# Making data count

*A collection of good practices in using statistics for policymaking*

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# Foreword

For data producers, seeing their work transformed into policy is no longer simply the icing on the cake of a job well done. Producing statistics that are then used by decision makers, as well as the public, is the end goal, the whole purpose of the work - or at least it should be.

There has been a focusin recent years on strengthening national capacity to use statistics to inform broad social and economic policymaking, including the achievement of the Millennium Development Goals (MDGs). Many of these activities address either the 'upstream' issues of data collection, or 'downstream' issues of dissemination, access, analysis, communication and interpretation.

In Asia and the Pacific, meeting the demand for statistics in policy analysis and advocacy, remains a challenge. While it is necessary to focus on weak areas and tackle problems, it is also important to identify and reflect on what is or has worked in the region. Focusing on good practices gives national statistical systems (NSSs) the opportunity to celebrate their many achievements. Showcasing successes allows others facing similar challenges to see possible strategies and what might be replicated.

The NSSs in Asia and the Pacific, and the political, economic and social contexts in which they operate, are diverse. These differences provide an ideal opportunity for mutual learning and sharing experience.

This publication showcases best practices in using official statistics to influence policy by detailing examples from across Asia and the Pacific.

The process of transforming statistical information into decision-making is a complex one and subject to many factors external to statistical evidence. The chosen case studies vary in scope and implementation, from data analysis to improving data sharing methods.

We hope this publication is a means of inspiration and motivation. The framework for assessing and documenting experiences is a guide to showcasing our achievements. We hope it leads to sharing of more experiences and thus help all NSS's improve the quality of their work.

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# Acknowledgements

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# Introduction

This publication presents good practices in enhancing the use of official statistics in policy and decision-making. It is divided into the following parts.

## Part I: Setting the tone

Comprising two papers, Part I gives a valuable background to the presentation of good practices.

The effective use of statistical data is essential for informed decision-making. However, much remains to be doneto improve the availability and use of relevant statistical information. One way to strengthen capacity is to focus and expand on successes in the region by sharing good practices.

The first paper provides a framework for identifying and documenting good practices in using statistics.

The second provides a valuable overview of evidence-based policymaking. Having the evidence is not by itself sufficient to bring about change. It requires institutional frameworks that encourage disseminate and defend good evaluation, and that make the most of opportunities to learn.

## Collection of good practices

The remainder of the publication presents twelve case studies, contributed by countries and one international organization.

The studies are grouped under three themes:

> Part II: Improving the relevance of statistics
> Part III: Bringing statistics closer to users
> Part IV: Using statistics to inform decision making

Each case study focuses on different aspects of improving data availability and use. They outline the demand for data and how the needs were met either through new collections or making better use of existing data.

The good practices highlight both the successes and the challenges, providing useful examples that can inspire others.

A short summary of each case study is below.

## Part II: Improving the relevance of statistics

Relevance is a primary dimension of data quality. For statistics to be useful in policymaking, they have to be relevant to the data users' needs.

Case studies from Australia, Bangladesh, India and Nepal highlight different approaches to improving the relevance of official statistics.

### The On Track student destinations monitoring project: The Collection and use of statistical data on student transition outcomes in Victoria (Australia)

Victoria is one of eight States and Territories in Australia. A major issue facing state education authorities is to ensure that all young school leaverseither undertake further study or training, or obtain a job. In 2003, the Department of Education and Training adopted a survey data tool intended to monitor the destinations of all schoolleavers (the survey is known as the *On Track* survey). The survey was designed to capture the destinations of different groups of young people (e.g., indigenous, low supplemental education services (SES)).

Several valuable outcomes have been achieved as a result of this annual survey:

- every secondary school in the state receives a report on the destinations of its exiting students along with comparative tables. This enables each school to examine patterns of post-school employment and further study or training and to identify any weaknesses in transition. As a result, planning of school programs has been significantly enhanced.

- authorities at a central, regional and local level each have detailed 'maps'that enable them to examine what happens to particular sub-groups across the state or across a region or local area.

- each student leaving school whose employment or education destination is problematic is offered personalized career counselling in order to assist them to find work or an appropriate education or training opportunity.

### How to fix a census: Lessons learned from Bangladesh

Population censuses are a key data source for Bangladesh, one of the poorest and fastest growing countries in the world. Significant challenges were identified in the 2001 census, with data quality and timeliness issues causing major problems. A decade later, the government set out to learn from the lessons and improve on the experience of 2001.

The case study details how each of the issues from the 2001 census were dealt with in the planning for the 2011 census. It concludes that the overall census procedure was significantly improved and the efforts led to greater accuracy and timeliness.

## Improving agricultural statistics to support food security in India

This case study from India demonstrates how agricultural statistics can be more effective with the introduction of new tools and techniques, such as remote sensing and Geographic Information Systems (GIS).

Remote sensing applications can help in crucial policy decisions, especially in a food security context. India has a variety of remote sensing-enabled products and services, which have formed the basis to enhance the information base in agriculture and to facilitate well-informed decision-making processes.

Remote sensing and GIS address some of the critical inadequacies in traditional agriculture statistical systems. New technologiesand methods better capture the dynamics and vulnerability of agricultural systems, and thus provide information which is critical for decision-making at various levels.

The systems have yielded tangible benefits. Improved statisticshas the potential to mitigate future losses if information is made available in a way that encourages government, private individuals and businesses to act on the information. This is exactly what has been demonstrated in a variety of agriculture related remote sensing applications in India.


## Surveying a hidden population: Uncovering hard drug use in Nepal

Like many other countries, drug control has become a serious challenge for the Government of Nepal. Due to changes in drug taking, a lack of reliable statistics on the population size and characteristics of hard drug users was an obstacle to formulating effective policies and programs.

Based on the need for better data, Nepal's Central Bureau of Statistics (CBS) successfully developed and conducted a survey, for the first time, on hard drug users in 2006.

The outcome of the survey was twofold. It benchmarked the total number of hard drug users in the country for the first time and also revealed characteristics ofdrug users. The survey also provided an ideal opportunity to train and increase in-house technical capacity within the Nepalese statistics office.

# Part III: Bringing Statistics Closer to Users

Disseminating and communicating statistics in a way that can be accessed and understood with ease is essential to improving data use. Regardless of which technologies are employed, there are common principles to bring statistics closer to users. These include developing statistical products that appeal to different user needs.

This sectionpresents case studies from Maldives, Mongolia, Philippines and Vanuatu.

## Improving an age-old practice: Statistical yearbook of Maldives

Most countries produce statistical yearbooks. Before the introduction of the *Statistical Yearbook of Maldives* in 1980, there was no single source for official statistics in the country for policy makers, international agencies and the general public.

This case study describes how the yearbook has evolved over recent years to be the most important and widely used publication of the Maldives Department of National Planning.

## An app for that: Visualizing NSO Data on handheld devices (Mongolia)

Historically, the Mongolian National Statistics Office has met the demand for statistical services through its yearbook, published annually for 51 years. After a user satisfaction survey revealed that only 46 percent were happy with the statistical servicesavailable to them, the NSO reviewed its approach and commissioned an iOS system-based (iPhone or iPad) application called EzStat.

The 'app' provides information by themein the format that suits their needs. In the months after the first launch of the EzStat application, 4,000 people – a quarter of iPhone and iPad owners in Mongolia – have downloaded the application and those numbers are still increasing.

## Localizing the Millennium Development Goals: The Community-Based Monitoring System (Philippines)

The Government of Philippines is committed to the Millennium Development Goals (MDGs), which aim to alleviate poverty and deprivation by 2015. Achievement of the goals is mostly devolved to local government units (LGUs). This case study describes how mainstreaming the MDGs in the local development planning agenda and gathering data through communities is helping to make progress.

The Community-based Monitoring System (CBMS) provides an information base for policymakers and program implementers to monitor the impact of economic reforms or policy shocks on vulnerable groups. It is well-positioned to track progress of the MDGs at the local level.

Through the adoption and implementation of the CBMS, it is now possible to produce Provincial MDG Reports. This case study gives examples of how these reports have assisted in the application of evidenced-based policy making, particularly in identifying priority programs and projects to reach their MDG targets.

## Data and privacy: Increasing access to information for research and policy development in Vanuatu

Access to data in the Republic of Vanuatu can be a problem. Although the small population size and nature of the people makes data collection at the local level possible, it has created a privacy concern.

Data is most useful at the provincial level and this is what researchers and policy makers need. However, lawsrestrict information sharing and this has meant data has often remained unused. An agreement stating to keep information private was required to allow the VNSO to share their research. The regulations created an overwhelming amount of paperwork for the statistics office and resulted in a backlog of requests too large for the available staff to manage.

This case study shows how this problem was solved by creating a new mechanism and provides examples of its use. The 'Data Access Agreement' provides approved personnel with access to the VNSO unit record data, but still safeguards privacy.

The mechanism has increased data access for research and policy development – within both the public and private sectors. It has also helped develop partner investment in training and technical assistance for data collection, processing and analysis with resource transfers often associated with data access.

# Part IV: Using statistics to inform policymaking

Finally, this section on using statistics to inform decision making provides examples of how data can be applied to guide and monitor sustainable development policies.

This section includes case studies from Bhutan, Mongolia, New Zealand and United Nations Educational, Scientific and Cultural Organization (UNESCO).

## Mapping poverty: A road to effective intervention (Bhutan)

While the Bhutanese standard of living has improved with increased income, there was no way of measuring the impact on poverty levels in the country due to a scarcity of data. This made it difficult for the government to monitor its development priorities with regard to alleviating poverty.

The *Bhutan Living Standard Survey* in 2003, and 2007 indicated that about a quarter of the population lived below the poverty line and that it was largely a rural phenomenon, accounting for more than 98 percent of all those considered poor.

However, policymakers and planners needed to know the locations or areas where poverty existed, as well as their causes, in order to bring about effective and focused interventions.

The growing demand for more disaggregated data coupled with the country's focus on alleviating rural poverty, led the National Statistics Bureau, with technical assistance from the World Bank, to initiate a process of poverty mapping using a Small Area Estimation (SAE) technique.
The results of the SAE were widely debated, particularly among parliamentarians who were interested in the situation of their constituencies. Grants were decided based on the results of the findings. A main criteria was the level and extent of poverty (others included area size of the district and population for the allocation of resources).

## The development and implementation of the Mongolia in World Competitiveness report

Mongolia identified a growing need for more detailed and coordinated statistical information to benchmark progress both nationally and internationally.

As a result, they established an independent, research-focused organization to address the many issues associated with national competitiveness: the Economic Policy and Competitiveness Research Center (EPCRC).

The case study outlines the processes followed to prepare a report whichpinpointed Mongolia's weakest areas of competitiveness. The report answered many unknown questions, and generated awareness and discussion about Mongolia's strengths and weaknesses. It has inspired national debate among policy makers, the private sector and the public.

## New Zealand: The use of data to improve energy efficiency

To promote energy efficiency, the New Zealand government has carried out a set of energy efficiency programs that provide funding, incentives and knowledge to help the public and private sector to improve their energy efficiency.

The energy saving programmes were designed to target the areas that have the most savings potential. This case study illustrates how the use of data has contributed to producing robust estimates of energy savings potential, which shaped the design of energy saving programs.

Since the implementation of the strategy, New Zealand has achieved substantial energy savings in the residential sector. The awareness of energy efficiency among New Zealand citizens has also risen.

## Going for goals: Supporting Countries to measure their progress using the Asia-Pacific Education for All Mid-Decade Assessment and Mid-Term Policy Review (UNESCO)

This case study differs from the others in that it looks at the experiences of an international agency and is not based on the experiences of an individual country.

It focuses on the mid-term review of the *Education for All* (EFA) initiative that had commenced in 1990. Global assessments of EFA achievements were undertaken in 1996 and 2000. These assessments were largely donor-led without much country ownership and did not translate to the institutionalization of EFA monitoring and assessment. Lessons from these assessments showed that monitoring undertaken and led by national governments, involving education partners and other EFA stakeholders, is more likely to have an enduring impact.

Countries in the Asia-Pacific region are at varying stages in their development of both education and statistical systems. Most countries in the region have detailed data on how many children of different ages are in school, but these indicators are not always used to strengthen and monitor education policy. The lack of data on population sub-groups makes it even more difficult to implement targeted policies and programs to ensure their inclusion.

The Mid-Decade Assessment and Mid-Term Policy Review (MDA-MTR) was a major strategic program conducted over a number of years to support countries in the Asia-Pacific region in producing their own reviews of EFA progress. It aimed to enhance in-country capacities to carry out a nationally-led comprehensive assessment of EFA and institutionalize EFA monitoring.

The MDA-MTR is a clear example of how a statistical capacity building process influenced education policies in countries. Countries used the strategic recommendations of UNESCO and UNICEF to create a national MDA-MTR process to strengthen their political commitment to monitoring progress. This strengthening in commitment supported and increased demand for the statistical data.

# Part I:Setting the Tone

Promoting good practices: ensuring relevance and effectiveness

*Yanhong Zhang*

Use of statistical data for policy analysis and advocacy: Some lessons learned and suggestions for action

*Carla Abou Zahr*

# Promoting good practices: ensuring relevance and effectiveness

*Yanhong Zhang*

## Introduction

Effective use of statistics is essential for informed decision-making and achieving inclusive and sustainable development. The importance of statistics has been heightened by international initiatives,such as the Millennium Declaration and associated development goals (MDGs), which include concrete indicators to monitor progress.[1]

Despite numerous efforts, much remains to be done in Asia and the Pacific to strengthen the capacity of governments touse statistical data for policy analysis and advocacy (ESCAP Committee on Statistics, 2010). While it is necessary to focus on weak areas and tackle problems, it is also important to identify and reflect on the methods that have worked and expand on such successes.

Just as their counterparts in relatively developed countries, national statistical systems in developing Asia and the Pacific have carried out their functions in compiling, analyzing and publishing official statistics. They have made a significant contribution to meeting the needs for statistical data and information on national social and economic development. In doing so, they have demonstrated resilience, even where statistical capacity is relatively weak.

Focusing on successes has several benefits. First, it gives national statistical systems the opportunity to celebrate achievements and encourages a sense of ownership, of not only problems, but also solutions. Showcasing successes helps build confidence in their ability and further tap into their potential. Looking for and relying on internal strengths, rather than external sources of assistance, is believed to be essential for sustainable capacity development (USAID 2004).

Second, identifying what has worked will not only help national statistical systems consolidate achievements, but also assist in finding solutions to other challenges. Only after the reasonsfor success are identified and the pathways of achievement are analyzed, is it possible to draw lessons that are useful in tackling other challenges. This does not necessarily mean that solutions to previous problems can be directly replicated to address new issues. However, a clear understanding of the processes of the successful solution, the context in which they were applied and the specific outcomes they led to, can shed light on the search for answers to different problems.

By sharing successful experiences, individuals in one part of the national statistical systems can inspire and help counterparts elsewhere in the system. Similarly, successful experiences from one country can inspire and help others in tackling their challenges. Again, this does not mean that one can always exactly replicate a solution that has worked in a different organizational or national context, despite the fact that many national statistical systems face common challenges. Nevertheless, seeing counterparts in other parts of the system or in another country succeed may inspire individuals and organizations to be self-reliant in finding solutions. This requires that the successful experiences be documented in a way that is complete and accessible.

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[1] Information on the MDG monitoring framework and the list of the official indicators is available at:
http://unstats.un.org/unsd/mdg/

Lastly, documentingsuccesses on the basis of careful reflection and analysis will lead to a knowledgebase of 'what works', or 'what has worked' in effectively using statistical data for policy analysis and advocacy. As demonstrated by Carla AbouZahr in this publication, there is a large body of literature on the complex relationship between statistical evidence and policymaking, as well as gaps and actions that can be taken to strengthen theconnection. However, there is limited information about how action has been taken in specific national and institutional contexts.

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### Improving data dissemination and access

While data availability is less than what is needed for policy debates and planning in many countries in Asia and the Pacific, there is data that could be better utilized if made available to interested researchers and analysts.

Despite technical guidelines and initiatives promoting the dissemination of data and microdata, analysts from government institutions as well as academia still lament the lack of opportunity to access data stored in government statistical offices and departments. Successful examples of 'unlocking' data would contribute to the understanding the issues involved.

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This paper outlines some of the main issues to be considered when identifying and documenting good practices in effective use of statistical data for policy analysis and advocacy. The aim is to promote self-learning and mutual learning as well as contributing to a knowledgebase of 'what works' in national statistical capacity development.

## Effective use of statistical data

When identifying what is important in terms of effective use of statistical data, it is useful to consider the policymaking process, the components of national capacity development as well as the process of statistical work. It is important to remember that if statistics are not used, then they are of no use, no matter how accurately or elegantly they have been collected.

Thus the number one priority is to look at statistical data from a user perspective. The potential demand will always be greater than the supply. The collection of statistics will always require consideration of competing demands and priorities. Also, it may not be possible to obtain some types of information for technical reasons. Other information may be constrained by cost reasons. This is often the case for small area data.

### The statistical capacity perspective

The ultimate goal of promoting good practices is to strengthen national capacity in the use of statistical data. Given this goal, it is necessary to be aware of what constitutes national capacity.

It is generally considered that national statistical capacity is the ability of a country to produce and disseminate data that meet the needs for policy and planning for social, economic and environmental development. Statistical capacity is determined by many factors, including the institutional and legal environment for collecting and disseminating data; the availability of resources; the relationships between data

producers and data users; the effectiveness of prioritization processes; technical skills and knowledge; and the use of accepted methodological standards (World Bank n.d.).

## The policymaking perspective

Understanding the policymaking process and the needs of policymakers and other stakeholders is essential for collecting, analysing and disseminating statistical data to make a difference. This is is useful for identifying priorities when considering examples of good practices. It is generally understood that statistical data can be used in the following ways: identifying problems or issues, informing the design and choice of policy, forecasting the future, monitoring policy implementation, and evaluating policy impact (World Health Organizationn.nd.; Scott 2005).

Many in policy studies accept a notion of the diffused nature of linkages between research and policy. Ideas that emerge from research gradually connect with decision-making by providing organizing frameworks within which policymakers are able to make sense of experience and interpret problems and priorities. According to this understanding, research findings influence the policymaking process by confirming what policymakers already know from their experiences, challenging existing knowledge and making decisions based on facts.

Research findings can also influence policymaking by generating clarifications of new concepts, giving hints about possible alternatives, stimulating innovative perspectives, and incrementally altering the language and issues discussed in policymaking circles. In addition, research enhances the environment in which policy reform takes place through several processes. That is, research provides a background of data, empirical generalizations, and ideas that affect the way policy makers think about problems. It influences their conceptualization of the issues with which they deal, affects those facets of the issue that they consider inevitable and unchangeable and those that they perceive as amenable to policy action, widens the range of options that they consider, and challenges some taken-for-granted assumptions about appropriate goals and activities(Weiss 1982).

This role of research in policymaking as described above can also be used to understand the role of statistical data in policymaking. After all statistical evidence is often constructed on the basis of analysis and research.

## Which practicesare considered 'good'?[2]

Good practices in increasing the use of statistics may emerge from a range of areas, such as:

- New data that provided crucial evidence for a program and/or policy
- Publication of statistical evidence that led to valuable debates and discussions
- New methods and procedures that led to wider use of statistical data
- Harmonization of data from different sources
- Increase analytic capacity of national statistical systems

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[2] The remainder of this paper is based on ESCAP/Statistics Division (2011) "Effective use of statistical data for policy analysis and advocacy: Framework for establishing a knowledge base" and outcomes of the workshop "Effective use of statistical data for policy analysis and advocacy in Asia and the Pacific: Building on success", 24-26 October 2011, Bangkok, Thailand. The author expresses gratitude to Jessica Gardner and Teerapong Praphotjanaporn for their input.

- Arrangements that led to increased availability of data for decision-making
- Ensuring adequate resources for statistical systems

Countries face common challenges in strengthening the link between statistical evidence and policymaking. However, the effectiveness of a particular approach is usually dependent on the institutional environment and broader social, economic and political context. A practice that is considered 'good' in one institutional context might not be in another.

A set of criteria has been proposed to guide efforts in identifying and documenting good practices. They are intended as a guide only - common sense should prevail in deciding whether a practice is good and worth sharing with others.

## Criteria for identifying good practices

### The practice caused a measurable change or impact

There must have been a measurable improvement to an existing process or procedure for using statistical data, or a successful solution to a problem regarding data use. It is not necessary that the policy or advocacy initiative resulting from the data use must have also caused a measurable change/impact.

### Data users and producers were both involved in the practice

It is expected that a practice can only be good if there has been some interaction between data producers and users.

### The practice is replicable, scalable and adaptable

The purpose of the knowledge base is for sharing of positive experiences and mutual learning. Thus it is essential to reflect on the conditions that contributed to the success and explain how the practice can be replicated, scaled up or down and adapted to suit other contexts.

### The practice adheres to the Fundamental Principles of Official Statistics

The practice should involve data produced and used in an ethical way. The ten Fundamental Principles of Official Statistics capture the ethics of official statistics and good practices must adhere to these principles.

The United Nations Statistical Commission adopted the Fundamental Principles in 1994. For more information: http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx.

### The practice objectives, processes involved and outcomes are clear

For a good practice to be understood and applied by others, the objectives, processes involved and outcomes must be clearly explained.

In addition, ideally a good practice will be innovative or demonstrate a new use of data; is sustainable over time; and is cost effective.

# Documenting good practices

Documents good practices are about the lessons learned, which can be used by the same institution to tackle new problems or by other institutions to solve problems in their own context. They should explain the process of applying the solution to successfully tackle the problem. They should also reflect the analysis of the problems, consideration of options and rationale for selection of the solution that resulted in the success.

Such documents are not just a chronicle of the events that occurred. Instead they are based on a careful analysis and reflection of the success as well as the limitations that the solution might have. Highlighting the specific conditions under which the success was achieved would not necessarily diminish its value. Rather, it might remind the reader of the particular challenges that the solution was aimed at, thus inspire the reader to think and search for his/her own solutions.

Documents of good practices are meant as a tool for the authoring individuals or institutions to share their successful experiences with counterparts elsewhere. Given this, it is necessary for such documents to include basic information about the practice. It is thus necessary to consider a common structure of such documents to ensure that essential information is included and it helps when reading and analyzing the content.

The following is a list of the components that a complete document of a good practice should contain:

### Problem statement

Describe the need for action or problem that is looking for solution through better use of data.

### Outcome achieved

Describe the change or impact that was achieved and how it was measured or assessed. This could be a new law or policy or a change in the perception/opinion of others as a result of the release of statistical data. It could also be concrete evidence of improved effectiveness/efficiency in meeting demands for information. Targets and indicators of achievements against a baseline where applicable should be provided.

### Details of the practice

This would include the objective of the practice, area covered (country / region), executing agency, implementing partners and actors involved, contact persons (name, agency, email), timeframe (start and end dates / time taken to complete), total cost and processes involved.

### Success factors

Analysis of the underlying factors that contributed to the selection of the solution that resulted in the success.

### *Challenges and solutions*

Explain the key challenges that were faced in establishing the practice and how these were overcome.

### *Recommendations for others*

Explain the minimum requirements and key recommendations for others attempting to replicate this practice.

### *Future plans and sustainability*

Outline the plans for sustaining the practice in the future, including financial and human resources where necessary.

### *Feedback from beneficiaries of the practice*

This would include the feedback provided by decision-makers as well as internal technical staff and external researchers.

## Conclusion

Identifying and documenting good practices is a powerful way to build on the achievements of national statistical systems. The aim is to encourage reflection and self-learning, promote mutual learning and stimulate active search for solutions to existing challenges. By sharing their successes and experiences, individuals and institutions will contribute to the establishment of a knowledgebase of how best to promote the effective use of statistical data.

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# Use of statistical data for policy analysis and advocacy: Some lessons learned and suggestions for action

*Carla Abou Zahr*

*'Statistics are the eyes of the policymaker'*[3]

*'Without good statistics, the development process is blind:*
*Policy makers cannot learn from their mistakes, and the public cannot hold them accountable'*[4]

*'There is nothing a government hates more than to be well-informed;for it makes the process of arriving at decisions much more complicated and difficult.'*[5]

## Introduction

The notion that the best available evidence should underpin policy decisions has a long history, though the term 'evidence-based policy making' is relatively recent (Nutley 2003). Today, evidence-based policy making is universally acknowledged as a goal to which all those with responsibilities in human and social development should strive. Experience shows, however, that basing policy development on evidence is not a simple and straightforward matter. The world of policy making is fluid and unpredictable, subject to competing vested and political interests, and often driven by pressure to act quickly to solve headline-grabbing problems (Briggs 2010). There is no linear path from data to evidence to policy. Instead, it is an iterative process in which policy outcomes are driven by unexpected political opportunity and stymied by political intransigence and risk aversion (Shergold 2011).

This paper examines how to ensure that policies are driven by evidence, identifying common barriers encountered and ways they can be overcome. It outlines different approaches to generating evidence and discusses how segmentation between different types of policy makers influences their receptiveness to information. The paper also discusses the role of statistical systems within the overall body of 'evidence' and suggests how to better position statistics as central to evidence-based policy making. The paper concludes with a framework for action to support increased use of evidence in the policymaking process. The Annex presents some questions to stimulate a discussion on barriers to evidence use, the quality of evidence, and ways of institutionalising evidence-based policy making.

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[3] Keith Muhakanizi, Director of Economic Affairs, Uganda quoted in United Kingdom Department for International Development (DFID) Statistics matter: Eliminating world poverty
[4] World Bank 2000, *World Development Indicators*, Washington DC.
[5] John Maynard Keynes, *The Times* (March 11, 1937); Collected Writings, vol. 21, p. 409

# What is evidence-based policy?

Evidence-based policy has been defined as an approach which "helps people make well-informed decisions about policies, programs and projects by putting the best available evidence at the heart of policy development and implementation" (Davies 1999). This definition is similar to that of the UN in the MDG guide which states, "Evidence-based policy making refers to a policy process that helps planners make better-informed decisions by putting the best available evidence at the center of the policy process".

Evidence-based policy making is an extension of the concept of evidence-based medicine to other aspects of socio-economic development (Cochrane 1972). In the health area, a defining feature of the evidence-based approach is the use of scientifically rigorous studies and statistical analyzes, such as randomized controlled trials (RCTs), to identify interventions and practices capable of improving policy-relevant outcomes (Chalmers 1995).The inextricable links between statistics, evidence and policy were highlighted by Adrian Smith, a former President of the United Kingdom's Royal Statistics Society (RSS), who used his 1996 presidential address to call for the extension of evidence-based approaches from medical practice to the broad process of policy making.

The use of strong evidence can make a difference to policy making in at least five ways (World Health Organization *Evidence-Informed Policy Network*):

- **Achieve recognition of a policy issue**: This occurs when data and evidence throw light upon hidden or newly emerging social or economic issues. Once the information is revealed, groups such as civil servants, non-government organizations, development agencies or the media, advocate and lobby for a new policy issue to be recognized and addressed.

- **Inform the design and choice of policy**: Once a policy issue has been identified, the next step is to analyze it, so that the dimensions, nature and impact of the problem can be understood. This understanding, which relies heavily on the application of statistical methods, provides the basis for subsequent policy recommendations.

- **Forecast the future**: Forecasting future scenarios is important in order to draw attention to the possible impacts of current trends on existing policies and programs. Forecasting can also allow an assessment of whether policy goals and targets are likely to be met.

- **Monitor policy implementation**: Once policies are being executed, information is required by policymakers to monitor the expected results associated with the policies. Careful monitoring can reveal when key indicators are going off-track, which prompts further analysis potentially leading to a change of policy.

- **Evaluate policy impact**: Advanced statistical methodologies are usually needed to evaluate the impact of policies, including their unintended effects. Incorporating an explicit mechanism for evaluating policy impact from the beginning, at the design phase of policy development, is key to enabling a good evaluation to be carried out.

When the evidence base is weak or equivocal, policy makers will tend to fall back on intuition, ideology or conventional wisdom or be driven by the interests of lobby groups. It has been said that "most policies are experiments"(Banks 2009a).

However, policies insufficiently founded on a strong evidence base can go seriously astray and are likely to stumble when faced with the challenges of bringing about change in complex and multi-layered societies and systems.

## What counts as evidence?

There is an ongoing debate about the methods and instruments that are considered critical for the collection of relevant evidence. Some researchers – especially in the health arena – argue that the highest quality of evidence is derived using quantitative evaluation, meta-analyzes of existing research or randomised, controlled trials (RCTs) (Chalmers 2003). Others maintain that some areas of knowledge are not well served by quantitative research (Hammersley 2005). Openness to different forms of evidence and different analytical methodologies does not necessarily mean lowering the standard of evidence for policy. Rather it means that different methods have to be used for different types of evidence.

In practice, the most rigorous evaluation tends to be applied to narrowly defined interventions, because they are analytically more tractable, and politically less contentious than actions that target broader socio-economic challenges. Some argue that the effect of a focus on randomized controlled trials as the source of evidence has led development researchers to 'lower their ambitions' because RCTs are infeasible for many of the big questions in development, such as the economy-wide effects of good institutions or good macroeconomic policies (Easterly 2009).

A broader view of evidence-based policy brings together statistics, analytical skills and political support (Banks 2009b). In this view, evidence-based policy making is a process that transparently uses rigorous and tested evidence in the design, implementation and refinement of policy to meet designated policy objectives. This definition stresses three characteristics (Productivity Commission 2010):

- Evidence should be broad, tested, rigorous and ideally capable of replication;

- Evidence should be robust and avoid common methodological pitfalls; and

- The entire process should be transparent and contestable.

The knowledge base for evidence-based policy making is, therefore, diverse. Systematic research, often, but not solely undertaken by academic institutions, generates *scientific* knowledge. But in addition to science, other types of knowledge and expertise are needed. The *professional* knowledge of service delivery practitioners and program managers is vital, especially when it comes to evidence related to feasibility. They have crucial experience in service delivery roles and field experience in implementing and monitoring services across systems such as social care, education and health. They wrestle with everyday problems of effectiveness and implementation, and develop practical understandings of what works (and under what conditions), and sometimes improvise to meet local challenges. Alongside the scientific and professional knowledge, *political* knowledge about strategies, tactics and agenda setting can contribute to the evidence base. In addition to the above *institutional* sources of expertise, the experiential knowledge of *service users* and stakeholders is vital for 'client-focused' service delivery. Ordinary citizens may have different perspectives from those of service providers and program designers (Head 2010).

Thus, evidence-based policy making is not just about what works, but also how things work, their broader ramifications, costs, beneficiaries, losers, and unintended effects.

An array of disciplines, evidence and research methods can be used (Figure 1) including:

- Quantitative evidence and statistics

- Qualitative evidence such as observational studies

- Systematic reviews, meta-analyses

- Quasi experimental studies

- Descriptive evidence, expert opinion and experiential studies.

Evidence-based approaches cannot, of course, guarantee perfect policy. Evidence can be difficult and time-consuming to obtain, and can be incomplete, indecisive or even contradictory. Even when an individual study is robust, it may not be sufficient to be conclusive if the results of other studies are at variance. Generating solid evidence in the areas of public policy and social-economic development is particularly complicated because there are so many moving parts and so much interdependence among actors and institutions.

**Figure 1: Contributions to the evidence base**
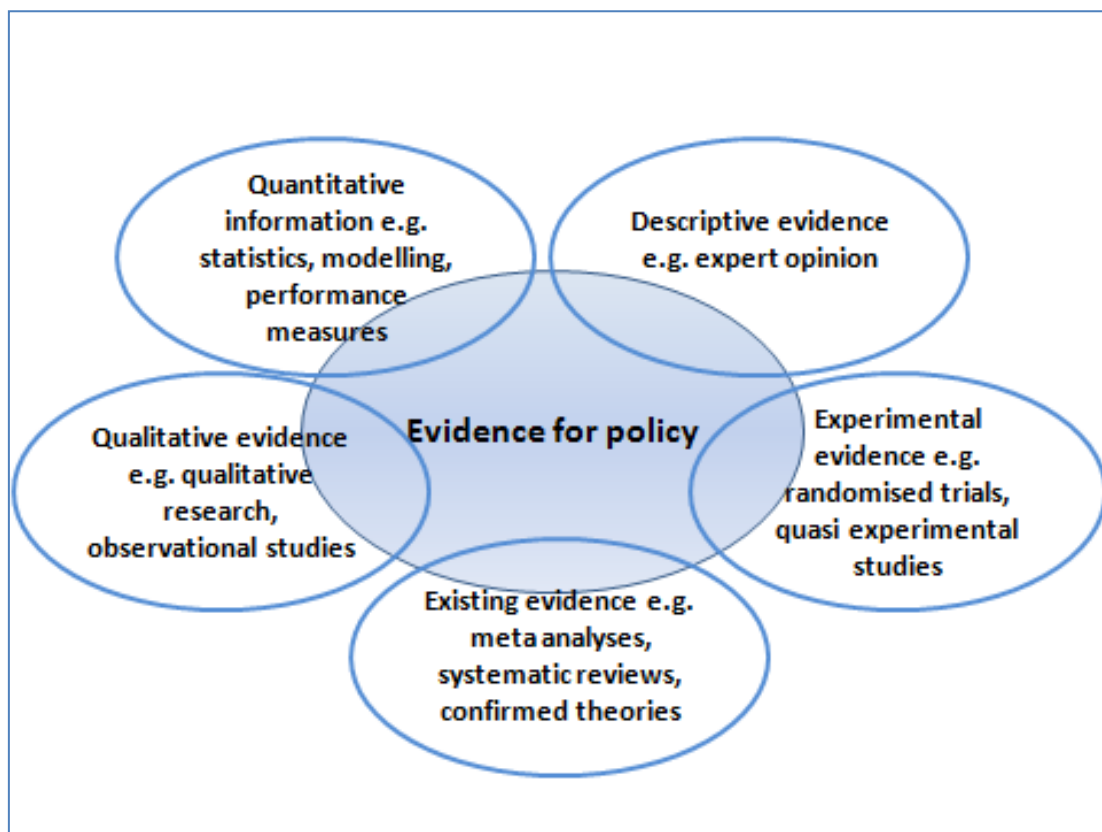


Source: Adapted from Productivity Commission 2010, Strengthening Evidence-based policy in the Australian Federation, Volume 2: Background Paper, Productivity Commission, Canberra, Australia.

## Evidence in the policy process

In the dictionary, policy is broadly defined as a plan or course of action either from the government, political party or business which intends to influence and determine decisions and other matters. Policies generally deal in broad issues such as why a course of action is needed and how it should be implemented. They can thus be understood as political, management, financial and administrative mechanisms arranged to reach explicit goals. Policies are operationalized by way of detailed procedures or protocols (including laws) that define roles and responsibilities for implementation. Policies are often thought of as specific to government, but they apply equally to nongovernmental organizations, academic institutions, private sector organizations, groups and individuals.

The policy process is sometimes visualised as a rational and cyclical process of policy development, implementation and review. However, in practice, this does not correspond with political realities (Colebatch 2006). A more realistic model recognizes complex and intricate pathways between policy initiation and delivery, with opportunities for evidence gathering from different sources at various stages along the way (Figure 2) (Head 2011). Evidence and evaluation are relevant at every stage, from identifying the policy problem, through assessing policy options, to ex-post evaluation. The extent to which, in practice, evidence is brought to bear at every opportunity is, however, highly variable and context specific for reasons that are examined more fully in the next section.

**Figure 2: The policy process**
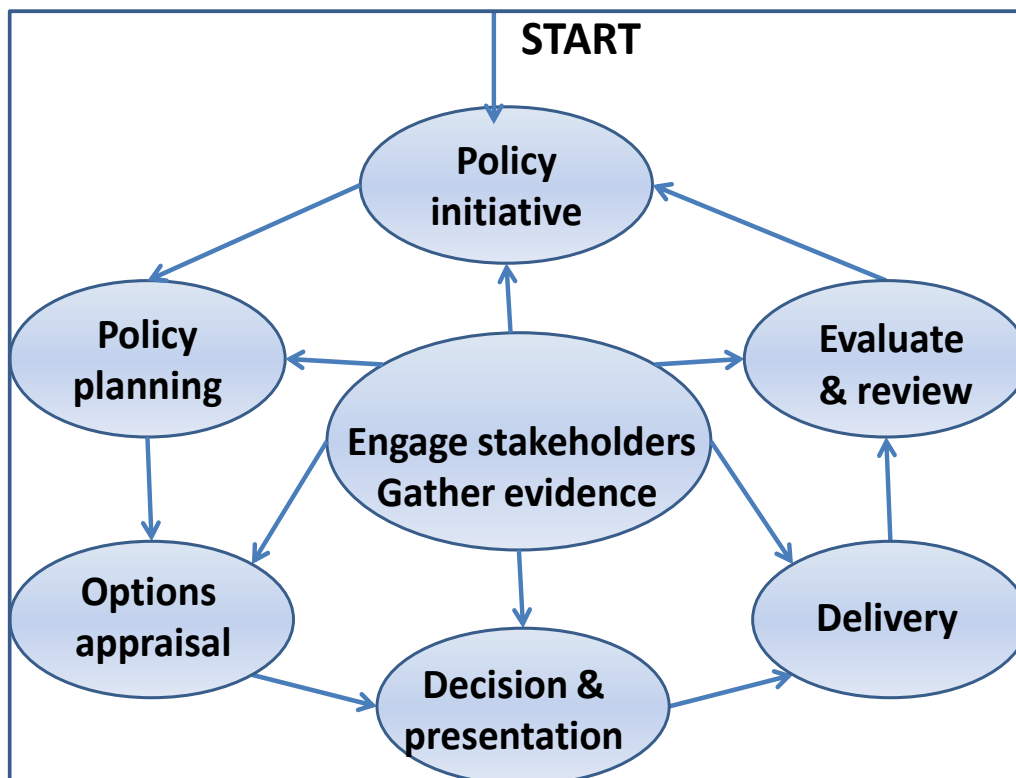


Source: Adapted from Scottish Executive 2006, quoted in Head 2009

## The chasm between evidence and policy

Even when the evidence for policy change is unequivocal, getting it implemented in practice can be a fraught process, with considerable risk of failure. The relationship between research, policy and practice is complex, multi-factorial, non-linear and highly context specific (Young et al 2009). What works in one situation or at one moment in time may not work in another. Over the past few years, there has been an explosion in institutions, academics, research programs, and journals focused on the challenge of implementing evidence-based policy such as the Coalition for Evidence-Based Policy or the Evidence Network. A general finding is that it is not easy to influence public policy; evidence is necessary, but not sufficient. To a great extent, this is because those working to produce evidence – whether academic researchers or statisticians – and those called upon to use it – leaders, senior planners, managers and politicians – do not speak the same language.

From the perspective of researchers and statisticians, there is a tendency to perceive it as the responsibility of the public policy makers to read their published work and incorporate their findings into the policy process. Most of their research, after all, is freely available as a public good. This passive approach on the part of researchers to the evidence they themselves generate is influenced by wariness that those in positions of power may bring pressures to bear on their work and risk compromising their intellectual integrity. Research studies are not always written in a way that can easily or directly feed into policy. Some research is academic; some has little policy implication while others have indirect policy implication and some others have policy recommendations that are not feasible. Research studies are often independently conducted without involving the policy makers and development partners and therefore they lack ownership.

From the perspective of policy makers, scientists display a difficult combination of intellectual combativeness and unwillingness to compromise, with a frustrating tendency to qualify every assertion that might, unadorned, provide independent testament to the virtue of policy intent (Nutley. 2003). This brings us to the question of what kind of statistics and evidence policy makers actually want and need and consequently will be more likely to use.

## What information do policy makers need?

The answer to the question of what kind of evidence policy makers want depends, to a large extent, on where they sit. The policymaking world is large and fragmented. At the top of the pyramid are government ministers with day-to-day responsibilities for policy development and parliamentarians who engage in policy debate as part of law-making. Policy decisions are also made by business leaders and senior decision makers working at institutional levels in the health, education and other sectors. Those working at the operational level where policies are implemented, for example in hospitals, schools, workplaces etc., are also stakeholders in the policy process as they are in the forefront of actually turning policy decisions into practices and actions.

At the level of governmental policy making, there is always pressure – time, political, media. Ministers need to act quickly, and satisfy their political constituencies. Inevitably, they bring their values and objectives to bear in interpreting the evidence and statistics, and in formulating policy. In this context, an evidence-based policy model will not provide all of the answers, and it may not be entirely welcomed, but it can improve the basis for decisions, help avoid costly mistakes, and make it transparent when political trade-offs are made.

A recent review in the health sector identified distinguishing features of policy makers' information needs. It was found that much of the evidence they are normally presented with is of little use (Davies 2011). Their information needs are varied and unpredictable, ranging from issues of international importance to the local needs of their constituents. Often what policy makers' need is not so much information about the present, but predictions about the future for which they need to prepare. While forecasts and projections are the bread and butter of statisticians, they tend to come with many provisos and assumptions that make interpretation difficult and open to alternative views. In summary, policy makers need information that differs significantly in terms of scope, level and timeframe from much of what is currently produced by researchers and statisticians.

While politicians may claim a preference for figures or quantitative information, in practice many political decisions are driven by the need to satisfy most of the people for most of the time and to minimise opposition (often referred to as 'blame avoidance strategies') (Ham & Coulter 2001). Politicians do not generally possess statistical expertise and find much of the evidence presented to them is too complex to be useful in decision-making. Even when easily accessible and understandable information is provided to politicians, they will often allow their own values and political ideologies dominate their decision making (Malik 2010). In the final analysis, politicians will tend to balance any scientifically-based evidence with other sources of information, including personal experiences, values, political ideologies and the media (Zwart-van Rijkom et al 2000; Ryynanen et al 1998).

Decision makers working at the institutional level in different sectors, with responsibilities for planning and managing specific programs, will likely require detailed technical information and be more open to scientific/statistical evidence. They need to be able to predict what is likely to occur if a new policy is introduced, to monitor its implementation and impact, and to manage unintended effects. Despite this, the use of evidence at the institutional and operational levels can be hindered by institutional inertia, vested interests in established ways of doing things, and reluctance to change.

The notion of actively reaching out to policy makers to identify their needs for evidence is gaining ground. For example, in its early years, the Cochrane Collaboration did not really engage policymakers to help set the research agenda. Instead, volunteers undertook systematic reviews on topics of their interest and expertise. While this resulted in the production of many reviews at a little financial cost, it left gaps in terms of coverage. Over time, the Collaboration has devoted more effort to engaging policy makers and practitioners to help set the research agenda and prioritise reviews by asking what sorts of questions they would like to see answered (Green and Cumpston 2010).


## The role of national statistics systems

Country statistical systems exist to serve "*the Government, the economy and the public with data about the economic, demographic, social and environmental situation*" (United Nations Department of Economic and Social Affairs 2000). The *statistics system should* generate the evidence needed by government "to inform debate, decision making and research both within government and by the wider community" (Her Majesty's Stationary Office (HMSO) 1993). National statistics are expected to provide an objective perspective, to enable public scrutiny of government actions and accountability to the public.

Yet it is not always clear that statistics offices are able to fully step into this role. There are a number of constraints, including lack of essential data; ambiguous relationships between governments and national statistics offices; inadequate collaboration between the research community and national statistics offices; and failure of national statistics offices, to engage with researchers in policy and program evaluation.

The inadequate availability and poor quality of statistics in many low-income and middle-income countries limits their contributions to the evidence-based policy discussions. Statistics offices face difficulties in generating some kinds of data that are critical for building the evidence base. For example, there are major data deficiencies, especially in management and use of administrative data. In some settings there are weaknesses in even the basic statistics on population size and its distribution. In general, data in social and environmental domains are weaker than in economic domains. In health, reliable data on disease incidence and prevalence is not generally available especially among disadvantaged groups. In education, there is no consensus around performance indicators making it impossible to judge the effectiveness of education policies (Banks 2009).

A more fundamental constraint is the divergences in cultures and value systems of the research community and statistics offices. Researchers do not perceive national statistics offices as potentially valuable and authoritative sources and prefer to collect their own data to analyze certain topics. In particular, they regard official statisticians as too conservative, especially in the access they provide to micro data. National statistics offices, on the other hand, fear that any real or perceived breach of confidentiality could damage their reputations as custodians of the privacy of individual units in their data sets. This could adversely affect respondent cooperation and thus the quality of official statistics (United Nations Statistics Division 2007). This is especially relevant for countries where the distinction between statistical and non-statistical use of microdata does not have a long tradition, or is not incorporated in any legislation.  The potential of active collaboration between government statistical systems and academic researchers to generate evidence that is useful for policy making has yet to be fully exploited.

Relationships between statistics offices and policy makers are not always straightforward, especially when statistical findings are not supportive of government policies. National statisticians must bridge a difficult divide between meeting their government's need for data to support established policies and refute alternatives, and the broader societal interests in data that may draw attention to government failings. They must also face the reality that, to some extent, good statistics are not what policy makers really want because they can actually make decision making more difficult, especially when the data confront established ways of doing things or vested interests.

Ministers, with the support of the statistical service, have a natural advantage in the use of statistics and want these to reflect and reinforce established government policies and programs rather than raise critical questions (Thomas 2010). National statistics offices that are independent or quasi-independent entities, at arms-length from government, may enjoy a measure of protection from of government interference, in which case official statistics are more likely to be perceived as having strong scientific integrity.

The ultimate test of policies is through rigorous evaluation of their impact. Yet government statisticians – in national statistics offices or other ministries – are not generally involved in policy and program evaluation. In particular, there has been a lack of effort to develop the baseline data essential for before-and-after comparisons

(Banks 2009b). The MDGs provide a telling example. Although governments signed on to the Millennium Declaration in 2000, and committed to achieving the stated goals and targets, they did not, on the whole, trouble to ask critical questions about the data sources for the baselines or about the systems that needed to be established to permit robust, country-led monitoring and evaluation.

## Framework for action

There are many reasons why evidence-based policymaking is preferable to the alternatives, despite the known difficulties of getting it right (Australian Bureau of Statistic 2010). In particular, it can:

- Ensure that policies are responding to the real needs of the community;

- Highlight the urgency of an issue or problem which requires immediate attention, and help secure resources to address it;
- Enable information sharing across society in regard to what policies have or have not worked;
- Reduce government expenditure which may otherwise be directed into ineffective policies;

- Produce an acceptable return on the financial investment that is allocated toward public programs by improving service delivery and outcomes;

- Ensure that decision-making is characterised by transparency and accountability.

Given the potential advantages of evidence-based policy, it is worth investing in making it happen – examples of this are found throughout the case studies included herein. Country experiences in developing, implementing and monitoring policy making indicate some actions that can be taken by those generating statistics and prove a good reason to increase the uptake of evidence in policy and practice (Sengone 2004).

## Fostering ownership

If policy makers and practitioners are to use evidence it is essential to harness their commitment and buy-in at all levels. At the central government level this usually means getting ministers and senior policy officials to understand and own the available evidence. This implies that they commit to use not only of those findings that support received wisdoms, but also – and more critically – those that are contrary to expectations or shown to be ineffective. At the institutional and operational levels, it means that key decision makers champion the evidence that supports good practice (Davies 2004). This is most likely to take place, and most likely to be effective, in organizational structures which are non-hierarchic, open and democratic (Dowd 1994; Martin 1997).

## Improving dialogue

To improve ownership, better dialogue and interactions between producers of statistics and policy makers is paramount (Nutley et al 2002). What is needed is not simply discussions between the two groups but ongoing and sustained interactivity throughout the process of data collection, compilation and analysis, policy

development and implementation. Closer and more integrated working over prolonged periods is needed to foster cross-boundary understanding and develop mutual trust. Doing so, however, is not cheap or organizationally straightforward, and it raises some concerns about independence and impartiality that need to be openly acknowledged and addressed.

## Matching demand and supply

A distinction can be made between people who are users of research and evaluation and those who are doers of research and evaluation. Whilst it may be unrealistic for professional decision makers and practitioners to be competent researchers and evaluators, it is both reasonable and necessary that they be able to understand and use data, research results and evaluation findings in their professional practice. An increasingly necessary skill for professional policy makers and practitioners is to know about the different kinds of social, economic and policy statistics, research and evaluation which are available; how to gain access to them; and, how to critically appraise them (Segone2004). Without such knowledge and understanding it is difficult to see how a strong demand for research and evaluation can be established and, hence, how to enhance the practical and policy application of research and evaluation. Joint training and professional development opportunities for policy makers and analysts may be one way of taking this forward and for a matching strong demand with a good supply of appropriate evidence (Segone2004).

## Making statistics understandable

A further challenge is making statistical information and the findings of research and evaluation accessible to the policymaking community. Too often statistics are shared only within departments or among selected institutional users and debate is confined to technical experts. When data are disseminated, they are often poorly presented, with insufficient information needed to assist interpretation, such as summary analyzes, methodological descriptions, definitions, data sources and possible sources of bias and error. Presentations of evidence are sometimes so hedged about with caveats and qualifications that the underlying messages and implications for policy and practice are unclear. Researchers and evaluators need to 'translate' evidence into a language that is useful to the users of evidence, without distorting or misrepresenting the findings. They need to become what's known as 'knowledge brokers', facilitating the transfer of knowledge from where it is available to where it is needed to inform and guide policy and action.

## Effective dissemination and access

A key issue is how to communicate findings to those who need to know. The strategies used to get evidence to the point of use involve both dissemination (pushing information outwards), and provision of access to data and evidence through web-based and other repositories of information. For example, some UN and development agencies make their own statistical databases available on the Internet. Researchers and scientists are increasingly recognizing that making data accessible, both within the scientific community and, more broadly, to potential users of the information, can contribute to a stronger culture of evidence-based decision making (Pisani et al 2009).

Much effort has gone into improving the dissemination process, and good practice guidance abounds (United Nations, Economic Commission for Europe 2009). It is now widely appreciated that dissemination is not a single or simple process. Different messages may be required for different audiences at different times. The information communicated to stakeholders must address their needs and concerns. Dissemination of evidence should emphasise key findings for action and include recommendations that are useful and feasible. The promulgation of individual research findings may be less appropriate than distilling and sharing pre-digested research summaries. Evidence is more likely to be used by policymakers operating at different levels if it is *available, accessible, relevant and useful (*Measure Evaluation 2009). Multiple channels of communication (horizontal and vertical networks and hierarchies), may need to be developed in parallel (Nutley and Davies 2000).

## Investing in institutional development

One of the key factors in ensuring that objective evidence has an influence is having the right institutions – appropriately staffed with skilled analysts – producing publicly available statistics and analyzes. This renders evidence transparent and contestable — for example, by enabling academics and other researchers to have access to data and methods. A strong institutional environment, working to long-term horizons, can ensure that data are collected and statistics are analyzed on an on-going basis, rather than at the last minute when policy options have already been determined. Institutional collaboration between researchers, government statisticians and government officials responsible for program implementation can significantly increase the reach and impact of evidence on the policy process (Haskins 2010). Some key features of such collaboration include:

- Improving transparency

- Building in and financing evaluation from the start of the policy process

- Introducing policy innovations in conjunction with a variety of evaluation techniques including sequential roll-out, pilots and randomised trials where appropriate

- Establishing channels to disseminate evaluations and share results across institutions and departments

- Strengthening links between researchers, official statisticians, practitioners as partners in evidence-building and the decision making process.

## Incentivize data use

As in other fields of human endeavour, getting policy makers touse evidence and do things that have been shown to be effective will probably require a range of incentives (Segone2004). These include mechanisms to increase the 'pull' for evidence, such as requiring spending bids to be supported by an analysis of the existing evidence base, and mechanisms to facilitate evidence use, such as integrating analytical staff at all stages of the policy development process. Table 1 summarises strategies for strengthening both 'push' and 'pull' factors.

**Table 1: Encouraging better use of evidence in policy making**

| Increasing the demand for evidence | Facilitating better evidence use |
|---|---|
| • Require the publication of the evidence base for policy decisions<br><br>• Require departmental/ministerial spending bids to provide a supporting evidence base<br><br>• Submit government analysis (such as forecasting models) to external expert scrutiny<br><br>• Provide open access to information and statistics, thus generating better informed public opinion and pressure groups<br><br>• Implement multi-faceted evidence dissemination strategies using a variety of communication channels and techniques<br><br>• Train statisticians and researchers in ways of presenting evidence in ways relevant to policymakers | • Encourage better collaboration across areas of expertise (researchers, statisticians, policy analysts)<br><br>• Co-locate policymakers and analysts<br><br>• Involve statisticians, researchers and analysts at all stages of the policy process<br><br>• Link research and development strategies to departmental/ministerial business plans<br><br>• Establish links such as secondments between research institutions, academia and government departments<br><br>• Train staff in evidence use<br><br>• Provide policymakers at all levels with guidance to help in recognizing reliable evidence |

## Conclusion

Successfully integrating evidence into the policymaking process requires first and foremost that good evidence be available. This implies not only collecting data and investing in research, but also ensuring that policy makers have the right skills to discriminate between evidence which is reliable and useful, and that which is not. Evidence should be open to rigorous professional scrutiny and public debate. As well as validating evidence, transparency can help governments to gauge community reaction to ideas before they are fully formed and so better anticipate the politics of pursuing different courses of action. However, this does add to the challenge for policy makers, as transparency takes time and effort, and governments often have a need for speed (Briggs 2010).

Ideally, policy making should be informed by evidence at each stage of development, from the initial issue identification, to the development of the most appropriate responses, and subsequent evaluation of their effectiveness. This is particularly important when dealing with broad social and systemic issues that require not simply technocratic interventions, but changes in behaviors on the part of actors at all levels of society.

The tension between authority and power on the one side, and knowledge and evidence on the other has to be acknowledged and managed if evidence-based policy making is to be successful. Linking evidence-based policy formulation to ongoing monitoring and evaluation helps facilitate informed public debate between policymakers and societal stakeholders and strengthens public confidence in accountability mechanisms. Dialogue between the suppliers and users of evidence can help bridge the gap between the information needs of policy makers and the information offered by researchers and evaluators.

Having the evidence is not by itself sufficient to bring about change. Evidence is rarely a dominant force in on-going policy debates. Nonetheless, it can play an important role in policy choice under the right circumstances (Haskins 2010). Evidence-based policy requires institutional frameworks that encourage disseminate and defend good evaluation, and that make the most of opportunities to learn. Where evidence is incomplete or weak, good processes for learning, and for progressively improving policies, become even more important.

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# Part II:Improving Relevance of Statistics

The *On Track* student destinations monitoring project: The collection and use of statistical data on student transition outcomes in Victoria
*Richard Teese*

How to fix a Census:Lessons learned from Bangladesh
*Riti Ibrahim Ahsan and Hannah Strohmeier*

Improving agricultural statistics to support food security in India
*Sanjay K Srivastava*

Surveying a Hidden Population: Uncovering Hard Drug Use in Nepal
*Saroj Prasad Aryal and Nebin Lal Shrestha*

# The *On Track* student destinations monitoring project: The collection and use of statistical data on student transition outcomes in Victoria

*Richard Teese*

## Problem statement

A major issue facing the public education authorities in the state of Victoria in Australia is to ensure that all young people leaving school undertake further study or training or obtain a job. In 2003, the Department of Education and Training adopted a survey data tool intended to monitor the destinations of all students leaving school (the survey is known as the *On Track* survey). The survey was designed to capture the destinations of different groups of young people, and not simply the population of school leavers as a whole (e.g., indigenous, low supplemental education services (SES)). This was achieved partly through the design of the survey instrument itself and partly by data matching. The survey was telephone-based.

## Outcome achieved

Several valuable outcomes have been achieved as a result of this survey (which is now administered every year). Firstly, every secondary school in the state receives a report on the destinations of its exiting students along with comparative tables. This enables each school to examine patterns of post-school employment and further study or training. Teaching staff and career counselors are able to identify any weaknesses in transition, e.g., low uptake of placements in university or unemployment amongst low achievers. As a result, planning of school programs has been significantly enhanced. Better decisions can be made about relevant courses and student support services as there is now a clear view of how well young people are faring once they leave school.

Secondly, authorities at a central, regional and local level each have detailed 'maps' of destinations. These maps enable them to examine what happens to particular sub-groups across the state or across a region or local area, e.g., what happens to girls from low-SES backgrounds who struggle with schoolwork. Some additional specific examples include the relatively low level of access girls have to apprenticeship or the comparatively low level of aspirations for higher education or middle-level vocational training amongst boys in rural communities. Having a map of differences in levels of aspirations enables universities and technical and further education institutes to plan more suitable provisions and to develop more effective relationships with schools.

Thirdly, each student leaving school whose employment or education destination is problematic is offered personalized career counseling in order to assist the person to find work or an appropriate education or training opportunity.

# Details of the practice

## Objective

The objective of the survey was to provide schools with accurate and comprehensive data on the post-school destinations of students leaving school each year. An additional objective is to make information available to education authorities regarding the destinations of sub-groups of the school leaver population, especially those who are at greater risk of making a poor transition from school to work or further study. In Victoria about 20per cent of young people do not complete secondary school, and this group is particularly vulnerable to unemployment. Amongst those young people who do complete school, the most vulnerable are low achievers and students from low-income and certain immigrant backgrounds.

## Area covered

The *On Track* survey covers the whole of the state of Victoria—all regions and all government and non-government schools. Since 2005, a similar survey, modeled on *On Track*, has been administered in the state of Queensland (the *Next Step* survey). Several other states in Australia have administered the survey on a trial basis (South Australia), or to monitor the destinations of particular groups of students (as in New South Wales, where the focus was on students in vocational education programs).

## Executing agency, implementing partners and actors involved

The executing agency in Victoria is the Department of Education and Early Childhood Development (DEECD). The concept and design of the survey were created by researchers in the University of Melbourne. The researchers were responding to the concerns of school principals about 'league ladders' (a school rating system based on student academic performance)and inadequate reporting of the outcomes of school. They were seeking a broader approach which reflected the employment, study and training outcomes of education.

Schools that served poorer communities were particularly concerned about adverse media publicity of examination results and test scores. These were considered to give a misleading picture of what the schools were achieving, including for very disadvantaged young people.

From the start of the activity and until recently, *On Track* has had a partnership between DEECD and the Center for Research on Education Systems in the University of Melbourne. Under this partnership, the university designed the survey instrument in consultation with DEECD. The administration of the telephone contacts was made through a commercial telemarketing firm, while the data were analyzed by the university team. Reports for all schools - as well as statewide reports, were written by university staff according to an agreed format.

## Government and university collaboration

The tracking projects in the different Australian states, such as *On Track* in Victoria and *Next Step* in Queensland, involved collaboration between the relevant government department and the University of Melbourne. While the concept and methodology of the project were developed by university researchers independently, the decision to implement the project, the funding for it, and project administration all

rested with government. The education departments in each state sought approval from the respective state governments, and established steering committees to oversee the research.

Different roles came into play in this collaboration. The researchers have an understanding of the factors which affect student decisions about when to leave school and what to do after leaving school. This understanding is reflected in the way the tracking survey instrument is designed. Government departments, on the other hand, have an understanding of the key issues about school performance and student progress that have to be addressed. These concerns, too, are reflected in the design of the survey instrument, e.g., reasons for leaving school without completing a qualification, or the level of vocational-technical training that is undertaken by an early leaver. This form of collaboration works well, providing that both researchers and officials are able to reflect their priorities in the design of the project and the data collection instruments.

## Engaging stakeholders

The *On Track* project was a researcher-initiated project. To gain acceptance of it, four different groups of stakeholders had to be satisfied that it was a valuable, feasible and fundable project. The four stakeholder groups were: (1) The principals of public secondary schools; (2) Relevant state government agencies; (3) Authorities or organizations within the private sector of schooling; and (4) The state government. Support from these groups was gathered through a series of meetings initiated by the researchers, but subsequently managed and extended by the state education department.

It is vitally important to convince school principals (the first group) of the value of participating. Schools are busy places, staff resources are limited, and research or publicity can sometimes be negative. There must be a clear and convincing case for schools to become involved. Their co-operation influences how many young people will participate as schools are in a position to communicate with students before they leave school.

The rationale for the research must reflect the operational needs of schools, that is: (1) Planning and evaluation of curriculum; (2) Delivering suitable careers education and guidance, based on a knowledge of what actually happens to students (and to *which* students); (3) Reporting to parents and the wider community ("How well is our school working"?); and (4) Understanding the impact of differences in student achievement (what happens to low *versus* high achievers?).

Different state government authorities may have a connection with a project that tracks students from school to further education or work. These authorities include education departments, curriculum authorities (if separate bodies), and government departments with economic or central policy portfolios (e.g., treasury and finance). Any large-scale research project represents a significant budget commitment and must be fully justified in terms of government policy objectives. It is important in making a case for funding to draw attention to the economic costs associated with drop-out or unemployment amongst young people at the end of school.

Where a school system has schools operated by the private sector, it is important to involve the relevant authorities or associations. A research project generates potentially publicly available information on schools in the public and private sectors. So stakeholder involvement of all sectors is desirable.

State governments are usually the largest providers of schools and have the biggest stake in the effective functioning of schools and the most to fear from adverse publicity.  On the other hand, governments have a strong interest in 'good news'.  Tracking projects have both 'good' and 'bad' news.  This places researchers under a degree of pressure and tension.  They need to reveal any problems in who is completing school and who is making a successful transition from school, but at the same time they need to point to positive features, e.g., the proportion of students from low-income families who go to university or who gain apprenticeships.

## Data collection methods

Different options are available for collecting student destinations data.  These will be more or less relevant, depending on the national context.

(1) Tracking student destinations using Smart Phones is feasible if many school leavers were equipped with these.  These phones connect to the internet and to a server with an online survey instrument.  This is cost-effective, but must be carefully managed, e.g., using passwords.

(2) Still using the Internet, but from a desktop computer or laptop, is a viable option, where most (if not all) school leavers have computer access, either at home or through a commercial outlet (e.g., an Internet café).

(3) A telephone survey is feasible if every school leaver can be reached either via a landline or a cell/mobile phone.  The contact details should be available from school enrolment forms or through the curriculum and assessment authority responsible for enrolling students in exams.

(4)The mail-out survey is a feasible option, provided that valid addresses are available (e.g., from schools).  However, while mail-out surveys have response-rate problems, this may be the best approach in some circumstances.  The survey instrument should be designed to be electronically scanned.  This saves on costs which, in the past, would have involved manual coding and data entry.

(5) Establish a call-in center.  School leavers can be encouraged through newspaper, radio and TV notices to visit designated call-in centers where they can login to a program and provide their destination details.  Some incentives can be offered, e.g., the chance to win a Smart Phone.

## Who is a 'school leaver'?

School leavers include two groups of young people: (1) Those who complete a school leaving certificate, representing a defined and certificated stage of schooling, and (2) Those who leave school without a certificate ('drop-out', 'early leaver').  It is important to reach both groups.

Gaining assent to be contacted should be organized *before* young people leave school.  For example, students can be given a consent form to be completed by parents.  This is the most effective approach providing that teachers in each school follow up to ensure consent forms are returned by parents.

## Access to the survey data

The questions cover aspects of the student's school experience, background information, aspirations, and destinations, that is, further study or training, levels of training, course, institution, employment, occupation, hours of employment, etc (for *On Track* questionnaires for early school leavers and school completers, see: http://www.eduweb.vic.gov.au/edulibrary/public/voced/ontrack/destination 2010appendices.pdf).

Individual data collected by the tracking survey is confidential. Only the researchers and the relevant state government agency have access to it. Data are aggregated by school, district/region and state level to produce reports at each of these levels, e.g., all schools receive their own report (which is confidential).

Reports at school, district/region and state levels are used to help drive improvements at each of these levels. For example, school reports highlight gender differences in destinations, or differences based on achievement level or indigenous status. District/region reports focus on issues, such as unemployment patterns or post-school training opportunities (apprenticeship, technical college). State-level reports provide a wider perspective and enable authorities to target interventions to particular regions or districts, or to target resources or programs to particular groups of students (e.g., indigenous).

## Communicating with schools and teachers

Communication is best done by convening district or regional meetings in which key research findings are presented and the implications are drawn out and discussed. Findings should be contextualized to the district or region (as well as being presented at a state level), and a focused discussion should be undertaken regarding the uses or applications of the data in school to promote better transition.

## Response rates

Response rates can be expected to vary considerably by sub-groups of school leavers. For example, in Victoria a response rate of 71.6per cent of leavers who completed the final year of school was achieved in 2009 as compared to a much lower response rate of 49.8per cent of young people who left school without completing the final year of school (see www.eduweb.vic.gov.au/edulibrary/public/voced/ontrack/destination2010ch1.pdf).

## Timeframe

The *On Track* and *Next Step* surveys are annual destination monitoring surveys. They are administered about six months after young people leave school (between March and May in the year after the young person has left school). The telephone surveys involve an approximately four-minute phone call. Processing of data takes about two months, while the preparation of reports for every school takes about six months. Results at a statewide level are available in August (Queensland).

## Total cost

As a guide, the estimated total cost of On track (2004) was AUD$1,628,583 (approximately $1.7mill USD).

## Start to Finish: processes involved

The processes involved in the *On Track* destinations survey program range from design all the way through to analysis and reporting (including ministerial and media briefings). In the design stage, a review is made of the performance of the survey in the previous year. This is done from a number of angles, such as response rates, item response, cost issues. Consideration is given to varying a 'free' section of the questionnaire to address emerging issues or particular facets of the student experience of school or the labor market. For example, in one survey year, school leavers were asked to comment on the quality of their school experience, its value, their access to a broad range of courses, etc.

While *On Track* aims to reach all school leavers, participation was voluntary. There was a process in which students were asked to indicate their willingness or unwillingness to participate. Contact details of students who agreed to participate were supplied to the surveying agency by the Victorian Curriculum and Assessment Authority (VCAA) and were passed on to the telemarketing company.

The telephone survey was administered over a two-month period and a data file was transmitted to the surveying agency for analysis. Key results were presented in a brief to the Department (DEECD) and usually also in a formal ministerial briefing. In past years, there has been a media presentation, usually conducted in a school with the Minister and senior officers attending. In parallel, reports for schools and a statewide report were prepared. Other reports (e.g., local area) were also created.

## Success factors

The biggest success factor behind the acceptance and implementation of the *On Track* concept has been the need for schools to measure their success in broad social terms rather than more narrowly in academic terms. As noted above, schools are concerned to ensure that information published about them should reflect the impact that they make on young people's lives, not only academically, but regarding employment, study and training opportunities. A high school may not be outstanding in exam results because it serves a very poor community with complex and multiple disadvantage. However, it may be very successful in helping young people get apprenticeships or other full-time employment (e.g., through work placements which a young person is still at school). Information which related simply to exam results would not capture this important work. Similarly a high school may see relatively few of its students entering university, but will have many enrolling in Diploma courses in Technical and Further Education (TAFE) institutes. If the only measure of 'transition' was the traditional one of 'university', the school's work in helping young people access valuable training programs in TAFE would be overlooked.

A second success factor has been the depth of information produced by the survey. In decades past, it was fairly easy to measure the proportion of school completers entering higher education (thanks to central processing of all applications). *On Track*, by contrast, provides a complete picture of education and employment destinations (which can be cross-tabulated for very detailed analysis). Thus, schools and other organizations learn about employment, including the job that a young person has, the sector of industry in which that job is located, the number of hours worked, etc.

Thirdly, the survey gives information about the reasons why school leavers make particular education and employment choices - the factors that appear to motivate

them, and it also gives information on the kinds of barriers to a more successful transition than they encounter.  This 'young people's voice' is invaluable.

The joining-up or matching of data on destinations with data on achievement at school has been a fourth factor behind the success of the practice.  Schools and public authorities have been able to see the impact that achievement level makes on destinations (after controlling for other factors, such as socio-economic status and gender).

A fifth success factor relates to the take-up of the project by the Department of Education and Early Childhood Development itself.  For the first time, the Department is able to measure the extent and composition of the movement of students from school into different sectors of post-school education and training.  This has enabled the Department to formulate policies aimed at strengthening connections between sectors, including differential funding for disadvantaged students and other incentives to promote high levels of post-school educational participation.

Finally, from the perspective of schools, the survey information is highly accessible and 'fresh' (i.e., recent in time and able to be acted on).

## Challenges and solutions

The first challenge in gaining acceptance for this survey practice was convincing a number of education authorities and stakeholder organizations of its potential value and its feasibility.  These authorities and organizations included the Department of Education and Early Childhood Development, the Victorian Curriculum and Assessment Authority, the Catholic Education Office, the Association of Independent Schools of Victoria, and the Australian Education Union (teacher union).  Meetings were held with these different stakeholders as well as with the Victorian Secondary School Principals' Association.  Some of these organizations were initially cautious or even reluctant to be involved as data can be used negatively in the media, others were concerned about confidentiality issues.

In the meetings with stakeholders, these concerns were addressed from several angles.  For example, what credit did schools at that time get for placing students in apprenticeships at the end of school?  What was the public (media) image of a large public or Catholic school serving a disadvantaged community?   How should education as a sector highlight the valuable work that schools do?

A second angle of approach related to equity.  How do we know how well a school system is working if we cannot analyze outcomes by social background, migration background, gender, etc.?  If no data are available on what happens to different groups of school leavers, how do we expect schools and education authorities to orient their policies and measures towards improving outcomes?

Taking these two perspectives together, the meetings were concerned about (a) Representing the *breadth* of work that schools do, and (b) Representing the *depth* of their work in reaching all groups of students.  The success of these stakeholder meetings cleared the way for the next step forward.

Was a comprehensive destinations monitoring project technically feasible and cost manageable?  To address these concerns, researchers at the University of Melbourne undertook a funded trial of the telephone survey.  This tested the interview time required for each contact, the range and wording of items in the survey instrument,

issues associated with English language learners and students with disabilities, the usefulness of telephone contact numbers on the VCAA database, the attitude of school leavers to being contacted, and the feasibility of matching the destinations data from the survey with data on achievement levels held by the VCAA.

This trial was successful and led to the implementation of a full survey in 2003; for the report of the first year of the project[6].

A third challenge that the project faced was to convince schools of the practical value of collecting accurate and comprehensive data on student destinations. While schools welcomed the chance to 'showcase' their achievements across a broad spectrum of student destinations, how they might use the data to drive policy in their schools was another question.

We tackled this challenge in 2004 through meetings conducted in localities across the state. At these meetings, we first presented the survey findings relating to the local area and then turned to the question of how these findings might be used for policy and practice in schools. Using the findings relating to particular groups (e.g., low achieving boys), we highlighted the need to improve curriculum options and to build destinations-mapping into decisions about these options. For example, were schools offering accredited vocational options in the upper secondary years to create more engaging and more secure pathways? The workshops also emphasized the importance of sharing the destinations data with students themselves. Were young people who were still in school aware of what actually happened to students who had just left school? How did that affect their thinking? For example, were students in schools in rural areas aware of the extent of the difference between their aspirations for technical training and the aspirations of their peers in metropolitan schools? Were they aware of the employment prospects of young people exiting school in their local area or region? What was their thinking about university?

An additional solution to this challenge was to hold additional workshops in selected regions in which teachers discussed their use of the reports they received. These workshops were different from the more formal presentations of research findings in that the university team worked with teachers who (by then) had acquired some familiarity with school-level reports and had conducted in-house activities, such as presenting at staff meetings or providing career classes with students, based on the destinations data.


## Recommendations for others

To replicate this practice, there are some minimum requirements to be met. First, potential practitioners should conduct a pilot in a particular local area or set of areas. This is with a view to establish the value as well as the feasibility of the practice in the relevant national context. Second, consideration should be given to varying the methodology of contact with exit students. For example, while *On Track* uses telephone, *Next Step* (Queensland) also trialed an online survey administration and mail-out paper questionnaires. Large cost savings can be made by going online. But this may not be feasible in jurisdictions in which access to high-speed Internet is limited. Care also needs to be taken to ensure the integrity of online administration (e.g., the same student completing a survey several times or a person completing the survey who is not within scope [an 'interloper']). A third important point to make is the need to win over schools. If they can see the value of their exit students participating in a destinations survey, they may also be willing to 'prime' their

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[6] See www.eduweb.vic.gov.au/edulibrary/public/voced/ontrack/destinations_2003.pdf

students before exit, i.e., inform them of the survey, encourage them to participate, even contact them through a newsletter once they have left school. Fourth, government can help improve response rates by advertising the survey and also by offering participants a modest reward or prize. Fifth, engagement of stakeholders is critical. Specific efforts are needed to ensure the co-operation of different interested groups.

## Future plans and sustainability

Contact with young people once they have left school is a valuable opportunity to gather feedback on the student experience of school as well as what happens to them in their first year out from school. There are pressures on students while they are still in school which prevent them from participating in surveys that enable them to reflect on their experience. For example, in upper secondary school the rhythm of exams and other assessment will often rule out participation. Both students and their teachers will be reluctant to give up time for this exercise. Moreover there may be other tasks that are similar and that are occurring at the same time. There is simply too little time. Recognizing the value of a post-school survey, however, should also be accompanied by a willingness to adapt the survey rather than institutionalize it in a fixed and invariant form.

Experience over eight years with destinations tracking in Victoria suggests some directions of change. There could be a much greater emphasis on quality of school experience and perhaps less detail on destinations. There could also be attention to quality of instructional experience and where students have encountered problems (e.g., instructional style, assessment methods, content load, pace of learning, style of learning). Can we learn to teach better from talking to students who have left school and who are now engaged in applying their learning in one way or another?

Besides possible changes in scope and emphasis, there is also an issue of sustainability. Clearly there is a question of sustainability when no changes are made in content. For destination patterns do not change greatly from one year to the next, even though they may shift a lot over a longer time frame (e.g., a gradual increase in applications for university or a long-term decline in applications for middle-level technical training). If no changes are made to content, arguably the survey should not be administered every year. If, instead, the survey were administered every second (or even third) year, a better way of using the budget would be to work with schools intensively on the use of the data in the intervening year (or years). In this way, the capacity of schools to work usefully with data would be enhanced and this would improve the delivery of benefits to students. At the same time, close work with schools would contribute ideas for improved design of the survey, in terms of both scope and methodology.

Value for money requires evaluation. But equally it requires a continual re-thinking of the focus of practice on the benefits that schools are trying to create for young people.

## Feedback from beneficiaries of the practice

When the university researcher's work shopped teachers on the *On Track* program in 2005, they also collected feedback sheets from the participants, and this feedback points to the reaction of teachers who were in the process of using the data. Most participants reported that the destinations tracking survey was used for planning

purposes within their schools and that the reports for schools were useful and easy to use. Teachers welcomed the approach which disaggregated findings to different sub-groups (e.g., gender, achievement level). As one teacher said, "Especially engaging were the more detailed analyses around levels of achievement and destinations". Being able to break down patterns according to student characteristics was widely commented on, as was the care to contextualize findings to local areas. The workshops presenting the findings were highly valued by teachers. One teacher wrote, "I have a much better understanding of how to interpret the charts". Another observed, "…the extra analysis of the data could provide very useful information as a tool to drive improvement processes".

Policymakers have embraced the *On Track* survey, both in Victoria and Queensland, as providing a much needed tool to help guide the formulation of policy at a central level, but also as a tool for use at a school and local planning level. The substantial investment that successive governments have made in the project confirms this assessment.

However, it is important to consider independently the future directions of this program to make sure that the investment continues to produce the benefits that have justified it to this point in time.

For academic research, the datasets created by this comprehensive tracking program provide an invaluable window through which to view the operation of a large and complex school system as it seeks to deliver high quality outcomes to a very broad range of young people.

## Supporting documents

Information for *On Track* and also *Next Step* can be found in the published reports over successive years which are available at the websites listed above.

## Contacts

Currently *On Track* is administered by the Youth Transitions division of the Department of Education and Early Childhood Development in Victoria.
For a detailed listing of reports available on-line, see
www.education.vic.gov.au/sensecyouth/ontrack/data.htm.
For contacts, see www.education.vic.gov.au/sensecyouth/contacts.htm.

For Queensland *Next Step*, see http://education.qld.gov.au/nextstep/.
For contacts in Queensland, see http://education.qld.gov.au/nextstep/contacts.html.

# How to fix a Census: Lessons learned from Bangladesh

*Riti Ibrahim Ahsan and Hannah Strohmeier*

## Problem statement

As a key marker in one of the poorest and fastest growing countries in the world, the census is one of the most important undertakings of the Bangladesh government. Vast challenges were identified in the 2001 Census. A decade later, the government set out to learn from the lessons and improve on the practice. The following includes the history of the census, the challenges identified and the way they were addressed ten years on.

## About the population and housing censuses

Originally stemming from the Latin word 'censere', meaning to assess, censuses are commonly understood today as a full count of a population conducted at specified times in an entire country or well-delimited part of it. Population and housing censuses constitute a specific type of census and encompass the entire process of demographic, housing, economic and social data collection, compilation, evaluation, analyzes, and release (UNSD 2010). The four essential features of this type of census encompass individual enumeration, universality within a defined territory, simultaneity, and periodicity (UNSD 2008).

Given the type of data collected, population and housing censuses provide answers not only to the query "How many are we?", but also address the very critical questions "Who are we?" and "How do we live?"(UNSD 2008). These data are, once the census is completed, used for policymaking, planning and administration, as well as in management and evaluation of programs in education, labor force, family planning, housing, health, transportation and rural development. A basic administrative use is in the demarcation of constituencies and allocation of representation to governing bodies (UNSD 2010).

The data collected through population and housing censuses are also an invaluable resource for research, for scientific analysis of the composition and distribution of the population and for statistical models to forecast its future growth. Furthermore, census data provide business and industry with the basic information they need to appraise the demand for housing, schools, furnishings, food, clothing, recreational facilities, medical supplies and other goods and services (UNSD 2010). In short: the data collected through population and housing censuses build the basis for evidence-based decision-making at all levels.

## Population and housing censuses in Bangladesh

The census history on the territory of today's Bangladesh goes back to 1872, the year in which the first census of British India took place. Since then, 14 censuses have been undertaken, each of which traditionally takes place in February or March of the first year of a new decade.

The first housing census in Bangladesh was conducted in 1973 followed by the first population census in 1974. While the practice of using separate questionnaires for each census is maintained up to this date, the censuses were combined in 1981 and have ever since been undertaken as 'population and housing censuses'. In March 2011, Bangladesh conducted its fifth population and housing census.

The overall time-span of this census covers the period from 2008-2013 and can be broken down into the preparation, implementation and post-census stage. The preparation stage includes activities such as the updating of maps and geo-codes, development and conduction of training, printing and pre-testing of questionnaires, and distribution of census material. The census phase encompasses amongst others the actual enumeration and the return of the filled-in questionnaires to the headquarters in Dhaka. Data processing and dissemination, preparation of reports and updating of databases, and the payment of allowances and remunerations take place during the post-census stage.

Following what is globally recognized as the 'traditional census approach', the process in Bangladesh includes a main census in which all households and people are counted via a short questionnaire; a post enumeration check (PEC) survey undertaken within 15 days after the main census to assess its quality; and a sample census conducted within three months after the main census to complement the hitherto information with further socio-demographic data collected via a more detailed questionnaire.

The method of enumeration applied during the main census is a 'modified de facto' procedure. This means that people are counted where they are found during the census night with those who are away from home due to night duty or travel being enumerated at their household. The sample census follows the 'de jure' procedure. Here, citizens are counted at their usual place of residence. In both cases, data is collected via the 'canvasser method', that is, direct interviews.

Bangladesh is one of the poorest and most densely populated countries in the world. Its capital Dhaka is the fastest-growing city on the globe. In Bangladesh, the population part of the short main census questionnaire is developed to collect data on people's age, sex, marital status, religion, disabilities, literacy and level of education, the field of education and occupation. The household module assesses electricity connections, sources of drinking water, toilet facilities, and the type of house people live in. The more detailed sample questionnaire covers additional areas such as access to media, land and property ownership, fertility and reproductive health, birth and death rates, and migration.

In line with the country's needs, these data are specifically used for the formulation of poverty alleviation measures and policies to improve the quality of life of the Bangladeshi people. The data collected serve as a basis for monitoring progress in achieving the Millennium Development Goals and are necessary to facilitate meaningful improvement through structural change and modernization in all socio-economic dimensions including education, employment, and health. Furthermore, these data are vital for updating of the country's electoral rolls at a national, district, and community level, the reformulation of electoral zones, the assignment of quotas including minority quotas, and the allocation of national resources. Finally, data collected through population and housing censuses in Bangladesh are used as a basis to develop sampling frames for all other socio-economic surveys in the country and to facilitate cross-country comparison and dialogue on a regional level.

While cooperating closely with other departments, the Census Wing of the Bangladesh Bureau of Statistics (BBS) is the main entity within the GoB responsible for undertaking censuses. In the context of the 2011 population and housing census, the

United States Agency for Development (USAID), the United Nations Population Fund (UNFPA) and the European Union (EU) provided additional financial resources and technical expertise. Furthermore, the United States Census Bureau (USCB), the United Nations Statistics Division (UNSD) and a great variety of non-governmental organizations (NGOs) and research institutions contributed to the census procedure.

**Table 1: Population and Housing Census 2011 at a Glance**

| | |
|---|---|
| Overall time frame | Preparatory stage: 1.07.2008 – 21.02.2011<br>Census implementation stage: 22.02.2011 – 25.03.2011<br>Post census stage: 26.03.2011 – 31.12.2013<br>Dates of main census: 15.03.2011 – 19.03.2011 |
| Census approach | Traditional: census in three phases including a main census, a post enumeration quality check, and a sample census |
| Enumeration method | Main census: modified de Facto<br>Samplecensus: deJure<br>Canvasser/ interviewmethod |
| Entity responsible for census | Census Wing, Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of Bangladesh<br>Contact persons:<br>MsRiti Ibrahim -  Secretary, Statistics Division, & Chief Census Commissioner, Government of Bangladesh<br>Mr. Mohammad Shahjahan Ali Mollah – Director General, Bangladesh Bureau of Statistics & Deputy Census Commissioner |
| Implementing partners | EU (financial and technical support)<br>UNFPA (financial and technical support)<br>UNSD (technical support)<br>USAID (technical support)<br>USCB (technical support)<br>Others: universities, research institutions, NGOs and further census committee members (technical support) |
| Territory covered | Entire country |
| Total budget available | 36.88 Million USD |

## Outcome achieved

A highly functional census practice in 2011; much improved from 2001.

## Details of the practice/challenges and solutions

### The 2001 Census: what were the problems?

In line with Bangladesh's census tradition, the fourth population and housing census took place in 2001. While the key idea of this and any other household and population census was to count and collect information on *each and every individual and set of living quarter separately*, it is exactly this idea which made successful implementation in countries like Bangladesh so difficult: counting 130.5 million people (estimation of

2001) in a period of five days with limited human, technical, and financial resources is a gigantic operation and undoubtedly anything but easy.

As a result of the difficult task at hand, a high number of people were not counted. About 6.33 million people, or 4.85per cent of the country's population, were omitted which resulted in the presentation of inaccurate census data. Specifically, minority groups and urban populations were among those who were not counted during the main census. The problem was taken care of in retrospect as best as possible by adjusting the population figure through the findings of the Post Enumeration Check (PEC).

Not having been counted means in effect not being reflected in the corresponding statistics; since these statistics build the basis of policymaking in areas affecting the well-being of millions of people, incomplete census data constitutes a tremendous issue for both those who are to make decisions, and those who are to benefit from them.

The second key issue was the extensive delay in the processing and dissemination of the already sketchy data due to technical difficulties. Instead of the envisioned timeframe of two to three years, the census data was disseminated after four years and the completion of respective publications five years after the data collection. The delay in data interpretation and dissemination further complicated timely decision-making and took away the baseline information for any other follow-up survey and census planned.

The situation described led to a series of questions: Why were a large number of households and their members not included in the census? Why did the data processing prove to be difficult and, as a result, was delayed? Did these issues manifest in the earlier censuses, too? If so, why had they not been addressed?

## The 2001 Census: what caused the problems?

### Shifting of census date

The factors that contributed to the inaccuracy of census data and the delay in data processing and dissemination are manifold. One key aspect in this context and specific to the 2001 census is the sudden shift of the census date due to the Bangladesh general elections which happened to be scheduled for October of the census year. As electoral rolls needed to be updated based on the data collected, the GoB decided to undertake the census on 23 to 27 January 2001 and not as originally planned in March. This resulted in a significant reduction in time allocated for census preparation. Well aware of the likely consequences, this decision caused fierce resistance among those in charge for the accurate implementation of the census. However, the request of sticking to the original census date was not approved.

### Lack of digital maps

Connected with, but not exclusively caused by the shift of the census date, was the lack of adequate maps. The availability of adequate maps for enumerators is crucial to avoid the omission or duplication of persons or housing units during the census enumeration (UNSD 2010). Vice versa, if the maps used by enumerators are inaccurate or illegible, it is almost guaranteed that the census results will be adversely affected.

Aerial photography was undertaken to prepare digital enumeration area maps for the 2001 census. However, the production of sufficiently good photographs failed various

times, not least due to climatic problems and seasonal weather conditions. Since the census dates were shifted, digital maps could not be produced in time and old sketch maps, originally prepared by the Ministry of Health for malaria eradication purposes in the 1970s, were provided to supervisors instead; due to their limited number, maps could not even be provided to every enumerator.[7]

While the maps distributed were updated over the decades, most of them were illegible due to their repeated use and marking in previous censuses and surveys including the 1981 and 1991 population census, the 1986 economic census, and the 1983/84 and 1997 agriculture censuses. As many of them were also still imprecise or even flawed, some of the supervisors did not use them at all. The overall lack of adequate maps and the occasional resistance to use the ones available to the extent possible has significantly contributed to the reported key issue of undercounting.

### Lack of adequate training

Just as important as the dissemination of adequate maps is the provision of training to ensure that enumerators and all staff involved in the registration process are competent in using these tools and understand the census procedure to be applied in detail. This is more complex than it may seem at first glance and includes a whole range of aspects: Enumerators and census staff need to know whom they have to count in what territory and when; what questions they need to ask; how they have to record the information received; and whom they need to deliver the final results to. Enumerators need to understand the definition of household and how to count and collect information on those who do not have an abode to live in and are found sleeping at railway stations, launch stations, bus stands, foot paths, under the stairs, shrines, walkways of shopping malls and other public places. Furthermore, the procedure to be applied in case all household members are absent during the time of the enumerators' visit needs to be clear. Finally, details such as the usage of specific pencils and the writing of numbers and letters as well as the correction of textboxes in a standardized manner are important for the subsequent data processing.

Census training and capacity building among enumerators and other staff involved proved to be insufficient in 2001. With two days only, the time allocated for explaining the entire census procedure was too short and did not allow for the detailed instructions needed. Furthermore, the training provided to the different groups of enumerators was not standardized and was not held in an exclusive verbatim manner. In partially overcrowded facilities with too many trainees per instructor, important information and details got lost. Finally, direct instructions in the field which is an important part of the capacity building process as it includes the demarcation of enumeration areas, was not part of the 2001 training package.

These factors have further contributed to the first key issue of omitting households and individuals in the 2001 census. In addition, insufficient practice of and instructions on how to fill in the questionnaires to ensure smooth processing with optical mark recognition (OMR) and optical character recognition (OCR) technologies, respectively, has contributed to the second key issue, the delay in data processing and dissemination.

### Staffing and budgetary issues and limited publicity

The complex hierarchy of supervision with a total of seven layers hampered the smooth implementation of the census, not least due to a lack of accountability. Throughout the entire census period, the project director changed five times and three

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[7] Each supervisor monitored the work of 5-6 enumerators.

different census commissioners were in charge. District census coordinators and zonal officers (ZOs) had to control the census proceeding in more than one area with a number of enumerators too large to supervise smoothly. Yet supervision and control would have been much needed and could have contributed significantly to the prevention of problems such as omission, duplication or the false marking of questionnaires.

In addition to the complex supervisory structure and the mismanagement in staffing, frequent revisions of the census project document hampered the timely processing of the census: Budgetary issues within the GoB manifested in a cut of finances for the census, causing various reallocations of resources and revisions of activities. All in all, the project document was modified seven times which had an adverse effect on the quality and timeliness of the census results.

Media campaigns were launched and information on the census was spread via posters, banners, the public television program and similar channels with the aim to inform the population about the upcoming count. Furthermore, announcements in mosques were negotiated with religious leaders. However, the activities undertaken were not sufficient to reach citizens throughout the entire country and to raise the necessary awareness and commitment of the population to participate in the census. The fact that parts of the population did not receive sufficient information on the census including its date and importance complicated the enumeration process and contributed to the key issue of omission and duplication.

### *Difficulties with OMR and OCR technologies*

Optical Mark Recognition (OMR) and Optical Character Recognition (OCR) are two technologies commonly used to transfer data from paper form into electronic media. OMR technology, which had already been used in the 1981 and 1991 censuses, is designed to detect the presence or absence of a mark, but cannot read the shape of a mark, neither can it recognize characters. While OMR is more accurate than OCR, the latter technology facilitates the translation of scanned images of characters into machine-encoded text. The recognition of handwriting, however, remains difficult (NCS Pearson 2004).

For the 2001 census data processing, five OMR machines were provided. However, the OMR machines were delivered by the United Nations Development Program (UNDP) in 1999 – more than one year before the actual census took place. As a consequence, the warranty period ended before the data processing started and the machines were not used due to a lack of additional funds that would have been required for use outside the contracted period. Incidentally, four OCR machines were procured in 2001 for the Economic Census. These machines were used instead, but there were problems.

The printing of census questionnaires was originally planned to be left exclusively to the GoB press. However, due to the shift in census dates and the time pressure, parts of the questionnaires had to be printed and cut externally under limited quality control. Timing marks and border marks could not be maintained due to erroneous cutting, the printing color was not adhered to properly, and the thickness of the forms was marginal. When the data was finally processed with the OCR technology, these issues as well as power cuts, database errors, a lack of sufficient training in how to use and maintain OCR machines and the delayed delivery of the necessary OCR software accounted for the delay in data processing and dissemination.

## New problems or well-known challenges?

Some of the difficulties that occurred in 2001, for instance the shifting of the census date, are unique to this specific year and census round, respectively. Other problems, however, such as the usage of obsolete maps and insufficient training were not new and had manifested themselves in one way or another in previous censuses.

Among the key reasons why these issues were not addressed even though they were understood was a lack of human and financial resources and technical capacities to implement the necessary measures for improvement. The state of the art of technology at that time played a key role. While equipment such as OCR machines and video recorders to provide standardized training existed long before 2001, the large scale application of these as required for population and housing censuses in countries like Bangladesh was not common enough for the GoB to afford or request them from external stakeholders.

## The 2011 Census: necessary and jointly sufficient conditions for success

No census is ever perfect. However, various approaches and methods can be adopted to improve data quality and achieve timely processing and dissemination – and Bangladesh did so.

Taking the critical outcome of the fourth census seriously, the GoB and its census management team committed itself strongly to making the fifth one a success. Success means to improve all features that were identified as having contributed to the difficulties in 2001 to the greatest extent possible with the aim to produce more accurate and timely processed and disseminated census data. Throughout the last decade, the GoB increasingly recognized the great value of census data and the importance of being able to answer the questions "How many are we?", "Who are we?", and "How do we live?". The GoB aspires to be in a position to resolve recurring disputes over the figures of the country's population that reached their peak after the launch of UNFPA's 'State of the World Population 2010' which estimated a total population of 164.4 million, a number that contradicts the findings of other studies and data collected (UNFPA 2010). Furthermore, the GoB seeks to be able to provide for the needs of its citizens.

The Honorable Minister for Ministry of Planning and Vice Chairman of the Executive Committee of the National Economic Council, Air Vice Marshal (rtd.) A.K. Khandker formulated the core reason for the GoB's efforts as follows:

"We need the census data so badly. We want to be sure about our population. The Government has taken up the target to become a middle-income country by 2021 and we need everything including food, health care, and education. If we have so many people, the number will be even higher in ten years and we will have to provide more to them. We can plan much better with the census results; the data will help us to achieve the target set for 2021" (A.K. Khandker, Minister of Planning, GoB, Personal Interview, 13.06.2011).

BBS Director General MdShahjahan Ali Mollahadded, "Quality data is essential to improve people's lives" (Shahjahan Ali Mollah Director General, GoB, in: The Daily Star, 20.07.2010), and UNFPA Bangladesh representative Arthur Erken confirms that "everything in Bangladesh depends on the census data" (Arthur Erken, UNFPA, Personal Interview, 14.06.2011).

To overcome the difficulties faced in previous censuses, institutional change was required. In contrary to the previous practice, BBS staff initiated a series of in-depth discussions on the census, consulted with a large number of external experts from International Organizations, Universities, and research institutions on how to improve the process, and asked data users what kind of additional information they needed. As part of the three-year preparation phase of the census, a detailed evaluation of the 2001 census took place concluding with a formulation of lessons learned.

Based on these lessons learned, the following necessary conditions were identified for a successful 2011 population and housing census: Financial and administrative support by the GoB; provision of human resources and support in the overall census implementation by BBS; preparation of digital maps by the Bangladesh Space Research and Remote Sensing Organization (SPARRSO); financial support for questionnaire printing, technical support, and procurement of the intelligent character recognition (ICR) machine by UNFPA and the EU; questionnaire design, procurement of the necessary iCADE and CSPro software, as well as training and technical support in data capturing and processing by USAID and USCB; and capacity building and advisory support by UNSD.

Real success, however, requires more than this: "This census is very important in our national life and to make this venture a success, all out cooperation from the general mass is needed", recognized the Minister of Planning, A.K. Khandker, at a press conference on 15 March 2011 (A.K. Khandker, Minister of Planning, GoB, in: The Bangladesh Daily, 15.03.2011).

The support and participation of the Bangladeshi people in combination with the GoB's commitment and the identified human, technical and financial support and innovations were defined as jointly sufficient for undertaking a successful 2011 population and housing census. The approved budget available to achieve this goal added up to US\$36.88 million – more than four times as much as in 2001. The increase in budget was a result of an increase in remuneration of enumerators and supervisors, cost related to the increase of training duration, added expenses due to printing maps and manuals, cost for added publicity and an added cost in establishing a wireless network system in BBS.

# Success factors

## Meeting the needs: census preparation and implementation

### *Improved maps*

The new maps delineated enumerator areas clearly. Developed by SPARRSO, they were based on aerial photography, scaled, location specific and covered all mouzas in rural areas and mahallas in urban areas.[8] Facilitating the timely provision of accurate maps was a special concern to the GoB to ensure that the entire country was covered during the census, including minority groups and urban populations – those who were affected most by undercounting in the previous census round. In 2011, not only supervisors, but also each enumerator received a map of the respective area as part of the census kit.

The maps are expected to have contributed significantly to reducing cases of omission and duplication of households in the census. In addition, the digital maps are

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[8] Mouzas and mahallas are two types of administrative districts in Bangladesh.

envisioned to support the quick and simultaneous dissemination of census results in hard and soft copy formats.

### *Improved training*

The training provided to enumerators was extended to three days to provide sufficient time for introducing the entire census procedure. In addition to verbatim training, a standardized training video was prepared to ensure that all relevant key facts were covered and explained in detail. Most importantly, the video included detailed demonstrations for enumerators on how to correctly fill in the questionnaires.

The video was not only shown during the training sessions, but also broadcasted repeatedly on television. This newly introduced practice had two positive effects on the quality of census data at the same time:

*"Handing the video to the media facilitated that enumerators can watch the instructions again from home. Simultaneously, those who are to be counted learn about the procedure. This enables them to prepare for the answers in advance and to point out potential mistakes to the enumerator that may occur during the actual interview situation"*

Ashim Kumar Dey, GoB, Personal Interview, 14.06.2011

A reduced number of trainees per instructor provided the opportunity for focused question and answer sessions. Most importantly, the first day of the revised training approach was allocated exclusively for introducing census staff to the respective enumerator areas in the field: "Every enumerator and supervisor will be briefed about their respective areas through using these maps", ensured the Planning Minister A.K. Khandker at the Dhaka Divisional Workshop on Census (A.K. Khandker, GoB, in: The News Today, 20.02.2011). Applying the maps in the field under supervision prior to the census increased enumerator's skills and confidence in using this tool and is expected to have contributed to further reducing the risk of omission and duplication.

AfrozaAkter, the enumerator who registered the Honorable Prime Minister of Bangladesh, Sheikh Hasina, summarized her experiences as follows:

*"The training was good and the video very helpful. The maps we received were clear"*

Afroza Akter, Enumerator, Personal Interview, 14.06.2011

## Revision of supervisory structure and staffing

In addition to improved mapping and training, the GoB increased the total number of staff supporting the census and hired 310,000 enumerators out of which 50per cent were women and 57,000 were supervisors. More intense supervision in smaller areas facilitated better management and error control. The country was divided into 130 census districts thereby providing Government officers from departments other than BBS to take a lead in the census procedure in their assigned areas. The complex hierarchy of supervision was revised to avoid confusion and increase accountability among those involved.

The employment of female enumerators followed the GoB's policy of women's empowerment. However, of even greater importance in the context of data quality is that evidence from previous censuses shows that women obtain access to households easier than men. During daytime, most men are at work and women are the ones providing information to enumerators. For security reasons, women are more likely to open the door to other women and a trustful relationship is established quicker than with men in which it is helpful in obtaining correct data. Furthermore, women were found to take fewer breaks than their male counterparts and focus on the job more thoroughly.

## Increased publicity and mobilization of citizens

To ensure citizens' awareness of and commitment to participation in the census, publicity is of great importance. As the 2001 campaign was evaluated as insufficient, increased attention was given to providing information to all people about the date and purpose of the census in the preparation phase. Based on discussions with experts and the general public and with an allocated publicity budget more than seven times as high as in 2001, information was spread through public and private television, radio, newspapers, posters and banners, brochures, booklets, leaflets and stickers. Slogans such as "Census is important for making national development plans and administration of the Government" were communicated via these channels throughout the entire country.

To reach also those who live in remote areas, speak different languages or are illiterate, songs, theater plays, and short movies were produced and presented in the respective areas with hand microphones and portable cinema equipment. Tailored campaigns for people with disabilities were prepared and published.  The cooperation of the upper class and religious leaders was used to raise awareness and to motivate the population to participate in the census.

The newly introduced measure of sending a text message to mobile phones proved to be a particularly powerful tool. The SMS with the slogan "Population and housing census from 15 to 19 March 2011. Provide information to enumerators" directly reached about 50per cent of the country's population. A second new and effective measure is the census postage stamp, which was available for public sale in post offices and inaugurated by the Honorable President ZillurRahman on 27 January 2011.

In addition to the broader use of the media and the increase in quantity of publicity products, a part of the budget was also allocated to ensure a longer duration of the campaign. An example for the practical implementation of this is the production of plastic instead of paper banners, posters and similar products as had been the practice in previous censuses.

To further ensure that those who made up the largest share of omitted cases in the previous census - minority groups and urban populations - were represented in the 2011 data, the new census questionnaire included a list with 27 minority groups to be marked accordingly by the respondent. In enumeration areas with a large share of minority group members the GoB assigned enumerators belonging to this minority group . "If the area is dominated by ethnic groups, the appointed people will be members of these communities" (Riti Ibrahim, GoB, in: Indigenous Portal, 26.02.2011).
The revision of the census campaign and questionnaire demonstrated the inclusive approach promoted and the GoB's commitment to ensure that everyone is counted.

That these measures paid off becomes amongst others evident through the statement of a female citizen from Dhaka:

*"I heard about the census through television. Many people know about the census. All my neighbors talk about it. We know that the census is important, it will help the Government to make policies to develop the country"*

Citizen from Dhaka, Personal Interview, 14.06.2011

## Improved technology and data processing methods

For the 2011 data processing, ICR technology has been applied. This technology recognizes both hand- and machine-written documents and facilitates their conversion into PDF or Word files and ensures fast data processing. The necessary software was acquired in time and tested in each and every machine in advance to avoid the 2001 scenario. Based on the experiences from the fourth population and housing census, the questionnaires for the 2011 count were printed abroad under strict quality control from BBS and USCB to ensure that ICR machines were able to read the data.

Encompassing long-term support from USCB was provided in the recruitment and training of staff involved in data management and processing. This included a number of steps such as setting up a library, supervising the cutting of census books, the usage and maintenance of software and computers, the scanning and the actual data interpretation. Furthermore, Kodak trained staff in India on how to use and maintain the scanners.

## The census moment

After three years of hard work and intense preparation, the population and housing census 2011 started with the counting of the Honorable President of Bangladesh, MrZillurRahman, at a function with external stakeholders including United Nations representatives at the zero hours of 15 March 2011. The Planning Minister A.K. Khandker monitored the counting process of floating people at Kamalapur Railway station starting at 1:00am to ensure transparency and accuracy of the process. All the years of joint intensive preparatory work put him in a position to describe the experience with the following words, "The people were very keen to provide information to the enumerators; the census constitutes a change from their routine life and they understood why it is important" (A.K. Khandker, GoB, Personal Interview, 13.06.2011). Over the course of the following five days, enumerators were sent out to count Bangladesh's entire number of households and people.

## Tabular comparison of the 2001 and 2011 census

The following table presents the key differences and improvements between the population and housing censuses in 2001 and 2011.

## Table 2: Comparison of 2001 and 2011 Census at a Glance

| | 2001 | 2011 |
|---|---|---|
| Total budget available (million USD) | 7.98 | 36.88 |
| Hierarchy of supervision | | |
| Census commissioner | 1 (Secretary, Statistics Division/ Director General of BBS = same person at that time) | 2 (Secretary, Statistics Division = Chief Census Commissioner; Director General of BBS = Deputy Census Commissioner) |
| Divisional coordinators | 8 (most senior BBS officers) | None |
| Regional coordinators | 32 (chosen by BBS senior officers) | None |
| Total number of Zila-coordinators | 119 (Class II/ Junior class I BBS officers) | 130 (Class I BBS officers / officers from other GoB ministries) |
| Total number of zonal officers | 2,478 (BBS manpower setup) | 2,612 (BBS officers/ officers from other GoB ministries) |
| Total number of supervisors/ supervisor areas | 47,678 (temporary appointed, unemployed educated youth) | 50,000 (temporary appointed, unemployed educated youth) |
| Total number of enumerators/ enumerator areas | 262,000 (temporary appointed, unemployed educated youth) | 310,000 (temporary appointed, unemployed educated youth with 50per cent women participation) |
| Training methodology | Verbatim training | Verbatim and standardized audio-visual training |
| Maps | Sketch maps from 1970's<br><br>Maps and instruction manuals were not provided to each enumerator | Newly produced digital maps based on aerial photography<br>Maps and instruction manuals were provided to each enumerator |
| Questionnaires | Printed in Bangladesh under poor quality control | Printed abroad under strict quality control from BBS and USCB staff Include a list of 27 minority groups |
| Publicity | Limited media campaign | Extended media campaign including new measures such as sms and census stamp with a budget more than seven times as high as in 2001 |
| Data processing technology | OCR | ICR |

## Evaluation of the 2011 censuses

President Mohammad ZillurRahman released the final results of the census in July 2012 and they showed the population of the country was 152.5 million people. These results were released 12 months after preliminary results were released. The timing of the release of results was a significant improvement over the release from the 2001 census.

The Bangladesh Institute of Development Studies (BIDS) undertook a post-enumeration scrutiny to determine errors in the coverage and content of the census. They found 3.97 per cent were left out of the census count.

It is evident that the 2001 census was carefully analyzed and that the identified key problem issues were addressed in the 2011 count.

During the actual census dates, the BBS continuously received feedback from ZOs, supervisors and enumerators, as well as from officers and staff members of other departments. Many congratulated the BBS and the GoB. External experts confirmed that the steps undertaken by the GoB contributed to an improvement of the census procedure which has resulted in more accurate and timely processed and disseminated data, which was the overall goal. Consequently, the 2011 census qualifies as a success.

Professor AKM NurunNabi from the Population Science Department at Dhaka University, is one out of many confirming "that the administrative and technical preparations for the census have been better than the previous censuses. New techniques and technologies including digital enumeration maps have been introduced so that every household can be identified and reached during the census" (AKM NurunNabi, Dhaka University, in: New Age, 30.03.2011). Specifically, the introduction of digital maps was identified by experts as a step forward in building the 'digital Bangladesh' (Muslim World News, 14.03.2011).

Although the measures applied have contributed significantly to reduce the problems of omission and duplication and are expected to facilitate fast data processing and dissemination, the census preparation and implementation was not entirely free of complications. The BBS still received complaints from citizens stating they had not been counted: "We came to know about the population census from the media, but no enumerator visited our house yet" said Nasim Reza, a resident of Sector 14 of Uttara in the capital (Nasim Reza, Resident, in: The Daily Star, 20.03.2011). Similar statements were also made by the country's upper class. To prevent the omission of individual persons and entire households, the BBS published contact details including telephone numbers from BBS staff. In those cases where citizens informed the BBS through this or other channels, the respective enumerator was sent back to the household, even after the official census period had ended on 19 March 2011. Frequently, it turned out that one household member had already provided the data for everyone to the enumerator but missed out on informing the other household members.

Furthermore, some new challenges emerged during the preparation phase. The delayed release of funds from some donors for instance threatened the timely printing of census questionnaires and the procurement of the ICR machines. However, continuous coordination and persuasion by the GoB led to the release of the respective funds at the last moment. Special permissions issued by the National Board of Revenue for on the spot clearance and from the Police Department for free

movement of census trucks at any time of the day successfully prevented any difficulties.

Although the available budget was more than four times as high as in 2001, the financial resources available were yet not sufficient to provide audio-visual training to each and every enumerator due to a lack of DVD-players in some rural areas and the non-availability of electricity. The solution applied to minimize this problem was to produce copies in CD format to be shown via PCs and laptops and generators and batteries were hired where possible.

## Sustainability and recommendations to other countries

Committed to foster regional dialogue and cooperation by sharing experiences, the GoB encourages countries in similar circumstances to follow the example of the preparation phase of the 2011 population and housing census.

Thinking of the future, the GoB stated clearly that digital maps will build the basis for any upcoming census and survey and as a result, they will be updated on a regular basis. The same applies for the audio-visual training approach and the application of ICR technology. Soft copies of the training manuals, supervisor manuals, the training in DVD and CD format as well as the questionnaires printed in ICR format will be retained in the country's optical library while simultaneously being made available as hard copies. All funding and administration reports are documented and stored for future interventions.

Colored copies of digital maps have proven to be a very effective tool for better delineation of boundaries and therewith the prevention of omission and duplication of households during the census count. Printing good quality questionnaires and complementing verbatim instructions with standardized audio-visual training sessions helped increase the quality of the census data and are measures that can be replicated in other countries. Introducing ICR technology for data processing is an option countries should consider to improve data processing. Finally, the involvement of Government officers from other departments and the upper class in combination with encompassing publicity campaigns proved to be very supportive in creating an understanding of the census as a joint initiative, in awareness raising and encouragement of the population to participate in the census.

Although not implemented during the 2011 census, but in line with their own planning, the GoB also recommends separating the population and housing census and conducting the operations in two phases. Undertaking the household module first and the population census in the following year – as it used to be in earlier times – would constitute an automatic control measure of enumerators and could as such contribute to an improved quality of census data.

Finally, the GoB recommends the precise documentation of all actions undertaken in relation to the census. This includes all expenses, contracts with external partners, companies and staff, experiences and feedback, discussions and others. This is vital for the monitoring of the process and the subsequent evaluation and formulation of lessons learned and best practices.

# Conclusion

In Bangladesh, data collected through population and housing censuses information on people's age, sex, disabilities, level of education, and occupation. They reveal the conditions under which citizens live including access to electricity, drinking water, and toilet facilities. As such, census data facilitate evidence-based policymaking, planning and administration, and management and evaluation of programs. Furthermore, they constitute the basis for scientific research and provide business and industry with the basic information they need to appraise the demand for goods and services.

Bangladesh is highly dependent on population and housing censuses and the information they provide, respectively. However it is challenging to collect such comprehensive data in a reliable and timely manner. This came out clearly during the 2001 census where omission of individuals and entire households lead to inaccurate census data and the processing and dissemination of the census was significantly delayed. Among the key reasons for this are the provision of sketch maps, inadequate training, insufficient publicity, a complex supervisory structure, budgetary issues, and technological problems with data processing.

Recognizing the importance of census data and its need for evidence-based policy formulation and the improvement of people's lives, the GoB committed itself to make the 2011 census a success by addressing the identified issues from previous census years to the greatest extent possible with the aim to ensure that everyone is counted and that the data is processed and disseminated in time. With financial and technical support from USAID, UNFPA, and the EU and additional advice from USCB, UNSD, and a great variety of NGOs and research institutions, the GoB provided new maps based on aerial photography, encompassing and standardized training, ICR technology for data processing, revised the supervisory structure and launched encompassing media campaigns to inform about the census.

It is evident that the overall census procedure was significantly improved and the efforts undertaken led to more accurate census data and supported timely data processing and dissemination. Based on this, the 2011 population and housing census is a success. While some old challenges remained and a series of new ones emerged, other countries are encouraged to follow the Bangladesh example.

# Contacts

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# Improving agricultural statistics to support food security in India

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## Problem Statement

The agriculture sector is quite dynamic and complex and traditional statistical systems can be limited in providing *in-season* (when the crop is still in the field) crop acreage, conditions and production assessment. Sampling techniques are not robust enough to address the inherent heterogeneity of the agriculture system.

There are several critical decision-making processes such as, trade, procurement, and disaster impacts, which call for *in-season* crop statistics. Similarly, there are urgent needs to understand the heterogeneity of agriculture ecosystems in order to maximize the productivity gains. Remote sensing and GIS add considerable value to agricultural statistics. These tools and techniques contribute to make statistics more dynamic and actionable for the critical decision making processes.

The case studies presented below from India exemplify how agricultural statistics can be more effective with the introduction of new tools and techniques such as remote sensing and GIS. The costs and benefits of remote sensing products are closely linked to the decision-making processes at various levels.

## Outcomes Achieved

Remote sensing-based Crop Acreage and Production Estimation (CAPE) were used in the 80's as an alternative to other methods of gathering and processing crop information. Using CAPE can reduce the costs of production or increase the value of the produced agricultural goods or services. Some of the key remote sensing applications in agriculture demonstrate how, if it is used strategically in well-knit institutional framework, it can help in crucial policy decisions especially in a food security context. India has a variety of remote sensing-enabled products and services, which have formed the basis to enhance the information base in agriculture and to facilitate well-informed decision-making processes for to food security issues.

Remote sensing applications today have made significant contributions in the agriculture sector in many countries. Some of the key applications such as agricultural crop forecasting, watershed management in dryland agricultural areas, improving irrigation efficiency, addressing disaster management, providing farmer's advisories and agro-meteorological services, have been helpful in the rejuvenation of agriculture. It is important to highlight that all these applications are funded by user agencies committed to realizing the respective programmatic goals in the agriculture sector. Recognizing that building up natural resources remains an important priority for agriculture and rural development in India, some remote sensing applications offer opportunity cost, productivity gains and risk reduction. These components are summarized below:

## Opportunity Cost

It is key to have the opportunity cost for dynamic and basic data on production, acreage and yields of various crops which influence many economic activities in the short-term as well as the long-term. Such data and information are used by various

players involved in transactions along and across the complex chains of value-adding activities that characterize the agricultural economy.

If basic forecasts and estimates on crop production are inaccurate, biased and subject to manipulation by interested parties, it may lead to an agrarian crisis. The sudden increase in the prices of onions in the middle of 1998, which created a major problem for the Indian government, was related toan absence of timely and accurate information on onion production.

## Details of the Practice

Accurate data on crop acreages and production at various levels of aggregation is therefore important for farmers, traders and industries involved with the agricultural sector. Timely forecasts and estimates of production, yields and acreages as well as their geographic spread and distribution are important for improving economic and market efficiencies. Forecasts, which get refined into estimates as a crop approaches harvesting, directly affect the domestic and foreign trade as well as various down-stream and upstream activities. Timely import and export decisions and trading in futures also depend on accurate forecasts of production and its link with demand. In order to address such issues, a remote sensing-based, nationwide mission called pre-harvest Crop Acreage and Production Estimation (CAPE) was launched in late 80s. Covering the major cereals, pulses and oilseeds, CAPE provides pre-harvest crop statistics with 90/90 accuracy (Box 1).

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### Box 1: Statistical accuracy of 90/90 criterion

The 90/90 criterion is statistical accuracy estimation approach that compares the total areas estimation, determined from remote sensing with that of corresponding field measurements with regards to location. Statistical accuracy considers two components: precision and bias. Precision refers to the reliability with which a certain estimate is made, while bias refers to the deviation of the estimate from true value. Precision in crop production estimation is measured in terms of the coefficient of variance (CV) of remote sensing based estimates and biased is measured as relative deviation from the standard estimates, e.g., estimates made by Directorate of Economics and Statistics (DES) of the Ministry of Agriculture, Gov. of India. The relative deviation (RD) can be expressed by RD=[(RS-Ref)/RS]*100, where RS is the estimate of the crop from remote sensing, and Ref is the standard or reference estimates.

The most commonly used statistically accuracy for crop acreage estimation is termed as 90/90 accuracy criteria. This means that only 10 percent of the estimation can deviate from the true population. The RD and CV of the estimated acreage are used to assess whether the goal of 90/90 criterion has been achieved.

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In 1998, the country lost heavily by making a late decision about wheat imports. As a result, it was felt that the country should have the capability for an objective and scientifically-based *in-season* multiple crop forecasting system, which could provide advance information on the possible shortfalls, if any, in the production of major crops.

The Ministry of Agriculture, Government of India used CAPE experiences to develop Forecasting Agricultural Output using Space Agro-meteorology and Land-based Observations (FASAL) (Box 2). Integrating econometrics, agro-meteorology and land-based observations, FASAL captures the unforeseen minor impacts of unusually high temperatures during harvesting period of the crop and it then revises the forecast accordingly and highlights the areas from where shortfalls are expected. The advantage lies in timelines, as FASAL forecasts are one-month before harvest.

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## Box 2: Using Space, Agro-meteorology and Land based observations for agriculture statistics in India

Timely availability of reliable information on agricultural output and other related aspects of the harvest are of great significance for planning and policy making particularly, in the management of concerns in areas such as food security, price stability and international trade. The information is extremely useful in identifying problem areas and the nature of required intervention in terms of spatial, temporal and qualitative inferences. However, the existing system of agricultural statistics, in spite of established procedures and wide coverage, has inherent limitations in providing an objective assessment of crops at the pre-harvesting stages with the desired spatial details.

In order to enhance the capabilities of the existing system of crop forecasts and crop estimation, the Ministry considered the introduction of technological advancements and the adoption of emerging methodologies such as Remote Sensing (RS) and Geographic Information System (GIS). Accordingly, in 1987, the Department of Agriculture & Cooperation (DAC) sponsored a project called "Crop Acreage and Production Estimates (CAPE)" with the objective of developing methodologies using Remote Sensing (RS) techniques for crop area and production forecasting. The project was implemented through the Space Application Centre (SAC) in Ahmedabad and provided the platform for development and the standardization of basic procedures, models, and software packages for crop area and production forecasting, using remote sensing and weather data. The project successfully demonstrated the national level forecast of wheat and kharif rice, in addition to making district level pre-harvest production forecasting for cotton, rapeseed/mustard and rabi sorghum in the country's major growing regions.

Besides Remote Sensing, other important inputs such as weather data, land-based observations and economic parameters influencing farmers' decisions, also served as complementary and supplementary information for crop forecasts.While crop forecasting with the RS technique required using the data when the crop has sufficiently grown, forecasting at the sowing stage is attempted through econometric and agro-met models using previous years' crop acreage and production data, market prices, current season weather data.

Thus, an approach which integrates inputs from these diverse sources was needed to make forecasts of desired coverage, accuracy and timeliness and the concept of "Forecasting Agricultural output using Space, Agro-meteorology and Land based observations", or FASAL, was devised. FASAL was approved as a central sector plan scheme and has been in operation since August 2006.

*Adapted from Agricultural Statistics at a Glance 2010 - Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Government of India*
*http://eands.dacnet.nic.in/At_Glance_2010/METHODOLOGY_OF_CROPper cent20ESTIMATION.pdf*

## Success Factors

It is important to highlight how the timeliness of FASAL forecasts can be cost effective (Box III). The FASAL forecasts are made from February to March, which is the rabi season (i.e. winter crops in India). FASAL, as an integral component of the Ministry of Agriculture, has been helpful in making decisions on import and export related matters in agricultural trade primarily by virtue of providing *in-season* multiple forecasts.

For example, FASAL's timely results of the 2005-06 season helped the country make well-informed and timely decisions about the import of 5.5 Million tonnes of wheat. It is important to highlight the following aspects of FASAL forecasts, which demonstrate how critical information support is in making major decisions:

- *In-season* information on shortfall and surpluses in agricultural production facilitate the decisions with regards to the trade, procurements, prices, and so forth;

- Information on shortfalls and surpluses in agricultural production from a particular region enable mobility of goods and services to address the issue. For example, a shortfall in wheat production in Harayana State and higher production in Bihar State are brought to the attention of decision makers for intervention;

- FASAL forecasts provide an alternate route of agricultural statistics and thus play supplementary/complementary role in the traditional system. It is however not the standalone system fully integrated with land-based and agricultural meteorology-based crop forecasting models.

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**Box 3: Forecasting Agricultural output using Space, Agrometeorology and Land-based observations (FASAL)**

This countrywide project was funded by the Ministry of Agriculture and Cooperation and executed by the Department of Space, along with various State Remote Sensing Applications Centres, State Departments of Agriculture and Agricultural Universities. The forecasting of major crops including kharif rice, rabi rice, wheat, jute, potato, mustard and of wheat, cotton, mustard, sorghum, sugarcane, at the district level, was done for 2009-10. The methodology includes analyses of remote-sensing data acquired during crop season using limited field observations for crop identification as well as the use of stratified random sampling (5*5 km land area) incorporating 15-20per cent as a sample size of population for acreage estimation. The agromet, time trend and crop simulation models were used to predict crop yields.

Kharif rice production forecasting for 2009-10, using the three-date Synthetic Aperture Radar (SAR) data for the state and national level, there was an estimated 14per cent reduction in acreage and 19per cent reduction in production, as compared to the 2008-09 forecast. The reduction was mainly due to lower acreage in the States of Bihar, Jharkhand, Madhya Pradesh, Uttar Pradesh and West Bengal due to insufficient rainfall. National Wheat production forecast (third) for the year 2009-10 carried out using Resoucesat-1 AWiFS data and LISS-III data have shown that the acreage is around 28.33 Mha and estimated production is around 81.21 Mt, which is 5.1per cent and 10.3per cent more than the second forecast for the year 2008-09.

*Source: http://www.isro.org/scripts/rsa_fasal1.aspx*

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In an agrarian economy like India, crop forecasts, which are neither objective nor timely, have many negative effects. They delay import decisions if they overestimate production and prevent exports if they underestimate production. They can also create artificial and temporary shortages that can lead to high prices. Improved crop forecasts, leading to more efficient markets, can result in more efficient decision-making process and better response to the market demands.

An efficient market is able to convert information into prices that reflect the dynamics of change between supply and demand. If conditions of shortages or surpluses are known, then actions like import and export can be handled more efficiently. As India moves into a regime of trading in the future, the role of improved forecasts and estimates of production in all commodities will become increasingly important. The opportunity cost of CAPE/FASAL forecasts, which are as accurate as 97 percent, have achieved.

## Productivity Gains

There are some unique examples demonstrating how the earth imaging satellite (EO) enabled information led to considerable productivity gains in agriculture. Illustrated below are two important EO enabled agricultural applications that led to significant productivity gains.

**Horizontal gains:** Wasteland management has been accepted as a powerful strategy for poverty alleviation, food security and environmental protection. Along these lines, the Department of Space (DOS), at the request of Ministry of Rural Development (MRD), carried out a nation-wide wasteland mapping on a 1:50,000 scale using data from the IRS. Through this exercise, the extent of wastelands in the country was estimated as 63.85 Mha.

During this period of mapping and inventory, MRD implemented a variety of wasteland development activities across the country using these databases. This is reflected in terms of a large increase in financial and physical resources. For example, the Department of Land resources (DoLR) had a financial allocation of Rs 269.81 Crore (US $60 million) during 1993-97. About 3,74,000 ha of wastelands were treated in the different parts of the country.

For the year 2002-07, the financial allocation grew to Rs 1800 Crore (US $400 million) for interventions in A, B and C categories of the land, identified in the wastelands. In addition, there are increasing physical and financial investments, by state agencies, NGOs and International Funding Organizations. To monitor the impact accrued out of these interventions, MRD sponsored yet another project with DOS called the 'National Wasteland Updation Mission' (NWUM). NWUM envisaged mapping of wastelands across the country, using 2003 IRS data, and was carried out over a period of two years during 2003-05.

The total extent of wasteland in the country was estimated at 55.27 Mha, indicating that geographical areas of around 8 Mha have been gains to diversified agriculture, predominantly agro-horticulture, social forestry, energy plantations at the cost of wastelands. This effort has helped in the diversification and intensification of agricultural activities especially in rain fed areas.

There are remote sensing based innovative operational projects in dryland areas – like participatory watershed development, integrated land and water resources management and cropping system analysis. While these projects have made significant impacts locally, most efforts are to scale up in the different parts of the country through the inter-ministerial National Rainfed Authority Programme.

By pooling the efforts of the MRD, Ministry of Agriculture and Ministry of Environment and Forest, the National Rainfed Authority intends to concentrate on enhancing agricultural productivity and halting the depletion of natural resources. Integration of remote sensing/GIS applications, as outlined in watershed development guidelines, would strengthen implementation of integrated land and water resource related activities taken up under the National Rainfed Authority, National Rural Employment Guarantee Act (NREGA), and several initiatives identified under the 'Bharat Nirman' programme (an Indian plan for creating basic rural infrastructure).

**Vertical gains:** Extensions of irrigation, genetically improved crops and use of inorganic fertilizers have been the sign of things to come for the Green Revolution in India. Depleted irrigation efficiency, water logging and salinity now characterize multi-purpose irrigated lands, which accelerated the irrigation networks of the 70's and 80's. As a result, there is a considerable gap between the potential and the actual use, which is said to be as high as 9 Mha. Thus, along with the thrust to bring in additional areas under irrigation, efforts are also needed for the optimum utilization of the land.

The temporal and spatial analysis of satellite data has helped in mapping areas of poor performance of some of the irrigation areas. The Ministry of Water Resources, in its effort to improve the irrigation use efficiency, used remote sensing and GIS in 14 large irrigated areas in five States (Andhra Pradesh, Assam, Maharashtra, Rajasthan and West Bengal), covering an area of 3.12 Mha for capacity evaluation. Subsequently, at the behest of Ministry of Water Resources, the Department of Space under took a major project to assess salinity and alkalinity affected and waterlogged areas using multi-temporal satellite data in more than 1,700 major and medium irrigation areas.

Under the Bharat Nirman Project, the Ministry of Water Resources entrusted the Department of Space with carrying out Irrigation Potential Assessment under 53 Accelerated Irrigation Benefit Program (AIBP) projects. The project a 5.45 million hectare spread across 18 States in India.

The silting up of reservoirs is a major issue and the annual siltation rate of Indian reservoirs is 1.5 to 3 times the designed value. Due to this, the reservoirs are fast losing their storage capacity. Multi-temporal satellite remote sensing data has been used to aid the reservoir capacity survey of 124 reservoirs for the Central Water Commission under the National Action Plan for Sedimentation Survey. The interlinking of rivers is yet another important aspect being discussed as a long-term measure. In this connection, the Ken-Betwa link canal was launched in the States of MP and UP. Using high resolution imaging from space and aerial platforms, inputs were provided in support of this major national initiative. It is estimated that India can add at least another 10-15 Mha under the irrigated agricultural areas if the efforts are focused and interventions made appropriately. These are the efforts leading to vertical gains in the agriculture sector.

**Gains through restoration of land capability:** The Indo-Gangetic plains of Uttar Pradesh State, the northern state in India historically the most fertile and irrigated agro-ecosystem in India, turned infertile and stakeholders became poor, after the Green Revolution period, in the mid-70's. Lack of proper drainage associated with a shallow groundwater table has resulted in water logging and soil salinity and alkalinity, over an area of 0.6 Mha.

In order to control soil degradation and improve agricultural productivity the World Bank funded the "U.P. Sodic Land Reclamation Project". This was undertaken and executed by the U.P. BhumiSudhar Nigam, supported by the Remote Sensing

Applications Centre – Uttar Pradesh (RSAC-UP) and Lucknow, which provided satellite-based information.

The wastelands maps, prepared as a part of the national wasteland mapping mission, were used to identify areas with various levels of severity - 10 districts having maximum area of sodic soils were selected from these maps.

Furthermore, based on the ground water quality reported from ground observations, villages were selected for reclamation. For actual execution and identification of plots within the villages, using aerial photography, three categories of sodic lands namely, 'C' barren sodic lands, 'B' single cropped sodic lands and 'A' double cropped sodic lands, were mapped on cadastral scale (1:4,000) for about 900 villages.

Specific physical interventions like gypsum and improvements of drainage networks were resorted to, concurrent monitoring and evaluation contributed to the success of this project in terms of reclaiming the degraded soil and restoring the productivity.

After reclamation the lands are now producing cereals to the extent of 2.6 tons per hectare and increasing family income by 50 percent, against virtually nothing before the treatment. The UP sodic land reclamation has estimated the net returns of Rs 700 Crores (US $16 million) from an area of 35,937 ha. This indicated that for 1 Mha salt-affected lands, the net returns would be nearly Rs 2,000 Crores (nearly US $450 million). Apart from good financial return and the restoration of sodic soils, the project has assisted in poverty reduction, and the increased income benefitted 2,280,000 families of small and marginal farmers.

## Benefits at a glance

- Cost of Phase I of the Project:  Rs.400 crores (US $89 million)

- Cost of remote sensing mapping, monitoring, GIS and infrastructure: 2 percent of the project cost

- Overall Economic Rate of Return (ERR) exceeding initial expectations: 23 percent

- Incremental productivity Gains from C and B lands: Rs. 70.47 Crores (US$16 million) per year
- With an average family income of Rs.6200(US $138) per year, total increase in income from the project: Rs. 99 Crores (US $22 Million).

Remote sensing and GIS inputs, while just 2 percent of the project cost, contributed significantly to the success of the project in terms of M & E activities which led to mid-course interventions.

The wasteland maps estimate there are 7 Mha saline/alkaline soils which need treatment. The wasteland maps are the only spatial information which serve the purpose of making all kinds of physical as well as financial interventions, addressing poverty alleviation, food security and ecological restoration.

# Disaster Risk reduction

Remote sensing and GIS-based products form an important component of disaster response. In India, GIS databases of the themes related to vulnerability in disaster (geographical location, administrative boundaries, status of infrastructure, land use/land cover) are assessed from remote sensing satellite data to develop usable products disseminated to the end-users (Table 1).

Satellite data captures the state of vegetation, especially the crops experiencing drought conditions. The Normalized Difference Vegetation Index (NDVI), a parameter extracted from the satellite data, indicates the severity levels of agricultural drought. The National Agricultural Drought Assessment and Monitoring System (N-ADAMS) has been operating under this parameter, since 1989, at the National Remote Sensing Agency (NRSA) Hyderabad, to provide timely information on drought severity. Under NADAMS, agricultural conditions are monitored at the state and district levels using a daily-observed coarse resolution (1.1 km) NOAA AVHRR data for the entire country and at the sub district level for Andhra Pradesh, Maharastra and Karnataka states using higher spatial resolution IRS AWiFS data (55 m).

Furthermore, drought reports are being generated regularly to assess and monitor agricultural drought at the district level for 14 drought-prone states and further, sub-district levels for three states (A.P, Karnataka, Maharastra) during the kharif season (during the south-west monsoon July-October).

This information is provided to the Department of Agriculture and Cooperation (DAC) of Ministry of Agriculture, State Agricultural departments, relief agencies and district authorities towards taking up appropriate relief measures.

It is important to highlight that with the establishment of the Decision Support Centre (DSC) at NRSA as a single delivery mechanism and interface with end-users, remote sensing ensures products are institutionalised.

Remote sensing products as listed in Table 1 form the basis for better targeting of affected populations and their agricultural assets for relief and rehabilitation. All these efforts contribute significantly to make well-informed decisions towards mid-course corrections leading to risk reduction in the agriculture sector.

**Table 1: Remote sensing products for disaster risk reduction in agriculture sector**

| Disaster Theme | Remote sensing & GIS based Deliverables | | |
|---|---|---|---|
| | Pre-Disaster | During-Disaster | Post-Disaster |
| Flood | Chronic flood prone areas/ flood-plain zoning | Flood inundation map, Flood damage assessment | Detailed damage assessment, flood control works, river bank erosion and damages |
| Drought | Integrated land and water management plans (long term plan) | Drought assessment in spatial format, damage assessment | Drought mitigation measurements |
| Cyclone | Satellite based Monitoring input to forecast models | Impact assessment | Detailed damage assessment |

# Key messages/Recommendations for others

Remote sensing and GIS address some of the critical inadequacies in traditional agriculture statistical systems. These new tools and techniques capture the dynamics and vulnerability of agricultural systems, and thus provide information which is critical for decision-making at various levels. Although remote sensing-enabled information products and services in agriculture have been found to potentially yield tangible benefits, the gain from better information depends not only on the quality of information, but also on how it is used and disseminated. For example, improved information on various aspects of agriculture will have greater potential to mitigate future losses if information is made available in a way that encourages government, private individuals and businesses to act on the information. This is exactly what has been demonstrated in a variety of agriculture related remote sensing applications in India.

First of all, remote sensing enabled information has been demand driven, owned and funded by the end-users. For example, there was a demand for the information with regards to timely *(in-season)*, precise information (within the range of 90/90 criteria of accuracy) with broad coverage (at country/province/district level) of crop statistics for making policy decisions. The use of remote sensing and GIS have the ability to respond to this demand and facilitate a well-informed decision making process. There have been similar experiences in case of land and water resource management to enhance the productivity gains and to reduce disaster risk in multi-hazard areas.

Second, there is an institutional arrangement in place enabling this to happen. The institutional arrangement like the end users (Ministry of Agriculture and Rural Development in the case of India) and specialized agencies (e.g, the Directorate of Economics and Statistics and Space Applications Centre) worked jointly with the strong networks of key experts and institutions following the program implementation strategy and protocol, which were later institutionalized in the form of FASAL).

Third, remote sensing inputs are meant to be integrated with other information for value addition to translate them to 'action' on the ground. Remote sensing and GIS are not stand alone. While remote sensing is a source of primary data, GIS is software to integrate this data with related statistical information. It is therefore important to recognize that unless these tools and techniques are integrated appropriately with conventional statistical systems they may not be effective to produce 'actionable' information.

Fourth, it is important to recognize the nature of roles that remote sensing enabled products and services do play, such as, catalytic, enabler or facilitator. For example, agricultural statistics and remote sensing data are used for stratifications to design effective sampling strategy. It's a catalytic role. When remote sensing data is integrated into the crop production forecasting models, it's the enabling role because it's the primary source of the data. Among the various data used for decision making, remote sensing data complements/supplements in order to fill the information gaps. This is facilitator's role. It's important to recognize these roles in the more specific context by the decision makers to harness the tangible benefits.

# Feedback and Sustainability

Case studies drawn from India exemplify all these aspects: FASAL's timely forecasts on the shortages and surpluses of crop production have been found helpful to facilitate a well-informed decision making process on wheat imports and thus demonstrated a unique example of opportunity cost. An inventory of wasteland

dynamics at village and watershed levels enabled physical and financial interventions leading to 'horizontal gains' not only in terms of productivity, but also by building natural resource assets for highly diversified agriculture at the cost of environmentally degraded wastelands.

Diagnostic analysis of irrigated areas not only helps in filling the gaps between the created and realized scenarios of water resources, but also, enhances the 'vertical gains' to agriculture. Monitoring of salt-affected areas is only 2 per cent of the project costs of rebuilding ecosystems.

Remote sensing products enable enhanced incomes to the small and marginal farmers from participatory watershed development. It assists in risk reduction due to the floods and drought by targeting the affected population and their damaged agricultural assets. The value added to remote sensing products with cadastral level geo-referenced land records enable the community to be reached directly for beneficiary oriented development of natural resource development programs.

From India's experiences of remote sensing applications in agriculture it seems clear that while indirect and direct gains are substantial, in the long run the economic gains will outweigh the costs of using remote sensing products many times over.

The gains have yet to be fully seen in terms of making agricultural statistics more efficient, effective and evidence-based for a complex and fragile agriculture sector. Furthermore, the process allows India to build up natural resources, strengthen social and environmental capital, as well as livelihood assets, and present the information which links market forces with agricultural outputs.

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# Surveying a Hidden Population: Uncovering Hard Drug Use in Nepal

*Saroj Prasad Aryal and Nebin Lal Shrestha*

## Problem statement

As drug use shifts from cannabis to synthetic substances, drug control has become a serious challenge for the government of Nepal. Due to the shift in use, a lack of reliable statistics on the size and characteristics of hard drug users was an obstacle to formulating effective policies and programs.

Prior to a survey done on hard drug users conducted in 2006, there was little to no information on this hidden population, not only because it is a relatively new problem in Nepal, but also because of the inherent difficulty of collecting information on a population of people partaking in illegal activities. These types of groups tend to be hidden within society, and thus, remain without help.

## Outcome achieved

Based on the clear and urgent need for reliable statistics on hard drug users, defined as those using all forms of synthetic opiates and chemical substances that are treated as illicit drugs by law (e.g. Cocaine, Heroin, LSD, Morphine, Buprenorphine, Propoxyphene etc.), as well as those who inhale adhesive substances, Nepal's Central Bureau of Statistics (CBS) successfully developed and conducted a survey, for the first time, on hard drug users in 2006 upon the request, and in close collaboration with, the Ministry of Home Affairs (MoHA).

The outcome of the survey was twofold: The survey not only benchmarked the total number of hard drug users in the country for the first time, but also revealed key statistics on the users. As a result, the information collected in the survey formed the basis for drug control policy and program formulation.

Survey results estimated Nepal had approximately 46,309 hard drug users mainly between 15-29 years old with the first drug use occurring at 15-19 for more than half (53.4per cent) of respondents. A third (31.5per cent) had taken drugs for 3 to 5 years and 76.2per cent took drugs at least twice a day. Of those taking drugs, only 14.4per cent were attending school and 51.4per cent had some work. Only 29.7per cent of drug users were married, but 79.5per cent had a family, most living with both parents. Disturbingly, 29.0per cent admitted to sharing needles among other drug users and only 21.1 per cent had ever visited a rehabilitation center.

Importantly, it was found that 40per cent of the respondents wanted free rehabilitation treatment and 37per cent said employment opportunities would increase their chances of not doing drugs. These two findings helped to identify underlying social and economic issues. After learning this, the government mobilized police forces and non-governmental organizations; both national and international, to focus more on drug trafficking and drug users. The government, mainly the Ministry of Home Affairs, turned their focus on increasing employment opportunities. Based on the survey results, the ministry has identified the intensity of the drug-affected areas and has targeted groups with programming. Accordingly, several awareness programs have been carried out about the harms of hard drug intake and several rehabilitation centers have been opened.

The survey also provided an ideal opportunity for the CBS to train and increase in-house technical capacity. During the eight-month period of the survey development and implementation, e.g., survey methodology development, questionnaire designing, instruction manual writing, interviewer training, data processing and dissemination, CBS staff members were actively engaged and appreciated the opportunity for professional development. They also expressed their readiness to take on similar or more advanced tasks.

## Details of the practice

### Objective

The purpose of the survey was twofold: To estimate the total number of hard drug users in Nepal and to produce reliable statistics on the characteristics of hard drug users such as age, sex, education, age at first drug intake, frequency/duration of drug use, money spent on drugs, etc. in order to come up with proper policies and actions for the government.

### Area covered

The survey covered 17 municipalities from the 15 districts that are spread over the five development regions of Nepal. These areas had been previously identified by MoHA as drug affected areas of Nepal based on their drug monitoring system.

**Table 1: Sub-national divisions of Nepal**

| Development Region | District | Municipality |
|---|---|---|
| Eastern (EDR) | Jhapa | Damak + Mechinagar |
| | Morang | Biratnagar |
| | Sunsari | Dharan |
| Central (CDR) | Parsa | Birgunj |
| | Makwanpur | Hetauda |
| | Chitwan | Bharatpur |
| | Lalitpur | LalitpurSub-metropolitan City |
| | Bhaktapur | Bhaktapur |
| | Kathmandu | Kathmandu Metropolitan City |
| | Kavre | Banepa |
| Western (WDR) | Kaski | PokharaSub-metropolitanCity |
| | Rupandehi | Sidarthanagar + Butwal |
| Mid-western (MWDR) | Banke | Nepalgunj |
| Far-western (FWDR) | Kanchanpur | Mahendranagar |
| | Kailali | Dhangadhi |
| Total | 15 districts | 17 Municipalities |

### Domain of estimation

The estimates relate to all of Nepal and have been derived from the main nine major drug affected districts (Jhapa, Morang, Sunsari, Parsa, Makwanpur, Chitwan, Kathmandu valley, Kaski, Rupandehi).



**Study Districts of Hard Drug Users (2006), Nepal**

Map Source: Survey Department, DLGSP/MLD

Prepared by: Central Bureau of Statistics
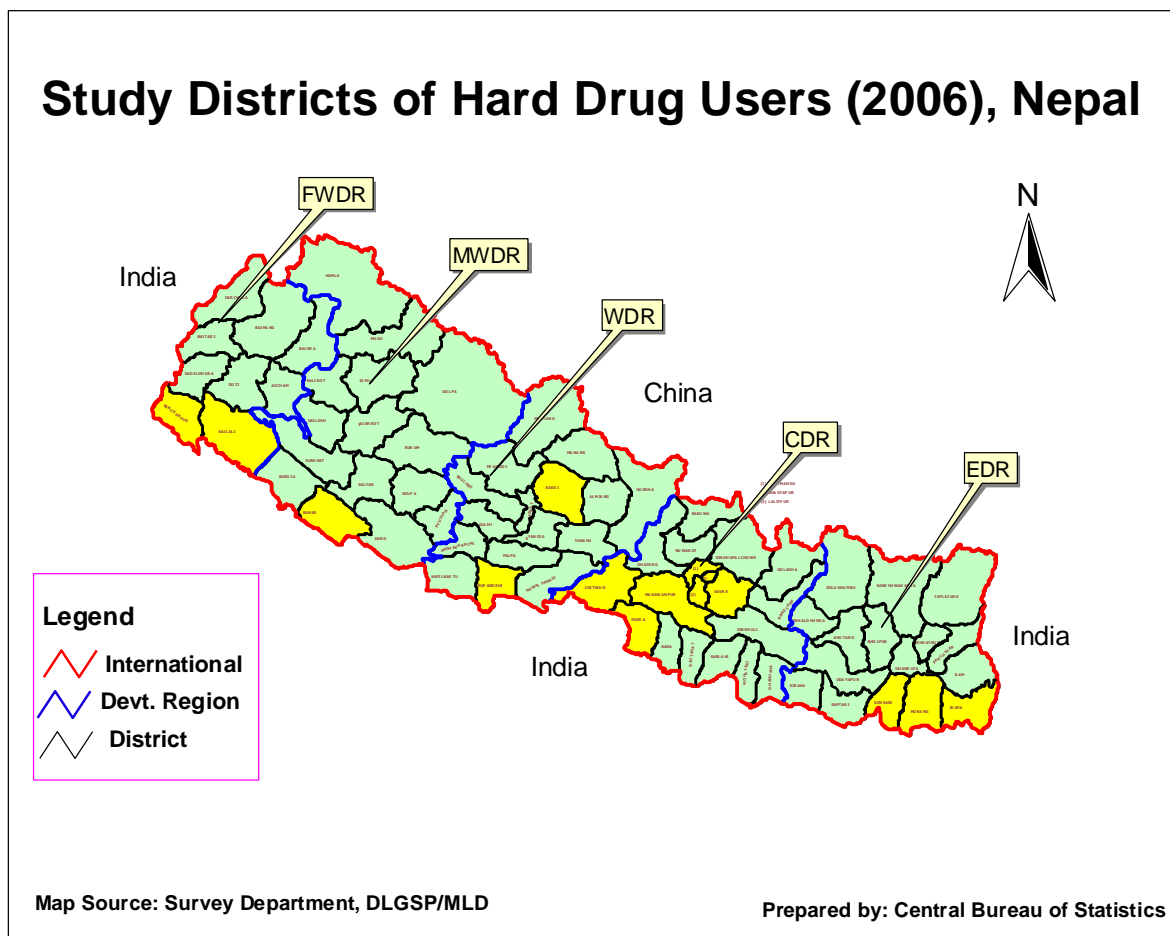
## Executing agency, implementing partners and actors involved

The executing agency was the MoHA along with the implementing partner, CBS. Other actors involved included, but are not limited to, the Department of Drug Administration, rehabilitation centers throughout the country, the Association of Rehabilitation Centers.

## Timeframe

January 2006-August 2006 (8 months)

## Total cost

The total cost of the survey, funded through the CBS, was US$24,000, which included developing the questionnaire, printing the questionnaire and field manuals for interviewers to take with them, as well as the training of the interviewers and taking care of travel costs and daily allowances. Interviewers were staff members of the CBS trained by senior statistician officers. The 33 branch statistical offices were also mobilized in the effort.

## Methodology

The Multiplier Method of indirect estimation technique was applied. The Multiplier Method has two elements in common: The benchmark and the multiplier.

The benchmark (B) used was the data source that captured the number of hard drug users who are under treatment in the rehabilitation centers in the reference year. This data was obtained through phone calls to the rehabilitation centers that then shared the contact details of past patients.

The multiplier (M) used was an estimate of the proportion of current hard drug users who have experienced the event recorded by the benchmark, i.e. the proportion of such drug users who have been in treatment in the rehabilitation centers in the reference period. This information was obtained independently of the benchmark data. The inverse of that proportion is the multiplier (M), which is an indirect estimate of the proportion of the total population of the hard drug users represented in the benchmark data.

The prevalence is calculated by multiplying the benchmark by the multiplier (B x M). Hence, N = B x M = B x (1/p), where N is the total number of hard drug users and p is the proportion of the hard drug users who have visited the rehabilitation centers in the reference period.

## Data source

For the survey, those who had been treated in the drug rehabilitation centers within the country in the specified reference period were completely enumerated by information obtained from the treatment centers and kept as Benchmark Data. The independent random spot interviews of more than 1,300 current hard drug users from different parts of the country were also carried out. Through this, rehabilitation center, visit rate, relapse rate and other characteristics of hard drug users were established. By combining this information, an estimate of the total hard drug users in the country was established.

With the help of the outreach workers of the rehabilitation centers, it was possible to interview the current hard drug users.

## Sample size

In each of the selected areas, the sample size for the interview with current hard drug users was fixed at **100** respondents. This number is derived with following assumptions:

Estimated proportion of drug users visiting rehabilitation centers = 7per cent
Margin of error in estimation = 5per cent, and

Level of confidence = 95per cent

The total achieved sample size was 1,319.

## Success factors

### Methodology

The Multiplier Method of indirect estimation technique was applied to estimate the total number of hard drug users. The method is considered one of the statistically valid indirect ways to estimate hard-to-reach populations such as drug users, sex workers or other hidden groups of people which no qualitative survey can estimate.

### Fieldwork, resource mobilization and coordination

- Vital support was received from the rehabilitation centers in that they provided benchmark data and arranged spot interviews with current hard drug users;

- Provision of incentives to the respondents for participating in the interview (US$2.5/respondent)was another factor that contributed to success;

- Few but well-trained interviewers were deployed to conduct the field work so that the survey would be completed within budget but to high quality standards;

- Monitoring and supervising the mechanism of interviewers ensured effectiveness;
- Pilot survey and effective interaction with stakeholders before the finalization of the survey methodology, questionnaire and execution validated the survey. The rehabilitation centers provided baseline data, and an expertise from their day to day interactions with this otherwise hidden group of people. Previous to the survey, there were few rehab centers spread over 15 districts. Now the RCs have expanded to more than 100 spread over 35 districts, which will all be included in the second round of the survey as benchmark data. Questionnaire wording, flow and some concept definitions were updated after the pilot survey, for instance, the characteristics by each type of drug were changed as well as the characteristics of the 'age at first intake' criterion;

- Supporting outreach workers working in the rehabilitation centers for ensuring availability of the hard drug users for interviews enabled the process.

## Challenges and solutions

Conventional survey methodologies, e.g., general household or population surveys, are not considered suitable to estimate the prevalence rates of hard-to-reach hidden populations such as hard drug users, commercial sex workers and homeless people for the following reasons:

i. Sampling frame is not usually available and is unrealistic to construct
ii. Due to the low prevalence rates in relation to the total population of the country, it may require a larger sample size and therefore more resources

iii. Respondents may not be willing to respond due to the sensitivity of the subject in the household survey.

Such biases are likely to result in an underestimation of the population size. Hence an alternative approach of estimation technique is necessary to produce more realistic data. The challenge was to include and represent hard-to-reach populations as accurately as possible. Household surveys have been observed to underestimate such populations and their characteristics. Therefore a new methodology, the 'Multiplier Method', was selected to estimate the total number of hard drug users in Nepal.

To validate the selection, CBS worked closely with various stakeholders including rehabilitation centers while gaining knowledge of hard drugs, their use, patterns and different methodologies that could be applied for estimation. A pilot study was conducted and confirmed the selection of the methodology.

Another challenge faced by CBS was the unwillingness of the respondents to publicly speak, which hampered the data collection process. Therefore, the interviewers were instructed to build a good rapport with the respondents to encourage openness. Unwillingness to respond due to the sensitivity of the subject was overcome by conducting spot interviews by trained interviewers ensuring confidentiality of the responses. As a further incentive, respondents were offered US$2.5 per spot interview. The survey was accomplished within the allocated budget.

## Recommendations for others

### Methodology

- Traditional household surveys should not be selected to estimate hard-to-reach hidden populations mainly because respondents may not be willing to respond to drug related questions in the household survey questionnaire due to the sensitivity of the subject;

- No qualitative survey can estimate the total number of hard drug users which can be generalized to the entire population;

- Indirect techniques of estimation should be applied depending on the possibility of data for benchmark;

- Survey methodology and questionnaire should be finalized in close collaboration with stakeholders and a thorough pilot study.

### Fieldwork

- An incentive mechanism may be necessary for respondents to accept interviews in order to obtain reliable data;

- Interviewers should be well trained about the questionnaire and handling interviews with hard drug users;

- Strong monitoring and supervision mechanisms for interviewers should be implemented during the data collection stage;

- Sufficient budget should be allocated for the survey. However, the total cost is expected to be much less than that of a household survey.

## Statistical capacity of NSO

- The National Statistical Office (NSO) should be involved in conducting the survey because of its technical capacity;

- Strong coordination mechanisms should be in place among National Statistical Office and stakeholders;

- Training for NSO staff on indirect techniques of estimation, if necessary, should be conducted. For training, the core team members of CBS updated their knowledge on estimation techniques through a literature review. This knowledge was then passed on to their subordinate staff. Interviewers, CBS officials who are experienced in data collection, were specially trained by CBS core members for five days on the questionnaire and the handling of interviews with current hard drug users, with an emphasis on confidentiality and creating a safe environment for the interviewees to willingly speak freely.

## Future plans and sustainability

The survey is cost-effective, as the money spent built a strong foundation for future surveys to build on the acquired knowledge and will enhance future efforts to collect information on drug users. For instance, staff trained to do the interviews can go out again using the same questionnaire and results will be compared over time to show how the situation is changing.

Upon satisfactory completion of the survey in 2006, MoHA has requested and approved funding for CBS to conduct the survey again in the fiscal year 2011/12 in order to monitor changes in levels and patterns of hard drug users across Nepal. The same data will be collectedas the survey conducted in 2006, thus allowing comparison over the five-year period. This will provide further evidence on the effectiveness ofdrug control policy and program formulation.

## Feedback from beneficiaries of the practice

The Government and other organizations highly appreciated the survey results for their reliability, validity, simplicity, timeliness and cost-effectiveness as Nepal does not yet have an administrative data management system for data on hard drug users in the country. The Government disseminated the results to numerous stakeholders for mobilizing human resources as well as mitigating the problem.

## Contacts

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# Part III: Bringing Statistics Closer to Users

Improving an age-old practice: Statistical Yearbook of the Maldives
*Aishath Shahuda*

An App for that:Visualising NSO data on handheld devices
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Localizing the Millennium Development Goals:
The Community-Based Monitoring System
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Data and privacy:Increasing access to information for research and
policy development in Vanuatu
*Simil Johnson*

# Improving an age-old practice: Statistical Yearbook of the Maldives

*Aishath Shahuda*

*"The special role of yearbooks: In addition to giving a summary of – and an introduction to - national statistics, a yearbook also has a central secondary function:*

*Yearbooks play an important role in the sense that they are part of the nation-building strategy or process. In the same way as national symbols like flags, national days, national monuments and national airlines, yearbooks symbolize and help shape national unity, integration and identity.*

*In many ways a statistical yearbook represents the tip of the dissemination pyramid, and one of the functions of this kind of flagship is also to present (and represent) the nation state and the publishing institution and to increase their visibility and public recognition."*

User-friendly presentation of statistics; Guide to creating and dissemination strategy and dissemination guidelines for developing and transition countries; PARIS21- Statistics Norway 2009.

## Problem statement

Before the introduction of the *Statistical Yearbook of Maldives* in 1980, there was no single source for official statistics in the country. A decentralized statistical system was a barrierto accessing data for policy makers, international agencies and the general public.

In July 1980, the *Statistical Yearbook of Maldives* was established as a separate section of the national statistics office within the National Planning Agency. Since then, the agency has evolved – in2008 the planning agency became the Department of National Planning within the Ministry of Finance and Treasury – allthe while producing the most important and widely used publication of the agency.

While most countries now have statistical yearbooks in one form or the other, the importance of this basic and reliable publication cannot be diminished, particularly for statistical organizationsthat are still developing their methods. Yearbooks vary from one country to another, in the amount of information and areas covered, to the level of disaggregation provided. Much can be learned from the processes and methods involved in the production of yearbooks.

## Outcome achieved

Over the past three decades, the content and quality of the Maldives yearbook has improved substantially. Today it is considered the most comprehensive source of national statistics and is the most widely used statistical publication in the country.

The *Statistical Yearbook of Maldives* is a trusted source for easy access to national statistics for policymakers and the general public. The first issue of the *Statistical Yearbook of Maldives*, published in 1980, contained only 99 tables. Twenty years later, the 2010 issue -released on the first World Statistics Day in the presence of the President of the Republic of Maldives – addressed 18 areas of the economy and has nearly doubled the amount of tables to 176, along with many graphical presentations. The coverage of data has been broadened and data published in previous years is revised. The launch of the yearbook was shown in a nationwide telecast.

Keeping up with the times, and with the intention of providing easy access to statistics for users, the tables published in the *Statistical Yearbook of Maldives* have been made available free of charge on the website (www.planning.gov.mv). The publication is also available on CD-ROM.  A *Statistics Pocketbook of Maldives* and a leaflet, *Maldives in Figures,* are produced together with the yearbook, to provide a variety of products that cater to different audiences.

Historical data 1980 to 2009 is available in the *Statistical Archive of Maldives* on the Department's website.To reach a wider audience, statistics are being made available via SMS and a 'statistics corner' opened at the national library in October 2010.

With the regular availability of national statistics and easier access, the use of data by government agencies, public and international agencies have increased. Publication is only possible through the timely and valuable contributions of the data producing agencies, including all atoll offices and island offices.

## Details of the practice

The main objective of the yearbook is to provide easy access to statistics for users and act as a single source where users can gain access to all areas covered by the statistics office.

### Areas covered

National, sub-national (atolls and islands) divisions of the country.

### Executing agency, implementing partners and actors involved

The Department of National Planning is the executing and implementing agency for this work. All the related line ministries producing statistics, as well as atoll and island offices, act as partner agencies.

### Timeframe

The data collection for the publication usually starts in February and ends by September (approximately seven months). The book is published on the Department's website as soon as the tables are completed. The hard copy is published and made available around October.

In some years, publication and distribution of the hard copy is delayed. In 2010 the pocketbook was not published due to extensive delays at the printers.

## Total cost

Printing of the *Statistical Yearbook of Maldives 2011*: Yearbook, Pocketbook, CD_ROM cover and *Maldives in Figures* leaflet cost 104,563 Rf, (US$6,781) as shown in Table 1.

**Table 1: Printing costs of Statistical Yearbook of Maldives 2011**

|  | Quantity produced | Cost (Rf) | Unit cost (Rf) |
|---|---|---|---|
| Yearbook | 400 | 80,396 | 201 |
| Pocketbook | 400 | 18,380 | 46 |
| CD-ROM cover/pocket* | 400 | 3,320 | 8 |
| Maldives in figures (leaflet) | 400 | 2,467 | 6 |
| Total |  | 104,563 |  |

\* CD-ROM costs 5rf  & printing on CD is not included here
Note: exchange rate is 15.42  Rf per US$1 (April 2011)

Printed copies of the *Statistical Yearbook of Maldives* are sold for 150 Rf and the CD-ROM for 75 Rf at the counter of the Ministry of Finance and Treasury. Internet users can download the electronic copy from the website ([www.planning.gov.mv](www.planning.gov.mv)) for free. The accompanying leaflet *Maldives in Figures* is provided free with each purchase of the yearbook.

Hard copies of the yearbook are distributed complimentarily to national agencies, including various government offices, island offices and international agencies.

## Overview of the yearbook

A great accomplishment in 1980, has improved with time. The structure, coverage and presentation of the Statistical Yearbook have evolved in response to user demands and as technology improved. The 2010 publication is divided into five main parts: Summary statistics, tables categorized by sectors, a statistical archive, island-level basic indicators and additional information to guide users on regulations and what is available elsewhere.

Statistical tables are categorized by 17 main areas or sectors. The following are sectors used for grouping related statistical tables: Geography, Environment, Population, Housing, Employment, Health, Education, Law and Order, Fisheries and Agriculture, Tourism, Transport and Communication, Electricity and Water, Public Finance, Money and Banking, Foreign Trade and Balance of Payments, National Accounts, Price, and Public Investment. The contents pages at the beginning of the yearbook list the tables provided in the printed version as well as in the CD-ROM version.

The yearbook starts with a section on summary statistics and graphs categorized by these sectors, covering a period of 10 to 15 years, to provide users with the longer-term trends in the key statistics and indicators in a snap-shot. In addition, 1990 is also shown, because it is the base-line year for the MDGs. The MDG indicators are given as a separate indicator sheet in this section to give special focus on the monitoring and progress of MDGs in the country. This section is printed in color to make it more attractive.

The section that provides tables by sector also provides selected graphs. In the 2011 publication an additional page has been added at the beginning of each section that provides selected graphs and some text on the statistics. This page is also printed in color to make it more attractive.

At the end the publication, it is indicated that information on statistical publications is available on the website of the Department of National Planning, along with statistical publications of other line-agencies of the government, links to websites of selected local and international agencies and the full text of the statistical regulation of the Maldives.

The statistics publication and dissemination section of the statistics division, in charge of the publication, prepares formats for existing tables by creating space to add data for the latest year, while keeping the data for the past year, and removing data for some of the previous years, depending on the format of the table. These formats are prepared in Microsoft Excel.

Each year additional tables have been identified to widen the coverage and improve the content of the publication. Formal letters are sent as data requests and table formats are emailed to data providers; soft copies are received through email. In order to improve the coverage of the respective sectors, when the data request is sent, data providers are requested to provide additional tables as well as data that is disaggregated at sub-national levels as much as possible.

As very few additional tables come from other data providers, in recent years formats for new tables are prepared by the statistics division and sent with the data request at the beginning of the year. The new tables are targeted to capture the new developments taking place in the country and in respective sectors. For instance, in the 2011 yearbook a completely new sector called 'social protection' was added, with the introduction of new social protection benefits and schemes in the country. As the completed tables are received at the statistics division, data verification, consistency checks and formatting work begins. Graphs and layout are done by the Department of National Planning (DNP). Revisions to the previous year's data are indicated in the following year's publication and footnotes indicate revisions and in some cases revision dates are given.

To keep the cost of publication low, the design of the book is handled by the statistics division team using Adobe InDesign. The cover design focuses on an important statistical theme and the graphical presentation is explained in detail with accompanying data on the inside of the cover. The whole process is carried out by the staff of the Statistics Division of DNP. Only the printing is outsourced.

For additional information on the process, please refer to the flow-chart detailing the process of the statistical yearbook production and dissemination in Annex 1.


## Success factors

Buy-in from data providers and users has been essential to collecting data from various producers. For many government agencies in the Maldives who are producing statistics, the yearbook serves as a platform whereby they can publish their statistics and disseminate them widely.

Making the yearbook available in different forms (hard copies of the publication, indicator sheets, CD-ROM, online) helps to reach a wider audience. Also, the regularity of the publication is of utmost importance for success from year to year.

## Challenges and solutions

Delays in getting the data from some sectors is one of the main challenges in the Maldives. This is partly due to time required to transmit data from the islands and atolls to the line ministries and for compiling and verifying the data. Inconsistencies in data received and obstacles in verifying and receiving corrected tables add to the delay.

To address this challenge, meetings are held with relevant government agencies and members of the *National Statistics Coordinating Committee* on the importance of getting timely data. However, due to limited number of statistical staff working in most of the line-ministries, limited skills, high staff turnover and low prioritization of statistics work are barriers to progress.

The proposed solution is to increase statistical staff in government agencies and establish statistical units in those offices that do not already have one. The unit would then place officers at the atoll/island/city councils and the seven sub-regional government offices within the atolls.

Work is underway in developing a system for collecting basic statistics at the island level. Options are being explored to develop templates using *DevInfo* software. The statistics division, with support from UNICEF, has developed *MaldiveInfo*, containing several indicators on the country at national and sub-national levels. The program is used and promoted as a data dissemination tool. Options will be explored as to how the data for the statistical yearbook can be collected using such templates.

In terms of the aesthetics of the publication, DNP needs to explore software options that will be easy for the statistics team to use. *InDesign* is a complex program for people who are not graphic designers and creates issues when transferring spreadsheets of data. In this regard it will be useful to learn from other statistical agencies.

Considering low-levels of statistical literacy among the majority of policymakers and the general public in the Maldives, we do not get clear answers on user needs. Many users are not sure what they want. Even so, the need to make our publications more user-friendly is recognized and DNP continually seek ideas for improvement.

## Recommendations for others

A statistical yearbook as a regular publication of consise, but comprehensive statistics, is a valuable dissemination tool. It serves as an introduction to national statistics, by guiding the users to where more detailed statistics can be found. Yearbooks are also a means to promote the visibilty and credibility of the statistical office.

Seeking user feedback and making statistical publications as user-friendly, non-technical and widely available as possible, will help make the publication a success. Some user-friendly publications we have encountered  include:

- *This is Norway -What the figures say* (Statistics Norway)
- *Denmark in Figures 2010* (Statistics Denmark).

Guidance on user-friendly presentations of statistics is found in the PARIS 21 and Statistics Norway 2009 publication, *User-friendly presentation of Statistics: Guide to creating a dissemination strategy and dissemination guidelines for developing and transition countries*, which can be downloaded from the PARIS21 website.

Coordinating with other statistical agencies in the government and making the publication available free of charge are two other components of the successful practice that should not be overlooked.

## Future plans for sustainability

There is still room for improvement even with yearbooks that have been published and perfected for decades. In future publications, we plan to include explanations below the provided graphs and include new tables on emerging issues. Furthermore, we aim to provide more disaggregated data at the island level to support national planning in the new, decentralized government operations

It is intended to grow the number of users from the general public, including students, while also appealing to policymakers with information on indicators to monitor sectoral and national development goals.

There is a proposal for a new product, which gives a small write-up on the important aspects of the yearbook, to be published together with future  issues. Achieving this will depend on the availability of qualified staff with analytical and writtenskills. Ultimately, there is a need to increase the capacity of the Statistics Division of the DNP in this regard, which will require focussed staff training.

It is planned to introduce a new quarterly statistical publication this year to provide up-to-date data to the public. At present a number of statistics are collected for the production of the monthly leaflet *Maldives at a Glance* and for *Key Economic Indicators*. In addition, separate tables and write-ups are done on the Consumer Price Index  by the price statistics unit. It is planned to prepare a publication using this information and get additional information available on a monthly basis to develop this new publication.

## Feedback from the beneficiaries of the practice

During the statistics day celebrations of 2010, a statistics fair was held for the general public with participation from all related line agencies.  In conjuction with displays of statistical publications, feedback forms for the *Statistical Yearbook of Maldives* and the DNP website were distributed, with prizes awarded to lucky winners among those providing feedback. This led to useful feedback from visitors to the fair.

Most feedback asked for more information in every form, for example, through giving explanations of what graphs show, more presentations and animations, more data on youth, and the inclusion of private sector statistics. There were also useful suggestions to enable users to ask questions online, and make things fun through quizzes and games.  Feedback was received from students, government officials, private sector and other users. The yearbook and statistics on the website were mainly used for research projects either for school or work.

Work is underway to develop a new website dedicated solely to statistics, which is easier to search by topic and with linkages to websites of other major data producers.

At present, the DNP website is used: [www.planning.gov.mv](www.planning.gov.mv), where the *Statistical Yearbook of Maldives* and also statistical archive is located.

## Contacts

The contact for the statistical yearbook and this paper is Aishath Shahuda([admin@planning.gov.mv](mailto:admin@planning.gov.mv)).

# An App for that:
# Visualising NSO data on handheld devices

*Urtnasan Enkhbold*

## Problem statement

Enabling easy access to statistical data and information for all potential users –general public, government officials, private sector, civil society, etc. – hasalways been a priority for the National Statistical Office of Mongolia (NSO). Historically, the NSO has met this demand through the *Mongolian Statistical Yearbook*, published annually for 51 years and made available online for the past13. But, in this age of handheld devices and applications, we realized it was time to upgrade.

In 2010, *ErdemTugeehTuv*, a local NGO, conducted a user's satisfaction survey with statistical products and services among 500 respondents selected from businesses, universities, international agencies. It was found that only 46 percent were happy with the statistical information services available to them. Along with the reported dissatisfaction, respondents expressed the need for data right at their fingertips.

## Outcome Achieved

The production and dissemination of official statistics must help the users from government officials to the general public, make informed decisions. There is a paradigm shift in the dissemination of information and the way it is used. While hardcopy publications remained a dominant mode of statistical data dissemination through to the end of 1990's, now more and more the NSO is turning to electronic media, such as the Internet and email lists, to make information accessible and accessed.

Adapting to the times, to improve and increase the number of possible ways to disseminate statistical data, the NSO commissioned Mezorn, LLC to develop a data visualization application for mobile phone subscribers, supported by the Ministry of Finance of Mongolia. As a result, in 2011 the NSO ushered in the new decade with an iOS system-based (iPhone or iPad) application called *EzStat*. The application provides information by theme: Macro economy, population, social statistics, industry, education, science, technology, judicatory, environment and business register (Figure 1).

Currently, iPhone, iPad and iPod Touch users can access the statistical data from the NSO in the format that suits their needs (Figure 2).



Figure 1: Main Subject Areas: Macro country, demography, manufacturing, science and tech, Judicatory, environment and business
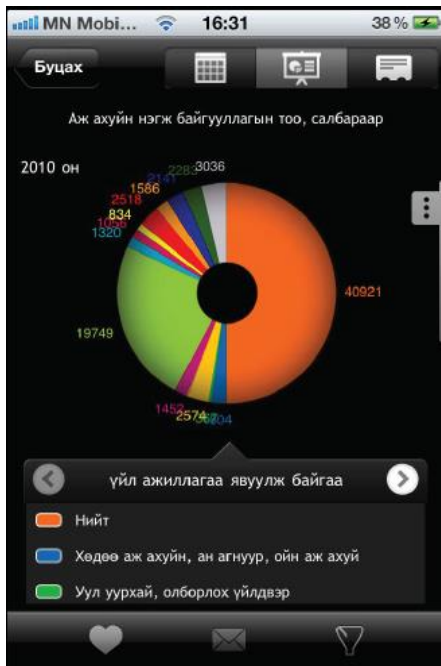
Figure 2: The number of enterprises in Mongolia by economic sector as pie chart

According to the market research report from MobiCom Corporation, the largest mobile phone operator in Mongolia whose network points cover 90per cent of the Mongolian territory, the number of iPhone and iPad users in Mongolia rose to 16,000 at the end of July 2011. In eight months, after the first launch of the *EzStat* application, 4,000 people – a quarter of iPhone and iPad owners, have downloaded the application from the App Store and the number of users is increasing continually.

The application is user-friendly and makes reliable, up-to-date, easily-understood and interpretable information available at all levels of society so that everyone can be informed. The initiative has enabled researchers and analysts from government ministries as well as civil society and non-governmental organ-izations to participate more effectively in policy development and the decision making process with information only as far away as their phone.

*EzStat* is currently being used by Mongolian parliamentarians, inter-national organizations, government agencies, students, researchers, enterprises and the general public.

## Details of the practice

The Ministry of Finance of Mongolia and the National Statistical Office of Mongolia initiated and financed the *EzStat* application. It all started in 2006, when the Mongolian Parliament approved the Program of Official Statistics Development 2006 – 2010 with the principal objective of developing national standards which meet public needs based on internationally accepted methodologies and which provide users with high-quality statistical information through innovative technology.

Therefore, the main objectives of the *EzStat* application, implemented in 2010, were, and continue to be:

- To grant easy and equal access to statistical data and information for all potential users

- To examine the public demand for statistics, and the type of statistical data that fits user needs

- To improve statistical data dissemination

- To raise the skill level of staff involved in the development and production of content for the application



Figure 3: GDP by division and by time series as grid table

- To improve the decision-making process at the micro and macro levels.

The project started in November 2010 and took two and a half months to complete. The first version of *EzStat* was publicly introduced on 28 January 2011 (the application is updated as the NSO obtains new information). The cost of the project was approximately US$10,000, mainly including developer's cost and some small marketing demands.

The application covers all of Mongolia's 21 aimags (regions) and Ulaanbaatar, the capital city with provincial status. The database contains different information categories – environment, business, economy - and users can filter the search results according to the aimag or date. For example, a user can look up the GDP by aimag or division.

*EzStat* users can share information with others via e-mail and it provides a good foundation for making effective use of statistics in communications. Going forward, the greater use of statistical data and demand for data would encourage statisticians to collect and release information.

The NSO is required to provide statistical data and update the information in *EzStat*. The process is easy for both data users and producers.

## Success factors

Nearly one month after the launch of *EzStat*, more than 400 users downloaded the application from the App Store. Since then, the number of users has increased tenfold. There are a variety of contributing factors that made this project a success:

- It was relatively quick and cheap to implement

- It was one of the first iOS-based (iPhone) applications among data producers in the country

- It has created emerging trends in data dissemination. For instance, the Bank of Mongolia and some other organizations are now developing their own data application

- There is a rapidly increasing number of users

- Collecting feedback from users has helped to know what was needed and now that the application has launched, feedback has helped to show what is working and what can be improved. As a result, user satisfaction with electronic dissemination of statistical data is increasing

- The application has helped users develop statistical thinking. A definition of selected terms, methodology, glossary, source of information, frequency of data are included this application (Figure 4).
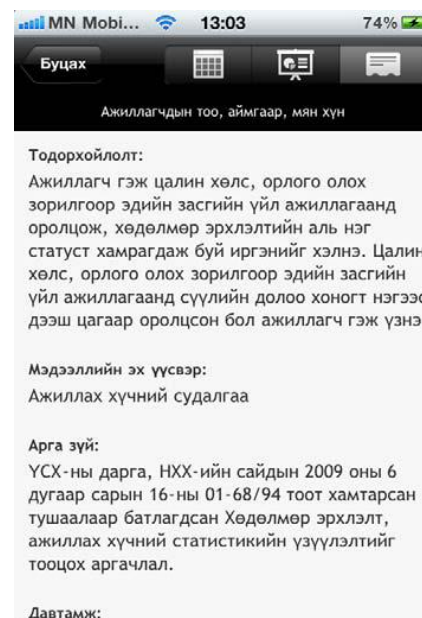
Figure 4: Definition of employee, data source and methodology

## Challenges and solutions

In the era of information technology, there are important challenges for statistical dissemination in terms of keeping users accurately informed and providing sufficient information for decision-making by stakeholders. Anytime the NSO has new information, the goal is for *EzStat* to be updated. The *EzStat* application project has addressed some of these needs, but highlighted other challenges. It is recognized that an application on a handheld device is only accessible to those who have the means to own one. Thus, reaching the middle- and low-income population in Mongolia remains a challenge.

Furthermore, at present, the application is only available in Mongolian. The goal is to translate the content into English so as to make the dissemination even broader, to include foreign investors and staff of international organizations.

Going forward, we also aim to improve our marketing techniques, extend the information to other subject areas and refine the breakdown of information to the lowest administrative unit.

## Future plans and sustainability

The NSO of Mongolia owns the copyright to *EzStat*. It is easy and cost effective to maintain and upgrade. And it can be extended to ANDROID based devices.

## Feedback from beneficiaries

*"I just downloaded. Very good started. We need more detailed information, [especially at the lowest administrative unit]."*

*Z.Enkhbold, Member of Parliament*

*"This application is awesome. Congrats developing team"*

*Z.Odonsuren, student*

*"Good job. Please don't forget to update the data. Keep it up"*

*B.Battulga, researcher*

## Contacts

Five engineers and one designer participated in the project. The contact person and lead person is Mr. A.Naranbayar, chief executive officer of Mezorn LLC and can be contacted at the following email address: info@mezorn.mn.

# Localizing the Millennium Development Goals: The Community-Based Monitoring System

*Marites B. Lagarto*

## Problem statement

The government of the Philippines is committed to the Millennium Development Goals (MDGs), which aim to alleviate poverty and end deprivation by 2015. For the most part, the MDGs are basic development goals, the delivery of which is the responsibility of the local government units (LGUs).[1] Mainstreaming the MDGs in the local development agenda is thus critical in achieving the associated targets.

An important prerequisite in the localization of MDGs is the availability of good statistics. The capacity of the local government, among others, to systematically measure, monitor and report on their economic and social progress is key. While the Philippines national statistical system captures progress at the national level, the data are usually only disaggregated to the regional level. Aside from the population census, traditional sources of data from national surveys conducted by the National Statistics Office (NSO) produce data which are reliable only down to the regional and, in some instances, the provincial level. Also censuses and surveys are conducted infrequently and at irregular intervals. Hence, data at the provincial, municipal and barangay levels are insufficient. With the compelling need to localize MDGs, there is an increasing demand for micro-level[2] data to help the LGUs in:

a) diagnosing poverty at the provincial, municipal, barangay and even household levels

b) designing appropriate policy and program interventions

c) targeting beneficiaries within the locality

d) monitoring progress.

The Community-based Monitoring System (CBMS)[3], developed in the early 1990s under the Micro Impacts of Macroeconomic Adjustment Policies (MIMAP) Phase 2 Project, provides a good information base for policymakers and program implementers to monitor the impact of economic reforms or policy shocks on vulnerable groups. It evolved due to a lack of disaggregated data for planning, program formulation and poverty monitoring at the local level.

The CBMS is well-positioned to track progress of the MDGs at the local level. A number of MDG indicators form part of the CBMS. Also, CBMS is to be undertaken every two or three years (depending on the resources of the LGUs) and can therefore be used for updating MDG indicators and facilitating preparation of MDG reports on a regular basis.

While CBMS is very useful in generating local statistics in general, this case study will focus on the role of CBMS in producing MDG-related statistics for localizing MDGs.

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[1] As provided for under the Republic Act (RA) 7160 or the Local Government Code (LGC).

[2] There are five geopolitical levels in the Philippines, namely: National, subnational or regional, provincial, municipal, and barangay or village level. Micro-level refers to below subnational levels.

[3] The CBMS is an organized way of collecting data at the local level for the purpose of planning, budgeting, and implementing local development programs as well as for monitoring and evaluating their performance. It involves a census of all households in the barangay level and has a core set of indicators but the system is flexible enough to accommodate additional indicators.

The CBMS has been adopted by the national government agencies in the Philippines, particularly the National Anti-Poverty Commission (NAPC) and the Department of the Interior and Local Government (DILG), as the local poverty monitoring system. The CBMSs role in localizing the MDGs was recognized in an Experts Group Meeting on Localizing the MDGs held at ESCAP, Bangkok, in 2006.The Committee on Poverty Reduction agreed that CBMS could complement the official data collection of national statistical agencies and improve the availability of development-related indicators at the local level.

## Outcome achieved

Through the adoption and implementation of the CBMS, MDGs were localized as demonstrated by the following:

1. **Establishment of MDG database**– a database of MDG indicators at the micro level was established using the CBMS for benchmarking and monitoring. A good number of LGUs have already consolidated their CBMS databases and are positioned to generate their own local MDG reports.

2. **Formulation of the Provincial MDG Reports**– to bring the further mainstream the MDGs into the local development agenda, formulation of the Provincial MDG Reports was piloted. Ten provinces[4] have consolidated their CBMS data at the provincial level and subsequently formulated their *Provincial MDG Reports* with disaggregated data at the municipal and household levels.

   This is a milestone as the preparation of the MDG reports used data that the community themselves collected through the CBMS. The reports informed stakeholders about the status of the MDGs in their locality and served as an evidence-based tool for prioritizing programs and projects that will contribute to the achievement of the MDGs.

3. **Formulation of Local Development Plans integrating MDG targets**–inPasay City, a crowded highly urbanized city in Metro Manila, it was demonstrated that the results of the CBMS can influence integration of MDG targets in barangay and city plans. In 2004, City Ordinance No. 3223 s-2004 required every barangay[5] in Pasay City to implement their own Bayanihan-Oriented Barangay Development Plans (BDP) (Bayanihan is a Filipino term referring to the community's effort to work together toward a common goal). Each BDP was formulated using an MDG-based planning process and used data generated from CBMS. These BDPs were a basis for crafting Pasay City's MDG-based work plan and in identifying priorities for resource allocation at the city level. The whole process has been beneficial in improving local development planning. As a result, local benchmarks on each MDG target were established.

4. **Application in evidenced-based policy making**– inthe municipality of Mariveles, in the province of Bataan, the results of the CBMS released in 2007 were used as reference in crafting the municipality's  Executive-Legislative Agenda (ELA) 2008-2010. The ELA identified specific strategies, programs, projects and activities to respond to the most pressing problems of the municipality, as diagnosed by the CBMS.   The priorities identified in the ELA include reducing the number of

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[4]The ten provinces are Agusan del Norte, Agusan del Sur, Batangas, Biliran, Camarines Norte, Eastern Samar, Marinduque, Romblon, Sarangani and Siquijor.
[5]The barangay is the smallest political division in the country. A city or municipality is composed of barangays.

households without access to safe drinking water and identifying specific interventions to reduce the number of school-aged children not attending school.

In Batangas, a province in Luzon, a policy that makes the CBMS the basis for identifying development gaps and focusing resources. The CBMS survey results so far have been used by provincial and municipal governments of Batangas in identifying priority programs and projects to reach their MDG targets.

5. **Application in resource allocation and resource mobilization**– therole of CBMS is significant for localities that used it in decision-making.Identification of projects and target beneficiaries were based on objective criteria and not on the personal or political agenda of local officials.

   In the province of CamarinesNorte, the provincial government utilized CBMS data to decide which projects submitted by different barangays will be prioritized in the regular budget. Given the limited resources, CBMS data were used in assessing and deciding which projects are urgently needed. Aside from their use in the regular budgeting process, the province also used CBMS in the preparation of project proposals to mobilize additional resources from external funding sources.

   In Pasay City, the CBMS-based local development plan was a contributor to increasing efficiency in the allocation of resources since programs and projects were prioritized based on unmet needs of the community. Social service programs have since become demand-driven and resulting programs include employment generation, skills training, community-based savings and credit and health system improvement.

   In one municipality in Bataan, a 65,000 pesos (US$1,444) allocation for small infrastructure projects for each barangay in 2008 was scrapped to give way to MDG-responsive projects such as construction of water systems, construction of additional health facilities and provision of additional medical equipment.

   Another example of how CBMS was demonstrated as a credible tool for resource mobilization is through the experience of the CBMS-UNDP Development Grant Program, an initiative of the CBMS Network Coordinating Team of the Angelo King Institute for Economic and Business Studies-DeLa Salle University in collaboration with UNDP Philippines. The program provided grants to finance poverty reduction projects contributory to the attainment of the MDGs. These were identified using data gathered through CBMS. The winning grant applications were chosen from project proposals submitted by LGUs, non-government organizations, people's organizations, etc. In the province of Eastern Samar in the Visayas, for instance, projects related to improving livelihood, access to sanitary toilets and access to safe water were implemented in 2009.

6. **Empowerment and capability building of communities and LGUs through the CBMS process**- the LGUs were given the capacity to collect, analyze, and use CBMS data in local planning and program implementation. There is 'ownership' of the information gathered and this steered the LGUs and the community to find solutions and together act on their conditions. Armed with CBMS information, the the LGU's can demand the services they need from local and national governments. LGUs can approach development partners to seek assistance and development partners, in turn, can effectively realign some of their funds for identified priority projects in priority areas. By tapping existing LGU personnel and volunteers, the community collectively monitors their own progress.

In 2006, the Pasay City was awarded a Special Citation on Local Capacity Innovations for the MDGs by the GalingPook Award Foundation[6] for its utilization of CBMS in pursuing the MDGs. Through the implementation of the CBMS with the Fact-based Intervention Exchange MDG Localization Action Plan, the city used data generated from CBMS to diagnose the needs of every household using a set of family-based MDG indicators. Communities were provided space to analyze their problems and identify solutions which they then implemented through collective action and in partnership with the government and other partners. Through this process, the city government was able to bring the MDGs to the household level and was able to deliver appropriate demand-driven services.

In 2009-2010, the formulation of ten Provincial MDG Reports had a capacity building component where training workshops and one-on-one mentoring provided participants in the provinces with knowledge and skills in processing CBMS data to generate MDG indicators. Technical assistance was also given to the Provincial Technical Working Group in preparation of provincial MDG reports using CBMS data.

7. **Enhanced partnerships** – CBMS offers a venue for collaborative efforts among researchers (developers of the tools), academia and training institutes/centers, government agencies, NGOs, development agencies, communities, and local authorities. For example, in the Calabarzon Region in Luzon, the implementation of the CBMS is being funded through the cooperation of resources of the concerned LGUs and government agencies particularly DILG, NEDA NAPC and the Statistical Research and Training Center (SRTC) through its Regional Affiliates Program, as well as the state universities and colleges.

## Details of the practice

### Objectives

The practice aims to generate micro level data using the CBMS approach for the purpose of benchmarking the MDG indicators at the local level, identifying and implementing appropriate policies, programs and projects and monitoring progress of achievement of the MDGs.

### Area covered

As of October 2010, CBMS is being implemented in 61 out of the total 80 provinces, 46 out of 138 cities, and 710 out of 1,496 municipalities in the Philippines covering 18,706 out of 42,025 barangays all over the country.

### Executing agency, implementing partners and actors involved

The LGUs, in particular the local chief executives (LCEs) and the local planning and development offices in collaboration with the communities, implement the CBMS at the local level. The LGUs take the lead in data collection and processing and serve as the repository of data at the local level. Data are submitted to the next higher geopolitical level allowing for the establishment of databanks at the barangay,

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[6]A private award-giving body and resource institution promoting innovation and excellence in local governance.

municipal, city and provincial levels. NAPC and DILG serve as the national repository of data.

Providing supervision and technical/funding support to the LGUs are national and regional level agencies (DILG, NAPC, National Economic and Development Authority (NEDA)), the League of Municipalities (LMP), research institutions (Poverty and Economic Policy (PEP)-CBMS Network, Statistical and Research Training Center (SRTC), non-government organizations, state universities and colleges (SUCs), and development partners (World Bank (WB), United Nations Development Program (UNDP)and the Spanish government).

The DILG is the lead agency in providing capacity building to local government units and other government agencies. The LMP of the Philippines are the lead advocates of the CBMS in the municipalities. The NEDA, Region IVA in particular, has collaborated with the CBMS Team for the implementation of CBMS in sites in the Calabarzon area, specifically in selected sites in Quezon. NGOs such as the Social Watch, the Dawn Foundation and Kagabay, are also actively advocating for the implementation of CBMS in their sites. On the other hand, Peace and Equity Foundation (PEF) has been providing resources to finance poverty interventions identified through the CBMS.

## Timeframe

The CBMS has evolved through the years, starting with a pilot-test in two barangays in Bulacan in 1995 and 1996. It was refined and documented by Dr. Celia Reyes and Kenneth Ilarde of the PEP-CBMS in 1996. In 2002, the CBMS core set of indicators for local poverty diagnosis and monitoring was identified. The CBMS is a continuing initiative with the goal of expanding to other communities until all areas in the country are covered.

## Total cost

An estimated amount of 70 pesos (US$1.56) per household or about 2.33 million pesos (US$51,850) per province is needed to install CBMS. This cost includes the whole range of training, data collection, data processing and report preparation. This does not include travel costs of enumerators and computer hardware, which were paid for by the LGUs as Their contribution to costs.

## Processes involved

Following are the processes involved in localizing the MDGs using the CBMS. Some steps may be conducted simultaneously:

a) At the national level, an existing mechanism or structure for the MDGs was tapped to create an enabling policy and program environment for the localization of the MDGs. The mechanism that coordinates the implementation and monitoring of the MDGs was established by expanding the functions of an existing inter-agency committee, the Multi-Sectorial Committee on International Human Development Commitments (MC-IHDC) based at the NEDA, the premiere socio-economic planning agency in the Philippines.

Through the MC-IHDC, tasks and responsible agencies were identified. The NEDA was tasked as the overall coordinator for MDGs while the DILG was designated as the lead agency in the localization of MDGs. The National

Statistical Coordination Board (NSCB) was tasked as the repository of MDG statistics. Meanwhile, the national repository of the CBMS database is located at NAPC and shared with the DILG. At the local level, for instance, in the province of Albay, the Albay MDG Office and MDG Super Committee were created to facilitate monitoring of the achievement of MDGs in the province including identifying innovative and indigenous mechanisms in providing services.

b) The national government issued several policies to support MDG localization. In 2004, the DILG issued the *Guide to LGUs in Localizing the MDGs*, whichallows diagnosis of the local situation using existing local indicators and monitoring system, as well as a menu of programs, projects and activities that can be implemented to respond to MDGs. In 2005, the NSCB issued a resolution recognizing and supporting the CBMS as a tool to strengthen the statistical system at the local level.

c) The Department of Budget and Management (DBM) also issued a local budget memorandum encouraging LGUs to include in their annual budget programs, projects and activities supportive of the MDGs.   LMP Memorandum Circular 027-2006 issued in June 2006, enjoins all CBMS-implementing municipalities to adopt/sustain the adoption of the CBMS as a tool for local poverty diagnosis and ensure the incorporation of the MDG targets and utilization of CBMS data in the formulation of local development plans.

d) Through consultation workshops and meetings, the DILG in collaboration with national government agencies, LGUs and the CBMS Network Coordinating Team, assessed CBMS core set of indicators vis-à-vis MDG indicators to ensure matching/correspondence. Thirteen (13) core indicators[7] which capture the multi-dimensional aspects of poverty were identified and with the inclusion of the indicator on maternal deaths, the CBMs core indicators were adopted as the set of core indicators for MDG localization. LGUs have the option to add indicators or use proxy indicators to monitor community-specific concerns,e.g., effects of climate change.

e) A pool of CBMS trainers was created from the CBMS Network, research institutes, national government agencies and provincial technical working groups depending on which are available/existing in the locality.

f) Data were generated using the CBMS.  The following resources were tapped: i) the CBMS Network for technical expertise and continued mentoring; ii) DILG, NAPC, NEDA (national and regional offices, SRTC) for technical assistance; iii) International organizations and non-government organizations for financial and technical support; iv) the academe for training; v) the LGUs for counterpart resources; and vi) the community for manpower.

The system involves the following steps:

### Step 1 - Advocacy/organization

DILG or NAPC, in coordination with the CBMS-PEP Network, conduct orientation and consultation meetings among the LCEs to make them aware of and adopt the CBMS in diagnosing poverty in the community, formulating plans to address identified problems, and monitoring and assessing the impact of programs and projects. Upon getting the endorsement of the local chief executives, a

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[7] The core indicators are categorised under eight major dimensions of poverty namely: Health, nutrition, shelter, water and sanitation, basic education, income, employment and peace and order.

memorandum of agreement was signed clarifying the commitments and responsibilities of all concerned in the conduct of the CBMS as well as the timetable and resource requirements. Preparatory activities include: a) Determining data gaps between data requirements and existing database for incorporation in the core CBMS instruments for collecting and processing data; b) Mobilizing financial, physical and human resources for training, data collection and processing, database management and dissemination. Costs may be shared by the province, city, municipality and barangay. NGOs were also tapped to provide services such as data processing.

*Step 2 – Data collection and field editing*

*Step 3 – Data encoding and map digitization*

*Step 4 – Data consolidation, database building and poverty mapping*

*Step 5 – Data validation and community consultation*

*Step 6 – Database management*

*Step 7 – Plan formulation*

*Step 8 – Dissemination, implementation and monitoring*

Some initiatives to institutionalize CBMS which were also presented as success factors in this study include: Organizing CBMS teams at the local level to oversee the implementation of the CBMS; issuing ordinances and memorandum circulars adopting the use of CBMS in planning and monitoring;  LCEs, with assistance from the local planning and development office, ensurethat data are used for and incorporated in local development planning and monitoring and used as the basis in allocating budget for prioritising programs and projects.

g) CBMS data were processed for the following purposes:

- Generate MDG indicators to determine the baseline and to track local progress to attain the MDG targets

- Consolidate MDG databases to generate local MDG reports

- Determine MDG targets, priority programs and budget for integration in local development planning and budgeting

- Develop proposals for demand-driven programs and projects for resource mobilization

- Use data in formulating or changing policies

h) Continuing exchange and sharing of experiences, e.g., annual conferences, workshops, etc., where good practices were documented.

## Success factors

- **Enabling policy environment**– CBMS has been supported through the provision of a number of policy issuances in relation to its adoption and implementation at the national and local levels.

- **Commitment of the Local Chief Executives**– Getting the endorsement of the local chief executives and other local officials has been a prerequisite to set the CBMS

in place. To get their commitment, they had to be made aware of and appreciate the values of the CBMS, including its application towards attaining the MDG targets. The common practice is the issuance of Executive Orders and Sangguniang Bayan Resolutions signed by the LCEs and other local officials. The local officials' commitment ensures mobilization of financial, physical and human resources towards institutionalizing CBMS in their locality.

- Having **dedicated and well-trained local technical staff** provides inspiration to other stakeholders in the application of the approach.

- Putting in place **coordinative structures/mechanisms like a Technical Working Group(TWG) on MDGs** or a TWG on CBMS ensures accountability and sustainability in implementing the activities. It also clarifies the roles of various players and provides direction towards long-term goal.

- The **community participation in data collection**, **processing, validation and analysis** enables the community to identify with and own the process in selecting projects to respond to the unmet needs. The support of civil society groups and non-government organizations complemented the limited resources of the government.

- There has been notable **donor assistance** for CBMS roll-out. Various development partners have supported the implementation of programs and projects aimed at institutionalising CBMS.

- The CBMS system has been **developed and field-tested** with impressive results. The methodology has been proven and certified to be statistically sound, cost-effective, valid and reliable. There is general acknowledgment that the CBMS Network Coordinating Team contributed to the credibility of CBMS as a tool for local diagnosis, planning, budgeting and monitoring for poverty reduction and addressing the MDGs.

## Challenges and solutions

Scaling up the CBMS implementation in the country remains a major challenge to the national government given the autonomy of the LGUs. Currently, half of the country's LGUs need to adopt a monitoring system such as CBMS that will track their progress and provide timely and disaggregated data on interventions needed to meet the MDGs. More advocacy is still needed to inform other LGUs about the usefulness of CBMS in tracking MDG progress at the local level. Also, advocacy on the MDGs need to be intensified to increase LGU level of appreciation of the MDGs. Enlisting the support of the LGUs right from the start and ensuring participation of the community will guarantee ownership of the process.

Advocacy for LGUs must emphasize good governance especially among traditional politicians. This will make them appreciate the use of objective evidence-based results in their choice of programs and projects.

The inadequacy of resources hampers the implementation of a massive and rapid CBMS institutionalization program at a resource requirement of more than P2 million (US$ 51,000) per province. The institutionalization of CBMS for MDG localization must therefore be included in investment programming.

Aside from the financial requirements of establishing database, the more critical concern is the allocation of funds to implement priority programs and projects

identified through the CBMS. To realize concrete results, LGUs must ensure that diagnoses of their respective community problems/issues are translated into appropriate interventions and those resources are available to finance their implementation. People will believe in the CBMS technology if they see outcome and not just outputs.

Mechanisms and procedures for periodic monitoring of ongoing project operations must be installed to ensure that activities occur as planned, that they remain directed towards stated objectives and that appropriate action is taken if required. On the other hand, impact monitoring of completed projects should likewise be conducted to verify whether these interventions resulted in changes in the development conditions of the communities where they were implemented.

Scaling up CBMS creates greater demand for training among the LGUs. National agencies like the DILG, NAPC and NEDA in close coordination with the PEP-CBMS Network, need to organise and train more trainers at the local level to provide assistance to our LGUs that are willing to adopt CBMS. In order to scale up CBMS, a uniform and standard training module needs to be prepared which can be easily disseminated to trainers.

Training should not be limited to the technical aspects, e.g., data collection, validation, processing, analysis and technical writing. Training on leadership is also required for the volunteers, purok leaders and other players in the community involved in the CBMS-MDG process, to develop them to become more dependable leaders.

The implementation of CBMS is done in different years depending on the readiness of the LGUs and the availability of funds and other necessary resources. To appreciate the data, e.g., at the provincial level, we need to synchronize the conduct of CBMS rounds to enable aggregation and comparison across LGUs. Related to this, there is a need to harmonize efforts among the DILG, NAPC, NEDA, and the PEP-CBMS Network in the scaling up of CBMS.


## Recommendations for others

1. There must be adequate and appropriate training at the local level especially in processing CBMS data to generate MDG indicators.

2. Advocacy for localising the MDGs must be a continuing initiative. Based on the Philippine experience, the rich CBMS database may be packaged into appealing advocacy tools in different ways:

   a) Production of local MDG progress reports
   b) Formulation of local development and MDG plans
   c) Documentation of good practices
   d) Production of brochures, MDG scoreboards and websites.

   Also, effective dissemination of CBMS-MDG results is important, e.g., the launching of National and Provincial MDG Reports. This will generate interest of other LGUs as they become aware of the benefits of using the CBMS results in attaining the MDGs.

   Promote networking and active exchanges among CBME practitioners and local communities to share experiences especially those whose good practices have made them successful in meeting the MDGs.

Build on what the communities already have and are already doing to avoid duplication of efforts thus maximizing resources.

Facilitate communities to participate in identifying their problems based on the CBMS findings and in deriving their own solutions to challenges. While this takes more time, it will make the communities own the data and the reports.

3. Strengthen partnerships of LGUs with civil society, NGOs, business and private sectors. LGUs should tap the vast potential of these groups to help support the implementation and sustainability of the CBMS in their respective areas.

## Future plans and sustainability

There will be continuing advocacy to inform LGUs about the usefulness of CBMS in tracking MDG progress at the local level. Lessons learned from the experiences of successful LGUs will be continuously documented for replication in other LGUs, e.g., methodology in preparing Provincial MDG Reports, integrating MDG targets in the local development plans, among others.

The PEP-CBMS Network and initial ten provinces will be tapped to expand the formulation of MDG Progress Reports in other provinces. The expertise of research and statistical institutions may also be tapped in training local stakeholders in collecting, processing and analysing data.

The MDG Acceleration Plan will be formulated, implemented and monitored to include concerns about MDG localization.

## Feedback from beneficiaries of the practice

### Regional Government Agency (NEDA-CALABARZON)

In 2009, the CBMS was adopted by the Calabarzon-Regional Development Council. This was in line with the efforts of the region to institutionalize a common data generation instrument at the local level in order to improve its system of identification of programs, projects and beneficiaries in addressing poverty in general and as a support mechanism in monitoring the progress of performance of the MDGs in particular.

This was very timely as the Provincial Government of Batangas had wanted to adopt a system that could monitor the performance of the province   vis-à-vis attaining the targets of the MDGs. The CBMS was implemented by Batangas on a province-wide scale using 2009 as the baseline of the survey. The implementation was supported with a policy that the CBMS shall be the basis for the province and the municipalities in focusing their limited resources to the gaps that will be identified based on the results of the survey.

The CBMS survey results so far have been used by the provincial and municipal governments of Batangas in identifying priority programs and projects for their constituents.  For example, referring to the MDG target on "reducing half of the proportion of people without access to safe drinking water and basic sanitation", the province was able to locate the specific households in need of water facilities and

toilets as well as the corresponding resource allocation needed. CBMS results also facilitate identifying targets for the priority programs and projects of the province which support attaining the goals and targets of the MDGs: The distribution of health cards, food commodities for malnourished children, distribution of school supplies and bicycles to students in far flung areas, financial grants and other support services to farmers.

Through the CBMS, sex-disaggregated data were made available at the local level thus gender analysis can be done by the local departments.

### Pasay City Planning and Development Office

Based on the results of the 2005 CBMS survey in Pasay City, the local government officials were able to identify their top four priority concerns: Children 13-16 years old not in secondary school; children 6-12 years old not in elementary school; unemployed persons in the labour force; and households with incomes below the poverty line. As a result, the city government was able to design programs to address their main problems. They created the Fact-Based Intervention Exchange (FBI-Ex) where they matched their service providers with their people's needs. CBMS data were used as baseline data for MDG monitoring.

After CBMS was implemented, the city benefited from using first hand data based on the actual survey and on personal accounts, thus clearly identifying the community's problems and analysing the situation properly. Their targeting became need-based, specific and certain. And they now have clear benchmarks and a clear set of indicators making monitoring easier.

### PEP-CBMS Network Coordinating Team (on preparing the Provincial MDG Reports)

Tracking progress towards the MDGs at the local level is very critical. This is where disparities owing to different circumstances and socioeconomic factors are revealed which are vital for policymaking and for crafting of interventions. For instance, while a certain province may appear progressive, there will still be pockets of communities or households in poverty and deprivations in terms of income levels, health, educational attainment and poor quality housing. In many urbanizing provinces, these pockets of poverty can become hidden and difficult to detect amid relative affluence in surrounding areas.

## Contacts

PEP-CBMS Network - Dr. Celia Reyes, Anne Bernadette Mandap and Marsmath Baring, Jr.
DILG Bureau of Local Government - Director Manuel Gotis
NEDA - Director Erlinda Capones
NAPC – Undersecretary Florence Dorotan
SRTC – Director GervacioSelda, Jr.

## Acknowledgments

# Data and privacy:
# Increasing access to information for research and policy development in Vanuatu

*Simil Johnson*

## Problem statement

Access to data in the Republic of Vanuatu is a problem. While, the small, personal nature of the 234,000 people living in this 83-island nation spread across the Pacific has made data collection possible down to the most local level, the small-nation culture has also created a privacy concern for the people and security concern for the researchers.

For instance, recently, an international group collected data in Vanuatu and then gave a presentation on what they found, neglecting to properly conceal the identity of the subjects. As a result, when government workers went to the same area the data was collected, they were physically assaulted by the locals who thought the government researchers were to blame for publicly sharing private and potentially embarrassing information.

Of course, data is most useful at the provincial level and this is what researches and policy makers need. However, as part of the Vanuatu Statistics Office Act of 1983, there is a law that has restricted information sharing, and thus collected data was stuck at The Vanuatu National Statistics Office  (VNSO) and rather unusable. Thus, an agreement, signed by any organization, local or international, explicitly stating the need to keep information private was needed to allow the VNSO to share their research. The regulations created an overwhelming amount of paperwork for the statistics office and resulted in a backlog of requests too large for the available staff to manage, thus creating an obstacle to putting collected data to use.

## Outcome achieved

After careful internal staff consultation, the VNSO successfully created a new mechanism – a memorandum of understanding called the *Data Access Agreement*, that provides approved personnel access to the VNSO unit record data, but still safeguards privacy by blocking key identifiers and including a clause in which the government and private sector (users of the data) agree not to disclose the individual information to the public. The agreement is drafted according to the specific needs of the data requester and thus only very specific figures are turned over after the agreement is signed.

Under the mechanism, the VNSO and partner organization(s) agree to data access, data use, and other terms and conditions specified in the data access agreement. The mechanism increased data access for research and policy development – within both the public and private sectors. Through the formal request process, the agreement helped to tailor make packages of useful data for the user.  Furthermore, the mechanism helped develop partner investment in training and technical assistance for data collection, processing and analysis with resource transfers often associated with data access.

**Example 1:** Agreement between VNSO and the Vanuatu Telecommunications and Radio communications Regulator (TRR) to improve internet access in un-served and underserved areas, primarily in rural and remote areas of Vanuatu as part of the Government's development strategy – as well as to achieve the Millennium Development Goal 8, a global partnership for development.

The government of Vanuatu recognizes the importance of access to Information and Communication Technologies (ICTs) for the development of the country both economically and socially. However, gaps currently exist in the spread of ICT services to rural communities. Universal Access Policy (UAP) is an initiative by the Ministry of Infrastructure and Public Utilities which provides funds to bring Broadband Internet Access to areas that are currently not served or underserved. Following a pilot project, the TPR through the UAP, plans to provide Broadband Internet Access to every telecenter, health center and high school in underserved areas. In order to achieve this, first the underserved areas need to be identified through the mapping of current telephone coverage in Vanuatu. TPR will obtain the GPS coordinates of mobile base stations of two mobile and telephone service providers of Vanuatu, Telecom Vanuatu Limited (TVL) and Digicel Vanuatu Limited (Digicel). TPR, utilizing Vanuatu National Statistics Office (VNSO) expertise in GIS mapping and Telecommunications Information System database, will establish Vanuatu's mobile telephone coverage map.

TPR is interested in NSO data from the 2009 Household Census GIS data to determine areas which it should focus its implementation of UAP Broadband Internet Access under its UAP Program.

**Example 2:** The agreement between VNSO and the Vanuatu Energy Unit is designed to increase electricity access in communities in Vanuatu.

The Energy Unit, with support from AusAID Governance for Growth (GfG) program and the Utilities Regulatory Authority has now initiated an Access Power Investment program in order to expand electricity access to communities in Vanuatu. In order to facilitate the Energy Unit's ability to undertake the planning and implementation of energy activities, the program has identified the development of an Energy Information Management System database with geographically referenced datasets.

The Energy Unit seeks to utilize the recently acquired NSO 2009 Household Census GIS data to determine areas which it should focus its implementation of off-grid energy systems under its Access Power Investment program.

In both of the above-mentioned examples VNSO provided access to its Geographic Information System (GIS) data pertaining to the 2009 National Housing and Population Census in order to help identify 'hot spots' that require urgent attention in terms of development needs.

As a result of the mechanism the VNSO observed significant improvements in the following priority areas:

- Increased data access for research and policy development

- Wider use of statistical data

- Better communication between data producers and users

- Strengthened capacity of the VNSO

    - better coordination within the VNSO
    - VNSO staff more involved with development planning and policy making processes
    - better human resource management and improved technical capacity
    - improved survey documentation such as meta data, codes and classifications, etc.
    - more time for senior staff to train junior staff;

- Increased awareness of the importance of statistical data for decision making

- Increased profile of VNSO – which also leads to wider use of statistical data.

## Details of the practice

The objective was to increase data access for policy and decision making while minimizing the workload required to respond to requests for information and to better manage human and financial resources. Prior to the initiation of Data Access Agreement, requests for statistical data and analysis from data users in Vanuatu and around the world were becoming too demanding for the staff of the VNSO both in terms of human resource allocation and technical capacity. Consequently, the requests were not processed in a timely manner. The Agreement thus helps better manage the requests by allowing personnel access with an agreed level of confidentiality to unit record data.

The executing agency was VNSO and the target area involved all of Vanuatu. The preparation of a data access agreement can take anywhere from one week to a few months depending largely on the response time and efficiency of the communication of the parties involved. Communication takes place mainly by e-mail and sometimes by phone to clarify any questions. The agreements are project specific and for a specified period of time only.

The cost of the solution has been covered by the regular annual budget, which increased 45 percent (adding $20,071,688 to the Statistical Leadership Coordination section and provincial offices) to pay for the development of a new section of the statistical office. The National Housing Census and Household Income and Expenditure Surveys also have dissemination budgets that cover the costs of dissemination activities.

All data access requests must first go through and be approved by the Government Statistician. Approved requests will then be passed onto the newly established Statistical Leadership and Coordination section of the VNSO to be processed and overseen during the agreed period of time. This section was established at the end of 2010 specifically to manage and oversee data dissemination activities including data access agreements. The Section also works to promote better coordination internally, within and outside Vanuatu. The budget of the VNSO was increased by 43 percent in order to pay for this essential new section.

# Success factors

## Data dissemination efforts

The new initiative was a result of close collaboration within the VNSO, as well as with partners within and outside Vanuatu. A concerted effort on the part of VNSO to disseminate data played a key role as it led to the conception of the agreement. For instance, the new agreement resulted in establishing a data-sharing relationship with the department of energy, which has their own set of data-sharing restrictions. Among others, VNSO's dissemination efforts include:

- Reviewing development strategies and plans at the national level and at the sector level

- Identifying 'core information' requirements and redundant statistical information

- Working with sectors to develop more realistic statistical indicators within existing data collection systems

- Working internally to realign structure to better work with other stakeholders in the national statistics system

- Working internally to review data dissemination, publications, etc. to include the 'core' national statistical indicators in a format which users can use to meet their requirements

- Sharing its expertise and experiences with Pacific island nations such as the Cook and Solomon islands

- Working with the Secretariat of the Pacific Community in establishing a database.

## Establishment of the Statistical Leadership and Coordination Section

The VNSO established the Statistical Leadership and Coordination Section at the end of 2010 with the dissemination of data as the main responsibility. A new section head was appointed at the same time to oversee the dissemination and coordination activities of VNSO. VNSO also established provincial statistical offices across Vanuatu as part of its dissemination strategy.

# Challenges and solutions

## Better inter-ministerial collaboration

As with many other countries VNSO was faced with a lack of inter-ministerial collaboration. However, through better communication and coordination, VNSO successfully managed to bring about an attitude change that unblocked inter-ministerial communication and collaboration in statistical data use. This was particularly successful in the fields of health and education, contributing to malaria reduction.

While sharing data among government ministries is no longer a major challenge in itself, barriers remain primarily due to differing regulations from ministry to ministry. To this end it is essential to ensure communication lines are open and all parties involved demonstrate flexibility. Having broken down the communication barrier through formal and informal dialogues in the public sector, VNSO would similarly like to establish effective working partnerships with private organizations in Vanuatu in order to further promote good statistical data use.

## Ensuring compliance and legality

Ensuring compliance with the agreement is one of the challenges. For instance, data access agreement holders are constantly reminded that any use of the unit record data from a report needs to be approved and acknowledged officially even with a valid data access agreement in place. The VNSO believes trust forms the basis of any effective relationship and that good communication helps prevent or eliminate any mistrust issues. The VNSO works to ensure the correct use of the data including understanding of the concepts and methods applied in order to avoid any misunderstanding or misinterpretation. This is done through close consultations between data access agreement holders and the VNSO.

Timely response from all parties involved is another crucial compliance factor in meeting the VNSO's objectives. This should be explicitly written in the agreement in order to ensure effective operation. Timely response should be backed by the Statistical Review Act to ensure timely delivery. In this respect, cooperation from all stakeholders is needed.

The VNSO must also ensure that the legality of the data access agreement is in line with the current statistical legislation of Vanuatu. The VNSO has put forward amendments to be tabled by the parliament which should be put into place by the end of 2011.

## Recommendations for others

The VNSO recommends the data access agreement includes a specific data format or template of the variables and outputs of the analysis. Without such specification, liaising about data requirements, especially with organizations based overseas, can be time consuming.

VNSO recognizes the importance of developing and maintaining good working relationships internally and externally including other Pacific island nations that can learn from each other through effective coordination mechanisms.

## Future plans and sustainability

Currently data access agreements concern only Household Income and Expenditure Survey results as there is great demand for them. However the VNSO is planning to expand and include other data areas as well in the near future. Building on the success of the agreement mechanism at the national level, the VNSO is to replicate the practice at the international level. Data access agreements are currently being negotiated with international organizations such as ADB, UNDP, and UNFPA, which will be finalized by the end of 2011. These opportunities are expected to lead to capacity building and resource mobilization. The VNSO believes the data access agreement is a long-term sustainable solution.

## Feedback from beneficiaries of the practice

The data access agreement allows for providing survey data instead of providing a series of 'output' statistical tabulations or indicators. The very nature of the Household Income and Expenditure Survey (HIES) data means that different researchers use the data for a wide range of purposes. The VNSO conducted the HIES in 2006 and is currently finalizing the data from the 2010 HIES. Initially the VNSO invested resources in making the 2006 HIES data available at the aggregated income and expenditure (consumption) level; so, for example all health and education expenditures were included in the group. It also used standard age groups to create the 'adult equivalence' scales for poverty analysis.

However this dataset did not meet the needs of users who wanted information on expenditures at more detailed levels, e.g., annual expenditure on primary education, and for different age groups where the UNICEF definition of a child is ages 0 to 17 years and the adult equivalence scales use 0 to 15 years as a child. It seemed that every researcher or agency had slightly different areas of interest or levels of detail required. It transpired that it was more resource effective to output different databases for each researcher although obviously if the information needs are similar then the same database could be provided.

The VNSO found engaging with researchers to define their data requests on a 'field by field' (question by question) basis resulted in researchers having a better understanding about how to use the data in terms of which variables were collected at the household level (mainly expenditure) and which variables were collected from individuals within the household (mainly income). It also reduced the amount of follow-up questions from researchers about the results of the analysis.

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# Part IV:Using Statistics to Inform Policymaking

Mapping poverty:A road to effective intervention

*Kuenga Tshering*

The development and implementation of the *Mongolia in World Competitiveness* report

*Lkhagvasuren Rentsenbyamba*

New Zealand: The use of data to improve energy efficiency

*Lulu Zeng*

Going for Goals - Supporting countries to measure their progress: *The Asia-Pacific Education for All Mid-Decade Assessment and Mid-Term Policy Review* (MDA-MTR)

*AIMS team based at UNESCO Bangkok*

# Mapping poverty:
# A road to effective intervention

*Kuenga Tshering*

## Problem statement

Through a wide range of development activities, many aimed to improve the situation of Bhutan's poor, the country has shown an average growth rate of 6 to 7 percent in recent years. Although no specific poverty interventions were targeted, the government addressed poverty issues through the expansion of social services, rural development and income generation activities which benefited a large proportion of the population had in tangible ways.

While people's standard of living improved with an increase in income, there was no way of measuring the outcomes and impacts on poverty in the country due to a scarcity of data. It was difficult for the government to monitor its development priorities particularly with regard to alleviating poverty.

The National Statistics Bureau (NSB), with assistance from the Asian Development Bank, carried out two standard of living studies – the Pilot Household Income and Expenditure Survey in 2000 and the Bhutan Living Standard Survey in 2003, and another in 2007. The results from the studies revealed that about a quarter of the population lived below the poverty line and that poverty was largely a rural phenomenon, accounting for more than 98 percent of all those considered poor.

Although the studies have shed light on the poverty situation in the country, the information was not so relevant in terms of targeting poverty interventions on the ground.  As pointed out by the World Bank, "Popular perceptions suggest that the geography of poverty and economic affluence is accentuated at the local level, and that an understanding of the spatial distribution of economic welfare is needed in order to spread the benefits of growth to lagging regions" There was, therefore, a demand from policy makers and planners for disaggregated data.  Planners needed to know the locations or areas where poverty existed, as well as their causes, in order to bring about effective and focused interventions.

## Outcome achieved: poverty mapping

The growing demand for more disaggregated data coupled with the country's tenth five-year plan which had the main objective of alleviating rural poverty led to the National Statistics Bureau, with technical assistance from the World Bank to initiate a process of poverty mapping using the Small Area Estimation (SAE) technique. The report from the Small Area Estimation compliments the Poverty Analysis reports by identifying pockets of poverty. This mapping challenged perceptions. For instance, it was revealed that there were pockets of poverty in districts considered relatively rich, with some of the people much worse off than those living in districts considered very poor. This would have never come to light if such an exercise was not undertaken. Consequently, these pockets of poverty would have been overlooked in the development plans.

The results of the Small Area Estimation were widely debated among planners and policy makers, particularly among the parliamentarians who were interested in the situation of their constituencies. Block Development Grants were decided based on the

results of the findings. A main criteria was the level and extent of poverty (others included area size of the district and population for the allocation of resources).

Also the information from the report allowed for more targeted interventions as it not only identified the poor areas but also some of the causes of poverty in the area, e.g., lack of access to markets, health services, schools, irrigation.

Indirectly, the report helped to create interest and pro-activeness among the development sectors in monitoring their activities. It not only focused the government but also created awareness among local people of the situation of their community and also helped them in making choices on development needs.
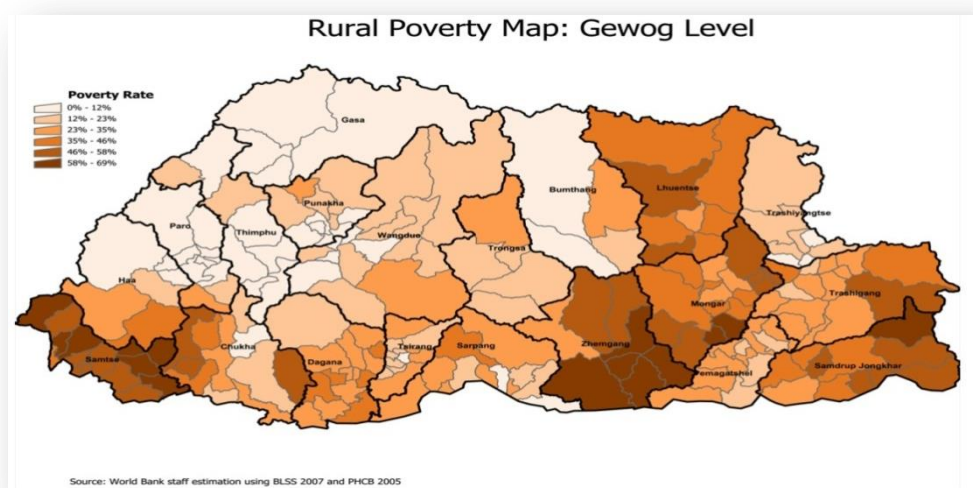


Although the information from the exercise has proven to be extremely useful in allocating funds for poverty reduction the full impact will only be determined after the completion of the Tenth Plan in June 2013.

## Details of practice - small area estimation (SAE)

The poverty analysis reports were helpful in understanding the level of national poverty. They also, to some extent, allowed for a comparison of poverty at the district level. However, this was not useful in identifying poor pockets and communities at the sub-district levels because of the small sample size

To collect details data on economic and social conditions at lower administrative levels would require the undertaking a census and would be beyond the resource means of the country and the National Statistics Bureau. Therefore with advice and non-lending technical support from the World Bank, it was decided to undertake the Small Area Estimation study, a technique developed by Elbers et.al. (2003). This technique was developed as part of the ELL method, which has been widely tested and applied around the world.

The technique combines existing census and survey data and produces reliable poverty estimates at lower levels of disaggregation than existing survey data would permit. The ELL method used the 2005 Population and Housing Census data and data from the Bhutan Living Standard Survey 2007 to produce statistically reliable poverty estimates at the geographic or the block level. The report by the World Bank outlines that in the method:

"The consumption levels are imputed for each household in the population and housing census based on a consumption model estimated from a household survey. The consumption model must include explanatory variables (household and individual characteristics) that are available in both the census and the survey. By applying estimated coefficients to the same variables in the census data, consumption expenditures can be imputed to each census household. Poverty and inequality statistics for small areas can then be calculated based on this imputed per capita consumption and for each census household".

The ELL methodology besides helping to develop the poverty incidence also gives the standard errors on the estimates which guide the analysts on the precision and reliability of the estimates produced by the method - as poverty estimates are computed based on imputed consumption, they are subject to imputation errors which are reflected in the standard error.

## The Small Area Estimation method

**Box 1: The Small Area Estimation method developed by ELL (2003)**

The method proposed by ELL has two stages. In the first stage, a model of log per capita consumption expenditures ($\ln y_{ch}$) is estimated in the survey data:

$$\ln y_{ch} = X_{ch}' \beta + Z' \gamma + u_{ch}$$

where $X_{ch}'$ is the vector of explanatory variables for household $h$ in cluster $c$, $\beta$ is the vector of associated regression coefficients, $Z'$ is the vector of location specific variables with $\gamma$ being the associated vector of coefficients, and $u_{ch}$ is the regression disturbances due to the discrepancy between the predicted household consumption and the actual value. This disturbance term is decomposed into two independent components: $u_{ch} = \eta_c + \varepsilon_{ch}$ with a cluster-specific effect, $\eta_c$, and a household-specific effect, $\varepsilon_{ch}$. This error structure allows for both a location effect—common to all households in the same area—and heteroskedasticity in the household-specific errors. The location variables can be at any level of disaggregation—district, *gewog*, or *chiwog*—and can be drawn from any data source that includes all the locations in the country. All parameters regarding the regression coefficients ($\beta$, $\gamma$) and distributions of the disturbance terms are estimated by Feasible Generalized Least Square (FGLS). In the second part of the analysis, poverty estimates and their standard errors are computed. There are two sources of errors involved in the estimation process: errors in the estimated regression coefficients ($\hat{\beta}$, $\hat{\gamma}$) and the disturbance terms, both of which affect poverty estimates and the level of their accuracy. ELL propose a way to properly calculate poverty estimates as well as measure their standard errors while taking into account these sources of bias. A simulated value of expenditures for each census household is calculated with predicted log expenditures $X_{ch}' \hat{\beta} + Z' \hat{\gamma}$ and random draws from the estimated distributions of the disturbance terms, $\eta_c$ and $\varepsilon_{ch}$. These simulations are repeated 100 times. For any given location (such as a *dzongkhag* or a *gewog*), the mean across the 100 simulations of a poverty statistic provides a point estimate of the statistic, and the standard deviation provides an estimate of the standard error.

*Adopted from page 7 of the report on "Small Area Estimation of Poverty in Rural Bhutan – National Statistics Bureau, Royal Government of Bhutan and the South Asia Region Economic Policy and Poverty, World Bank, August 2010.*

The project comprised of a technical working group consisting of members from the National Statistical Bureau, the Gross National Happiness Commission (Planning Commission) and the World Bank. National Statistics Bureau staff were provided with both on-the-job training outside the country. A number of meetings were conducted by the technical working group and two workshops were conducted. At the first

workshop the stakeholders were presented with the preliminary findings and asked for comments and views. The second workshop presented the final report. As with most projects undertaken by the NSB, other governmental statistical agencies were involved in the workshops. The authors also consulted peers and experts at the World Bank to ensure the quality of the report was of an acceptable level. The exercise took about eight month for the results to be made available to the government planning agencies. The published report was disseminated to the public through hard copies and through the website of the National Statistical Bureau at www.nsb.gov.bt.

## Success factors

The basic factor that underlies the success of this work is that the Royal Government is genuinely committed to improving the quality of life and the well-being and happiness of its people, particularly the rural poor. The commitment of the government to alleviate poverty by bringing down the level to 15 percent by 2013 (from 23 percent in 2007), has stimulated efforts to find a way to identify and locate those left behind in Bhutan's development.

The Small Area Estimation provided the right technique in identifying the poor at sub-district levels for the government to bring about focused interventions. In fact, as the report points out:

> *"The technique allows, by overlaying a poverty map with other geo-referenced information such as transport infrastructure, public service centers like health and education and information on natural resources like soil quality etc., for the government to determine the cause of poverty and may also be helpful in identifying the investments necessary to lift such areas out of poverty".*

The consultations and the workshops that were carried out among the technical working committee and with stakeholders proved to be vital for the development and the finalization of the report. The availability of the data like the *Population Census of 2005* and the *Bhutan Living Standard Survey 2007*, which are relatively comparable in terms of the time reference period, also allowed for the methodology to be applied and the study to be undertaken.

Another important factor was the motivation of the staff of the National Statistics Bureau to learn something new and also to work towards our objective of providing information for evidence-based decision making. To complement all this was the full support from the World Bank and the hard work of the expert not only to bring out the report, but also to carry the knowledge for sustainability of the practice into the future.

## Challenges and solutions

The report has identified two technical challenges. The first is related with pooling of census and survey data of two different years. It combines the data of *Population and Housing Census 2005* with the *Bhutan Living Standard Survey 2007*. The changes that might have taken place in terms of consumption patterns and the size of the population from 2005 to 2007 were a concern due to the potential errors introduced into the poverty estimates and their standard errors derived from the ELL method.

The other technical challenge identified in the report was the Tarrozi and Deaton (2008) critique of the ELL method in terms of 1) Differences in consumption patterns within a domain can bias both poverty estimates and the standard errors and 2)

Misspecification in the error structure that can lead to an overstatement of the precision of the resultant poverty estimates.

For both of these technical challenges, procedures and solutions have been identified and explained in detail in the published report by way of selecting sound consumption models and selecting the level of disaggregation.

Besides the technical problems stated above, there was not many issues as the government and the data users were all very supportive. In particular, the exercise did not place a significant demand on resources, particularly monetary. The only drawback faced initially was the lack of capacity within the National Statistics Bureau. However, this was overcome with full technical support by World Bank experts who also trained the staff on-the-job, as well throughout the region.

## Recommendations

Data producers, particularly the national statistical offices are traditionally concerned with just producing data and publishing them without much analysis. What planners and decision makers are looking for is information to help them make informed decisions and investments. Most of the decision makers either do not have the time or do not possess the skills to turn data into information. At the most basic level, the information that is available should be relevant to the needs. For example, the poverty level in the country is aggregated at the national level, which just indicates that there is a certain level of poverty in the country. But if the government wishes to plan and develop programs for interventions, the information can be irrelevant when it does not specify the location or the type and cause of poverty. Therefore, the government cannot put in place the right interventions based on the evidence.

Many times governments allocate huge funds for alleviating poverty that mostly fall in the wrong hands and funds are used for something else other than helping the poor. It is often that those who are better off and the more vocal take the lion's share, which leaves little for those whom the program was intended in the first place. This sort of general intervention will have very little or no impact and may lead to a waste of resources.

Therefore, techniques like Small Area Estimation using maps and cross-referencing data can help identify target areas and people and enables informed decision making and allows for direct and effective interventions. The practices of adopting such techniques with use of data that exists from past censuses, surveys and also administrative data helps to avoid conducting large surveys that are very resource intensive and most of the time beyond the means of many organizations and governments.

The use of maps and picture layouts with digital data is accessible and, as a result, tend to interest even those who suffer from data phobia. This will lead to more informed people, particularly those making policies and decisions.

As data producers we need to be aware of the additional needs of the data users with new development challenges that arise (e.g. climate change) and build capacity to be able to meet these needs. Not only is it important to coordinate with data users but it is equally  important, to have good coordination among the data producers particularly in the areas of standards, definitions and methodologies if data are to be comparable and used for cross referencing in such in future.

## Future plans and sustainability

Alleviation of poverty has always been high on the list of development priorities of Bhutan, a country that measures Gross National Happiness. In fact, many countries, including developed countries, are beginning to rethink growth and development in terms of well-being. Poverty has been linked to various problems that are happening around the world. Poverty and inequality have been identified by some as one of the causes of the recent rioting in Britain that destroyed lives and property.

The use of the technique had a relatively small initial cost of around USD$ 90,000 - 100,000, which includes staff time, consultancy fees, training and travel, workshops and the publishing of the report. Once the capacity is built then the exercise will fully depend on the availability of appropriate data with a regular budget for workshops and printing.

With some staff already trained in the poverty mapping methodology using the World Bank's *PovMap2*, Bhutan hopes to continue to apply this practice not only to poverty prevalence, but also to other socio-economic issues and problems like child malnutrition and HIV prevalence.

Although the Bhutan National Statistics Bureau may not be fully confident in carrying out the whole exercise of using the small area estimation technique after this first experience it is hoped that capacity cab be built by continuing to undertake the exercise regularly, using expertise from outside the statistics bureau and by providing on-the-job and other training. For future continuity of the exercise, the knowledge can be passed on by coordinating younger staff with more senior staff.

## Feedback from the beneficiaries of the practice

As mentioned earlier, the report was received very well by all. In fact, with the government's main objective of the Tenth Plan to reduce poverty to 15 percent, the report proved to be very timely and relevant. The poverty estimates from the report were one of the major criteria used to allocate the Block Development Grants for the local governments or the gewogs (blocks) to tackle poverty directly, say, by building farm roads to improve access, or by constructing irrigation channels to improve agriculture production, depending on the priorities for development in the respective gewogs.

The study also generated a lot of interest and debate among the planners and policy makers, particularly the parliamentarians who were interested in the situation of their constituencies. The report was used by some members of the parliament to invest their Constituent Development Fund in various activities like building roads, small bridges, irrigation channels and developing training programs.

The report also indirectly stirred interest among the development sectors and district administrations to evaluate their past activities and to realign their priorities.

The report was mentioned and quoted on several occasions in parliamentary debates and in the National Mid-Term Review of the Tenth Plan. In fact, the Prime Minister personally congratulated the work of the National Statistics Bureau for being pro-active and relevant in response to the report.

## Supporting documents

The report, *Small Area Estimation of Poverty in Rural Bhutan* (August 2010) and other reports and documents of the NSB can be downloaded and viewed on the website of the National Statistical Bureau: www.nsb.gov.bt.

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# The development and implementation of the *Mongolia in World Competitiveness* report

*Lkhagvasuren Rentsenbyamba*

## Problem statement

President TsakhiaglinElbegdorj was inaugurated in 2009 and came into office on a platform focused on increasing Mongolia's competitiveness throughout the world. Therefore identifying the growing need for more detailed and coordinated statistical data and research papers to benchmark Mongolia's development progress both nationally and internationally became a priority.

A consortium of sponsor companies, at the president's bequest, pooled their resources to establish an independent, research-focused organization to address the many issues associated with national competitiveness. The organization is the Economic Policy and Competitiveness Research Center (EPCRC). The EPCRC, Mongolia's pre-eminent think tank, then responded to the president's call to promote competitiveness by creating and using a report titled, *Mongolia in World Competitiveness 2010*.

## Outcome achieved

The report used 300 indicators to analyze Mongolia in comparison to 14 other countries and was published in cooperation with the World Competitiveness Center IMD, in Switzerland. The end result was not only a report that documented Mongolia's position in the world, answering many unknown questions, but generated awareness and discussion about Mongolia's strengths and weaknesses. Thanks to widespread dissemination, the report's contents have inspired national debate among policy makers, the private sector and the public.

Firstly, through the process described below and by using a methodology adapted from the IMD, the report successfully pinpointed Mongolia's 40 weakest areas of competitiveness. The EPCRC then selected relevant issues from these 40 weakest criteria before organizing and disseminating the information in order to stimulate discussion among policy makers and researchers.

Prior to the report, it was not clear where Mongolia stood with some indicators. For example, it was known that the total public expenditure on education was 6.9 percent of GDP in 2008, but a benchmark was needed to show if this was an acceptable rate or not. So, at its most basic level, the report, this clearly highlights areas in which Mongolia can improve, streamline discussions as a reference point and is expected to lead to more efficient policy making.

After publishing 1,800 copies of the competitiveness report in English and Mongolian, the EPCRC submitted 500 copies of the report to parliamentarians, cabinet members, other important policy makers and cooperating organizations of Mongolia, with whom the EPCRC signed memorandums of understanding (such as universities and research institutions for the sharing of experience and data). Seven hundred reports were sold to the private sector and the report was also made available on the EPCRC website. Several results – including generating nationwide discussions - were linked to the mass distribution of the information:

- The *Mongolia Competitiveness Report* took center stage at multiple international forums including the Mongolia Economic Forum; the 'Discover Mongolia' International Mining Investors' Forum, as well as the International Conferences: 'Democratic Governance: Challenges and Opportunities' and 'Competitiveness and Corporate Social Responsibility'.

- Mongolia's national broadcaster showed support in committing airtime to the competitiveness report every week. Discussions related to Mongolia's global competitiveness now take up 15 minutes of the Business Times, an hour-long program airing during primetime. Every week EPCRC chooses a weakness criterion to discuss and assembles a panel of experts to generate a debate. For instance, if education was the chosen topic, EPCRC would bring together a high school teacher, an official from the ministry of education and a university professor for a discussion on the show.

While the report showed that Mongolia had a competitive advantage in some areas, such as gender equality and the growth of the mining sector, other areas, such as infrastructure, were found to be lagging. As a result, taking the report a step further, in March 2011, the EPCRC decided to focus on Mongolia's aviation industry, part of the country's infrastructure that was found to be one of the 40 weakest indicators.

The EPCRC published a research paper, *Mongolia: Impact from International Air Service Liberalization*, which made policy and practice recommendations for the improvement of this sector. Ultimately, recommendations made in the report have led to the process of privatizing Mongolian Airlines Company.

## Details of the practice

### Objective

The EPCRC wanted to create an independent and powerful database that is accepted as an international benchmark in an ever-globalizing world. Though the aim was to improve Mongolia on a national level, the acceptance of this as an international benchmark and independent database was vital to its credibility. It also served as a tool to attract foreign investment into Mongolia's booming sectors (such as the mining industry). Consequently, the EPCRC chose to use the well-respected methodology of IMD to create a database containing more than 300 indicators covering issues regarding the country's economic and business environments, as well as infrastructure and governance concerns.

It was then decided to use this benchmark as a way to describe where Mongolia is in relation to world competitiveness by comparing Mongolia to other similar countries in terms of mining, geography, economy etc.

Using the benchmark, the 40 weakest and the 20 strongest criteria in Mongolia were then identified and these indicators were used to build policy recommendations and specific, targeted research papers addressing the strongest and weakest criteria. Finally, the hope was to generate discussions and organize workshops regarding issues based on the strongest and weakest factors for policy makers, analysts and the public. Part of achieving the final goal involved disseminating and advocating the importance of Mongolia's national competitiveness to the wider public through the EPCRC website, a weekly TV program on the Mongolian National Broadcaster, as well as through daily newspapers.

## Method

To benchmark Mongolia, the EPCRC chose to include and compare Mongolia to 14 similarly developed economies covered by the *World Competitiveness Yearbook* (WCY), published by IMD and which includes indicators showing the competitiveness of 57 countries around the world. Selected countries include: Singapore and South Korea (benchmark countries), Chili, and Qatar (similar mining sectors), Slovenia and Ukraine (similar transition economies), Kazakhstan and Mexico (similar in geography).

The 300 competitiveness criteria included 212 hard, statistical data examples and 115 examples of 'survey data', collected from an 'Executive Opinion Survey'.

Statistical data was collected by first submitting an official request to the data producers, such as NSO or the Bank of Mongolia. However, if the requested institution did not have the data it was then requested from the private sector employing a research consulting company.

Because the methodology and design of the report is owned by IMD, one of the first steps taken was a workshop with the Prime Minister of Mongolia and the IMD team to discuss the goals and implementation of the report. The EPCRC also held workshops in provinces such as Darkhan, Erdenet, Khovd, in order to generate new information through surveying people and also introduce the idea of competitiveness to the people.

Feedback was obtained mainly from social media sites such as Facebook, YouTube (where people commented positively on the posted videos of the program which airs on the national broadcaster) and on the EPCRC website.

## People involved

EPCRC worked as an executing agency in this report, employing the help and expertise of IMD. Four researchers and one manager from EPCRC participated.

As the proprietors of the methodology behind creating the World Competitiveness Yearbook, IMD collaborated with the EPCRC by sharing data and advising on approaches and database architecture. The following international organizations were involved to co-finance the 2010 report: The Asian Development Bank, The World Bank, Swiss Agency for Development and Cooperation, and the German Society for International Cooperation.

EPCRC prepared the report in six months. Operation of the report started in September of 2010 and finished in February of 2011. The total cost was approximately USD$60,000 excluding printing costs. The main cost was the payment to the IMD for advice and data retrieval of the other 14 countries. This is necessary every time the report is done because IMD created the method of collecting and compiling the data and owns the copyright of the report, as well as the information collected on the benchmark countries. The remaining USD$20,000 covered salaries and operational costs.

## Success factors

As a result of the financial support from international organizations and the private sector, it was possible to employ IMD's expertise in forming the report and comparing Mongolia to other countries. EPCRC was also able to disseminate the report on a large scale by publishing 1,800 reports and over 2,000 CDs that contained electronic versions of the report, as well as lectures from StephaneGarelli, professor at IMD and director of the World Competitiveness Center. Most of the published reports and CDs were submitted to important policy makers and analysts with the intention of promoting an understanding of the important competitiveness statistics in the policy making process.

Furthermore, the support from the government, especially from the office of the president, enabled the EPCRC to organize and take part in many workshops and meetings regarding the report which generated many discussions and took the reports to the front of Mongolia's policy debates.

The support of the National Broadcaster of Mongolia (MNB) enabled us to advocate and disseminate national competitiveness information beyond policy makers, to the public, through a weekly TV program on the MNB. This continues to facilitate the efficient mass dissemination of such information.

In terms of reaching the public success was found in making the report available and accessible for free by using the Internet through postings on the EPCRC website, Facebook and YouTube.

Through the financial support of the broader business community, special research papers were prepared based on the strongest and weakest aspects of Mongolia's competitiveness in the commercial sector (e.g. Mongolia: Impact from International Air Service Liberalization).

With the cooperation of other research institutes, the data collection process was very efficient and effective. However, some research undertaken by EPCRC for the report, gathered from universities and public organizations, such as determining average living costs, proved to be difficult for the small staff of five and as a result, we cooperated with the professional researching company such as *Human Fortis Co. Ltd*. The cost was US$3,000.

## Challenges and solutions

The Mongolian statistical system is under development and some important data could not be found or did not meet the minimum requirements of the IMD. In response, we collected minor data, such as salary, apartment expenses and office rental prices, as well as the cost of mobile phones, through surveys and research.

At the outset, public awareness about competitiveness was not high; therefore, advocacy was very important for raising public awareness about the report's findings. Finding funding for this report and project was difficult the first time around and international donors such as the World Bank made it possible. However, the popularity of the report has led to support from both the public and private sector,which see the value in the information and want to make this a regular, annual practice. Also, in terms of cost, using IMD's methodology and data is a fixed cost that is simple to budget for.

There were issues with the communication and the understanding of the 'Executive Opinion Survey' questionnaire by some people, especially those from provinces with limited exposure to communities outside their own. In response, workshops were organized for those who did not understand the survey and its questions.

## Recommendation for others

The main cost was the payment made to the IMD for the use of their methods and approaches as well as their data from other countries; this is unavoidable because the material is copyrighted. The cost was related to the volume of countries selected, so, to reduce costs, we selected 14 comparison countries and paid USD$40,000, rather than requesting all comparison countries, in which case we would have been liable to pay USD$100,000. This reduced costs and kept the report focused.

We found that many countries, such as Kazakhstan, United Arab Emirates and Oman have implemented the project successfully, so we are confident the applicability is widespread and helpful.

## Future plan and sustainability

With funding available, EPCRC plans to publish the report annually, but this is totally dependent on the ability to collaborate with IMD as they own the intellectual property and the data that makes the report possible. We are already working towards the preparation of the next version of the report, *Mongolia in World Competitiveness 2011*. We have found that the report is only the beginning and spurs further research and papers into areas of potential improvement for Mongolia.

This report will be the main discussion task of the panel session on Competitiveness of Mongolia Economic Forum, the biggest economic forum of Mongolia.

Finally, based on the experience of the *Mongolia in World Competitiveness*, the EPCRC is working to launch a project, *Regional Competitiveness Index*(RCI).

## Contacts

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# New Zealand:
# The use of data to improve energy efficiency

*Lulu Zeng*

## Problem statement

The New Zealand government is interested in pursuing energy initiatives that have both an economic benefit and a positive overall effect on the environment (Ministry of Economic Development 2011). In order to promote energy efficiency, the government has carried out a set of energy efficiency programs that provide funding, incentives and knowledge to help both the public and private sector to improve their energy efficiency. The energy saving programs were designed to target the areas that have the most energy savings potential. This case study illustrates how the use of data has contributed to producing robust estimates of energy savings potential, which shaped the design of energy saving programs.

Every five years, the government determines its energy savings strategy through its National Energy Efficiency and Conservation Strategy department. The strategy is reviewed five years after it is released and subsequently replaced by a new strategy that reflects more up-to-date energy saving needs. The first strategy was introduced in September 2001 and replaced in 2007. New Zealand is now on its third strategy, in place since 2011.

In 2006, the review of the strategy in place, released in 2001, suggested it was insufficient in producing substantial energy savings (New Zealand Government 2007).

To determine the sectors and areas with the most savings potential and to set targets, the government needed a robust estimate of the energy savings potential.

## Outcome achieved

Given the increase in energy supply risks, energy prices and environmental pressure (EECA 2006), the Government's new strategy released in 2007 aimed to accelerate energy efficiency. The programs in the 2007 strategy were designed to target sectors (e.g., residential, transport, commercial and industrial) and areas with the most energy savings potential (e.g., space heating, lighting and cooking for the residential sector)  and set energy savings targets based on more robust estimates of savings potential (New Zealand Government 2007). The programs were designed with the following steps:

- Estimation of the energy savings potential. The energy savings potential was used as a guideline when deciding New Zealand's energy savings capability and setting key performance indicators;

- Consultation of government agencies, energy providers and energy users, in addition to other entities, to identify the most efficient way in deliver the programs.

- Originate programs that reflected the areas with the most energy savings potential, and that efficiently address the needs of energy users.

The Building Research Association of New Zealand (BRANZ) maintains a database through The Household Energy End-Use Project (HEEP), which has energy, temperature and social and physical house data on 400 selected homes across New Zealand from 1997 to 2005, monitoring all fuel types. The survey was comprehensive including monitoring equipment and frequent visits to collect data from the random sample The HEEP data represents half of the country including all main centres. The collection of data was part of a long-term study with the objective to measure and model the way energy is used in New Zealand households (BRANZ 2002).

BRANZ's HEEP database was used to estimate the energy savings potential for the residential sector. The residential sector consumes 13per cent of total energy use, and 33per cent of total electricity use (EECA 2008).

The project was funded continuously by the Building Research Levy and at various times in various ratios by the Energy Efficiency and Conservation Authority (EECA), among others, and was the most thorough investigation of the way energy is used in New Zealand homes since the 1970s.

The HEEP database records residential energy use in physical buildings and appliance characteristics, as well as socio-demographic factors to describe energy consumption patterns and some of the energy services, in particular, the achieved indoor temperatures. The database was used to understand current and future national household energy requirements and as a tool to evaluate the implications of building and appliance performance changes.

The sample of the database includes households from large and small cities, urban and rural areas and both the North and South Islands. HEEP monitoring activities included a detailed occupant survey as well as a detailed house energy examination. The monitoring covered all fuel types (electricity, natural gas, LPG, solid fuel, solar water heaters) as well as temperatures in at least three locations.

In particular, the HEEP database helped to:

- Identify the areas with the most savings potential in the residential sector. This would improve the value for money of the government's investment in energy savings programs;

- Set energy savings targets. Robust estimates of targets increased the confidence in target setting and the accountability for program delivery (New Zealand Government 2007).

The energy savings potential was estimated based on the HEEP database. Since the release of the 2007 strategy, New Zealand has achieved substantial energy savings and health benefits in the residential sector. The awareness of energy efficiency among New Zealand citizens has also risen. The benefits realized from the strategy accelerated in the period from 2007 to 2010. This is presented in Table  below.

## Table 1: Benefits of 2007 strategy developed using the HEEP database

| Year | Action | Benefit |
|------|--------|---------|
| 2007/08 | 571 homes had clean heat appliances installed. | 11,000 low-income homes were insulated, with energy savings of NZD$1.5 million pa and health* savings of $2.3 million per year;<br><br>Achieved savings of approximately 1.8 PJs (NZD$73 million) as a result of promoting energy efficient products (e.g. fluorescent light bulbs). |
| 2008/09 | 20,600 homes were retrofitted with insulation, clean heaters or other improvements. | Delivered 1.8 PJs of energy savings (NZD$73 million) through more efficient products;<br><br>Market research showed the awareness of consumers to energy efficiency product labels increased to 73per cent from 61per cent from the previous year. |
| 2009/10 | 57,908 houses were retrofitted with insulation and clean heating devices. | Research showed consumer awareness of energy efficiency products has turned into purchasing action. |
| 2010/11-2012/13 (estimated) | 2,000 full-time job creation economy wide. | NZD$100 million in warm home health benefits; NZD$150 million in air pollution health benefits; Energy saving of 0.2 PJ. |

*Research shows retrofitting insulation reduced admission to hospital by 43per cent and doctors' visits by 19per cent (EECA 2008). A third of New Zealand's housing stock is poorly insulated, with indoor temperature often falling below the levels recommended by the World Health Organization (EECA 2009)

Source: NZIER, (EECA 2010a), (EECA 2008), (EECA 2009), (EECA 2010b)

The forecast lifetime benefit cost ratio, the ratio of the benefit of the program to its cost throughout the program's period, for the residential programs at 2010 was four to one. The government has demonstrated value for money for its investment.

Most of the outcomes listed in the table above met the targets set by the 2007 strategy. This achievement further provided evidence of the feasibility of the energy savings potential and target estimates based on the HEEP database.

# Details of the practice

## Objective of data use

The ultimate objective of using the BRANZ's HEEP database was to improve energy efficiency in New Zealand. In order to achieve the energy efficiency goals, the New Zealand Government used the HEEP database as a foundation to estimate energy savings potential in the residential sector.

## Sector for data use

The HEEP database was used for the residential sector in New Zealand. Although the energy saving programs included in the 2007 strategy cover all sectors (residential, transport, commercial and industrial) in New Zealand, the HEEP database was used for estimating the energy savings potential in the residential sector as the HEEP survey covers only the residential sector.

## Agencies involved

The agencies that delivered the energy efficiency programs were the EECA and the Electricity Commission (EC) before November 2010.

EECA is a Crown entity and was set up by the government to encourage, support and promote energy efficiency, energy conservation and the use of renewable sources of energy. EC was established under the Electricity Act to regulate the operation of the electricity industry and markets (wholesale and retail) in accordance with the government energy policy. EC was succeeded by Electricity Authority (EA) in November 2010.

Since November 2010, EECA is the only agency responsible for energy efficiency programs in New Zealand.

However, the agency that directly used the HEEP database was KEMA, an international energy consulting firm, which was contracted by the EC to estimate the energy savings potential. The KEMA study was released in September 2007 and the programs designed based on KEMA's estimates are on-going. The impact of the HEEP data on New Zealand's energy efficiency is continuous rather than ad hoc.

## Process

The process for carrying out the energy saving programs that used the HEEP data as the source for savings potential estimates are described as follows (Tanner Ritchie & Company 2009).

### Modelling, economic evaluation, and research

The first step of the energy saving practice is to estimate the energy saving potentials across sectors to design the programs. The estimation of the energy saving potentials required the use of the HEEP database. This process involves the following:

**Commission of contract.** EC contracted KEMA to carry out the study on the energy savings potential in New Zealand;

**Access to data.** KEMA had access to BRANZ's HEEP database as the data was available to BRANZ's financial partners, one of which is EC (BRANZ 2002);

**Data analysis.** The energy saving potentials were estimated based on household level information provided by the HEEP database. The HEEP database includes information on: Household socio-economic characteristics, energy consumption, energy use patterns, household floor size and energy use by in-house appliances.

The model used for estimating the potentials is KEMA's DSM ASSYST™ model. The model takes a bottom up approach and looks at the energy saving that can be achieved for each household by replacing inefficient appliances given their household characteristics (e.g. socio-economic characteristics and energy use patterns);

**Collaboration of data user and producer.** BRANZ worked with KEMA together to define the questions to address and provided assistance on the use of HEEP data (BRANZ 2002);

> **Modelling and the publication of results.** **KEMA** carried out the study on the savings potential estimation and provided the result to EC in the report titled '*New Zealand Electric energy-efficient potential study (volume 1)*' (KEMA 2007).

## Program design

The programs were designed with consideration of the following factors (EC 2007):

Areas that have the most savings potential based on KEMA's estimates. The study by KEMA identified insulation as one of the areas that has the most savings potential. This is reflected in the design of the programs by introducing programs that help low to medium income households insulate their homes;

The main barriers New Zealand faces in achieving energy efficiency. The programs aim at removing these barriers to achieve energy savings. The identification of the barriers was through a series of consultations with businesses and EECA and EC staff.

Examples of the top barriers identified are – financial barriers to energy efficient products and the lack of energy savings information. The design of the programs reflected this. The government introduced programs that subsidises consumers in purchasing energy efficient products (e.g., fluorescent light bulbs) and provide energy rating labels for electrical appliances;

Government's energy saving plan. This determines how radical the programs are, in other words, how big the investment is. The investment into the programs is a balance of the government's energy savings goals and other priorities.

## Program delivery

The delivery of the programs is contracted to business providers through contracting processes such as request for proposal. Once the programs were contracted, regular feedbacks were obtained from contracted providers and businesses to ensure the programs are tailored to their needs and are managed effectively.

The government also introduced a series business campaigns across a range of media to raise people's awareness of energy efficiency products and programs.

## Program monitoring and evaluating

This involved comparing the savings achieved through the programs against the target set based on the savings potential estimates. The government's energy strategy is also updated regularly to reflect the most up to date energy savings needs.

# Success factors

## Availability of the HEEP database was key in the success of the practice

Ultimately, this factor made the practice possible. The dataset provides a detailed breakdown of the characteristics of household energy use, which met the need for KEMA to estimate the savings potential in the residential sector.

By contrast, there was no equivalent end use data available for the commercial and the industrial sectors. To estimate the potentials, KEMA had to carry out its own data collection and use data from other countries as a proxy. This has reduced the confidence in the potential estimates (KEMA 2007).

## Collaboration of data producer and user

BRANZ worked with KEMA to define the questions to address and provided assistance for the use of HEEP data (BRANZ 2002).

## Using data as evidence

The design and delivery of the programs were based on the savings potential estimates, which is highly data driven.

# Challenges and solutions

The main challenge when using HEEP data is that little information on energy use in new homes was provided (KEMA 2007). To fill this gap, KEMA surveyed home builders throughout New Zealand about their building practices.

This challenge identifies an area for future improvement of the HEEP database. This indicates that it is important to update a survey regularly to include timely information and new features of the sample.

# Recommendations for others

Through the use of the HEEP database, New Zealand has achieved significant health, environmental and economic benefits in the residential sector. The use of data should be considered as an essential element when forming policies and decisions. In this capacity, it is important to invest in data collection and make data available for policy making. In contrast to the residential sector, the lack of data in the commercial and industrial sectors forced KEMA to look for other sources to gather data, and this have reduced the confidence of KEMA's estimates of energy savings for these sectors.

With the increasing attention of energy efficiency around the world, there is a need for countries, where a similar database does not exist, to make such a database available. To make this happen, it requires the energy authorities in these countries to take the lead in demonstrating and persuading the public and the government about the importance of the database in informing evidence-based decision making and in achieving energy savings potential.

First and foremost, in general, and very much so in this instance, consulting stakeholders was an essential step in the design of policies. This helped the policy makers understand the practical needs of the different entities involved and helped work out the most efficient way to deliver the policies.

Furthermore, a good database should be able to support studies with various purposes and, in doing so, will make the project more economic. The HEEP database contains information that not only can be used for environmental studies (the main focus of the government's energy saving programs), but also can be used for health and economic

analysis. This type of 'one covers all' database streamlines data collection and processing without duplicating processes.

Once the database is in place, it is important to update it regularly to include timely information and new features of the sample. The lack of information on new homes from the HEEP database forced KEMA to approximate the estimates based on other information, and this has reduced the confidence for these estimates.

Finally, good policy making involves not only the use of data up front when designing the policy, but also regular review of the policy with the assistance of data. The review of the policy helps us to assess the effectiveness of the policy with regard to its goals. The review of the policy also ensures the policy is updated to reflect the current situation. The New Zealand government updates its energy strategy every five years with each strategy guided by data.

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*For details about the HEEP database, please see: http://www.branz.co.nz/HEEP*

# Going for Goals - Supporting countries to measure their progress: The Asia-Pacific Education for All Mid-Decade Assessment and Mid-Term Policy Review (MDA-MTR)

*AIMS team based at UNESCO Bangkok*

## Background

In 1990, the international community committed to "meet the basic learning needs of all" and launched the Education for All (EFA) initiative. The pledge to EFA was renewed in 2000, with a target date of meeting the following goals: 1) Expanding early childhood care and education; 2) Achieving universal primary education; 3) Providing life skills and lifelong learning opportunities; 4) Improving literacy; 5) Achieving gender equality in education; and 6) Providing quality education by 2015. The education goals of the Millennium Development Goals (MDGs) also reinforced the need for quality education for all.

There has also been growing recognition that regular and systematic monitoring of EFA and the MDGs at the global, regional and national levels is central to the achievement of the goals by 2015. As a result, since 2000, countries set up and strengthened regular EFA monitoring mechanisms either as part of, or complementary to, the overall education sector monitoring.

At the same time, global assessments of EFA achievements were undertaken in 1996 and 2000. These assessments, however, were largely donor-led without much country ownership and did not translate to the institutionalization of EFA monitoring and assessment. Lessons from these assessments showed that monitoring undertaken and led by national governments, involving education partners and other EFA stakeholders, is more likely to have an enduring impact. Regular monitoring of EFA also focused mainly on reporting achievements and those who are enrolled. This has left huge questions about those who are not reached or those who are left out by the education system.

At the halfway point of the 2000-2010 decade, a mid-decade assessment of EFA progress was again undertaken in the various regions around the world. The Asia-Pacific region, however, took on a slightly different approach to the assessment through the Mid-Decade Assessment and Mid-term Review (MDA-MTR). The process was concluded with an independent evaluation, the findings of which are referred to in the discussions below.

## Problem statement

Countries in the Asia-Pacific region are at extremely varied stages in their development of both education and statistical systems. Most countries in the region have detailed data on how many children of different ages are in school, but these indicators are not always used to strengthen and monitor education policy. Systematic monitoring and assessment of progress towards the EFA goals and MDGs is imperative for countries to know where they stand and what more needs to be done. Achieving EFA and the MDGs also requires all children, young people and adults to have equal opportunity for a quality education. Certain groups of the population are often left behind because of their geographic location, socioeconomic status, ethnicity, sex, disability, etc. The lack of data on these unreached groups makes it even more

difficult to implement targeted policies and programs to ensure their inclusion. Additionally, there is some sensitivity and lack of attention to systematically gather data on unreached groups (e.g. ethno linguistic minorities, refugees, illegal immigrants, etc.) as well as weak capacity to collect data.

The Mid-Decade Assessment and Mid-Term Policy Review (MDA-MTR) was a major strategic program conducted over a number of years to support countries in the Asia-Pacific region in producing their own reviews of EFA progress. It aimed to enhance in-country capacities to carry out a nationally-led comprehensive assessment of EFA and institutionalize EFA monitoring. The exercise endeavored to institutionalize a culture of monitoring in countries, taking into account the need to identify and reach marginalized groups, and address education disparities and inequities in a sustainable way. The MDA-MTR consisted of a regular series of regional and national workshops backed up by provisions of expert advice through specific training missions to countries. These activities, organised by UNESCO and UNICEF in conjunction with other partners, built capacity in the sense that they were not in themselves designed to assess EFA progress, but were designed to help countries assess and publish their own reports on progress to the EFA goals.

## Outcome achieved

*"[The MDA-MTR] shifted the emphasis from pride on enrolment rate to concern for those not enrolled"*

Education official interviewed as part of the MDA-MTR evaluation

The MDA-MTR is a clear example of how a statistical capacity building process influenced education policies in countries. Countries used the technical advice of experts provided by the MDA-MTR program to improve their technical capacity to collect and analyze data. Countries used the strategic recommendations of UNESCO and UNICEF to create a national MDA-MTR process to strengthen their political commitment to monitoring progress of the EFA goals. This strengthening in political commitment supported and increased demand for the statistical data which formed the core of national and regional EFA progress reports. In particular, the MDA-MTR led to the following key outcomes:

**1. The institutionalization of EFA monitoring, strengthened capacities in monitoring and coordination in countries, including heightened awareness on the need for reliable data in policy making.**

Strong ownership of the national assessment process led to the institutionalization of EFA coordination and monitoring mechanisms in countries. It also expanded the knowledge base on EFA and education MDGs monitoring. National committees and technical working groups for each EFA goal were formed and continue to function in many countries even after the MDA was complete, e.g. Cambodia, Indonesia, Malaysia, Nepal, the Philippines, Sri Lanka, and more. An EFA unit under the Ministry of Education was established in Sri Lanka. In China, India, Indonesia and the Philippines, national structures were replicated at the provincial level (state level for India) where EFA assessments were undertaken.

The capacity of education staff in countries have also been enhanced to carry out a comprehensive EFA assessment and **systematic** monitoring of EFA.

Training was carried out at the regional, sub-regional and national levels. Thailand, Sri Lanka and the Philippines were among the countries that carried out provincial-level training on EFA monitoring and assessment as part of the MDA. Various databases and data systems related to education were also integrated as an outcome of the national MDA in India, Thailand and Samoa.

"The MDA exercise offered Malaysia a structured method to collect data," an Education official from Malaysia interviewed as part of the evaluation said. Malaysia is among the countries that continued to produce its own national EFA assessment report after the MDA. Other countries are Indonesia, China, Uzbekistan and Sri Lanka.  Pacific countries in 2011 carried out an end-of-decade assessment of EFA.

National and sub-regional EFA mid-decade assessment reports were among the major outputs of the MDA process. Countries in the region continue to produce, on their own initiative, national EFA reports patterned after the MDA, demonstrating that EFA monitoring has been institutionalized.

Countries have also come to value the need for reliable data for use in policy and decision-making. The independent evaluation of the MDA-MTR further noted that the process was an "opportunity to bring about change in attitudes and behaviours of education planners and develop a more evidence-based approach to policy development." National and sub-regional EFA MDA reports were used for education planning purposes by governments, donors, UN agencies, and other EFA partners. In Lao PDR, the national assessment report was used in preparing the Education Sector Development Plan and its EFA Fast Track Initiative application. Nepal used its MDA report as a reference for the national School Sector Reform Program.

## 2. The project resulted in political acknowledgement of unreached and marginalized groups and the need to address disparities in education.

The exercise generated political recognition of the unreached and marginalized groups in education and increased awareness of the need for their inclusion. As a result, countries began to collect data on these groups and reviewed and analyzed existing data. Countries also revised or developed new policies to address marginalization in education (see specific examples under item 3 below). Meeting the EFA goals and the MDGs by 2015 first entails full recognition by governments and key stakeholders of these unreached, underserved and disadvantaged groups, followed by political commitment and action to ensure that these groups have access to quality education, and learn and stay in school. The MDA-MTR pushed countries to use a different lens when reporting on EFA achievement; one that now focuses on 'progress for everyone', including the unreached groups.

Countries in Asia-Pacific also continue to give attention to addressing inequalities in education, which are either referred to as 'reaching the unreached', 'education with equity', or 'addressing marginalization'.  The theme has resonated globally with the EFA Global Monitoring Report adopting "reaching the marginalized' as the focus of its 2010 report. The 2010 and 2011 meetings of the High-Level Group on EFA also recognized the need for countries to address marginalization. The Southeast Asian Education Ministers Organization (SEAMEO), in collaboration with ASEAN and UNESCO, launched 10 inter-country collaborative projects on reaching the unreached in education to help accelerate EFA progress.

### 3. There are now concrete actions toward reaching the unreached and addressing marginalization in education.

The genuine political recognition of unreached groups led to concrete actions in countries for their inclusion. This included, first and foremost, the systematic collection of data on unreached groups and disaggregating data for a deeper analysis of education disparities. Using findings of the national assessment, countries also began to implement policies aimed at reaching the unreached.

Specific examples of actual changes in countries related to data collection include the collection of data on enrolment at the primary level for the most disadvantaged castes (*Janajati* and *Dalit* groups) in Nepal starting in 2009; the acknowledgement of Indonesia of the importance of disaggregated data prompted the country to carry out the assessment down to the provincial level; and in Viet Nam in 2010 there was a launch of a comprehensive mapping of available education data, including data on unreached groups.

Some examples of policies and programs adopted by countries to reach the unreached in education include the abolition of school fees and expansion of school feeding programs in Lao PDR; the development of an inclusive education policy in Lao PDR, Myanmar, Sri Lanka, Pakistan and Timor Leste; the introduction of the Vulnerable Community Development Framework for marginalised groups in Nepal; adoption of mother-tongue based multilingual education in the Philippines; and efforts to improve education quality for ethnic minorities in China. More examples of policy change directly or indirectly attributed to the MDA-MTR are identified by the countries themselves and are included in the evaluation report.

### 4. There was an increased relevance of EFA in the countries.

Many countries in the region now see the realization of the EFA goals as linked to the achievement of national education goals. Thus the monitoring of EFA is not considered as a separate process, but rather, integral to the monitoring of the education sector and national targets. The MDA led to a "shift in the attitudes of the Ministry – from collecting data for publishing in global reports to an awareness of monitoring and evaluation and using data for forward planning," said a high-ranking MOE official from Cook Islands interviewed as part of the evaluation.

According to the evaluation, although many issues highlighted in the MDA "were known for a while, the MDA put these issues in the spotlight and generated a momentum to do something about it."

## Details of the practice

Coordinated at the regional level, the MDA-MTR aimed to strengthen national capacities in:

- Assessing **national *(and sub-national)* progress** vis-à-vis the EFA goals and education MDGs; and

- Identifying the **remaining gaps** in terms of *quality* and *equity*, in order to plan the next phase of education reforms with a focus on addressing marginalization issues to attain the 2015 EFA goals and education MDGs.

The MDA was undertaken from 2006 to 2008 with a special focus on identifying and reaching the unreached in education. The findings of the MDA contained in national and sub-regional reports were then used for the policy review (MTR) in 2009. An evaluation of the MDA-MTR process was conducted in 2010 to document lessons and good practices for future assessments.

The whole process was coordinated by the UNESCO Asia-Pacific Regional Bureau for Education, in particular the UNESCO Institute for Statistics - Assessment, Information Systems, Monitoring and Statistics (UIS-AIMS) Unit. The multi-sectoral regional Thematic Working Group (TWG) on EFA that is co-chaired by UNESCO and UNICEF, served as the technical advisory body to the MDA-MTR. TWG members, such as UNICEF supported the process at the regional and national levels.

Learning from previous EFA assessments (1996 and 2000), the MDA-MTR took on a collaborative approach to encourage national ownership of the exercise).  MDA-MTR processes were designed to maximise influence in the region and gain traction among the different stakeholders. The strategy for the assessment, guidelines and instruments, came from the regional level through a consultative process with concerned countries and EFA partners.

The *Guidelines for the Asia-Pacific EFA Mid-Decade Assessment*, often referred to as 'Technical Guidelines', were developed with various EFA partners and with country inputs. This contained policy and systems indicators, core indicators and additional indicators for the EFA assessment. The Technical Guidelines explained the methodology to calculate and interpret indicators and their data sources. Countries were encouraged to use other sources of education data, e.g. household surveys and case studies, to give a comprehensive picture of EFA progress. Major groupings of unreached groups in the region were agreed upon through a consultative process. Countries were also encouraged to collect data, report on the unreached groups and use disaggregated data for analysis.

Regional and sub-regional training was undertaken for both education statisticians and policy makers. This training also served as a venue for collegial dialogue to further strengthen linkages between data and its use for policy making. National-level training and technical advisory visits were further conducted upon the request of the countries themselves. The MDA-MTR training and meetings focused on the setting-up of national structures for the assessment, enhancing partnerships and networks, data collection, analysis and reporting.

The evaluation of the MDA-MTR noted that the Technical Guidelines and training were critical in making countries get a sense of the tasks related to the assessment. To increase accessibility and facilitate information dissemination, all training materials, the Technical Guidelines and other related documents were made available on a dedicated website, which was part of the regional EFA homepage. All information related to the MDA-MTR process was also widely disseminated through the regional EFA electronic newsletter. Training materials saved on compact discs (CDs) were distributed widely, especially in countries with slow or limited Internet access.

Recommendations were made to establish national multi-sectoral technical working groups for each EFA goal that would carry out the assessment. Ministries of education (MOEs) led the national assessment. National committees were formed and inter-ministerial technical support groups for each EFA goal were established. Education developmental partners supported the process at the country level. The creation of these structures at the country level ensured the institutionalization of the process. It

also facilitated the collection of data from other ministries since they were involved in the exercise.

According to the evaluation, the creation of these structural mechanisms was critical to the effectiveness and efficiency of the MDA-MTR process, in particular this led to:

- An inter-ministerial platform for information and data exchange

- Added status and impetus to the process of collection and analysis of data

- Served as a vehicle for constructive debate, consultation and dissemination

- Was an integrated approach to issues and challenges facing education

- Offered easier access to data

- Built or strengthened relationships and networks

- Shared workload.

UNESCO, UNICEF, other UN agencies, INGOs and civil society organization (CSO) members of the Regional TWG on EFA provided technical and funding assistance. Technical Support Groups for each EFA goal were formed at the regional level to review national and sub-regional assessment reports. It was, however, emphasized that the review process was technical in nature hence countries readily submitted their draft national reports for review.

The UNESCO Asia-Pacific Regional Office provided assistance in fund mobilization by securing funds to support regional coordination and for decentralization to countries through the UNESCO field offices. The funds served as seed money for the national assessment that enabled countries to raise more counterpart-funding. UNICEF regional and country offices, and other national-level donors, also helped fund the country-level assessments.

The majority of countries covered by UNESCO's geographical grouping for the Asia-Pacific region participated in the MDA-MTR, grouped by sub-region:

- **Central Asia:** Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan

- **East Asia:** China, Mongolia (representatives from Japan and the Republic of Korea attended meetings as observers)

- **South-East Asia:** Indonesia, Malaysia, Philippines, Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam

- **South and West Asia**: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and Iran

- **Pacific:** Fiji, Samoa, Marshall Islands, Cook Islands, Papua New Guinea, Vanuatu, Tonga, Tuvalu, Kiribati, Solomon Islands, Micronesia, Niue, Tokelau and Palau.

Brunei Darussalam, Singapore and Timor Leste participated in the EFA Mid-Term Policy Review (MTR) conferences, but not the MDA process, for various reasons.

Brunei Darussalam, which joined UNESCO in 2007, carried out a national EFA assessment in 2009-10 using the MDA model.

**Figure 1: Conceptual linkages of the MDA-MTR process**
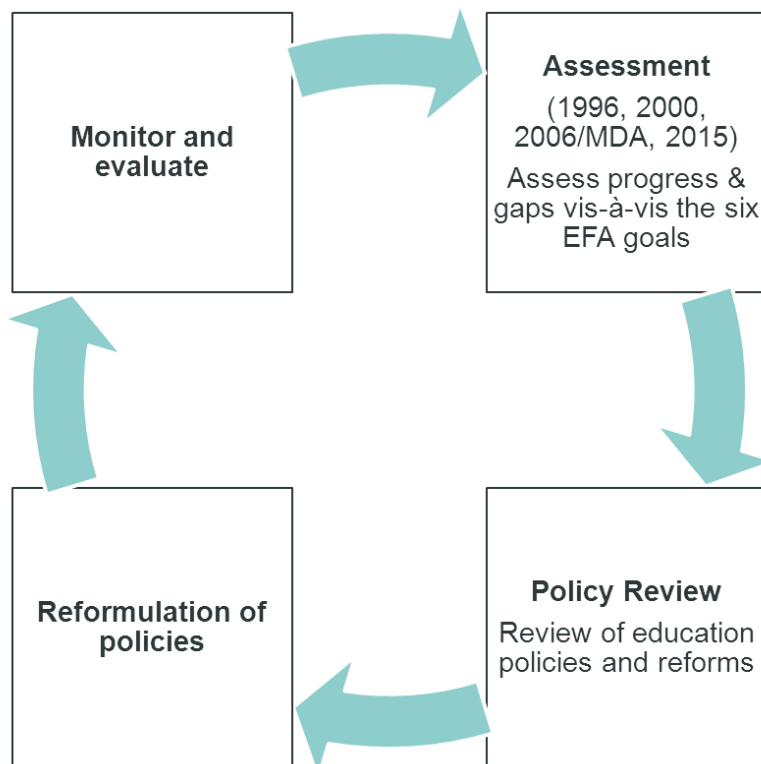


## Success factors

An assessment of EFA progress at the halfway point of the 2000-2010 decade was undertaken in various regions of the world. The Asia-Pacific MDA-MTR process, however, differed in its approach from those in other regions and from previous EFA assessments. It was focused on national capacity building and on identifying disparities in education. This focus increased national ownership prompting countries to work hard for the exercise's success.

Below are the key factors that differentiated the Asia-Pacific EFA MDA-MTR from the previous EFA assessments (1996 and 2000) and contributed to its success:

- A participative, flexible and multidisciplinary approach

- A strong emphasis on building national capacity, including training and technical assistance; at regional, sub-regional and national levels

- Led by institutions within the country rather than consultants

- Created regional structures to facilitate coordination and technical support

- Provided a systematic and robust framework for gathering and analysing data

- Included a wider range of indicators allowing for a more in-depth analysis of progress and gaps

- A strong focus on sub-national disparities, in particular the identification of unreached groups.

The above factors were considered by the independent evaluators of the MDA-MTR to be the most important elements that distinguished the MDA-MTR from other programs designed to measure progress towards international goals, and are the key considerations which other regional partnerships (countries or international organizations) should plan future programs of this type.

An evaluation of the MDA-MTR showed that "clear vision and purpose [were] key factors for success that galvanized many stakeholders to action." The evaluation noted that there was a clear strategy and guidance for the MDA-MTR with each major step decided after a consultative process with countries. At the same time, the exercise adopted a flexible, non-judgmental approach which recognized that the situation and context in each country is different.

Some countries have more established monitoring systems and could easily produce most of the MDA indicators while other countries were struggling with even the core indicators. The MDA recognized these different capacities among countries in the region and gave each of them flexibility to produce what they can, taking into consideration the national capacity. Similarly, by allowing countries to define marginalized groups according to national policy, the MDA was able to avoid any political issues in labeling such groups while encouraging countries to be explicit about the problems of such minorities.

The emphasis was on strengthening in-country capacities rather than merely having a national report at the end of the process. **Thus the MDA was seen not just as a statistical process** but as a participatory social process that brought countries on a journey towards monitoring. The impact of capacity building efforts was also maximized with training conducted at multiple levels: Regional, sub-regional and national. With more than 40 countries covered as part of the Asia-Pacific region, UNESCO adopted the strategy of focusing training on specific countries that then share their experience with other countries in regional and sub-regional meetings. A cascading effect was also achieved with Thailand, Sri Lanka and the Philippines carrying out training down to the provincial level.

Sustainability of the process was insured by institutionalizing the structures and mechanisms at the country level. "Our aim was very clear – we had to bring about change at the country level, by setting up country-level working groups," the evaluation report quoted a respondent from the UIS-AIMS Unit of UNESCO Bangkok. The appointment of high-level EFA coordinators to oversee the whole process as well as the creation of working groups ensured continuity despite staffing changes in the Ministry. For example, technical working groups continue to function in Indonesia and Malaysia, among others, and both countries have produced national EFA progress reports even after the MDA-MTR.

Political commitment at the country level was achieved through a deliberate strategy of engaging policy makers and decision makers throughout the process. This was done through meetings with Ministers during country visits, getting high-level participation to meetings, etc. The buy-in from high-level officials was instrumental in realizing the changes in countries, including their data collection processes and changing the mindset from reporting on achievements to also including unreached groups.

At the regional level, coordination of the MDA-MTR was undertaken by UNESCO, which also mobilized funding and technical support from the TWG on EFA members,

particularly UNICEF. Technical support groups were also formed for each EFA goal. These groups, composed of TWG members and individual experts, were responsible for the technical peer review of national and sub-regional MDA reports. The strong partnership between UNESCO and UNICEF helped mobilize other EFA partners and created a 'movement' around the MDA-MTR.

The MDA-MTR provided a systematic and robust framework for gathering and analysing data. Recommendations were made on activating national structures in countries to carry out the assessment, the tasks and milestones, as well as the collection of more than the core 18 EFA indicators previously set as part of the EFA 2000 Assessment. The MDA Technical Guidelines included 51 core indicators, 42 policy and systems indicators and 52 additional indicators for all EFA goals. This allowed for a more in-depth analysis of EFA progress and gaps. Moreover, collection of data on unreached groups not just through the education management information systems (EMIS) but also from other sources such as household surveys was encouraged.

The engagement of countries in the MDA-MTR process further increased the relevance of the EFA initiative in participating countries. Linkage was successfully established between the international EFA goals and the national education goals. Most countries in the region now see EFA monitoring also as monitoring national education goals. It is therefore in the national interest to sustain systems and structures set-up during the MDA-MTR.

## Challenges and solutions

Prior to the MDA-MTR, countries in the region monitored EFA progress, but not all had systematic and comprehensive processes in place. Monitoring mainly focused on aggregates. There was initial resistance to collect data on unreached groups (e.g., ethno-linguistic groups, refugees and illegal immigrants) due to political sensitivity.

The MDA-MTR aimed to address this by enhancing in-country capacities to systematically monitor and assess EFA. Tools were developed and trainings were conducted at regional, sub-regional and national levels. The whole process included high-level advocacy on the overall need for reliable and timely data, as well as data on unreached groups to be used as basis for making inclusive policy decisions. This led to the softening of the initial resistance to recognize the unreached groups and the collection of data on them.

Countries have different monitoring systems and different definitions of indicators and methodology of collecting them. The MDA-MTR tried to address this by harmonizing definitions based on international standards (International Standard of Classification for Education or ISCED) through the preparation and dissemination of the Technical Guidelines for the MDA. The MDA-MTR exercise also raised the awareness of countries on the process and importance of internationally-standardised education data.

Most data available in countries are related to Goal 2 (universal primary/basic education). The evaluation of the MDA-MTR specifically mentioned that countries had difficulty getting data and calculating indicators for Goals 1 (early childhood care and education), 3 (life skills and lifelong learning) and 6 (quality education). The MDA-MTR encouraged countries to calculate indicators for all goals and expand the list of indicators for all the EFA goals from the core 18 indicators.

The different levels of capacities and resources available (including human resources) in countries also meant that the MDA-MTR process had to be realistic and responsive

to national circumstances. Training, particularly at the national level, was adjusted and tailored, to take national capacities into account. As a by-product of the MDA-MTR, training modules on (i) EFA Monitoring and education management information systems (EMIS), and (ii) Use and analysis of household and census data for EFA monitoring, have been developed for use by countries from the national down to the school level.

Education data is inter-sectoral. Some data are held by other ministries other than the MOE. In many countries, MOEs have difficulty getting data from other ministries and the national statistical office. The MDA thus encouraged MOEs to involve other ministries and line agencies in the national assessment by forming inter-ministerial committees and technical working groups. It was also recommended to include NGO and CSO representatives since they may also have data on their grassroots education programs that the MOE may not have. Countries followed this recommendation to varying degrees depending on the openness of the political system. Thus countries still face challenges in obtaining data from other ministries and line agencies to varying degrees. It was also difficult to break the mind-set of using data outside of the EMIS.

The systematic collection of data on unreached groups remains a challenge. Although there is now recognition of these groups, countries still struggle to integrate regular data collection on these groups to their existing systems, e.g., EMIS. Some countries collected data on these groups as part of the MDA through special surveys (e.g., Bangladesh). Some countries have integrated this in their data collection mechanism - Nepal which now collects primary education enrolment data for the most disadvantaged castes (*Janajati*and *Dalit* groups). Viet Nam is also exploring ways to institutionalize data collection on marginalized groups and has started with an inventory of all education data available, including those on unreached groups.

The policy review component of the MDA-MTR process proved to be challenging due to the lack of analytical capability in many MOEs in the region. While the whole MDA-MTR exercise focused largely on statistical capacity building on EFA monitoring, it somehow lost steam when implementing the policy-review component. This should be taken into consideration when planning, for example, the 2015 assessment, wherein linkages to the policy implications of review findings should be given strong consideration.

## Recommendations for others

The MDA was carried out by countries and international organizations that shared and discussed a very wide range of issues over many years at many meetings. Replication would have to be undertaken by a similar partnership, or by particular countries or groups of countries, with the key success factors based on the strategic structure of the partnership concerned.

Essentially, the MDA- MTR approach can be adopted to strengthen capacities in EFA monitoring and assessment in other regions. It can also be replicated for the monitoring of other initiatives (e.g. other MDG goals) in Asia-Pacific and other regions. In order to do so, the following factors must be considered:

1. International agencies should take into account the context either of the country or region where it will be implemented to adjust the MDA-MTR model. Understanding the political, social and cultural ecology and the interdependencies between them is essential to the effectiveness of the

approach. This also implies that the guidelines, instruments, training and other materials should be tailored to suit the country needs.

2. International agencies and their partners must keep the focus on country ownership and strengthening in-country statistical capacity.  Buy-in from countries is needed for the process to be truly successful and sustainable. Therefore, planning the strategy, milestones, the development of instruments and guidelines, and so forth, should be consultative and collaborative from the start.  It is also important to establish a strong linkage to monitoring and assess national goals so it will be seen as a complementary process, rather than merely a reporting requirement for UN agencies.

3. Coordination at the regional level by international agencies is very much needed, particularly in giving guidance to countries, facilitating information exchange, raising funds, mobilizing support of country offices, etc.

4. Countries, in the case of EFA with the Ministry of Education as lead, should be encouraged to involve a wide range of national and sub-national partners early on. Involvement from other sectors (e.g., other ministries, the national statistical office, NGO and CSO representatives, etc.) is needed if a comprehensive assessment is to be undertaken. If their participation is solicited early on in the process, then they are more likely to feel more consulted and involved.

## Future plans and sustainability

The MDA-MTR exercise has led to strengthened and better-coordinated EFA monitoring in Asia-Pacific countries. Coordination structures have been put in place and continue to function in Cambodia, Indonesia, Nepal, Sri Lanka, Malaysia, and more. Monitoring systems have been expanded to include data on unreached groups (e.g., Nepal, Viet Nam, etc.) and more and more countries are using disaggregated data for analysis (e.g., Indonesia, India, China, Philippines, etc.).

The MDA-MTR was able to transform monitoring practices in countries into a regular systematic process with a strong political commitment. However, there is a need to maintain the momentum gained in this area through a continued high-level push, as well as through coordinated regional and even global processes.

The UNESCO Asia-Pacific Regional Bureau for Education is thus taking into account the findings of the MDA-MTR evaluation as it plans for an assessment to mark the 2015 end-of-term for the EFA and MDG initiatives.  In particular, the MDA-MTR evaluation showed that most indicators available and collected by countries focus on EFA Goal 2. Countries had difficulty collecting data for EFA Goals 1, 3 and 6 for various reasons. If a clear statement on EFA and MDGs achievement is to be made by countries in 2015, national capacities in reporting on EFA Goals 1, 3 and 6 need to be further enhanced between now and 2015.

Technical assistance for countries to systematically collect data on unreached groups is also being planned. It should be noted that although there is now political recognition of unreached groups, countries are still facing difficulty in the systematic collection of data on these groups as part of monitoring equitable access to quality education.  Continued support is thus needed to enhance in-country capacity to monitor and report on ALL the EFA goals and the education MDGs, including those who remain left behind.

Other regions are also using the Asia-Pacific 'MDA model' as reference for capacity building support to countries in the Arab states and in eastern Africa.

## Feedback from beneficiaries of the practice

According to the external independent evaluation, the MDA-MTR was described by various respondents as "path breaking"; "a historical step"; "an eye opener for governments"; and "empowering".

Several MOE officials, representatives from other ministries and line agencies involved in the national technical working groups, and representatives from UN agencies, donors, NGO and civil society groups involved in education were interviewed as part of the evaluation. The evaluation report further said the interviewees described the EFA MDA as hugely relevant, beneficial, invaluable, important and effective process. "There was an explicit acknowledgement from participants that EFA MDA created a climate of inquiry and dialogue in the country".

In summary, the evaluation noted that the MDA-MTR contributed to a deeper understanding of the issues related to EFA in countries. It also expanded the knowledge-base about monitoring, and provided insights on current policy levers and how they work.

An online survey was also conducted as part of the evaluation. The survey respondents were national EFA coordinators, education statisticians and UNESCO and UNICEF education officers who were involved in the MDA-MTR process.

## Contacts

AIMS represents the UNESCO institute for Statistics within the UNESCO regional office at Bangkok pursuing UIS objectives of statistical standard setting, capacity building, analysis and the collection of internationally comparable data. The AIMS team can be contacted through email at aims.bgk@unesco.org.

## References for further reading

Evaluation report of the Asia-Pacific EFA Mid-Decade Assessment and Mid-Term Policy Review
Website:
www.unescobkk.org/fileadmin/user_upload/efa/EFA_News/EFA_News_2011/EFA_report_with_note_January 2011.pdf

Executive Summary of the Evaluation Report of the Asia-Pacific EFA Mid-Decade Assessment and Mid-Term Policy Review
Website:
www.unescobkk.org/fileadmin/user_upload/efa/EFA_News/EFA_News_2011/MDA_evalaution_report_ExeSummary.pdf

Documents related to the Asia-Pacific EFA Mid-Decade Assessment and Mid-Term Policy Review, including country reports
Website: www.unescobkk.org/education/efa/mda/

Documents related to the EFA 1996 Assessment (Mid-Decade Meeting on EFA in 1996)
Website: www.unesco.org/education/efa/ed_for_all/background/mid_decade_amman.shtml

Documents related to the EFA 2000 Assessment
Website: www.unesco.org/education/efa/efa_2000_assess/index.shtml

Information about the UIS-AIMS Unit, UNESCO Bangkok
Website: www.unescobkk.org/resources/aims/

Information about the UNESCO Institute for Statistics
Website: www.uis.unesco.org

# About the Authors

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**Richard TEESE (Australia)** is Professor and Director of the Center for Research on Education Systems in the University of Melbourne. For many years, he has worked closely with state governments in Australia to help improve the performance of school systems and to promote greater equity. He has also undertaken reviews of education systems and policies on behalf of the Organization for Economic Co-operation and Development(OECD) in Spain, Scotland and Ontario. Teese holds a bachelor's degree and Ph.D. from Monash University and has been visiting scholar in the Ecole des Hautes Études en Sciences Sociales in Paris. He can be reached at rvteese@unimelb.edu.au.

**Kuenga TSHERING (Bhutan)** is the Director of the National Statistics Bureau of Bhutan. He was instrumental in bringing about an autonomous status for the Bureau. Prior to joining the National Statistics Bureau, he worked as a Monitoring Officer in His Majesty's Secretariat and then later as a Planning Officer in the Ministry of Agriculture, where he was fully involved in the development of the Seventh Five Year Plan for the sector. Mr. Tshering has a Bachelor's degree in Public Administration from Punjab University, India, and a Master's degree in Public Affairs in Strategic Management from Indiana University, Bloomington, USA. He can be reached at nsbdir@hotmail.com.

**UNESCO,** A large number of people from both countries and international organizations contributed to the success of the MDA-MTR. This piece was written by the UNESCO Institute for Statistics (UIS) AIMS team based at UNESCO Bangkok which was responsible for the central co-ordination of the MDA-MTR, including NyiNyiThaung, Leotes Lugo-Helin and Simon Ellis. The AIMS team is responsible for

statistical capacity building across the Asia Pacific region in areas of UNESCO's mandate: Education, science, culture, media and ICT use. AIMS have played a central role in regional co-ordination of the international goals of Education for All, Millennium Development Goals and World Summit on the Information Society. AIMS represents the UNESCO institute for Statistics within the UNESCO regional office at Bangkok pursuing UIS objectives of statistical standard setting, capacity building, analysis and the collection of internationally comparable data. The AIMS team can be contacted through email at aims.bgk@unesco.org.

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Established in 1958, NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

Before joining NZIER in 2010, Zeng was an analyst in the Ministry of Social Development. She completed her post-graduate studies at the University of Waikato. She can be contacted at lulu.zeng@nzier.org.nz.

**Yanhong ZHANG (Thailand)** is a Statistician at the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in Bangkok. As part of his work, he has led this initiative to systematically identify, document and promote the use of good practices in linking statistical data and decision-making. Prior to his current position, Zhang was a Program Specialist and Policy Analyst at the UNESCO Institute for Statistics where he was responsible for indicators of education for more than 40 countries and territories in Asia and the Pacific. He has also worked at Statistics Canada, the World Bank and China Association for Science and Technology. Zhang has a Doctorate of Education from Harvard University. He can be reached at zhangy@un.org.

# Annex 1:
## Advisory Committee on 'Promoting good practices in using statistical data for policy analysis and advocacy'

The responsibilities of the Advisory Committee are:

a) provide guidance on the overall direction of the work on promoting good practices,
b) provide advice to the secretariat on concrete measures in implementing work plans, and
c) review case studies of good practices and provide suggestions of improvements.

## Co-Chairs:

Mr. Kuenga Tshering *Bhutan*
Ms. Erlinda M. Capones *Philippines*

## Members:

Mr. Frank Van Cappelle
*Australia*

Ms. Riti Ibrahim Ahsan
*Bangladesh*

Mr. Kai-ming Cheng
*China*

Ms. Aishath Shahuda
*Maldives*

Ms. Urtnasan Enkhbold
*Mongolia*

Mr. Lkhagvasuren Rentsenbymaba
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Mr. Saroj Aryal
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Dr. Phusit Prakongsai
*Thailand*

Mr. Simil Johnson Iaus
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*Viet Nam*

Mr. Thi Thu Trang Tran
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Mr. Kaushal Joshi
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Ms. Bui Linh Nguyen
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Ms. Sarah Tumen
*UNESCO*

Ms. Mariko Sato
*UN-HABITAT*

Ms. NanakoTsukahara
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Mr. GAO Jun
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# Annex 2:

## Participants of 'High-level consultative meeting on promoting effective use of statistical data for policy analysis and advocacy'

*13-14 December 2010, Bangkok, Thailand*

**Afghanistan**:

Mr. Mohammad Ibrahim Naimi

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**Bhutan**:

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Mr. Shiu Raj Singh, Mr. Epeli Waqavonovono

**Maldives**:

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**Nepal**:

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**Tajikistan**:

Mr. Hofiz Shoinbekov

**Thailand**:

Ms. Kulluck Lertpatarapong, Ms. Supaporn Arunraksombat

**Tuvalu**:

Mr. Semu Malona

**Vanuatu**:

Mr. Simil Johnson Iaus

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**ASEAN**:
Mr. AgusSutanto

**FAO**:
Mr. Pietro Gennari

**SPC**:
Mr. Gerald Haberkorn

**UNDP**:
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# Annex 3:

## Participants of 'Effective use of statistical data for policy analysis and advocacy in Asia and the Pacific: Building on success'

*24-26 October 2011, Bangkok, Thailand*

**Australia**:
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