RESEARCH OUTREACH PROGRAM- ORGANIC FOR UPSCALING ORGANIC AGRICULTURE IN BHUTAN

Tirtha Bdr. Katwal, Tshering Wangchuk and Chimi Rinzin

JULY, 2020

NCOA/Strategy/20-21/1

Table of Contents

Acronyms

AMC	Agriculture Machinery Centre
ARDC	Agriculture Research and Development Centre
BAFRA	Bhutan Agriculture and Food Regulatory Authority
DAMC	Department of Agriculture Marketing and Cooperatives
DoA	Department of Agriculture
DoFPS	Department of Forests and Park Services
DoL	Department of Livestock
FMCL	Farm Machinery Corporation Limited
FYP	Five Year Plan
ILM	Integrated Landscape Management
LOAS	Local Organic Assurance System
MoAF	Ministry of Agriculture and Forests
NFOFB	National Framework for Organic Farming in Bhutan
NOB	National Organic Board
NOFP	National Organic Flagship Program
NOP	National Organic Program
NPHC	National Post Harvest Centre
NPPC	National Plant Production Centre
NSC	National Seed Centre
NSSC	National Soil Service Centre
NWFP	Non Wood Forest Products
OA	Organic Agriculture
PAMS	Prevention, Avoidance, Monitoring and Suppression
ROPO	Research Outreach Program- Organic
UNFCCC	United Nations Framework Convention on Climate Change

1.0 Introduction

Emerging issues such as climate change and its impacts agriculture, water shortage, unsustainable production emanating from the overuse and dependence on external inputs like inorganic fertilizer and pesticides, increasing pollution of ecosystem and plateauing farm productivity has called for a paradigm shift in global food production system. Organic Agriculture (OA) is seen as the best alternative for a sustainable production system to the current conventional system and green revolution technologies.

Bhutan had long envisioned making the country's agriculture system wholly organic. This long term national goal blends very well the overall development philosophy of our Gross National Happiness and conservation of environment as one of its four pillars. Bhutan's' pristine and clean Himalayan environment which is largely organic and uncontaminated with very low use of external inputs give us a very strong footing to become wholly organic. It is evident that many agribusiness and entrepreneurs are interested in Bhutan despite our geographical limitation to utilize and capitalize on "Brand Bhutan". Recognizing the potential of the Organic sector, the government in this 12th FYP year plan has approved the National Organic Flagship Program (NOFP) and given the best opportunity and platform to propel, upscale and strengthen the organic sector. OA is also seen as the most potential pathway for resilience to Climate Change, and has been included as one of the major programs to be pursued under the Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) for 2025 to 2030.

However, despite having an enabling policy framework, a strong political and substantial financial resource for organic sector development, our organic initiatives and push for OA has remained at a very low profile and niche scale. The Agriculture Research and Development Center (ARDC), Yusipang is mandated to coordinate and nationalize research and development in OA. ARDC Yusipang's underlying objective therefore is to rapidly promote OA technologies in the NOFP site, facilitate the registration and certification of organic produce and promote the OA in collaboration with relevant stakeholders. To be able to achieve these objectives there is a need to refine and reprioritize its research and development strategies which is largely inclined towards the promotion of conventional agriculture and green revolution technologies.

The Research Outreach Program - Organic a therefore is a refined approach and an on-farm research and development strategy designed to upscale and fastrack OA. It builds on the existing concept of Research Outreach Program (ROP).

2.0 Research Outreach Program

The current Research Outreach Program (ROP) was first initiated by Agriculture Research and Development Center (ARDC) Wengkhar and has been adopted by all ARDCs as one of the popular technology transfer methodologies with the key objective to fast track the dissemination of agriculture technologies to the farmers. ROP is a modified on-farm research and extension methodology which constitutes elements of on-farm participatory experimentation, social and economic aspects of a technologies and it's rapid up scaling if appreciated by the clients. The most appreciated element of ROP is the faster dissemination of a new finished or semi-finished technology prior to their official endorsement for formal release. ROP has many advantages as

farmers have much quicker access to new technologies; they are engaged in the assessment of the technologies that they will be adopting and the promotion of the technology itself is much quicker. ROP was, however, designed and focussed on conventional technologies. Overall ROPs promoted by ARDCs have been widely appreciated by most stakeholders particularly the Dzongkhags as it helped in building a stronger research and extension linkages.

2.1 Research Outreach Program- Organic

Recognizing the merits of ROP and that it has become popular with the clients for quicker access to the new technologies, it could be emulated for upscaling and fast tracking OA technologies. In the present context, OA agriculture technology transfer is largely based on capacity development and demonstrations targeting research and extension staff, farmers and other stakeholders engaged on OA. It is anticipated that those trained will further promote the technologies and that the technologies will be adopted by farmers.

However, it is quite apparent that the current approach and strategy of training first and adoption thereafter is not adequate enough for the rapid upscaling of OA. The National Organic Flagship Program (NOFP) has set a huge target in terms of area and production to be accomplished in the current 12th FYP. Dzongkhags have already identified substantial areas to be transitioned to fully organic. As the OA is a fairly new concept, the Dzongkhags are looking to ARDCs for support to demonstrate and promote organic interventions. Furthermore, as the mindset of the research and extension staff is largely inclined towards conventional technologies they have to be practically convinced with good on-farm demonstration of OA interventions. Unless a suitable and a pragmatic strategy is put in place the promotion of OA interventions are likely to be slow. A modified **Research Outreach Program (ROP)-Organic** is therefore proposed to rapidly push the transfer of OA interventions.

The modified ROP-Organic builds on the four key principles of OA. The four principles of OA are:

i. **Principle of Health -** Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible. The health of individual and community cannot be separated from health of soil ecosystem- healthy soils contribute to healthy crops that stimulate the health of the animals and people.
ii. **Principle of Ecology-** Organic Agriculture should be based on living systems and cycles, work with them, emulate them and help sustain them.
iii. **Principle of Fairness -**Organic Agriculture should build on the relationships that ensure fairness with regard to the common environment and life opportunities.
iv. **Principle of Care-** Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment.

2.2 Objectives of ROP- Organic

The overriding objective of ROP- Organic is *"to demonstrate and upscale organic technologies in the organic production sites identified by Dzongkhags with the ultimate aim to register and certify the entire landscape and commodities produced therein under the Bhutan Organic Guarantee System(BOGS) finally supporting the development of Organic value chain.*

The specific objectives are:

i. To put in place an effective and pragmatic strategy for rapid promotion and upscaling of OA.
ii. To create awareness and advocate the wider benefits of OA on health and ecosystems and promote long term sustainability through lesser dependence on external inputs for food production.
iii. To fastrack the dissemination of OA technologies.
iv. To generate empirical data for assessing the benefits and impacts of OA.
v. To streamline and strengthen On-farm research on OA and scale up the dissemination of OA technologies through actual field demonstrations.
vi. Register and certify the land and commodities under the Bhutan Organic Guarantee System following the Bhutan Organic Standards.
vii. To effectively contribute to the achievement of the long term national vision of becoming fully organic.

2.3. Key Approaches for ROP-Organic

The overriding objective of the ROP-Organic implemented in a particular village, Chiwog or an identified landscape or watershed is that the site should be organically certified within the purview of the BOGS and the standards prescribed in the Bhutan Organic Standards (BOS). Once the site is certified any commodities produced therein will be eligible for organic certification. The farmers and operators in the ROP–organic sites will be registered and certified following the BOGS norms and ultimately be eligible for using the Bhutan Organic Mark which is the key requirement for marketing of any produce as Certified Organic. Therefore for initiating the ROP-Organic the selection of site is very critical. The key approaches for initiating ROP- Organic are:

2.3.1 Selection of sites

The ROP- Organic sites have to be selected based on a well defined landscape or a watershed so that registration and certification of the land will be easy. Individual farms could be used for ROP-Organic provided that it has minimum risks of contamination from adjoining fields that are managed conventionally. The NOFP sites where most ROP-Organic will be target should be selected following two key approaches.

i. Integrated Landscape Management (ILM) approach: Bhutanese farmers largely continue to practice an integrated farming. In the integrated mountain farming systems, no component of the farming system can be singled out and managed organically or otherwise. The Integrated Landscape Management (ILM) approach appropriately provides holistic scope to appreciate large-scale processes in an integrated and multi-disciplinary manner, combining natural resource management with environmental and livelihood considerations. This approach protects vital ecosystem services and sustains livelihoods, tackling food security challenges while adapting to the likely future impacts of climate change. The landscape approach recognizes that the root causes of problems may not be site-specific and that a development agenda requires multi-stakeholder interventions to negotiate and implement actions). With Organic Farming as the entry point, the ILM will consider the following:

- Without considering the landscape and its entities holistically, organic production of a single commodity in isolation will not be possible
- The entire production landscape, farming systems, other livelihood and enterprises and stakeholders will be targeted for organic farming

- A landscape managed organically will facilitate organic certification of land which is fundamental for certification of products produced thereof.
- Consider conservation of traditional crops and livestock species through commercialization to promote economic value to the products.

ii. Watershed Based Approach

Watersheds are contiguous landscape and in Bhutan we have well defined watersheds in abundance. Watershed based planning and development has been consistently adopted for the integration of the agriculture, livestock and forestry sector activities. Watersheds have well-defined natural boundaries that make them ideal for initiating organic farming. The promotion of OA interventions in such well define watershed will facilitate the certification of the entire area and commodities produced in that location.

2.3.2 Promotion of Organic Soil Nutrient Management Approach

Soil is the most the vital component of crop production in both OA and conventional system. In OA, soil health and nutrient management is more critical as supplementation of nutrients through inorganic fertilizer is not allowed. A healthy soil produces healthy crops which in turn produces healthy food. Improving and maintaining soil health and fertility through adoption of locally available organic resources is fundamental for promoting organic farming. It is important to develop and implement a comprehensive soil fertility strategy. There is wide range of technology options available for soil nutrient management and plant protection in OA. Some of the practical intervention includes: promotion of use of cover crops, green manures, animal manures and crop rotations; soil and water conservation techniques, enhance microbial activity in soil (soil health), create awareness on nutrient re-cycling through proper management of crop residues.

2.3.3 Promotion of Organic Plant Protection Approach

Prevention, Avoidance, Monitoring and Suppression (PAMS) is the best strategy to reduce pest and diseases in the organic farming. Prevention and avoidance are the first line of defense against pests, weeds, and diseases. If pest or weed suppression becomes necessary, producers should be encouraged to use mechanical and physical practices, such as mulch, intercultural tools and cultural operations in both crops and livestock. Suitable and affordable bio-pesticides/ ethno veterinary should be promoted while the use of pesticides and drugs for animals should be done in consultation with organic certifier as the ultimate resort.

2.3.4 Promotion of Indigenous Crops and Livestock Breeds

Currently, there is a drive on commercialization of agriculture and livestock production in the country with the emphasis on the promotion of hybrid seeds, inorganic inputs and commercial breeds of livestock. The immediate outputs from these conventional systems of commercial farming are high but have been proven to be unsustainable overtime. Most of the exotic species are nutrient exhaustive and demand the use of high levels of external input and all external inputs used in the conventional farming have to be imported, are often adulterated and expensive.

Our traditional crops, land races and varieties; and livestock can equally ensure household food security. There is high potential to promote the indigenous crops and species. In spite of very good demand in the market for traditional crops and local livestock products, there is a declining trend on

the area cultivated, production and productivity of native crops and livestock species. Under the organic production regime with no external inputs the use of traditional crops and livestock species will be more sustainable.

2.3.5 Integration of Livestock

Livestock sector plays a critical role in nutrient flow and recycling at landscape level. Livestock is the primary source of nutrient in the form of manures and is an important source of income for small holder farmers. In addition to cattle dung; chicken manure, pig and goat manure are increasingly used. In many areas draught power continues to be important for land preparation in agriculture where mechanization is difficult. Traditional livestock breeds will play a very important role to sustain organic farming. In the ROP-organic sites all animal husbandry practices, feed and feeding practices should be practiced based on the Bhutan Organic Standards.

2.3.6 Integration of Forests

Traditional farming in Bhutan is strongly associated and supported by the forest system. It is the primary source of fodder and beddings for animals, and biomass for Farm Yard Manure (FYM) and composting. In view of the significant role of forests in organic farming, some of the specific intervention that could be promoted are agro-forestry which is commonly practiced by integrating fodder trees in agriculture lands, intercropping of fruit trees with annual crops, promotion of plant species with bio-pesticidal properties and multipurpose shrubs and tree species.

4.0 Seven Critical Steps for Initiating Research Outreach Program - Organic

The steps and mechanisms for initiating ROP- Organic is not very different from those already in vogue for conventional production system. The same steps could be followed with slight modifications that are in line with the principles of OA and that it facilities and supports the ultimate objective of organic certification. Six critical steps are proposed for systematically starting the ROP-Organic.

Step 1: Creating Awareness on OA principles and its scope to the stakeholders

Although Bhutan is by default considered largely organic, there are very specific consideration which needs to be understood by the communities and all Organic Operators engaged in the organic value chain. Before imitating the ROP-Organic it is very fundamental to understand the processes outlined in the Bhutan Organic Guarantee System and the adoption of Bhutan Organic Standards which are linked to Step 2 and 5. After this step communities and Organic Operators should be clear on the Do's and Don'ts of OA. Without adequate awareness and understanding of the OA principles, BGOS and BOS a good site selection and interventions cannot be started.

Step 2: Identification of potential landscape, watershed, Geog, Chiwog or villages by Dzongkhags as NOFP sites to promote OA

As a part of the implementation of NOFP activities, Dzongkhags in consultation with Local Government and communities should identify potential landscape, watershed, Geog, Chiwog or villages is identified. The NOFP sites have been formalized and activities are ongoing with NOFP

support and ROP-Organic has to been initiated in these sites immediately to achieve NOFP targets. Therefore the immediate sites for ROP- Organic should be the NOFP sites.

Step 3: Participatory Planning with all Relevant Stakeholders for ROP- Organic

This step is similar to the ROP under conventional program. It should be always preceded by the awareness on the principles of OA. All participatory tools such as community lead planning, focussed group discussion, resource maps, development of cropping colander, understanding roles of gender and lead farmer interviews could be used. Sine ROP-Organic involves the development of some On-farm permanent structures such as bio-digester, compost shed, Bokashi Shed and many more rigorous planning is very important. The final outcome should be a consensual plan for implementation of ROP on Organic

Step 4: Implementation of OA Interventions

After the participatory planning the implementation of activities should start with the most potential, feasible and the one with the maximum chance of success to win the confidence of the farmers. For OA interventions, protected agriculture could be the best entry point as everything can be controlled in the protected system. Since all agriculture activities are seasonal, it is very important to start at the right time which often guide by the communities. All relevant programs from ARDCS should lead the implementation of specific interventions

Step 5:Registration and Certification

This step is absent in the conventional ROP. It is perhaps the most important and mandatory step for all ROP-organic sites. This process starts with the awareness and training of the communities and organic operators. The tolls used are in this steps include registration forms, farmers diary and BOS. If this step is missed or neglected the ultimate aim of certified organic cannot be achieved. Since registration and verification is new step in the ROP-Organic utmost attention will be required in this step. After registration, feasibility study, Inspections as per BOS is very important.

The certification process will be based on the Local Organic Assurances Systems (LOAS) or Third Party certification norms. LOAS system is good for domestic market while the Third Party certification is necessary for internal market. The LOAS certification will be lead by RDC OA Yusipang while Third Party certification will be done by BAFRA. Following the successful completion of these two processes the communities can use the Bhutan Organic Mark on their products

Step 6: Support and Strengthen Organic Value Chain

This step is very critical to finally complete the Organic value chain. In this step initiatives should be taken to link organic producers to organic entrepreneurs, organic market, and support value addition, and promote local organic entrepreneurs. The participation, support and guidance of the Department of Agricultural Marketing and Cooperatives or its Regional Offices and experts will be critical for the successful implementation of this step.

Step 7:Monitoring and Evaluation, and Documentation

As ROP- Organic is new and the communities have voluntarily agreed and pledged to transition to OA it is very important to continuously monitor all the process. There are always very high possibilities of defaulters who may not follow the BOS. Any violation will lead to the non accomplishment of certification. The evaluation process in the ROP- Organic is very specific and is an integral part of the certification process. The evaluation for certification will be based on either Local Organic Assurances Systems (LOAS) or Third Party certification. After certification, farmers should be linked to other Organic Operators in the value chain. Finally, impact assessment and documentation of results are very important and will have to be done by the lead researchers. The outputs and deliverables should contribute to NOFP objectives and goals.

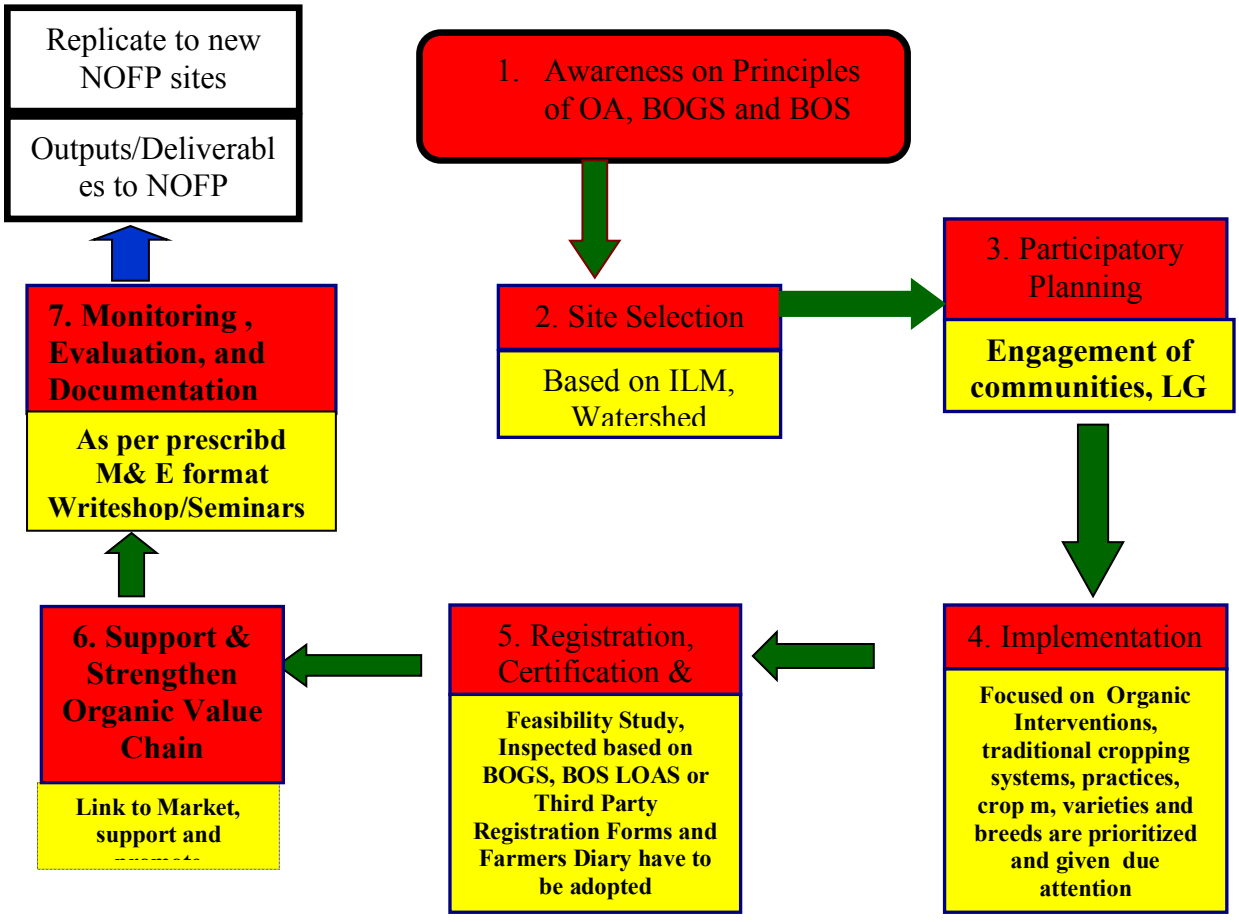

Figure 1: Schematic representation of the steps in implementing ROP- Organic

5. Roles of Stakeholders

To enable the effective implementation of ROP- Organic the following roles and responsibilities are very critical.

5.1 The roles of Researchers

- Overall coordination of the ROP-Organic
- Identify and promote promising OA interventions, technologies, crops and rotations
- Mobilizing and sourcing of organic inputs associated with the interventions
- Develop and demonstrate appropriate OA strategies and interventions
- Lead in the advocacy and awareness on OA
- Training and demonstration of OA interventions
- Link farmers to different Organic Operators
- Promote BOGS and BOS to facilitate organic certification
- Support and facilitate certification
- Link with BAFRA for Third Party Certification

5.2 The roles of Dzongkhag, Geog Extension and Local Government

- Identify sites based on prescribed approaches and norms for OA
- Facilitate community mobilization with support of Local Government officials
- Support and promote the principles of OA
- Lead in planning and implementation of the ROP
- Help in supervision, reporting and documenting
- Use the ROP for wider dissemination and replicate in potential new areas
- Take the lead role for registration and support the certification processes
- Takeover the ROP-Organic after its inception

5.3 Role of National Post Harvest Center and Department of Agricultural Marketing and Cooperatives

- Provide overall support and guidance for strengthening the organic value chain
- Link organic producers to organic entrepreneurs and potential market.
- Promote local organic entrepreneurs
- Support and promote value addition and product development and standardization where feasible
- Awareness and support to promote establish and promote organic brands.

5.4 The roles of the collaborating farmers and Organic Entrepreneurs

- Pledge to be fully organic as prescribed under the BOGS
- Participate and cooperate in the targeted OA interventions
- Adopt the recommendations in BOS as applicable
- Maintain and regularly update the Farm Diary issued by the team
- Follow the cost sharing guidelines developed by MoAF
- Apply for registration and participate and bear the cost of certifications

6.0 Conclusion

Research Outreach Program has proven to be very effective mechanism in fastracking the transfer of agricultural technologies to the farmers. All the ARDCs have widely adopted ROPs and used as the starting point the commercialization of agriculture in the country. ROPs have helped to strengthen the research and extension linkages by providing a common platform to work together. Considering the success and lessons of the ROP which focussed on conventional system, a modified ROP is designed and proposed for upscaling OA in the country. The primary objective of the ROP-Organic is to demonstrate and upscale organic technologies in the NOFP sites identified by Dzongkhags with the ultimate aim to register and certify the entire landscape and commodities produced therein within the purview of the Bhutan Organic Guarantee System (BOGS).

References

Dorji, L., Katwal. T.B and Tashi. K. (2006). research Outreach Centre a s a new RNR research and extension methodology. Manual to guide implementers. RNR RC Wengkhar Technical Publication No. 34/2006

RDC-OA, Yusipang. (2020). Draft General Guidelines for Establishment of Permanent Organic Research and Demonstration plots

DoA, 2019. Sustainable Socio-Economic Development through the Commercialization of Organic Farming

Annexure 1. Important Definitions

Organic Agriculture:	Organic Agriculture is defined as "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved (IFOAM).'
Bio-pesticides:	Bio-pesticides are natural pesticides that are sourced from natural materials, such as minerals, bacteria, plants, or animals.
Bio-fertilizer	A bio fertilizer (also bio-fertilizer) is a substance which contains living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant.
Organic fertilizer	Organic fertilizers are substances made up of one or more unprocessed material(s) of a biological nature (plant/ animal) and may include unprocessed mineral materials that have been altered through microbiological decomposition process"
Green manure	Green manures are cover crops or other plants that are left in the field to decompose, reducing dependence on fertilizers and increasing soil organic matter, and often providing a range of other benefits from preventing soil erosion to detracting pests.
Integrated landscape management	Integrated landscape management is the management of production systems and natural resources in an area large enough to produce vital ecosystem services and small enough to be managed by the people using the land and producing those services (FAO, 2013).
Area Under Organic Management	It is the estimated area under Forests (used for collection and production of all types of Non Wood Forest Products NWFP other than mushrooms), Agriculture and Livestock (Apiculture, pasture, fishery, poultry, etc) that is **REGISTERED** with the National Center for Organic Agriculture (NCOA) for organic production/management
Area under Organic Agriculture	It is the estimated agriculture area exclusively under cultivated agriculture crops and mushrooms (wild collection & cultivated) that is **REGISTERED** with the National Center for Organic Agriculture (NCOA) for organic production/management.
Households Registered for Organic Management	It refers to the total count of households, institutes, individual farms, Land Use Certificates, private firms and producer groups that are engaged in Organic **Production** or **Collection** (from wild) **in** Forests, Agriculture and Livestock and that are **REGISTERED** with the National Center for Organic Agriculture (NCOA**) for Organic**

	management.
Organic Operators	It includes any entrepreneurs or enterprises (Processing, Marketing, Food supply Chain, Exporters, Importers etc) engaged in any part of the Organic Value Chain that are **REGISTERED** with the National Center for Organic Agriculture (NCOA). It excludes the primary producers.
Area Certified	It includes the total area under Forests, Agriculture and Livestock sectors that is **CERTIFIED AS ORGANIC** under the **Bhutan Organic Guarantee System (BOGS).** It will include the area certified under Local Organic Assurance System (LOAS), Participatory Guarantee System (PGS), Third Party Certification at National and International level and in compliance to Bhutan Organic Standard (BOS) and other relevant International Organic Standards.
Certified Agriculture Land	It exclusively includes the total area of land used for Agriculture production including organic seed production and **CERTIFIED AS ORGANIC** as defined in serial no 4.
Total Number of Organic Commodity Certified	It is the single count and total number of any commodities CERTIFIED AS ORGANIC irrespective of production area.
Total Number of Organic Products Certified	**It is the single count and total number** of any value added products **CERTIFIED AS ORGANIC.**