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Animal Production

Effects of government subsidy support on livelihood of dairy farmers in Bhutan

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ABSTRACT

The Royal Government of Bhutan provides up to 30% subsidy support to supplement major costs of cows for dairy farming. However, no study was conducted to evaluate the effects of this initiative. A nationwide study was conducted with the objectives to compare production of milk and milk products and income generation of Dairy Farmer Group (DFG) members before and after subsidy support, understand contribution of subsidy scheme to rural household, and gain deeper insight into the future prospects of subsidy scheme for dairy enterprise development. Field sampling included 566 households across all four regions of the country. Results showed that subsidy support led to significant increase in production of milk and milk products mainly butter and cheese. The support also enabled respondents to purchase more improved breed of cattle. With the subsidy support, many farmers were able to improve their living condition and nutritional status of farm families. The increased household income as a result of subsidy support has reduced the financial burden of those parents or guardians who had to fund their children for higher education. The study concluded that subsidy scheme is highly beneficial to resource poor farmers. However, in future, the scheme needs to be strategic and target areas where it is most needed.

INTRODUCTION

Dairy farming in Bhutan is still at subsistence level and needs to be promoted to enterprise level. In order to enhance milk production and reduce import of milk and milk products, large numbers of Dairy Farmers Groups (DFGs) were formed during the 10th Five Year Plan (FYP) from July 2008 to June 2013. These groups were encouraged to rear improved breeds of cattle to increase productivity. With increase in numbers of DFGs the demand for dairy cattle has increased over the years in the country. In such situation, the government intervention in the form of subsidy support is important. The extent of government's support to farmers in the form of subsidy determines the immediate response to increasing dairy production in the shortest possible time (Salunkhe and Deshmush 2014).

Subsidy support is important since farmers do not have adequate financial and other resources to invest on dairy production. Subsidies feature in many government budgets (Salunkhe and Deshmush 2014) and are a worldwide agricultural phenomenon (Kaur and Sharma 2012). To enhance dairy production, the Royal Government of Bhutan (RGoB) approved the subsidy support scheme as package for two cow level to DFG members mainly to purchase improved dairy cattle breed, meet other associated costs such as transportation (from the source of purchase to the point of destination), support in construction of dairy shed, silo pit, and construct milk processing units. To date, the National Dairy Research Centre (NDRC) had coordinated in sourcing and supplying of 2,200 heads of dairy animals from in- and ex-country (India) with subsidy support amounting to Ngultrum (Nu.) 15.59 million. Besides, Nu. 6.68 m was provided as a subsidy support for construction of 440 dairy sheds and silo pits from 2010-2013 of 10th FYP.

Agriculture subsidies have shown positive impact on the income of farmers in India (Kaur and Sharma 2012). Similar impact is also felt in Bhutan over the years but has not been studied. Particularly, there is lack of study to assess production and sale of milk and milk products by DFG members before and after the subsidy support. Further, to date, no reliable information is available on the effects of subsidy support on farmers' income generation capacity and rural livelihood condition. Thus, a well-designed study was needed to provide a basis for policy recommendations on benefits of such scheme. Therefore, a study was conducted with three main objectives. The first objective was to compare production of milk and milk products and income generation of DFG members before and after subsidy support. The second objective was to quantify the contribution of subsidy scheme to rural household. The third objective was to gain deeper insight into future prospectus of subsidy scheme for dairy enterprise development in the country.

MATERIALS AND METHOD

Study area and data collection

Bhutan has 20 *dzongkhags* (districts) spread across four regions namely Western, West-Central, East-Central and Eastern. In each region, two *dzongkhags* with maximum functional DFGs

who have availed government subsidy support during 10th FYP were selected for the study. The study sampled 566 households (115 households in western region, 109 in West central region, 143 in East Central region, and 199 in eastern region). About 90% of members were randomly selected and interviewed using a semi- structured open ended questionnaire. Wherever possible, informal discussions were held with some of the resource poor farmers to capture additional information on existing dairy production management practices, prospects and support for dairy development in future.

Data analysis

The dataset was analyzed with SPSS version 20 (Landau and Everitt 2004). Descriptive statistics such as mean, standard error and percentage were used for quantitative variables. Multivariate ANOVA was used to test difference in production of milk and milk products before and after subsidy. Farmers' perceptions and opinions were displayed in percentages. Where required, Microsoft Excel program was used to prepare graphs.

RESULTS AND DISCUSSION

Profile of respondents

The respondents comprised of 56.2% male and 43.8% female (Table 1) with an average age of 45.42 years. The youngest respondent was 17 years and oldest was 93 years old. Data showed that male representation was higher than female. However, higher proportion of female respondents in Western and males in Eastern region are indicative of difference in gender representation regionally. The average land holdings of farmers in the study area were 1.46 acres wetland, 3.25 acres dry land, 1.03 acres improved pasture, and 1.08 acres orchard. According to Wahome and Mwanyumba (2009), land plays a vital role in sustainable dairy farming as it is the main farm component and a medium through which animal nutrition is provided. In addition to fodder production, land is required for accommodation of farmer's house, farm animals and infrastructure such as shed and store. The findings from the current study showed that farmers across the *dzongkhags* possessed agricultural lands and were put to different land use practices.

Milk production

The quantities of milk produced before and after subsidy are presented in Figure 1. Following subsidy support, the overall average monthly milk production increased by about 45%. The higher milk production after the subsidy scheme indicates that farmers have the capacity for improved dairy husbandry practices such as better housing and improved feeding supplemented with concentrate feeds. The finding of this study demonstrates that more milk can be produced with subsidy support through provision of more milking animals of improved breeds managed under proper feeding and care.

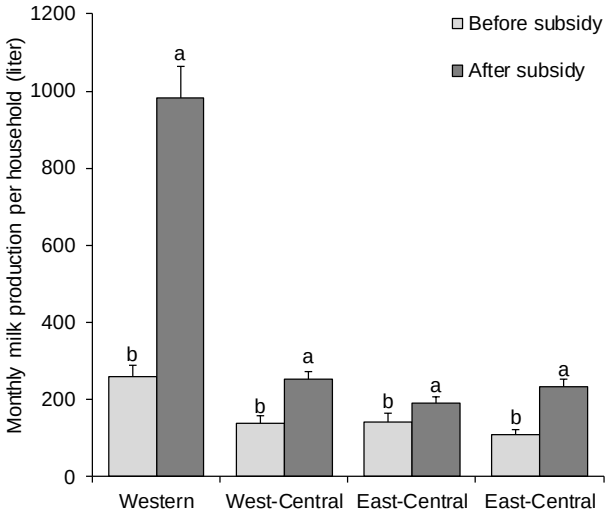

Figure 1 Average monthly milk production per household before and after subsidy support in four different regions. Means with different letters are significantly different.

Milk products

Butter and cheese production increased after subsidy support (Figure 2 and 3). The overall average monthly butter production per household was little below 5kg before and over 8kg after subsidy support. The average monthly cheese production per household was little over 94 balls before and over 145 balls after subsidy support. The national average weight of one ball of cheese was reported to be 99.44gms (Wangdi et al. 2014). The increase in butter and cheese production reflects the positive effect of subsidy support. This indicates that the support has encouraged DFG members to produce more butter and cheese at household level. However, in the eastern region, no milk products were produced after subsidy support. This is mainly due to the fact that processing of milk at the household level does not take place since farmers directly supply fresh milk to Milk Processing Unit (MPU). According to the farmers of this region, the main reason was the assured monthly income from supplying fresh milk to MPU. Such practices would mean that farmers are less willing to invest time and energy on milk processing at household level. Thus, farmers have more time to engage themselves in other income generating activities.

Income from milk and milk products

Incomes from milk, butter, and cheese are presented in Figure 4, 5 and 6. After subsidy support, the income per household

Table 1 Profile of respondents according to regions.

Profile	Western	West Central	East Central	Eastern	Total
No. of respondents	115	109	143	199	566
No. of DFGs	8	7	5	8	28
No of Dzongkhags	2	2	2	2	8
Male respondents (%)	52.2	37.6	64.3	62.8	52.6
Female respondents (%)	47.8	62.4	35.7	37.2	43.8
Average age	48.55	45.71	45.47	43.41	45.42
Average Wet land (acres)	1.06	2.59	1.48	0.86	1.46
Average Dry land (acres)	3.23	1.94	3.39	3.79	3.25
Average Improved Pasture (acres)	0.68	0.67	0.91	1.35	1.03
Average Orchard (acres)	1.7	0.67	1.25	0.77	1.08

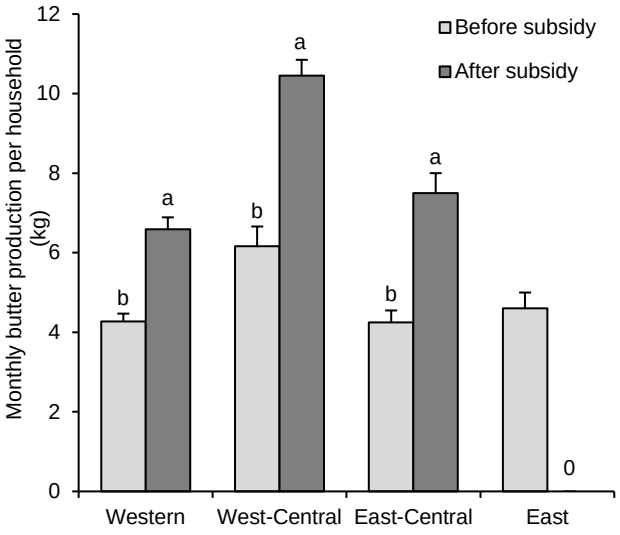

Figure 2 Average monthly butter production per household in four different regions. Means with different letters are significantly different.

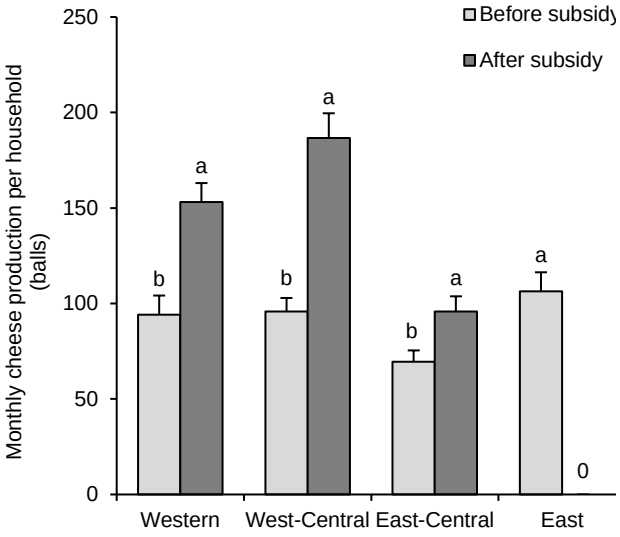

Figure 3 Average monthly cheese production per household in four different regions. Means with different letters are significantly different.

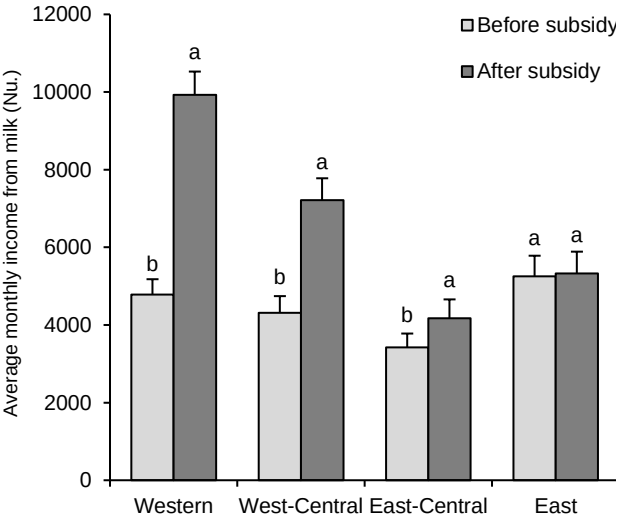

Figure 4 Average monthly income from sale of milk in four different regions. Means with different letters are significantly different.

increased significantly in all regions except for the eastern region. The significant increase in income can be attributed mainly to increased production and more sale of milk and milk products after subsidy support. Subsidy support resulted in a drastic increase in milk production and sale, which led to corresponding increase in average monthly income per household by over 43%. Similarly, with increase in milk production, the butter and cheese production and sale also increased coherently by over 144%. Bhujel and Sonam (2014) also found that the sale of dairy products contributed 18% of annual household income. The higher income after subsidy support clearly demonstrates the benefits of such scheme.

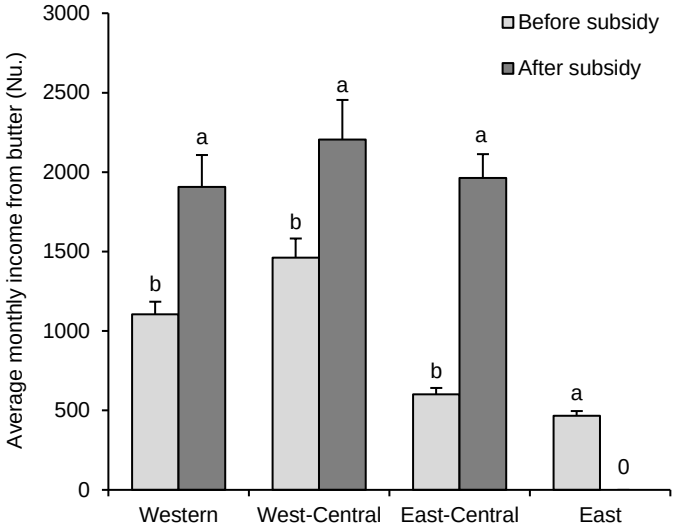

Figure 5 Average monthly income from sale of butter in four different regions. Means with different letters are significantly different.

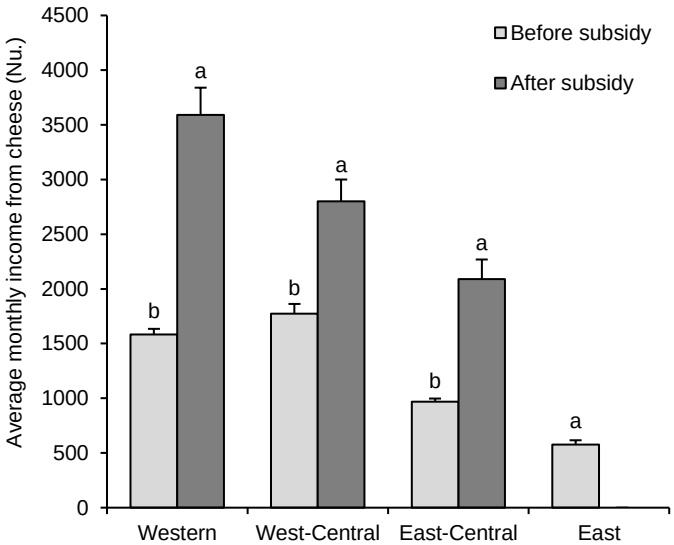

Figure 6 Average monthly income from sale of cheese in four different regions. Means with different letters are significantly different.

Contributions of subsidy support

Contributions of government subsidy support to rural livelihood are presented in Figure 7. Dairy farmers reaped several positive benefits from the subsidy program. Increase in income after subsidy support led to increases in the number of dairy sheds and silo pits by over 82%. There was increase in purchase of improved dairy cattle by about 70%. About 45%

of dairy farmers felt that the increased income helped them to meet expenses on children's education. Subsidy support enabled rural households to form DFGs and the number of groups increased by about 38%. Subsidy support also helped households to attain self-sufficiency in dairy products by over 10%. It is evident that, with the subsidy support, many farmers were able to improve their living condition and nutritional status of farm families. The increased household income might also have reduced the financial burden of those parents or guardians who had to fund their children for higher education. Furthermore, some degree of self-sufficiency in dairy products at household level and its increased consumption pattern might have impacted positively on the family nutritional status in terms of protein intake. Bhujel and Sonam (2014) reported that the availability of food and facilities in the household, accessibility to cash to carry out routine household activities, and providing children with better education are three essential livelihood factors that contribute to people's well-being. They also reported that the increased income in the household leads to better investment in children's education and thereby increased enrollment rate in the school.

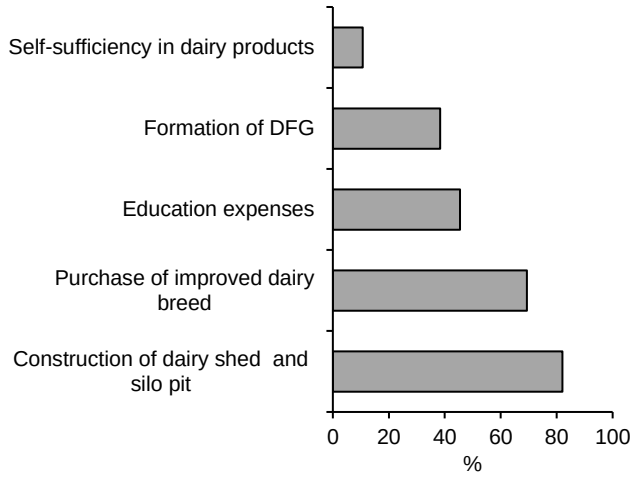

Figure 7 Contributions of subsidy support to dairy farmers.

Future prospects of subsidy support

Subsidies are often criticized for huge financial burden (Kaur and Sharma 2012). However, without subsidy support, farmers with limited resources and expertise cannot adopt technologies to transform their livelihood. Investments and interventions from the government are required to address constraints facing dairy farming. This study suggests that farmers require government interventions and support in the strategic areas to upgrade dairy farming from subsistence to enterprise level. To enable farmers to be independent at the later stage, subsidy support requires to be withdrawn in a gradual manner. If subsidies are curtailed abruptly, there is a fear of sudden decline in agricultural production and income. General opinions and views of participants suggest that subsidies will attract people, including the educated lot in taking up dairy farming as a lucrative venture in rural areas. Analysis of current scenario suggests that subsidies in one form or the other are required in the Bhutanese mixed farming system as a productive incentive to encourage rural households to take up commercial agriculture and livestock farming.

CONCLUSIONS

Subsidy support provided by the government to DFG members during the 10th FYP yielded a series of positive results in dairy production. Primarily, the subsidy program has enabled farmers to purchase more number of improved breeds. There was a substantial increase in production and sale of milk and milk products at the household level. Farmers could sell more dairy products in the local markets and enhance their family income. The increased income has helped dairy farmers in reducing the financial burden. Subsequently, increased household income has improved their overall living standards and nutritional status of family members. In general, the subsidy support has immensely benefitted DFG members both in financial and non-financial areas and in particular, enhanced household income and improved rural livelihood situations. Given the financial constraints and limited resources of farmers, some form of government subsidies must continue in order to encourage farmers to upgrade dairy farming from subsistence to commercial level. This may contribute to reducing the rate of rural-urban migration. However, with time, subsidy scheme needs to target strategic areas where it is most needed.

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