Bhutan's Data Ecosystem Mapping

FINAL REPORT

Coordinated by National Statistical Bureau and

Gross National Happiness Commission

2017

Acronyms

ACC	Anti-Corruption Commission
ADB	Asian Development Bank
ADC	Africa Data Consensus
ASEAN	Association of Southeast Asian Nations
BHMIS	Bhutan Health Management Information System
BIPS	Bhutan ICT Policy and Strategy
BSS	Bhutan Statistical System
BLSS	Bhutan Living Standard Survey
CSO	Central Statistical Office
DANIDA	Danish International Development Agency
DITT	Department of Information Technology and Telecom
DSO	Dzongkhag Statistical Officers
EDP	Economic Development Policy
EMIS	Education Management Information System
FYP	Five Year Plan
FGD	Focus Group Discussion
GDDS	General Data Dissemination Strategy
GNHC	Gross National Happiness Commission
HIES	Household Income and Expenditure Survey
HLP	High Level Panel
ICT	Information Communication Technology
IEAG	Independent Experts Advisory Group
JICA	Japan International Cooperation Agency
KII	Key Informant Interview
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MoAF	Ministry of Agriculture and Forests
MoH	Ministry of Health
MoE	Ministry of Education
MoLHR	Ministry of Labour& Human Resources
MoF	Ministry of Finance
MoEA	Ministry of Economic Affairs
MoI	Means of Implementation
MTR	Mid-Term Review
NEC	National Environment Commission
NKRA	National Key Result Areas
NSB	National Statistics Bureau
NSDS	National Statistics Development Strategy
NSO	National Statistical Office
NSS	National Statistical System
ODI	Overseas Development Institute
PHCB	Population & Housing Census of Bhutan
RIA	Rapid Integrated Assessment
RMA	Royal Monetary Authority
RGOB	Royal Government of Bhutan
SDGs	Sustainable Development Goals
SDSN	Sustainable Development Solutions Network
SAARC	South Asia Association for Regional Cooperation

SKRA	Sectoral Key Results Areas
TCB	Tourism Council of Bhutan
UN	United Nations
UNDESA	United Nations Department for Economic and Social Affairs
UNDP	United Nations Development Programme
UNDG	United Nations Development Group
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNGA	United Nations General Assembly
UNICEF	United Nations Children's Fund
UNSC	United Nations Statistical Commission

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Executive summary

This report synthesis the findings and recommendations of the Bhutan's data ecosystem mapping. Drawn through the pedestal of the ecosystem approach, it presents a gamut of assessments of Bhutan statistical system, principally including the legal and the policy frameworks, entry points and obstacles for multi-stakeholder engagement on data for implementation and monitoring of the 12th Five Year Plan, innovation and new technologies for participation, infrastructure/institutional requirements for the improved collection, analysis, dissemination and use of data, and efforts to support the creation of national and international legislative frameworks for monitoring and accountability of the Sustainable Development Goals (SDGs). It evaluates the data gaps, availability and credibility and assesses the capacity and institutional upgrading required to address these gaps for effective tracing and monitoring of the 12th Plan progress, including the SDGs, both at national and sub-national levels. The primary aim of the project is to design a complete data ecosystem for Bhutan which will help and corroborate progress towards Bhutan's 12th Five Year Plan to deliver measurable and accurate development results in line with both GNH and the SDGs. The implementation of the 12th FYP and the SDGs in Bhutan provides an impetus to improve data availability, quality, timeliness and comparability nationally and sub-nationally amongst others.

The key findings of Bhutan's data ecosystem are:

- While several executive orders, policies and laws that govern official statistical activities are in place, the implementation/operationalization of the existing legal and policy frameworks are not always satisfactory and consorted efforts and intervention is imperative to update and ensure consistency.

- Although there have been gains in the availability of data produced through censuses and surveys, the coordination of the Bhutan statistical system remains weak leading therefore to a low-quality data and less cost-effective use of limited resources. Beyond the poor coordination among official data producers, lack of coordination is visibly seen amongst official and non-official data producers, and frequent dialogues between data producers and users to ensure that data is demand-driven.

- With the existing ICT infrastructures in Bhutan, future efforts must prioritize and leverage the existing and new technologies for statistical purposes in order to conduct timely and more cost-effective surveys and censuses to minimize respondent's burden is viewed to be of paramount importance.

- To create avenues for better use of statisticians and develop the technical know-how at the national and sub-national levels, the necessity to upgrade the human resource capacity through regular and up-to-date training programs under the coordination of the National Statistics Bureau is deemed imperative.

- Although donors and development partners must synergize their interventions towards funding statistical activities in Bhutan, a more high-level political awareness and engagement is necessitated to be mobilized through a dedicated year-marked budget for surveys and censuses.

- In consideration of the role of administrative data in measuring and monitoring various key performance indicators revealed from the assessment of data availability, issues related to the conflict of interest raising concerns about the quality and the objectivity of the data warrants a diligent intervention.

- Momentum in support of more disaggregated data is growing. Beyond this, a fair amount of attention towards improving the availability and accessibility to data disaggregated at various levels to ensure that "no one is left behind" with the implementation of the 12th FYP and SDGs in Bhutan

To improve the statistics to meet the data requirements of the 12th FYP and SDGs, the principle set of recommendations necessitated to be considered are:

For NSB and GNHC:

» Develop mechanisms and a framework to review existing legislation regarding statistics, including micro data dissemination policy, coordinated by NSB and GNHC;

» Harmonize methodologies and develop guidelines for quality assurance frameworks in compliance with international standards, spearheaded through NSB leadership;

» Promote up-to-date trainings for those in charge of statistical production at national and LG levels, based on an in-depth assessment of their needs and capacities in close collaboration with NSB and GNHC;

For the Royal Government of Bhutan:

» Undertake assessment of existing capacities through the lens of financial resources in order to fulfill 12th FYP and SGDs data requirements;

» Explore opportunities to expand domestic resources for providing financial support to conduct mandatory and designatedstatistical operations (surveys/censuses such as RNR, NHS, LFS, BLSS, PHCB, Economic Census, etc.) that are necessary to meet the data requirements for 12th FYP and SDGs.

Introduction

Bhutan will begin its 12th FYP in 2018, in a global context where the world has witnessed the adoption of a new global development agenda. Both national and international development agendas have recognized that data is the lifeblood of sustainable development, given its critical role for measuring, monitoring and assessing progress. In Bhutan, even if some efforts exist towards data improvements, evidence has shown that more work need to be done to provide reliable, timely and high-quality data. In fact, the Mid Term Review of the 11th FYP underlined the weakness of the statistical system to produce timely and reliable data for Key Performance Indicators (KPI) as one of the major challenge, with existing discrepancies between local and national data sources, unreliable estimation of baseline and targets for many sectors, and inadequate capacities within such sectors in terms of data production, analysis and use.

With the adoption of the Sustainable Development Goals (SDGs) in September 2015, and their implementation since January 2016, there is a strong recognition of the important role of high-quality, timely and reliable data in the development agenda, leading therefore to a call for a "data revolution". Consequently, there is a growing debate on how to improve the availability and quality of data for measuring and monitoring development progress. Regarding SDGs, Bhutan was designated as a first-mover country and was therefore selected as one of the five Asia Pacific countries for SDGs localization by UNDP. Since the implementation of the SDGs will be country-led, it is important to ensure its integration with national development plans for a better mainstreaming. Consequently, at the country level, there are increasing efforts to improve data availability and institutional capacities required for monitoring development progress both for the 12th FYP and the SDGs.

Against this backdrop, the Bhutan's Data Ecosystem Mapping has emerged as a key concern, with an overall objective to design/institute a complete data ecosystem for Bhutan which will help measure progress of Bhutan's 11th and 12th Five Year Plan, including the SDGs which are embedded as part of the plan. To reach this objective, a mix of qualitative and quantitative research methodologies were utilized, with data collected and interviews held with key stakeholders.

Following the introduction, the present report includes five sections. The first section gives an overview of the international development context, beginning from the Millennium Development Goals and their data-related issues to the Sustainable Development Goals along with their data requirements. The second section summarizes the methodology, including activities undertaken and the limitations of the study. In the third section, the Bhutan Data Ecosystem is analyzed with a detailed presentation of the legal and policy framework that govern the key components of this data ecosystem, followed by a presentation and an analysis of key data stakeholders, infrastructure, coordination issues and capacities that are likely to impact the whole data ecosystem. Section four puts forward the results of the data mapping analysis. In section five, a model of data ecosystem is proposed for Bhutan. The last section provides conclusion and proposed a set of recommendations.

1. AN OVERVIEW OF THE INTERNATIONAL CONTEXT: FROM MDGS TO SDGS

1.1.1 The Millennium Development Goals

In September 2000, 189 world leaders signed the Millennium Declaration that lead to the adoption of eight Millennium Development Goals (MDGs), with a set of measurable time bound targets, to be achieved by 2015. Having poverty eradication as the cornerstone, the UN qualified the MDGs as the *most successful anti-poverty movement in history*. The final UN MDGs report released last year shows that the MDGs have been successful in achieving many of the goals. Despite the unprecedented progress, resulting from the benefits of a global development agenda, the MDGs have been criticised for many reasons. They *did not take into account the initial starting points of countries*; they were highly disadvantageous to countries with bad starting conditions (*Easterly, 2009; Takeuchi et al. 2015, cited by Kindornay et al. 2016*). Moreover, the MDGs were characterized to be a "one-size-fits-all" (*Vandermoortele, 2011*). The MDGs have also been criticised for *being developed through a top-down process*, promoting therefore a donor-led agenda instead of involving a broad-based participatory approach for developing these global goals. Indeed, according to some experts, there was generally very little involvement of developing countries and civil society constituencies in the creational process. *Inequalities were not well addressed by the MDGs* because development progress were measured in a more aggregated way, with a lack of reaching

the very poorest and most excluded people. In fact, most of the MDGs data used averages for monitoring, with a little focus on the poorest of the poor. The MDGs have also been criticized for the *failure to deliver a Means of Implementation* (MoI) *framework* for the global development agenda, and the *absence of well-defined and effective accountability structures* at global and national levels (*Bhattacharya et al. 2014*, *Bhattacharya et Ali, 2014*).

One of the ***key challenges of the MDGs is related to data***. In fact, during the MDGs era, there has been an increasing demand for data to support the implementation of these goals and monitor development progress. The demand for data to sustain the indicators have been fuelled by donor support, and the focus on social statistics has been strengthened with the MDGs (*Round, 2014*). The main data source to monitor MDGs and other development indicators is household surveys, characterized by an increasing use since MDGs launch (*Boerma and Stansfield, 2007; Prabhu, 2005; Carr-Hill, 2013*). Despite all these efforts on data, the availability, reliability and quality of data are among the issues mostly underlined as being a challenge to measure and monitor MDG progress. According to *Chen et al. (2013)*, nearly a third of MDG indicators lack data for more than half of the countries.

Moreover, for indicators that have available data, the quality and reliability of data is still questionable (*Boerma et Stansfield, 2001; Murray, 2007; UN, 2012*). Particularly the reliability of MDG data and the comprehensiveness of indicators, raised questions for many reasons as mentioned by *Poku and Whitman (2011)*.

The data gaps reported for the Asia-Pacific region based on the Asia-Pacific Regional MDGs Report 2012/2013 and the report of the ASEAN on regional assessment of MDG achievement include the discrepancies between national and international data sources, the availability of data and the timeliness. For example, in the case of Nepal, for the net enrolment ratio in primary education which is an indicator under MDG 2, there are huge discrepancies between UN-reported data and estimates calculated from surveys and produced by Nepal's Central Bureau of Statistics; even though the UN-reported data seem to be consistent with the country's administrative sources(*Pedersen and Roll-Hansen, 2011*). For health indicators, especially those related to reproductive health and HIV/AIDS, the data collection/reporting is generally weak; while for other indicators, disaggregated numbers by gender or rural/urban location are not readily available (*ASEAN, 2015*).

With the 2015 deadline drawing near, there was an international agreement to elaborate a new development agenda after 2015. Given the wide range of issues covered, this new development agenda is expected to heavily rely on data and therefore its development process should be based on lessons drawn from the implementation and monitoring of the MDGs.

1.1.2. The Sustainable Development GoalsThe Post-2015 process for a new global development agenda

At the UN High-Level Plenary Meeting (2010 MDG Summit)in September 2010, the General Assembly agreed to launch a new process for defining the future global development agenda that should succeed to the MDGs after 2015. Consequently, several initiatives have been taken. The High-Level Panel (HLP) of Eminent Persons on the Post-2015 Development Agenda has been launched in July 2012 to give advice on the Post-2015 Development Agenda. The HLP report was submitted in May 2013, highlighting that the Post-2015 Agenda is a universal Agenda that needs to be driven by five big transformative shifts: 1. Leave no one behind, 2. Put sustainable development at the core, 3. Transform economies for jobs and inclusive growth, 4. Build peace and effective, open and accountable institutions for all and 5. Forge a new global partnership.

Furthermore, at the 2012 Rio+20 Conference (UN Conference on Sustainable Development), there was an intergovernmental agreement to launch an inclusive and transparent process of defining the Sustainable Development Goals (SDGs). Subsequently, an Open Working Group (OWG) was formally established by the General Assembly in January 2013, with the mandate to develop and propose candidate SDGs. These SDGs should be drawn on the MDGs, while addressing the three dimensions of Sustainable Development. A UN System Task Team on the Post-2015 UN Development Agenda, co-chaired by UN-DESA and UNDP, has been established in order to provide technical support with analytical inputs and recommendations to the OWG. Moreover, broad consultations have been organized involving various stakeholders, including Regional Consultations led by the Regional Economic Commissions, national and thematic consultations led by the UN

Development Group (UNDG), and an online global consultation through MY World which is a global survey for citizens. The private sector was also engaged in the Post-2015 process through the UN Global Compact in order to take into account the views and contributions of businesses. In fact, CEOs from three hundred major corporations from around the world, with over $8 trillion in annual revenues, were consulted under the guidance of the UN Global Compact (*Kharas and Zhang, 2014*). Regarding the universities and scientific community, they have also contributed to the process and their views were delivered through the Sustainable Development Solutions Network (SDSN).

Given the two parallel processes, the High-Level Panel has been asked by the UN Secretary-General to work with the Open Working Group on SDGs to ensure that the processes are mutually reinforcing and to advise him on how the SDGs relate to the broader Post-2015 Development Agenda (*UN, 2012*).

After two years of preparation, the OWG submitted an outcome document containing a proposal of 17 goals and 169 targets. In September 2015, the United Nations General Assembly (UNGA) adopted the Post-2015 Development Agenda based on an outcome document untitled "*Transforming our world: the 2030 Agenda for Sustainable Development*" comprising 17 Sustainable Development Goals (SDGs) and 169 associated targets. These SDGs, adopted by 193 countries, are "integrated" and "indivisible" and will guide efforts towards sustainable development from January 2016 to 2030 (*Figure 1*).

In addition to these global goals and targets, a final list of 230 indicators is proposed based on a general agreement. The indicators are grouped into three tiers based on their level of data availability and methodological development. Tier I concerns indicators which are conceptually clear, with an established methodology, standards available and data regularly produced by countries. Tier II consists of indicators conceptually clear, for which a methodology has been established and standards available, but data are not regularly produced by countries. Tier III concerns indicators for which an internationally agreed methodology has not yet been established and no data is therefore available.

Figure 1 : The Sustainable Development Goals

Source : http://www.un.org/sustainabledevelopment/fr/objectifs-de-developpement-durable/

1.1.3. The Data Revolution: a critical element of the Post-2015 Development Agenda

The High-Level Panel highlighted the ***need for a data revolution for sustainable development*** to support the monitoring and implementation of the Post-2015 Development Agenda. While it is recognized that efforts in support of the MDGs led to considerable improvements in terms of data quality and availability in developing countries, significant gaps remain (*OECD, 2013, UNDG, 2013, UNTT, 2013*).

Following this call for a data revolution, the UN Secretary-General appointed an Independent Experts Advisory Group on the Data Revolution for Sustainable Development Data (also called Inter-agency and Expert Group on Sustainable Development Goal Indicators, IEAG-SDGs) to advise him on the opportunities offered by a data revolution for sustainable development. In the words of the IEAG-SDGs, "*Data are the lifeblood of decision-making and the raw material for accountability*". In their report, untitled "*A World that Counts*" published in 2014, two overarching challenges regarding the current state of data were highlighted, namely the challenge of invisibility and that of inequality.

Furthermore, it is noteworthy to mention that the United Nations Statistical Commission (UNSC), at its forty-sixth session, acknowledged the importance of a systemic approach going beyond official statistics in measuring development progress. In fact, the UNSC suggested that "the modernization of the statistical production process requires a new architecture for data collection, processing and dissemination through a standard-based production process and the adoption of an integrated statistics approach away from the traditional stove-piped approach". This will imply the mobilization of various stakeholders, in addition to the National Statistical Offices (NSO) and other traditional actors around the National Statistical System (NSS).

In other words, the ***Post-2015 Development Agenda should be supported by a wider range of data stakeholders***, including private sector, academia and civil society, instead of relying only on those producing official data. The coordination between a wide variety of stakeholders on data should occur given that SDGs cover various fields beyond the social and economic ones, compared to the MDGs, and in most of the countries NSOs do not necessarily produce all the types of required data to handle this. It is the case for the governance goal, SDG 16, because data for measuring its indicators will stand out to be a key challenge for NSOs. According to *Bolaji-Adio (2015)*, measuring SDG 16 provides the international community with a unique opportunity to have a better understanding of the relationship existing between governance, peace and security, and development. To achieve this, there is a need to develop a measurement approach that adequately reflects country dynamics, history and priorities. This is confirmed by a recent study conducted in Bangladesh on the readiness of the key data stakeholders to monitor SDG 16 (*Bhattacharya et Khan, 2016*). This study highlighted the need for the Bangladesh Bureau of Statistics to establish a platform for coordinating the large number of stakeholders, both governmental and non-governmental parties, involved in the data collection related to governance. This study also put emphasis on the role of administrative data sources as the major sources for data related to Governance, in addition to the perception data and the validation of private data that are required.

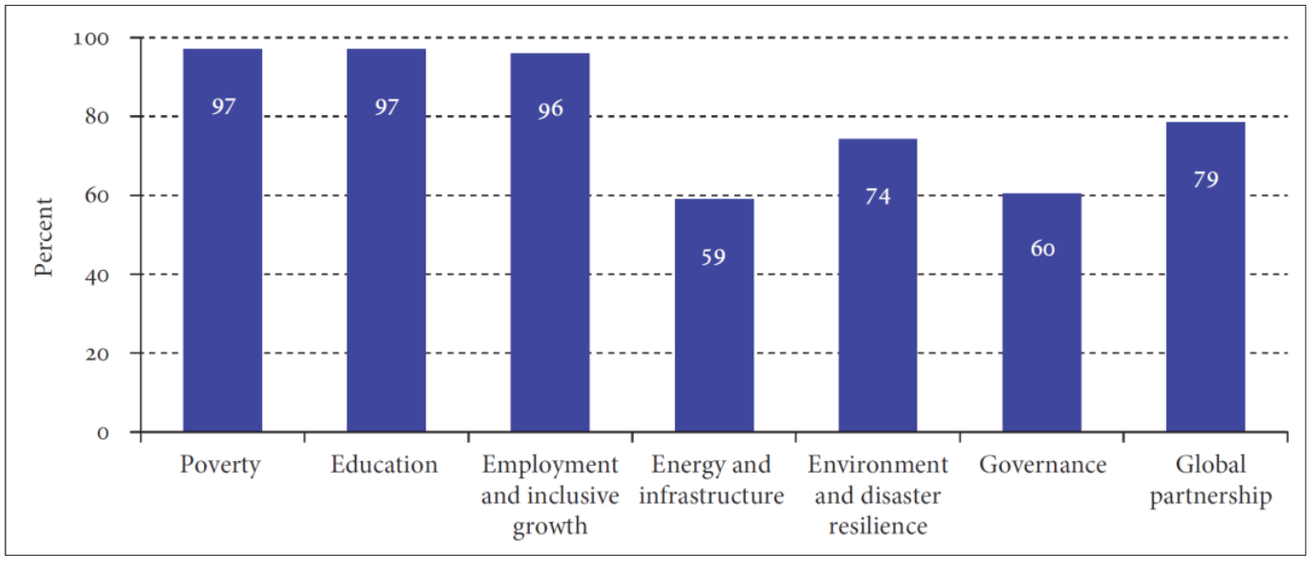
1.1.4. The data requirements for SDGs: lessons learned from some country cases

With the endorsement of the goals, targets and indicators of the SDGs, it is crucial to investigate the readiness and ability to measure, monitor and report on the development progress. In some studies, the SDG data-related issues were examined by considering a range of countries with different contexts, while other studies are more country-specific in conducting a SDG data gap analysis.

Based on a set of selected SDG indicators, Cassidy (2014) found that health indicators have a high level of data availability and a high reporting frequency comparatively to other indicators, and the areas with the lowest data availability are related to indicators on environment and biodiversity, governance and urban-specific indicators. In addition, the same study reveals that MDG indicators or revised MDG indicators have a much higher level of data availability, compared to non-MDG indicators. These results are consistent with those of the Post-2015 Data Test project, which involved seven countries around the world.

Through an in-depth examination, the results show that across countries data are available for nearly all indicators related to poverty, education, employment and inclusive growth; but they are less available for other goal areas among which energy, infrastructure and governance are the most problematic (*Kindornay et al. 2016*). Moreover, they also pointed out the fact that overall data quality tends to be better for poverty, education, employment and inclusive growth; which also have more available data and the National Statistical Office serve as the official data producer. The *Figure 2*: Data availability by goal area across countries below illustrates the results on data availability for a set of seven goal areas analysed across seven countries, namely Bangladesh, Canada, Peru, Senegal, Sierra Leone, Tanzania and Turkey.

Figure 2: Data availability by goal area across countries



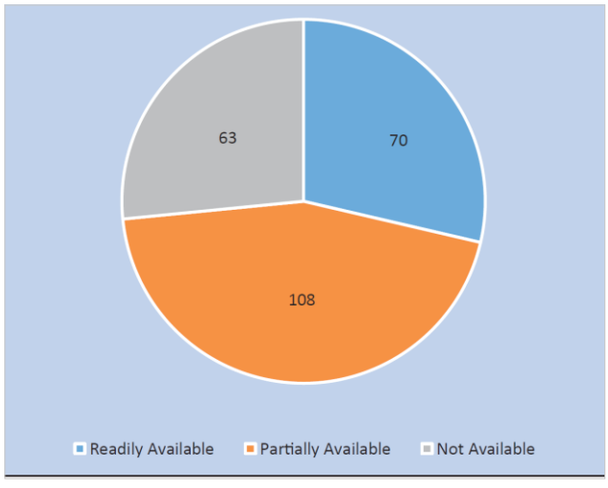
Source: Kindornay et al., 2016

For the country-specific studies, Bangladesh and Malaysia are among the Asian countries that have conducted a data gap analysis to examine the data availability for monitoring and assessing the attainment of the SDGs.

As illustrated in *Figure 3*, the results from Bangladesh reveal that for 70 indicators, data are readily available because it is already produced by the national statistical system; data are partially available for 108 indicators meaning that additional work need to be undertaken for generating the required data; data are not yet available for 63 indicators for which there is a need to conduct new surveys or census to have the necessary data . Most of the 63 indicators for which data are not yet available are not among MDG-indicators and very close to environment and climate, but also governance. These indicators are related to SDG 13 on climate change, SDG 12 on sustainable production and consumption, SDG 14 on marine ecosystems, SDG 15 on terrestrial ecosystems, SDG16 on Governance, SDG 11 on sustainable cities, and SDG 6 on water and sanitation.

The preliminary review of the data gap analysis in Malaysia found similar results in terms of data availability for SDG indicators. Data are only available for 8% of indicators under SDG 12, 16% for SDG 13 indicators, 10% for SDG 11 indicators, 18% for SDG 6 related indicators, 21% and 22% respectively for indicators of SDG 15 and SDG 16 (*DOSM, 2016*). These results from Bangladesh and Malaysia are consistent with those from *Cassidy (2014)* and *Kindornay et al. (2016)*.

Figure 3: Availability of data to monitor SDG indicators in Bangladesh



Source: GED, 2017

1.1.5. The Data Revolution: Data disaggregation needed to "leave no one behind"

The Sustainable Development Goals strives to "leave no one behind", leading therefore to a strong push towards data disaggregation in the data revolution debate. In fact, a significant level of data disaggregation will be required, in order to meet the ambitious principle of leaving no one behind, which is one of the five transformative shifts of the Post-2015 Development Agenda. Following the recommendations from HLP (2013) report, SDG targets can only be considered as achieved if they are met for all relevant groups. Therefore, there is an agreement on the overarching principle of data disaggregation,to accompany the list of indicators and inform the follow-

up and review processes, which is formulated as follows: "Sustainable Development Goal indicators should be disaggregated, where relevant, by income, sex, age, race, ethnicity, migratory status, disability and geographic location, or other characteristics, in accordance with the Fundamental Principles of Official Statistics".

During their fifth meeting, the IEAG-SDGs defined disaggregation as the breakdown of observations within a common branch of a hierarchy to a more detailed level to that at which detailed observations are taken; the disaggregation dimensions are the characteristics by which data is to be disaggregated (by sex, age, disability, etc.) and the disaggregation categories correspond to the different characteristics under a certain disaggregation dimension (female/male, etc.) (*IEAG, 2017*).

As underlined in the previous section on MDGs, some limitations in terms of data are related to the use of average, meaning that less disaggregated data are available. As *Kindornay et al.*, (2016) note, where disaggregated data exist across countries and goals areas, they tend to be available by sex, age and sub-region; while disaggregation by ethnic groups and income levels are often not available.

1.1.6. The Data Revolution: UNDP's role in facilitating the process

UNDP is one of the UN agencies that was very engaged in the discussions related to the Post-2015 Development Agenda and the data revolution. UNDP considers that the data revolution goes beyond statistics, where people play a key role in accountability and participatory mechanisms for the 2030 Agenda. In January 2014, with the support of the William and Flora Hewlett Foundation and in collaboration with several partners, UNDP convened a workshop untitled "Dialogue on data and accountability for the Post-2015 Development Agenda". The main objective of this workshop was to start building bridges between various stakeholder groups active in the data constituencies and the development world, from the local to the global levels, to foster a common understanding of the data revolution and explore its opportunities. In other words, it is about taking advantage on the energies and potential synergies around the call for a data revolution, improving coordination and identifying opportunities of collaboration and complementarity in order to be collectively more effective in bringing about the data revolution and meeting development challenges. In April 2015, UNDP convened the Cartagena Data Festival in Colombia, jointly organized with other partners among which CEPEI, ODI, Paris21, Africa Gathering, Data-Pop Alliance and UNFPA. The main objective of this event was to contribute to global efforts on strengthening the use of data for the implementation of the Post-2015 development agenda, specifically by bringing people together to drive the needed changes, identify concrete solutions and tools for sustainable progress and promote innovations and partnerships to monitor the SDGs.

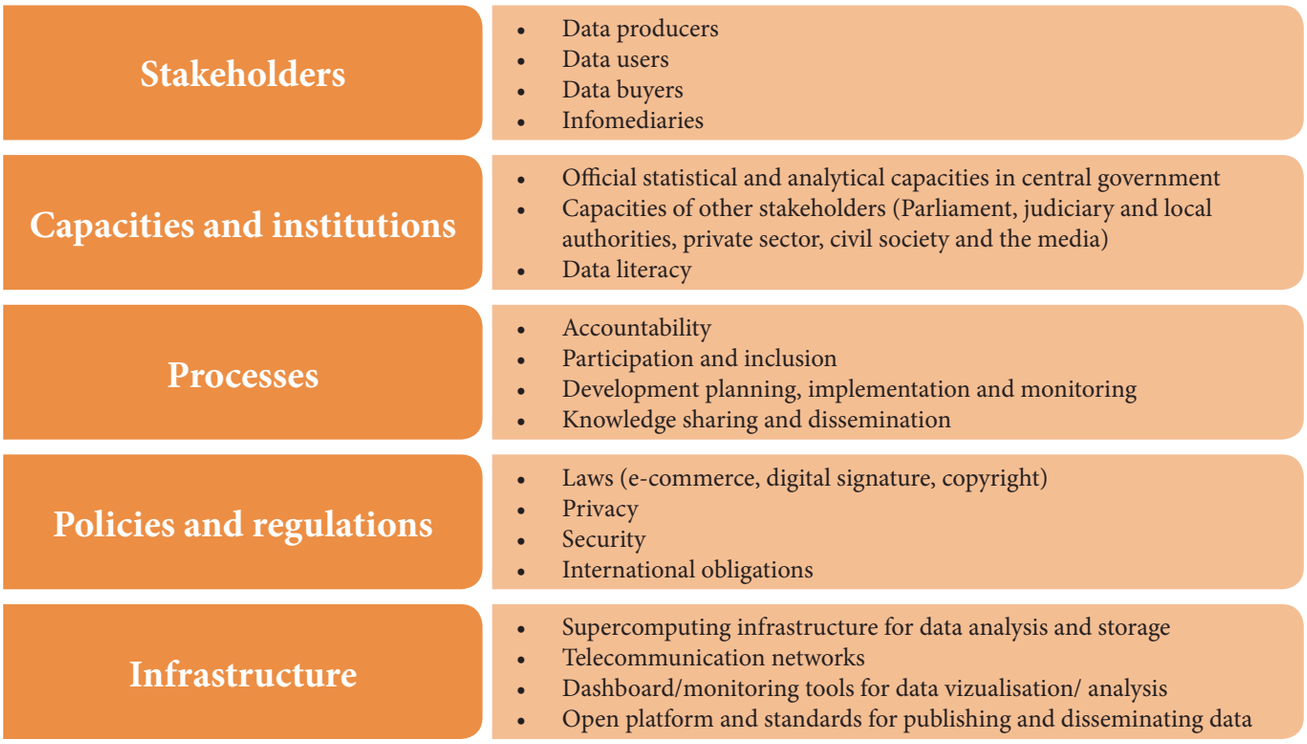
Moreover, assuming that development experience from the grassroots informs global discussions and that the data revolution is actionable at the national level, UNDP supported an initiative for mapping the data ecosystem in six countries, namely Bangladesh, Moldova, Mongolia, Senegal, Swaziland and Trinidad and Tobago. The aim is to evaluate the existing data availability to measure the SDGs and assess the capacity and institutional upgrading required to track the new agenda. The concept of "data communities" interacting with one another in a "data ecosystem" to achieve the data revolution has been introduced and defined by the *Africa Data Consensus (ADC)*. The "data community" refers to a group of people who share a social, economic or professional interest across the entire data value chain- spanning production, management, dissemination, archiving and use. The ADC further defines the "data ecosystem" as multiple data communities interacting with one another on all types of data, through various institutions, laws and policy frameworks, using innovative technologies to achieve the data revolution.

According to a UNDP document (*UNDP, 2015*), to conduct the data ecosystem mapping it is important to have an in-depth understanding of the following components, namely stakeholders, capacities and institutions, processes, policies and regulations, and infrastructure (*Figure 4*). In other words, the data ecosystem mapping will include official statistical capacity, legal and policy framework on open data, entry points, and obstacles for multi-stakeholder engagement on data for implementation and monitoring of the SDGs, innovation and new technologies for participation, the infrastructure requirements for improved collection, dissemination and use of data, and efforts to support the creation of national and international legislative frameworks for monitoring and accountability of development delivery. From the global workshop held in New York in June 2016, the six pilot countries involved in the Data Ecosystem Mapping project shared the following messages as main takeaways

(*UNDP, 2016*):

- *Access to high quality and reliable data* can have a transformative impact in societies;
- *Collaboration and partnerships* across and between all stakeholders is crucial;
- *Greater engagement with non-traditional data sources* may lead to better service delivery and enhanced development outcomes;
- Many *national statistics offices* are underfunded and *require additional resources*;
- *Better coordination is a priority* across the board- between line ministries and national statistical offices; between official producers of data and non-official sources; and between different UN agencies;
- It is necessary to *reform national legislative framework* across many countries, particularly around the sharing of data and how it is utilized;
- *Regional and global engagement must be balanced with local solutions* that are tailored for countries' specific needs;
- There is a *need to question how data is used and perceived*, and how it may influence policy choices;
- A *commitment to improving data quality and standards* is key to ensuring better policy outcomes;
- It is *important to ensure open access to data* whilst also *protecting data privacy*;
- *Improving technology and knowledge exchange,* through greater South-South Cooperation, and sharing of experiences could collectively raise capacities for data production and use across countries;
- *Incentives* must be created *to unlock access to existing troves of administrative* and other *data and information*;
- *In fragile settings*, data can support recovery efforts, but *greater investment is required* in data processes and infrastructure, as well as focused attention on local context, information sensitivity and trust-building.
- There is a *need to change the administrative culture* around data production, use and sharing.

Figure 4 :Mapping of the components of the data ecosystem



Source: UNDP (2015)

2. PROJECT OVERVIEW AND METHODOLOGY

2.1. Objectives

The objective of the study is to design/institute a complete data ecosystem for Bhutan which will help measure progress of Bhutan's 11th and 12th Five Year Plan including the SDGs which are embedded as part of the plan. Specifically, it is about:

1) Conduct detailed assessment and map Bhutan's 'data ecosystem', including national official statistical capacity at the national and sub-national levels, legal and policy frameworks on open data, entry points and obstacles for multi-stakeholder engagement on data for implementation and monitoring of the development plans, innovation and new technologies for participation, which could be leveraged in the development of inclusive plans, infrastructure/institutional requirements for the improved collection, analysis, dissemination and use of data, and efforts to support the creation of national and international legislative frameworks for monitoring and accountability.

2) Assess the 11FYP and the draft 12 FYP data needs, evaluate data gaps, timely availability and credibility, and assess the capacity and institutional upgrading required to address these gaps for effective tracing and monitoring of the 12th Plan progress, including the SDGs, sub-nationally and nationally

2.2. Activities undertaken

The following activities were undertaken for conducting the ecosystem mapping exercise:

2.2.1. *Literature Review*

The study was informed by an extensive review of recent literature and policy documents on data availability for 12th FYP and the Sustainable Development Goals (SDGs). The desk review was conducted based on a mix of literature produced by government, development partners, civil society organisations and academics, in order to have a better understanding of the current status of the statistical capacity both at national and sub-national levels in Bhutan, and identify key data needs and challenges.

2.2.1. *Data mapping*

In order to investigate the Bhutan data ecosystem, it is important to evaluate the data gaps and availability through a data mapping exercise from national data sources within the National Statistical System. For conducting the data mapping, we used the KPI (Key Performance Indicator) for the NKRA (National Key Results Area) and the LGKRA (Local Key Results Area). With the data mapping, various information was analysed including the data sources (data producer), the type of data (administrative data, survey, census, etc.), the level of disaggregation (urban/rural, income, male/female, etc.).

2.2.1. *Stakeholders consultations*

In order to complete/confirm the findings from the literature review and the data mapping exercises, key informant interviews and focus group discussions were carried out with a broader spectrum of stakeholders and relevant experts. The national workshop organized in Paro and the two sub-national workshops that took place in Paro and Bumthang provided valuable inputs regarding stakeholders' consultations. Among the key issues addressed is the identifying of main challenges and opportunities for Bhutan to ensure that its data ecosystem is effective to implement and monitor the 11th and the 12thFYP and the SDGs.

The key informant interviews were carried out with experts from the National Statistical System, including those of the National Statistics Bureau and line ministries which are at the centre of the NSS. In fact, given that the National Statistics Bureau and other Government Bodies, will be responsible in generating most of the data relevant to the 11thand 12th FYP and the SDGs, it was relevant to conduct in-depth discussions with them uncovering data needs and gaps, institutional/infrastructure capacities requirements, legislative frameworks, synergies and opportunities for collaboration. Face to face meetings, follow up phone calls and skype calls were used for conducting Key Informant Interviews, at the NSB, GNHC, GPMD, MoH, MoAF, MoEA, MoIC, MoE, MoLHR, RCSC, UN Task team, TCB, etc.

The focus group discussions (FGD), wascarried out both at national and sub-national levels, in Paro and Bumthang, involving key data stakeholders engaged in the discussion according to their role in the data ecosystem. In addition to the interviews and focus group discussion, questionnaires covering all the components of the data ecosystem were circulated to solicit stakeholders' feedback, including on challenges and opportunities of the Bhutan data ecosystem. The questionnaire could be found in Annex 2.

2.2.1. *National and sub-national workshops*

A National Consultation Workshop was organized in Paro gathering the data communities, stakeholders and partners identified together in order to network and provide feedback on their experiences, perspectives and challenges in using or producing data relevant to developing indicators for KPI. The workshop was also a great opportunity to validate the findings and recommendations that emerged from the desk review. To complement the national workshop, two additional workshops were organized at the sub-national level, one in Bumthang and another one in Paro. During these national and sub-national workshops, stakeholders gave valuable inputs for the data mapping of KPI under LGKRA and NKRA. Annex 1 gives an overview of participants to national and sub-national workshops, with their affiliated organizations. It is noteworthy to mention that the bulk of attendees were from Ministries/Agencies and GNHC.

2.3. **Limitations**

A major limitation to the study was related to the data mapping for KPI under NKRA and LGKRA, which is strongly linked to a time constraint issue. Consequently, the data mapping exercise was conducted on a set of selected indicators, in order to assess data availability of some indicators for NKRA. Another important limitation is the weak engagement of relevant stakeholders such as academics and research center. The engagement of the private sector and that of the civil society organizations could also not be considered as enough. An increased engagement of such stakeholders could have valuable impacts on the robustness of the results, while ensuring consensus around the Bhutan data ecosystem.

3. THE BHUTAN'S DATA ECOSYSTEM MAPPING

A functional data ecosystem requires a robust legal framework based on a set of policies, where various data stakeholders have the required capacities (human, technical and financial) to effectively play their role in an enabling environment with processes in place.

The Royal Government of Bhutan has developed several policies, executive orders and laws to help regulate various components of the data ecosystem, including official statistical activities, data dissemination, privacy and confidentiality, transparency, ICT infrastructure, e-commerce. The sections below will analyse the current situation of the legal and policy frameworks that govern the key components of the data ecosystem in Bhutan, present the key data stakeholders within the data ecosystem and assess the capacities, specifically, human, technical and financial.

3.1. **Policies and regulations governing the key components of the data ecosystem**

3.1.1. *Legal and Policy framework governing statistics: literature review*

Legal and policy framework dealing with official statistics in Bhutan are in the form of executive orders, and the statistics bill of Bhutan 2015 has been drafted for reinforcing the overall legal framework that govern the statistical system. According to one of its provision, it shall apply to all aspects relating to the collection, processing, compilation, analysis, publication and dissemination of statistical data. Its main objectives are to strengthen the statistics for development, defining clearly the purpose and process, and ensure consolidated approach towards ensuring a single source of information. The Act sets out provisions regarding the establishment of the National Statistics Bureau (NSB), the creation of Statistics Offices in the ministries, agencies and at various administrative levels, and the establishment of a Statistical Coordination and Technical Committee. The drafting of the Statistics bill of Bhutan has been initiated since 2000 with the financial support of the World Bank, and revised in 2006 with the technical assistance of the Asian Development Bank (*NSB, 2015*). However, despite its preparation through extensive consultations with all relevant stakeholders and its publication in the registry of regulatory forward plans since January 2014 with an adoption scheduled for May 2015, this bill is still pending official endorsement.

Furthermore, through the Royal Monetary Authority Bhutan Act 2010, RMA is authorized and empowered to compile and disseminate balance of payment, monetary and financial statistics. The Research and Statistics Division of the RMA gathers and compiles economic and financial statistics in order to evaluate monetary and economic conditions and to make an assessment of the prospects for the domestic economy. The MoF statistical activities related to production of merchandise trade statistics are also covered by the Public Finance Act of 2007and further clarified by the Customs Act and Rules (*ESCAP, 2011*).

At the moment, the legal and institutional authority of NSB, which is directly under the Office of the Prime Minister, is provided by executive orders and promulgations issued by the Cabinet (*ADB, 2016*). The National Strategy for the Development of Statistics (NSDS) and the two Government orders of 2003 and 2006 are providing the legal and policy guidance for the improvement of the National Statistical System. The 2006 Executive Order designates NSB as "the central authority for collection and release of any official data, and their custodian, and consequently all ministries, departments, and agencies are directed to acquire prior approval from NSB on all statistical matters". The NSDS (2009-2013) is the first National Development Strategy of Bhutan, which was developed by the NSB in 2008 with the support of the World Bank Trust Fund for Statistical Capacity Building. The NSDS was in line with the Bhutan's development vision of Gross National Happiness and has taken into account the data needs for the 10th Five-Year-Plan (*NSB, 2014*). It is a five-year statistical work program that gives the data needed for the monitoring and evaluation of the performance and development progress of the country based on the national development priorities. The need for countries to design a NSDS results from the Second International Roundtable on Managing for Development Results; which issued a Marrakech Action Plan for Statistics that urged countries to design a NSDS by 2006.

Despite the development of a NSDS in Bhutan, it has not been fully implemented and several planned activities have been lagging behind schedule, partly due to the lack of enactment of a Statistical Law. A revised version of the NSDS was submitted in 2014 as a result of multi-stakeholder consultations, and with the support of the World Bank. In the first NSDS, the BSS has identified its strength to mainly rely on the success of some symbolic data collection events such as the Population & Housing Census of Bhutan (PHCB) 2005, the Bhutan Living Standard Survey (BLSS) 2003 and 2007, and the improvement in the range and quality of data produced by many administrative data sources (*NSB, 2008*). The NSDS suffered from numerous constraints such as a lack of financial support, adequate human resources, low technical capacity of the statistical officers, and lack of awareness and importance given to statistics, and consequently NSB on its own part has not been able to effectively implement it (*Chophel et al, 2012*). Other weaknesses that have hampered NSDS implementation are related to the absence of a legal framework for the statistical activities and the difficulties for users to access the data. All this might explain the low classification of the BSS, which is below the average compared to the South Asia region based on the World Bank's Statistical Capacity Indicator (SCI). In 2016, the SCI assigned a score of 68.9 out of 100 to the BSS, while the average SCI score for the South Asia region is 72.6.

3.1.2. *Data dissemination policy*

It's not enough to produce data, but they need to be disseminated to the right data users according to principles on what data to share, how, for whom and when it should be shared. Acknowledging the importance of up-to-date information for forward analysis and informed decision making, the Bhutan 2020 Vision emphasizes the need to develop information systems, ensuring the quantity, quality and timeliness of information required for informed decision-making, programme implementation, monitoring and evaluation. Accessibility is essential if data are to be used to make, improve, or implement policies or hold government accountable (*Glassman and al. 2014*).

Ideally, the national statistical office should be the core entity responsible for the dissemination of statistical data, in addition to production. Unfortunately, there is no single data dissemination policy in Bhutan, and therefore many data producers have developed their own dissemination method. The NSB has its own dissemination system while the other producers operate within their own framework without consultation with NSB on the range and type of data, their consistency and reliability issues, leading therefore to data duplication or conflicting data on the same topic (*NSB, 2008*). The enactment of the Statistic bill should contribute in the dissemination policy because it lays out a provision for the publication of results of surveys and census that shall take place only upon issuance of clearance from the Bureau.

- *Micro data dissemination*

An important component of data dissemination policy should be on microdata because of the required confidentiality and the compliance to protect the identities of the data suppliers. Microdata is defined as a processed dataset pertaining to individual respondent units and their characteristics. Data producers do not have clear policy and guidelines on disseminating microdata in the absence of policy, and consequently they are disseminating microdata without following any uniformity and standards, such as for data anonymization. Anonymization is required when raw data have to be compiled and manipulated to create processed data, and it can guarantee that microdata could be accessible to data users, such as academia and researchers, without breaching the confidentiality of the respondent units. Appropriately anonymized, microdata should be made available to academics, CSOs and other stakeholders to facilitate the development of accountability systems (*OHCHR, 2016*).

Being aware of the importance of confidentiality, NSB's approach is to ensure that only samples of the census data are disseminated, and that below the gewog level, which automatically cover-up for the confidentiality of data and protection of the respondents' rights, no census microdata are disseminated and no microdata of the BLSS is disseminated. In its efforts to archive and promote the use of microdata in Bhutan, NSB has conducted a number of activities with the introduction of the Accelerated Data Program (ADP). Aiming to increase the use and value of survey data, the ADP supports data producers and users in developing countries by carrying out inventory, documentation, dissemination and preservation of micro-datasets, establishing national and regional survey data repositories to make existing survey microdata more accessible to users, establishing national microdata dissemination policies, and developing and implementing outreach and advocacy programs targeting the microdata users to increase awareness of microdata availability and use. According to the Statistics Bill of Bhutan 2015, NSB will be the data repository and it should maintain an inventory of all available statistics in the country.

Even if the Statistics Bill notes the general dissemination of statistics, there is no focus on the dissemination of microdata. In terms of microdata management and dissemination, the drafting of a microdata dissemination policy is among the undertaken ADP activities in Bhutan, in addition to data documentation, NADA publication, and promoting data use through microdata outreach workshops. With the support of ADP/PARIS21, NSB started developing a microdata dissemination policy in 2014 which clearly defines the various data types and terms and conditions for allowing access to microdata by users (*PARIS21, 2015*). However, this microdata dissemination policy is not yet approved.

By evaluating the performance of the country through key performance indicators, based on Metadata quality, data dissemination, engagement with users, and ownership and internalization of the ADP activities, NSB has a poor performance in terms of microdata management and dissemination relative to three South Asian countries in the region (*PARIS21, 2015*). In fact, compared to India, Nepal and Sri Lanka, Bhutan is not well positioned, given that NSB occupied the 4th place and scored 37% in overall performance regarding the microdata management. Given that ensuring a balanced and equitable development is among the development objectives, the endorsement of the microdata dissemination policy, which is planned for the end of 2017, could be of valuable inputs for more in-depth analysis integrating detailed disaggregation at the local level.

- *Metadata dissemination*

Another key component of the dissemination policy is related to the provision of guidelines on metadata dissemination. These metadata provide basic information about the data, such as the methodologies and concepts used for data compilation in order to help data users have a better understanding on the process. Better descriptions of data, through metadata, facilitate communication between organizations and software systems to improve the quality of statistical documentation provided to users.

NSB is in the process of developing a metadata repository with the World Bank, while the RMA publishes a small user manual to provide users with better understanding of their methods and practices (*UNESCAP, 2011*). Some efforts are noted to provide a common metadata dictionary, that need to be updated and improved frequently, and to make accessible the metadata of surveys and census conducted by the BSS partners through the National Data Archiving Systems (*NSB, 2014*). More specifically, notable progress has been made in select areas

among which the dissemination of price data using a map portal (*World Bank Group, 2014*). Furthermore, the dissemination free of charge is the common price policy shared by all the producers regarding all the publications from administrative bodies (*NSB, 2014*).

Despite a good score in terms of metadata quality regarding NSB studies, some of them lack complete information on sampling, data collection and data appraisal (*PARIS21, 2015*). There is a room of improvement regarding the issue of metadata and documentation. In fact, some organizations/departments do not have a regular process for documenting current methods and practices, affecting the quality of statistics and constraining the level of knowledge users should have of the methods and practices used to produce data (*UNESCAP, 2011*). Many National Statistical Offices and other government departments are hesitant to publish their data, lack the capacity to publish and manage data according to international best practices, or do not understand what data users want to know and how to get that information to them (*Glassman et al. 2014*).

It is noteworthy to mention that the Bhutan Statistical System subscribed to the General Data Dissemination System (GDDS) of the International Monetary Fund (IMF) and began participating in this system since May 2010. As a subscriber to the GDDS, the Bhutan Statistical System makes available comprehensive information on its statistical production and dissemination practices on the IMF's Dissemination Standards Bulletin Board. Bhutan is on the verge of implementing the Enhanced General Data Dissemination System (e-GDDS), which superseded the GDDS, with support from a mission of the IMF's Statistics Department to develop the National Summary Data Page (NSDP). The NSDP that will be hosted on the NSB's website, utilizes the Statistical Data and Metadata Exchange (SDMX) to serve as one-stop portal for key macroeconomic data, and give users access to full information about Bhutan's e-GDDS data categories by June 12, 2017. In other words, this will allow users to spend less time for collecting macroeconomic statistics from various organizations websites. The e-GDDS was established by the IMF's Executive Board in May 2015 to support improved data transparency, encourage statistical development, and help create synergies between data dissemination and surveillance. As mentioned in NSB's website, the initiative, which is part of Japan administered Account Project on the improvement of Data Dissemination in the Asia and Pacific region, makes Bhutan one of the first countries in this region to implement the recommendations of the e-GDDS.

Box 1 provides an overview of some efforts made in the management, including dissemination of metadata and microdata for agricultural statistics. More sustained efforts are needed with regard to data dissemination policy in order to reduce the time lag between the end of data collection and the release of results, and ensure that data producers adopt standards tool and methods.

Box 1 : *Improving metadata and microdata for Agricultural Statistics in Bhutan*

The Ministry of Agriculture and Forests (MoAF), known as the Renewable Natural Resources (RNR) sector, has the authority to conduct surveys and census on agriculture. Given the key role that the RNR sector plays in contributing to the Gross National Happiness and realizing the Vision 2020, the RNR data requirements and the crucial role of RNR statistical stakeholders in delivering these data in the 11th FYP period and, beyond are well recognized. The Renewable Natural Resources Statistics Division (RSD) of the MoAF has the responsibility for collecting, compiling, analysing and disseminating the RNR, including the export-import data of food commodities. The RSD has a policy of "One Gateway" for the dissemination of the RNR statistical data, through Country-Stat and ministry's website, publications and digital copies. Country Stat illustrates the significant efforts made, with the support of FAO, for a better dissemination of data for this sector. It is a web-based system for dissemination of harmonized national food and agricultural statistical data along with metadata for analysis and policy making. Through Country -Stat, regularly updated statistical data are available on land use, productions, exports and imports of agricultural products, agricultural inputs, commodity prices, farm machineries, and development infrastructures. In addition, the publication of "Bhutan RNR Statistics", which is at its fourth edition, is intended to provide "One Window" access for most of the harmonized RNR related statistics. Furthermore, the Ministry of Agriculture and Forests conducted a workshop on metadata production and microdata archiving in 2014, with the support of PARIS21 and the Asian Development Bank. This was an opportunity for participants to use the International Householder Survey Network (IHSN) Microdata Management Toolkit to document data collection processes for agricultural statistics.

Sources: ADB (2016), MoAF (2015), MoAF (2012), Tshering and Dorjee (2009)

3.1.3. *Policy on privacy and protection of personal information*

Preservation of privacy and protection of personal information must be balanced while producing, analysing and using statistical data. With the increasing availability of disaggregated data and data-silos become more integrated, privacy issues are increasingly a concern about what data is collected and how it is used (*IEAG, 2014*[1]). According to the Fundamental Principles of Official Statistics, data collected to produce statistical information must be strictly confidential, used exclusively for statistical purposes and regulated by law[2]. In a context where data collection is increasingly being collected through the use of technological devices, such as mobile, the need to ensure the confidentiality of personal information and protect their privacy are very important. The right to preserve privacy and confidentiality of personal information is also relevant with the use of big data within the data ecosystem. In fact, a large amount of information is now being automatically recorded and stored as a result of widespread use of the Internet, smart mobile phones and electronic modes of payment; such information is often referred to as "big data" (*UN Global Pulse, 2013*[3]). As online transactions and e-commerce are evolving, issues related to privacy and protection of personal information data need to be effectively addressed. The development of online payment system and the storing of personal data opens up new challenges for regulation such as ensuring that customer and consumer privacy and data protection are implemented[4].

The right to privacy is implicitly provided for in the Constitution of the Kingdom of Bhutan, under article 7 on Fundamental Rights. It provides that "A person shall not be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, nor to unlawful attacks on the person's honour and reputation"[5]. The Penal Code of Bhutan, available in the list of Acts on National Portal of Bhutan, addresses privacy issues. The Policy guideline on information sharing of Bhutan stipulates that privacy of participants and protecting confidential and proprietary data must be taken into account, while acknowledging the need to make information as widely and freely available as possible (*MoIC, 2006*[6]). The issue of confidentiality of information is also mentioned in the Local Government' Act of Bhutan 2007. The Bhutan Information Communications and Media Bill of 2016[7] speaks to data protection and the protection of personal rights and security under its chapters on cyber-security and data protection. While there is no domestic law relating to privacy and data protection, a Right to Information bill was passed by the National Assembly in 2014 and is awaiting approval in the National Council[8]. According to the Minister of Information and Communications, the RTI Act in place would benefit the country's governance system with better transparency and accountability, while helping curb the issue of corruption[9].

3.1.4. *ICT policy and transparency initiatives*

To create an enabling environment and effectively support the development of ICT, a legal, regulatory and institutional framework was put in place, along with the development of capacities and infrastructure. The Ministry of Information and Communication (MoIC) was established in July 2003 which was in charge of policy formulation and implementation, and the drafting of ICT domestic legislation. During the same year, the ministry has come out with an ICT Policy for Bhutan (A White Paper), approved by the Cabinet in October 2003, and stating the Royal Government's ICT vision, strategic components and future directions (*MoIC, 2003*[10]).

As a follow up to this White Paper, the Bhutan ICT Policy and Strategy (BIPS) was developed and launched in June 2004, to serve as the main policy document guiding ICT development. The BIPS 2004 was reviewed, to take into account the changing environment and the need to attach new/dynamic components, and which has contributed in 2009 to the final production of the document BIPS update (*MoIC, 2009*[11]). The Bhutan Telecommunications and Broadband Policy 2014 was developed to guide the development of this sector. Being aware of the value

1 IEAG (Independent Expert Advisory Group on a Data Revolution for Sustainable Development). 2014.
2 Principle 6 of the United Nations Fundamental Principles of Official Statistics
3 United Nations Global Pulse. 2013.
4 Ugyel, P. Bhutan Info Comm and Media Authority. Policy and regulatory interventions for smooth development of e-services in the country. http://www.bicma.gov.bt/bicmanew/data/reports/other-reports/eservice-reports.pdf
5 The Constitution of Bhutan. 2008.
6 Ministry of Information and Communications. 2006
7 Royal Government of Bhutan. 2016.
8 http://www.baliprocess.net/UserFiles/baliprocess/File/Privacy%20and%20data%20protection%20laws%20of%20Bali%20Process%20members%20States.pdf
9 http://www.business-standard.com/article/pti-stories/bhutan-s-national-assembly-passes-rti-bill-114020600888_1.html
10 Ministry of Information and Communications. 2003.
11 Ministry of Information and Communications. 2009.

of ICT for social and economic development, guided by the values of GNH, the RGoB developed the Bhutan ICT Roadmap in October 2011. A review of the Bhutan ICT Roadmap has been initiated by the Ministry of Information and Communication, with the World Bank support in May 2015, resulting in a revised Bhutan ICT Roadmap and a revised ICT vision[12]. It is noteworthy to mention the existence of a draft e-Government Policy in Bhutan. Its main objective is to provide a clear guidance to the implementation of e-Government initiatives in the country. Among its specific objectives, the e-Government Policy should ensure the security and integrity of government data and promote the use of secure national government data centers.

Furthermore, Bhutan put in place a regulatory environment; a Telecommunications Act was passed in 1999, a Copyright Act in 2000, and the Bhutan Information, Communications and Media Act was passed in 2006 (*MoIC, 2009*). To carry out responsibilities entrusted under the BICMA 2006 Act, a regulatory authority named Bhutan InfoComm and Media Authority was established. This Act includes among its provisions, those related to ICT facilities and services, electronic commerce (e-commerce), electronic governance, electronic signature, privacy, consumer protection, etc. The provisions within the Act, along with the Consumer Protection Act 2012, which applies to all goods and services, will provide the protection of economic interest and safety of consumers[13]. However, there is a lack of statistical data and research on "consumer issues".[14]

With the development of ICT, various e-government initiatives have been undertaken in Bhutan to facilitate public services delivery, whilst increasing transparency and accountability. The Virtual Zomdu, officially launched at the National Assembly and the National Council of Bhutan in 2015, is a notable form of e-government initiative undertaken by the Bhutanese government. It is an online initiative, supported by UNDP, that allows a direct connection between citizens and parliamentarians via videoconference. It provides a platform for real-time discussion -via community meetings, public hearings and committee meetings- where Parliamentarians can explain about their work, and citizens can voice their concerns and hold them accountable for their promises(*Wangchuk, 2016*[15]). Furthermore, the Government-to-Citizens (G2C) services is also an important initiative aiming to improve the efficiency and quality of service delivery to citizens by improving accessibility, optimizing human resources and reducing service delivery time[16]. As underlined in the Bhutan e-Government Master Plan document, 22 G2C e-services have been made available through the Community Centres that are connected to the internet.

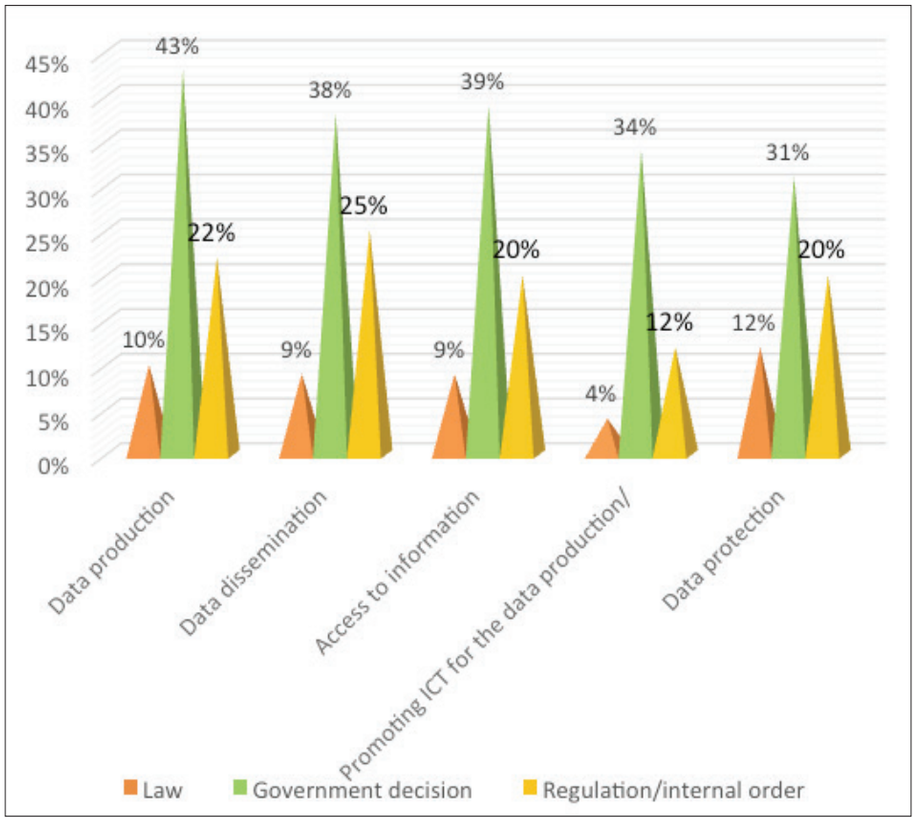
According to a study assessing the G2C and G2B aspects of key ministry e-governance websites of SAARC countries, Bhutan shares the honors with Bangladesh as SAARC's leader in e-governance, with the highest score[17]. Moreover, Bhutan holds the 143position out of 193 member states for the E-Government Development Index -EGDI, with an increase of 9 points compared to the 2012 ranking (152rank for EGDI)[18]. The increasing efforts towards transparency are likely to reduce corruption within the country. Considering the Corruption Perception Index (CPI) released by Transparency International (TI), which ranks the countries based on how corrupt their public sector is perceived to be, Bhutan is at the 27th place in 2015 for the TI-CPI, with a score of 65, which is significantly higher compared to global and Asia Pacific Region's average score of 43 each (*ACC, 2016*[19]).

3.1.5. *Legal and policy framework: key findings from surveys*

Considered as being one of the important components of the data ecosystem, a section on legal framework and data policies was included in the questionnaire filled by key data stakeholders during surveys. In addition, the issue of legal framework and data policies was addressed during Focus Group Discussion -FGD, Key Informant Interviews -KII, and consultation workshops. As discussed in the section above, the legal and policy framework for statistical activities are mostly governed by government decisions and regulation and internal order. This is confirmed by the survey results as illustrated by *Figure 5*where we found that the mandates hold by organization for data-related-activities are mostly based on Government decisions and regulations/internal orders, and to a less extent on Law.

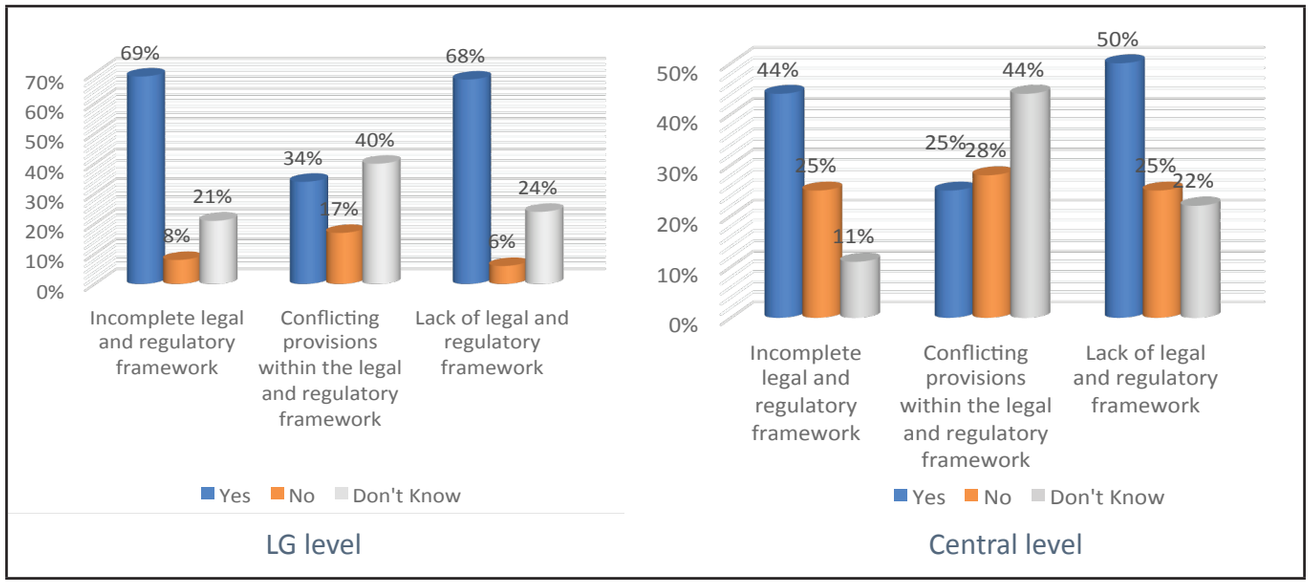
12 Ministry of Information and Communications. 2015.
13 http://www.bicma.gov.bt/bicmanew/data/reports/other-reports/eservice-reports.pdf
14 Tshering, D. 2016.
15 Wangchuk, N. 2016.
16 G2C, "G2C: Service Delivery Initiative," ed. Thimphu: Royal Government of Bhutan, n.d. cited by Choejey, P. et al. 2015. Cybersecurity Practices for E-Government: An Assessment in Bhutan. The 10th International Conference on e-Business -iNCEB2015- November 2015
17 Anandkumar et al. 2013
18 UN DESA. 2016.
19 Anti-Corruption Commission. 2016. http://www.anti-corruption.org.bt/?q=node/1586

Figure 5 : Mandates of organizations for data-related-activities



According to survey results, the legal and regulatory framework has certain limitations in the production and/or use of data. The two main limitations are the incompleteness and the lack of the legal and regulatory framework according to respondents from both Local Government (LG) level than Central one, even though there is a slight difference as shown in*Figure 6*. It is noteworthy to mention that regarding the legal framework governing official statistics in Bhutan, the Executive Order 2006 was the last one developed with the objective to streamline and strengthen the statistical system in the country. The need to revise this Executive Order 2006, and ensure its coherence with the country's context and priorities, was raised by participants to the FGD and KII, both from LG level and Central level. In the same vein, participants also stressed the need of enactment of the Statistical Law and the approval of the microdata dissemination policy, while recognizing that they could take time, going from the medium to the long term. Before its enactment, the Statistic Law need to be reviewed by integrating a provision that address the issue of unofficial data producers and the role they can play in the NSS. This is particularly timely, with the implementation of SDGs and given that most of the indicators related to Governance cannot be measured without other types of data, such as perception data and qualitative data, which are not produced by the NSS. However, it is noteworthy to mention that data from non-official producers would be a strong complement to official data.

Figure 6 : *Limitations of the legal and regulatory framework*



Furthermore, as underlined in the literature review on legal and policy framework, an important issue is related to the implementation of policies and standards on data-related-activities. The survey results reveal that, about 57% of LG level respondents do not implement metadata standard and policies in their organizations but they are two times less important for the Central level. With regards to policies for ensuring data quality, disaggregation and timeliness, 42% and 47% of respondents, at Central and LG levels respectively, mentioned not implementing such policies within their organizations.

Furthermore, participants to the FGD stressed the absence of uniform format for data collection and for data sharing, which they consider as a challenge at the local level. Depending on the availability of internet which is not ensured every time at the local level, most of the data sharing is done by post through hard copy; Gewog Administrative Officers share data with District Statistical Officer which compiles all the data from Gewogs to share with NSB.

To facilitate the use of data to various stakeholders, basic information on the collection and dissemination process should be available and accessible to them. However, at the LG level 64% of respondent mentioned that the terms and conditions under which data are collected, processed and disseminated within its organization are not available to the public.

It's not enough to assume that all the basic information is available to the public, along with the produced data, because they will not have any value if data users lack the appropriate capacities or know-how to understand, analyse and use data in an efficient way. Consequently, there is a need to promote data literacy and ensure capacity-building of different stakeholders in order to overcome this challenge faced by data users. The issue of data literacy was raised by participants for FGD, KII and consultation workshops, which highlighted the need to strengthen data literacy particularly for high-level decision makers. Raising the awareness of the policy makers on the importance of data could likely impact the share of the national budget dedicated to data and statistics.

3.2. **Key data stakeholders**

The key data stakeholders are those who hold a special interest in data. They could be classified in four main groups, namely data producers, data users, infomediaries and data funders. The group of stakeholders of the Bhutan Statistical System, as highlighted in the revised version of the NSDS, are almost the same. These groups are: producers of official statistics, users of official statistics, providers of the raw data on which official statistics are based, and wider stakeholders and society as a whole such as parliament, development partners, non-governmental organizations, the general public, and also wider interest groups such as employers, trade unionists or professional societies (*NSB, 2014*). Each of these groups is presented below, with more details on their responsibilities within the data ecosystem.

3.2.1. *Data Producers*

Data producers are those involved in data collection and generation. With a highly decentralized statistical system, there are many ministries and government agencies that have the responsibility to carry out the production of statistical data. These statistical data obtained through surveys and censuses are available at various levels, including national, district (*dzongkhags*) and sub-districts (*gewogs*). The main producers of official statistics are the National Statistics Bureau, the Royal Monetary Agency, the ministries and government agencies at national and local levels.

3.2.1.1. *National Statistics Bureau (NSB)*

In order to meet statistical needs, the first Statistical Cell was established within the Ministry of Development in 1971, during the formulation of the 3rd Five-Year-Plan. Further in 1979, the Central Statistical Office (CSO) replaced this Statistical Cell, having a divisional status under the Planning Commission. As such, the CSO was mandated to regularly conduct national surveys and censuses, and generate official statistics on various sectors, in order to facilitate informed decision-making and planning process (*NSB, 2008*).

Following a restructuring of the Government in 2003, a change occurred within the decentralized Bhutan Statistical System, leading to the establishment of a full-fledged institution named National Statistics Bureau (NSB), through a Government Order. NSB is the main central statistical agency in Bhutan, with its own budget and autonomy, and mandated to coordinate the production of fundamental statistics, disseminate high-quality

data statistics through publications and streamline all the statistical activities in the country. The central role of the NSB within the country has been reaffirmed by an Executive Order of the Prime Minister in 2006 as follows: NSB *is the central authority for collection and release of any official data and their custodian*. The main objective of the NSB is "to establish a sound national statistical system capable of providing reliable, accurate and timely data that are required for planning, monitoring and decision-making".

NSB's mission is "to provide timely, relevant and reliable statistics, consistent with international principles and standard for effective decision making and monitoring" and its vision is "to be a key provider of world class statistical information, in supporting the evidence-based policy/decision making in the country". As such, NSB is responsible for carrying out major surveys and censuses in the following statistical domains: population statistics, health, income and living conditions, national accounts, and price statistics. The censuses and surveys include the Population and Housing Census of Bhutan (PHCB), the economic census, the Bhutan Living Standards Survey (BLSS), the Multiple Indicator Cluster Survey (MICS), the Household Income and Expenditure Survey (HIES), the demographic and health survey, the multi-sector survey, the business survey, the consumer price survey and the production price survey.

The BLSS was designed to collect statistics on various aspects such as housing, employment, health status, fertility, education, access to public facilities, asset ownership, service provision, and commodities prices. The NSB received a grant from the ADB, which provides technical and financial support, to conduct the BLSS based on the Living Standards Measurement Study (LSMS) methodology from the World Bank. From an administrative perspective NSB operates through the following divisions: Survey/Census and Data Processing Division, Coordination and Information Division, National Accounts and Price Division, Population Housing and GIS Division, Socio-Economic and Research Analysis Division, Secretariat Services. The NSB has a total of forty-six existing staff, including support staff, and 20 Dzongkhag Statistical Investigators. These latter are posted in each Dzongkhag, operate under the responsibility of NSB, and have the mandate to gather data with other sector officials at the sub-national level.

3.2.1.2. *Royal Monetary Authority (RMA)*

Through the RMA Act of Bhutan 2010, the RMA is empowered for the collection, compilation and dissemination of monetary and financial statistics, along with balance of payments (BOP) and International Investment Position Data. Through its research and statistics division, the RMA which is the Central Bank, compiles the monetary and financial statistics on a monthly, quarterly and annual basis, while it reports annual fiscal year balance of payment statistics. Data sources include reports published by government departments and data collected through balance of payments survey forms and questionnaires sent out to financial institutions, government corporations, private companies, and other private sector sources.

3.2.1.3. *Ministries and agencies*

Most of the line ministries, through their Policy and Planning Divisions and other dedicated departments and divisions, produce, analyse and disseminate primary data in their own fields through surveys and census, in addition to administrative records. Regarding administrative records, there is a greater data reliance for fields such as Education, Health, Vital Statistics, Tourism and Monetary Statistics (*NSB, 2008*).

The Ministry of Agriculture and Forests (MoAF) conducts 5 yearly RNR census and annual surveys for its planning purpose. The MoAF with the support ofUN's Global Strategy to Improve Agricultural and Rural Statistics, after conducting an in-depth country assessment of the national system for RNR Statistics in Bhutan in 2013, has adopted and launched the Strategic Plan for RNR Statistics (SP-RNRS) in December 2017.The erstwhile scattered statistical units across the various Departments/agencies have now been consolidated into asingle dedicated division called the RNR Statistics Division (RSD).

The Ministry of Labour and Human Resources (MoLHR) conducts on annual basis the national Labour Force Survey (LFS) and the establishment census and survey, the job prospecting survey and unemployed youth perception survey. The MoLHR has developed a Labour Management Information System (LMIS) based on many data sources such as the LFS, the PHCB and statistical reports. The MoLHR is the ministry with the highest number of statisticians (3), compared the other ministries which are also data producers.

The Ministry of Health (MoH) collects and compiles data obtained from the national health survey, supplemented by the administrative data. The results of these administrative data collected at various levels, on a monthly basis, are compiled within the Bhutan Health Management Information System (BHMIS) which provides information on the healthcare system and the health status of the population (*NSB, 2014*).

The Ministry of Education (MoE) compiles the annual education statistics through the web-based Education Management Information System (EMIS) which gives direct access and rights to Dzongkhags and schools to view and update their data. Via the EMIS, the ministry conducts the school census to collect the administrative data of schools, students and teachers, on annual basis.

Under the Public Finance Act of 2007, the Ministry of Finance (MoF) conducts statistical activities related to the production of merchandise trade statistics. Under this ministry, the Department of Revenue and Customs and the Department of Public Accounts provide the Bhutan trade statistics and external debt data. As mentioned in the revised version of the NSDS, the Ministry of Home and Cultural Affairs (MoHCA) is in charge of the production of statistical data on civil registration. This ministry is also designated for Crime Statistics/survey to be conducted on an annual basis, with the Royal Bhutan Police. The Ministry of Economic Affairs (MoEA) is producing data on trade and industry sector, energy statistics, including production, consumption and sales, and statistics on tourism. According to the EDP 2017, the RGoB shall promote and support research and tourism statistics development to improve the competitiveness and facilitate informed public policy and decisions affecting tourism. The MoEA is responsible for conducting a number of surveys and census, namely the Women Entrepreneurship Survey, the Business Survey and the Manufacturing Industries Census.

Other ministries such as the Ministry of Works and Human Settlements (MoWHS) and the Ministry of Information and Communication (MoIC) are producing administrative data on infrastructure road statistics, infrastructure Bridges Statistics, drinking water supply statistics, air transport statistics, driving licenses information, accidents information, etc. Despite the important number of statistics for which they are responsible, MoWHS and MoIC have only one senior statistical officer each.

3.2.2. *Data Users and infomediaries*

Data users are those who process, analyse and use data for various purposes, while infomediaries are those who use raw data and translate it in order to generate usable information that can be disseminated.

The data users of the BSS include, the policy-makers working with ministries and government bodies at national and local levels, researchers from academia and research centres, civil society organizations, private sector actors, media and development partners. From the Government side, GNHC is one of the key data users because it is the coordinating agency responsible for implementing the five-year development plan and plays a central role in policy formulation. Therefore, GNHC needs data on all areas of economic and social activities in order to build the required indicators for monitoring the implementation of the five-year plan (*NSB, 2008*). Some of the key data producers, such as RMA and NSB, can also be considered as users of statistical data, because they are compiling other data. In fact, RMA uses data from other producers when compiling the BoP or monetary statistics, while NSB prepares the Statistical Yearbook of Bhutan through a compilation of National Accounts.

Data are also used by research centres such as the Centre for Bhutan Studies and GNH Research. CBS is a semi-official think tank established in 1999, with the support from the government. CBS works closely with GNHC and other central agencies, and is responsible to conduct all GNH-related empirical research and disseminate findings through publications and conferences (*Ura, 2015*). As for donors and development partners, they are using statistical data to assess the impacts of their support, and plan for future assistance strategy, to ensure that their support, towards policies, plans and programmes, achieves its intended purpose. The comparison between donors and government as data users, regarding their data preferences, displays interesting figures. In fact, international donors often prefer small-sample, technically sophisticated, possibly multisector, infrequent surveys designed to facilitate research and comparisons, and make allocation decisions across countries (*Glassman, 2014*). Whereas, governments prefer large-sample surveys or administrative datasets providing regional or district-level statistics on key indicators that can be used to make budget allocations and track performance.

3.2.3. *Data Funders*

Data funders are those who commission and pay for data collection, as well as those who bankroll data for development efforts. The availability and diversity of funds is one of the enabling conditions for a well-functioning data ecosystem. Data funders of the BSS, include several international organizations, multilateral donors and cooperation agencies, which provides technical and/or financial support to conduct statistical activities.

The main data funders are World Bank, ADB, FAO, JICA, DANIDA, UNICEF and other UN agencies such as UNDP and UNFPA. The World Bank is one of the main data funders which has a long story of engagement with the RGoB and the NSB in the areas of statistical capacity building and poverty measurement analysis. The World Bank supported the drafting of the NSDS through its Trust Fund for Statistical Capacity Building, and collaborated with the NSB and the GNHC for the production of Poverty Maps, which are being used by the RGoB to allocate block grants. The ADB funded one of the most important nation-wide survey, i.e. the third Bhutan Living Standard Survey (BLSS) 2012 conducted by NSB.

3.3. **Coordination**

Given the number of data producers, which are interacting with other data stakeholders in a decentralized statistical system, the need to ensure a great coordination is essential in order to minimize duplication and adopt harmonized standards and methods. Although an Executive Order of the Prime Minister on May 2006 reaffirmed the NSB's function as the central authority for the collection, release, and custodianship of official data, other ministries have continued to collect data for their respective statistical needs (*ADB, 2016*). As highlighted in a recent NSB's report, many surveys and censuses are being carried out by different agencies within the Bhutan Statistical System without proper coordination thereby leading to duplication of activities, data inconsistencies, waste of resources, respondent fatigue, etc..

This is confirmed during FGD and KII, where participants pointed out the fact that data availability is not really an issue, but the problem is the data not being centralized, presentation and communication of data differing between agencies, leading therefore to difficulties in gathering data from many places or sources. The lack of coordination is identified as a key challenge during FGD conducted with data producers and data funders.

The poor coordination between data producers within the same sector is considered as being one of the main reasons behind the low quality of data, according to 67% and 57% of survey respondents, respectively at the Central level and the LG level. The lack of coordination at the LG level were confirmed by the KII conducted with DSO who mentioned that *they do not feel that there is a coordination between officials (agricultural, education, health, etc.) at the local level because everybody is mandated to do its own work and since DSO work is just to compile and produce a report*.

The lack of coordination can lead to discrepancies between various sources of data for a given indicator produced by one ministry, and other problems related to double-counting, overlaps and underestimation. The comparison of the livestock and land ownership data from the MoAF and the results of the three rounds of BLSS is an example of data discrepancies as detailed inBox 2. In order to solve the problem of data discrepancies, due to different departments collecting data based on different methodologies, the MoAF proposes to create a single division comprising of all the statistical units within the ministry.

The problem related to double-counting and overlaps was raised during the KII we have had with official from the PPD of the Ministry of Economic Affairs. They highlighted *the double counting and overlaps in the tourism and CSMI sectors. Contribution from some CSMI, such as those related to media, internet, telecom, entertainment, etc., are also underestimated because they are under the MoIC and not with the MoEA*.

A change to a centralized statistical system in Bhutan, a new proposition from NSB, will help avoid duplication of activities and ensure efficient use of resources, given the small size of the country (NSB, 2016). In the centralized statistical system, NSB should be the central agency having the mandate to carry out major nationwide surveys and censuses which are conducted by various agencies, except for small sector specific surveys. Moreover, the parenting of all statistical personnel is proposed as a strategic intervention to institute a well-coordinated system that professionally produces timely, reliable, accurate, consistent official statistics to supporting evidence-based

planning and decision making to achieve the GNH (*NSB, 2016*). At the local level, with the proposition of a centralized statistical system, NSB will facilitate the establishment of the Gewog level database system in all the Gewogs, and will ensure the responsibility to coordinate directly with the central government organizations, autonomous agencies, corporate and private sectors for all the data requirements.

If the coordination issue is solved, this will contribute to strengthening the administrative data by ensuring their reliability, consistency, comparability and timeliness.

Box 3 : *Differences in livestock and land ownership data from MoAF and BLSS surveys*

There exist data discrepancies for the livestock and land ownership data between and within the data series from the MoAF and the three-rounds of the BLSS. The mains reasons behind these data discrepancies are potentially related to the coverage, definition, the process of data collection, the sampling design and the measurement errors.

For example, in 2013 no buffaloes were raised in Trashigang Dzongkhag, but the number of Zo-Zoms significantly increases from 165 in 2008 to 6,297 in 2013, according to the report of the Department of Livestock. This raises the question of having a clear definition on the livestock type that should be counted and the livestock category to consider for ensuring consistent and comparable data across years. For the data discrepancies related to coverage, data on ownership of drylands could be a good illustration while comparing estimates from the MoAF and the BLSS 2007. In fact, there is 62.7 thousand hectares based on BLSS 2007 which only covers land owned by households; this is much lower than the 119.8 thousand hectares obtained from MoAF for which data include privately- or community-owned lands,or those belonging to rabdeys and lhakhangs.

The sampling design is one of the possible source of data discrepancies, because of changes within and between data sources. For instance, the data series from the three rounds of the BLSS lack consistency because of the changes made in the sampling design, in terms of sample sizes and coverage. Moreover, the technical documentations of the sampling designs or the corresponding microdata of MoAF surveys were not available. Furthermore, the significant differences that exist on estimates for wetland ownership Regarding the measurement errors, the substantial differences for wetland ownership estimates are indicative that measurement errors could have been committed in some Dzongkhag.
Source: ADB, 2016

Box 3 : e-Government Interoperability Framework (e-GIF)There exist data discrepancies for the livestock and land ownership data between and within the data series from the MoAF and the three-rounds of the BLSS. The mains reasons behind these data discrepancies are potentialy related to the coverage, definition, the process of data collection, the sampling design and the measurement errors.

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Source: ADB, 2016

With the centralized statistical system in place, NSB will be vested with the responsibility of coordination and this can help avoid the potential problem of conflict of interest raised by participants during surveys, FGD and KII. They highlighted the conflict of interest as an issue in many of the ministries and agencies who conduct surveys, set targets and are evaluated on an outcome based approach with the introduction of the Annual Performance Agreements (APA). The main ministries mentioned by the participants to KII and FGD as being particularly concerned by the conflict of interest are the MoAF with the RNR census and surveys, and the MoLHR with the LFS. In order to preserve the integrity of data and reduce the probability of conflict of interest, it is crucial to separate the function of data collection, target establishment and outcome-based evaluation performance for a single ministry or agency. According to the KII participants, one of the solutions could be the establishment of a harmonized framework, based on a holistic approach, coordinated by NSB, GNHC and GPMD where the mandates and role of each stakeholder is clearly defined.

Finally, with the centralized statistical system, there could be a room for improvement in terms of coordination regarding the various information systems existing within the BSS, such as the BHMIS, the EMIS, the LMIS, the local government web-based system, etc. One of the recommendations to overcome the challenge of multiple information systems and ensure better coordination is to develop one system for all the BSS. This recommendation, which requires adequate resource allocation for data collection and management, could take place in the medium to long term. However, the implementable recommendations in the short term include, the development of proper and clear SoP/ToR for Statistical Officers, Sectors and Gewog officials, the institution of regular coordination meetings between key stakeholders both at local and national levels, the definition of a uniform methodology for data collection and dissemination at different levels and the development of a data verification system.

3.4. **Infrastructure**

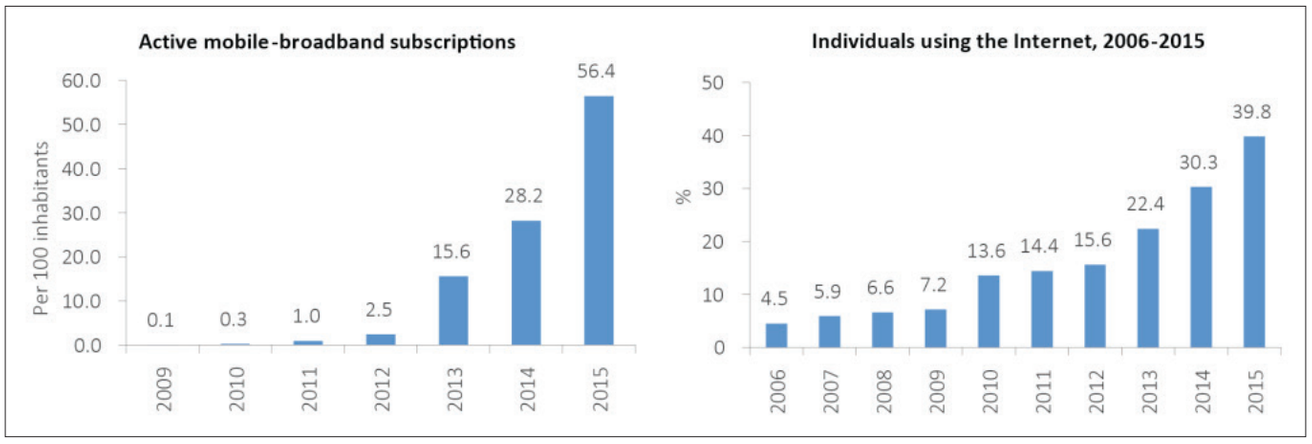
A well-functioning data ecosystem requires strong ICT and statistical infrastructure, throughout the data value chain. The use of ICT infrastructure has the potential for significantly reducing the time for data collection, analysis and dissemination, while improving the quality of produced data, the timeliness and user-friendliness for an effective dissemination. Given the existing efforts noted towards the development of ICT infrastructure in Bhutan, there is a room for improvement for a greater use of technology and ICT-related tools within the data ecosystem.

3.4.1. *Data centres and telecoms*

In March 2017, the Department of Information Technology and Telecom, of the MoIC, launched the Government Data Center (GDC) corresponding to the Bhutan first centralized government data hub. The GDC is identified as one of the priority activities in the 11th FYP and is aimed to house, operate and maintain government systems and services at the highest standards (*DITT, 2014*). In addition to offering security services, the Government Data Center will provide an enabling environment for information sharing amongst the government agencies and other services users improving the overall public service delivery.

Regarding telecom, there are two operators, the *Bhutan Telecom* which launched the first mobile communication service in the country in 2003, and *Tashi Info COMM Limited* which started its operation in 2008 as a private Telecom operator. With these two telecom operators, mobile sector has achieved up to 76.6% penetration (*MoIC, 2014*). The mobile market in Bhutan has grown moderately, and the penetration reached 88% in 2016. As for Internet, four licensed Internet Service Providers (ISPs) are providing internet and hosting facilities with reasonable costs. Telecom providers in countries like Bhutan, Bangladesh, India, Japan, Kazakhstan and Nepal, have systems in place to provide a variety of telecom services at reasonably affordable costs (*UNESCO, 2011*). Consequently, there was a steady increase in the proportion of individuals using Internet and the active mobile-broadband subscriptions per 100 inhabitants (see*Figure 7*). This proportion will likely increase by 2018 because, as underlined in the Economic Development Policy (EDP) 2017, the licensing for ISPs, mobile service providers and cable operators shall be liberalized to encourage and increase penetration of internet use and accessibility by 2018.

Figure 7: Evolution of active mobile-Broadband subscriptions and internet users (2006-2015)



The active mobile-broadband subscriptions per 100 inhabitants showed a significant increase from 2.5 in 2012 to 56.4 in 2015; while the proportion of individuals using internet has more than doubled with 15.8 per cent and 39.8 per cent during the same period. With the implementation of the National Broadband Master plan project, optical fibres have been established to reach all 20 Dzongkhags and 138 Gewogs; all 205 Gewogs are now connected to mobile services (*MoIC, 2014a*).

These significant efforts towards the development of ICT infrastructure help the country in achieving good ranking at the global and regional levels. In fact, Bhutan has qualified as the most dynamic country in the Asia-Pacific region in 2015-2016, based on the evolution of the ICT Development Index (IDI). The IDI rank for Bhutan has improved from 122 in 2015 to 117 in 2016, making the country as holding the highest ranking LDC -117th place out of 175 (*ITU, 2016*). According to recent ITU data, Bhutan holds the third position in the cheapest mobile-broadband services in the Asia-Pacific region (5.15 PPP$) in 2015, after Cambodia and Sri Lanka.

3.4.2. *Data standards and interoperability*

The use of standardized methods, definitions and classifications is essential for ensuring comparability of data over time and across geographic locations. The application of standards has two main functions, on the one hand it is to ensure that data from different sources can be safely compared, and on the other hand it is to inform data users that the data meet a defined technical standard and that confidence can be placed in the results (*Eele, 2015*). At the international level, the United Nations Statistical Commission has the responsibility for developing and monitoring the use of standards. Sometimes, those who are funding data prefer statistics based on standardized methodologies and questionnaire formats because of their concern with internal comparability (*Sandefur and Glassman, 2014*). There are standards for data documentation and transfer, such as the Data Documentation Initiative metadata standard, to document surveys in statistical agencies and academia; and efforts to describe production processes for data, such as the adoption of a Common Statistical Production Architecture and the Generic Statistical Business Process Model, to produce coherent statistics across information domains. In Bhutan, one of the main challenges is the lack of respect for international agreed standards, according to the regulatory impact assessment for the Statistics Bill of Bhutan (*NSB, 2015*). In fact, various agencies adopt inconsistent statistical application with their own statistical concepts, definitions, standards and methodology, and the root cause of this problem is that NSB is not authorized to ensure uniform application of statistical concepts, definitions and standards, despite its technical competence. For example, the geographic coding system used by the NSB is different from the other statistical services, and there is no common definition for basic concepts such as Household, Urban/rural areas, and Corporation and establishment.

The lack of harmonized standards and methods, and its impacts on the quality of data, were confirmed by the findings from surveys, KII and FGD. About 73% of respondents consider the lack of standardized tools for data collection, analysis and dissemination as one of the main reason of the low quality of data. While 53% of respondents stated that the low data quality is due to the non-compliance with international standards/ guidelines for data production. One of the condition to ensure quality data is to follow training in up-to-date standards and norms related to data. Unfortunately, the training on data standards and norms seems not to be of a great importance, given that only 8% of the survey' respondents indicating having received training once a year in this field.

As for data interoperability, it addresses the ability of systems and services that create, exchange and consume data to have clear, shared expectations for the contents, context and meaning of that data. Interoperability of statistical data need to be addressed in compliance with international classifications and standards. In Bhutan, initiatives are undertaken to facilitate interoperability at various levels. Recently, the MoIC in collaboration with the Royal Monetary Authority (RMA) of Bhutan, has initiated the development of a national e-Payment Gateway at RMA, and the infrastructure will be ready for public consumption by end of 1st quarter 2017. This project aimed to enable inter-bank interoperability, facilitate online payments and build the fundamental infrastructure necessary for e-commerce. Furthermore, the Government put in place an e-Government Interoperability Framework (e-GIF), to adopt common standards in terms of data, applications and technology, and facilitate government processes at various levels. The Box 3 below gives a more detailed information on the e-GIF in Bhutan. Furthermore, the Department of Information Technology and Telecom (DITT) is also developing a Data Interchange platform for sharing data across government agencies, which will reduce the need for duplication in data collection.

Box 3: *e-Government Interoperability Framework (e-GIF)*

Having recognized the importance of common standards in terms of data, applications and technology, the Government has invested in the development of e-government interoperability framework (e-GIF) which will facilitate and promote integration, and interoperability for the future/upcoming ICT systems of the government for efficient delivery of e-services. The e-GIF allows diverse government application systems to seamlessly exchange data and use the data that has been exchanged meaningfully, with support of standardized technologies, data and applications. It institutes set of standards and guidelines that the government agencies must adopt to enable better sharing and collaboration within government agencies. The e-GIF has four main components, namely Business Architecture, Applications Architecture, Data Architecture and Technical Architecture. Regarding the Data Architecture, it lists the data definitions and data elements of common and shared data that are used across the Government, and defines technical standards, design and security considerations and best practices related to the management of data. While the Technical Architecture, defines the infrastructure technologies and their respective technical standards to enable better system integration and interoperability across the Government. It also defines the security considerations and standards related to the infrastructure technologies. The e-GIF was awarded the Open Group 2017 Awards for Innovation and excellence in Enterprise Architecture.

Source : DITT website
http://www.dit.gov.bt/content/e-government-interoperability-framework-e-gif
http://www.dit.gov.bt/sites/default/files/e_gif_summary_with_forward_pdf_53582.pdf
http://www.dit.gov.bt/ditt-moic-awarded-open-group-2017-innovation-excellence

3.5. **Capacities**

To enable the efficient functioning of the data ecosystem, data stakeholders need to acquire key capacities. These capacities are determined by the availability and quality of human and technical resources, but also the provision of predictable and sustainable financial resources.

3.5.1. *Human*

The lack of human resources is one of the key weaknesses of the Bhutan Statistical System according to the assessment conducted during the development of the first NSDS. The gap in terms of human resources are not only on the number of staff, but also on their ability to efficiently undertake key statistics-related activities. The factors explaining the problem of human resources include the insufficient number of staff, the lack of an adequate number of staff having the required qualification skills to conduct the key statistical activities and, the low probability to retain the qualified staff because of an underuse of their potential and limited career evolution and prospects. According to a recent NSB report, the total number of staff within the NSB is 29, ministries and agencies have 15 statistical personnel, and at the Dzongkhag level, there are 20 Dzongkhag Statistical Investigators (*NSB, 2016*[20]). The issue of low qualification of majority (only 3 graduates out of 20) of DSOs and many staff leaving the job (15 left) was raised by the KII participants.

20 NSB. 2016.

The inadequacy of human resources is particularly a problem within the RNR sector, as illustrated by the in-depth country assessment report jointly produced by FAO and RGoB in 2014. The Statistical Coordination Section of the RNR, which assists in the design and analysis of statistical surveys, lacks qualified statisticians, except some who have availed short trainings and hands on experiences at job (*Thinley, 2014*[21]). Moreover, the extension officials, serving as enumerators for almost all activities related to RNR data collection, do not have statistical backgrounds and skills.

The problem of human resources, as one of the major roadblock of the data ecosystem, is confirmed by the findings from surveys, KII and FGD. The lack of adequate human resources is partly correlated with the supply from the educational system, particularly in terms of data scientists and statisticians. According to the surveys, more than half of respondents from LG level assess the number of statisticians and data scientists produced by the formal education system as being low. At the central level, about one out of three respondents consider that the statisticians and data scientists from the formal education system is low. From these results, one could argue that the supply of statisticians and data scientists is not enough compared to the demand, and when statisticians and data scientists are available, Agencies and Ministries at the Central level will have the priority in terms of recruitment before services at the LG level. Other survey results are consistent with these ones, because many survey respondents do not have enough staff related to statistics or data management within their organizations.

As shown by, more than 75% of respondents both at LG level than central level do not have any data manager, data operator, data analyst or programmer within their organizations. The issue of staff seems to be less problematic for ICT-related positions within the organizations both at LG and Central level, where the ICT skills and competencies of staff is assessed as medium by respondents. The problem of appropriate human resources in charge of data is also experienced at the top management level of most organizations (*Figure 8*). Among the survey respondents at the Central level, only 11% have a Chief Statistician, 6% a Chief Information Officer and 14% a Senior Data Manager. These are less important at the LG level, particularly for Chief Statistician and Senior Data Manager as shown in *Figure 9*.

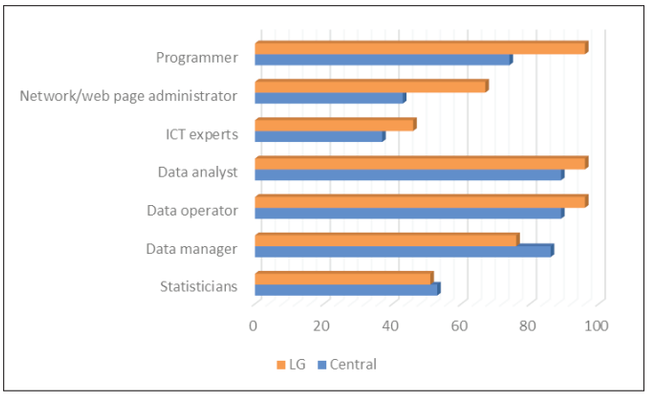


Figure 8 : *Positions related to data management within organizations*

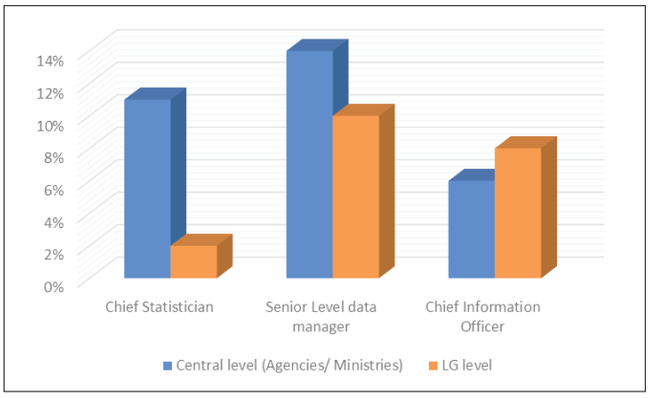


Figure 9 : *Availability of Top Data Manager within organization*

The problem of human resources is also exacerbated by the fact that data stakeholders within the data ecosystem, are not receiving frequent training in the field of statistics and data. In terms of data collection and data management software, only 8% of respondents from Central level and 4% from LG level have received training once a year; while 66% at both levels reported having received no training in this field. With regards to data norms and standards, only 2% of respondents from both levels have received training once a year in this area, while 77% of respondents at Central level and 62% at LG level have mentioned having received no training on data norms and standards. The lack of regular training on data norms and standards is likely to impact the quality of data, because data producers will not be able to update their skills, and apply a harmonized framework.

21 Thinley, K. 2014.

According to surveys, 57% of data producers at the Central level and 59% at the LG level consider that the lack of regular training for data producers is one of the main reasons for the poor quality of data.

Furthermore, interesting results are obtained while comparing the fields in which more training is received by respondents from LG and Central levels. In fact, at the LG level, data collection methods is the field where more respondents have reported received one training a year (14% while it is less than 5% for all the other fields). At the Central level, the two main areas where respondents have been more trained once a year are related to data analysis and ICT use in data process, reported by 19% and 14% respectively. The implications emerging from these results has tended to assume that the differences in terms of training fields between LG and Central levels is a good indicator to be taken into account while exploring training opportunities to strengthen capacities of staff at both levels.

3.5.2. *Financial*

The financial resources, which are sufficient and predictable, are essential for a good functioning of the data ecosystem. In Bhutan, statistical activities are financed by government budgets and external funds from donors, through technical or financial assistance.

For the majority of data producers, either for NSB as for Agencies and Ministries, a range of their statistical activities for conducting surveys or censuses are funded by external partners. For NSB, even if BLSS is considered as one of the most important surveys conducted, it has external funding support and technical advice from international development community for the third round (*ADB, 2011*[22]). As highlighted in a recent NSB report, almost all major survey activities of the Government are conducted through support of donor agencies, often leading to collection of data on an ad-hoc basis and fulfilling donor data needs in many instances (*NSB, 2016*). One of the implication of this heavy reliance to donors' funds, is that, a delay in the availability of the funds will have impact on the timeliness and the frequency of releasing official statistics. In addition, donors are mainly funding statistical activities that commensurate with their own priorities, leading therefore to the dominance of donor data priorities over national priorities.

The evolution of the budget dedicated to surveys conducted by some key data producers of the BSS between 2009 and 2015 reveals the heavy reliance on external funds from donors to undertake different statistical activities (*NSB, 2016*).

For example, on the total amount of the costs of past surveys conducted by NSB during the period 2009-2015, about 8.4% were funded by the Royal Government of Bhutan, while the majority of funds are allocated by UNICEF, ADB and World Bank (*Figure 10*). These donors respectively financed the Bhutan Multiple Indicator Cluster Survey in 2010, the Bhutan Living Standards Survey in 2012 and the Enterprise Survey in 2015.

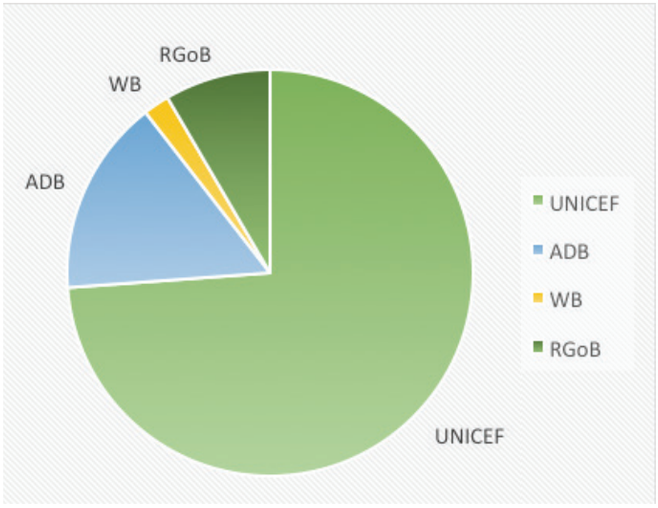
The breakdown of costs for surveys conducted by the Ministry of Health during this period displays the same trends, but with a higher donor dependency. Out of a total amount of 64.2 million, 39% are funded by UNFPA for conducting the National Health Survey 2012, about 34% and 13% comes respectively from UNICEF and the World Bank.

For the Ministry of Agriculture and Forests, one of the main data producers, the two RNR censuses of 2000 and 2009, covering activities on agriculture, livestock and forestry, were fully funded by DANIDA (*Thinley, 2014*).

Unlike the NSB, MoH and MoAF, the surveys conducted by the Ministry of Labor and Human Resources (MoLHR), namely the Labor Force Survey and the Job Prospecting Survey, were fully funded by the RGoB for a total cost of 19.5 million.

22 Asian Development Bank- ADB. 2011.

Figure 10 : Sources of funding for surveys conducted by NSB during the period 2009-2013



3.5.3. *Technical and material*

The role played by adequate technical and material capacities, including statistical ones, in all data-related activities is well-recognized as a prerequisite to a functional data ecosystem. The data producers and DSOs, of the BSS are generally equipped with the required number of basic hardware equipment, and the software packages they mostly use for statistical data processing include CsPRO, STATA, SPSS, E-views and Microsoft Office (*NSB, 2008*). The use of these software for analyzing and visualizing data is confirmed by the survey results, with the majority of respondents using Excel, followed by SPSS but with a slight difference between LG and Central levels (*Figure 11*). In particular, at the Central level, some respondents mentioned using Excel with other statistical software such as SPSS and STATA.

However, the problems related to security and safety of the system, with unreliable and unlicensed software, and lack of archiving facility to securely safeguard all the information, were highlighted by the first NSDS report. Furthermore, the level of use of some interactive data visualization tools for decision making or planning is not well developed according to survey findings. In fact, the process of decision - making and planning are not routinely data-driven as illustrated by *Figure 12*, because one respondent out of three approximately are using data visualization tools such as maps, info graphics and online database in the process of decision making, while dashboard is less frequently used.

Such results could be explained by a lack of awareness on the importance of data in the process of decision-making and planning. The consultations with DSO is illustrative to this problem at the local level, because they emphasize that *higher authority (Dasho Dzongda) are not aware of data importance since they are not using data in their day to day activities*.

Figure 11 : Software used for analyzing and visualizing data

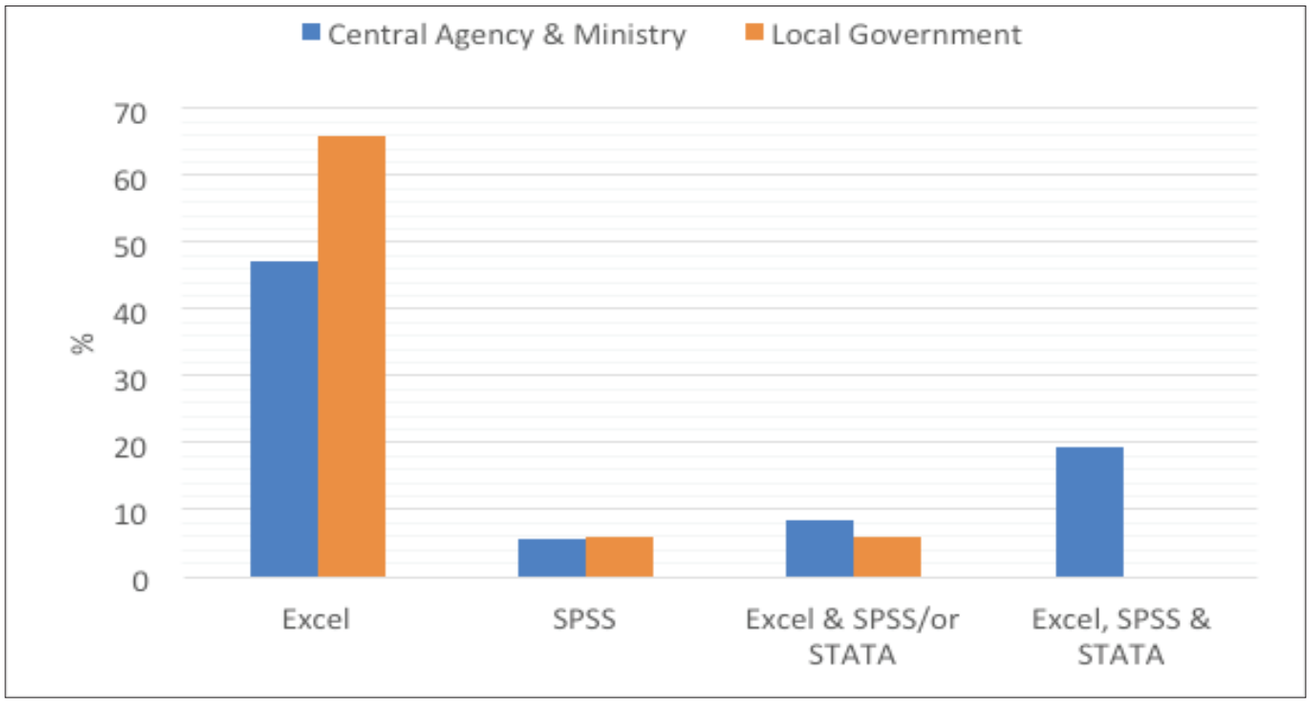
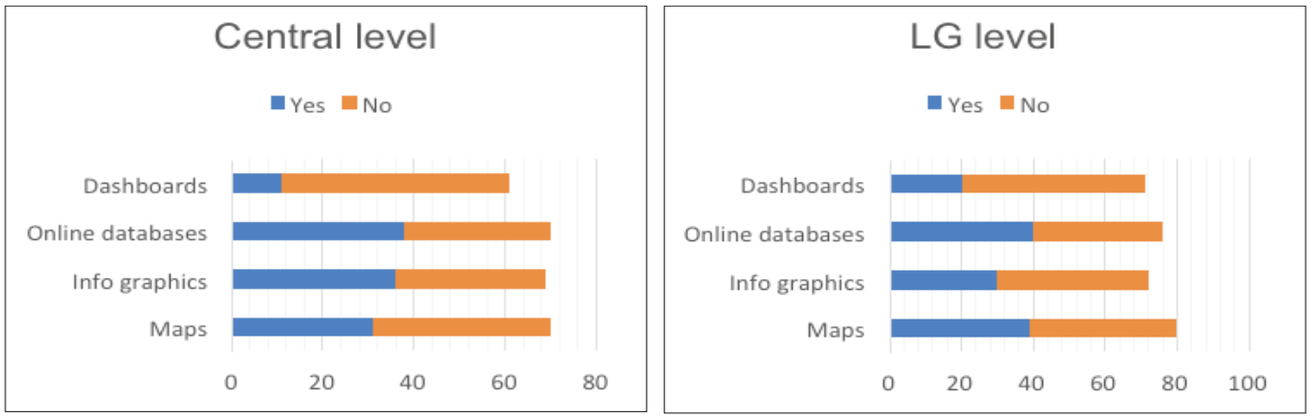


Figure 12 : Use of data visualization tools in the process of decision making and planning



Technical capacities include the use of technology, such as GPS to undertake statistical activities or internet for dissemination and user-friendliness access of data to user. GPS has allowed data collection to be more accurate and consistent than estimating locations or area using paper maps and distance measurement (*ADB, 2016*). Administrative data from ministries such as MoE and MoH are often collected and transmitted through automated system using technology. The publications are still made available largely through hard-copy, but some data producers, such as the MoE and the MoH, are using their website for publications even if their interface sites are not always user-friendly (*NSB, 2014*).

Although an interactive website is one of the easier way to disseminate data, the survey results reveal that there is a mix between traditional methods such as hardcopy and technology through internet/email for disseminating data. (*Figure 13)*. The findings from surveys display the same figure regarding tools used for data collection, where traditional methods such as paper are still largely used (*Figure 14*). From Central level respondents, about 44% are still collecting data by using paper, and it is slightly more important for respondents from LG level (48%).

The survey results in terms of access to supercomputing and existence of online data portal, regularly updated and maintained, show the need to promote to a greater extent the use of technology within the data ecosystem. About 60% of respondents at the Central level, and 76% at LG level, lack access to a super-computing capacity and connectivity to process large volumes of data within their organizations. Moreover, one out of three respondents at the LG level has reported that an online data portal is regularly maintained and updated within their organizations. Such results raise an issue that were discussed during sub-national workshops and FGD where participants pointed out the inadequate access to technology at the local level.

Considering the efforts noted in Bhutan with regards to ICT infrastructure, there is a room for improvement for data stakeholder, particularly data producers at the local level, to take advantage on the technology-related opportunities, given the positive impacts they can have on the whole data ecosystem.

Figure 13 : Methods used for disseminating data

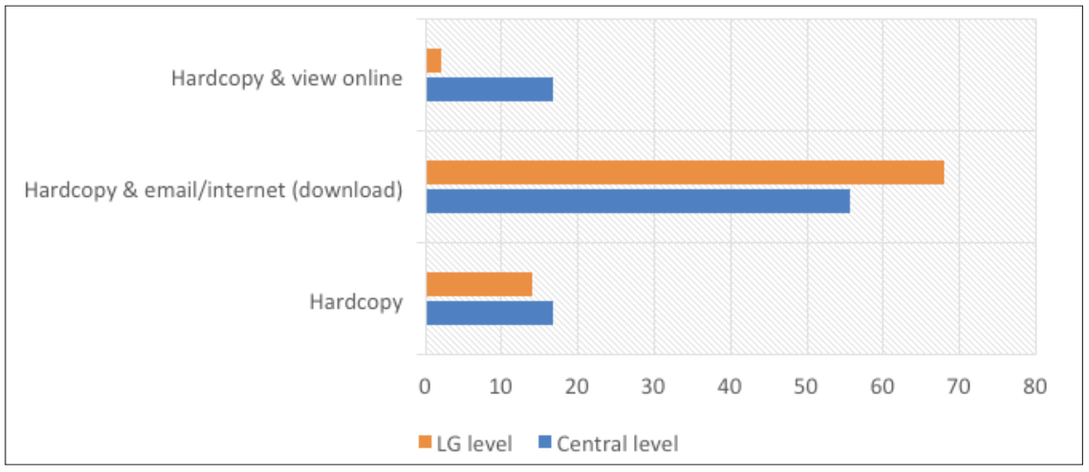
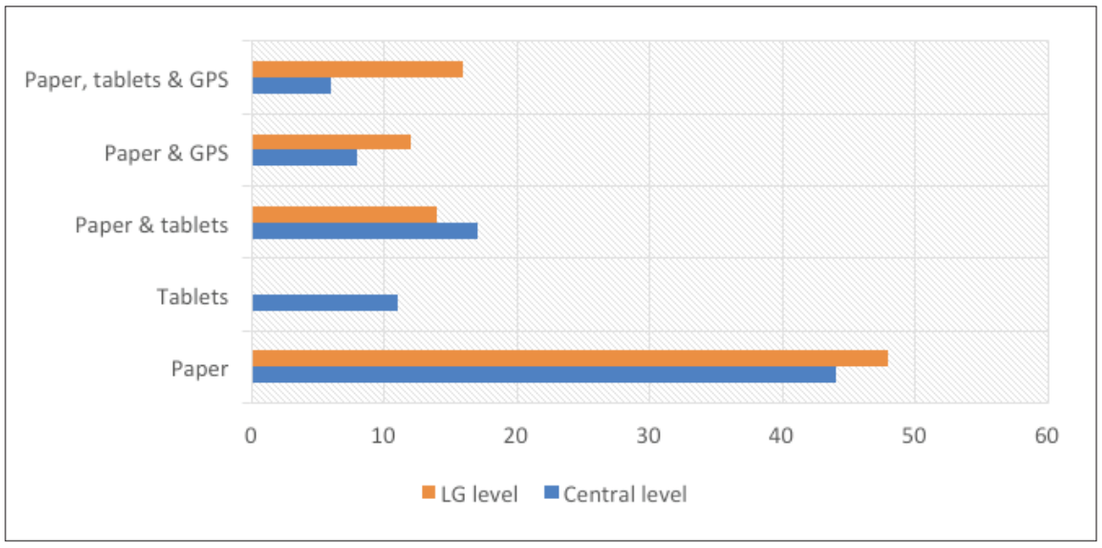


Figure 14 : Methods used for collecting data



In addition to statistical and ICT infrastructure, material resources such as office infrastructure, transport facilities and equipment are required conditions for an enabling environment to data production, analysis and dissemination. From the multi-stakeholder consultations, participants highlighted the need to have more appropriate office infrastructure with sufficient space, for the data producers (for eg.NSB).

4. DATA MAPPING ANALYSIS

As part of the present project, a data mapping exercise was undertaken on Key Performance Indicators for LGKRA and NKRA. The aim of this data mapping is to analyze the appropriateness of KPI data for LGKRA and NKRA. In the section below, we propose to present the results of the data mapping by summarizing some of the LGKRA and NKRA that are very close in terms of topics addressed. Furthermore, on a selected set of 8 targets and indicators of 11th& 12th Plans and APA indicators, the availability of data were assessed and presented, along with the main data sources.

LGKRA 1 & NKRA 11: Employment

The LGKRA 1 "Gainful employment created, and local economy enhanced" has initially 10 KPI. Among these KPI one is defined as the "*Proportion of resident population with Bank Accounts*". Given the importance of mobile banking and that the focus is on rural population, we propose a reformulation of this indicator as follow "*Proportion of rural resident population using or having access to bank services, including bank accounts and mobile banking*". Such indicator is relevant with regards to the growth of mobile market and the internet penetration in Bhutan. In terms of disaggregation, such KPI could be disaggregated by gender, age, income level and education level.

Furthermore, another KPI is proposed: i°) *Youth employment rate engaged in the local economy*.Given that part of the LGKRA is related to an enhanced local economy, it is important to know how employed young people are contributing to this economy. In terms of disaggregation, this KPI could be disaggregated by gender, location or place of residence, formal and informal sectors, type of activities conducted in the local economy; and the Labor Force Survey should be the primary source of data for this indicator. With this new indicator, the number of KPIs for LGKRA 1 will be 11, among which *75% are measured and monitored based on administrative data*. Consequently, there is a huge need to strengthen the capacities of those who are producing administrative data at the local level, in order to ensure that they are of good quality and reliable.

The data mapping exercise conducted on LGKRA 1 also revealed a problem of conflict of interest, because for 5 KPI the data producer is in charge of monitoring the data, at the same time he is the main data user, and the one where the reporting is done. With such system, there is a potential conflict of interest, because incentives could exist for data producers to overstate the performance of a given indicator. It is not enough to have data available for one year, but the availability of data for several years could be useful to assess progress. However, for LGKRA

1, only 3 KPI have data available for several years, while no time series were mentioned for the majority of KPI. The quality guidelines of KPI is not specified, except the two proposed KPI. Furthermore, all the KPI are aligned with the SDGs 1, 2, 8 and 9, particularly indicators 1.4.2, 2.3.1., 8.3.1., 8.5.2., 8.6.1., 8.9.1., 8.9.2., 8.10.2., 9.2.1., 9.3.1.

Regarding NKRA 11 "Productive and Gainful Employment Created", five KPI were initially defined for which data are obtained through Labor Force Survey (LFS). We propose three KPI, in addition to the five already defined: i°) *Proportion of population with an informal employment*, ii°) *Proportion of time spent on unpaid work* and iii°) *Number of children removed from child labour*. For these three KPIs, data could be obtained through LFS or other surveys, such as DHS, MICS, LSMS, etc. In terms of disaggregation, all the KPIs under NKRA 11 could be disaggregated by age, gender, location or place of residence. For the alignment with SDGs, 7 KPI out of 8 are aligned with SDG 5 on Gender and SDG 8 on Employment, decent work and sustainable economic growth, particularly indicators 5.4.1., 8.3.1., 8.5.2., 8.6.1., 8.7.1. If the proposed KPI for LGKRA 1 and NKRA 11 are accepted, an additional work is needed to determine their targets and baseline.

Summary table for LGKRA1 & NKRA11

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
LGKRA 1	*Proportion of rural resident population using or having access to bank services, including bank accounts and mobile banking*	i°) *Youth employment rate engaged in the local economy*	- gender - location - place of residence -formal and informal sectors - type of activities - local communities	*Administrative* (about 75%)	*Fully* aligned (100%)
NKRA 11		i°) *Proportion of population with an informal employment*, ii°) *Proportion of time spent on unpaid work* iii°) *Number of children removed from child labour*	- gender - age - place of residence	*Surveys* (LFS and others)	*Almost fully* aligned (87.5%)

LGKRA 2& NKRA 8: Food, water and nutrition security

There are 10 KPI under LGKRA 2 "Food and Nutrition Security Enhanced" and 8 KPI for NKRA 8 "Water, Food and Nutrition Security Ensured". The data mapping exercise showed a potential problem of conflict of interest for the LGKRA KPI, with MoAF playing the key role in terms of monitoring, reporting and use of data. However, as mentioned earlier in LGKRA related to Employment, this conflict of interest could be influenced by the way data are funded, produced and used. In order to ensure reliable data and promote accountability in the data value chain, there is a need to separate the main data user, the responsible for monitoring and the one to whom data should be reported to. For some of the KPI, the level of disaggregation was not stated, but they could be disaggregated by farm size, age and gender of the farm manager. We propose a reformulation of one of the KPI that is "Area under organic agriculture" as follow "*Share of organic agriculture land area on total agricultural land*". In fact, it is important to know what the area of land under organic agriculture represents on the total area of agricultural land. The availability of data for such indicator is useful for the government and particularly the MoAF to put into place measures for promoting such type of agriculture. In terms of data source, all the KPI could be measured and monitored through censuses and surveys produced by the RNR sector. Compared to other LGKRA, the KPI for LGKRA 2 are available from 2008 to 2016, except one "Proportion of food requirement met from SAP for school feeding" which is available only for 2015-2016. Regarding the quality

guidelines, for all the KPI it is mentioned standard format which is not relevant when we are addressing the data quality issue. The quality guidelines should be revised for all the KPI by referring on international standards for indicators related to food and nutrition security. There is an alignment between these KPI and indicators under SDG 2, particularly 2.1.2. and 2.4.2.

Regarding the KPI for NKRA 8, we propose to reformulate the "*Area of land under assured irrigation*" and the "*Prevalence of Anemia in women*". The reformulated KPI would be "*Area of land under assured irrigation as a percentage of cultivated land*" and "*Prevalence of Anemia in women of reproductive age (15-49)*". In fact, for the sake of relevancy and result-focused, it is more useful to measure and monitor an indicator corresponding tothe total acreage of cultivated land that is covered by functional and reliable irrigation with assured water supply. Such indicator could be disaggregated at various levels, e.g. location, age and gender of the farm manager.

For the indicator on Anemia, we propose a reformulation in order to take into account the importance of reproductive age. Therefore, the target is no longer all women, but only those who are in the age group 15-49. In fact, many studies have shown that Anemia in women of reproductive age could serve as a proxy for micronutrient deficiencies. In terms of disaggregation for this indicator, age, education, place of residence, income and socio-economic status are relevant levels to consider.

In addition to the reformulated indicators, we propose to add two KPI for NKRA 8. The first one is "*Wasting (weight for age)*" that is a good complement to the KPI on "Stunting (height for age)" when we want to address the issue of nutrition security. This new KPI could be disaggregated by sex and education level of the parent, but also income & place of residence. The second proposed indicator is "*Percentage of wastewater treated and reused*" which is directly linked to water security. Such indicator is important because treated water can be used for many purposes such as agriculture, industry, etc. A total of 5 KPI are aligned with indicators under SDG 2 on Food & Nutrition Security and sustainable agriculture and SDG 6 on Water and Sanitation, particularly indicators 2.1.2., 2.2.2., 2.4.2., and 6.3.1. There is a needed to determine the targets and baseline for the four proposed KPI if they are accepted.

Summary table for LGKRA2 & NKRA8

	Indicator reformulated	**New indicator proposed**	**Disaggregation level proposed**	**Main data source**	**Alignment with SDGs**
LGKRA 2	i°)*Share of organic agriculture land area on total agricultural land*	*None*	- farm or household size -age of the farm manager/ or household head - gender of the farm manager/ or household head	*RNR censuses & surveys*	*Almost fully* aligned (80%)
NKRA 8	i°) *Area of land under assured irrigation as a percentage of cultivated land* ii°) *Prevalence of Anemia in women of reproductive age (15-49)*	i°) *Wasting (weight for age)* ii°) *Percentage of wastewater treated and reused*	- location -age - gender -education -socioeconomic status -source of wastewater (industrial, domestic, etc.)	*Administrative sources & surveys*	*Partially*aligned (50%)

LGKRA 3& NKRA 14: Healthy and caring society

There are 18 KPI under LGKRA 3 "Community health enhanced and water security ensured", among which two could be reformulated, namely "Institutional delivery" and "Doctor to population ratio". We propose to change the first one as follow "*Percentage of birth attended by skilled health personnel*", with a disaggregation by residence

(urban/rural), household wealth (quintiles) and maternal age. For the second one, it could be reformulated as the "*Ratio of health professionals to population*", measuring the number of health professionals (doctors, nurses, caregivers, community health workers, etc.) to resident population of Dzongkhag. Censuses, Labor Force Survey and CRVS -Civil Registration and Vital Statistics- are relevant as data sources for these new KPI, because questions are designed to integrate nationally representative population, new born, persons in health-related occupations, place of work, etc. Administrative records from health centers and hospitals are valuable sources of data and good complement to these above-mentioned surveys and censuses. For more than half of the KPI, there is no clarification on the quality guidelines and the time series.

For all the KPI under LGKRA 3, there is no clarification on the agency which is responsible for reporting; and the main data user corresponds to the one in charge of monitoring for 7 KPI out of 18. As mentioned for LGKRA 2 on "Food and nutrition security", this could be a potential source of conflict of interest.

For NKRA 14 "Healthy and Caring Society Enhanced", we propose only one indicator "*Road traffic deaths rate*", which measures the number of deaths per 100,000 population caused by road traffic injuries. This indicator is very relevant for Bhutan because according to a recent study there is a significant mortality and morbidity from Road Traffic Accident (RTA) in Bhutan and the productivity loss due to RTA is around 1% of national GDP (*Wangdi et al., 2017*). Data for measuring and monitoring such indicator could be obtained through surveys and administrative data, from civil registration and vital statistics. In terms of quality guidelines, the KPI related to HIV, it is recommended to follow internationally standardized methods for quality assurance defined by UNAIDS[23]. At both levels, LGKRA and NKRA, their KPI are aligned with SDGs 1, 2, 3 & 6, as shown in the following tables.

Summary table for LGKRA 3 & NKRA 14

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
LGKRA 3	i°)*Percentage of birth attended by skilled health personnel* ii°) *Ratio of health professionals to population*	*None*	- residence (urban/rural) -household wealth (quintiles) - age	*Administrative*	*Almost fully* aligned (83%)
NKRA 14	*None*	i°) *Road traffic deaths rate*	- location -age - gender	*Administrative*	*Almost fully* aligned (80%)

LGKRA 10& NKRA 10: Gender

A total of 7 KPI is defined for LGKRA 10 "Gender equality promoted, women and girls empowered", among which one should be reformulated as follow: "Women, men and children covered by sensitization/awareness programs on elimination of VAW and VAM". In the initial formulation, we had only men and women, while in the definition children are clearly mentioned. The data sources exist for only three KPI out of seven for which administrative data are used to measure and monitor such KPI. Other important information such as the quality guidelines, years for which data is available, the main data user, the agency in charge of data monitoring and data reporting are not specified.

Furthermore, in order to emphasis women's economic empowerment, we propose to add one KPI which is defined as follow: "Number of programs/initiatives to enable rural women to undertake income generating activities". Given that the LGKRA is about promoting gender equality and empowering women and girls, we think that it could be relevant to integrate an indicator for assessing local governments efforts which facilitate economic opportunities for women. For all the KPI under LGKRA 10, there is no information on the time series in order to know the number of years for which data are available, the quality guidelines, the

23 http://www.unaids.org/sites/default/files/media_asset/2016_methods-for-deriving-UNAIDS-estimates_en.pdf

main data user, those who are responsible for data reporting and monitoring. In terms of alignment with SDG indicators, only two KPI, namely "Proportion of female availing skills/entrepreneurship trainings" and "Women representatives in user groups, self-help groups, committees and cooperatives" are aligned with indicators 5.5.1 and 5.5.2.

For NKRA 10 "Gender equality promoted and Women and Girls empowered", six KPI were initially defined, but without targets. We propose a new KPI corresponding to "Gender gap in wages, by sector of economic activity", which is defined as the difference between male and female earnings. This KPI should reflect gender equality and discrimination, and could be disaggregated by sector of activity. All the KPI under NKRA 10 are fully aligned with indicators of SDGs 4, 5 and 8, namely 4.3.1, 5.4.1, 5.5.1, 5.5.2, 5.c.1 and 8.5.2. The tables below on LGKRA 10 and NKRA 10 give more details on the data mapping.

Summary table for LGKRA 10& NKRA 10

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
LGKRA 10	i°)*Women, men and children covered by sensitization/awareness programs on elimination of VAW and VAM*	i°)*Number of programs/initiatives to enable rural women to undertake income generating activities*	- age - place of residence/location - type of activities	Administrative	*Partially* aligned(25%)
NKRA 10	*None*	i°) *Gender gap in wages, by sector of economic activity*	- age - education level - sector of activity - income	Administrative	*Fully* aligned(100%)

LGKRA 7: Transparent, effective and efficient public service delivery enhanced

There are 13 KPI under the LGKRA 7, among which only four have clear baselines and targets. For all the KPI, data are gathered from administrative source, emphasizing therefore the significant efforts to be undertaken towards strengthening the capacities, including institutional, human, financial and technical, of those who are responsible for producing administrative data, particularly at the Dzongkhag level. There is no information for all KPI in terms of quality guidelines, main data user, responsible for monitoring, for reporting, and time series. Moreover, the level of disaggregation is not specified, but for some KPI we propose that they could be disaggregated by location or place of residence, sex and age.Some KPI are aligned with indicators under SDG 4, 7, 9, 11, 16 and 17 as shown in the table below.

Summary table for LGKRA 7

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
LGKRA 7	i°)*None*	i°)*None*	- age - sex - place of residence/location	Administrative	*Partially* aligned (45%)

NKRA 9: Infrastructure, Communication & Public Service Delivery Improved

On the ten KPI under NKRA 9, we propose a reformulation for two, namely "Roads accessible throughout the year in all types of weather" and "Gewogs connected by public". For the first KPI, instead of considering "the proportion of motor roads that are all weather accessible throughout the year", we propose to address the problem by considering the proportion of the population that lives within [x] km of roads that are reliably passable all-year round. Therefore, the reformulated KPI will be "Access to all-weather road throughout the year". In fact, one could assume that a given motor road could be all weather accessible throughout the year, but for a given reason it is not fully used by the population. In addition to administrative data for measuring

and monitoring such indicator, remote sensing and satellite imagery data could be a valuable source of data for this KPI related to road.

Regarding the second KPI, it could be reformulated as follow "Percentage of people within Gewog that have access to reliable public transport". One can argue that it's not enough to know the number of Gewogs that have access to public transport, but for a sake of consistency we should consider the population within Gewog that have access to reliable public transport. Such indicator is relevant for local government in order to improve public transport service delivery and ensure user's satisfaction. The levels of disaggregation proposed are region or location, income group, type of public transport, etc.

In terms of data sources, most of the KPI are measured through administrative data. However, for KPI related to "Public satisfaction on public services" and "Public satisfaction on corporate services", we propose perception surveys to be the preferred data sources. It is noteworthy to underline that most of the perception surveys are carried out by non-official data producers, such as research institutes, non-governmental organizations, etc. Even though perception data are not tracked by official data producers, a collaboration would be needed with the unofficial data producers focusing particularly on methodological aspects. For the disaggregation level, both indicators could be disaggregated by type of service, i.e. the type of public service for the KPI on "Public satisfaction on public services" and the type of corporate service for second one. Furthermore, for most of the KPI (6 out of 10), baselines and targets are missing as shown in the table below, and only 4 are aligned with SDG indicators.

Summary table for NKRA 9

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
NKRA 9	i°)*Access to all-weather road throughout the year* ii°)*Percentage of people within Gewog that have access to reliable public transport*	i°)*None*	- location/ region - type of service	Administrative	*Partially* aligned (50%)

NKRA 12: Corruption Reduced

Three KPI were initially defined for this NKRA related to corruption. Three new KPI are proposed, namely "Citizens' perceptions of public sector corruption", "Citizen's perceptions of private sector corruption" and "Number of prosecutions by the anti-corruption commission in a year". The two first KPI measure the perceptions of citizens who have already experienced some type of corruption, for example by paying bribes or giving gift, in order to be delivered for services either in the public or the private sector. To measure such KPI, perception surveys are required and they should be carried out frequently in order to assess measures taken by the government towards reducing corruption in the public and the private sectors. Regarding the third KPI, given the various anti-corruption measures, it is important to know whether they are relevant or not, by investigating the number of cases that are submitted to the ACC and effectively solved i.e. those for which prosecutions are engaged. These proposed KPI could be disaggregated by sex and age of victims of the corruption, education of bribe giver, by type such as administrative, judicial, institutional, political, etc. In terms of SDG alignment, all the KPI are aligned to indicators 16.5.1 and 16.5.2. as shown in the table below.

Summary table for NKRA 12

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
NKRA 12	i°)*None*	i°)*Citizens' perceptions of public sector corruption* ii°)*Citizen's perceptions of private sector corruption* ii°)*Number of prosecutions by the anti-corruption commission in a year*	- sex - age - location - type of service	Administrative& perception surveys	*Almost fully* aligned (68%)

NKRA 16: Justice Services and Institutions Strengthened

On the total number of KPI under NKRA 16, there is only one for which baselines and targets are specified. The two first KPI related to citizens' confidence on judicial services or police services should be measured based on perception surveys, compared to the others which mostly depend on administrative data. One additional KPI is proposed corresponding to "Percentage of children under age 5 whose birth is registered with a civil authority". Data for this KPI could be gathered through civil registration and vital statistics in addition to household surveys such as MICS and DHS. The following levels of disaggregation are proposed: by location or place or residence, sex, age and income. About half of the KPI are aligned with SDG 16 indicators, namely 16.3.2, 16.5.1, 16.5.2, and 16.9.1.

Summary table for NKRA 16

	Indicator reformulated	New indicator proposed	Disaggregation level proposed	Main data source	Alignment with SDGs
NKRA 16	i°)*None*	i°) *Percentage of children under age 5 whose birth is registered with a civil authority*	- sex - age - location - income	Surveys & CRVS	*Partially*aligned (36%)

Data Availability on a selected set of indicators for monitoring 11th & 12th FYP

A data-mapping assessment study was carried out to assess the availability of data for a selected set of indicators of eight NKRA of 11th& 12th Plans and APA indicators. Table1provides an overview of the data availability situation in Bhutan. Out of 95 indicators that have been analyzed, data are available for a total of 74 indicators (77.9 percent). Overall, the data availability situation is satisfactory. For some indicators, data need to be produced from information collected for administrative purposes, while for others data need to be calculated or estimated from existing survey data. Hence, more efforts will be required to make these data available in a user-friendly format. Moreover, data should be made available at disaggregated levels for many indicators.

Table1 : Data availability for the selected goal areas of 12th & 11th Five Year Plan

Goal area (NKRA)	Number of indicators for which data are available	Total number of indicators
1. Poverty Eradicated and Inequality Reduced	10	10
2. Carbon Neutral, Climate and Disaster Resilient Development Enhanced	7	9
3. Healthy Ecosystem Services Maintained	7	8
4. Quality of Education and Skills Improved	11	15
5. Gender Equality Promoted, Women and Girls Empowered	13	15
6. Productive and Gainful Employment Created	8	9
7. Healthy and Caring Society Enhanced	18	22
8. Justice Services and Institutions Strengthened	0	7
Total	74	95

In Bhutan, data are most available for the goal areas concerning poverty (100%), Productive and Gainful Employment Created (89%), Healthy Ecosystem Services Maintained (87.5%), and Gender Equality Promoted, Women and Girls Empowered (86.7%) as seen in the Figure 15 below. For other goal areas, the percentage of indicators for which data are available is below 80 percent. There is not a single data for NKRA 16: Justice Services and Institutions Strengthened. Scarcity of data for this indicator is perhaps understandable since the associated goal area deals mainly with softer issues. However, data may be generated for some of the indicators very easily by taking appropriate administrative steps. For example, administrative data recorded by the Ministry of Law, Justice and Parliamentary Affairs, the Royal Bhutan Police, etc. For some indicators, new surveys may need to be conducted. A major concern in the context of data availability is generating data at the needed level of disaggregation. The scope of current surveys may need to be broadened in order to provide robust data at disaggregated levels.

Figure 15: ***Data Availability for the selected 8 Goals (NKRA)***

In terms of data sources, data for monitoring progress on development indicators can be obtained from various sources. Eleven major national sources of data for a variety of indicators were identified during the data-mapping exercise. Brief descriptions of these sources are presented in Table 2 below:

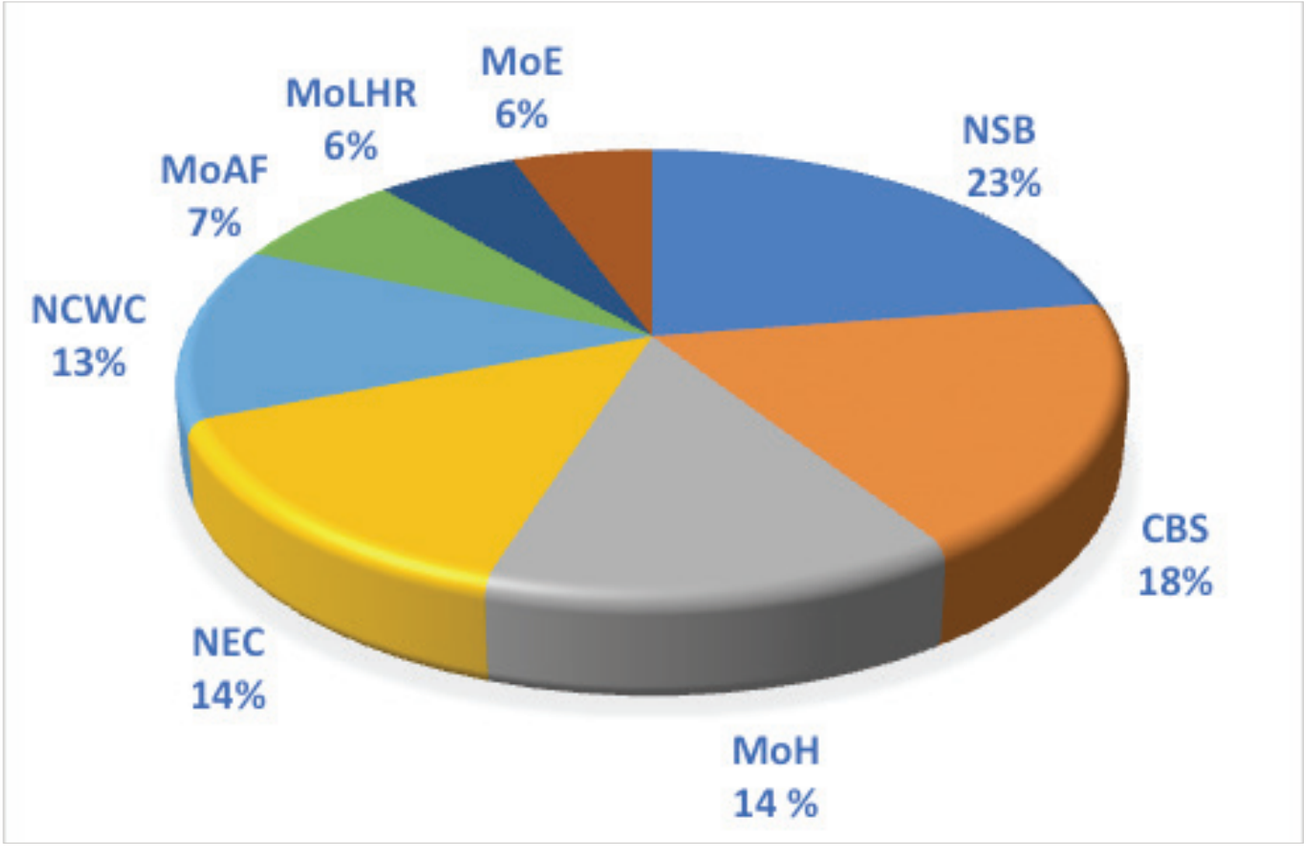
Table 2 :Major national sources of data

Survey	Latest issue available	Year started	Year of upcoming issue	Description	Publisher and frequency of publication
Bhutan Living Standard Survey (BLSS)	2012 (3rd round)	2003	2017	National survey conducted by the NSB. Household income and consumption data by income group are collected at the district level.	Published by the NSB at regular intervals of five years.
Labour Force Survey (LFS)	2015 (13th round)	2003	2016	One of the locally funded national surveys of the MoLHR. The LFS provides information on the labour force and employment situation.	Published by the MoLHR Annually.
Bhutan Multiple Indicator Survey (BMIS)	2010	2010	NA	Bhutan Multiple Indicator Survey (BMIS) conducted by the NSB. Financial and technical support provided by the United Nations Children's Fund (UNICEF) and the United Nations Population Fund (UNFPA).	Published by the NSB only at one point of time (2010)
National Health Survey	2012 (3rd round)	1994		National health survey conducted by the MoH. Household income and consumption data by income group are collected at the district level.	Published by the MoH at two point of time (2000 & 2012).

Gross National Happiness Survey	2015 (2nd round)	2010		Gross National Happiness survey conducted by the CBS.	Published by the CBS at regular intervals of five years.
RNR Census	2009	2009	2019	RNR Census conducted by the MoAF.	Published by the MoAF every 5 years.
Bhutan RNR statistics	2016	2013	2017	Surveys conducted by the MoAF	Published by MoAF annually
Establishment Survey	2007	2002		Establishment Survey conducted by the MoLHR.	Published by the MoLHR
Population and Housing Census of Bhutan	2017	2005	2017	Population and Housing Census of Bhutan conducted by the NSB.	Published by the NSB, at the interval of 10 years.
Household Income and Expenditure Survey (HIES)	2000	2000	NA	Household Income and Expenditure Survey (HIES)	Published by the NSB, in 2000 as a Pilot study.
EMIS (AES)	2016	-	2017	EMIS conducted by MoE	Published by the MoE
BHMIS (AHB)	2016		2017	BHMIS conducted by MoH	Published by the MoH

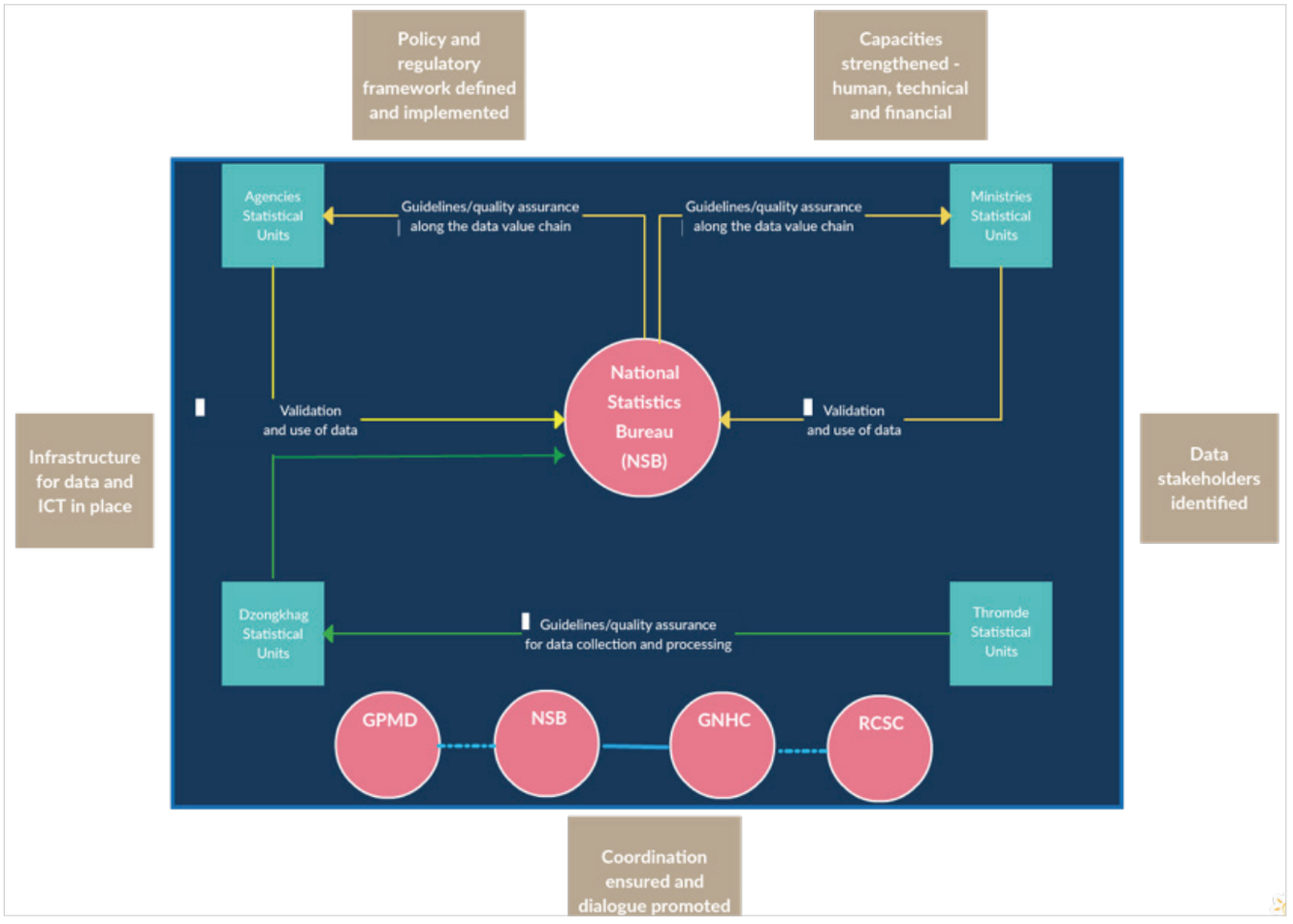
Figure 16 shows the distribution of data for the selected 8 goals and indicators by the national data producer. As expected, the NSB is the leading data producer, generating about 23percent of all available data. MoH contributes as the core national source for health sector data, while the CBS is responsible for many of the GNH related data. These two entities produce 32percent of available data for the selected national indicators for this study. The MoE produces data for education sector indicators. The other leading data producers are the Ministry of Labour and Human Resources, Ministry of Agriculture and Forests, National Environment Commission, and National Council for Women and Children.

Figure 16 : Distribution of data by national data producer for the selected set of indicators



5. PROPOSED DATA ECOSYSTEM MODEL

Figure 17 : Proposed data ecosystem model



The ecosystem model proposed above is based on the results of the literature review and the data mapping analysis. The literature review has shown that five pillars are important to consider for a functional data ecosystem, namely well-defined regulatory framework with implemented policies, strengthened capacities including financial, human and technical, both at national and local levels, available infrastructure in terms of data and ICT, identified data stakeholders, including the official one within the statistical system than the non-official one, with their respective roles in the data ecosystem, and finally the coordination and dialogue that should be ensured and promoted between key data stakeholders. All these pillars in place should improve the quality and use of data for evidence-based policy, from design, implementation, monitoring and assessment. NSB is at the heart of the data ecosystem, playing a key role along the data value chain at both levels, i.e. local and national.

NSB should provide guidelines and quality assurance to data producers by improving technical support to all statistical units in Ministries, Agencies, Dzongkhag, etc., and validate the produced data for their use by various stakeholders. For facilitating NSB's role to work with key data producers to provide guidelines and quality assurance, an enabling environment is needed where policies (for example microdata dissemination policy) and legislation are well defined and implemented. If infrastructure in terms of ICT and data are in place, they will facilitate the production and use of data in a timely manner and communication between stakeholders of the data ecosystem. It is important to mention that there are some efforts in Bhutan in this regard, where for example consumer price data are collected by statistical officers in various districts using a mobile telephone application and directly transferred to NSB. Using ICT along the data value chain, will help NSB to ensure the dissemination of real time data to data users and help them improve their decision making.

If policies and legislation are in place, with required data and ICT infrastructure, there will not be effective in facilitating data flows within the ecosystem without a good coordination and dialogue between stakeholders.

NSB, given its central role in data production, and GNHC which is at the heart of planning, are the two first stakeholders where steps should be taken to ensure that mechanisms are in place for ensuring their close collaboration. Consequently, this could enable the supply of data to meet users' needs, and change the state of play within a short timeframe. Once the mechanisms are in place for NSB and GNHC for an effective coordination, a dialogue with GPMD and RCSC will help strengthen the data ecosystem.

Conclusions and recommendations

The data ecosystem mapping conducted gives a detailed understanding on the global debate towards data and the global development goals on the one hand, and the key components of Bhutan's data ecosystem on the other hand. In addition to the literature review, key data stakeholders were consulted through surveys, FGD and KII to have a clear and in-depth assessment of the existing gaps regarding policies and capacities, and that need to be addressed for an effective measurement, monitoring and evaluation of the 12th FYP along with the SDGs. The conclusions and recommendations proposed below summarizes the outcomes of the literature review and the analysis made based on the multi-stakeholder consultation process and the data mapping analysis.

Legal and policy framework: an update is required

The literature review and the multi-stakeholders' consultations reveal that the legislation governing official statistics is outdated, with the 2006 Executive Order that need to be revised and the Statistical Law enacted. Even though this Executive order do exist, the provisions it lays out are not always respected by stakeholders, particularly those within the NSS. With regards to policies for statistical activities, anNSDShas been developed and adopted but unfortunately not fully implemented, and a micro data dissemination policy is still at a draft stage as of this writing.

- Short term:
    a. Develop mechanisms between data producers to review existing legislation governing the data ecosystem and make sure about their relevancy and avoid conflicting provisions;
    b. Revise the 2006 Executive Order, communicate about the outcomes of its revision and ensure its application by all stakeholders within the National Statistical System;
    c. Promote best practices between data producers on data collection & dissemination norms and standards, in compliance with international standards

- Medium & long term:
    a. Update and Enact the Statistical Law, and approve the BSS proposal;
    b. Approve and implement the microdata dissemination policy and the NSDS, by ensuring sufficient resources to avoid the many issues face in the first NSDS;
    c. Develop guidelines for quality assurance, in compliance with international standards
    d. Raise awareness on the importance of data and information to decision-making and generate interest in statistics for policy design, implementation and assessment at local and national level

Coordination: an improvement needed to ensure high-quality data

Coordination is one of the key issue that constraints the data ecosystem, particularly given the decentralized nature of the NSS. Data producers of the NSS, even those within the same sector, are not using the same standards in terms of concepts, methodologies, etc.; with potential negative impacts on the quality of produced data and comparability of statistics. The weak coordination between data producers is a reality both at the Central level than the LG level, where DSO are not regularly collaborating with other sectors officials. In addition to the weak synergy between data producers, frequent dialogue between data producers and data users is also lacking, and data seems to be often supply-driven than demand-driven. The following recommendations emerge from the literature review, survey findings and the multi-stakeholder consultations:

- Short term:
    a. Develop proper and clear SoP/ToR for Statistical Officers, Sectors and Gewog officials;
    b. Institute regular coordination meetings between data producers at Central and LG levels, and promote close collaboration between DSO and PO to reduce duplication of efforts and avoid respondents fatigue;

c. Harmonize methodologies and all database information systems, under the NSB technical guidance

- Medium & long term:
    a. Centralization of the surveys and censuses, with NSB playing the leading role for guaranteeing quality assurance
    b. Establish a harmonized framework coordinated by NSB, GNHC and GPMD, and that need to be connected to the KPI data requirements;
    c. Create space for and engage non-official data stakeholders in an ongoing dialogue in order to explore and discuss their potential role within the data ecosystem

Institutional capacities: appropriate human, financial and technical resources are necessary

Where legislation and policies are in place, with an effective coordination, the data ecosystem will not be functional without dedicated efforts towards ensuring adequate human, financial and technical resources. The following short-term and medium to long term recommendations are proposed based on literature review and finding from surveys and multi-stakeholder consultation process:

Human Resources

- Short term:
    a. Promote up-to-date trainings and data literacy for all data stakeholders
    b. Propose a revision of the ToR for DSO, focusing on their oversight role in data collection & dissemination at local level
    c. Make efficient use of available statisticians through parenting of statistical services**,** under NSB coordination

- Medium & long term:
    a. Rationalize Human Resources, with uniform deployment of statistical officials at all levels, under the coordination of NSB
    b. Conduct in-depth assessment on the relevancy to develop a curriculum in statistics
    c. Develop career opportunitieswith long term master plans for Human Resource development

Financial Resources

- Short term:
    a. Ensure a better coordination and more predictable funds from Development Partners for funding statistics;
    b. Assess existing capacities and set priorities based on investments requirements and priorities of the 12th FYP;

- Medium & long term:
    a. Explore the possibilities to introduce a budget line to support the production of key local & disaggregated data.
    b. Mobilize domestic resources, particularly from RGoB budget, to provide financial support for mandatory and designatedstatistical operations (surveys/censuses such as RNR, NHS, LFS, BLSS, PHCB, Economic Census, etc.)

Technical Resources

- Short term:
    a. Propose up-to-date trainings to data producers on the best practices for using technology in their data-related activities;
    b. Strengthen technical know-how of data producers, particularly those at the local level, to use technology for an upgrade of methodologies and tools
    c. Enforce implementation of LG portal, and ensure its coherence with other existing portals

- Medium & long term:
    a. Ensure reliable internet connectivity with better accessibility to data stakeholders at the local level;
    b. Promote the use of new technologies that are most cost-effective and ensure timely and user-friendly access to data
    c. Establish strong, skilled and qualified statistical unit with adequate staff.

Data gaps: strengthening the production of **administrative data** and **disaggregated data**
As shown by the data mapping analysis, a significant number of indicators, particularly at the LGKRA level, will be monitored by using administrative data. Consequently, capacity strengthening and considerable efforts are required to raise data stakeholders' awareness in keeping good administrative data records which could supplement surveys and censuses data.

One of the immediate next step in strengthening production of administrative data is that NSB to set standards and ensure effective quality control systems for all official statistics, including administrative data, from their production to dissemination. Furthermore, there is a need to undertake an assessment of the administrative data reporting systems, in order to fill gaps and improve the whole reporting system. Improving such system would require for NSB to support statistical units in ministries and agencies to prepare appropriate templates for collecting administrative data, in compliance with international standards.

Although the production of administrative data need to be strengthened, priority need to be given to some sectors that are involved in the production of data related to Justice, Governance, Corruption, and also Environment. Traditional methods of data collection are not sufficiently strong for the production of data in such sectors. Therefore, the capacities of statistical units who are in charge of administrative data production should be strengthened through up-to-date trainings on emerging technologies that offers significant opportunities such as earth observation data.

Significant efforts are also required to produce disaggregated data to "Leave No One behind". In fact, from a policy planning perspective, to be useful to the 12th FYP, data need to be disaggregated in such a way that could appropriately inform local and central governments on the regions, vulnerable groups and topics that need a particular focus. The recommendations regarding legislative and policy framework, and also human, financial and technical resources, if implemented, are likely to facilitate the availability of and access to more disaggregated data in Bhutan.

From the abovementioned recommendations, we propose three actions for NSB and GNHC to consider as immediate next steps to improve the statistics to meet the data requirements of the 12th FYP and SDGs:

- Develop mechanisms and a framework to review existing legislation regarding statistics, including microdata dissemination policy, coordinated by NSB and GNHC;
- Harmonize methodologies and develop guidelines for quality assurance frameworks in compliance with international standards, under NSB leadership;
- Promote up-to-date trainings for those in charge of statistical production at national and LG levels, based on an in-depth assessment of their needs and capacities, with a close collaboration of NSB and GNHC;

For the Government, the following recommendations could be considered as the next immediate steps in order to strengthen statistics in the country:

- Undertake assessment of existing capacities, in terms of financial resources, in order to fulfill 12th FYP and SGDs data requirements;
- Explore the opportunities to significantly increase domestic resources for providing financial support to conduct the mandatory and designatedstatistical operations (surveys/censuses such as RNR, NHS, LFS, BLSS, PHCB, Economic Census, etc.) necessary to meet the data requirements for 12th FYP and SDGs.

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ANNEX 1: QUESTIONNAIRE

Questionnaire No: |___|___|
Survey Date: |___|___||___|___||___|___|

SECTION I: IDENTIFICATION OF YOUR ORGANIZATION/ GENERAL INFORMATION

1.1. Dzongkhag	----------
1.2. Name of your organization	----------
1.3. Address of your organization	----------
1.4. Name of the respondent completing the questionnaire (optional)	----------
1.5. Position of the respondent	----------
1.6. Email address of the respondent	----------
1.7. Telephone No. of the respondent	|___|___|___|___|___|___|___|___|___|

SECTION II : INSTITUTIONNAL ENGAGEMENT ON DATA

Question	*Code*	*Category*
1.1. **Main activity/sector**: in which category, would you classify your organization?	|___|	**1.** Ministry **2.** Central Agency **3.** Local Government **4.** Civil Society Organization/NGO **5.** State owned company **6.** Private sector **7.** Academia/university/ Think Tank/ research institute **8.** Donor/ development partner **9.** Other (specify):

Question	*Code*	*Category*
1.2. Your organization in the data ecosystem: What is **the main role of your organization** with regards to data and statistical information?	|___|	**1.** ***Data producer***: collects and generates data within the National Statistical System **2.** ***Data user***: processes and analyses data for a particular purpose **3.** ***Data funder***: pays for the production of data **4.** ***Infomediary***: converts data to general information and proceed to its dissemination
Question	*Code*	*Category*
1.3. **Your organization and the National Statistical System (NSS)**: If your organization produces data, is it part of the national statistical system?	|___|	1. *Yes* 2. *No* 3. Don't know

Question	*Areas*	*Produce data*	*Use data*
1.4. **Areas of data used or produced** by your organization: In which of the following areas, your organization produces and/or uses data?	Education	|___|	|___|
	Employment	|___|	|___|
	Environment	|___|	|___|
	Democracy	|___|	|___|
	Decentralization	|___|	|___|
	Public Services	|___|	|___|
	Corruption	|___|	|___|
	Justice	|___|	|___|
	Health	|___|	|___|
	Poverty&Inequality	|___|	|___|
	Culture	|___|	|___|
	Food Security (or Agriculture)	|___|	|___|
	Gender	|___|	|___|
	HumanSettlements	|___|	|___|
	Water	|___|	|___|
	Others (specify)		

Question	*Type of data sources*	*Quality of data sources*(check one option per row i.e. for each type of data sources)				
		1	**2**	**3**	**4**	**5**
1.5. **Use of data** by your organization (**type & quality**): - What are the main data sources used by your organization? - How could you evaluate the qualityof these data sources? * **To evaluate the quality of these data sources, please consider a scale from 1 to 5:* *1: very low* *2: low* 3: medium 4: high 5: very high	***Official data*** produced by public authorities (from surveys, censuses, administrative sources within the NSS)	|___|	|___|	|___|	|___|	|___|
	Unofficial data produced by stakeholders outside of the NSS (data from Civil Society Organisation/ NGO, Universities/Think Tank, Private Sector, etc.)	|___|	|___|	|___|	|___|	|___|
	External data sourcesproduced by international organisations (data from sources such as World Bank, UN Agencies, IMF, etc.)	|___|	|___|	|___|	|___|	|___|

Question	*Category*	*Data Producer*	*Data User*
1.6. **Data with a low quality**: - What are the main reasons for the (poor) low quality of data? (*You can select more than one category*)	1. Low coordination between data producers within the same sector	|___|	|___|
	2. Inadequate assessment of user statistical needs per sector (or low collaboration between data producers and data users/ sector)	|___|	|___|
	3. Non-compliance with international standards/ guidelines for data production	|___|	|___|
	4. Lack of regular training for data producers	|___|	|___|
	5. Lack of standardized tools for data collection, analysis and dissemination	|___|	|___|
	6. Other (specify)	|___|	|___|

Question	*Category*	*Data Producer*	*Data User*
1.7. **Purpose for data use/ data production**: For what purpose your organization is using and/ or producing data? (*You may choose one or more categories*)	1. Decision making	|___|	|___|
	2. Policy /Planning	|___|	|___|
	3. Monitoring, Evaluation and Impact assessment	|___|	|___|
	4. Research and analytical issues	|___|	|___|
	5. Informing the general public	|___|	|___|
	6. Other (specify)	|___|	|___|

Question	*Code*	*Category*
1.8. **Funding of your activities** related to data: How activities related to data production and/or use within your organization are funded? (*You may choose one or more categories*)	|___| |___|	1. Government budget 2. Own budget (i.e. financial means generated by your organization) 3. Donor funding/ grants/ projects 4. Other (specify)

Question	*Key areas*	*Data producer*	*Data user*
1.9. **Major challenges/ constraints** related to data production and/ or use for your sector or within your organization: What are the major challenges/ constraints related to data production and/or use with respects to the following key areas?	2.9.1 Planning data production		
	2.9.2 Development of instruments		
	2.9.3 Data collection		
	2.9.4 Coordination of data production		
	2.9.5 Monitoring & Evaluation (quality)		
	2.9.6 Data processing		
	2.9.7 Reporting & Dissemination		
	2.9.8 Human Resources Development		
	2.9.9 Infrastructure Development (office, ICT, Statistics)		
	2.9.10 Funding for data production		

SECTION III : INSTITUTIONAL CAPACITIES

Question	*Code*	*Category*
3.1. Is there a unit/department within your organization in charge of data management activities (e.g. collection, analysis, dissemination, etc.)?	|___|	**1.** Yes **2.** No **3.** Don't know

Question	*Positions*	*No*	*Yes*	*Number of positions*
3.2. Do you have staff related to the following positions within your organization? (**Yes or No**) **If yes**, what is the number of each position?	Statisticien	|___|	|___|	|___|
	Data management Professional	|___|	|___|	|___|
	Data operator (data entry)	|___|	|___|	|___|
	Data analyste	|___|	|___|	|___|
	ICT experts	|___|	|___|	|___|
	Network and / or web page administrator	|___|	|___|	|___|
	Programmer	|___|	|___|	|___|

Question	*Areas*	*Once a year*	*Twice a year*	*Has not received*
3.3. To what extent your organization receives training in the following areas for a given year?	Data collection methods	|___|	|___|	|___|
	Use of data management software	|___|	|___|	|___|
	Analysis and presentation of data	|___|	|___|	|___|
	ICT use for data production, analysis, dissemination	|___|	|___|	|___|
	Data norms and standards	|___|	|___|	|___|
	Quality assurance	|___|	|___|	|___|
	If other training related to data (*please specify*)	|___|	|___|	|___|

Question	*Code*	*Category (Scale)*
3.4. How would you assess the ICT skills/ competences within your organization?	|___|	*1: very low* *2: low* *3: medium* *4: high* *5: very high*

Question	*Code*	*Category*
3.5. Is your organization part of a government inter-agency mechanisms that coordinate issues related to technical matters such as statistical norms and standards, data exchange, interoperability and ICT Infrastructure?	|___|	1. Yes 2. No 3. Don't know

Question	*Code*	*Category (scale)*
3.6. How would you assess the number of data scientists, statisticians and ICT experts produced by the formal education system?	|___|	*1: very low* *2: low* *3: medium* *4: high* *5: very high*

SECTION IV : LEADERSHIP

Question	*Category*	*Chief Statistician*	*Senior level data manager*	*Chief Information Officer*
1. 2. 3. 4. 4.1. Does your organisation has following top data management?	1. Yes 2. No 3. Don't know	|___|	|___|	|___|

Question	*Code*	*Category*
5. 6. 7. 8. 4.2. Is there a dedicated department/unit within your organization responsible for implementing programmes/activities on data for development, and accountable for them?	|___|	1. Yes 2. No 3. Don't know

Question	*Code*	*Category*
4.3. Is your organization leadership championing the use of data for development?	|___|	1. Yes 2. No 3. Don't know

Question	*Code*	*Category*
4.4. Does your organization provide authorizations for the use of its data? (**Yes or No**)	|___|	1. Yes 2. No 3. Don't know

Question	*Data visualization tools*	*Code*	*Category*
4.5. Do the decision making and planning within your organization routinely data-driven by using the following data visualization tools?	Maps	|___|	1. Yes 2. No 3. Don't know
	Infographics	|___|	
	Dashboards	|___|	
	Online databases	|___|	
	Other (specify)	|___|	

Question	*Code*	*Category (scale)*
4.6. How do you qualify the level of support across the political spectrum for initiatives aiming to improve the quality of data, transparency and openness?	|___|	*1: very low* *2: low* *3: medium* *4: high* *5: very high*

Question	*Area*	*Lead institution*
4.7. According to you, which institution is the nationwide leader in the following areas?	Data production	
	Use of data for the development and monitoring of policies, strategies and programs	
	Promotion of technologies and innovation in data production, accessibility, exchange	
	Promotion of technologies and innovation for data analysis, visualization, dissemination	

SECTION V: LEGAL FRAMEWORK & DATA POLICIES

Question			*Answer*			
1.1 What official policies, laws or regulations exist with respect to data, statistics, ICT, access to information, and privacy?						
Question	***Activities***	***Law***	***Government decision***	***Regulation, internal order***	***Has no mandate***	***Other (specify)***
5. 5.1. Is your organization holding mandate for the following activities? *(*For each row, check all that apply)*	Data collection and production	|___|	|___|	|___|	|___|	|___|
	Data dissemination	|___|	|___|	|___|	|___|	|___|
	Access to information	|___|	|___|	|___|	|___|	|___|
	Promoting ICT for the production/use of data	|___|	|___|	|___|	|___|	|___|
	Data protection	|___|	|___|	|___|	|___|	|___|
	Other (specify)	|___|	|___|	|___|	|___|	|___|

Question	***Limitations/obstacles***	***Code***	***Category***
5.2. Are there limitations/obstacles of the legal and regulatory framework regarding the production and/or use of data within your organization?	Incomplete legal and regulatory framework	|___|	1. Yes 2. No 3. Don't know
	Conflicting provisions within the legal and regulatory framework	|___|	
	Lack of legal and regulatory framework	|___|	

Question	***Area***	***Code***	***Category***
5.3. Is any of the following policies and standards implemented within your organization?	Metadata standards	|___|	1. Yes 2. No 3. Don't know
	Data accessible by the widest possible audience	|___|	
	Data license or sales agreement	|___|	
	Data sharing policy	|___|	
	Pricing policy	|___|	
	Policy for ensuring data quality, disaggregation and timeliness	|___|	
	Confidentiality policies for protecting privacy	|___|	
	Other (specify)	|___|	

Question	***Code***	***Category***
5.4. Are the terms and conditions under which data are collected, processed and disseminated by your organization available to the public?	|___|	1. Yes 2. No 3. Don't know

SECTION VI: INFRASTRUCTURE

Question	*Code*	*Category*
6.1 Does your organization maintain and regularly update an online data portal?	|___|	1. Yes 2. No 3. Don't know

Question	*Data exchange types*	*Code*	*Category*
6.2 Does your organization have access to intranet and/or extranet for automatic exchange of data, including with other data stakeholders?	Intranet (within the organization)	|___|	1. Yes 2. No 3. Don't know
	Extranet (with external partners)	|___|	

Question	*Code*	*Category*
6.3 Does your organization have access to super-computing capacity and connectivity to process and manage large volumes of data?	|___|	1. Yes 2. No 3. Don't know

Question	*Code*	*Category*
6.4 What tools and methods do you use for collecting data?	|___|	1. Paper 2. PDA 3. Tablets 4. GPS 5. Other technological tools (specify)

Question	*Code*	*Category*
6.5 What methods do you use for disseminating data?	|___|	1. Hardcopy 2. CD-ROM 3. Download via internet 4. View online only 5. Email 6. Other (specify)

Question	*Code*	*Category*
6.6 Do you regularly backup your data? (**Yes or No**)	|___|	1. Internal backup 2. External through an external service provider 3. No backup

Question	*Code*	*Category*
6.7 What software do you use for analyzing and visualizing data	|___|	1. Excel 2. SPSS 3. STATA 4. SAS 5. Other (specify)
6.8 . Any other comments (Suggestions or recommendations)		

ANNEX 2: INDICATORS FOR SELECTED NKRA & LGKRA

LGKRA 1

LGKRA	KPI	Unit	Baseline	Target	Data source	Collection methodology	Frequency of data collection	KPI Description	Data Producer	Quality guidelines	Time series	Disaggregation	Main data user	Who monitors the data you produced	Who do you report to	Link with SDGs indicators
1: Gainful employment created and local economy enhanced	Income generated from sale of local farm products	Nu. (in Million)	33.195 (2015)	35	Annual RNR stats	Sample Survey at household level	Biannual	This indicator measures total income from sale of local farm products. Annual farm income can be directly sourced from annual RNR statistics	Dzongkhag	No	2001-2016	No but should be per farm size and Dzongkhag Throm and Yenlag throm	DoA	DoA	MoAF	2.3.2: Average income of small-scale food producers, by sex and indigenous status
	Income generated from sale of local non-farm products	Nu. (in Million)	NA	Track	Dzongkhag Administrative Data	admin record	Annual	This indicator measures total income from sale of local non-farm products example: cottage, small & medium industries, Hotels, legal firms, workshops, IT& electronic shops, cobbler & saloon, dry cleaning, Internet café, handicrafts house, clothing & textiles house, furniture house, tourism firms & agents, mining & water related firms etc.	Dzongkhag	No	Nil	Dzongkhag Throm and Yenlag throm, should also be per farm size	MoEA/ MoAF	NA	Cabinet	2.3.2: Average income of small-scale food producers, by sex and indigenous status
	Number of CSMIs (farm)	Number	453 (2015)	550	Administrative Data, Dzongkhag and gewog	admin record	Bi-Annual	This indicator measures creation of farm based cottage, small & medium industries, example: agro-based industries, dairy farms, poultry farms etc	Dzongkhag	No	2008-2016	No, but should be per categorie	MoAF/MoAF	MoAF	MoAF	9.3.1: Proportion of small-scale industries in total industry value added
	Number of CSMIs (Non-farm)	Number	453 (2015)	550	Administrative Data, Dzongkhag and gewog	admin record	Bi-Annual	This indicator measures creation of cottage, small & medium industries both farm and non-farm example: Hotels, workshops, IT& electronic shops, cobbler & saloon, dry cleaning, Internet café, agro-based industries, handicrafts house, clothing & textiles house, furniture house, tourism firms & agents, mining & water related firms etc. The CSMIs can be in clusters, Business Incubation Centre or stand alone industries	Dzongkhag	No	2008-2016	No, but should be per categorie and gender in order to promote women entrepreneurship	MoAF/MoAF	NA	MoAF/MoAF	9.3.1: Proportion of small-scale industries in total industry value added
	Number of new/value added products, goods and services (farm and non-farm)	Number	3	10	RNR Sector & DTIO report	admin record	Bi-annual	This indicator measures products (goods & services) which has undergone changes/transformation thereby adding value. Example: strawberries to jam & marmalade, chili/fruits to pickles, corn to corn flakes, eggs to mayonnaise, honey to beauty products, timber to building parts such as doors and windows etc.	Any clarification	No quality guidelines mentioned	Any clarification	No disaggregation mentioned but it could be by farm/nonfarm or sector	Any clarification	Any clarification	Any clarification	9.2.1: Manufacturing value added as a proportion of GDP and per capita
	Tourist arrivals by bed nights	Number	824 (2015)	2000	Annual TCB Report	admin record	Annual	This indicator measures night spent by a tourist in a Dzongkhag	TCB	No	Any clarification	By gender	GNHC/MoEA	TCB	Cabinet	8.9.1: Tourism direct GDP as a proportion of total GDP and in growth rate 8.9.2: Number of jobs in tourism industries as a proportion of totral jobs and growth rate of jobs, by sex
	Proportion of ***rural*** resident population with Bank Accounts. A proposed reformulation of the indicator is: ***Proportion of rural resident population using or having access to bank services, including bank accounts and mobile banking,***	Percent	30 (2015)	50	Report from all financial institutions	admin record from banks	Annual	This indicator measures the number of rural people who have bank accounts in any banks in their respective names. There is a problem with this description because it seems that only rural people are taken into account, which is not clear and explicit while looking at the way the indicator is defined. To take into account the growing importance of mobile banking, a proposed reformulation is to introduce this idea in the KPI definition. Therefore the revised KPI include rural people with bank account and rural people using mobile banking in the past 6 to 12 months	Any clarification	No quality guidelines mentioned	Any clarification	If we accept to reformulate the definition by adding rural and the idea of mobile banking, the indicator could then be disaggregated by gender, age, income level and education level	GNHC/Cabinet	NA	GNHC/Cabinet	8.10.2: Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider
	Proportion of credit to priority sectors (Agri, tourism & CSMIs)	Percent	any baseline mentioned	Track	Report from all financial institutions	admin record from banks	Annual	The indicator measures the proportion of total credit disbursed to priority sectors of Agriculture, Tourism, and CSMIs to total credit by financial institution in the Dzongkhag.	Any clarification	No quality guidelines mentioned	Any clarification		GNHC/MoEA/MoAF	MoEA/MoAF	GNHC/Cabinet	9.3.2 Proportion of small-scale industries with a loan or line of credit
	Number of jobs created (farm and non-farm)	Number	150	1000	Any clarification	Administrative data	Annual	This indicator measures jobs (farm and non-farm) created within Dzongkha. A job is defined as a profession or a work earning cash or payment. The number of jobs created to be distinguised by 1)jobs created solely by Dzongkhags plan interventions 2) jobs created through partnerships of Dzongkhag & central agenciesand 3) jobs created by private entities with support/facilitation from Dzongkhag	Any clarification	No quality guidelines mentioned	Any clarification	No, but should be by gender	Any clarification	Any clarification	Any clarification	8.3.1 Proportion of informal employment in non-agriculture employment, by sex
	Number of people unemployed by gender	Number	159 (m) 296 (w) 2015	Track	LFS Report	Labor Force Surveys (LFS)	Bi-Annual	This indicator measures people (from farmers to different level of education) 1) without work 2) currently available for work and 3) seeking work diaggregated by gender	Any clarification	No quality guidelines mentioned	Any clarification	No, but should be by gender as per the der definition	Any clarification	Any clarification	Any clarification	8.5.2 Unemployment rate, by sex, age and persons with disabilities
	Youth employment rate engaged in the local economy	Percent	To be defined	To be defined	LFS Report	Labor Force Surveys (LFS)	Bi-Annual	This indicator reflects the percentage of the youth population that is employed in the local economy. Youth population is determined based on the definition of young people in terms of age group in Bhutan (15-24). The labor force comprises all persons in the relevant age group that are 1) without work, 2) currently available for work and 3) seeking work.		The ILO stat database could be a good reference in terms of quality assurance		Disaggreggation could be by gender, location or place of residence, formal and informal sectors, type of activities conducted in the local economy	To be defined	To be defined	To be defined	8.6.1. Proportion of youth (aged 15-24 years) not in education, employment or training 8.5.2 Unemployment rate, by sex, age and persons with disabilities

No.	KPI	Description	Unit of Measurement	Baseline Year (2016)	Baseline	Target	Source	SDGs links (& TIER)	level of disaggregation
11,1	National Unemployment Rate	The indicator measures the national unemployment rate defined as the proportion of the total unemployed to the total labour force by the Labour Force Survey conducted by MoLHR	Percentage (%)	2015	2,5		Labor Force Survey Report, 2015	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Could be disaggregated by gender, age, location or place of residence
11,2	Youth unemployment rate	The indicator measures the youth unemployment rate (between ages 15-24) as defined by the Labour Force Survey conducted by MoLHR	Percentage (%)	2015	10,7		Labor Force Survey Report, 2015	8.5.2 Unemployment rate, by sex, age and persons with disabilities (TIER I) 8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training	Could be disaggregated by gender, location or place of residence
11.2 (a)	Female	The indicator measures the youth female unemployment rate (between ages 15-24)							
11.2 (b)	Male	The indicator measures the youth male unemployment rate (between ages 15-24)							
11,3	Regular paid employee	The indicator measures the percentage of employed population that are salaried	Percentage (%)	2015	23,1		Labor Force Survey Report, 2015	Indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location	Could be disaggregated by gender, age, location or place of residence
11,4	Labor Force Participation Rate	The indicator measures the ratio of the labour force to the working-age (15 years plus) population. The labor force is the sum of the persons with work and those without work but are availabe and actively seeking work	Percentage (%)	2015	63,1		Labor Force Survey Report, 2014		
11,5	Chronic unemployment rate	The indicator measures the ratio of the labour force unemployed for more than a year	Percentage (%)	2015	45,3		Labor Force Survey Report, 2015	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Could be disaggregated by gender, age, location or place of residence
11.6	***Proportion of population with an informal employment***	The indicator measures the number of the population who are experiencing an informal employment situation, in the total people employed. The informal nature of the employment could be determined based on some countries rules in terms of labor legislation, income taxation, social benefits, etc.	Percentage (%)	To be defined	To be defined		Labor Force Survey is the primary data source	8.3.1 Proportion of informal employment in non-agriculture employment, by sex	Could be disaggregated by gender, age, location or place of residence
11.7	***Proportion of time spent on unpaid work***	This indicator measures the number of hours spent on unpaid work, for the provision of services/goods mostly at the household level.	Percentage (%)	To be defined	To be defined		Household surveys in addition to LFS for the data source, and in terms of quality assurance, UNSD is a good reference	5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location	Could be disaggregated by gender, age, location or place of residence
11.8	***Number of children removed from child labour***	This indicator measures the number of children that are removed from the labor market. The age that should be considered for defining someone in the children group could be estimated based on national policies.	Number	To be defined	To be defined		Labor Force Survey or other surveys such as the DHS, MICS, LSMS, etc.	8.7.1 Proportion and number of children aged 5-17 years engaged in child labour, by sex and age (TIER I)	Could be disaggregated by gender, age, location or place of residence

LGKRA 2

LGKRA	KPI	Unit	Baseline	Target	Data source	Collection methodology	Frequency of data collection	KPI Description	Data Producer	Quality guidelines	Time series	Disaggregation	Main data user	Who monitors the data you produced	Who do you report to	Link with SDGs indicators
Food and nutrition security enhanced	Egg production	Million	1.4 (2016)	3	RNR stats /Dzongkhag livestock sector	Survey/ Census	Annual	The indicator measures the annual production of eggs	Dzongkhag Livestock	Yes, standard format	2008-2016	Gewog wise	MoAF/ Dzongkhag	Livestock Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Milk production	MT	1030 (2016)	1500	RNR stats /Dzongkhag livestock sector	Survey/ Census	Annual	The indicator measures the annual production of milk	Dzongkhag Livestock	Yes, standard format	2008-2016	Cattle/prodn,	MoAF/ Dzongkhag	Livestock Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Meat production	MT	29,06	55,3	RNR stats /Dzongkhag livestock sector	Survey/ Census	Annual	The indicator measures the annual production of meat, including Pork, Chevon, Chicken and Fish	Dzongkhag Livestock	Yes, standard format	2008-2016	Gewog wise	MoAF/ Dzongkhag	Livestock Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Cereal production	MT	6351	6729	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This will measure the total cereal production of 1. Paddy 2. Maize	Dzongkhag Agriculture	Yes, standard format	2008-2016	Area & crops, but could also be disaggregated by gender and age of farm manager	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Vegetable production	MT	370 (2016)	728	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This indicator measures the annual production of 3 major Vegetable crops viz Chilli, Beans & Cabbage	Dzongkhag Agriculture	Yes, standard format	2008-2016	Area & crops, but could also be disaggregated by gender and age of farm manager	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Paddy field without access to assured irrigation water	Acres	196 (2016)	50	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This indicator measures acres of paddy field without access to proper and reliable irrigation water	Dzongkhag Agriculture	Yes, standard format	2008-2016	Area (farm size) & crops (crop is not relevant because we are talking about one crop), but could also be disaggregated by gender and age of farm manager	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	
	Area of wet land left fallow	Acres	2642 (2016)	1321	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This indicator measures area of total wet land left uncultivated due to various factors and reasons	Dzongkhag Agriculture	Yes, standard format	2008-2016	Could be disaggregated by farm size, gender and age of farm manager	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	2.4.1: Proportion of agricultural area under productive and sustainable agriculture
	Area under organic agriculture. ***Share of organic agriculture land area on total agricultural land.***	Acres	20 (2016)	120	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This indicator measures area under organic agriculture without use of pesticides, chemicals, fertilizers, growth hormones instead using organic waste and natural manures etc. If the reformulation is accepted, the new indicator will correspond to the area of land that is under organic agriculture (i.e. without use of pesticides, chemicals, fertilizers, growth hormones instead using organic waste and natural manures etc.) on the total area of agricultural land.	Dzongkhag Agriculture	Yes, standard format	2008-2016	Could be disaggregated by farm size, gender and age of farm manager	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	2.4.1: Proportion of agricultural area under productive and sustainable agriculture
	Percentage of households with kitchen garden	Percent	95 (2016)	100	RNR stats /Dzongkhag agricultural sector	Survey/ Census	Annual	This indicator measures the percentage of HHs growing at least three varities of vegetable at any point of the year excluding chilli.	Dzongkhag Agriculture	Yes, standard format	2008-2016	Could be disaggregated by household size, gender and age of household head	MoAF/ Dzongkhag	Agriculture Sector/MoAF	MoAF	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
	Proportion of food requirement met from SAP for school feeding	Percent	90	100	Education Statistics	Survey/ Census	Annual	This indicator measures the proportion of food requirement met from SAP in schools	Education Sector	Yes, standard format	2015-2016		MoE	MoE/MoAF	MoE	

NKRA 8

No.	KPI	Description	Unit of Measurement	Baseline Year (2016)	Baseline	Target	Source	SDGs links	level of disaggregation
8,1	Proportion of Agriculture Land under Cultivation	The indicator measures the proportion of Agriculture land that is cultivated as percentage of total Agriculture land	Percentage (%)	2010	2,93		State of Environment Report, 2016, NEC	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	by region or geographical area, size of the farm, gender and age (enterprise manager)
8,2	Area of Land under Assured Irrigation. Could be reformulated as follow: ***Area of land under assured irrigation as a percentage of cultivated land.***	The indicator measures the total acreage of land that is covered by functional and reliable irrigation with assured water supply. This indicator is defined as the total acreage of cultivated land that is covered by functional and reliable irrigation with assured water supply.	Acres. Should be percentage if we accept the reformulation.	2010. To be determined if we accept the reformulation of the indicator.	67676. To be determined if we accept the reformulation of the indicator		Administrative Data, MoAF	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	by region or geographical area, size of the farm, gender and age (enterprise manager)
8,3	Food Sufficiency	The indicator measures the sufficiency level of overall food as measured through the food basket determined by the MoAF	Percentage (%)	2014	81,91				by region
8,4	Case of Food Insufficiency in the country	The indicator measures the percentage of households that experience food insufficiency (as defined in BLSS 2012) in the country in the last 12 months	Percentage (%)	2012	4,8			2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	by region
8,5	Stunting (Height for Age)	The indicator measures the percentage of population that don't meet the height for age growth standards	Percentage (%)	2010	33,5		Food & Nutrition Security Policy 2014		by sex , education level of the parent, income & place of region
8,6	Prevalence of Anemia in women. ***Prevalence of Anemia in women of reproductive age (15-49)***	The indicator measures percentage of adolescent girls that are anemic (Hemoglobin concentrations less than 12g/dL at sea level). The indicator measures percentage of women of reproductive age (15-49) that are anemic ((Hemoglobin concentrations less than 12g/dL at sea level).	Percentage (%)	2014	31,3 (To be Determined if we accept the reformulation of the KPI.		Administrative data		by age, education level, income & place of residence, socio-economic status
8,7	Prevalence of Anemia in children (6-60 months)	The indicator measures percentage of children (6-60 months) that are anemic (Hemoglobin concentrations less than 12g/dL at sea level).	Percentage (%)		To be Determined		National Nutrition Survey, 2015		by age, education level, income & place of residence of the mother
8,8	Water Security Index	The indicator measures water security using the Bhutan Water Security Index which constitutes of 5 dimensions- Rural, Economic, Urban, Environment, and Resilience- developed by the National Environment Commission. The index is scaled frm 1 - 5, where a score of 1 represents the lowest level of security and 5 represents the highest. Score of 3 corresponds to 'Capable Stage' which is achieved upon fulfilment of a set of criteria.	Average Baseline Score	2015	3,06		Integrated Water Resource Management Plan, 2016		by region
8,91	***Percentage of wastewater treated and reused***	The indicator measures the percentage of wastewater that is treated in order to produce safe water suitable for reuse without impacts in the environment and a solid sludge suitable for disposal or reuse	Percentage (%)	To be Determined	To be Determined		It should be administrative data	6.3.1 Proportion of wastewater safely treated	by source, i.e. domestic, industrial, etc.
8,92	***Wasting (weight for age)***	The indicator measures the percentage of population that don't meet the weight for age growth standards	Percentage (%)	To be Determined	To be Determined		It should be administrative data and/or household surveys	2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)	by sex , education level of the parent, income & place of residence

LGKRA 3

LGKRA	KPI	Unit	Baseline	Target	Data source	Collection methodology	Frequency of data collection	KPI Description	Data Producer	Quality guidelines	Time series	Disaggregation	Main data user	Who monitors the data you produced	Who do you report	Link with SDGs indicators
Community health enhanced and water security ensured	Immunization coverage	Percent	100 (2016)	100	Annual Activity Report & Annual Health Survey	Administrative Record	Monthly	This indicator measures the Proportion of population covered by critical immunization like, Measles, rubbela and pentavalent vaccine	DHO	Yes (MCH Card)	Yes, Regular (monthly)	No disaggregation	MoH & LGs	DHO & MoH		*3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)*
	Incidence of IM	Number	13 (2016)	0	Annual Activity Report & Annual Health Survey	Survey	Annual	This indicator measures number of clincially preventative death of women starting from pregnancy till 42 days after delivery of child	DHO	Yes	Yes, Regular (monthly & Annually)	No disaggregation, but should be disaggregated by sex, age (neonatal, infant,child), wealth quintile, residence, and mother's education, and by cause, including preterm birth complications, pneumonia, and diarrhoea	MoH & LGs	DHO & MoH		*3.2.2: Neonatal mortality rate*
	Incidence of MM	Number	2 (2016)	0	Administrative Data, Dzongkhag Health Sector	Survey & administrative record	Annual	This indicator measures number of clincially preventative death of women starting from pregnancy till 42 days after delivery of child	DHO	Yes	Yes, Regular (monthly & Annually)	No disaggregation (except for age), could also be disaggregated by residence	MoH & LGs	DHO & MoH		*3.1.1 Maternal mortality ratio*
	Incidence of U5M	Number	15 (2016)	0	Administrative Data, Dzongkhag Health Sector	Survey	Annual	This indicator measures number of clincially preventative death of child bewteen 1-5 years of age	DHO	Yes	Yes, Regular (monthly & Annually)	No disaggregation (except for age), but should be disaggregated by sex, age (neonatal, infant,child), wealth quintile, residence, and mother's education	MoH & LGs	DHO & MoH		*3.2.1 Under-five mortality rate*
	Institutional delivery. ***Percentage of birth attended by skilled health personnel***	Percent	56.4 (2016)	100	Annual Activity Report & Annual Health Survey	Survey & administrative record	Annual	This indicator measures proportion of births attended by skilled health personnel (birth at health centers)	DHO	Yes	Yes, Regular (monthly & Annually)	No disaggregation (except for age), but should be disaggregated by residence (urban/rural), household wealth (quintiles) and maternal age	MoH & LGs	DHO & MoH		*3.1.2: Proportion of births attended by skilled health personnel*
	Doctor to population ratio. ***Ratio of health professionals to population***	Ratio	1:10000	Track	Annual Activity Report & Annual Health Survey	Survey & administrative record	Annual	This indicator measures the number of doctors to total resident population of the Dzongkhag. If we accept the reformulation, the definition should be as follow: This indicator measures the number of health professionals (doctors, nurses, caregivers, community health workers, etc.) to resident population of Dzongkhag	DHO			Could be disaggregated by residence				*3.c.1: Health worker density and distribution*
	Households without proper sanitation (PF toilet)	Percent	20 (2016)	0	Annual Health Bulletin, MoH Report/Administrative Data, Dzongkhag Health Sector	Survey	Annual	This indicator measures proportion of household without proper (PF toilet) sanitation	DHO	Yes	Yes, Annually	No disaggregation, could be disaggregated by place of residence (urban/rural) and socioeconomic status (wealth, affordability), gender, disadvantaged group	MoH & LGs	DHO & MoH		*6.2.1 Percentage of population using safely managed sanitation services, including a hand-washing facility with soap and water*
	Households without access to 24*7 safe clean water supply	Percent	7 (2016)	0	Administrative Data, Dzongkhag Health Sector	Survey	Annual	This indicator measures number of households without access to 24X7 clean drinking water at door step Or indoor whichever is feasible	DHO	No	Yes, Annually	No disaggregation, could be disaggregated by place of residence (urban/rural) and socioeconomic status (wealth, affordability), gender, disadvantaged group	MoH & LGs	DHO & MoH		*6.1.1 Percentage of population using safely managed drinking water services*
	Initiatives to reduce alcohol death	Number	25 (2016)	0	Annual Health Bulletin	Administrative record	Annual	This indicator measures programs/activities implemented to reduce harmful use of alcohol as per National Policy and Strategic Framework to Reduce Harmful use of Alcohol	Any clarification, but it should be the directorate in charge of death registration system	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		*3.5.2 Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol*
	Initiatives to reduce suicides	Number	13 (2015)	0	Annual Health Bulletin	Administrative record	Annual	This indicator measures programs/activities implemented to prevent suicides as per Suicide Prevention in Bhutan- A Three Year Action Plan	Any clarification, but it should be the directorate in charge of death registration system	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		*3.4.2 Suicide mortality rate*
	Initiatives to prevent HIV & AIDS	Number	12 (2016)	12	Annual Health Bulletin	Survey	Annual	This indicator measures the number of initiatives to prevent HIV & AIDS	Any clarification, but it should be the directorate in charge of health under MoH	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		*3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations*
	Initiatives to prevent NCDs	Number	90 (2016)	<50	Annual Health Bulletin	Survey	Annual	This indicator measures the number initiatives such as exercise, healthy and balanced life style etc. to prevent NCD cases	Any clarification	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		
	Initiatives to prevent Air & Waterborne diseases	Number	17 (2016)	<10	Annual Health Bulletin	Survey	Annual	This indicator measures the initiatives to prevent air and water born dieseas diseases such as awareness,	Any clarification	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		*3.9.1 Mortality rate attributed to household and ambient air pollution 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH)*
	Initiatives to reduce drug and substance abuse cases	Number	30 (2016)	<15	RBP	Record maintained by RBP		This indicator measures the number of initiatives such as: awareness programs, recreational facilities, managing bars and drayangs etc	Any clarification	Any clarification	Any clarification	Any clarification, but could be disaggregated by sex, age, place of residence	Any clarification	Any clarification		*3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders*
	Intra Dzongkhag and inter Gewogs Sporting events	Number	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification		
	Sporting facilities	Number	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification		
	HHs covered under Special Health Services	Number	25 (2015)	100	Annual Health Bulletin	Survey	Annual	Special Health Services is defined as specific programs targeted towards particular Group (Elder, youth, children, People With Disability etc.)	Any clarification	Any clarification	Any clarification	Any clarification, but could be disaggregated by place of residence	Any clarification	Any clarification		*3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the*
	Number of initiatives to promote adequate, healthy and balance diet	Number	Any clarification	Any clarification	Administrative Data, Dzongkhag Health Sector	Survey	Annual	This indicator measures the number initiatives such as healthy and balanced diet to promote nutrition	Any clarification	Any clarification	Any clarification	Any clarification, but could be disaggregated by place of residence	Any clarification	Any clarification		*2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)*

No.	KPI	Description	Unit of Measurement	Baseline Year	Baseline	Target	Source	SDGs links (& TIER)	level of disaggregation
14,1	Suicide Death Rate	The indicator measures the deaths caused due to suicide which is defined as an act of killing oneself or death caused by self-directed injurious behavior with any intent to die as a result of the behavior (Suicide Prevention Action Plan (2015-2018) of the Ministry of Health).	per 100,000 population	2013	15		Suicide Prevention Action Plan, MoH	3.4.2 Suicide mortality rate	by age, sex, education level, region & income level
14,2	Prevalence of Diabetes	The indicator measures the number of people suffiering from Diabetes (E10)	No. of cases reported	2014	6,4		Annual Health Bulettin	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	by age, sex, education level, place of residence & income
14,3	Raised Blood Pressure	The indicator measures the percentage of population who are currently on medication due to raised BP (SBP>=140 and/or DBP>=90mm/Hg) as per WHO STEPS survey 2014	Percentage (%)	2014	35,7		Health Fact Sheet	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	by age, sex, education level, place of residence & income
14,4	Maternal Mortality Rate	The indicator measures death of mothers per 100,000 live births	per 100,000 live births	2015	86		Annual Health Bulettin	3.1.1 Maternal mortality ratio	by age, education level, place of residence & income
14,5	Infant Mortality Rate	The indicator measures the infant (children below 1 year of age) deaths per 1000 live births	per 1000 live births	2015	30		Annual Health Bulettin	3.2.2 Neonatal mortality rate	by age, education level, place of residence & income
14,6	Under five mortality rate	The indicator measures the percentage of population whose Body Mass Index is greater than or equal to 25 Kg per square meter	per 1000 live births	2012	37,3		Health Fact Sheet	3.2.1 Under-five mortality rate	by age, education level, place of residence & income
14,7	HIV incidence (15-49 years)	The indicator measures the percentage of population that have met the sufficiency threshold of General Mental Health as defined by GNH survey	Percentage (%)	2015	0,016		GNH Survey, 2015	3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	by age, sex, education level, place of residence & income
14,8	People Enjoying Sufficiency Level in General Mental	The indicator measures the percentage of population that have met the sufficiency threshold of Safety as defined by GNH survey	Percentage (%)	2015	89		GNH Survey, 2015		by age, sex & region
14,9	People Enjoying Sufficiency Level in Safety	The indicator measures the number of targeted programs and projects specifically aimed to address the needs of Vulnerable groups	Percentage (%)	2015	92		Survey and administrative data	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	by age, sex & region
14	***Road traffic deaths rate***	The indicator measures the number of deaths per 100,000 population due to road traffic fatalities	Percentage (%)	To be determined			Survey and administrative data (civil registration and vital statistics)	3.6.1 Death rate due to road traffic injuries	by types of road users, age, sex, income groups

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LGKRA	KPI	Unit	Baseline	Target	Data source	Collection methodology	Frequency of data collection	KPI Description	Data Producer	Quality guidelines	Time series	Disaggregation	Main data user	Who monitors the data you produced	Who do you report to	Link with SDGs indicators
Gender equality promoted, women and girls empowered	Proportion of female NFE learners	%	54 (2016)	60	Administrative Data, Dzongkhag/Dzongkhag Education Stats	Administrative record	Any clarification	This indicator measures female NFE learners against total NFE learners	Schools and Dz. Education Sector	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Women representatives in user groups, self-help groups, committees and cooperatives	%	NA	50	Administrative Data, Dzongkhag	Administrative record	Any clarification	Any clarification	RNR Sector	No	Any clarification	Could be disaggregated by place of residence	Any clarification	Any clarification	Any clarification	*5.5.1 Proportion of seats held by women in national parliaments and local governments*
	Government employees (Parents) with access to functional day care creches	%	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	This indicator measures percentage of parents working in local govt and regional offices having access to day care creches	Schools and Dz. Education Sector	No	Any clarification	Could be disaggregated by place of residence	Any clarification	Any clarification	Any clarification	
	Number of girls in leadership position in schools	Number	328 (2017)	320	Administrative Data, Dzongkhag	Administrative record	Any clarification	This indicator measures female numbers of girls in leadership position in schools in various extra-cocurricular activities, clubs etc	Schools and Dz. Education Sector	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Proportion of female availing skills/entrepreneurship trainings	%	Any clarification	Any clarification	Any clarification	Surveys should be the preferred method for collecting data	Any clarification	This indicator measures percentage of female availing skills/entrepreneurship trainings for productive livelihood, economic and income enhancement	Any clarification	No	Any clarification	Could be disaggregated by age	Any clarification	Any clarification	Any clarification	*5.5.2 Proportion of women in managerial positions*
	Women, men and children covered by sensitization/awareness programs on elimination of VAW and VAM	%	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	This indicator measures percentage of women, men and children covered by sensitization/awareness programs on elimination of VAW, VAM and VAC disseggregrated by women, men and children covered	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Men, women and children covered by sensitization/awareness programs on elimination of violence against children	%	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification		Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Number of programs/initiatives to enable rural women to undertake income generating activities	Number	TBD	TBD	Administrative data, Dzongkhag, Surveys	Administrative records and surveys	should be annually	This indicator measures the number of programs and initiatives put in place at the local level in order to facilitate and promote income generating activities for women. This indicator is proposed to reflect the economic empowerment of women at the local level	TBD	TBD	TBD	Could be disaggregated by type of activities, by age group and by location	TBD	TBD	TBD	

No.	KPI	Description	Unit of Measurement	Baseline Year	Baseline	Target	Source	SDGs links (& TIER)	level of disaggregation
10,1	Women's representation in the Parliament	The indicator measures the number of women parliamentarians in the National Assembly and National Council as percentage of total parliamentarians	Percentage (%)	2016	0.08 (6 members)		Website of National Assembly. Should be administrative data from National Assembly	5.5.1 Proportion of seats held by women in national parliaments and local governments	by age, education level. Income and area of residence
10,2	Women's representation in the Local Governments	The indicator measures the representation of elected women in the local governments as percentage of total representatives including Gup, Mangmi, Chiwog Tshogpa, Thrompon, Thromde Tshogpa and Dzongkhag Thromde Thuemi.	Percentage (%)	2016	11.4 (162/1425)		Administrative Data, Department of Local Governance, MoHCA	5.5.1 Proportion of seats held by women in national parliaments and local governments	by age, income and education level
10,3	Ratio of Female to Male in tertiary education	The indicator measures the proportion of females to males in the tertiary education institutes in Bhutan	Ratio	2014	1 : 1.3		Should be administrative data	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	by region & income
10,4	Female Youth Unemployment	The indicator measures the level of female youth unemployment	Percentage (%)	2015	3,1		Labor Force Survey Report, 2015	8.5.2 Unemployment rate, by sex, age and persons with disabilities	by region, education level & income (rich or poor)
10,5	Gender Equality Index (HDI in the report & GEI)?)	The indicator will provide national level information on country's position in terms of achieving Gender Equality. The index shall be developed by NCWC in the 12th FYP	Score	2015	0,572		Human Development Report, 2015	5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment	
10,6	Female participating as candidate in management position in public Sector	The indicator measures the percentage of women candidates in management positions (Ex3 and above) in Government - measured as a percentage of total candidates against the total opening over the plan period.	Percentage (%)		TBD		RCSC	5.5.2 Proportion of women in managerial positions	by age & by background of the parents (education level & income)
10,7	***Gender gap in wages, by sector of economic activity***	The indicator measures the difference between male and female earnings. It is defined as a percentage of male earnings and should reflect gender equality and discrimination.	Percentage (%)	To be determined	To be determined	To be determined	To be determined	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	by sector of activity

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LGKRA	KPI	Unit	Baseline	Target	Data source	Collection methodology	Frequency of data collection	KPI Description	Data Producer	Quality guidelines	Time series	Disaggregation	Main data user	Who monitors the data you produced	Who do you report to	Link with SDGs indicators
Transparent, effective and efficient public service delivery enhanced	Complaints by people reported on public services other than commonly availed services	Number	NA	0	Administrative Data, Dzongkhag	Administrative record	Any clarification	This indicator measures complaints by people reported through standard mechanism such as complaint box/suggestion box and complaint register	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Annual GPMS Score	%	Any clarification	Any clarification	Administrative data from GPMD	Administrative record	Any clarification	This indicator measures percentage obtained in APA Score as per GPMS	GPMD	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Important positions not filled	Number	Any clarification	Any clarification	Administrative data	Administrative record	Any clarification	This indicator measures staff positions approved but not filled or left empty due to transfer, superanuation, long term studies, EOL etc.	Any clarification	No	Any clarification	Any clarification, but could be disagreggated by sex, age and location	Any clarification	Any clarification	Any clarification	
	Proportion of commonly availed services delivered as per TAT	%	100 (2016)	100	Administrative data	Administrative record	Any clarification	Any clarification	G2C office	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Proportion of critical road open to traffic all times	%	90 (2016)	95	Administrative Data, Dzongkhag	Administrative record	Any clarification	This indicator measures GC Roads and few critical roads (roads that benefits more communities to be specified by Dzongkhag) that are all weather accessible throughout the year	Any clarification	No	Any clarification	Any clarification, but could be disagreggated by location	Any clarification	Any clarification	Any clarification	
	Number of Gewogs accessible by public transport (Bus)	Number	4 (2016)	6	Administrative Data	Administrative record	Any clarification	This indicator measures Gewogs with buses with intervention from private promoters and MoIC	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	*11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities*
	Infrastructure with disabled friendly facilities	Any clarification	Any clarification	Any clarification	Administrative Data	Administrative record	Any clarification	This indicator measures number of infrastructures with disabled friendly facilities such as ramp,sen blocks, separate toliet for disabled, proper footpath, lift (if afforadable), if lift is not afforable service centers should be on the ground floor etc	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	*4.a.1 Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)* *11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities*
	Electricity downtime hours in 24 hrs in a year	Hrs	NA	Track	Administrative Data	Administrative record	Annual	This indicator measures electricity downtime in a year with intervention from MoEA and BPC	Any clarification	No	Any clarification	Any clarification, but could be disaggregated by place of residence	Any clarification	Any clarification	Any clarification	*7.1.1 Proportion of population with access to electricity*
	Mobile service downtime hours in 24 hrs in a year	Hrs	NA	Track	Administrative Data, that should come from MoIC	Administrative record	Annual	This indicator measures mobile downtime in a year with intervention from MoIC, BT and Tcell	Any clarification	No	Any clarification	Any clarification, but could be disaggregated by place of residence	Any clarification	Any clarification	Any clarification	*9.c.1 Proportion of population covered by a mobile network, by technology*
	Internet downtime hours in 24 hrs in a year	Hrs	NA	Track	Administrative Data, that should come from MoIC	Administrative record	Annual	This indicator measures internet downtime in a year with intervention from MoIC, BTand TashiCell	Any clarification	No	Any clarification	Any clarification, but could be disaggregated by place of residence	Any clarification	Any clarification	Any clarification	*17.6.2 Fixed Internet broadband subscriptions per 100 inhabitants, by speed* *17.8.1 Proportion of individuals using the Internet*
	Dzongkhag level Integrity Score	Score	NA	Track	ACC Report	Administrative record		Any clarification	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	
	Dzongkhag Corruption perception index	Rank	NA	Track	ACC Report	Administrative record		Any clarification	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	*16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months* *16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months*
	Complaints reported to ACC against the LGs (Dzongkhag and Gewogs)	Number	9 (2015)	Track	ACC Report	Administrative record		This indicators measures complaints reported to ACC in the dzongkhags as per ACC annual Report	Any clarification	No	Any clarification	Any clarification	Any clarification	Any clarification	Any clarification	

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No.	KPI	Description	Unit of Measurement	Baseline Year	Baseline	Target	Source	SDGs links	level of disaggregation
9,1	TAT for 50 most commonly availed public services (G2C+G2B+G2G)	The indicator measures the reduction in turnaround time for the 50 most commonly availed public services as percentage of current turnaround time	Percentage	2016	70%	50%	Administrative data, G2C Office		
9,2	Average Annual performance rating of government agencies	The indicator measures the average National Technical Committee evaluated APA scores of all Budgetary Agencies	Percentage	2015-16	94,6	TBD	Administrative Data, GPMD		
9,3	Public satisfaction on public services	The indicator measures the satisfaction level of people on the delivery of public services by public agencies	Percentage	TBD	TBD	TBD	Should be perception / surveys	16.6.2 Proportion of population satisfied with their last experience of public services	by type of public service
9,4	Public satisfaction on corporate services	The indicator measures the satisfaction level of people on the delivery of corporate services by corporate agencies	Percentage	TBD	TBD	TBD	Should be perception / surveys		by type of corporate service
9,5	New public services delegated from Central Agencies to LGs	The indicator measures the number of public services that are delegated by Central agencies to the Local Governments for effective and efficient delivery	Number	2016	0	15	Administrative data, G2C Office		
9,6	Roads accessible throughout the year in all types of weather. ***Access to all-weather road throughout the year.***	This indicator measures the proportion of motor roads that are all weather accessible throughout the year (black topped or permanent works). If reformulation accepted, the indicator measures the proportion of the population that lives within [x] km of roads that are reliably passable all-year round.	Percentage	TBD	TBD	TBD	Administrative data, satellite or remote sensing data	9.1.1 Proportion of the rural population who live within 2 km of an all-season road	by region or location
9,7	Gewogs connected by public. ***Percentage of people within Gewog that have access to reliable public transport***	The indicator measures the number of Gewogs that has access to public transport (Public bus). If reformulation accepted, the indicator corresponds to the proportion of the population within Gewog that have access to reliable public transport.	Number. Should be percentage if reformulation accepted	TBD	TBD	TBD	Administrative data, MoIC	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	by region or location, income group, type of public transport, etc.
9,8	EVs Penetration	The indicator measures electric vehicles as a proportion of all new vehicles (small and medium) in the country	Percentage	2016	0,13		Administrative data, RSTA		
9,9	Travel time in trucking hours along the national highway	Indicator measures reduction in travel time between Dzongkhags	Hours	TBD	TBD	TBD			
9,10	Internet Connection Reliability	This indicator measures the reduction in internet downtime (number of hours internet is totally down during 24 hours).	Hours	TBD	TBD	TBD		17.6.2 Fixed Internet broadband subscriptions per 100 inhabitants, by speed 17.8.1 Proportion of individuals using the Internet	by region or location

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No.	KPI	Description	Unit of Measurement	Baseline Year	Baseline	Target	Source	SDGs links	level of disaggregatio
12,1	Corruption Perception Index	The indicator tracks Bhutan's rank on the Transparency International's Corruption Perception Index	Rank (out of 175)	2015	27	20	Transparency International		
12,2	Control of Corruption	The indicator tracks Bhutan on the Worldwide Governance Indicators of the World Bank. Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	Percentile Rank	2015	80,77	90	"World Wide Governance Indicator",World Bank	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	by sex, age, type of services, location
12,3	National Integrity Score	The indicator measures the transparency and accountability of public officials and public service delivery on a scale of 0-10 based on the national integrity assessment survey carried out every 3 years by NSB and ACC	Score	2012	8,37	8,5	ACC		
12,4	***Citizens' perception of public sector corruption***	This indicator measures the perceptions of citizens on the corruption experienced for obtaining services in the public sector, by paying bribes, giving gift, etc.		TBD	TBD	TBD	ACC	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	could be disaggregated by type of services under the public sector for which citizens have experienced corruption, but also sex and age of citizens
12,5	***Citizens' perception of private sector corruption***	This indicator measures the perceptions of citizens on the corruption experienced for obtaining services in the private sector, by paying bribes, giving gift, etc.		TBD	TBD	TBD	ACC	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	could be disaggregated by type of business under the private sector for which citizens have experienced corruption, but also sex and age of citizens
12,6	***Number of prosecutions by the anti-corruption commission in a year***	This indicator measures the number of corruption cases annually submitted to the ACC and for which prosecutions are engaged	Number	TBD	TBD	TBD	ACC	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	could be disaggregated by type of corruption at the administrative level, judicial level, institutional level, political level, etc.

NKRA 16

No.	KPI	Description	Unit of Measurement	Baseline Year	Baseline	Target	Source	SDGs links	level of disaggregation
16,1	Citizens' confidence in judicial services	The indicator measures the confidence of citizens in judicial services. The measurement shall be done through a survey.	Percentage (%)	TBD	Survey to be carried out	TBD	BLSS/Survey. Should be perceptions surveys	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	could be disaggregated by type of judicial service
16,2	Citizens' confidence in police services	The indicator measures the confidence of citizens in Police services. The measurement shall be done through a survey.	Percentage (%)	TBD	Survey to be carried out	TBD	BLSS/Survey. Should be perceptions surveys	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months 16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	could be disaggregated by type of Police service
16,3	Criminal cases returned by OAG to the Investigative Authorities	The indicator measures the percentage of criminal cases submitted by Investigative Authorities to OAG and dropped by OAG	Percentage (%)	TBD	TBD	TBD	Administrative Data (OAG)		
16,4	Timely Justice services delivered (Investigate,Charges heet,Judgement)	The indicator measures the turnaround time for investigation, chargesheeting and litigation services	No of days	TBD	TBD	TBD	TBD		
		Investigate							
		Charge Sheet							
		Judgement (Percentage of cases decided within 365days)	Percentage (%)	2015	92,4	100	Administrative Data, Supreme Court (CMS)	16.3.2 Unsentenced detainees as a proportion of overall prison population	
16,5	Civil law cases handled by Informal Justice System	The indicator measures the percentage of cases handled by informal justice system such as Alternate Dispute Resolution ,LG Intevention,etc	Percentage (%)	TBD	TBD	TBD	TBD		
16,6	Reformative Programmes for Convicts	This Indicator measure the number of convict put through reformative programmes	Numbers	TBD	TBD	TBD	Jail Services (RBP)		
16,7	Harmonisation of National Laws	This indicator measures the number of National	Numbers	TBD	TBD	TBD	TBD		could be disaggregated by
16,8	***Percentage of children under age 5 whose birth is registered with a civil authority***	This indicator measures the proportion of children under 5 years of age whose births have been registered with a civil authority.	Percentage (%)	TBD	TBD	TBD	Civil registration and vital statistics in addition to household surveys such as MICS and DHS	16.9.1: Proportion of children under 5 years of age whose births have been registered with a civil authority, by age	Data should be disaggregated by sex, disability, location

Annex 3: List of participants to workshops and KII

3.1 NATIONAL CONSULTATION WORKSHOP, PARO, BHUTAN

SL. No.	Name	Designation	Organization/Agency
1	Chencho Dukpa	Principal Statistician	PPD, MoAF
2	Sherab Wangchuk	Sr. Planning Officer	PPD, MoAF
3	Sithar Dorji	,,	PPD, MoIC
4	Leki Choda	APO	RSTA, MoIC
5	Sonam Wangchuk	Planning Officer	PPD, MoWHS
6	Pema Rabgay	,,	,,
7	Dopo	Dy. Statistical Officer	PPD, MoH
8	Sonam Phuntsho	PO	,,
9	Rinzin Dema	PO	PPD, MoHCA
10	Ugyen Lhamo	PO	,,
11	Choki Tashi	Sr. Planning Officer	MoLHR
12	Checho Tshering	Offtg. CPO	PPD, MoF
13	Binod Sunwar	Offtg. CPO	PPD, MoE
14	Sangay Choden	Dy. Statistician	,,
15	Tashi Dorji	Dy. CTO	MoEA
16	Sonam Lhendup	Sr. PO	,,
17	Thinley Palden	Dy. CPO	,,
18	Sonam Gyeltshen	Program Officer	NCWC
19	Thuji	PO	RBP
20	Yonten Dolma	Communication Officer	BICMA
21	Rinzin Lhamo	Sr. HR Officer	RCSC
22	Bal Kumar Subha	Sr. ICT Officer	RAA
23	SonamWangmo	Sr. ResearchOfficer	RUB
24	Mani Kumar Ghalley	CPO	ECB
25	Tempa Gyeltshen	PO	Judiciary
26	Dawa Gyeltshen	ResearchOfficer	TCB
27	Kinlay Paday Dorji	APO	GPMD
28	Birkha Gurung	PO	NSB
29	Niamh Collier Smith	DRR	UNDP CO
30	Namgyle Wangchuk	Portfolio Manager	UNDP CO
31	Jigme Dorji	,,	,,
32	Dechen Zam	PME Specialist	UNICEF
33	Dechen Zangmo	PME Officer	UNICEF
34	PhuntshoWangyel	CRO	GNHC
35	Ka Ka	Sr. PO	GNHC
36	Sonam Yarphel	Sr. PO	GNHC
37	Sonam Tshoki	PO	GNHC
38	Sonam Chokey	PO	GNHC
39	Chimmi Dema	AMCO	GNHC
40	Sonam Choki	AMCO	GNCH
41	Pema Tenzin	SPO	GNHC
42	Krishna Lungeli	PO	GNHC
43	RinzinPem	UNW	UNW
44	Karma	FO	SSD GNHC

3.2. SUB- NATIONAL LEVELCONSULTATION WORKSHOP, PARO

SL. No.	Name	Designation	Organization
1	Kinley Namgay	ADAO	SarpangDzongkhag
2	Tshering Penjor	DHO	,,
3	Sangay Wangdi	Sr. ES	WangdiphodrangDzongkhag
4	Palden	Sr. ES	,,
5	Tenzin Namgyel	GAO (DarlaGewog)	ChhukhaDzongkhag
6	Lhachey	GAO	ChhukhaDzongkhag
7	Gyeltshen	DPO	
8	Dechen Zangmo	Unicef	Thimphu
9	Chandralal	SV MRT	Health
10	Tashi Norbu	DHO	Punakha Dzongkhag
11	Karma Gyeltshen	GAO	,,
12	Lobzang Choday	GAO	Dagana Dzongkhag
13	Pema Teznizn	GAO	Samtse ,,
14	Shacha Wangchuck	GAO (GakilingGewog)	Haa ,,
15	Ngawang	DAO	Samtse ,,
16	Sonam Rabten	GAO	Tsirang ,,
17	Tshewang Dorji	PDMO	Chukha ,,
18	Dorji Phuntsho	HRO	,,
19	Ugyen Pelden	GAO	,,
20	Tshering Dhendup	Sr. EA	Tsirang ,,
21	Pema Ugyen	LPO	Punakha ,,
22	Tashi	DPO	Samtse ,,
23	UgyenDorji	DPO	Sarpang ,,
24	Sonam	Offtg. DAO	Tsirang ,,
25	Dorji Wangchuk	DHO	Dagana ,,
26	Yontenla	GAO (UmlingGewog)	Sarpang ,,
27	Yeshi Pelzang	DPO	Dagana ,,
28	Langa Dorji	Envt. Officer	Tsirang ,,
29	Lemo	CDEO	Punakha ,,
30	Pema Wangchuk	Sr DLO	Dagana ,,
31	Phuntsho Wangdi	TPO	Phuntsholing
32	Kezang Deki	TPO	Gelephu
33	Lobzang	EE	Phuntsholing
34	Karma Yangzom	AMCO	Thimphu Thromde
35	Sachen Thapa	DLO	Wangdiphodrang ,,
36	Sonam Tshering	Architect	Thimphu Thromde
37	Rinzin Wangmo	DLO	Punakha ,,
38	Sonam Penjor	ADLO	Thimphu ,,
39	Tandin	ADPO	Thimphu ,,
40	Tshering Pelmo	GAO (MewangGewog)	Thimphu ,,
41	Loden Jimba	Sr. DLO	Haa ,,
42	Birkha Gurung	PO	NSB
43	Jamyang Phuntsho	AMCO	Thimphu ,,
44	Krishna Lungeli	APCO	GNHC
45	Ka Ka	Sr. PO	GNHC
46	Sonam Chokey	PO	GNHC
47	Sonam Tshoki	PO	GNHC

48	Jigme Dorji	PO	UNDP
49	Dechen Zam	PMEO	UNICEF
50	Pema Tenzin	Sr. PO	GNHC
51	Karma	FO	GNHC
52	Norbu Wangchuk	CPO	GNHC
53	Namgay Wangchuk	PO	UNDP

3.3. SUB- NATIONAL LEVEL CONSULTATION WORKSHOP, BUMTHANG

SL. No.	Name	Position	Organization
1	Dawa	Planning Officer (PO)	SamdrudjongkharThromde
2	Norbu Tshering	LivestockOfficer (LO)	MongarDzongkhag
3	Phub Dorji	ADAO	,,
4	Tshering Wangdi	Offtg. Envt. Officer	,,
5	Kinley Bhuthi	GAO (SalingGewog)	,,
6	Dawa Tshering	Sr. PO	LhuentseDzongkhag
7	Dorjee	Sr.DAO	,,
8	Wangchuk Dema	GAO (MaenbiGewog)	,,
9	Kelzang Wangdi	GAO (KhomaGewog)	,,
10	Karma	PO	GNHC
11	BN Sharma	DLO	PemagatshelDzongkhag
12	Kinley	DPO	,,
13	Tshering Dorji	ADAO	,,
14	Tashi Wangchuk	Offtg. GAO (ZobelGewog)	,,
15	Sonam Thinley	DPO	Trashigang
16	Tshering Wangdi	DSO	,,
17	Dorji Tshering	ICTO	,,
18	Kuenley Penjor	GAO (PhongmeyGewog)	,,
19	Lobzang Dhendup	GAO (Tang Gewog)	Bumthang
20	Sonam Jamtsho	ICT Officer	,,
21	Chedup Dorji	DPO	,,
22	Karma Seldon	DSO	,,
23	Ngwang Chophel	DPO	SamdrupjongkharDzongkhag
24	Rinchen Dorji	GAO (OrongGewog	,,
25	Dawa Gyeltshen	ADHO	,,
26	Sonam Phuntsho	ADAO	,,
27	Thinley Jamtsho	DPO	ZhemgangDzongkhag
28	Chojay Tenzin	GAO (PhangkharGewog)	,,
29	Jambay Ugyen	ADAO	,,
30	Tenzin Phuntsho	ADLO	,,
31	Tshering Tobgay	AMCO	TrashiyangtseDzongkhag
32	Kinzang Dema	ICT	,,
33	Phuntsho Rinzin	DPO	TrongsaDzongkhag
34	Ugyen Phuntsho	GAO (TangsijiGewog)	,,
35	Tashi Dorji	GAO (LangthelGewog)	,,
36	Sonam Tshewang	GAO (DraktengGewog)	,,
37	Krishna Lungule	PO	GNHC
38	Nawaraj	PO	UNDP
39	Dechen Zangmo	MEO	UNICEF
40	Pema Tenzin	Sr. Po	GNHC
41	Ka Ka	Sr. Po	GNHC

3.4. LIST OF BI-LATERAL MEETINGS AND KEY INFORMANT INTERVIEWS (KII)

SL. No.	Organization/Agency
1	Hon'ble Secretary, GNHC
2	Director, NSB
3	UNDP DRR
4	UN 12th plan project team
5	HIMS & PPD Head, MoH
6	EIMS, PPD Head, MoE
7	RNR, SCS & PPD Head MoAF
8	PPD Head, MoIC
9	PPD Head, MoLHR
10	PPD Head, Ministry of Economic Affairs
11	Planning Officer, NSB
12	Planning Officer, TCB
13	Sr. Research Officer, RNR, MoAF
14	District Statistical Officers
15	Private Consultants
16	DevelopmentPartners

3.5 NATIONAL VALIDATION WORKSHOP, PARO, BHUTAN

SlNo	Name	Organization	ContactID.
1	Dawa Gyeltshen	TCB	dawa@tcb.gov.bt
2	Sither Dorji	MoIC	sdorji@moic.gov.bt
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4	Choki Tashi	MoLHR	ctashi@molhr.gov.bt
5	Karma W. Tashi	MoHCA	kwtashi@mohca.gov.bt
6	Tandin Tshering	MoF	
7	Maj. Thuji	RBP	thuji@rbp.gov.bt
8	Ugyen Chophel	BCCI	ubcciaro@gmail.com
9	Pema Tenzin	GNHC	ptenzin@gnhc.gov.bt
10	Sonam Rinchen	GAO	srinchen@punakha.gov.bt
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15	Chimi Dorji	BICMA	chimidorji@bicma.gov.bt
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22	Dechen Zangmo	UNICEF	dzangmo@unicef.org

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24	Dechen Zam	UNICEF	dzam@unicef.org
25	Tashi Dorjee	NSB	tdorjee@nsb.gov.bt
26	Ugyen Zangmo	NSB	uzangmo@nsb.gov.bt
27	Tashi Choden	NSB	
28	Leki Wangdi	NSB	lwangdi@nsb.gov.bt