Research article

Contribution of Organic Agriculture to Gross National Happiness (GNH): Bhutan

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Abstract The objective of this review was to study the contribution of organic agriculture (OA) to the development paradigm of Bhutan, Gross National Happiness (GNH). This study examined contributions of OA on GNH on each of the domains under four pillars. The impacts of OA on GNH were assessed using the GNH Project Screening Tool of Agriculture. The tool was developed based on four pillars and nine domains of GNH by Centre for Bhutan Studies (CBS). Each of the screening variable consists of a 4-pointer scale: 1 (negative), 2 (uncertain), 3 (neutral), and 4 (positive). We found that OA and GNH share comparable principles. The principles focusing on the sustainability, well-being of the people, and natural ecosystem while enhancing the economic growth. Further, the result showed a positive score of 120 out of 136 scores. This is way beyond the neutral score of 102. Scoring was from judgement based on the available literature. The apparent result shows that Bhutan has chosen a viable option.

Keywords Bhutan, development, GNH, principles of OA, IFOAM norm

INTRODUCTION

Bhutan pursues Sustainable Development through GNH (National Environment Commission Secretariat, 2012). GNH is a holistic development philosophy build upon four pillars consisting of nine domains and 33 indicators. Bhutan is promoting organic agriculture (OA) due to the entailed sustainable qualities of OA that is socially acceptable, economically sound, and environmentally benign (Tashi and Wangchuk, 2016). The former Prime Minister of Bhutan Jigme Y. Thinley stated, "going organic is living GNH" indicating the wisdom of Bhutan pledging to be 100% organic by 2020. Furthermore, researchers claimed that the principles of OA are in alignment with GNH (Tashi and Wangchuk, 2016). Thus, Bhutan is promoting OA following the guideline of International Federation of Organic Agriculture Movements (IFOAM) definition (McCrae-Hokenson, 2014),

OA is a production system that sustains the health of soils, ecosystems, and people relying on ecological processes, biodiversity, and cycles adapted to local conditions, rather than the use of inputs with adverse effects. OA combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.

Bhutan had been into OA practice since 2003 (Tashi, 2015). Since then, the various literature and the talk by the leaders of Bhutan reveals the potential contribution of OA to GNH (Halberg and Müller, 2013; Setboonsarng and Gregorio, 2017; Seufert, 2012). However, no empirical studies were done on the topic. Thus, the study was conducted to quantify the contributions of OA on GNH based on the available literature.

METHODOLOGY

The study was examined based on the performance of OA in terms of four pillars and nine domains. The pillars are (1) Sustainable and Equitable Socio-economic Development, (2) Preservation and Promotion of Culture, (3) Conservation of the Environment, and (4) Good Governance. The domains are (1) Living Standard; (2) Education; (3) Health; (4) Time Use; (5) Cultural Diversity and Resilience; (6) Community vitality; (7) Psychological Well-being; (8) Ecological diversity, and (9) Good Governance. The impacts of OA on GNH was assessed using the GNH Project Screening Tool of Agriculture consisting of 34 variables (Table 1). The tool was developed based on four pillars and nine domains by CBS. Each of the screening variable consists of 4-pointer scale: 1 (negative), 2 (uncertain), 3 (neutral), and 4 (positive). The score was given based on the concept of OA inscribed in IFOAM norm 2014, National Framework for Organic Farming in Bhutan, and the findings from the scientific papers at our disposal.

Table 1 Variables of GNH project screening tools and the scores

	Variables	Scores
1	Traditional resource management knowledge	4 (Will enhance traditional natural resource management knowledge)
2	Traditional resource management institutions	4 (Will enhance traditional natural resource management institutions)
3	Farmland availability	1 (Will encroach on farmlands)
4	Fallow land	4 (Will decrease the number of fallow agricultural acres)
5	Land degradation	4 (Will reduce soil erosion and land degradation)
6	Urban migration	4 (Will decrease rates of rural-urban migration)
7	Voluntary reciprocal labor	4 (Will strengthen voluntary reciprocal labor practices)
8	Labor-saving devices	2 (Do not know the effects on the availability of labor-saving Devices)
9	Rural credit	4 (Will increase availability of rural credit)
10	Manure and biomass inputs	4 (Will favor farmyard manure and biomass inputs)
11	Herbicide use	4 (Will decrease the use of herbicides)
12	Pesticide use	4 (Will decrease the use of pesticides)
13	Genetically modified species	4 (Will decrease importation and use of GM seeds and crops)
14	Traditional crops	4 (Will favor the use traditional crop varieties)
15	Traditional practices	4 (Will promote this variable)
16	Nutrition	4 (Will result in an improvement in nutritionally balanced diet)
17	Food self-sufficiency	2 (Do not know the effects on rural food self-sufficiency)
18	Cereal self-sufficiency	2 (Do not know the effects on national cereal self-sufficiency)
19	Agricultural productivity	2 (Do not know the effects on the productivity of crop)
20	Crop damage	4 (Will result in a net decrease in crops lost to wildlife damage)
21	Agricultural biodiversity	4 (Will result in an increase in agricultural biodiversity)
22	Mono-cropping	4 (Will result in a decrease in monocropping)
23	Agricultural exports	4 (Will result in increased diversification of agricultural exports)
24	Value-addition	4 (Will increase value addition through organic marketing strategies)
25	Farmer income	4 (Will result in a net increase in rural income levels)
26	Ecological impact	4 (Will enhance surrounding biodiversity)
27	Values	4 (Will strengthen traditional values of respect for the natural environment)
28	Water supply	4 (Will result in greater availability of water supply for irrigation)
29	Water quality	4 (Will result in an improvement in the quality of water supply for irrigation)
30	Water demand	4 (Will decrease the demand for water)
31	Water pollution	4 (Will decrease levels of water pollution)
32	Air pollution	2 (Do not know the effects on levels of air pollution)
33	Employment	4 (Will generate local employment)
34	Equity	4 (Will address rural equity)

Calculation: the score calculation was done based on the following equations:
Positive score = 4 X Number of screening questions
Neutral score = 3 X Number of screening questions

RESULTS AND DISCUSSION

We found that OA has positive impact on GNH as per the examination through GNH Project Screening Tool. OA contributes to enhancing GNH with the positive score of 120 out of 136 scores. This is way beyond the neutral score of 102. This highly significant result could be due to the comparable principles between the OA and GNH. This indicates that the adoption of organic agriculture in Bhutan is the right choice. The food self-sufficiency, cereal self-sufficiency, agricultural productivity, labor-saving devices, requirement of more farmland, and air pollution remained as contentious issues. Some studies revealed positive while some revealed negative impacts on these topics.

Sustainable and Equitable Socio-Economic Development

Living standard: OA is climate resilient and gives better yield to the changing climate (Reganold and Wachter, 2016; Seufert and Ramankutty, 2017). Moreover, the production is feasible at the minimal cost (Department of Agriculture, 2007) on which the farmers fetch premium price resulting the higher income (Annunziata and Vecchio, 2016; Cocka et al., 2016; Jouzi et al., 2017; Meng et al., 2017). The labor-intensive nature of OA has provided employment opportunities in the rural areas building financial security (Department of Agriculture, 2007; Finley, Chappell et al., 2018; Jouzi et al., 2017; Seufert and Ramankutty, 2017; Tashi and Wangchuk, 2016). Further, OA restore the degraded land (Jouzi et al., 2017) and improving other social issues (e.g., public health) (Migliorini and Wezel, 2017). The creation of accessibility to the diversity of crops is another advantage of OA (Reganold and Wachter, 2016). Thus, it will minimize the risk of having to depend on a single crop (Seufert and Ramankutty, 2017). Collectively, these studies showed its contribution to the sustainable local economy and thus, enhancing the living standard. However, the potential of OA to feed the growing population (Reganold and Wachter, 2016) and its impact on the environment (Gomiero, 2018) still remains controversial debate among researchers.

Education: OA is a knowledge-intensive system (Siddique et al., 2014). It lures participation of farmers with the other actors such as researchers, farmers' associations, consumers etc., for collective management (Ortolani et al., 2017). This encourages social learning on the values, tradition, culture, and the environment (Mercati, 2016; Padel et al., 2015). Thus, OA provides a holistic educational platform to all involved in the system. The concept is still evolving with the constant search for multiple solutions to the challenges (Migliorini and Wezel, 2017; Rahmann et al., 2017).

Health: OA has an opportunity to enhance physical, mental and social wellbeing (IFOAM, 2017; Tashi and Wangchuk, 2016). It produces safe and nutritious food (Gomiero, 2018; Seufert and Ramankutty, 2017). The risk of farmers exposure to the chemical is also reduced due to the banned of chemical inputs (Brantsæter et al., 2017; Jouzi et al., 2017). However, the production of safe and nutritious food depends on the management practice (Jouzi et al., 2017; Mie et al., 2017).

Preservation and Promotion of Culture

Time use: Since OA is a labor-intensive farming system (Finley et al., 2018; Siddique et al., 2014), the family and leisure time will have to be compromised if there is labor shortage. However, the people working together on the farm will have enough time to get together. We conclude that people working together will get more time to exchange knowledge from each other.

Cultural diversity and resilience: As per the IFOAM norm 2014, the diverse and unique sets of cultural and traditional practices should be embraced with innovation and science (IFOAM, 2017). Moreover, locally adapted cultivars are conserved which are highly adaptable to changing climate (Migliorini and Wezel, 2017; Tashi and Wangchuk, 2016). Thus, OA can ensure cultural diversity and resilience.

Community vitality: OA has an opportunity to increase the sense of belongingness to the group

(Annunziata and Vecchio, 2016; Reganold and Wachter, 2016). It provides an opportunity to work together, and exchange knowledge and experiences among the wider stakeholders (Taheri et al., 2017; Tashi and Wangchuk, 2016). Also, the farmers are able to gain customers' trust once the product is certified (Rahmann et al., 2017).

Psychological wellbeing: It is an intrinsically valuable and desired state of being defined by reflective and affective elements (Ura et al., 2012). OA addresses the (1) health of the soil, plants, animals, humans for a healthy planet; (2) protect natural systems; (3) provide equity, respect and justice for those involved in OA; and (4) care for the current and future generations, and the environment (IFOAM, 2017; Migliorini and Wezel, 2017). Thus, we conclude that OA has the potential to address both reflective and affective elements (IFOAM, 2017).

Conservation of Environment

Ecological diversity and resilience: OA is the environmentally friendly practices that protect the public goods such as prevention of air and water pollution, and enhance water quality (Jespersen et al., 2017; Mercati, 2016). Also restores degraded land, increases biodiversity and ecosystem services (Markuszewska and Kubacka, 2017; Mercati, 2016; Seufert and Ramankutty, 2017; Taheri et al., 2017). OA creates favorable conditions for living organisms to thrive which are good for soil formation (Meng et al., 2017). However, so far no studies were conducted for the impact of OA and wildlife damage to the crops.

Good Governance

Good governance: IFOAM norm of version 2014 requires OA to inculcate transparency, autonomy, equity, and equality (IFOAM, 2017). Also, OA can promote empowerment of the small-scale farmers and women (Jouzi et al., 2017; Parrott et al., 2006; Rahmann et al., 2017; Taheri et al., 2017). Also, every individual can work in the farm irrespective of age and gender. Even the pregnant women and children can work on the farm since the exposure to the chemicals is reduced (Parrott et al., 2006). Further, the transparency is ensured through certification (Parrott et al., 2006; Rahmann et al., 2017).

CONCLUSION

OA is expanding progressively despite some contentious issues. The third phase of OA "Organic Agriculture 3.0 is Innovation with Research" is in place to address the challenges of OA by incorporating the principles of OA. The principles which are comparable to GNH principle. The study revealed various contributions of OA to every domain of GNH. OA scoring positive scores of 112 from Screening Tool and further indicate that AO has the high potential to contribute to GNH. The positive impact of OA on GNH will ultimately benefit the country. However, Bhutan should work more on contentious issues: productivity, requirement of more farmland, organic manure production and reduction of air pollution.

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