Challenges of Agricultural Farmers' Groups and Cooperatives in Eastern Bhutan

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Received: 2 September 2020; Revised: 24 November 2020; Accepted: 1 December 2020

Abstract

Bhutan has been promoting Farmers' Groups (FGs) and Cooperatives (Coops) – also referred to as 'group' or 'groups' in this study – to cater to the agricultural transition from subsistence to commercial farming. Despite the increasing number of groups in the country, their challenges remain unexplored, especially in Eastern Bhutan. Therefore, this study assessed the challenges of these groups in six Eastern districts of Bhutan. Face-to-face interviews using the semi-structured questionnaire were conducted to collect data from 301 members of groups selected via the proportionate random sampling. The results from the principal component analysis show that FGs and Coops in Bhutan face five major challenges: (1) group management issues; (2) technological and financial issues; (3) marketing issues; (4) farm input issues; and (5) member retention issues. The five components explained 19.42%, 11.81%, 7.70%, 6.88%, and 5.92% of the variance; and overall, they explained ~ 52% of the total variance. Accordingly, effectual group formation, group management training, farm machinery and input subsidization, contract business escalation, product value addition, and existing group reinforcement are recommended.

Keywords: Agricultural Challenges, Farmers' Group, Cooperatives, Bhutan

Introduction

Bhutan is an agrarian country, and its people practice integrated farming, comprising agriculture, livestock, and forestry (Katwal et al., 2015). Informal Farmers' Groups (FGs) existed in Bhutan as early as the 1960s; however, the Royal Government of Bhutan (RGoB) has been promoting modern FGs to cater to the agricultural transition from self-subsistence to commercial farming in the country (Dendup, 2018; MoAF, 2010). Cooperative (Coop) is "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (International Co-operative Alliance, 2018). FG is "a group of not less than three members deriving economic benefits from one or more economic enterprises related to the Renewable Natural Resources Sector" (MoAF, 2010). This article uses 'group' or 'groups' interchangeably to refer to FGs and Coops for convenience.

The RGoB reformed the legal and institutional framework by enacting the Cooperative Act of Bhutan in 2001 and later amendments in 2009 to promote group development (MoAF, 2010). In 2009, the MoAF set up the Department of Agricultural Marketing and Cooperatives (DAMC), an institute dedicated to looking after the groups, which registers groups, promotes efficient and effective marketing systems, develops institutional linkages, and strengthens groups. As of June 2019, there were 509 FGs and 71 Coops registered in Bhutan (MoAF, 2019). The DAMC has also established the Regional Agricultural Marketing and Cooperatives (RAMCO) in Mongar to deliver its services in Eastern Bhutan.

FGs and Coops deliver goods and services in areas not covered by the public and private sectors. For instance, groups address local needs, use local talent, and are led by local leaders (Kumar, Wankhede, & Gena, 2015).

These groups contribute significantly to the country's social, economic, and environmental development (van der Ploeg, Long, & Banks, 2002). However, mobilizing groups in Bhutan is constrained by several factors, including technology, policy, land, marketing, input, and group management (MoAF, 2019; Sonam & Martwanna, 2012). A recent study by Dendup & Aditto (2020) likewise reported issues related to market, production, and members as key factors hindering the performance of Agricultural Coops in Central Bhutan. However, the previous researchers mostly focused on FGs and Coops in the West and Central regions of Bhutan (Dendup & Aditto, 2020; Wangchuk et al., 2019; Bhujal & Sonam, 2014; Sonam & Martwanna, 2012). Thus, the challenges of FGs and Coops in Eastern Bhutan are unexplored. This study, therefore, assessed the challenges of FGs and Coops in six Eastern districts of Bhutan. This study is expected to pronounce FGs and Coops' challenges, which will help relevant authorities design and implement programs to strengthen and promote FGs and Coops in the country, particularly in Eastern Bhutan.

Research Question

What are the challenges faced by FGs and Coops in Eastern Bhutan?

Research Objective

To explore the challenges of FGs and Coops in six Eastern districts of Bhutan.

Methods

Study Area

Bhutan lies between 26° 42' 2.36" N and 28° 14' 51.64" N latitudes, and 89° 46' 5.7" E and 90° 32' 3.29" E longitudes (National Environment Commission, 2011). According to Nidup et al. (2011), Bhutan has 20 districts divided into four developmental regions (Figure 1): Eastern region, East-central region, Western region, and West-central region. Eastern Bhutan had 197 FGs and 14 Coops with 5,443 members as of June 2019 (MoAF, 2019). However, the previous studies are centered in Bhutan's West and Central regions (Wangchuk et al., 2019; Bhujal & Sonam, 2014; Sonam & Martwanna, 2012), leaving the eastern region unexplored. Therefore, this study seeks to address the research gap in Eastern Bhutan (Figure 1).

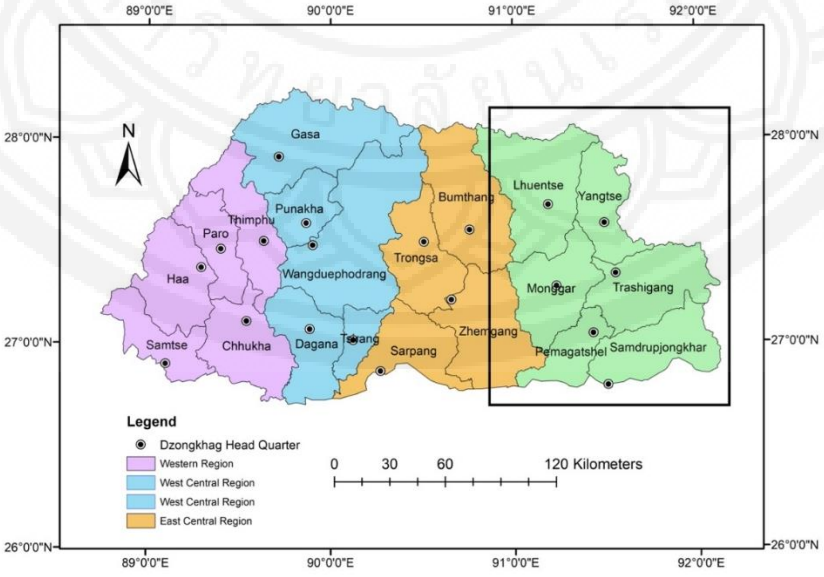

Figure 1 Study Area Showing Eastern Bhutan

Sample Size and Sampling

The proportionate random sampling was used to select 60 FGs' groups (53 FGs and 7 Coops) in six Eastern districts using the DAMC's online database (DAMC, n.d.). The researchers planned to collect data from 400 members sampled through proportionate random sampling, using the Yamane formula (1973). The target population was 5,443 members of groups in Eastern Bhutan (DAMC, n.d.) and the confidence level was kept at 95%. However, data collection covered only 301 members, as shown in Table 1, because it was terminated before the completion due to the COVID-19 outbreak in the country. Therefore, data gathered from 301 group members yielded results for this study. For the exploratory factor analysis, the sample-to-item ratio also decides the required sample size. The ratio should not be less than 5 : 1 (Suhr, 2006). According to this ratio, 21 items would require a minimum of 105 respondents. Thus, the sample size of 301 is adequate to analyze 21 items used in this study.

Table 1 Planned and Actual Sample

Dzongkhags	Total Members	Planned Sample	Actual Sample
Lhuentse	332	17	13
Mongar	1136	109	91
Pemagatshel	926	46	37
Samdrup Jongkhar	1367	75	30
Tashigang	1090	121	103
Trashiyangtse	592	32	27
Total	**5443**	**400**	**301**

Data Collection

The face-to-face interviews, necessitated by predominant illiteracy among the respondents, were conducted using semi-structured questionnaires from December 2019 through February 2020. Face-to-face interviews increase the respondent's cooperation and motivation when researchers meet, talk, and listen to them (Neuman, 2012).

The Cronbach's alpha for the questionnaire was 0.776, higher than the recommended threshold of 0.70 (Alay & Koçak, 2002). The RAMCO, Mongar, reviewed the content of the questionnaire and endorsed it before the field survey. The questionnaire was pre-tested with ten members of FGs and Coops in Mongar and corrected to improve its clarity. The questionnaire had three parts: (1) respondents' profiles; (2) characteristics of group members; and (3) challenges of groups. Respondents rated 21 statements explaining groups' challenges on five-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Table 2 shows the 21 items arranged in descending order by their mean scores. These items were developed based on issues highlighted in previous studies in Bhutan, including but not limited to Wangchuk et al. (2019); Pujara (2016); Bhujal & Sonam (2014) and Sonam & Martwanna (2012).

The Research Committee at the College of Natural Resources, Royal University of Bhutan, approved the research proposal. Researchers informed the DAMC and selected districts and gewogs (blocks) about the study through a formal letter. The researchers obtained verbal consent from all respondents about their participation in the survey and to use the data for this study. The secondary data were gathered from the earlier studies, government documents maintained by the selected districts and gewogs, and internet sources (e.g., DAMC's online database).

Table 2 Descriptive Statistics of 21 Variables

	Variables	Mean	Standard Deviation
1.	Pests and diseases decline products' quantity and quality	3.96	1.29
2.	Not able to attract new members	3.85	1.56
3.	Not able to update emerging technologies	3.69	1.37
4.	The small scale of production	3.46	1.64
5.	Difficult to maintain a sound financial status of the group	3.45	1.49
6.	Declining number of members	3.27	1.65
7.	Constant increase in the cost of inputs	3.27	1.45
8.	Unavailability of farm inputs on time	3.03	1.56
9.	Commodities do not fetch reasonable prices	3.00	1.42
10.	Groups face transportation problems	2.89	1.65
11.	Not aware of markets and marketing channels	2.74	1.61
12.	There is weak group cohesion	2.60	1.33
13.	Groups face acute shortage of farm laborers	2.52	1.44
14.	Not able to implement by-law	2.35	1.48
15.	Groups face competition from other competitors	2.26	1.49
16.	Low participation by members in group activities	2.22	1.39
17.	Group face management issues	2.15	1.31
18.	Poor access to credit for productions	2.09	1.25
19.	Not able to compete with the existing products in the market	2.09	1.34
20.	Members do not take ownership of groups	2.06	1.23
21.	Untimely payment of credits by members	1.91	1.35

Data Analysis

The data coding and cleaning were done using Microsoft Excel 2010. The descriptive statistics (frequencies, percentage, means, and standard deviations) and the principal component analysis (PCA) were computed using the Statistical Package for the Social Sciences 23.0. The PCA reduced 21 items into a few components for meaningful presentation and interpretation of the challenges faced by FGs and Coops in Eastern Bhutan. The study area map, i.e., Figure 1, was generated using the QGIS 3.14.15, a free and open-source geographic information system.

Results

Demographic Characteristics of Members

The respondents, which included more females (63.79%) than males (36.21%), were aged between 31 and 40 years. Most of them (47.84%) had no schooling, and none of the group had a member with a bachelor's degree. Most households (41.86%) had a medium-sized family comprising four to five members. About 72.42% of the member households earned less than Nu. 100,000 annually, which indicates that they are small-scale farmers. There is also an almost equal engagement of respondents in cropping (50.17%) and livestock rearing (49.83%). The majority (58.47%) of respondents were engaged in the production and marketing business, showing that only a few were in the processing and services business. Table 3 presents a detailed profile of respondents.

Table 3 Demographic Characteristics of Respondents

Characteristics	Frequency	Percentage
Gender		
Male	109	36.21
Female	192	63.79
Age		
19 years and below	8	2.66
20 – 30 years	48	15.95
31 – 40 years	93	30.90
41 – 50 years	69	22.92
51 – 60 years	51	16.94
61 years and above	32	10.63
Qualification		
Higher	15	4.98
Middle	25	8.31
Primary	36	11.96
NFE	81	26.91
Non	144	47.84
Family Size		
1 – 3 (Small)	98	32.56
4 – 5 (Medium)	126	41.86
> 6 (Large)	77	25.58
Annual Income		
Nu. 200,000 and above	34	11.30
Nu. 100,000 – Nu. 200,000	43	14.29
Nu. 50,000 – Nu. 100,000	112	37.21
Less than Nu. 50,000	112	37.21
Sector		
Cropping	151	50.17
Livestock	150	49.83
Business Activity		
Production	4	1.33
Services	6	1.99
Production and Marketing	176	58.47
Production, Marketing, and Processing	115	38.21

Decisions to Retain Extracted Components

The PCA was performed to extract uncorrelated linear combinations of the observed variables. The orthogonal Varimax rotation was used to club variables having high loading on each component. Initially, the PCA reduced 21 items into seven components, explaining 62.065% of the variance with initial eigenvalues higher than one. However, the Scree plot suggested retaining only five components as there is 'leveling off' on the curve after the fifth component (Figure 2).

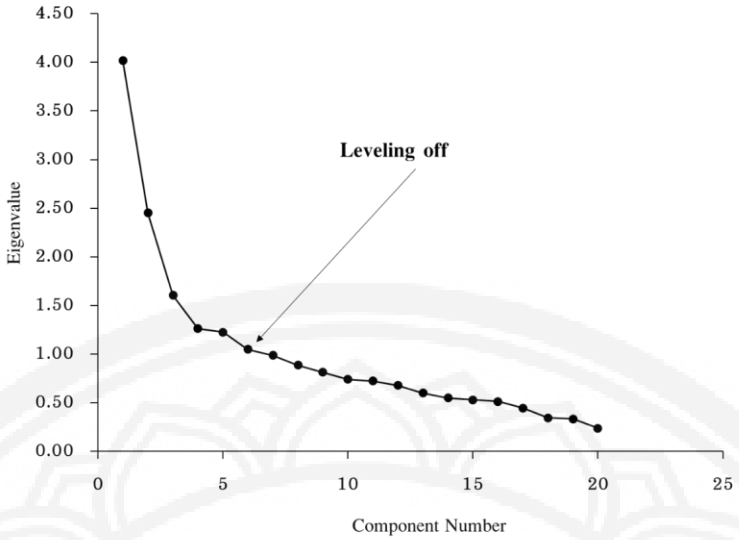

Figure 2 The Scree Plot Showing a Leveling Off Starting the Fifth Component

The Monte Carlo Parallel Analysis was performed to confirm the retention of five extracted components. In this analysis, components having initial eigenvalues greater than random eigenvalues were retained. Thus, we retained five components because initial eigenvalues up to the fifth component are higher than random eigenvalues (Table 4).

Table 4 Initial Eigenvalues and Random Eigenvalues

Component	Initial Eigenvalues	Random Eigenvalues
1	4.08	1.50
2	2.48	1.41
3	1.62	1.35
4	1.45	1.29
5	1.24	1.23
6	1.16	1.19

Adequacy Test for Factor Analysis

Before interpreting PCA results, Kaiser-Meyer-Olkin (KMO) was checked for the sampling adequacy for factor analysis. The KMO test determines the partial correlations among variables and the suitability of data for the factor analysis. In this study, the KMO value was 0.743, confirming the sample adequacy. Bartlett's test of sphericity assessed redundancy between the variables that summarize five extracted components through the correlation matrix. The test's null hypothesis is that these variables are orthogonal. As desired, Bartlett's test of sphericity was significant at 95% level, where $\chi 2$ (df = 210) = 1542.377, $p < .001$. rejecting the null hypothesis. Therefore, these two statistics suggested the suitability of data for the factor analysis

Components Extracted with Varimax Rotation by the PCA

These five extracted components explained ~ 52% of the total variance (Table 5). Specifically, the first, second, third, fourth, and fifth components explained 19.42%, 11.81%, 7.70%, 6.88%, and 5.92% of the variance, respectively. The items loaded under each component guided in the naming of five components: group

management issues (first component), technological and financial issues (second component), market issues (third component), farm input issues (fourth component), and member retention issues (fifth component).

Table 5 PCA with Varimax Rotation

Items	Factor Loadings	% of Variance	% of Cumulative Variance
Fist Component: Group Management Issues			
Group face management issues	.82		
Members do not take ownership of groups	.78		
Not able to implement by-law	.76	19.42	19.42
Low participation by members in group activities	.67		
There is weak group cohesion	.65		
Second Component: Technological and Financial Issues			
Not able to update emerging technologies	-.81		
Poor access to credit for productions	.69		
The small scale of production	.68	11.81	31.23
Difficult to maintain a sound financial status of the group	-.49		
Third Component: Market Issues			
Not aware of markets and marketing channels	.39		
Group face transportation problems	.67		
Commodities do not fetch reasonable prices	.59	7.70	38.93
Pests and diseases decline products' quantity and quality	.54		
Not able to compete with the existing products in the market	.45		
Fourth Component: Farm Inputs Issues			
Constant increase in the cost of inputs	.67		
Unavailability of farm inputs on time	.60		
Groups face acute shortage of farm laborers	.54	6.88	45.81
Untimely payment of credits by members	.46		
Fifth Component: Member Retention Issues			
Declining number of members	.71		
Not able to attract new members	.64	5.92	51.73
Groups face competition from other competitors	-.50		

Discussion

This study assessed the challenges of agricultural FGs and Coops in Eastern Bhutan. A total of 301 members took part in this study. Most (63.79%) respondents were females, and the ages of most of the respondents (30.90%) were between 31 and 40 years. About 48% of respondents had no formal schooling. This result is consistent with the finding of Pelzom & Katel (2017), who report a low preference among Bhutanese youths to take up agriculture as a career. Most households (41.86%) having 4-5 persons is also close to Bhutan's average household size of about 4.2 (4 in the urban areas and 4.4 in the rural areas) (National Statistics Bureau, 2017). In agreement with Katwal et al. (2015), respondents in the study area also practice integrated farming.

Five components retained in the study were extracted by the PCA using the Varimax rotation after checking for initial eigenvalue greater than one, leveling off on the Scree plot, and comparing initial eigenvalue with random eigenvalues generated from parallel analysis (Kanyongo, 2005; Ledesma & Valero-Mora, 2007). The KMO

test's value was greater than 0.7, and Bartlett's test of sphericity was significant. These two tests further confirmed the suitability of interpreting the PCA results (Tabachnick & Fidell, 2001; Cerny & Kaiser, 1977). The five extracted components explained ~ 52% of the total variance, which is more than the minimum threshold of 50% (Hair et al., 2006). The five components are interpreted and discussed in detail in subsequent parts of this article.

First Component: Group Management Issues

The first component loaded five items associated with group management issues and explained 19.42% of the variance. FGs and Coops could not enforce their by-laws. For instance, although groups are required to vote for the group leaders, they appointed the leaders through a lucky draw among the members. Therefore, the leaders were either illiterate inexperienced, and incompetent for efficient group management. On the other hand, appointing capable leaders is vital to a group because efficient group performance is contingent upon its management and supervision by competent and democratically elected leaders (Pujara, 2016). A weak sense of ownership of groups was also prevalent among the members, a reality attributable to a long tradition of the top-down approach of group formation adopted by the promoters (Sonam & Martwanna, 2012). Interviews with members further revealed that some members had joined groups only to receive subsidies and lacked genuine interest. Except in a few groups, members' participation was generally minimal due to the scattered nature of settlements from which the members came, infrequent group activities, weakly enforced by-laws, and poor sense of group ownership. All these issues weaken another binding cord of collective actions, the group cohesion. Thus, strict enforcement of existing mechanisms like meeting the total project cost through cost-sharing among members will improve the group's cohesion and oblige members to continue the groups. Pursuing cooperative principles (International Co-operative Alliance, 2018) could also address many management problems.

Second Component: Technological and Financial Issues

The second component loaded four items related to technological and financial issues, explaining 11.81% of the variance. FGs and Coops could not update emerging agriculture technologies. Most members were illiterate and had limited exposure to contemporary technologies. Moreover, FGs and Coops, as small-scale enterprises, faced financial constraints and a lack of credit access, which hindered them from purchasing and updating agricultural technologies. Thus, RGoB and other donors had supported existing technologies in most groups in Eastern Bhutan. Being small-scale enterprises – farmers working manually with limited technologies (Tshering, 2014) – groups were also not making a profit. Hence, the economic benefits members gained from joining groups did not satisfy their expectations. Thus, the authorities concerned – including Agriculture Machinery Centre and Farm Machinery Corporation Limited – should continue supplying farm technologies to the farmers and train them to use these technologies. Availability of and accessibility to technologies suitable to Bhutan's rugged terrain would increase production and make groups financially stable.

Third Component: Marketing Issues

The third component loaded five items related to market issues explaining 7.70% of the variance. FGs and Coops market their products through an informal and unorganized channel. Wangchuk et al. (2019) also reported an unregulated market and unstandardized marketing procedure in Western Bhutan. This result implies that groups should explore other marketing channels, like contract business and online marketing, to seize the fast-changing marketing systems. Only a few groups had access to pool vehicles; therefore, other groups located far from urban markets faced transportation challenges. Adverse road conditions in summer – during the peak production season – further worsened the transportation challenges. The deterioration of product quality due to pests and crop diseases

also resulted in fetching low prices for the products in the market. Being nascent enterprises, FGs and Coops in Bhutan also suffer intense competition from imported products. For example, Tashi & Wangchuk (2016) and Phanchung et al. (2002) also reported that Bhutanese farmers could not compete cheaply available imported products. Therefore, contract farming must be upscaled by linking smallholder farmers and large-scale consumers, including schools, religious bodies, and other institutes. Moreover, to meet the unifying agri-food value chain (Briggeman et al., 2016), groups should improve efficiency and pursue product differentiation.

Fourth Component: Farm Inputs Issues

The fourth component loaded four items connected to farm inputs, accounting for 6.88% of the variance. Respondents reported that increasing market prices for seeds, fertilizers, and animal feed is a growing challenge. Illustratively, a 50 kg bag of Karma Feed (a commercial cattle feed in Bhutan) costs about Nu. 1,380, which farmers described as a significant rise over previous few years' price. The gewog agriculture extension office, on which farmers depend for agriculture inputs, often delays the supply. Thus, the delay impedes production. Additionally, FGs and Coops face a shortage of laborers as the rural-urban migration is high in Bhutan, especially among the farming communities where youths and working-age villagers out-migrate searching for better education and employment, leaving behind the older people. Dendup (2018) and Pelzom & Katel (2017) likewise reported the disinclination of Bhutanese youths towards farming as full-time employment. Most FGs and Coops deposit varying amounts of cash in their joint savings account. Those groups with adequate savings also give credit to their members (Sonam & Martwanna, 2012). However, when members fail to repay loans on time, groups face a shortage of funds to buy other inputs.

Fifth Component: Member Retention Issues

The fifth component loaded three items related to member retention issues, which explained 5.92% of the variance. Retaining members in groups is vital because it measures how well groups can transform themselves from investor-owned firms to coops (Fulton, 1999). However, the attrition of members is a challenge among groups in Bhutan. The common reasons for the attrition described by the respondents include the inability of the elderly members to contribute to group savings and the death of cattle owned by the members of dairy groups. Farmers also underscored poor recordkeeping and transparency, inefficient leadership, and shortage of labor at household levels as other crosscutting reasons that inspired member attrition. The groups also faced a challenge in attracting new members. The unstable functioning of groups, notably at the initial stage, served as a deterrence to the other farmers from such collective ventures. Additionally, the growing competition in the market from imported products and state-owned corporations inhibited groups' growth and discouraged farmers from joining them. Some groups reported they could not sell their products; they had to feed them to the cattle or dispose them. Such illustrative cases where groups failed to accrue expected economic returns witnessed members leaving the group at higher rates. However, retaining old members and recruiting new ones are vital to groups' survival and growth because groups are jointly owned and managed by members to achieve shared goals (Jakobsen, 1995). Thus, creating value-added products to minimize waste and spoilage of products to enhance profitability and improve group management strategies through training can help groups retain existing members and attract new ones.

Conclusion

The study assessed the challenges of FGs and Coops in Eastern Bhutan. FGs and Coops faced group management issues due to poor by-law implementation, weak group participation, poor sense of ownership, and

weak group cohesion. The low income, coupled with the limited access to credit, negatively affects their financial sustainability. Groups also could not update emerging technologies, which lowered production and income. FGs and coops also faced problems linked to farm inputs, including increasing prices and delayed supply of inputs. The labor shortage was another challenge among groups. Market problems include transportation challenges for groups located far from urban areas, lower prices due to competition, and compromised product quality due to pests and diseases. Thus, promoters of groups need to emphasize strengthening existing groups to attract new members and minimize member attrition.

Suggestions

To strengthen existing groups to attract new members and minimize member attrition, we suggest the following recommendations:

1. Authorities concerned should facilitate effective group formations, help groups finalize and implement by-laws, and reinforce group management and operation by providing need-based training to the members.
2. RGoB should continue subsidizing farm equipment and enhance access to credit facilities for the farmers.
3. Extension offices need to deliver the farm inputs on time to boost production.
4. There is a need for up-scaling contract farming and value addition of products to address the market-related issues.

Acknowledgments

The authors gratefully acknowledge the office of RAMCO, Mongar, for financial support. The authors also immensely appreciate Mr. Dorji Rinchen, the Regional Marketing Coordinator, and all the other staff of RAMCO, Mongar, including Mr. Karma Tshering, Ms. Sherab Lhamo, Ms. Tashi Zangmo, and Ms. Cheten Zangmo, for helping in data collection. We also would like to thank all extension officials, chairpersons, and members of FGs and Coops for their cooperation.

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