

## PROMOTING STATISTICAL LITERACY: A SOUTH AFRICAN PERSPECTIVE

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*South African society emerges from a political legacy that strove to create a dysfunctional society by implementing an official policy of racial discrimination, the effects of which can be observed in education, wealth distribution, employment, and settlement patterns amongst others. Therefore the challenge of statistical literacy is not only improving levels of competency in economics, science and technology, but also to address basic literacy and numeracy. An impressive budget allocation to education in recent times has helped primary education, but less for senior school where drop-out rates are high. An even much bigger challenge is adult illiteracy. In his address to the nation, the President emphasised the need for economic literacy in South Africa. The basic ingredient for this is statistical literacy; thus enhancing knowledge of mathematics and statistics can begin to address deficiencies in economic literacy. While there are programs for training statisticians, this paper confines itself largely to the broad based statistics awareness raising programmes.*

### DEFINING LITERACY

First, let us attempt to define what economic literacy means- it is the ability of individuals and or society to acknowledge, understand, and engage their material life circumstances like the economy; and subsequently, take a coherent set of strategic and operational steps aimed at addressing their situation. Such could be observed in progress or lack of it on levels of investment and spending. Second, statistical literacy is the ability of individuals and or society to read and understand quantitative information such as indices and indicators. The combined thrust of these literacies enables individuals and societies to act both at the economic and political fronts through social discourse. Economic literacy is predicated upon, and intricately intertwined with, statistical literacy. Literacy in this context represents a continuum from the very rudimentary to the most complex levels of comprehension of concepts, the latter being privy largely to the elite of society. It is also the ability of individuals and society to understand facts and numbers and relate them to tangible losses or benefits in their life circumstances, currently and or prospectively.

### GLOBALISATION AND THE INFORMATION SOCIETY

Information has caused the world to be a global village where the exchange of ideas and resources move rapidly between and amongst areas. Information and communications technology (ICT), have been the main enablers of globalisation. In the trail of this exchange are perceived benefits and losses, and either outcome is predicated on the extent and depth of participation by the players in this exchange. In societies where levels of participation in the exchange are high, the advent of globalisation and informatisation can be mutually reinforcing. However, in those where the levels of participation are low, those left out suffer the negative consequences of globalisation. The marginalisation is activated at two levels. One level is the inability of individuals and society to use the technology and the other resides in not understanding and failure to manage the content of economics and/or statistics. In advanced parts of the world the negative effects of marginalisation are also felt. For instance, the elderly in Korea and Japan already feel the effects of being technologically illiterate. This illiteracy has largely to do with inability to use technology rather than understanding of the content of information. In this instance the challenge is to demystify the technology and make it an enabler for the benefit of society. In the third world, the problem is not only the inability to use the technology but the sheer lack of availability. Furthermore the remote possibilities of connectivity make difficulties even when some of the basic hardware and software components exist.

The means and possibly content of social discourse have largely been influenced by ICT, and those who lack the management capabilities to apply ICT are marginalised. Worse still, those who

lack the ability to collate and understand information are worse off in the global race for development. This paper will focus on the situation in South Africa and the nature of its challenges.

#### LOCATION OF STATISTICS AND STATISTICAL DEVELOPMENT IN SOUTH AFRICA

South Africa is amongst the few countries on the continent with a long history of statistical practice, which dates back to 1904. The importance of statistics and particularly as a public good is captured in the following way as relates to the establishment of a Council. “The object of the advisory agency, (*Council*), of the Census Office was to ensure that the various statistical operations were conducted in the best interests of the ‘public’ and that they serve practical purposes and are not merely of an academic nature.” (Statistics Act, 1914) Despite these good intentions, the practice has been largely influenced by the political systems and exhibited a process of systematic discrimination over time and undermined the notion of statistics as a public good. Under the foregoing set of circumstances, the promotion of statistical literacy became a pipe dream. It was only in the post apartheid era that statistics in South Africa received attention to become a public good.

In urging South Africa towards being one nation, President Mbeki (1998), noted to parliamentarians “We are not one nation, but two nations, and neither are we becoming one nation.” This summarises the net effect of systematic discrimination of the South African society in the last 300 years of colonial domination, 46 of which were attributed to years of apartheid rule. Where then does statistics feature?

#### THE ROLE OF THE CSS IN THE APARTHEID ERA

The Central Statistical Service (CSS), now Statistics South Africa, under apartheid rule wielded the monopoly of official statistics with very limited public participation. Consequently issues of social relevance, accessibility of products and the place of disadvantaged members of society occupied very low priority on their agenda. Orkin et al (1998) noted “As change began to unfold, serious conflicts arose from divergence between new user needs and CSS products, with negative implications for the system of official statistics.” The then CSS had statistical areas that excluded the homeland areas and, as was noted at the Millennium Conference of Commonwealth Statisticians in Botswana in 2000 “the undemocratic laws espoused by apartheid prevailed such that they fundamentally influenced the way in which society functioned and by extension, this practice influenced the way in which society was measured and assigned worth through the statistics system. Social and public policy of the time deliberately or otherwise, informed how official statistics were to be collected, interpreted and disseminated”. Seventy-eight non-contiguous geographic units were identified for the system and these excluded the so-called homeland populations.

A consequence of apartheid rule was manifested in discontinuities in transactions across society, in services, space and time. Over time, society so divided along race lines on the one hand, created a majority component that lived in conditions corresponding to the era of the turn of the twentieth century while on the other, the other component, consisting of a minority enjoyed the benefits of the 21<sup>st</sup> century. Geographically these components continued to be distributed in ways that would entrench this uneven development. Consequently the services provided and their quality, content, level and access were so uneven that their impact only helped to reinforce discriminatory practice and differential outcomes across society. The national statistics function was equally balkanised and replicated the forms of advantage and disadvantage observed elsewhere in society. “In assiduous conformity with the legal fiction of “independent states”... *the CSS* saw its task as catering for the population of the remaining “White” South Africa. Yet, because of the “non-independent homelands” within its borders, this area in reality was very heterogeneous – indeed, the majority of its population was African.”(Orkin et al., 1998)

#### CHALLENGES OF THE NEW ERA

The task of the new era has been to dismantle these statistical discontinuities and attempt to create a series that joins themes against time and space. The main aim is to institute a statistics system

that would provide for dialogue and foster interactions amongst all players namely, suppliers, users and producers of statistical information. To achieve this goal, management, in preparing for the 1996 Census noted the following. That “the contribution of a statistical agency is not only realised in direct relation to users, but also in indirect relationship with organisations of civil society such as schools and churches, that represent the citizens who ultimately benefit from the application of data in planning.”(Orkin et al., 1998)

The collection and compilation of statistics for decision making in South Africa increased dramatically in the post apartheid era. This trend was mainly influenced by the planning requirements of the Reconstruction and Development Program (RDP). One of the key exercises in this regard was the population census of 1996. Being aware that the support of prospective beneficiaries has to be solicited early during the preparations for Census '96, the largest five church groupings were asked to distribute publicity materials amongst members of their congregations. Four million comics were produced for primary schools across all eleven languages to promote participation in the census. While this effort was not deliberately aimed at promoting statistical literacy, its consequences in retrospect raised awareness in statistics amongst pupils.

The implementation of Census '96 was applauded as the most open in the history of census taking in South Africa and allowed for public input and participation. This included the provision of the questionnaire in all eleven languages. The census products have been made available through a popular pocket-size report to schools and libraries across the country. A new easy to use multi-dimension electronic census product has been made available for users and the uptake has been impressive particularly amongst government departments and business although a lot more could still be achieved. Council also became more representative, with people other than Whites being on Council for the first time. During this period the main activity of Council was to look into census activities and this mandate has been extended in the recent past to raise awareness amongst users.

#### INITIATING AND SUPPORTING STATISTICAL LITERACY PROGRAMMES

The thrust for supporting statistical literacy resides mainly in how well the users of information have been prepared to receive it, how the products are packaged and disseminated and how users are supported and kept informed of prospective developments. Compared to previous years, the uptake for census data has been unprecedented. This has been largely because of the demonstrable functionality that comes with the software used for dissemination. Secondly, there was an enormous dissemination drive that accompanied Census '96 using electronic products, and finally the demand for information itself by the vast number of users and the new government as it attempts to address issues of development brought on board new clients on the user list.

A comparison with Census '91 may illustrate the point. For Census '91 about ten copies of the total data set were sold, of which five were to private companies and the rest were shared amongst universities and parastatal entities. Two private institutions and one university could not use the data because of the size of the data and the difficulty with which one would have had to handle any statistical analysis on the data. There is no record suggesting that any of the government institutions actually acquired the census data then.

In 1998, when Census '96 results were issued, Stats SA offices received 3641 visitors and over 500 presentations were made by staff members on census results. In the same year 56183 telephonic enquiries were received and serviced. From August 1996 to October 1998 Stats SA's Website had 87087 visitors, an average of 3110 visitors per month. To ensure that the users could manipulate the data, Statistics South Africa embarked on a campaign to train users during software installation; distributed over 10,000 free *Census in Brief* booklets to individuals and libraries across the country; and also provided 2000 summary reports and 500 methodological reports.

#### CHALLENGES FOR 2001 CENSUS

Enhancing literacy in statistics, and therefore in social debate, can be achieved through an effective programme of dissemination of information to individuals in part through intermediaries.

This should be true for both those who are literate and illiterate. For example, we could apply our minds to the school and local government systems as agents that disseminate to individuals on a grand scale. Furthermore we could also look at Adult Basic Education Training, (ABET), as a means of promoting dissemination and engender understanding of information to the less literate of society. Schools could conceivably be targeted through having census results incorporated in the geography or social studies syllabi or in as many subjects as could be deemed relevant for teaching and or learning. As far as local government is concerned, as an avenue for dissemination, one can surmise that this would be in terms of application of the information at the level of policy outputs, such as houses built, clinics provided and schools supplied to the public.

#### CENSUS@SCHOOL AND INCORPORATING IT WITH CURRICULUM 2005

As part of the strategy for Census 2001, Stats SA launched an ambitious programme with schools. This had two aims: creating awareness for the census with the school system and promoting literacy on the way data are collected, analysed and applied. The Census@School project, devised by the Royal Statistical Society Centre for Statistical Education, UK, was brought to the attention of Stats SA in 2001, and it wanted to use it to develop a generation of South Africans to whom a census would be part of life. By so doing this generation would form the base for a statistical literate society. This is in line with the President's aim of improving economical literacy through a strong basic statistical foundation to all members of the South African society. The project follows Curriculum 2005 outcomes-based guidelines. Stats SA collaborated with the Department of Education to develop and distribute curriculum-based material to all schools taking part in the project. It is based on an educational model, which fosters learning through fun activities, hence the mixed bag of serious and light-hearted questions.

The aim is to introduce children in the complete statistical cycle of data collection, collation, organisation, presentation, analysis and evaluation. To date they have taken part in the collection and collation of the information. Data processing is handled by Stats SA and the tables in hardcopy or electronically will be presented to the schools for organisation, presentation, analysis and evaluation. This we believe will improve their understanding of the need to carefully plan and carry out the collection of data in order to be able to draw valid conclusions and subsequently to make evidence-based decisions. An interesting inset in the programme was when one of the children noted that before the Census@School project took place she did not know how tall she was.

A resource pack will be delivered to all participating schools this year. Teachers will receive guidelines for the use of the data in the context of relevant curriculum 2005 learning areas such as mathematics, geography, history, science, etc. The teachers will have carefully designed worksheets and other material to enhance their teaching of data handling. The material will also encourage improved computer skills for both teachers and learners. One of the major challenges would be to fast-track the development of the statistical literacy of teachers.

#### CENSUS@SCHOOL IN OTHER COUNTRIES

The first Census@School was conducted in the United Kingdom in 2000, in the run up to their national population census. The model has subsequently been adopted by, amongst others, Queensland (Australia), Italy and Norway. The UK project was conducted chiefly over the Internet, encouraging more effective computer technology skills and the use of the Internet for educational purposes. South Africa's Census@School differs from the UK's in that it is more survey-based and more schools were included. Australia took advantage of the popularity of the UK Census@School and implemented it as part of the publicity around the 2001 Australian census. South Australia and Northern Territory will take part in 2002.

#### THE QUESTIONS AND THE PILOT RESULTS

The project targets learners between Grades 3 and 12, and aims to gather basic information about South Africa's school children. There are two versions of the questionnaire, one for learners in

Grade 3 – 7 and one for learners in Grades 8 – 12. The questionnaire asks interesting yet simple questions about learners, their households and school life. Some are similar to the type of questions that will be asked in Census 2001, while others directly relate to learners and their interests.

The questions ask about gender, age, grade, birthplace, height, footsize and favourite sport, as well as more serious questions such as facilities and amenities at home, type of housing unit, mode of transport, and how far from the school the learner lives. A pilot Census@School was conducted in July 2001 across 277 schools countrywide in which 43,500 children from grades 3 to 12 participated. This pilot was conducted to test aspects such as the usefulness of the questionnaire and the teaching aids required for implementing the project. All the required questionnaires and aids were delivered to the schools. Teachers were advised to assist learners to complete their questionnaires, especially among the lower grades. Amongst other things, the pilot results show that:

- 48% of the sample were boys and 52% were girls
- Their ages ranged from 6 to 27 years
- 8% of children take an hour or more to reach school every day
- 33% of children take between ten and twenty minutes to reach school everyday
- The ratio of boys to girls decreases as grade increases
- 95% of learners had brown eyes
- 3% had blue eyes and 2% had green eyes

Finance Minister Trevor Manuel and Education Minister Kader Asmal, launched Stats SA's Census@School programme at four schools in the Western Cape on the 18 September 2001. Both ministers expressed their enthusiasm and support of the project, giving South Africa's Census@School national exposure.

#### GIS/SPATIAL COMPONENT FOR CENSUS@SCHOOL RESULTS

Adding a GIS/Spatial data component to the Census@School data is currently being considered and access to Census@School data will cater for all types of schools. Schools without internet access or computers will have hard copy data, while schools with computers but without internet access will have the data via CD Rom. The data that is accessed via the Webb or CD Rom could contain the latest inclusion of active/interactive live tables, graphs and maps that would form the basis of any type of querying or activity. The data system will also allow for time series as well as overlays from other information sources. To capture the imagination of children a GIS platform would be used and in the process would strengthen the project and facilitate: (1) Getting "buy-in" from the corporate market; and (2) Will it more likely attract corporate funding. In widening the scope of Census@School, this project could play a fundamental role in creating statistical awareness, developing statistical literacy and ensuring buy-in from both government departments and the corporate world.

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**Appendix A**  
**A Framework of using Census@School as a tool towards statistical capacity building.**

