

ROYAL GOVERNMENT OF BHUTAN



**RENEWABLE NATURAL RESOURCES (RNR)
RESEARCH POLICY OF BHUTAN**

2011

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RNR Research Policy of Bhutan at a Glance

During the 10th Five Year National Development Plan, RNR research policy has been put squarely on the negotiating table. Policymakers' are particularly demanding:

- a clarification of the purposes of RNR research and its role in development;
- an efficient and competitive national RNR research initiative in which public spending is well justified, and clients pay for some services and undertake some of the research;
- RNR research program that is in line with the national philosophy of Gross National Happiness and sustainability;
- RNR research programme that aspires to improve existing products while creating new RNR products and new uses for RNR commodities;
- RNR research system that supports mainly commercial rather than subsistence clients to take their place in competitive national and global markets;
- RNR research system that provides measured responses to the challenges of environmental and natural resources degradation, climate change and threatened biodiversity.

The RNR Research Policy of Bhutan responds to the demand in the 10th Five Year Plan and beyond to determine the progress that the research system has made in meeting the objectives set forth in these new areas, and to provide guidance on the management and conduct of RNR research. In doing so, the policy focuses on new ways to coordinate, prioritize, plan and programme, organize, finance, manage and implement RNR research to prepare the system and its clients for the challenges of the 21st century.

1. INTRODUCTION

Research in the Renewable Natural Resources (RNR) sector has so far been undertaken fairly successfully without a formal research policy. Recent developments and trends, however, point to the need for the sector to adopt a formal research policy. They include: growing pressure on the Government to provide more resources for RNR research as an essential driver of sustainable RNR sector socio-economic growth and poverty reduction; growing pressures for resource conservation and utilization and purposeful response to climate change; the need to make research more efficient, self-sustaining and less dependent on donor support; the need to improve the internal governance and administration of RNR research by providing more guidance and coordination to the larger number of participants in RNR research system that is more complex; growing pressure to transform operations in the RNR sector from mainly subsistence to commercial; and the importance that is attached to building a knowledge-based society.

The overall purpose of the RNR Research Policy is to provide a long-term framework for decisive action to address these and other urgent needs. More specifically, the policy is designed to ensure that research is relevant to clients' needs, problem-oriented and those research methods, research programmes, research administration, and research financing and resources sharing mechanisms are systematically and collaboratively coordinated, implemented, monitored and evaluated. The RNR Research Policy, thus provides a strategic framework to all RNR research stakeholders, including ministries, development partners, and the private sector, farmers and individuals on what needs to be undertaken in order to address the needs of RNR Research in Bhutan. As such, it provides the policy platform for the preparation of RNR Sector's Research Strategy and Action Plan which forms an integral component of the RNR Sector Five Year Plan (FYP). The RNR Research Policy reflects a direct response by Ministry of Agriculture and Forests (MoAF) to addressing the goals and aspirations of Bhutan's development philosophy of Gross National Happiness (GNH).

The contents of the RNR Research Policy include the overall scope of RNR Research, achievements, guiding principles, goals and objectives, priority research areas, and the institutional and other means and conditions through which to conduct high quality and relevant research. In the light of recent institutional changes in MoAF, the preparation of this RNR Research Policy has been undertaken in the spirit of consolidating and enhancing the administrative, planning, implementation and evaluation of the RNR research, and also consolidating the considerable achievements that RNR research has made thus far and addressing emerging issues and opportunities including climate change.

2. SITUATION ANALYSIS

2.1 The Renewable Natural Resources Sector

Renewable natural resources comprised of natural resources that can be replaced or replenished by natural processes or human actions. Plants/crops, animals/livestock, forests and the whole range of biodiversity are renewable natural resources. Minerals and fossil fuels are non-renewable natural

resources because they are regenerated on a geological rather than human time scale. Some aspects of the environment such as soil quality, assimilative capacity (of water and land) and ecological support systems are called semi-renewable because they are regenerated very slowly on a human time scale. In Bhutan, the RNR sector is defined to comprise both fully-renewable and semi-renewable natural resources.

The responsibility for public policy regarding the management, development and utilization of Bhutan's renewable natural resources is under the purview of the MoAF. The Council for RNR Research of Bhutan (CoRRB) is responsible for Ministry-wide coordination, screening, prioritizing and evaluating (but not implementing) of research. The Departments; Agriculture, Livestock, and Forests and Parks cater to respective specific sub-sector concerns, including research implementation. Under their respective mandates, the Department of Agricultural Marketing and Cooperatives (DAMC), the National Biodiversity Centre (NBC), the Bhutan Agriculture and Food Regulatory Authority (BAFRA) cater to designated sector-wide concerns including implementation of relevant areas of research. The Policy and Planning Division (PPD), the Administration and Finance Division (AFD) and the Human Resource Division (HRMD) function as respective Ministry-wide service units that are directly under the Ministry's Secretariat. Outside of MoAF, other parties that are involved in RNR research include academic institutions, the private sector, Non-Governmental Organization (NGOs) and development partners.

2.2 Scope of RNR Research in Bhutan

RNR research in Bhutan encompasses four generally accepted categories of scientific research: basic, adaptive, applied and policy research. Basic research activities are conducted in scientific laboratories of the Department of Agriculture, Livestock, Forestry and other central agencies like NBC, NSSC, NPPC. Agriculture focuses on conducting adaptive research while forestry and livestock research is applied and adaptive-oriented. Policy research is an emerging concern.

Basic research refers to investigation and analysis focused on a better or fuller understanding of a subject, phenomenon, or a basic law of nature. It encompasses to study and research on pure science that is meant to increase the scientific knowledge base, and it is often purely theoretical with the intent of increasing understanding of certain phenomena or behavior but does not seek to solve or treat these problems.

Applied research is designed to solve practical problems under the researchers' environment.

Adaptive research is designed to introduce available technologies from an external environment and to test and adapt them to suit local environmental conditions.

Policy research (sometimes called **strategic research**) is concerned with determining which of various alternative policies will best achieve a given set of goals in light of the relations between the policies and the goals. Policy research can be divided into three major fields that are mutually inclusive: 1) descriptive policy research which just attempts to explain policies and their

development; 2) analytical or strategic policy research which is involved with formulating alternative policies and proposals; and 3) policy studies which are a combination of policy analysis together with program evaluation. The area of interest and the purpose of analysis determine what type of policy research is conducted.

2.3 Achievements of RNR Research in Bhutan

Bhutan's RNR Research Policy recognises the major role that research has played and continues to play in the transformation of the RNR sector not just in Bhutan, but in many countries around the world. The RNR Research Policy builds on these and other achievements, to address emerging challenges and take on new opportunities in a systematic manner. Some of the overall achievements of RNR Research in Bhutan to-date include: improved and new crop and animal species and strains; good soil conservation and cultivation practices; reduction in or overcoming of crop, livestock and forest product losses due to insect pests, plant diseases, animal diseases, drought, frost, etc; improved means of using food crop, animal and forestry products; improved natural resource management and utilization practices; improved socio-economic and livelihoods, and food and nutrition security; and the gradual and steady transformation from subsistence to commercial agriculture.

2.4 Overall Policy and Legal Environment for RNR Research in Bhutan

The RNR Research Policy has been prepared in the absence of an overall national research policy. When a national research policy is developed, it will provide a framework within which to further develop and implement the RNR research policy. At the same time, there are many other policy and legislative frameworks influencing the way in which the policy has been formulated and the way in which it will be implemented (Schedule 1). Considerations of this overall policy environment are clustered around five areas:

- 2.4.1 Constitution of Bhutan and the Development Philosophy of Gross National Happiness (GNH):** the Constitution put an onus on RNR research to become a part of the solution in meeting the obligation to practice sustainable development and the conservation of natural resources. At the same time, Vision 2020 enunciates four Pillars around which RNR research can contribute to the aspirations of GNH.
- 2.4.2 National Five-Year Development Plan (FYDP) and Economic Development Policy (EDP):** these provide the operational guidelines for initiating the type of development processes that are in line with the constitutional requirements and the pillars of GNH. Under this process, RNR research prepares a five-year plan which becomes a part of the MoAF sector-wide plan, and the latter is in turn integrated into the national FYDP. EDP provides a framework with which growth-oriented RNR research needs can be identified, planned and implemented.
- 2.4.3 Policies and legal frameworks of MoAF:** these relate to subjects like forests, biodiversity, nature conservation, food security, livestock, plant, seeds and pesticides, many of which are part of the RNR research system's mandated concerns.

- 2.4.4 Policies and legal frameworks from other RGoB sectors:** these relate to subjects such as the water, environment, health and intellectual property rights. Although not under the direct purview of MoAF, such subjects need to be mainstreamed into RNR planning and implementation of RNR research.
- 2.4.5 International declarations, caveats and conventions:** these represent areas in which Bhutan has made international or global commitments, and which require RNR research to support Bhutan's commitment.

3. GUIDING PRINCIPLES

The RNR Research Policy is based on a number of mutually inclusive principles which are derived directly from the four pillars of Gross National Happiness. For the most part, none of the guidelines can be achieved in a linear, independent manner, and one principle or set of principles cannot be followed to some exhaustive end before moving on to others. Instead, they are to be treated in an inter-dependent manner that balances and synergizes both the GNH pillars and the RNR research process.

3.1 From GNH Pillar 1: Sustainable and Equitable Socio-Economic Development

- 3.1.1 **Optimization of returns to investment:** focus on promoting interventions that have a proven high benefit / cost ratio, offer people maximum opportunities to participate in economic activity, and involve populations and areas with the highest need and impact.
- 3.1.2 **Optimization of synergies:** maximize synergies within and between stakeholders, interventions, and delivery channels.
- 3.1.3 **Affordability:** research recommendations are within the clients' means to access and use them.
- 3.1.4 **Equitable development:** research identifies and promotes opportunities for reduction of poverty and malnutrition, balanced growth, sensitivity to geographical regions, increased economic security, and building a harmonious society.
- 3.1.5 **Optimal sequencing:** research simultaneously incorporates short-term, medium-term and long-term development perspectives in analyses, activities and implementation.

3.2 From GNH Pillar 2: Environmental Conservation and Sustainability

- 3.2.1 **Conserving and sustainably managing the environment:** research interventions strike balance between socio-economic growth and long-term environmental sustainability.
- 3.2.2 **Mainstreaming environmental change:** environmental changes and impacts including climate change are mainstreamed into all aspects of RNR research.
- 3.2.3 **Mitigating adverse environmental effects:** in-build environment-friendly mechanisms in research system that promote controls for adverse impacts on the RNR sector originating from other development sectors, and from exogenous environmental factors such as climate change.
- 3.2.4 **Minimizing external inputs:** give primacy to organically clean agriculture and minimize the role of external inputs.

3.3 From GNH Pillar 3: Good Governance

- 3.3.1 **Ethics:** adhere to established professional ethics pertaining to the health, safety, privacy, and other personal rights of human beings or to the infliction of injury or pain on animals.
- 3.3.2 **Integrity and openness:** the individual researcher has the personal responsibility to assure that the conduct of research, the sources of funding for that research, and its perceived applications are consistent with the researcher's own as well as peers' judgment and conscience, and with established professional ethics.
- 3.3.3 **Transparency:** increase information about government and other stakeholders and provide full transparency on roles and responsibilities as well as on progress, input, and output, and use information management systems to bridge the gaps between policy makers, managers, implementers and clients of research system.
- 3.3.4 **Accountability:** facilitate researchers to define strategies that are discrete, concrete, measurable, and have clear responsibilities.
- 3.3.5 **Meritocracy:** prioritize and allocate space, facilities, funds, and other resources and implement research programs based on the national development priorities and the scholarly and educational merits of the proposed research.
- 3.3.6 **Decentralization:** Use bottom-up planning supported by increased implementation at Dzongkhag and Gewog levels.
- 3.3.7 **Participation, empowerment and responsiveness to needs:** ensure local communities, especially women and disadvantaged groups participate in RNR research and play an active decision-making role and RNR research incorporates their needs and priorities.
- 3.3.8 **Institutionalization:** establish government-led coordination mechanisms for planning, implementation, management and monitoring and evaluation (M&E) of the RNR Research System
- 3.3.9 **Capacity building:** as far as possible, build on leveraging existing capacities, and whenever feasible, choose to use and strengthen in-country capacities over external / unsustainable solutions.

3.4 From GNH Pillar 4: Cultural Preservation and Promotion

- 3.4.1 **Cultural sensitivity:** research acknowledges and promotes the pursuit of cultural and spiritual heritage and identity of the people.
- 3.4.2 **Traditional knowledge:** research promotes the conservation, development and use of the centuries-old knowledge and practices of Bhutanese.

4. VISION, MISSION AND GOALS

4.1 Vision

The people of Bhutan benefiting from RNR technologies and information to build a prosperous economy, a healthy environment and a harmonious, knowledge-based society.

4.2 Mission

Provide a coherent mechanism through which appropriate technologies, information and knowledge in the RNR sector can be generated and made available to clients in an effective and efficient manner.

4.3 Policy Goals

The RNR Research Policy has two policy goals:

Policy Goal 1: A prioritized programme of high quality and relevant research undertaken for Bhutan's RNR sector.

Policy Goal 2: An efficient and effective RNR research system that produces high quality research results and facilitates their use in the plans and programmes of MoAF.

5. POLICY STATEMENTS

Under each policy goal, there are a number of policy objectives. Each policy objective is associated with a number of statements which express the Royal Government's commitments and the strategic approaches to achieving the goals and objectives of the RNR Research Policy.

Policy Goal 1: A prioritized programme of high quality and relevant research undertaken for Bhutan's RNR sector

Policy Objective 5.1.1 – Field Crop Research: generate and disseminate suitable technologies, information and knowledge to achieve and sustain critical levels of food self-sufficiency in cereals and grain legumes at the household and national levels.

- i. Conduct research and generate results that lead to improved practices and increase efficiency in production, processing, post-production technology, packaging, handling, marketing, and value-addition of cereals, oilseeds and grain legumes.
- ii. Make major sustainable breakthroughs in a number of specific strategic segments of the field crops namely: develop high-yielding, cold-tolerant, blast-resistant rice varieties; improve rice and maize yields in the low and mid-altitude areas; minimise post-harvest and storage losses; improve maize and oilseeds crop yields and processing; and integrate grain legumes in farming systems.

- iii. Ensure and sustain critical level of self-sufficiency in cereals consistent with food security and national security, and at the same time transform field crop production into a node of economic growth, commercialization and increased cash income for rural areas.

Policy Objective 5.1.2 – Horticulture Crops Research: generate and disseminate suitable technologies, information and knowledge to increase production, and enhance post-harvest handling, processing, and marketing of horticulture crops.

- i. Use research in horticulture sector to facilitate the transition from subsistence to commercial agriculture, the reduction of poverty, more equitable distribution of income, and contributing to the country's foreign exchange earnings.
- ii. Develop and make available technology and knowledge and improved practices to promote and enhance comparative advantages and opportunities deriving from the diversity of horticulture-friendly agro-ecological zones and products.
- iii. Introduce new enterprises in enterprise-poor situations and areas to reduce the overall level of poverty.
- iv. Improve quality of existing fruit plants with farmers, and identify and diversify potential economic/ commercial fruit plants/varieties, including targeting of off-season and high-value niche markets in South Asia Region and other countries.
- v. Improve and diversify vegetable production in kitchen gardens to boost and sustain household food security and nutrition and cash income.
- vi. Take advantage of and collaboratively promote opportunities for public-private partnerships in high value crops, such as Coffee, Cordycep and Hazelnut.

Policy Objective 5.1.3 – Veterinary and Livestock Research: generate and disseminate knowledge and information to improve the health, productivity, quality, quantity and value of livestock.

- i. Improve animal health and livestock production as a strategy to increase income, improve livelihood, alleviate poverty, improve nutritional status, and mitigate the spread of animal diseases, not only in rural areas but also in peri-urban areas.
- ii. Enhance sustainable livestock production and health through participatory selective breeding, identification of promising indigenous animals and animal products, improving and monitoring fodder and grassland resources, and eradicating important livestock diseases.
- iii. Develop focused programmes on improvement of production of small livestock such as goats, pig, poultry and honey bees.
- iv. Reduce grazing pressure on forest and conservation areas through research on animal feed, fodder and pasture.
- v. Provide research recommendations on linkages between livestock development and other dynamic sectors and initiatives, such as tourism, marketing and cooperatives.

Policy Objective 5.1.4 – Biodiversity Research: generate and disseminate suitable technologies, information and knowledge to promote conservation and sustainable use of biological resources and facilitate effective decision-making to improve livelihood and commercial opportunities.

- i. Develop better understanding of the current status as well as threats and changes in biodiversity through inventory, classification and mapping of species and habitats for the development of appropriate policies and plans for conservation and sustainable utilization.

- ii. Detect environmental changes, especially climate change, through the use of appropriate analytical techniques, modeling and synthesis of multidisciplinary and multi-scale datasets over a long term for identifying the impacts of climate change on biodiversity.
- iii. Develop techniques for defining ecosystem functions as an indicator of the health of the environment and socio-economic analyses and valuation of goods and services.
- iv. Enhance the value of biological resources through product development and biological diversity prospecting in order to promote revenue generation and improved livelihoods.
- v. Improve access to biological resources, other than for customary use, and any benefits arising from the access should be in conformity with policy directives and guidelines issued by the Royal Government of Bhutan (RGoB).

Policy Objective 5.1.5 – Forest Research: to generate and disseminate science-based information and knowledge to support better ways of forest management, forest utilization, and conservation of Bhutan’s forest and wildlife biodiversity.

- i. Ensure that forest research activities that are primarily guided by the tri-track focus on poverty reduction, the constitutional requirement to maintain at least 60% forest cover, and improve biological wealth.
- ii. Increase the economy of the rural poor through intensified forest development – including sustainable management of natural forests, non-wood forest product (NWFP) and medicinal and aromatic plants (MAP) resources, social forestry, watershed management and community forestry.
- iii. Step-up and streamline collaborative research activities between NWFP and MAP and social forestry sub-programs with functional and territorial divisions of the Department of Forest and Park Services (DoFPS).
- iv. Develop improved participatory research activities involving farmers, extension agents and field foresters on farms, in the forest management units (FMUs), in national parks, and at outreach research sites.
- v. Achieve national goal of sustainable management and conservation of forest resources by undertaking long term on-going research activities on conifer forest management, broadleaf forest management, forest protection, nature conservation and re-afforestation in the selected areas.
- vi. Forge and foster collaborative research activities on plantation forestry with wood-based industries and communities.

Policy Objective 5.1.6 – Integrated Natural Resource Management Systems Research: to generate and disseminate information and knowledge to improve management and conservation of the environment and common resources, and to facilitate Bhutan’s response and adjustment to climate change.

- i. Develop and promote appropriate responses to the effects of climate change on agriculture, livestock, forestry and the country’s biodiversity.
- ii. Develop and promote sustainable land management and soil fertility practices in line with sustainable environmental and resource conservation and food production and nutrition goals.
- iii. Develop and promote effective and economic management of water resources for the RNR sector through applied research on water conservation, management and development. Choice of specific areas of water research will be guided by the areas needing special attention that are identified in the Bhutan Water Vision and Water Policy.

- iv. Develop and promote use of clean biomass energy sources including means for compensating parties in the RNR adopting energy saving and/or enhancing technologies.
- v. Develop and promote integrated pest management (IPM) and integrated plant nutrient (IPN) systems that are appropriate for conserving resources, minimizing external inputs, and responding to the cultural sensitivities about the treatment of living things.
- vi. Improve understanding of food safety and to support implementation of food safety regulations.
- vii. Develop deeper understanding on mitigation and prevention of human-wildlife conflicts through food chain studies.
- viii. Develop and promote innovative solutions to the human-wildlife conflict, through collaborative arrangements with traditionally non-agricultural agencies like Bhutan Power Corporation and inclusion of farmers in the design of studies and in the packaging of solutions.

Policy Objective 5.1.7 – Policy Research and Socio-Economic Studies: identify policy constraints and opportunities in the RNR sector, and build socio-economic profiles of the RNR Sector as bases for further research and development activities.

- i. Prioritize policy research and socio-economic studies in compliance with the traditional RNR research programmes.
- ii. Policy research will be typically undertaken by CoRRB, DAMC, PPD and the network of RNR Research Specialists in MoAF and the Departments, in collaboration with researchers in RDCs and the National Programmes/Centres.
- iii. Socio-economic studies will be undertaken by CoRRB, DAMC and RNR-RDCs and National Programmes/Centres in all sectors.
- iv. Develop and promote informed decision-making in areas of policy, scientific research and development and extension through analysis of archival and contemporary documents and data in the MoAF.
- v. Recommend appropriate policy responses for sustainable growth and development the sector through examination of policies, regulations and conditions that affect how stakeholders operate in the RNR sector and how the sector performs.

Policy Goal 2: An efficient and effective RNR research system that produces high quality research results and facilitates their use in the plans and programmes of MoAF.

Policy Objective 5.2.1 – CoRRB and other central agencies: Streamline and strengthen institutional mandates and capacities of CoRRB and other central agencies for coordinating, planning and prioritizing RNR research.

- i. Strengthen and streamline the RNR research system to encompass RNR research programmes and activities of all institutions that are doing or supporting RNR research in the country.
- ii. Recognize and promote liberty of all Bhutanese RNR researchers and institutions to undertake any or all types of investigation falling within their mandates, responsibilities and functions and competences, and within the RNR research prioritization scheme established by MoAF.
- iii. MoAF issues and from time to time up-dates detailed itemizations of the RNR research mandates, responsibilities and functions of all MoAF agencies.
- iv. Strengthen CoRRB's function as the apex body for RNR Research in Bhutan for coordinating, priority-setting, technical clearance of research proposals and evaluation towards harmonizing and synergizing MoAF and non-MoAF research programmes and activities.
- v. CoRRB undertakes overall coordination of screening, prioritization and evaluation of all RNR research initiatives in Bhutan. The process covers Five Year and Annual Plans, donor initiatives and any ad-hoc proposals. It also includes review, priority-setting and clearance of research proposals during annual conferences and meetings, publications, and deputations of researchers from MoAF to other institutions.
- vi. CoRRB compiles and maintains a web-based, regularly up-dated "Policy and Operational Handbook" in which prevailing policies, approaches, protocols, guidelines and other modalities of carrying RNR research are outlined in a consolidated manner.
- vii. The agreed, prioritized RNR research programme of MoAF are implemented through the Departments, using the network of RNR Research and Development Centres (RDCs) and the specialized National Programmes and Centres (such as NBC, NPPC, NSSC, AMC, NPHC, NMC, NSC, NCAH, NLDP and RLDCs) under the respective Departments/agencies.
- viii. In each Department, one senior technical staff is designated as Research Focal Point (RFP) to serve as the contact and coordination person for CoRRB and for RDCs and other research programmes/centers.
- ix. CoRRB ensures that as part of its mandate to coordinate the screening, prioritization and evaluation of RNR research, all research that involves human participants meets appropriate professional, ethical and cultural standards.
- x. CoRRB organizes RNR Research Agenda and Strategic Meetings every five years to review and establish medium and long term RNR Research issues, needs, plans and programmes in line with the Five-Year Plan cycles of the RGoB.

Policy Objective 5.2.2 – RNR-RDCs and National Programmes/Centres: Streamline and strengthen capacities of RNR-RDCs to conduct RNR research activities.

- i. Develop and implement long-term (5 – 10 years), medium-term (2- 5 years) and short-term (1 – 2 years) research plans in each RNR-RDC and other central agencies including prioritized assessments of the problems, issues and opportunities faced by farmers, herdsman and forest users, and other stakeholders.

- ii. Include in plans the nature and level of mutual support and collaboration between RDCs and national support programmes/centres.
- iii. Institute collaborative mechanisms between RNR-RDCs and other central RNR agencies and academic institutions, including in planning and implementation, to optimize synergies on formers' primary focus on applied/adaptive research and latter's primary focus on basic research.
- iv. Make provisions in RDCs and other central RNR agencies for laboratories, equipment, supplies and manpower to enable unit RDC to carry out a minimal but critical amount of supportive basic research, while the majority of research activities at RDCs are applied and adaptive in nature.
- v. Ensure that the terms of reference of technical staff in RDCs and other central RNR agencies reflect their relative core research and development roles and responsibilities. Allocate at least 60% of time and activities of scientists who are designated in the researcher category to research activities.
- vi. Institute assessment measures for effectiveness of programmes and activities and individual scientists in RDCs and other central agencies including publications in peer-reviewed journals and adoption rates of technologies and information and knowledge from the respective RDCs and other central RNR agencies.
- vii. Conduct collaborative research activities with extension agents, farmers and private sector.

Policy Objective 5.2.3 – Research, extension and policy linkages: Streamline and strengthen research, extension and RNR policy linkages to ensure efficient delivery of research results to users.

- i. Streamline, strengthen and use the Research Outreach Programme (ROP) to conduct on-farm research trials, to package research results, and to share research results with extension institutions and/or, as necessary, directly with farmers, forest practitioners, businesses, and other clients.
- ii. Base RDC research programmes on comprehensive assessments of the problems, opportunities and other issues faced by clients as a pre-condition for a successful ROP. In this regard, strengthen and use Regional Research Forums as a planning, evaluation and feedback tool.
- iii. Strengthen research-communication capacity of RDCs and national programmes/centres to collect, collate and communicate research results in a manner and form that are useful to farmers, policy makers and other stakeholders.
- iv. Initiate a Researcher - Farmer - Policy Forum to facilitate interactions and bridge the gaps between policy and research.
- v. Organize annual RNR and ad-hoc research meetings, with extension staff, farmers and other stakeholders in attendance, to review on-going and future research activities, and decide on needs and actions for coordination, funding and evaluation.

Policy Objective 5.2.4 – Academic institutions: Streamline and strengthen the linkages and role of academic institutions under Royal University of Bhutan as an important component of the RNR research system.

- i. Incorporate Royal University of Bhutan (RUB), other academic institutions and UWICE in RNR research coordination, funding, and monitoring mechanisms, including full participation

in sponsored research programmes, and as direct or collaborative implementers of research programmes with MoAF.

- ii. Formalize and strengthen relationships between academic institutions and MoAF and other players in the RNR research system. Use instruments like shared visions, plans, programmes, research meetings, conferences, funding, and Memorandum of Understanding (MoU).
- iii. Encourage and support Royal University of Bhutan to undertake the bulk of basic research in the RNR Research System as part of their long-term strategy and interests.
- iv. Strengthen synergy between basic research programmes of national level priority of the academic institutions and RNR research programmes to avoid duplication.
- v. Strengthen the relationship between teaching and research through secondment and adjunct, part-time and other appointments of MoAF researchers in academic institutions.
- vi. Strengthen Ugyen Wangchuck Institute for Conservation and Environment (UWICE), under DoFPS as a centre of excellence in teaching, training and conducting basic academic research on conservation and environment.

Policy Objective 5.2.5 – International research institutions: Strengthen RNR linkages and collaborative arrangements with international research institutions in collaboration with RUB

- i. Strengthen and systematically implement CoRRB’s mandate as an RNR apex body in coordinating between Bhutan’s RNR research agencies and international research institutions in collaboration with RUB, with the active participation by the Departments and other central agencies
- ii. Explore, promote and reinforce collaborative linkages between Bhutanese and international research organizations and researchers for increased funding of research activities as well as capacity building through sharing of knowledge, facilities and materials.
- iii. Use international collaboration to develop Bhutan’s research manpower capabilities through education and scholarship programmes, and secondment of Bhutanese scientists for teaching, research and other assignments with relevant international research institutions.
- iv. Give priority to building more collaborative linkages in thematic and contemporary areas of research, such as climate change, conservation science, mountain forestry, and food and nutrition security.

Policy Objective 5.2.6 – Public – Private Partnerships: Increased collaboration between public and private sector research through Public – Private Partnership (PPP)

- i. Provide enabling environment for the country to position itself to respond to a shift from public to private sector in major areas of RNR research.
- ii. Include private sector RNR research initiatives in CoRRB’s assessments and monitoring of RNR research activities to avoid duplication and to synergize all efforts.
- iii. Encourage the private sector to invest in and undertake research activities and/or collaborate with public sector institutions through payment for research services, co-funding and joint ownership and sponsorship of research projects, and other mechanisms.
- iv. Explore ways of promoting PPP initiatives in RNR research focusing on high value products.

Policy Objective 5.2.7 – Human resource development: Strengthen human resource development for RNR research in collaboration with RUB/CNR

- i. Prioritize human resources development to improve availability, retention and maintenance of a critical mass of researchers, and efficiently deploy and use researchers, technicians and other staff.
- ii. Prepare and maintain a human resources master plan for the RNR research system that is jointly managed by CoRRB and the HRD of MoAF and supported by RUB/CNR.
- iii. Strengthen the critical mass of researchers in all fields by upgrading College of Natural Resources (CNR) and other first degree graduates to Masters and Ph.D. levels, based on ability to carry out high quality and meaningful research.
- iv. Give special priority to the training, recruitment and retention of socio-economic researchers for the RDCs and CoRRB, given the high rate of attrition of this category of scientists in the past years.
- v. Implement an incentives scheme to increase the attraction and retention of researchers, including remuneration, teaching and consultancy opportunities, and recognition of work through professional, public service and civic citations and awards.
- vi. All scientists to work to CoRRB/Dept. approved Terms of Reference (TOR) spelling out research, development outreach and extension.
- vii. Apply a result-based assessment and evaluation scheme for RNR research scientists in order to improve the efficiency.
- viii. Promote and designate researchers, including Specialists, based on demonstrated contribution to research. The promotion criteria should include; number of peer-reviewed publications in national and international journals, adoption rate of a researcher's recommendations, and assessment of the researcher's impact on the sector's development.

Policy Objective 5.2.8 – RNR Research funding: Increase, stabilize and diversify funding for RNR research

Overall Funding for RNR Research

- i. The Government shall, through the annual budgets, provide adequate fund to RNR research.

Regular Public Sector Budget

- ii. The budget for RNR Research shall be based in the annual work plan and drawn from the annual budget allocation to MoAF.
- iii. The Ministry of Finance allocates the RNR research budget between the various research institutions under MoAF based on priority needs and research work plans (five year and annual) scrutinized and endorsed by CoRRB.
- iv. Allocate RGoB budget codes and sub-codes to research in general and RNR research in particular in order to ensure focused funding on research, to highlight its importance, to increase the accountability of researchers, to raise the public profile and support for research, and to enable cost-benefit analysis of research.

Sponsored Research

- x. Encourage international or national agencies or individuals, including the private sector to fund research endeavours by Bhutanese researchers or research institutions.
- xi. Set up the coordinating and clearing mechanisms in CoRRB for any such sponsored research to be undertaken by researchers in the RNR sector.
- xii. Encourage donors in the RNR sector to meet research needs identified under respective projects to supplement the regular public sector budget allocated to RNR research.
- xiii. Explore opportunities for funding of relevant aspects of research from Clean Development Mechanism including carbon trading, Reduced Emission from Deforestation and Degradation (REDD+) and other global facilities established for mitigation of global warming and climate change.

Policy Objective 5.2.9 – Intellectual Property rights: Protection of intellectual property rights

- i. The RGoB has ownership rights over patentable inventions, innovations and discoveries made by RNR researchers in the course of their RGoB responsibilities.
- ii. Researchers must disclose all potentially patentable inventions, innovations and discoveries that are made in the course of their RGoB responsibilities.
- iii. Researchers/inventors will be provided incentives in due recognition of their work and to promote new inventions, innovations and discoveries.
- iv. All applications on property rights related to RNR research findings should be routed through CoRRB or any other agency designated by MoAF from time to time.
- v. Plough back a part of the royalties generated through new inventions, innovations and discoveries into the RNR Research Core fund.
- vi. CoRRB is the repository for all copyrights within the MoAF.

Transfer of Biological Materials

- vii. All biological material transfers other than for customary use and direct consumption, shall be in conformity with the RGoB policy and legislative frameworks and routed through the designated agency in MoAF.

Traditional Knowledge

- viii. Traditional knowledge is a cultural heritage passed over from generation to generation and it is a valuable asset for holistic research and development. Therefore relevant institutions should promote, document and protect Traditional Knowledge (TK), with emphasis on TK associated with farming systems and natural resources.
- ix. The rights of the TK holders will be recognized, respected and compensated in conformity with international frameworks which Bhutan is party to and RGoB policy directives and legal frameworks

Policy Objective 5.2.10 – Treatment of research animals: Development of acceptable standards for welfare and ethical treatment of research animals

- i. Promote adherence to universally accepted humane standards for treatment or use of animals in research, giving due cognizance to the religious and cultural norms and prevailing policies and instruments under the RGoB.
- ii. Establish an interim Administrative Panel on RNR Research Animal Care to oversee welfare and humane and ethical treatment of animals in RNR research and to guide the establishment of permanent mechanisms.

Policy Objective 5.2.11 – RNR Research Evaluation: Establishment of an effective RNR research evaluation framework

- i. The RNR research evaluation framework developed by CoRRB will enable policy makers, researchers and stakeholders to assess the efficacy of the research system, including the quality and usefulness of research activities and results.
- ii. The research evaluation framework will involve coordinating the management of all data and information generated by the research system and stakeholders with up to date information on the implementation status of research activities in compliance with the spirit and the letter of RNR Research Policy of Bhutan.
- iii. The research evaluation framework system will be dependent on data and information provided by the Departments, the RDCs and their sub-centres, other central programmes and projects under the Departments/agencies, and also on data and information collected independently or otherwise by CoRRB.
- iv. CoRRB will provide constant feedback to the Council, senior management of MoAF, donors and sponsors, and all collaborators in RNR research regarding progress of research programmes, projects and activities.

SCHEDULE 1

Policy and Legal Environment

A) Constitution of Bhutan and the National Concept of GNH

- 1) **The Constitution of the Kingdom of Bhutan:** requires the state to promote circumstances that would enable the citizens to secure an adequate livelihood, and for the Government to secure ecologically and environmentally balanced sustainable development while promoting justifiable economic and social development. Article 5 of the Constitution of the Kingdom of Bhutan makes it clear that: “Every Bhutanese is a trustee of the Kingdom’s natural resources and environment”. The Royal Government is enjoined in the Constitution to conserve and improve the environment and safeguard the country’s biodiversity.
- 2) **Vision 2020 and the National Philosophy of Gross National Happiness:** Vision 2020 sets the overarching goal of ensuring the future independence, security and sovereignty of the Kingdom, and maximization of Gross National Happiness (GNH), with four pillars, as the guiding principle for the future development of Bhutan. RNR research can and should facilitate the achievement of each of the four pillars of GNH.

B) National Five-Year Development Plan and Economic Development Policy

- 1) **National Development Plan (currently 2009 – 2013):** provides the national strategic framework for the sanctioning, financing and implementation of policies, programmes and activities for progress towards Vision 2020 and achievement of GNH over the specified Five-Year Plan. There is an RNR Research Plan which is a distinct component of the National Development Plan.
- 2) **Economic Development Policy (EDP) of the Kingdom of Bhutan (2010), following on Economic Policy of the Kingdom of Bhutan (2009):** is meant to lay the policy ground work to facilitate economic growth as one of the primary basis for meeting the pillars of GNH. RNR research plays a leading role in developing the technological base on which RNR sector growth and the latter’s multiplication effects in other sectors can be generated. The EDP identifies products that are already covered in existing MoAF research programmes and also some additional potential products that can come under the ambit of MoAF’s research programme.

C) Policies and legal frameworks originating from within MoAF

- 1) **Draft National Forest Policy 2008** underscores that application of good science and indigenous or local knowledge underpin all aspects of forest planning and management and explicitly attempts to bridge the research-management divide.
- 2) **Draft National Food Security Policy (2010), preceded by National Food Security Strategy (2006):** lays out a multi-sector approach to addressing availability, accessibility, proper utilization, and stability of food to achieve food and nutrition security as well as reduce poverty. RNR research has numerous distinct roles to play in achieving food security, such as increasing productivity, improving handling and processing and value addition, improving management of environment and resources, and others.

- 3) **Food Act of Bhutan 2005:** subjects all food businesses in Bhutan to standards for health and safety. It is a responsibility of research to contribute to the availability of food that is healthy and safe.
- 4) **The Biodiversity Act of Bhutan (2003):** provides for the conservation and sustainable use of biological resources through the regulation of access and equitable sharing of benefits as well as the documentation and protection of traditional knowledge associated with biological resources.
- 5) **Forest and Nature Conservation Act of Bhutan, 1995:** provides legal environment for community based resource management and utilization, community forestry, transport and trade of forest produce, soil and water conservation and royalty free domestic consumption of non-wood forest products (NWFP) that are not in the list of Schedule 1 of the Act.
- 6) **The Seeds Act of Bhutan, 2000** regulates the quality of seeds, sale of seeds and certification of seed industry in the country to enhance rural income and livelihood
- 7) **Plant Quarantine Act of Bhutan, 1993:** prevents the introduction of pests into the country through regulation of import and export of plants and plant products.
- 8) **Pesticide Act of Bhutan (2000):** provides for integrated pest management in Bhutan, restricting the usage of pesticides only as second-line measures against pests and diseases.
- 9) **Livestock Act of Bhutan, 2001:** aims to enable only appropriate and acceptable breeds of livestock, poultry and fish to be introduced in the country, and makes provisions for regulation of livestock breeding, health and production, sale of animals, animal products, feeds, drugs, and other inputs necessary for enhancing livestock production.
- 10) **Cooperatives (Amendment) Act of Bhutan, 2009:** provides legal framework for the formation of co-operatives and farmer groups to enhance their economy of scale.

D) Policies and legal frameworks from other RGoB sectors

- 1) **National Environment Protection Act – NEPA 2007:** lays out the principles and legal framework for environmental protection that have significant implications for the use, management, protection and conservation of renewable natural resources. The conduct and the results of RNR research need to be supportive to both the spirit and letter of environmental protection laws and policies.
- 2) **Environment Assessment Act 2000:** requires that environmental concerns are fully taken into account when formulating, reviewing, modifying and implementing any policy, plan or program. RNR research can contribute to the assessment of environmental impact, while research activities that, in themselves, would have significant environmental impact need to be subject to environmental assessment.
- 3) **Bio-security Policy 2008:** addresses the protection of human health from zoonotic and pest-borne diseases, sustainable use of natural resources, protection of agricultural production systems from pests and diseases, and facilitation of safe and sustainable trade and tourism.

- 4) **Bhutan Water Policy, 2003, Bhutan Water Policy 2002:** developed under the Bhutan Water Partnership, recognizes the role of rivers as an aquatic habitat as a source of food, as well as individual right to safe, affordable and sufficient quantity of potable and commercial water. It also recognizes the need for adequate water to be allocated for sustainable agriculture for achieving overall national food security. Research can make significant contributions to improving the efficiency of use of water distribution and use.
- 5) **Land Act of Bhutan, 2007:** While protecting *Chhuzhing* (paddy land), the act is meant to facilitate the commercialisation of agriculture. It enables the Government to declare any area in the country as protected agricultural areas on the basis of creating desired economic, social and environmental well-being of the citizens of Bhutan. The Act makes provision for enabling the construction and renovation of irrigation channels and embankments. It also it clarifies issues regarding the right of way when passing through the property of any other person. Research activities and recommendations are moderated within parameters of the Land Act.
- 6) **Draft National Health Policy 2010:** aims to promote self-reliance and sustainability by increasing efficiency, productivity, accountability and ownership in health care interventions and service delivery. RNR research can be supportive to Health Policy through measures like promoting of healthy and safe food for consumption; reduction of malnutrition and; availability of adequate safe water.
- 7) **The Industrial Property Act of the Kingdom of Bhutan (2001):** extends recognition and legal protection to industrial property rights in order to stimulate innovative activity and promote technological advancement, and protects against certain acts of unfair competition to create a sound environment for the development of industry and commerce. The Act may need to be amended or extended to cover non-industrial property, including that arising from RNR research.
- 8) **Industrial Property Rules (2001):** makes the Industrial Property Act (2001) operational by providing detailed guidelines and formats to people who may want to establish rights to industrial property through patents registration of industrial designs and grant of patents and other action. The rules may also need to be amended or extended to make them more easily applicable to non-industrial property.
- 9) **Copyright Act of the Kingdom of Bhutan (2001):** extends to authors and creative and intellectual workers the protection of rights over their creative work in order to foster their creative endeavour by assuring them of recognition and rewards. This Act can be applied to authorship and other intellectual property rights arising out of the RNR research system and processes.

E. International declarations, caveats and conventions

Bhutan has been signatory to a number of declarations, caveats and conventions that make it imperative for the RNR research system to respond in ways that support the spirit and intent the RGoB in being associated with those causes. Such international declarations, caveats and conventions include:

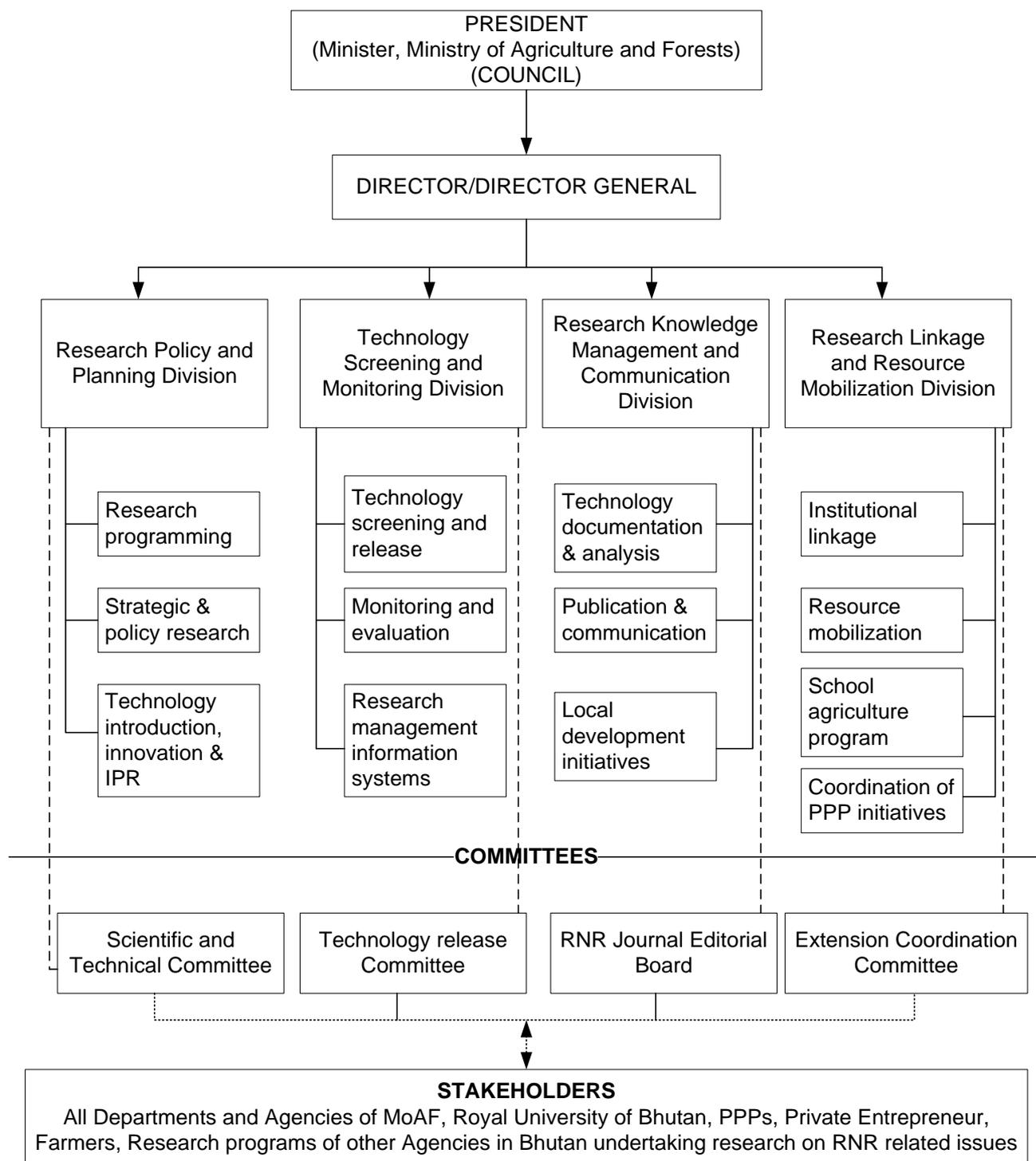
- 1) **Millennium Development Declaration (MDD)**, and the associated Millennium Development Goals (MDGs) – RNR research is most pertinent in the achievement of MDG 1 to reduce extreme poverty and hunger and MDG 7 ensuring environmental sustainability. RNR research

also indirectly implicated in the achievement of the remaining 6 MDGs since the latter would have little chance of being achieved without significant reduction in hunger and poverty.

- 2) **International Declaration on Nutrition** – recognizing the need for countries to respect and uphold everyone’s individual right to adequate food, nutrition and health.
- 3) **Convention on the Rights of the Child (CRC)** and **Convention on the Elimination of all Forms of Discrimination against Women (CEDAW)** – respectively address the particular rights of the most vulnerable groups consisting of children and women.
- 4) **The World Food Summit (1996)** - set the target to halve the number of undernourished people by 2015, based on the recorded number in 1992.
- 5) **International Covenant on Economic, Social and Cultural Rights (2007)** - Article 11.1 establishes the “Right to Adequate Food”, and the Convention makes commitments to safeguard culture and traditional knowledge.
- 6) **UN Framework Convention on Climate Change (1992)** – the centerpiece of global efforts to combat global warming. It was a central outcome of the 1992 United Nation Conference on Environment and Development (UNCED). It has been one of the international community's most essential tools in the struggle to promote sustainable development by addressing environmental changes.
- 7) **Convention on Biological Biodiversity (1992)** – also came of UNCED and addresses the primacy of biodiversity to sustainable development and the survival, recognizing that biological diversity is not only about plants, animals and micro organisms and their ecosystems, but also people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live.
- 8) **United Nations Convention to Combat Desertification [UNCCD] (1994)** – resulting from the 1977 United Nations Conference on Desertification (UNCOD) and Plan of Action to Combat Desertification (PACD), UNCCD addresses the problem of land degradation in arid, semi-arid and dry sub-humid areas. It is very pertinent to land management and conservation issues in Bhutan’s mountainous environment.
- 9) **Paris Convention for the Protection of Industrial Property (first accepted 1883)**: provides for the protection of industrial property, having as its object patents, utility models, industrial designs, trademarks, service marks, trade names, indications of source or appellations of origin, and the repression of unfair competition.
- 10) **Berne Convention for Protection of Literary and Artistic Works (first accepted 1886)**: requires signatories to recognize the copyright of works of authors from other signatory countries in the same way as it recognises the copyright of its own nationals. It also establishes a system of equal treatment that has internationalized copyright amongst signatories, and requires member states to provide strong minimum standards for copyright law.

SCHEDULE 2

Organogram of CoRRB



Acronyms

AFD – Administration and Finance Division
AMC – Agriculture Machinery Centre
BAFRA – Bhutan Agriculture and Food Regulatory Agency
CNR – College of Natural Resources
CoRRB – Council for RNR Research of Bhutan
DoA – Department of Agriculture
DAMC – Department of Agricultural Marketing and Cooperatives
DoFPS – Department of Forests and Park Services
DoL – Department of Livestock
EDP – Economic Development Policy
FMU – Forest Management Unit
FYDP – Five-Year Development Plan
FYP – Five-Year Plan
GNH – Gross National Happiness
GNHC – Gross National Happiness Commission
IPM – Integrated Pest Management
IPN – Integrated Plant Nutrition
MAP – Medicinal and Aromatic Plants
M&E – Monitoring and Evaluation
MoAF – Ministry of Agriculture and Forests
MoU – Memorandum of Understanding
NBC – National Biodiversity Centre
NCAH – National Centre for Animal Health
NEPA – National Environmental Protection Act
NGO – Non-Government Organisation
NMC – National Mushroom Centre
NPPC – National Plant Protection Centre
NRM – Natural Resource Management
NSC – National Seed Centre
NWFP – Non-Wood Forest Products
PPD – Planning and Policy Division
PPP – Private-Public Partnership
RDC – Research and Development Centre
RGoB – Royal Government of Bhutan
RNR – Renewable Natural Resources
ROP – Research Outreach Programme
RUB – Royal University of Bhutan
TK – Traditional Knowledge
TRP – Tangible Research Property
UWICE – Ugyen Wangchuck Institute for Conservation and Environment