



ROYAL GOVERNMENT OF BHUTAN
MINISTRY OF AGRICULTURE AND FORESTS



In-depth Country Assessment of the National System for Renewable Natural Resources Statistics in Bhutan

(An implementation of Global Strategy to Improve Agricultural and Rural Statistics)

August 2014

Foreword
By
Honorable Secretary, Ministry of Agriculture and Forests

The Ministry of Agriculture and Forests is pleased to present the In-depth Country Assessment Report (IdCA 2014). The IdCA report is deemed very essential as it provides the benchmarks for developing Strategic Plans for Renewable Natural Resources Statistics (SP-RNRS) for Bhutan.

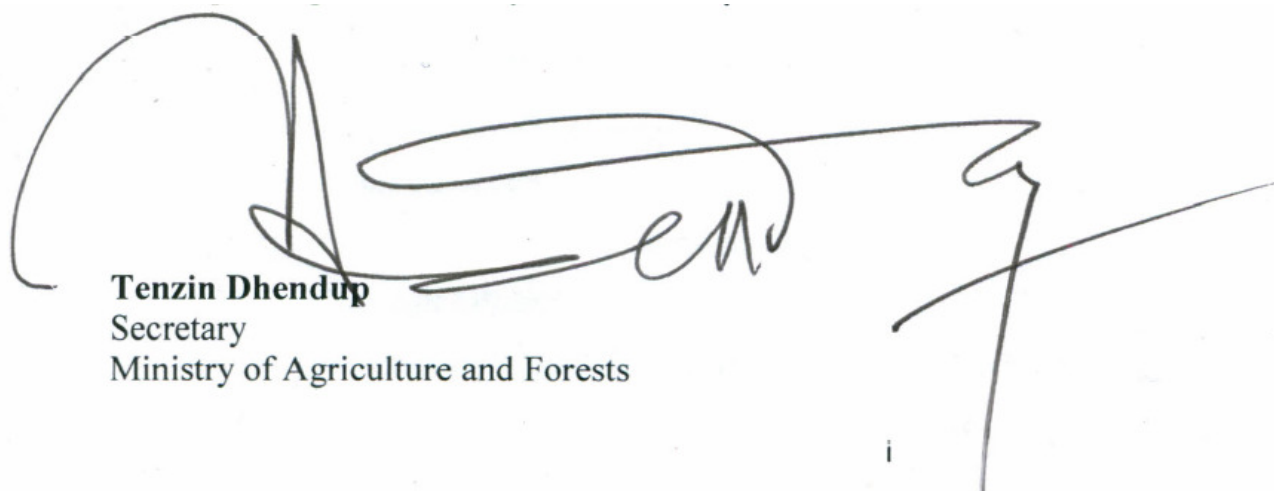
The RNR statistical system has come a long way in terms of institutional settings, coverage and availability of data. However, the reliability, timeliness and adequacy of most of the data have remained rather poor. To formulate effective policies, good data support systems are essential. Timely and reliable data and information help us understand critical issues, design appropriate interventions and efficiently monitor programs and policies.

This IdCA report provides an insight into the problems in the domain of RNR statistics in the country and pinpoints the inputs, processes and outputs for bringing improvement in them. It also provides benchmark for monitoring and evaluation of the impact and outcome of the support to be provided for improvement in the RNR statistical system in the next 5 years.

The IdCA report is the result of intensive studies conducted using FAO's standard methods of country assessment concerning agricultural and rural statistics. Slight modifications were however, integrated into the study to fit our own context and address our need. Intensive deliberations took place over the findings and recommendations of the IdCA report among stakeholders both within and outside the RNR sector that produce and use RNR data.

The Ministry of Agriculture and Forests would like to thank the United Nations Food and Agricultural Organization for its generous support. We also acknowledge the unwavering hard works and contributions put in by concerned RNR colleagues and members outside of the RNR sector in bringing out this report. Our sincere appreciation should also go to the National Statistics Bureau for technical guidance being rendered to RNR staff in the process of data production.

This assessment report is intended to be used as an authentic reference document by the RNR sector, other relevant government agencies and international community interested in the development of RNR statistics in preparing proposals and action plans. It is our hope that this report will lead to development of practical RNR statistical plans and contribute to informed decision making towards poverty alleviation and improving food security in the country.



Tenzin Dhendup
Secretary
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Abbreviations

ADB	Asian Development Bank
BAFRA	Bhutan Agriculture and Food Regulatory Authority
BLSS	Bhutan Living Standard Survey
BSS	Bhutan Statistical System
CPI	Consumer Price Index
DAMC	Department of Agricultural Marketing and Cooperatives, MoAF
DCC	Dzongkhag Census Coordinator
DoA	Department of Agriculture, MoAF
DoFPS	Department of Forests and Park Services, MoAF
DoL	Department of Livestock, MoAF
DRC	Department of Revenue and Customs, MoF
EA	Enumeration Area
FAO	Food and Agriculture Organization of the United Nations
FCB	Food Corporation of Bhutan
GAP	Global Action Plan to Improve Agricultural and Rural Statistics
G2C	Government to Citizen
IdCA	In-Depth Country Assessment of the National System for Agriculture Statistics
ILO	International Labour Organization
IDR	Import Dependency Rate
MoAF	Ministry of Agriculture and Forests
MoF	Ministry of Finance
MoLHR	Ministry of Labor and Human Resources
NA	Not Applicable
NEC	National Environment Commission
NRDCL	Natural Resources Development Corporation Limited
NSB	National Statistics Bureau
NSDS	National Statistics Development Strategy
PPD	Policy and Planning Division
PPI	Producer Price Index
RAP	Regional Action Plan to Improve Agricultural and Rural Statistics
RGoB	Royal Government of Bhutan
RNR	Renewable Natural Resources
RNR-SF	RNR-Statistical Framework
RNR-SCS	RNR-Statistical Coordination Section
RNR-SSC	RNR-Statistical Steering Committee
SPARS	Strategic Plan for Agricultural and Rural Statistics
SP-RNRS	Strategic Plan for Renewable Natural Resources Statistics
SSR	Self Sufficiency Rate
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TA	Technical Assistance
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

Summary

The **Global Strategy to Improve Agricultural and Rural Statistics** is the outcome of an effort made by the UN Statistical Commission, the Food and Agriculture Organization of the United Nations (FAO), the World Bank, and an extensive consultation process that involved national statistics offices, agricultural ministries, and other government institutions that produce and use agricultural and rural statistics. The purpose of the strategy is to provide a framework and methodology that will improve the quality and availability of national and international food and agricultural statistics to guide policy analysis and informed decision making. The strategy is based on three pillars:

- i. Establishment of a minimum set of core data that countries will provide to meet the current and emerging demands;
- ii. Integration of agriculture into the National Statistical Systems (NSS) in order to meet the needs of data policy makers and other data users and to ensure data comparability across countries and over time;
- iii. Helping countries to enhance the sustainability of the National Agricultural Statistics System through governance and statistical capacity building.

The integration of agricultural statistics system into the national statistical systems (Pillar II) is a key component to the strategy. The strategy recognizes that improving agricultural statistics starts with developing Strategic Plans for Agriculture and Rural Statistics (SPARS) and incorporating such plans into the National Statistical System (NSS).

The IdCA of Bhutan was undertaken by Royal Government of Bhutan in cooperation and consultation with FAO in the period 17 November to 30 May 2014. The main objective of the current IdCA is to prepare groundwork for developing a Strategic Plan for Agricultural and Rural Statistics (SPARS) which hereafter is referred to as “**Strategic Plan for Renewable Natural Resources Statistics (SP-RNRS)**” for Bhutan. Hence, the importance of In-depth Country Assessment (IdCA) of Bhutan is obvious.

The IdCA Report provides an insight into the problems in the domain of RNR statistics in the country and pinpoints the inputs, processes and outputs for bringing improvement in them. It also provides benchmarks for monitoring and evaluation of the impact and outcome of the support to be provided for improvement in the RNR statistics system in the next 5 years. The assessment report is intended to be used as an authentic reference document by the national and international community interested in the development of RNR statistics in the country.

Findings

- a. Inter-agency duplication of effort is not found in RNR data collection. Cooperation is good.
- b. Within MoAF several departments collect statistics and coordination of their statistical activities is difficult.
- c. At NSB human resources constraint is more of manpower than technical in nature.
- d. For RNR Statistical Framework's effectiveness other stakeholders' collaborative linkages are very important, especially in statistical development processes.
- e. A significant input to the SP-RNRS is available from the "RNR Statistical Framework 2012 - An Implementation Guideline".

Recommendations

- a. All RNR data-producing agencies (MoAF, NSB, DRC, MoLHR, NRDC and FCB) should be supported in training, equipment and data processing methods.
- b. RNR-Statistics Framework should include agencies outside MoAF (e.g. NSB, GNHC, DRC, etc.) also. Their inclusion is absolutely necessary for the integration of the RNR Statistics System into the Bhutan Statistical System.
- c. A single division in MoAF should be mandated to manage all aspects of data collection, processing and dissemination of RNR statistical data. This will ensure more efficient use of MoAF's technical manpower, coordination and management of statistical operations, evaluation of accuracy and appropriation of financial resources. Coordination with NSB/Gewogs will be improved so as to ensure proper sampling techniques and quality of data. It also ensures harmonized data for decision makers.
- d. The RNR census should be jointly conducted by NSB and MoAF. This will be conducive to RNR statistics development that shall overcome issues of inconsistency, lack of proper sampling techniques, coordination and management of statistical operations, evaluation of accuracy.
- e. Fast changing indicators should be avoided in the RNR Census; these should be covered by surveys.
- f. In DoA annual survey: (1) Frame/design should be improved and (2) Gewog level data should not be generated from the sample data.
- g. DoL Census should: (1) Focus on estimating livestock number/production only (2) Make use of BLSS results for consumption, etc.

- h. Capacity of MoAF in survey data processing should be strengthened soonest. This can be easier if a single division is mandated for all responsibilities of RNR statistics.
- i. SP-RNRS requirements should be incorporated into the revised RNR Statistical Framework, currently being drafted.

Next Steps

In line with the IdCA recommendations, following documents will be prepared in the future:

- (i) Country Project Proposal (CPP) for the development of the national agricultural statistics programme
- (ii) Strategic Plan for Renewable Natural Resources Statistics (SP-RNRS).

For the country proposal, the IdCA sets priorities and resources required, which need to be validated by the users, producers and decision makers. A significant input to the development of SP-RNRS is already available from the “RNR Statistical Framework”.

1 INTRODUCTION

1.1 Objective of the In-depth Country Assessment

The **Global Strategy to Improve Agricultural and Rural Statistics**¹ is the outcome of an effort made by the UN Statistical Commission, the Food and Agriculture Organization of the United Nations (FAO), the World Bank, and an extensive consultation process that involved national statistics offices, agricultural ministries, and other government institutions that produce and use agricultural and rural statistics. The Global Action Plan (GAP)² provides the framework and steps for the implementation of the strategy which is based on three statistical capacity building components: technical assistance, training, and research.

The Regional Action Plan (RAP)³ sets up a regional effort to improve national agricultural statistics systems of the countries in the Asia and the Pacific region. The RAP includes provision for detailed in-country work for bringing improvement in statistical capacity, with plans to assist 20 countries in the region over a five year period. Bhutan has been selected as one of these countries. The implementation of the RAP requires Bhutan (i) to provide a country specified minimum set of core data, (ii) to support the integration of agricultural statistics into the national statistical system, (iii) to ensure coordination of activities between the MoAF, NSB and other relevant agencies, and (iv) to ensure the consistency and sustainability of the system while integrating into the national statistical system. The In-depth Country Assessment (IdCA) is a key element of the in-country work.

The main objective of the IdCA is to prepare groundwork for developing a Strategic Plan for Agricultural and Rural Statistics (SPARS) or Strategic Plan for Renewable Natural Resources (SP-RNRS) for Bhutan. The IdCA provides an insight into the problems in the domain of agricultural and rural statistics in the country and pinpoints the inputs, processes and outputs for bringing improvement in them. It also provides benchmarks for monitoring and evaluation of the impact and outcome of the support to be provided for improvement in the RNR statistics system in the next 5 years. The assessment report is intended to be used as an authentic reference document by the national and international community interested in the development of RNR statistics in the country.

1.2 Background and Scope of the In-depth Country Assessment

The IdCA of Bhutan was undertaken by Royal Government of Bhutan in consultation with FAO. The assessment was carried out in the period 17 November to 30 May 2014. The IdCA used the

¹ Exact details on the strategy can be found at: <http://www.fao.org/docrep/015/am082e/am082e00.pdf>

² Precise details on the GAP can be found at: <http://www.fao.org/docrep/016/i3082e/i3082e.pdf>

³ Details on RAP can be found at:

http://www.fao.org/fileadmin/templates/rap/files/Project/Regional_Action_Plan_to_Improve_Agricultural_and_Rural_Statistics_2013-2017_01.pdf

results of the first stage of country assessment of Bhutan carried out in 2011 and the country profile derived from that assessment.

The IdCA report is prepared in line with the guidelines of FAO. Draft report of the assessment was prepared by an International Consultant in close consultations with the stakeholders. The Draft report was reviewed, validated and updated by stakeholders at the Second Workshop held in May 2014. The IdCA report was finalized with incorporation of further feedbacks and comments of the stakeholders.

The IdCA identifies the priorities that need to be validated by the national statistical stakeholders, including users, producers and the decision makers. The findings presented and the recommendations made in this IdCA are reasonably representative of the overall problems of RNR data in Bhutan.

The IdCA gives increased focus on the data on the RNR sector, environment, rural economy and the farm household. Annex 6.1 assesses the availability and quality of relevant RNR data, particularly against the core data set identified by the RAP.

1.3 Country Capacity Indicators

To complement this assessment, a set of country capacity indicators (CCI) was developed through the Framework for Assessing Country Capacity (CAF) to monitor the development of statistical capacity at the country level more objectively. These indicators, which span four dimensions and twenty-three elements (Annex VII), are based on information collected during the in-depth assessment using a Standard Questionnaire revised for use in Asia Pacific.

This baseline assessment under the CAF fielded responses from the National Statistics Bureau (NSB), the Ministry of Agriculture and Forests, and other general producers - representing the major producers of agricultural and rural statistics in the country. Responses received fed into the calculation of a complete set of indicators covering four dimensions and 23 elements outlined in Annex 6.7. Scores are recorded on a scale of 0 to 100, where a score of 100 defines a complete coverage of the criteria under the CAF.

Of the four dimensions of country capacity, Bhutan showed relatively uniform strengths across all four dimensions in the state of its institutional infrastructure (69), resources (67), statistical methods and practices (57), and the availability of statistical information (73) (figure 1). The state of statistical methods and practices was the weakest of the four dimensions, led by particular weaknesses in the adoption of international standards, and the use/analysis of data.

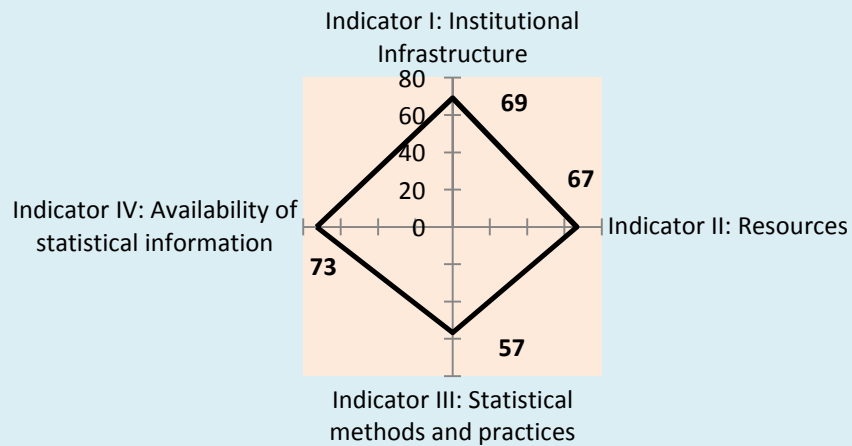


Figure 1. Four dimensions of country capacity to produce agricultural and rural statistics

On the state of institutional infrastructure, inherent weaknesses were identified in the legal framework element where the legal basis for general statistical activities as directed by the “Statistics Bill of Bhutan 2013” is still pending official endorsement. When endorsed the law intends to bring fundamental reform in the Bhutan Statistical System providing a precedented increase in financial and human resources to future statistical activities. At present, only the National Statistics Development Strategy (NSDS) for 2009-2013 and the RNR Statistical Framework provide the legal guidance for statistical activities in agriculture, but both are yet to become fully operational. Coordination with both data producers and data users was also a highlighted concern among several data producing agencies noting the need for significant improvements to existing mechanisms.

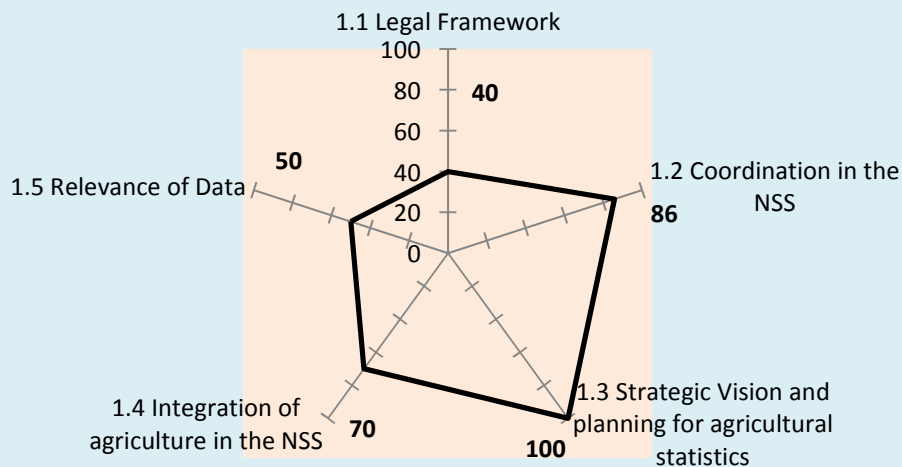


Figure 2. Elements of Institutional Infrastructure capacity in Bhutan

On the state of available resources for the production of agricultural and rural statistics, weaknesses were observed across most elements, particularly in the area of financial resources where data producers reported severe funding constraints in RNR sector. These deficiencies were noted to have adverse impact in the country’s eleventh plan period (2013-2018) with regards to providing proficient staff and training resources to manage current RNR data collection, processing, reporting, and dissemination. Many of the ongoing statistical activities were also noted to rely on funding from international cooperation sources which have been essential to carrying out large-scale sample surveys.

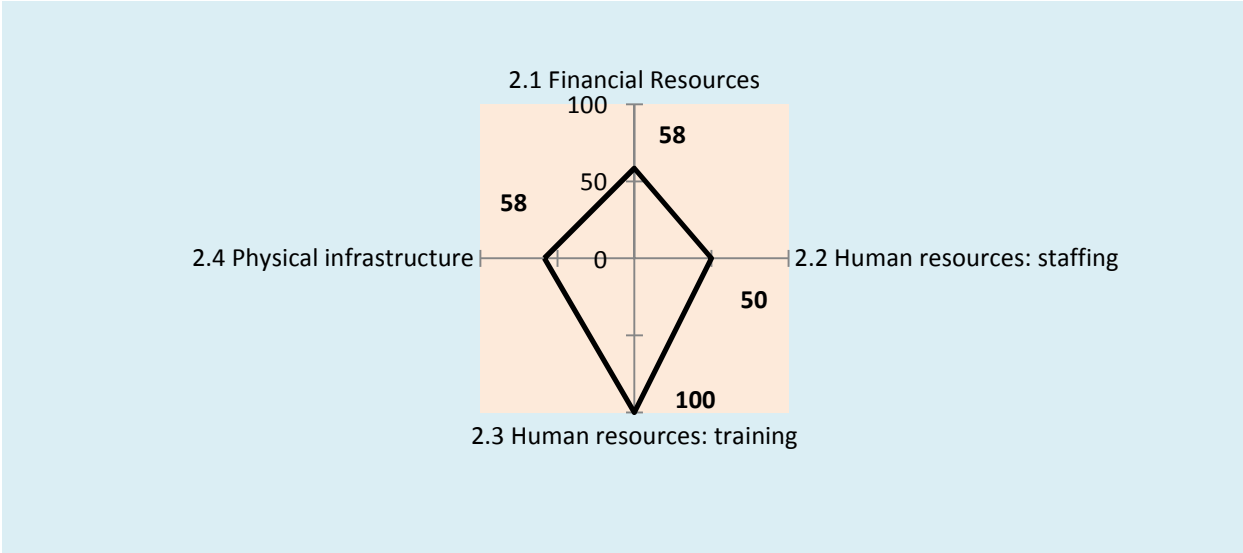


Figure 3. Elements of Resource capacity in Bhutan

The weakest of the four dimensions identified was the state of statistical methods and practices where weaknesses in the adoption of international standards, use of up to date data collection technologies and limited analysis and use of data contributed to the relatively low score. It is strongly inferred by data producers that many of these issues arise from the unavailability of manpower and are compounded by a lack of regular training. Inherent environmental and geographic reach to remote areas also pose country specific issues to survey design and methodological selection with the consideration of limited manpower and funds.

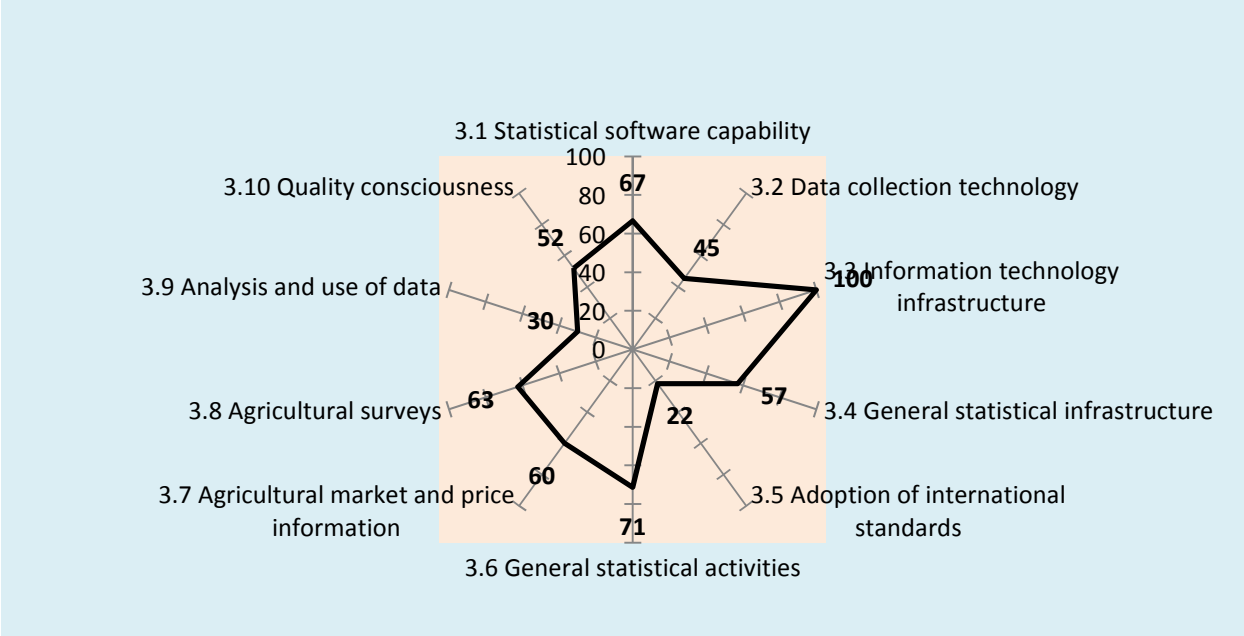


Figure 4. Elements of Statistical Methods and Practices in Bhutan

On the state of core data availability, the standard questionnaire noted a timely but limited coverage of the minimum set of core indicators (37 items of the minimum set of core indicators) with major deficiencies in the availability of data for agro-processing and rural infrastructure. Data producers again noted the constraints in manpower in its ability to provide timely annual estimates for much of the minimum core data set and argued that expanding the coverage of the core set would be difficult without first addressing the issue of manpower in the country. Despite the limited coverage of the minimum core set, producers scored the currently available statistical products as “acceptable”.

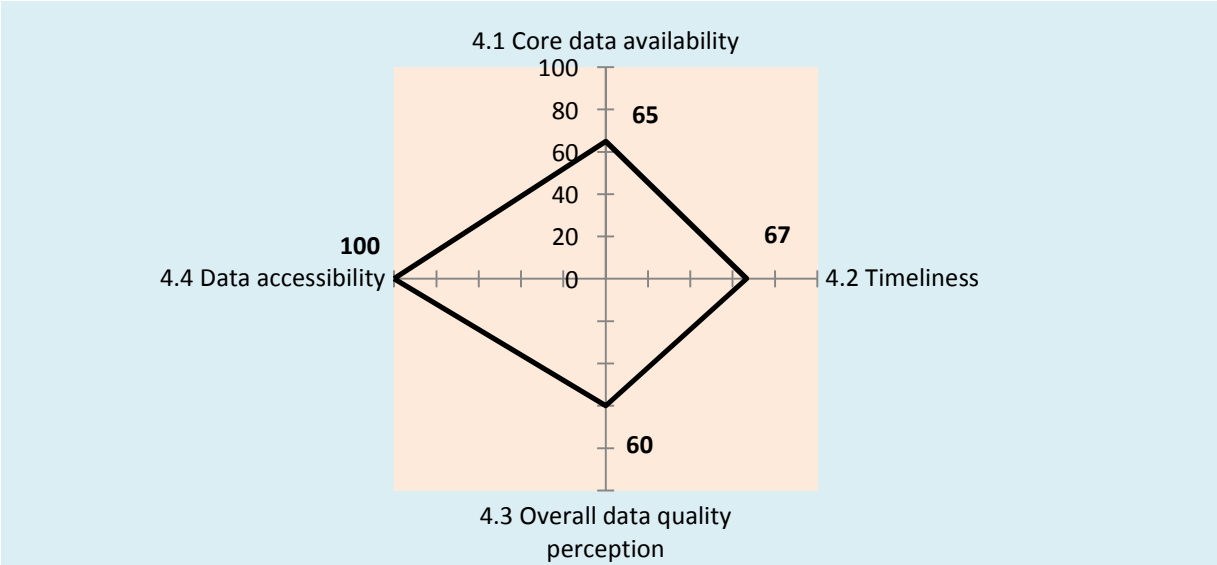


Figure 5. Elements of Core Data Availability in Bhutan

2 INSTITUTIONAL ENVIRONMENT

2.1 Administrative structure of the country

Administratively Bhutan is divided into 20 Dzongkhags (Districts), which are sub-divided into Gewogs/Towns. A group of villages are grouped to form a Gewog, each of which is further sub-divided into Chiwogs. There are 20 Dzongkhags, 205 Gewogs and 1,044 Chiwogs in the country.

The seat of the government is located at the Tashichodzong in the capital Thimphu. The elected Prime Minister is the Head of Government. There are 10 ministries: Ministry of Agriculture and Forests, Ministry of Economic Affairs, Ministry of Education, Ministry of Finance, Ministry of Foreign Affairs, Ministry of Health, Ministry of Home and Cultural Affairs, Ministry of Information and Communications, Ministry of Labor and Human Resources and Ministry of Works and Human Settlement. The NSB comes directly under the Head of Government (Prime Minister). At the center NSB is independent of any of the 10 ministries mentioned above.

At the Dzongkhag, Dzongdag is the chief executive officer. Most of the ministries maintain respective Dzongkhag Offices. At Dzongkhag level NSB has Dzongkhag Statistics Office, which is under the overall management of Dzongdag.⁴ At the Gewog or village-block levels, the Gup is a locally elected head and an important link between the district administration and villages. Gewog is administered by Gup.



⁴ See Section 2.3 and Annex 9

2.2 Legal and administrative framework for the collection of statistics

2.2.1 Legal Framework for the collection of statistics

A legal framework for the regulation of the collection of statistics is yet to be established in Bhutan. The “Statistics Bill of Bhutan 2013” (Draft) attempts to set a basic set of ground rules for collection, collation, operations, interpretation and dissemination of official statistics. The law intends to bring fundamental reform in the BSS described in National Statistics Development Strategy (NSDS) for 2009-2013. The NSDS proposes massive rise in staff and budget requirements at NSB, which are not possible to fulfill. Long lead time will be required for a Statistical Bill of Bhutan to come into force. Experience and precedence suggest that it is difficult to keep a strict timetable for enactment and for implementation.

As a working document, NSDS is used by NSB despite its limitations. It was drawn up by the NSB in October 2008 with the support of the World Bank Trust Fund for Statistical Capacity Building. The NSDS emphasizes the importance of administrative data collection and well-designed small-scale sample surveys, such as poverty mapping for small area estimations. It elaborates upon the severe constraints in conduct of censuses and large-scale surveys due to remoteness of the primary and ultimate sampling units and the considerable time, costs and human resources involved in the data collection. The NSDS considers all economic activity in general and it does not have a separate section for agricultural component. However, NSDS’s stipulated program explicitly includes the following two RNR-related statistical operations that are already in place at MoAF: DoA’s agriculture surveys (annual), DoL’s livestock census (annual) and PPD’s RNR Census (decennial).

“RNR Statistical Framework 2012 – An Implementation Guideline” was drawn up by PPD of MoAF to serve the execution of statistical operation in the RNR sector. As it is already in a form of SP-RNRS, it can provide a significant input to the development of SP-RNRS. At MoAF, several departments (DoA, DoFS and DoL, etc.) and corporations (FCB, NRDCL, etc.) are involved in the collection and release of statistics on RNR and its economy. The main aims of the RNR Statistical Framework 2012 are to issue institutional mandates to individual departments/companies for agricultural statistics, to strengthen coordination mechanism, to promote use of appropriate methodologies, and capacity building. The framework also sets out a statistical operations matrix defining data elements, frequency, reference period, release time schedule and identifies agency that takes the leading role. MoAF urges all departments, agencies and other stakeholders to work within the RNR Statistical Framework 2012. The framework has extensive coverage, in line with the minimum set, as far as RNR sector is concerned.

Widespread adoption of the NSDS in the intended implementation period (2009-2013) was not possible due to funding and operational constraints. However, even with the partial implementation of the NSDS, the coordination and cooperation arrangements made by NSB with the institutional partners and the activities undertaken by it with very limited funds and human resources are highly commendable. Due to funding constraints, conduct of large scale RNR surveys or RNR census would be possible at NSB only if foreign development assistance is made available. For example, Bhutan Living Standard Survey (BLSS) 2013 and Multiple Indicator Cluster Surveys (MICS) commissioned by the NSB are entirely funded by ADB and UNICEF, respectively. At MoAF annual agriculture surveys and livestock census of DoA and

DoL respectively are entirely or largely funded by the government. However, RNR Census and Land Cover Mapping were (or will have to be) funded by donors.

Coordination, cooperation and technical consultations between NSB and MoAF in agricultural data collection are commendable. For example, NSB supports the conduct of RNR censuses and surveys by MoAF on ad-hoc basis. It also supports the collection of RNR statistics from the administrative records that extension workers keep. MoAF sought technical guidance from NSB during the conduct of the 2009 RNR Census. Coordination in this regard was successfully handled through the meetings of RNR Census Working Group, which included senior officers from NSB, PPD, DoA, DoL, and DoFS. Similar conducive environment exists between NSB and Ministry of Labor and Human Resources (MoLHR) in conduct of Labor Force Survey.

To summarize, at present the necessary institutional infrastructure is not at a desired level to smoothly run an integrated National Statistics Service, holistically, and RNR Statistics Service, in particular. It is true that both NSDS and “RNR Statistical Framework” are yet to become fully functional. Fully Operational NSDS and “RNR Statistical Framework 2012” will help integrate Agricultural Statistics System in National Statistical System. As regards to this, enactment of the Statistics Law is an absolutely necessary first step. Staff at DoA and DoL mentioned that Population and Housing Census of Bhutan – 2005 does not provide a suitable sampling frame for RNR surveys and census. As regards to this, in the Population and Housing Census of 2015, NSB intends to gather data required to create a suitable frame for RNR data collection. In due course, modestly operational NSDS and “RNR Statistical Framework 2012” are going to make a big difference in bringing improvement in quality of agricultural and rural statistics of Bhutan. In the case of RNR statistics, continuation of NSB’s current supportive role and RNR Statistical Framework’s effectiveness are necessary to get to a modestly operational point. For this most important is to strengthen RNR Statistics Framework with (increased) participation from NSB and the agencies outside MoAF. This action will provide the push for integration of RNR Statistics with BSS.

2.2.2 Administrative Framework for the collection of statistics

The Bhutan Statistical System (BSS) is a decentralized system with NSB as a central agency. In 2006 NSB initiated the development of a National Statistics Development Strategy (NSDS). The NSDS is consistent with Bhutan’s overall development vision of Gross National Happiness and especially its 5-year Action Plan are fully integrated in the 10th Five Year Plan (FYP). The NSDS also supports the 10th FYP as it has taken into account the data needed for the monitoring and evaluation of the plan, especially the macroeconomic and sectoral indicators. The NSDS takes account of Official Statistics specificities applying to small country when proposing technical solutions to produce the requested data: priority is given to administrative data sources compilation rather than data collection through large and costly survey; (and) the use of new statistical techniques like poverty mapping or small area estimations is also emphasized.⁵

⁵ Source: NSDS

The main ministries/agencies involved in Bhutan Statistical System (BSS) include NSB, Ministry of Agriculture and Forests, Ministry of Economic Affairs, Ministry of Education, Ministry of Finance, Ministry of Health, Ministry of Information and Communication, Ministry of Labour and Human Resources, Ministry of Home and Cultural Affairs, Ministry of Works and Human Settlement, Gross National Happiness Commission, National Environment Commission, Centre for Bhutan Studies, Royal Civil Service Commission, and Royal Monetary Authority. Policy and Planning Division (PPD) in a ministry is responsible to provide sector-specific data to the users within the ministry. The main players in the case of agricultural and rural statistics production are MoAF and NSB, in that order of importance. The coordination mechanism among the agencies includes ad-hoc meetings, formation of consultative groups, appointment of focal points and consultative workshops.

The NSB has six divisions (Coordination and Information, Population and Housing, National Accounts and Price Statistics, Socioeconomic Research and Analysis, Survey and Data Processing and Secretariat Services). The total number of staff at the NSB headquarters is 46.

The NSB has assigned one focal person from the Coordination and Information Division for agricultural statistics related issues. The Coordination and Information Division is responsible for stimulating and supervising all statistical activities, including agricultural statistics, in Dzongkhags. At each Dzongkhag center NSB has only one regular staff, Dzongkhag Statistics Officer, who undertakes both technical and operational activities in the Dzongkhag. NSB does not have any staff in Gewogs.

The NSB is not directly involved in collection of bulk of RNR statistics. Most of RNR statistics are collected and produced by four Departments (DAMC, DoA, DoL and DoFPS) of MoAF. At DoA, DoL and DoFPS, there are only 2-3 staff members that are solely meant for statistical activities. At sub-national levels, statistical activities of these departments are carried out by the RNR extension staff members stationed in Dzongkhags/Region and Gewogs. Generally speaking, there is no separate staff or budget allocated for agricultural statistics activities at the Dzongkhag or Gewog levels. Such activities are part and parcel of RNR development projects and programs. For example, Agricultural Officer, Livestock Officers and Forestry Officer of Dzongkhags assume responsibility of respective RNR statistical activities in the Dzongkhag under their commands. Such activities include conduct of annual survey (for DoA) or annual census (for DoL). Similar arrangement exists in the case of MoAF staff posted in 205 Gewogs for collection of all current RNR data at Gewog level.

As DAMC (in the case of consumer price data collection), DoFPS (forestry data) and FCB (auction amount and price) have staff placements mostly at non-Dzongkhag level, use of regional/territorial staff in data collection is more common in their case.

MoAF Staff at Headquarters, Dzongkhags, Central Program and Field offices⁶ (June 2012)

MoAF Departments	Headquarters	Dzongkhag	Central Program	Territorial/ Regional	Others (Park/ Institution)	Sub-total
PPD	23					
DAMC	27	--	--	13	--	40
DoA	61	293	88	--	--	442
DoFPS	162	241	28	733	269	1,433
DoL	36	395	403	--	--	834

In the case of RNR Census of 2009, which was conducted by PPD (MoAF), census coordinators were appointed at national, regional and dzongkhag level. These included one National Census Coordinator (NCC) from PPD, four Regional Census Coordinators (RCC) (1 from PPD and 3 from technical departments) and one Dzongkhag Census Coordinator (DCC) in each Dzongkhag from among the three RNR Sector Heads of Agriculture, Livestock and Forests. The DCCs headed the survey team and their assistants served as 60 field supervisors. The enumeration was carried out by RNR Extension Officers posted in Gewogs. The total number of enumerators was 730.

Organizational structures of the NSB and MoAF are shown in Annex 6.3 and Annex 6.4 respectively.

2.3 Structure of the National Statistical System

The NSDS sets out the mission, vision and strategic objectives for the Bhutan Statistical System (BSS) and provides its 5 year implementation plan.

The NSDS rightly notes that the BSS is weak due to the lack of human resources, absence of legal framework for statistical activities, some data weaknesses and poor coordination. The system also does not offer the users outside MoAF and NSB an easy access to the data they may require. These issues are dealt with in more detail later in the report.

MoAF and NSB, in that order, are most important parts of de-facto BSS as far as RNR Sector is concerned. NSB is not directly involved in the conduct of annual RNR surveys, although it provides technical inputs to MoAF when they need them. For example, NSB was involved in RNR Census of 2009. For the conduct of BLSS, NSB takes the full responsibility.

⁶ Although overall supervision is done by the headquarters, the categories of staff mentioned in the table are independent of each other.

2.4 Strategic framework

The strategic framework for Bhutan Statistical System⁷, which was set out by NSB in 2008 in consultation with the line ministries, has five salient elements:

i. Define and implement a legal and policy framework for development of Official Statistics

- Finalize and adopt the Statistics Bill for submission to the parliament for adoption
- Implement the Statistics Act and develop the procedures for coordination and cooperation within the framework

ii. Develop BSS staff efficiency and career satisfaction

- Develop a National BSS human resource policy in cooperation with the Royal Civil Service Commission (RCSC) so that the management of the BSS technical staff is centralized in NSB under a “National Statistical Service”, which was agreed by Technical Working Group that consisted of senior officers from line agencies
- Improve the skills of the BSS staff

iii. Make an efficient use of the technical and financial resources across the BSS

- Develop a BSS-wide funding strategy for the Official Statistics⁸
- Rationalize the use of technical resources across the BSS

iv. Increase the Official Statistics availability to fulfil the user needs

- Implement a BSS multi annual programs of surveys and censuses
- Develop the use of administrative data sources
- Strengthen the national accounts
- Streamline the dataflow among the data producers
- Manage the data quality

v. Offer the users an easier access to the data

- Development and implementation of a BSS coordinated dissemination policy.
- Improve the quantity and timeliness of the Official Statistics available to the users
- The NSB acts as focal point for the data dissemination to the users.

Above is the BSS as stipulated in the NSDS. However, in actual practice, the BSS is essentially a decentralized system in the case of RNR statistics, while some of the most important users of RNR data are producers as well.

⁷ Source: National Statistics Development Strategy, NSB, October 2008.

⁸ That was the intent in NSDS. However, decentralized system prevailed.

2.5 Dialogue with data users

The IdCA mission's dialogue with the data users included the mission's interaction with them during the workshop. In addition, face-to-face interviews and meetings provided ample opportunity for dialogues. The NSB holds ad-hoc meetings with the main potential users before a survey or a census is undertaken.

The PPD of MoAF is responsible for providing policy and planning services and for monitoring and evaluation of the various programmes and projects. It liaises with the donor agencies for mobilizing funds and with the other ministries in the government for clearing programmes and projects. The division is also responsible for ensuring equitable distribution of human and physical resources amongst the various agencies in MoAF and for providing secretarial support to the Minister and Secretary.⁹ PPD is the most important user and producer of RNR data in Bhutan. It takes the lead in coordinating statistical activities of various departments in MoAF. Its involvement in any activities related to RNR statistics inside or outside MoAF is obvious.

The IdCA mission found that the dialogues with the data users are not frequently held. This can be satisfactorily explained in some of the cases because the data producer and the main user is the same. In such cases data are demand driven from the beginning itself.

At PPD there is "RNR Statistical Coordination Section" (RNR-SCS) that upgrades and disseminates RNR statistics. It also provides backstopping to departments and agencies in production and use of RNR statistics in consultation with RNR - Statistics Coordination Committee (RNR-SCC). This committee is responsible for making recommendations on the conduct of surveys/censuses, methodologies, and TA. The committee is chaired by department heads on a rotational basis. RNR-SCC meets on a biannual basis. Through RNR-SCC, frequent dialogues can be held with the main users of RNR sector data in NSB, MoF, MoAF and other agencies. Here also PPD's role is very important.

Needs assessment is crucial if Bhutan Statistical System (BSS) is to deliver effective outputs. As regards to this the MoAF and NSB intend to establish a network of stakeholders (producers and users) led by National Strategy Coordinator, Chief, PPD, MoAF. The main focus of the network would be to engage in discussion of strategies, emerging data requirements and other technical matters related to RNR statistics. The network would include all 9 institutional members¹⁰ in RNR-SSC and the stakeholders mentioned in Annex 6.8. In addition, following officials will act as "Champions" to promote production and use of agriculture statistics:

- Chief, PPD, MoAF
- Director General, National Statistics Bureau
- Head Statistical Section, PPD, MoAF
- Collector, Department of Revenue and Customs
- Director, Department of Employment, MoLHR
- Chief Forestry Officer, DoFPS, MoAF

⁹ http://www.MoAF.gov.bt/MoAF/?page_id=136

¹⁰ PPD, DOA, DOL, DOFPS, DAMC, Council for RNR Research in Bhutan (CORRB), BAFRA, Bhutan Bio-Security Information Section (BIMS) and Human Resources Information Section (HRIS)

- Chief Statistical Officer, NSB
- Statistics Officer, PPD, Ministry of Finance (MoF)

3 DATA AVAILABILITY AND QUALITY – USERS’ PERSPECTIVE

Potential users are aware of official RNR statistics being collected and published on the production, trade, prices, GDP, CPI and PPI. By and large, they express that the access to user-oriented RNR data is unrestricted.

Sectoral plans in Bhutan are guided by four pillars of Gross National Happiness (GNH) (i) promotion of equitable and socioeconomic development, (ii) preservation and promotion of cultural values, (iii) conservation of the natural environment and (iv) good governance. Hence, usefulness of the following data sets is obvious to one of the most important main users (GNHC): the BLSS data, land cover data, forestry data, current crop area and production data, livestock data, market price data, FCB data, etc.

As a user the NSB reported that there is a need to improve the timeliness and frequency of dissemination of RNR data. For example, in December 2013, much of the data on production, marketing, trade and pricing were for October 2013. In September 2013 publication, the NSB used provisional data of 2012’s agricultural production for calculating Gross Value Added (GVA) for agriculture sector. They will have to revise GVA calculations after the final data are provided by MoAF. Buyers, sellers, consumers and other institutions also need near real time data for taking more informed timely decisions.

The NSB would also like to get quarterly data on agricultural production for GDP calculation on quarterly basis, but it is not possible for MoAF to deliver such data. Mainly due to a lack of data on production and producer price of various food items, some of the output tables produced by NSB in “Producer Price Index” include only logging; it does not include crops and livestock products. Currently CPI and PPI are available on quarterly basis.

MoLHR and MoAF reported that migration and rapid urbanization are causing profound impact on land use and land development, shifts in economic activities, environment, type of labour use, type of employment, cost of labour, and changes in agricultural and non-agricultural employment ratios. Given this, besides other data gaps, there is an urgent need to update data on land cover and use, covering all land classes in the country. Special attention needs to be paid to the updated analysis of agricultural land (wetland in urban areas and dry land in rural areas, in particular) and natural vegetation in urban and semi-urban areas to record both spatial and temporal changes.

At present most of RNR data are produced at national level and sub-national level. Data are also required by agro-ecological zone for users such as Council for RNR Research of Bhutan. Data needed for mitigation of weather and disaster risks are also equally important. There is also a lack of comprehensive data on: (i) primary production infrastructure and inputs: irrigation systems and canals; fertilizer and pesticides use by crop and (ii) storage infrastructure like godowns, cold storages, warehouses, etc.

MoF, which is one of the main users of RNR data, expressed that some crop data, especially at sub-regional level, show very wide annual variations and their reliability is questionable.

As unofficial import and export cannot be taken into account in official recording, trade data are underestimated. Users in MoAF, especially those involved in calculation of Self Sufficiency

Ratio (SSR) and Import Dependency Ratio (IDR), reported that trade data are underestimated because the volumes and values of unofficial imports and exports cannot be ascertained. For bringing improvements in SSR and IDR calculations, MoAF would like to get following data for individual crops: per capita consumption (from BLSS database) and latest import and export (from DRC). At present Royal Monetary Authority (RMA) for the purpose of Balance of Payments Compilation does periodic survey on informal trade which may not be specific on agriculture statistics. For this, in the future, MoAF together with RMA would like to conduct a survey on informal trade on agriculture produce.

DoL reported that quality of livestock production data collected at household levels is weak because the reference period of reporting is 'past 1 year'. There is a lack of data on breed-wise milk yield (milk production/cow). DoL would like to get following data: per capita consumption of livestock products (from BLSS database) and latest import and export (from DRC). For the future, users suggested conduct of a trade flow survey on informal import of livestock and livestock products. Data on pond area and pond fisheries are of good quality, but timeliness of the delivery of such data is a problem.

In forestry sub-sector, timber-use data are reported in local measures, which are very difficult to standardize. Hence, timber use data is quality deficient. The minimum data set of RAP covers only the state forestry. As social forestry (community forestry, leasehold forestry and private forestry) are very important in Bhutan, data on these should be included.

Although sources of environment statistics are dispersed over a variety of data producers, users such as PPD of various ministries have good access to latest available data on environment. Updating of land cover mapping is very important. Bhutan's Greenhouse Gas (GHG) emissions were adjudged insignificant in 2000. However, continued study and monitoring of GHG emissions will be required. A repeat survey is needed in the near future.

Users in MAIL expressed that, for faster access of data, the ICT needs to be strengthened in producer agencies. For this RNR data need to be fed into online Management Information System (MIS) and Information Gateways (IGs) of all agencies. The speed of data transmission needs to be accelerated through the establishment of electronic links between the central office and offices in the Dzongkhags, Gewogs (in the case of DoA and DoL) and specialized locations (DRC, DoFPS and FCB).

Potential uses of RNR data are yet to be appreciated by public and private sector investors, university students and agricultural researchers. However, generally speaking, transparency and quality consciousness of the users are at very high levels. This is because all RNR data collected are mostly demand driven.

Some potential users are not using available data for more informed decision making. FCB, which is a potential user of RNR data, do not use crop production data of MoAF in taking important decisions. For example, FCB aims to maintain buffer stocks of food grains to ensure national food security. It allocates food grains for public distribution in various parts of the country. Currently FCB decisions are mainly based on historical data and current demand. Crop production data at the national and sub-national levels are not considered. FCB reported that they would make use of such data in future. This is an area in which PPD intends to provide assistance to FCB. There is room for improvement in this matter.

Emerging RNR data needs of the users are considerable, but some of the data gaps mentioned by the users are outside the scope of agricultural statistics. Such out-of-scope data include yield of a crop variety by agro-ecological zone (for the use of Council for RNR Research of Bhutan) and milk yield of a livestock breed by agro-ecological zone (for DoL).

MoAF, NSB, DRC and MoF are the main providers of data on RNR. Capability of NSB's staff is increasing. Hence, at NSB human resources constraint is more of manpower than technical.

When needed NSB provides technical advice to MoAF for the conduct of the RNR census and surveys and their data processing. Compared to NSB, MoAF has a reasonable number of staff available for the conduct of surveys or censuses at the sub-national levels. Current agriculture, livestock and forestry surveys and other RNR data collection efforts of MoAF in Dzongkhags and Gewogs are embedded into the respective departmental annual work plan and budget in them. Although there is no separate budget allocated for current RNR data collection, such activities are carried out as a part of the RNR developmental intervention in the Dzongkhags. This situation is truly conducive to the sustainability of the current statistical activities undertaken in the sub-national offices.

Most of the agencies involved in the RNR data collection in Bhutan follow most of the 10 principles of official statistics laid by the United Nations Statistics Division, These principles are necessary - but not necessarily sufficient - conditions for ensuring good quality of official statistics. The NSB (in the case of Bhutan Living Standard Survey, National Accounts, Consumer Price Index and Poverty Analysis), DRC (in import/export recording and reporting), and MoLHR (in Labor Force Survey) are closely following recommended Statistical Standards¹¹ of "International Classification", "Concept and Definitions" and "Methodologies and Procedures" well. MoAF would need at least 2 years to reach to the level of NSB and MoLHR in adoption of international statistical standards for the conduct of agriculture annual surveys and livestock annual census (DoA and DoL), RNR Census and Land Cover Mapping. Towards this, priority should be focused on strengthening capacity in questionnaire design, methodologies and data processing in the case of surveys/censuses and adoption of FAO's Land Cover Classification System (LCCS) in the case of land cover mapping. Requirements on these are briefly shown in Annex 10.

4.1 Data collections

4.1.1 National Statistics Bureau

Bhutan Living Standard Survey (BLSS) 2012 was commissioned by NSB and funded by ADB. The sample size in BLSS 2012 is 8,968 households, which represents a total of 127,942 households with 581,257 persons. The population coverage of BLSS 2012 was less than the de facto population. Firstly, overall non-response rate was 10.6% (8,968 households were covered out of the targeted 10,030). Secondly, the analysis excluded visiting members of households.¹² The cost of the BLSS 2012 was about \$240,000.

¹¹<http://unstats.un.org/unsd/iiss/List-of-Statistical-Standards.ashx>

¹² Source: BLSS Survey Report 2012

BLSS is an important source of information for many users including MoAF. It provides data and indicators needed for monitoring and evaluation of the international and regional commitments such as Millennium Development Goals (MDG) and South Asian Association for Regional Cooperation (SAARC) Development Goals (SDG). Crucial RNR-related data provided by this survey includes household level information on composition, demographics, employment (in farming), asset ownership (of land, livestock and poultry), sources of income, and food consumption in minute details. Bhutan Poverty Analysis is entirely based on BLSS data.

The data on RNR Sector GDP prepared by NSB is primarily based on annual data on agricultural production supplied by MoAF. Quarterly GDP is desirable but MoAF can provide only annual production data. Sources of price data for CPI are NSB, DAMC and FCB. For PPI data are from NSB. The IdCA mission noted that:

- NSB has a very good technical capacity to undertake probability sample surveys and to process and analyze their data. Its human resources constraint is more of manpower than technical in nature.
- Mainly due to a lack of data on production and producer price of various food items, some of the output tables produced by NSB “*Producer Price Index*” include only logging; it does not include crops and livestock products.
- There is no inter-agency duplication of efforts in RNR price data collection. The NSB collects price data for PPI and CPI extensively. DAMC/FCB collects consumer and auction price data for a limited number of locations for providing market information to traders and to the farmers (with marketable surpluses). DAMC and NSB will continue to coordinate to prevent duplication of efforts in the collection of data on consumer prices.

4.1.2 Ministry of Agriculture and Forests

4.1.2.1 Policy and Planning Division

The RNR Census 2009¹³ was conducted by PPD with a budget Nu. 17.6 Million. The census was steered by a Census Working Group consisting of staff from PPD, DoA, and DoL, DoFPS. The NSB Focal Person, a Senior Statistician, served as the technical advisor to the Census Working Group.

The RNR Census 2009 intended to cover a total of 61,578 households listed as having engaged in RNR activities. The household frames for individual Gewogs were provided by the Gewog Extension Centers. The census provides data on land area by land use and by type of land (wet, dry or cash crop); land holding by size (<1 Acres, 1-2.9 Acres, 3-4.9 Acres, 5-9.9 Acres, Above 10 Acres) and by tenure; area and production of crops; livestock population and products; cereal and potato used for seed; amount of agricultural products sold; farm machinery and equipment; means of cultivation; use of fertilizers, manure and plant protection chemicals; area under

¹³ reference period of RNR Census data is January-December 2008

improved pasture; area planted with fodder trees; number of dead livestock; cereal self-sufficiency; quantity and amount of various food commodities purchased. The census also included crucial information on social capital (social forestry); reason for leaving arable land fallow; access to fundamental services; damage to cropped area and production by wildlife; livestock killed by wildlife; and farming constraints. In the cases of supply and utilization of forestry products, the census used secondary data from Forestry Information Database maintained by DoFPS. Data on topography also came from Land Use Planning Project (LUPP). Secondary sources were used also in the case of data on fertilizer distribution, seed distribution, import, and purchase and distribution of food commodities.

Following observations and recommendations can be made in the light of RNR Census of 2009 conducted by PPD:

- Firstly, overall management and the output of the RNR Census 2009 are entirely commendable. The outputs served the purpose they were intended to and all users (both in MoAF and outside MoAF) are satisfied with the outputs. Hence, conduct of next RNR Census together with or soon after the Population and Housing Census of 2015 is a necessity. MoAF intends to conduct next RNR Census in 2016.
- Secondly, MoAF intends to use Enumeration Area (EA) defined by NSB in the next RNR census. The frame of agricultural households would come from Population and Housing Census. Both MoAF and NSB aim at capturing limited agricultural data during the population and housing census. One of the purposes of this would be to build a master frame for agricultural surveys and to promote integrated sample survey approach, in line with the recommendation made by the Global Strategy. Good planning and close coordination with NSB will be needed as regards to this. In the future the RNR census should be jointly conducted by NSB and MoAF. This will be conducive to RNR statistics development. For this TA will be needed at NSB in this field of expertise before the questionnaires of Population and Housing Census is finalized in 2015. (Annex 6.5a)
- Thirdly, collection of fast changing indicators should be minimized in any census. Compared to a census, BLSS is a more cost effective way of gathering household data on income, expenditure and consumption.
- Capacity for large-scale survey or census data processing is rather limited in MoAF and it needs to be strengthened soonest. MoAF is yet to make use of appropriate software (e.g. CSPro) for processing and analyzing survey and census data. Such data are currently processed in Excel and Access. Designing, data processing, analyses and documentation was all done by PPD in consultation with line departments and NSB. No international experts were involved in this work. However, it will take time for MoAF to reach the level of NSB in this area of expertise even with abundant hardware and better software supplies. Hence, data processing of the next RNR Census results should preferably be entrusted to NSB. Among other benefits, this will ease the processes of “linking population and housing census with RNR Census” and “master frame development”. The second best option is to develop survey data processing capacity in MoAF in close association with NSB. As regards to this one of the activities of ADB’s LOA - analysis of 2004, 2007, 2012 BLSS - offers good opportunity.

- Whatever is the action plan for data processing on RNR Census, MoAF, NSB and other stakeholders should agree upon the output tables of the next RNR census before the data processing starts.

4.1.2.2 Department of Agriculture

Annual crop statistics published by DoA are based on data collected from individual Gewogs. The number of households drawn in a Gewog ranges from 10 to 50 percent, depending on the number of households in the Gewog. At the national level, the survey covers 12 percent of the total rural households in the country. Following observations can be made about the DoA annual survey:

- The sampling design used by DoA needs to be improved. DoA's emphasis has been on generating Gewog statistics for all data items covered by the DoA survey. This is in line with the real users' (DoA and PPD) demand and user-driven strategy (for assessing food security at the sub-national levels and for calculating SSR at the sub-national levels and IDR at the national levels). However, the DoA survey precludes MoAF from producing reasonably precise crop statistics at Gewog level. This is because sampling error of crop estimates – or any estimates, for that matter - rises rapidly as the targeted geographical area gets smaller. Furthermore, reasonably precise estimates will not be possible to generate for sporadic variables (such as area planted with green vegetables). The solution to this is to generate only national and Dzongkhag estimates for the most important crops from the survey and use RNR Census data of Gewogs, with adjustments based on Dzongkhag's estimates, in between the RNR census years.
- A sample of about 10 to 50 percent in a Gewog is an acceptable, practical rule as there is no other solution to the problem at present. The IdCA mission provided DoA with an advice on calculating "sample size" for a targeted variable for a desired precision based on the RNR 2009 census data. As regards this, it is quite possible that the sample size required for generating reasonably precise estimators of some crop statistics will be unaffordable.
- Complete non-response rate (over 15%) in DoA sample survey is increasingly becoming a serious problem because the *frame* used for the survey is old. Complete non-response rate was 8% in the case of RNR Census of 2009. Remoteness partly contributes to high non-response rate in annual surveys. DoA intends to bring improvement in the existing *frame* by collecting additional information on cultivated area by type (wet, dry and cash crops) from the individual households in the updated *frame* which would identify and include new units also. This action will preclude non-crop growing households in the DoA survey domain and will definitely increase the efficiency of the sampling design.
- Through FCB the government aims to maintain buffer stocks of food grains to ensure national food security. One of the important instruments as regards this would be construction of annual "Food Balance Sheet" at the national level based on the available secondary data. Potential data sources of these data are Population and Housing Census

(for population data), BLSS (for per capita consumption of individual food item), DoA (for production, crop area, seed rates, use of feed, post-harvest losses), DoL (for livestock numbers and products), DRC (for net import data), and FCB and traders (for carry-over or change in stocks).

Latest Land Cover Maps for Bhutan, which uses updated digital image, are available *for* 2010. An updated Land Cover map is a fundamental decision making tool for a sustainable use of RNR. It is also most important element for description, study and assessment of environment. As rural to urban migration, absenteeism from the holding and rapid urbanization have caused more land fallow (or otherwise used), updated land cover map is needed soon. In this connection, FAO's Land Cover Classification System (LCCS) is recognized worldwide as a very fine and reliable method to describe the reality with a very high level of accuracy and sharpness. Its output is a comprehensive land cover characterization, regardless of mapping scale, land cover type, data collection method or geographic location. Besides LCCS has proven potential for use in agro-ecological stratification and area sampling. Further information in this regard will be sought from Global Land Cover Network initiated by FAO and United Nations Environment Program (UNEP).

4.1.2.3 Department of Livestock

Annual data on livestock number, livestock products (amount produced, sold and consumed) published by DoL are the results of complete enumeration of households carried out by Gewog Livestock Extension Officers in 205 Gewogs. Enumeration for the DoL survey begins in October. Under this operation the officer collects the data by using a set of structured questionnaires developed by DoL. The enumeration is closely monitored by Dzongkhag Livestock Officer and Asst. Dzongkhag Livestock Officer. Data on numbers include animals in government farms also. Preliminary data processing of livestock census data starts at individual Gewog level. By the last week of December all compiled data from Gewogs and Dzongkhags reaches DoL.

After final processing, data are firstly presented to departmental level Livestock Statistics Committee headed by Director of DoL and then to RNR Statistical Steering Committee (RNR-SSC) of MoAF for consideration for approval. Presented data are cross-checked by the users in MAIL. The cross checks involve consistency checks of the reported data against the historical data sets. No Post Enumeration Survey is conducted to assess the quality of reported data. However, large differences are always rechecked and explained. After approval the compiled data by Dzongkhag and Gewog (in Excel templates) are submitted to the RNR-SCS in PPD of MoAF for publication and dissemination. Dissemination of the data is done via MoAF's website, and in hard and soft copies. Users are confident in the reported data.

Following observations and recommendations can be made as regards DoL survey:

- Officer of DoL, like the Officer of DoA, could extract filtered data from the database swiftly. Their technical capability is good.
- Given the vastness of the coverage it is very difficult to control and assess the overall quality of data on livestock numbers. As Gewog level annual data on livestock and

livestock products are not national requirements complete enumeration of households is not necessary on an annual basis.

- No Post Enumeration Survey is conducted to make quality checks.
- Reference period of reporting livestock production, sale and consumption is 1 year, which is too long. DoL has devised some norms and cross-checks for livestock production reported at the household level. Under the circumstances, together with the cross-checks, this is probably the best method of collection. Complete enumeration of households is not necessary on an annual basis in case of livestock production also.
- For maintaining consistency and validation, focus should be on estimating livestock numbers and production and data on consumption should be taken from BLSS results.

DoL is the only source of data on fisheries production. Fish production from water streams, rivers and lakes is unknown. However, fish exploitation from these sources is minimal as only controlled and limited sport fishery is allowed. DoL's data on pond fisheries are based on administrative records. DoL as a producer of data is confident in the reported data.

4.1.2.4 Department of Forests and Parks Services

The responsibility of collection, compilation and processing of current data on forestry rests on DoFPS. Main sources of data on forestry are land cover maps, RNR Census, DoFPS and NRDC. "Forestry Facts, Figures and Trends 2011" published by DoFPS provides current data on protected areas, social forestry, and sustainable utilization of forest resources. "Forestry Facts, Figures and Trends 2012" is going to be published soon.

To summarize, following observations can be made in the case of MoAF:

Within MoAF several departments collect statistics and coordination of their statistical activities is difficult. A single division in MoAF entrusted with entire statistical activities will be needed to ensure more efficient use of MoAF's scarce resources. It would help bring improvements in coordination with NSB/Gewogs and deliver harmonized data. Capacity of MoAF in survey data processing (including for the use in the analysis of BLSS data) should be strengthened soonest. This can be better achieved if a single division in MoAF is mandated for all statistical activities.

4.1.3 Ministry of Labor and Human Resources

The tenth Labour Force survey was conducted by MoLHR in March and April, 2012. The survey gives useful information on the size, composition and economic characteristics of the urban and rural population. In addition, useful data on labor and human resources are available by sex, age, occupation, location, industry, nature of employment, and labor force participation. The cost of the survey was Nu. 5,000,000.

The sampling frame for the survey for the rural areas came from the Population & Housing Census of Bhutan 2005, whilst the latest *frame* (2012) developed by the National Statistics Bureau was used in the case of urban areas. Stratified two-stage sampling was adopted for the survey, in which primary sampling units (PSUs) were blocks (in urban) and the Chiwogs (in

towns). Sampled PSUs were drawn by *probability proportional to size* (pps), the size being the number of households in them. The households in the sampled blocks and Chiwogs were considered as *secondary sampling units* (SSUs). A pre-assigned number of sampled households were selected from the selected PSU's by Circular Systematic Sampling (CSS). Overall, the survey targeted to cover a sample of 12,000 households, of which 236 households (less than 2%) were non-respondents.

Following observations can be made about the Labor Force survey:

- MoLHR has technical capacity to undertake Labour Force Survey, a probability sample survey, on an annual basis. The survey procedures and instruments closely follow *international statistical standards*¹⁴ and ILO recommended norms. Statistical Package for the Social Sciences (SPSS) and Census and Survey Processing System (CSPRO) were used for data analysis and processing.
- MOLHR's current capacity should be strengthened by providing valuable assistance in training of its staff in data processing and ICT, in equipment and in strengthening ICT development. (See Annex 6.5b)
- As line agencies are involved in a decentralized data collection of Bhutan, the survey is an excellent, representative example of how a National Statistical System can work.

4.1.4 Ministry of Finance

MoF is the sole source of information on the government's expenditures on agricultural and rural development, including public investment and subsidies.

Department of Revenue and Customs (DRC) of MoF is the main source of data on export (quantity and value) and import (quantity and value) of core crops, livestock, forestry and fisheries.

4.1.5 National Environment Commission

Sharp focus of NEC has been on land and agriculture, forests, air and climate, energy and minerals, biodiversity, water resources, natural disasters, and waste. A proper framework to guide development, coordination and organization of environment statistics is already in place. Main stakeholders in the case of environment statistics are National Environment Commission Secretariat, PPD of MoAF, DoFPS, Gross National Happiness Commission, National Soil Services Centre of DoA, Biodiversity Centre, National Land Commission and Ministry of Economic Affairs (Department of Geology and Mines, Hydro-Met Services Department and Department of Renewable Energy).

Some Technical Assistance supported by adequate resources will be needed to bring improvement in the environmental data.

¹⁴ see Section 3 (in the beginning)

4.1.6 Other Agencies

Data collected and produced by DAMC, FCB, NRDCL,BAFRA¹⁵, and some others fall generally under administrative reporting. DAMC, FCB and NRDCL require assistance in office and computer equipment, software, training and ICT.

Gender statistics produced by Research and Evaluation Division, Gross National Happiness Commission (GNHC) come from the secondary sources.

4.2 Agency infrastructure

4.2.1 Information and Communication Services

All agencies producing RNR statistics reported that they have reasonable number of computers and ICT services in the office.

At MoAF the information and communication services division in the past year published and distributed over 16,500 copies of various RNR newsletters, farmers' newspapers, diaries and magazines. Apart from this, ICS also disseminated RNR information to the public through various media and aired 32 different RNR programs. ICS has also been mandated to implement G2C services and 21 different services have been identified. In a move towards enhancing RNR ICT services, the internet bandwidth has also been upgraded.¹⁶

The newly introduced eGov Master Plan will provide a coherent direction for ICT development in all sectors, including the RNR Sector. The direction will help to bring all government ICT systems on a common platform.

4.2.2 Transport Infrastructure

At MoAF there is no provision of official vehicles solely for data collection activities. The NSB and other agencies also do not have a fleet of vehicles for data collection or survey supervision and enumeration. However, this is not a constraint in the case of Bhutan. A civil servant can always claim for fuel while using a private vehicle for an authorized fieldtrip. This arrangement will stand in any surveys or censuses to be commissioned in the future also.

4.2.3 Funding and Support for the Agricultural Statistics System

The MoAF and NSB very much appreciate that sound Agricultural Statistics System requires reliable and internationally comparable statistics and that the conduct of sample surveys and censuses is an appropriate means towards that end. In all agencies involved in RNR data collection, funding support for data collection is very limited from the RGoB budget. For example, at MoAF, there is no separate budget allocated for statistical data collection. Most of the censuses, large-scale surveys and maps conducted/prepared by NSB and MoAF (such as BLSS, PA, RNR Census, Multiple Indicator Cluster Survey (MICS) of UNICEF, Land Cover Map) were funded by international agencies or bilateral donors. For example, the RNR Census

15 BAFRA provides export data on cash crop, cordyceps sinensis, etc.

16 Source: Major achievements of RNR Sector 2012-2013, MOAF, March 2013

2009 was funded by DANIDA-supported Decentralized Natural Resource Management Component (DNRMC) set up at PPD and Land Cover Mapping Project (LCMP) was set up at the National Soil Services Centre (NSSC) of DoA in 2008 with the financial support of Nu. 7 million from the GEF/WB funded Sustainable Land Management Project.

MoAF has capacity to continue with DoA survey, DoL census and administrative reporting without outside assistance. However, even with additional funding, the ministry does not have capacity to undertake ad-hoc large-scale sample surveys to satiate additional data needs of the Global Strategy that cannot come from the already existing sources. Similar situation prevails also in other line agencies involved in RNR sector statistics collection, processing and dissemination. Additional data can be provided only if they can be generated through a variety of existing secondary sources.

The Asian Development Bank (ADB) is assisting in implementation of the Global Strategy through its project on “Improving Agricultural and Rural Statistics for Food Security (R-PATA 8029)”. With a budget of US\$ 500,000, R-PATA aims to provide assistance to a set of pilot countries including Bhutan, Lao PDR, Maldives, Thailand and Viet Nam during its implementation in the period December 2011 to May 2014. The IdCA benefited from the briefing provided by MoAF officers on a three-day stakeholders’ workshop on “Improving Agricultural and Rural Statistics for Food Security”, which was conducted in line with the Letter of Agreement (LOA) signed between MoAF and ADB. In this connection, the ADB’s LOA, with a total funding support of \$26,000 from R-PATA, requires the MoAF to undertake the following activities: (i) finalize country action plan (by November 2013), (ii) conduct methodological research, including (a) documentation of all data collection methods and analysis being undertaken to compile RNR statistics (by December 2013) and (b) analysis of 2004, 2007, 2012 BLSS (by January 2014), (iii) dissemination of the results of the methodological research (February 2014), and (iv) advocacy for the Country Action Plan (February/March 2014). The officials responsible for the implementation of the LOA are Ms. Dalisay S. Maligalig, Principal Statistician from ADB and Mr. Tenzin Chophel, Chief of PPD from MoAF. The action plans of R-PATA/LOA and RAP are virtually the same. It is obvious that the Country Action Plans of FAO and ADB need to be coordinated. As regards to this following recommendation and observation are made:

- Officials from FAORAP and Asian Development Bank (Ms. Dalisay S. Maligalig, Principal Statistician) should hold a meeting to resolve the issue once and for all.
- PPD will not be able to undertake the activities mentioned in LOA on its own, especially ii (b), which would require use of household level data from the BLSS databases stored in CSPro.

4.2.4 Human resources and training

The number of staff in RNR Sector is very unlikely to increase in the near future and MoAF and NSB will have to manage current RNR data collection, processing, reporting and dissemination by using the available staff optimally and more efficiently. In the case of annual surveys and other generic work of RNR data collection, TA will have no real impact if sustainability of the

activities initiated by the TA requires an increase in manpower and funding in the future. Given above, there will be minimum requirement of Technical Assistance in running the current activities. However, substantial TA will be required in the case of RNR census and land cover mapping, which are once in five or ten years operations. (Annex 6.5b)

As severe funding constraints in RNR sector is likely to have adverse impact on its stipulated plan in the eleventh plan period (2013-2018), MoAF and NSB will not be in a position to address resources constraints in overseas training on RNR data collection through internal means.

4.2.5 International cooperation in agricultural statistics

Much needed international cooperation in RNR statistics has been negligible in the past 3 years. There is no donor supported on-going or pipeline projects or programs on RNR statistics.¹⁷ Only DoFPS has benefitted from FAO forestry projects in developing forestry database and in producing forestry data. Publication of RNR statistics and land cover maps was sponsored by donors like DANIDA and IFAD. The ADB's grant of \$26,000 from R-PATA is available to support MoAF in carrying out the activities pertaining to the Global Strategy. So far only \$6,000 has been spent (on the stakeholders' workshop on revision of RSF held in Phuntsholing). As per the LOA, MoAF is authorized to spend the remaining amount as follows: Workshop, training and seminar (\$12,000); Publication (\$6,000); and Contingencies (\$2,000).

¹⁷ Source: PPD 2012: RNR Sector - donor supported project profiles, PPD, MOAF, December 2012

5 CRITICAL CONSTRAINTS IN RNR STATISTICS SYSTEM

5.1 Critical constraints and challenges

Severe constraints on RNR data collection in MoAF are given below:

- i. Activities are severely constrained by the unavailability of manpower;
- ii. Resources available for data collection are very limited and will continue to be like that in the future;
- iii. Good quality data is difficult to gather from remote areas;
- iv. Choice of variables, frequency and basic geographic units for data aggregation and disintegration is needed to be made carefully and very selectively in order to improve the quality of data, using limited manpower and funds prudently and optimally;
- v. A single division in MoAF should be held responsible for RNR data management, publication and dissemination. On statistical matters the division should be guided by the RNR Statistics secretariat.
- vi. It was commented that there is a need to improve the sampling frame at the start and improve the sampling methodology. As frame updation is expensive and time consuming, Agriculture Census may be conducted soon after the conduct of Population & Housing Census to take advantage of the list frame resulting from the population census.

The constraints mentioned in (i), (ii) and (iv) are valid in the case of other agencies also, as per the discussions held and the questionnaires.

The NSDS is yet to become fully operational. Its effectiveness impinges primarily on the Statistics Law, which is yet to be enacted by the parliament and largely due to availability of fund. The NSDS had noted the following as regards the implementation risk:

The adoption of the Statistics Bill early in the beginning of the Action Plan will be the signal of a strong support from the Government for the development of the BSS. On the contrary any delay would be an obstacle to the development of the official statistics and coordination between the BSS partners. It may postpone the full implementation of the NSDS First Action Plan¹⁸.

Unequivocally, there is a huge challenge ahead. Hence, in due course, in line with what is already mentioned in Section 2.2.1, RNR statistics should operate within the RNR Statistical Framework 2012. Some other serious constraints are mentioned in Section 4.2.

5.2 Strengths and Weaknesses, Opportunities and Threats

The SWOT Matrix for the Bhutan Agricultural Statistics Program is presented in Annex 6.2 The matrix provides guidance as to what needs to be done to increase the statistical program's

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strength, to seize the opportunities for its success, to overcome its weaknesses and to reduce foreseen threats. SWOT of data collection for all sub-sectors, as mentioned in Section 5.1, are virtually the same.

The SWOT matrix greatly facilitated MoAF's successful pursuit of effective short and medium-term strategies described in the next Section.

5.3 Strategy for the development of the Bhutan Agricultural Statistics Program

Although a substantial amount of RNR data and information are collected in Bhutan, there are deficiencies in many respects, e.g. as regards the quality, consistency, data gaps, lack of standardization, inappropriate data management, insufficient analytical capacities, delays in delivery of data and contradictions. Some typical examples of these deficiencies are given in Section 3.

Other problems are weak capacity in survey data processing and data analysis in some agencies including MoAF. MoAF is looking forward to full support from the RAP on the matter. However, any future project should attempt to build upon the existing activities at MoAF, with due consideration to the Global strategy's and RAP's requirements.

Ensuing above, all data producing agencies should be supported in training, equipment and data processing methods. The RAP should give sharp focus on strengthening the capacity of central and sub-national offices {in providing office and computer equipment, and ICT facilities} and in increasing capabilities of staff (by organizing and availing training in statistical standards, conduct of sample surveys, and survey data processing in appropriate organizations such as Statistical Institute for Asia and the Pacific (SIAP), Indian Agricultural Statistics Research Institute (IASRI)) and The U.S. Census Bureau's International Programs Center (on CSPro and survey sampling). This approach will ensure that the delivery of reasonably reliable data sets would be possible in a sustainable way. Precise details on the equipment and training requirements of the individual agencies involved in RNR data collection are shown in Annex 6.5b.

NSB always takes a lead in developing national capacity by providing valuable advice on census and survey matters to various line agencies and in organizing in-country training programs. One of its efforts in this direction is the organization of "Training on Sampling" in March 2014. The resource person for this training was from IASRI, Delhi. Many such types of training will be needed in the future. (Annex 6.5)

Except for once-in-five-years activities, such as RNR Census and Land Cover Mapping, MoAF would prefer to be involved only in the activities that can be sustained by MoAF after the outside assistance would come to a close. However, funding assistance would be badly needed for the construction of updated frame/master frame for RNR data collection, for conduct of RNR Census, and for preparation of Land Cover Mapping. Such efforts will carry added value in the eleventh plan period (2013-2018).

Both PPD and DoA reported that they are not in a position to implement annual or seasonal activities that require substantial Technical Assistance and intense involvement of RNR extension workers in 205 Gewogs to gather data. Such activities are not sustainable for years to come.

MoAF professionals have devoted considerable hard effort in establishing RNR-Statistical Framework 2012. Any Agricultural Statistics Program in Bhutan, including the intended Strategic Plan for Agricultural and Rural Statistics (SPARS), must be built up from RNR-Statistical Framework 2012. For RNR Statistical Framework's effectiveness other stakeholders' collaborative linkages are very important, especially in statistical development processes. RNR-Statistics Framework should include agencies outside MoAF (NSB, GNHC, DRC, etc.). A significant input to the SPARS is available from the "RNR Statistical Framework 2012". SPARS requirements should be incorporated into the revised RNR Statistical Framework, currently being drafted.

The timeframe of the new program is recommended to be 5 years (2014-2018), which synchronizes with the eleventh plan period.

6. ANNEXURES

Annex 6.1: Global minimum set of core data items compared to national priorities - Bhutan

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark
Economic						
Output	Production	Core crops (e.g. wheat, rice)	Annual	Paddy, Maize, Wheat, Buckwheat, Barley and Millet Apple, Orange, Potato, Chili and Cardamom	Annual	Their normative uses in GDP calculation and production monitoring are well known. These data are needed for calculations involved in Self Sufficiency Rate (SSR) and Import Dependency Ratio (IDR). Source of data: DoA, MoAF
		Core livestock (e.g. cattle, sheep, pigs)	Annual	Cattle, Goats, Pigs, Chickens, Yaks, and Horses Beef, Pork, Mutton (Goat and Sheep meat), Chicken, Milk and Eggs	Annual	In addition to their uses in GDP calculation and production monitoring, these data are needed for Self Sufficiency Rate (SSR) and Import Dependency Ratio (IDR) calculations also. Source of data: DoL, MoAF
		Core forestry products	Annual	Production of Timber, Woodchips, Firewood , Briquette and cordyceps	Annual	DoFPS, DRC and NRDCL are main source of data.
		Core fishery and aquaculture products	Annual	Fish production from ponds	Annual	Fishing from river is illegal. Aquaculture is important in Chhukha, Samtse, Wangdu, Tsirang, Dagana, Sarpang and SadrupJongkhar Dzongkhags. DoL, MoAF is the source of data.
	Area harvested and planted	Core crops (e.g. wheat, rice)	Annual	Area Harvested: Paddy, Maize, Wheat, Buckwheat, Barley and Millet	Annual	Area planted and harvested differs a lot at times because wild animal damages to planted area are substantial. Main source of data: DoA, MoAF

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark
				Total Trees and Bearing Trees: Apple and Orange Area Harvested: Potato, Chili and Cardamom		
	Yield/Productivity	Core crops, core livestock, core forestry, core fishery	Annual	Yield/Acre of paddy, maize, wheat, buckwheat, barley, millet Yield/fruit-bearing-trees for apple and orange Yield/Acre of potato and cardamom Yield in the case of Beef, Pork, Mutton (not possible); Chicken, Milk and Eggs (possible)	Annual	
Trade	Exports in quantity and value	Core crops, core livestock, core forestry, core fishery	Annual	Apple, orange, cordyceps, potato, rice, wheat, barley, chili	Annual	Source of data: Department of Revenue and Customs
	Imports in quantity and value	Core crops, core livestock, core forestry, core fishery	Annual	Rice, wheat, barley, apple, orange, potato, chili, milk, butter, cheese, pork, beef, chicken, fish, mutton	Annual	

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark	
Stock of resources	Land cover and use	Land area ¹⁹	Land cover by type (e.g. forest area, cultivated agriculture area [by wetland, dry land, orchard] , meadows, shrub, snow cover, etc.	5 years	Cultivation in all types of land is declining. These are due to urbanization, population migration from rural to urban areas, and shortage of local labor.	
	Economically active population	Number of people of working age by sex	Not specified	Number of people of working age by sex	5 years	Population and Housing Census	
	Forest	NA	NA	NA	Forest area (% of the total area)	5 years	Land Cover map
		NA	NA	NA	Forest area under tree cover (%)	5 years	Land Cover map
		NA	NA	NA	Protected areas and biological corridor	Annual	Annual report of Department of Forest, MoAF
	Livestock	Number of live animals	Not specified	Cattle, goats, horses, pigs, chickens, yaks, horses	Annual	Department of Livestock, MoAF	
Machinery	e.g. number of tractors, harvesters, seeders	Not specified	a) Farm machinery b) Distribution of farm machineries and equipment (e.g. plough, rice mill, oil mill, power sprayer, power tiller, rice huller, trailer)	a) 5 years b) Annual	a) Department of Agriculture, MoAF b) RNR Census		
Inputs	Water	Quantity of water withdrawn for agricultural irrigation	Not specified	NOT possible to gather and/or deliver	NA	Proxy indicator is Wetland (Acre)	

¹⁹The frequency for the following items will be established by the framework provided in the Global Strategy to determine the national priorities for content, scope, and frequency. The frequency requirement will also be considered in the establishment of the integrated survey framework where the data sources will be defined.

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark
	Fertilizers in quantity and value	Core fertilizers by core crops	Not specified	Suphala (NPK: 15:15:15); SSP (15% P2O); Di-Ammonium Phosphate, CAN (15% N); bonemeal, MOP (15% K2O) distributed by MoAF	Annual	Department of Agriculture, MoAF and Department of Revenue and Customs (DRC), Ministry of Finance.
	Pesticides in quantity and value	Core pesticides (e.g. fungicides herbicides, insecticides, disinfectants) by core crops	Not specified	Total amount distributed by categories (e.g. insecticides, fungicide, rodenticides, herbicides, acaricides, non-toxins)	Annual	Department of Agriculture, MoAF and Department of Revenue and Customs (DRC), Ministry of Finance
	Seeds in quantity and value	By core crops	Not specified	Amount of seed distributed	Annual	
	Feed in quantity and value	By core crops	Not specified	NOT possible to deliver	NA	Guesstimates can be made available from MoAF
Agro-processing	Volume of core crops/livestock/fishery used in processing food	By industry	Not specified	- Fruit - Milk	Annual	
	Value of output of processed food	By industry	Not specified	- Fruit - Milk	Annual	
	Other uses (e.g. biofuels)		Not specified	- Firewood (qty.)	Annual	
Prices	Producer prices	Core crops, core livestock, core forestry, core fishery	Not specified	Core crops, core livestock, core forestry needed for GDP calculation (identified in "outputs")	Monthly/Annual	Mainly for the use of NSB; scope and coverage need to be widened
	Consumer prices	Core crops, core livestock,	Not	Core crops and core	Monthly/Annual	Mainly for the use of MoAF, NSB and

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark
		core forestry, core fishery	specified	livestock identified in "outputs"		FCB; scope and coverage need to be widened
Final expenditure	Government expenditure on agriculture and rural development	Public investments, subsidies, etc.	Not specified	Public investments, Subsidies	Annual	Ministry of Finance
	Private Investments	Investment in machinery, in research and development, in infrastructure	Not specified	NOT possible	NA	
	Household consumption	Consumption of core crops/livestock/etc. in quantity and value	Not specified	Consumption of core crops/livestock/etc. in quantity and value	Once in 2-3 years (Bhutan Living Standard Survey)	Bhutan Living Standard Survey and RNR Census are the main sources
Rural infrastructure (capital stock)	Irrigation/roads/railways/communications	Area equipped for irrigation/ roads in km/railways in km/communications	Not specified	Area under irrigation (Acre) Roads (km) Telephone connection (Number) Trunk connection (Number)	Annual	Department of Agriculture, MoAF Road Safety and Transport Authority Bhutan Infocom Media Authority
International transfer	Official development assistance for agriculture and rural development		Not specified	Official development assistance for agriculture and rural development	Annual	Ministry of Finance and PPD, MoAF
Social						
Demographics of urban and rural population	Sex	Not specified	Not specified	Sex ratio (overall) Unemployed by sex Proportion participating in agriculture by sex % of female - parliament members - decision makers at	Decennial Annual	Population and Housing Census Labor force Survey

Group of variables	Key variables (Global minimum)	Core data items (Global)	Frequency (Global)	Core data items (Bhutan)	Desirable Frequency (Bhutan)	Remark
				local level (Gup, Mangmis, Tshogpas)		
	Age in completed years	By sex	Not specified	Age in completed years	Decennial	Population and Housing Census
	Country of birth	By sex	Not specified	Country of birth	Decennial	Population and Housing Census
	Highest level of education completed	1 digit ISCED by sex	Not specified	Highest level of education completed	Decennial	Population and Housing Census
	Labour status	Employed, unemployed, inactive by sex	Not specified	Labor status	Annual	Labor Force Survey
	Status in employment	Self employment and employee by sex	Not specified	Status in employment	Annual	Labor Force Survey
	Economic sector in employment	International Standard Industrial Classification by sex	Not specified	Economic sector in employment	Annual	Labor Force Survey
	Occupation in employment	International Standard Classification of Occupations by sex	Not specified	Occupation in employment	Annual	Labor Force Survey
	Total income of the household		Not specified	Total income of the household	3 years	Bhutan Living Standard Survey
	Household composition	By sex	Not specified	Household composition by sex	Decennial	Population and Housing Census
	Number of family/hired workers on the holding	By sex	Not specified	Number of family/hired workers on the holding by sex	Decennial	Population and Housing Census/RNR Census
	Housing conditions	Type of building, building character, main material, etc.	Not specified	Housing conditions	Decennial/3 years	Population and Housing Census/Bhutan Living Standard Survey
Access and distance to services and social capital						Bhutan Living Standard Survey/RNR Census

Environmental						
Land	Soil degradation	Variables will be based on above core items on land cover and use, water use, and other production inputs	Not specified	Land use, land use change and forestry (net emission gigagram/year; CO ₂ , CH ₄ and N ₂ O)	5 years Ad-hoc	MoAF National Environment Commission/ The United Nations Framework Convention on Climate Change (UNFCCC)
Water	Pollution as a result of agriculture	Variables will be based on above core items on land cover and use, water use, and other production inputs	Not specified	NOT possible	NA	
Air	Emissions resulting from agriculture	Variables will be based on above core items on land cover and use, water use, and other production inputs	Not specified	Emissions resulting from agriculture	5 years	For this data item, funding support from UNFCCC and/or other donor will be needed like in 2010.
Forest	NA	NA	NA	Forest cover (% area) Biodiversity (recorded species; their numbers) Protected area (km ²) Community forest (acres) Private forest (acres)	Annual	DoFPS, MoAF
Geographic location						
GIS coordinates	Location of the statistical unit	Parcel, province, region, country	Not specified	GIS coordinates of Enumeration Area (EA) of Population and Housing Census and other large-scale surveys	Not Applicable	National Statistics Bureau
Degree of urbanization	Urban/rural area	Not specified	Not specified	% of people in urban area by sex, age, education and employment status	5 years	Migration of people from rural to urban areas is one of the prime concerns of RGoB

Annex 6.2: SWOT Matrix for RNR Statistics in Bhutan

(Based on specialist inputs provided by the stakeholders)

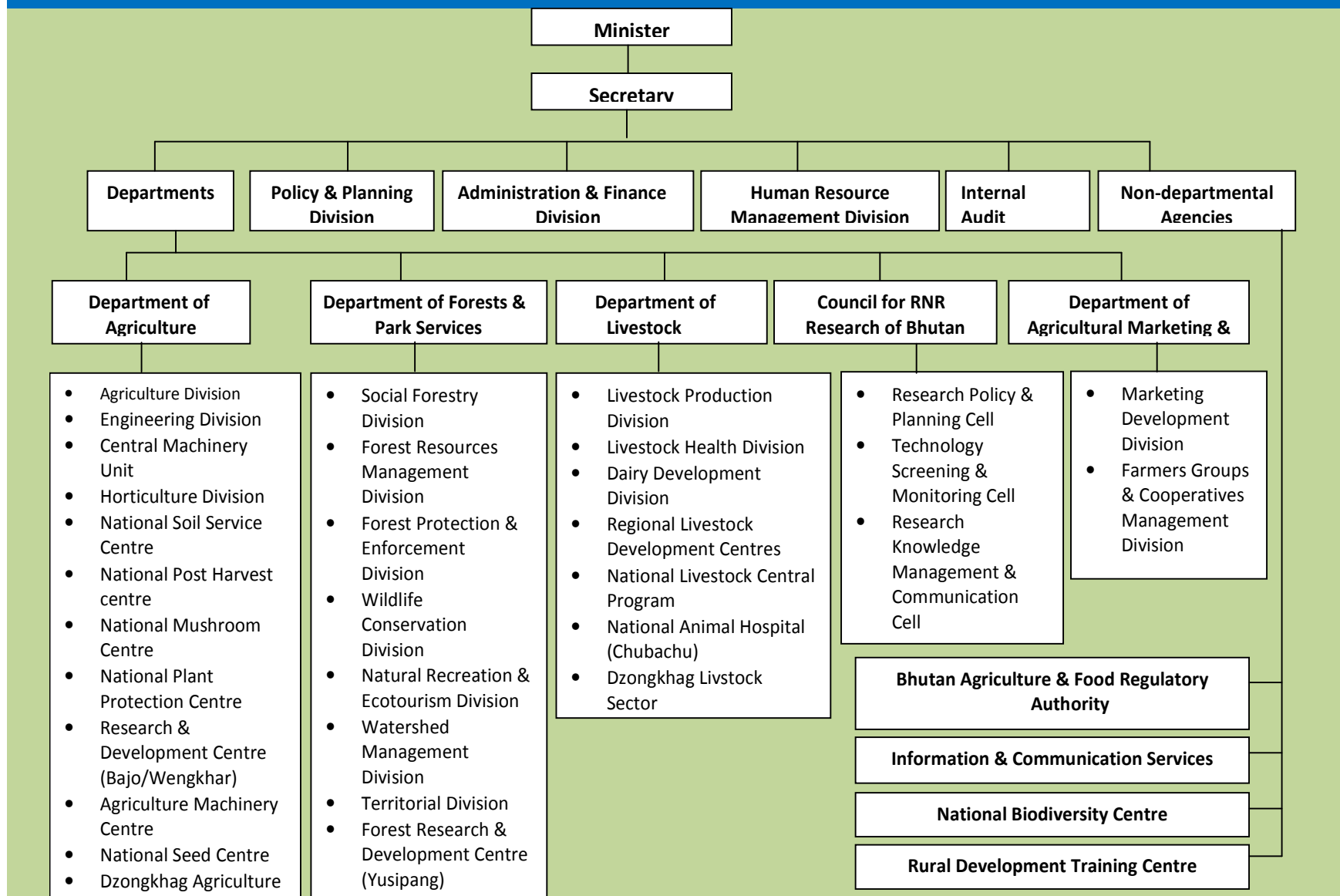
<i>Indigenous to RNR Statistics</i>	<i>Helpful</i>	<i>Harmful</i>
	Strengths	Weaknesses
	No duplication of efforts in data collection	Sectoral requirements gets priority over a perceived soft goal of statistical development; timeliness wins against accuracy in the trade-off between the two
	Highly relevant to RNR policy, planning, program and strategy	Quality of data suffers due to complete non-response and/or item non-response; in some cases reference period of reporting is too long (1 year)
	Not divorced from the main users; In fact MoAF is directly involved in identifying the data needs	RNR census does have the topical scope of an agriculture census
	Timeliness maintained albeit occasional hiccups; well defined frequency; transparency; easy access (web-based)	Existing capacity of the MoAF cannot keep pace with the ever increasing demand of data.
	Annual RNR surveys and admin data collection activities are almost entirely funded by the government resources; sustainable; commensurate with MoF policy	Due to remoteness, some survey or census households are not visited but interviewed at a pre-assigned place; high non-sampling errors
	RNR census includes fast changing indicators (such as production) and social wealth (such as social forestry).	Under used despite being relatively easy to access
	Unlike in many other countries, data are not perceived by some users to be biased towards RNR Sector; happy NSB, other line agencies and MoF, for example	Precision of the estimates obtained from sample surveys unknown
	Happy coordination and collaboration among producers of data; conducive, excellent environment for BSS	Absence of a law governing statistics
Quality conscious users, including NSB and MoF		

Exogenous to RNR Statistics	Helpful	Harmful
	Opportunities	Threat
	RNR Sector Eleventh Plan (2013-2018)	Manpower constraints; number of staff involved in RNR is unlikely to increase in the near future
	Population and Housing Census 2015 (updated frame availability for an Agriculture Census)	Placement of tight spending constraints in RNR Sector
	Agriculture Census 2016 possible soon after the conduct of Population and Housing Census	Occurrence of rural to urban migration, sudden abandonment of land, and urbanization will cause effective survey sampling difficult
	Large-scale surveys (BLSS), Labour Force Survey, RNR Census and Land Cover Mapping likely to be funded by donors	Remoteness of enumeration units; harsh weather during preferred enumeration time
	Capacity development in office and computer, equipment, training, ICT, staff training) RAP and others	

Annex 6.3: Organizational Chart of National Statistics Bureau



Annex 6.4: Organizational Chart of Ministry of Agriculture and Forests (MOAF)



Annex 6.5a: Summarized Cost Estimates (2014-2018)

Accounts	Description	Cost (US\$)	Remark
5011	Professional Staff		
5013	Consultants	560,000	TA
5014	Contracts		
5020	Temporary Assistance	2,500,000	Survey/Census/Land Cover Mapping costs
5021	Travel	70,000	
5023	Training	265,000	
5024	Expendable Equipment		
5025	Non Expendable Equipment	690,000	
5027	Technical Support Services	12,000	Reporting cost
5028	General Operating Expenses (GOE)	200,000	
	SUB-TOTAL	4,297,000	
5029	Support Cost (13%)	558,610	
	TOTAL (US\$)	4,855,610	

Annex 6.5b: Cost Estimates (2014-2018) in US\$

Agency	Item	TA				Overseas training	TA (BL 5013)	Conduct of Survey/ Census (BL 5020)	Training (BL 5023)	Non-expendable Equipment (BL 5025)	Total (US\$)
		(Description)	(p/month)	Cost (per p/month)	Computer with Accessories (atv)						
DRC	Customs data				7	Reporting customs data/ICT	-	25,000	70,000	95,000	
FCB	Auction data				7	Analysis of auction data		10,000	70,000	80,000	
MoAF											
DAMC	Consumer price data				4	Price data reporting/ICT		10,000	40,000	50,000	
DoA	Annual Agri Survey	Survey design (1)/data processing (1)	2	20,000	5	Survey and survey data processing	40,000	30,000	50,000	120,000	
DoA	Land cover/use maps (2015)	Land cover/use expert	10	20,000	5	Land use data interpretation	200,000	500,000	30,000	50,000	780,000
DoFPS	Forestry data sets				3	Data processing/ICT		10,000	30,000	40,000	
DoL	Annual Livestock Survey	Data processing and analysis expert	1	20,000	5	Survey data processing and analysis	20,000	25,000	50,000	95,000	
PPD	RNR census (2016)	Census expert (7)/data processing (3)	10	20,000	12	Data collection, processing and analysis	200,000	1,000,000	40,000	120,000	1,360,000
ICT and other	Strengthening ICT		1	20,000	5	ICT	20,000	20,000	50,000	90,000	
MoF	RNR data use				2	Use of RNR data		15,000	20,000	35,000	
MoLHR	Labor Force Survey (2014, 2016, 2018)				5	Analysis of labor and employment data		240,000	10,000	50,000	300,000
NEC	Environment data sets (2015)	Environment statistics expert	1	20,000	2	Analysis of environmental data	20,000	40,000	10,000	20,000	90,000
NRDCL	Forest resources use				2	Processing of forest resources data/ICT		10,000	20,000	30,000	
NSB											
	BLSS (2014, 2016 and 2018)				2			720,000			720,000
	RNR census (2016; 2 visits)		3	20,000	5	Pop and Agri census linkage/Master Frame	60,000	20,000	50,000	130,000	
					Sub-total (A)		560,000	2,500,000	265,000	690,000	4,015,000
					Travel (B) (BL 5021)						70,000
					Reporting cost (BL 5027) (C)						12,000
					General Operating Expenses (D) (BL 5028)						200,000
					Total (E=A+B+C+D)						4,297,000
					Project Servicing Cost (PSC=13% of E)						558,610
					Total project cost (US\$) (E+PSC)						4,855,610

NOTE:

So far BLSS is entirely funded by ADB; LFS is funded by RGoB/ILO
PSC includes costs of providing administrative and operational support (AOS) to the project

Annex 6.6: References

- Bhutan Poverty Analysis 2012, National Statistics Bureau (**NSB**) and the World Bank, 2013
- Statistical Yearbook of Bhutan 2013, NSB, October 2013
- National Accounts Statistics 2013, NSB, 2013
- Major Achievements of Renewable Natural Resources Sector (**RNR**), Ministry of Agriculture and Forestry (**MoAF**), March 2013
- Bhutan RNR Statistics 2012, RNR Statistical Coordination Section, Policy and Planning Division (**PPD**), MoAF, March 2013
- Livestock statistics 2012, Department of Livestock, MoAF, May 2013
- Summary of RNR Sector Eleventh Plan (2013-2018), (DRAFT) RNR Program and Project Coordination, MoAF, March 2013
- Framework for the Development of Environmental Statistics, a guide for the development and organization of environment statistics, United Nations Statistics Division, March 2013
- The Statistics Act of Bhutan 2013 (DRAFT), NSB, 2013
- Comparative Socioeconomic indicators for Bhutan (between 1985 and 2011), NSB, January 2013
- RNR Statistical Framework 2012 - An implementation Guidelines, MoAF, January 2012
- Annual Report 2012, Natural Resources Development Corporation Limited, 2012
- PPD 2012: RNR Sector - donor supported project profiles, PPD, MoAF, December 2012
- Action Plan for Improving Agricultural and Rural Statistics Bhutan, ADB, 2012
- Bhutan Trade Classification, DRC, January 2012
- Land Cover Atlas of Bhutan (1:250,000), Land Cover and Area Statistics of 20 Dzongkhags, National Soil Services of Department of Agriculture and PPD, MoAF, June 2011
- Forestry Development in Bhutan, Department of Forests and Park Services, MoAF, 2011
- Forestry facts, figures and trends 2011, Forest Information Management Section, Forest Resources Management Division, Department of Forests and Park Services, MoAF, 2011 (2012's report is ready for printing)
- Labor Force Survey Report – 2011, Ministry of Labor and Human Resources, Department of Employment, Labor Market Information Division, November 2011
- Policy and Planning Division Handbook, PPD, MoAF, 2010
- Gender Statistics Bhutan 2010, Research and Evaluation Division, Gross National Happiness Commission, 2010

The RNR Census 2009, Volume I (National and Dzongkhag level data) and Volume II (Geog Level data) MoAF, August 2010

RNR Sector Tenth Plan (2008-2013) Volume I and Volume II (Program and Budget Details), October 2009

The RNR Census 2009, MoAF, August 2009

Country Panorama Report, FAO CountryStat, January 2009

National Statistics Development Strategy (NSDS), October 2008

Vulnerability Analysis and Mapping 2005, MoAF and WFP Bhutan, September 2005

Handbook of Statistical Organization, A study on the national statistical services and related management issues, United Nations, 1980

Annex 6.7: Bhutan Country Capacity Indicators

Note: Indicator scores are calculated on a scale of 0 – 100, where a score of 100 meets all the defined criteria.

	Score	Notes	Graph
Indicator I: Institutional Infrastructure	64		
1.1 Legal Framework	40	The legal basis for the collection of agricultural statistics comes from the RNR Statistical Framework approved by the RNR-GNHC of the MoAF, which is rated by the MoAF as “somewhat adequate”. A draft Statistical Act for the legal basis of statistical activities in general is however still pending official endorsement.	
1.2 Coordination in the NSS	60	The RNR Statistical Coordination Section and the RNR Statistical Steering Committee were both established under the RNR Statistical Framework 2012 for the coordination of agricultural and rural statistics. The committee covers agricultural sub-sectors related to crops, livestock, forestry, and aquaculture statistics.	

1.3 Strategic Vision and planning for agricultural statistics	100	The strategy for agricultural statistics is provided by the RNR Statistical Framework 2012, which is noted to be consistent with the NSDS. Operational integration of the plan was however noted to be delayed.
1.4 Integration of agriculture in the NSS	70	The RNR Statistical framework 2012 covers agricultural sub-sectors related to crops, livestock, forestry, and aquaculture statistics.
1.5 Relevance of Data	50	There exists an official forum for dialogue between suppliers and users of agricultural statistics in which regular meetings are conducted. There also exists a well-established channel for receiving feedback but the need for significant improvements was noted by MoAF.

Indicator II: Resources

67

2.1 Financial Resources

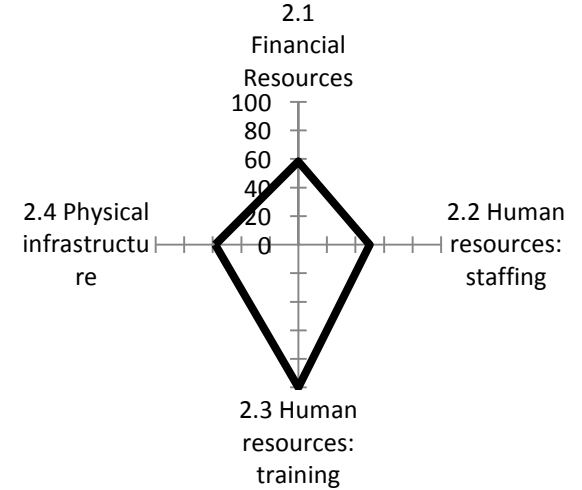
58 The National Statistics Bureau and the relevant line ministries reported that approximately 80-100 percent of statistical activities related to agricultural statistics were funded by the national budget. Other producers such as the Bhutan Agro industries agency reported that approximately 0-20 percent of their statistical activities were funded by the national budget.

2.2 Human resources: staffing

50 The NSB and the MoAF (Department of Agriculture) reported there were 1 and 2 professional/technical staff respectively dedicated for statistical activities. The Department of Forests and the Department of Livestock were comparatively larger reporting 42 and 261 professional/technical staff. Among data producers, the turnover of professional staff was “not at all” seen as a constraint.

2.3 Human resources: training

100 Training activities for agricultural statistics were noted at the NSB and the MoAF, but unavailable at other related line ministries.



2.4 Physical infrastructure 58 The availability of transport equipment, office space, and office equipment for field statistical activities was not rated as a constraint in producing agricultural and rural statistics.

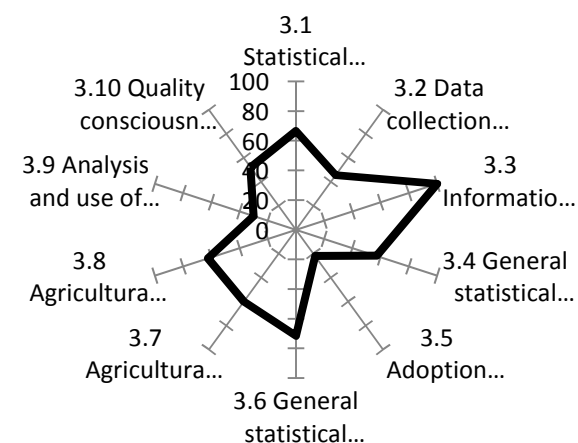
Indicator III: Statistical methods and practices 57

3.1 Statistical software capability 67 Various Statistical software packages are utilized for processing, analysis, and databases activities including: SPSS, ACCESS, and EXCEL.

3.2 Data collection technology 45 The NBS relies on paper based personal interviews and is entered manually into the computer for archiving purposes. GPS technologies are also used where relevant.

3.3 Information technology infrastructure 100 The computer to staff ratio is higher than 1 in the NBS; there is also one computer server available for data storage and communication.

3.4 General statistical infrastructure 57 To support statistical activities, the following services are available: up-to-date digitized topographical maps, enumerators are provided with a printed map for data collection, and geo-coded statistical units.

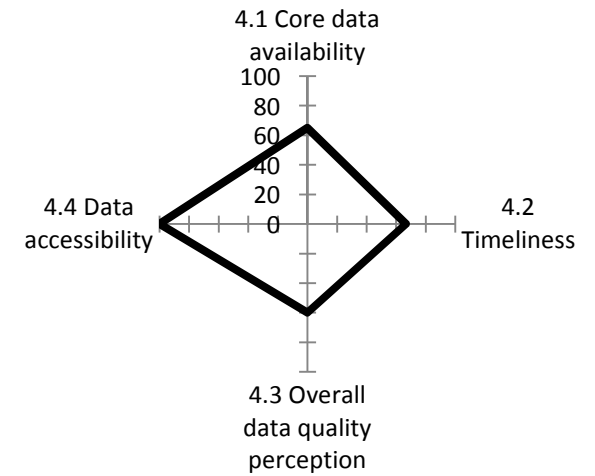


3.5 Adoption of international standards	22	ISIC (Rev3.1, 4 digits), CPC (4 digits), COICOP (6 digits) classifications are used within the NBS.
3.6 General statistical activities	71	A variety of statistical activities are conducted including: a Population census, national accounts including agriculture, a consumer price index, a wholesale price index, and estimates of rural household income are published/ available.
3.7 Agricultural market and price information	60	Indices of wholesale and producer prices are published. Agricultural market prices are also collected and disseminated covering crop commodities.
3.8 Agricultural surveys	63	A variety of agricultural surveys are carried out in the country relating to crops, livestock, fishery, and forestry.
3.9 Analysis and use of data	30	The MoAF uses its available data to derive a production account for the agricultural sector, and agri-environmental indicator.
3.10 Quality consciousness	52	The probability sample, sampling errors, metadata, and micro data are compiled for some crops, livestock, and forestry surveys.

Indicator IV: Availability of statistical information

73

4.1 Core data availability	65	37 items of the minimum set of core indicators are covered with deficiencies in the availability of data for agro-processing, investment subsidies or taxes, and rural infrastructure.
4.2 Timeliness	67	The modal year of availability of all items produced from the minimum set of core indicators is 2012
4.3 Overall data quality perception	60	The modal quality score of all items produced from the minimum set of core indicators is "Acceptable"
4.4 Data accessibility	100	The NBS has a website for hosting official statistics and is accessible to external users on the internet.



Annex 6.8: Stakeholders of RNR Statistics

National Stakeholders

1. Phub Sangay, Chief Statistical Officer, NSB
2. Jigme Dorji, Dy. Collector, DRC, MoF
3. Tashi Namgay, Assistant Collector, DRC, MoF
4. Phuntsho Wangmo, Planning Officer, PPD, MoF
5. Tashi Wangdi, Dy. General Manager, BAI Ltd
6. Norbu Wangchuk, Dy. Chief Planning Officer, GNHCS
7. Jamyang Kuenzang, IMS, DoA, MoAF
8. Namgay Dorji, IMS, DoL, MoAF
9. Kinley Wangmo, FIMS, DoFPS
10. Nima P Sherpa, RNR-SCS, PPD, MoAF
11. Toyonath Acharya, CoRRB, MoAF
12. Chencho Dukpa, CoRRB, MoAF
13. Kencho Thinley, RNR-SCS, PPD, MoAF
14. Karpo Dukpa, RNR-SCS, PPD, MoAF
15. Dawa Zangpo, RNR SCS, PPD, MoAF
16. Tashi Tshering, DAMC, MoAF
17. Sangay Choden, DAMC, MoAF
18. Sonam Penjor, RNR-SCS, PPD, MoAF
19. Rinzin Dorji, PICS, PPD, MoAF
20. Karma Tenzin, ICS, MoAF
21. Arun Rai, DoFPS, MoAF
22. Sonam Dorji, BAFRA, MoAF
23. Dr. Kuenga Namgay, PICS, PPD, MoAF
24. Cheni Dema, FCB, Thimphu

International Representatives / Resource Persons

25. Mr. Allan Nicholls, Regional RAP Coordinator, FAORAP
26. Mr. Yagyash Gautam, FAO's International Consultant
27. Mr. Chadho Tenzin, AR, FAO-Bhutan
28. Mr. Sangay Tempa, National Consultant

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