnaires.

Some reluctance has been experienced from either very small or large entities; mostly stating time constraints or lack of relevance as the main reasons. Some entities have also questioned the compulsory nature of the questionnaire stating that they are “over surveyed and won’t participate unless they have to”. In some instances participants will only complete the questionnaire if it is available in a language of their preference. In an

effort to address this, basic in-house translations have been done and each SCC operator is able to offer assistance in at least two official languages. If a request is made for assistance in a specific language the request will be forwarded to the relevant operator.

A number of respondents have indicated their interest in innovation and made enquiries on possible sources of funding for R&D and innovation. A list of potential sources has been included in the SCC Standard Script so that operators are able to refer interested individuals to useful links. Consideration should be given to possibly including an innovation information pamphlet as part of the key high-level results that is to be distributed to all participants.

In instances where respondents voice objections to completing the questionnaire or strongly indicate that the survey is not relevant to them, a request is made to them to please complete the company profile section of the questionnaire and to return the incomplete questionnaire, stating their reasons for non-participation.

5. Progress

After 31 weeks in the field we have received 970 completed questionnaires (31% return rate). Of these, about 895 have so far been captured on the survey database. In previous innovation surveys in South Africa, the 1994 FRD/ISP innovation survey received 244 completed questionnaires (8.9% return rate) while the Innovation Survey for the year 2000 carried out jointly by the Universities of Pretoria and Eindhoven received 617 completed questionnaires (8.4% response rate). CeSTII was advised by Statistics South Africa to choose a sample size that was manageable and feasible in order to provide the required response rates under the constraints of available human resources and finances. Given these constraints in CeSTII a sample of 3087 enterprises was specified in consultation with Statistics South Africa.

Of the 895 firms entered in the database, about 26% recorded intramural expenditure on R&D in 2004 (the majority of these enterprises spend less than R1 million on R&D) and a further 8% claim to have other classes of innovation expenditure. There could be a bias in these results since respondents that return completed questionnaires could be from the

more innovative enterprises. This emphasises the importance of aiming for a 70% response rate so that any sampling biases are controlled for. A non-response survey will now be carried out to check for any biases.

The confirmed existence of a “tail” comprising of many enterprises with small R&D budgets is an important finding for the R&D survey. Again, this finding emphasises the importance of obtaining an acceptable response rate so that the results of the innovation survey can be reliably extrapolated to the full target population. If this is achieved it will be possible to use the results obtained from the random sample of the innovation survey to provide an informed estimate of the amount of R&D that is not being covered in the purposive sample of the R&D Survey. However, some checks will need to be made to ensure that enterprises have not misunderstood the concept of R&D.

The CC has made approximately 3200 phone calls and \pm 1700 e-mails have been dispatched.

6. Future

The survey will stay in the field until early April May 2006 but it appears that we will be unable to achieve our ideal target response rate of 70%. Thus a non-response survey will be necessary in April/May. We aim to provide DST with a preliminary quantitative report by June/July 2006. The final results will first be submitted to StatsSA for approval and assistance with final imputations and extrapolations. Survey work might still have to be finalised after the initial report in order to improve data quality and accuracy for international comparisons. Decisions in this regard will need to be taken in consultation with DST. Once the final report is approved by DST the key high-level results will be released to the public through a news release and a press conference addressed by the Minister of S&T. Simultaneously, the thank you process and distribution of results to all survey participants will commence. Following this, a book containing the full report and comparisons with other countries is to be published by the HSRC on behalf of DST and NACI.