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Members' Perceived Performance of an Agriculture Cooperative in Nepal: A Case of the Devisthan Agriculture Cooperative Limited in Pokhara, Nepal

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Abstract

Cooperatives are associations of people who voluntarily cooperate for mutual socio-economic and cultural benefits. It is important to understand the performance of cooperatives as perceived by their members, which would be crucial to sustaining a cooperative in the future. However, there is limited research that unpacks members' perceived performance of the cooperatives in the Nepalese context. This study (a) assesses the perceived performance of the board members and general members of the Devisthan Agriculture Cooperative Limited (DACL), and (b) examines if the perceived performance varies by members' characteristics. We used a self-administered questionnaire to collect data from 138 randomly sampled respondents who were members of the DACL. The survey included five indicators to measure performance: relevancy, efficiency, effectiveness, impact, and sustainability. Both descriptive and inferential statistical tools were used for analysis. Findings showed that the perceived performance of the members on various indicators of performance significantly varied. The characteristics -respondents' category, sex group, caste/ethnicity, involvement in business, formal education, and participation in capacity and skill development training — were among the significant predictors influencing performance. Implications for enhancing the performance of agriculture cooperatives have been discussed.

Keywords: agriculture, agriculture modernization, agriculture cooperative, cooperative performance

Introduction

A cooperative is an autonomous group of individuals working together for their mutual social, economic, and cultural benefits. A cooperative has thus been simplified as being 'from members', 'by members' and 'to members' (Ishak et al., 2020). Cooperatives aim to improve the well-being of their members, eradicate poverty, and provide an alternative way to distribute national wealth among people (Aini et al., 2012). Cooperatives have been improving living standards of lower-income people. Thus, these are considered the backbones for the development of developing countries like Nepal (NRB, 2017).

Globally, about a billion cooperative members, which is about 12% of the world population, are involved in one of the three million cooperatives. These cooperatives have a total turnover of US$ 2,146 BN. They have provided jobs to 10% of the employed population (ICA, 2018a). The cooperative efforts of China, Canada, Israel, America, and India are significantly contributing to the national economy. For example, the Amul cooperative in India procures 25.9 million liters of milk each day from 3.6 million dairy farmers involved in 18,600 village milk cooperative groups of 33 districts (IFAD & GDP, 2023).

In Nepal, it is believed that 7,381,218 people are affiliated with cooperatives and collected nearly Rs. 0.5 BN

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amounts (MoF, 2024). Of the total 31,373 cooperatives; 4,072 cooperatives are managed by women (DoC, 2024). Agriculture cooperatives allow farm products to move to the marketplace and influence prices and other trade terms providing fair treatment and other benefits to members (Chukwukere & Baharuddin, 2012; Sarmila, et al., 2017). These cooperatives are crucial to the social movement of independent farm operators. The mutual efforts among members help perform commercial farming, agro-based entrepreneurship, and development. An agriculture cooperative minimizes the distance between farmers and consumers (Budha, 2017). Participation, coordination, and cooperation among the farmers are key to the development and success of cooperatives.

Cooperatives or self-help groups are age-old practices among Nepali people. However, cooperatives' values are not included in the policies of today's financial cooperatives (Nepal, 2014). It is now the time to redefine the roles of the state, the private sector, and the cooperatives as grassroots actors of development (Nepal, 2014). National cooperation development strategies must acknowledge the role of cooperatives in empowering grassroots people socially and economically to foster inclusive development (Khatiwada, 2019).

Equally, the country has a huge potential for agricultural development, but a large amount of the Nepali economy imports agricultural products. The import was Rs. 44.43 BN in the FY 2009-2010, which increased to Rs. 284.98 in FY 2021/22 (MoF, 2018, 2024). During the first eight months of FY 2017/18, the trade deficit increased by 23% to Rs. 713.94 BN (MoF, 2019). Undoubtedly, due to the inflation in consumer prices, a large portion of a household's budget is invested in daily necessities. At the same time, the country has a remittance-based economy. The country received US$ 5.89 BN workers' remittance in FY 2014 which increased to US$ 9.29 BN in 2022 (Ganbolds, 2023; MoF, 2018; NRB, 2019). More importantly, 60.04% of the population is involved in the agriculture sector, which contributes 21.5% to the national GDP (MoF, 2021). It is inevitable that the poor subsistence-based agriculture system of the country will be transformed through the mobilization of skilled and semi-skilled youths in rural areas, which could be possible through cooperatives.

Cooperatives are recognized as means of implementation for the 2030 Agenda for Sustainable Development Goals along with other private sector enterprises (NFSCCU, 2017). Hence, sustainability is becoming a key issue in cooperative movement which can be addressed through better performance of the cooperative. Performance is a fundamental construct in the strategic management of cooperatives (Hamann et al., 2013). Performance is a complex and subjective concept that remains disputed among researchers (Iuliana & Maria, 2016), but it usually refers to the ability of organizations to achieve their target objectives. Ishak et al. (2020) revealed that the definition of performance revolves around the dimensions of efficiency (i.e., doing things right) and effectiveness (i.e., doing the right things). The performances of cooperatives are still questionable in terms of building social capital, financial management, agriculture transformation, and modernization. Besides, there is limited research that has assessed the performance of cooperatives using performance evaluation indicators. Therefore, this study addressed the research question- How do members of the agriculture cooperatives perceive the performances of their own cooperative?

Cooperative Development in Nepal

In the era of King Jaisthithi Malla around 600 years ago, Kutasa cooperative ran an indigenous oil expeller mill in Khokana, Nepal (Sigdel & Sakya, 2009). It is believed that cooperative management was used in the oil mill before the formal cooperative movement was initiated worldwide. In 1960, the first Cooperative Act was enacted by the Nepal government. The capital of savings and credit cooperative societies was converted into a Cooperative Bank in 1963, which later transformed into the Agricultural Development Bank in 1968. After that, a new generation of community-based savings and credit groups began to emerge in 1980 and formed the Nepal Federation of Savings and Credit Cooperative Unions in 1988. At present, the Department of Cooperatives has been established under the Ministry of Agriculture and Cooperatives (DoC, 2017). The Department of Cooperatives followed seven Rochdale Principles: voluntary and open membership; democratic member control; member economic participation; autonomy and independence; education, training, and information; cooperation among cooperatives, and concern for the community (Budha, 2017; NCDB, 2019). Rochdale was the first cooperative established in 1844 in Germany, and its principles were officially adopted by the International Cooperative Alliance (Fairbairn, 1994).

The 2015 Constitution of Nepal (Article 51 [Gha-3]) highlighted the promotion of cooperatives for national development. The state policies listed in the Constitution provisioned policy regarding finance, industry, and commerce: strengthening the national economy through the participation and free development of the public-private-cooperative sector. Cooperative development-related power/jurisdictions are equally devolved to the Federal (power number 28), provincial (power number 2), and local governments (power numbers 2 &15) of the 2015 Constitution of Nepal (CAS, 2015). In this context, cooperative development and agriculture modernization go side by side in Nepal. The long-term agriculture development strategy (2015-35) (MoA, 2014) was designed and implemented by the Prime Minister Agriculture Modernization Project (PMAMP) (MoA, 2017). It has emphasized production, processing, and industrial centers through Pocket (10 ha), Block (100 ha), Zone (500 ha), and Super Zone (1000 ha) areas to commercialize the agriculture sector in the country. The total area covered by

these areas is 143,300 hectares including 69,600 hectares area in the FY 2016/17- and 73,700-hectare land area in the first eight months of 2019. The federal budget for FY 2019 aimed at expanding the PMAMP (2016-2025) to boost agricultural productivity (MoF, 2019). Policy reforms and economic growth around the world have changed the basic supply and demand factors, making agriculture a more market-driven industry. This shift has created investment opportunities, especially in developing countries (OECD, 2013). The roles of cooperatives are crucial to institutionalizing these agricultural modernization-related changes in Nepal.

As of 2023, about 31,373 cooperatives have been established in Nepal which are categorized as saving and credit, multipurpose, agriculture, milk, customer, electric, vegetable and fruits, tea, coffee, herbs, beekeeping, communication health, sugarcane, sweet orange, and others (MoF, 2024). Cooperatives generate employment for the 93,771 people (MoF, 2024). It examined the performance of the Devisthan Agriculture Cooperative Limited (DACL) located in Hemja region of Pokhara Metropolitan City as perceived by its members. This DACL has implemented a Vegetable Pocket Zone Project with the technical/financial support of the PMAMP, which focuses on two objectives. First, to describe the perceived performance of the board members and general members of the DACL. Second, to examine the associations between various performance measurement indicators (relevancy, efficiency, effectiveness, impact, and sustainability) and member characteristics.

Review of Foundational Work

Globally, several studies have examined cooperative management, member's satisfaction, and sustainable cooperative policies. Alajid and Base (2021) evaluated the perceived satisfaction of members of a multipurpose cooperative in Cagayan de Oro City, Philippines. The study found that personal attributes such as gender, education, saving amount, and membership types of coop-members positively impacted their perceived satisfaction. Peng et al. (2020), using data from Chinese agricultural cooperatives (240 CEOs and 543 members), found the difference between the chief executive officer (CEO) and members regarding the performance of cooperatives. The results showed that members have higher scores than CEOs regarding member profitability and overall performance. However, CEOs have a higher score regarding social influence as members are satisfied with their leadership.

Ismaila et al. (2017) identified a significant relationship between service quality and satisfaction levels of members of cooperative societies. Chareonwongsa (2017) revealed that the motivation of the cooperative board of directors significantly affected cooperative performance. Factors that are found to affect board members' motivation include board authority and function, board composition, board meeting quality, board members' skill, transparency in the measurement and compensation setting process, and financial compensation. Zikalala (2016) studied 38 saving and credit cooperatives in Swaziland, Africa, and found that saving and credit cooperatives in Swaziland failed to meet the international standard for performing financial sustainability. Cooperatives are facing a couple of challenges such as low levels of skill and competition from commercial banks. Results also showed that the savings and credit cooperatives vary in terms of human resource policies and staff incentives.

Liang and Hendrikse (2013) revealed that the genesis of cooperatives in China is due to entrepreneurial farmers and the government; rather than a bottom-up, collective action process of many small farmers. Cechin et al. (2013) found relationships between dependence, behavioral uncertainty, market risk reduction, and adaptation support, which could account for the higher quality products of the cooperative farmers in Brazil. Shah (2012) found supportive governance structures and suggested choosing professional/accountable board members to maintain an efficient structure in India. Thabethe et.al. (2012) explored that micro-credit for microenterprise development contributes to social cohesion and greater co-operation in the community of KwaZulu-Natal, South Africa.

Ramanauskas and Stasys (2011) connected cooperative activities with economic, social, cultural, and natural environments. They suggested applying sustainable development indicators for assessing performance in agriculture cooperatives, including expertize of the greenhouse managers. Rafat et al. (2009) revealed that the performance of agricultural cooperatives depends on the business objectives of the three vary cooperatives: (a) vertical integration of firms, (b) independent enterprise, and (c) coalition of firms. Lama (2018) evaluated the social and economic impact of the Mahilamilan Cooperative of Hetauda in Nepal and found that the cooperative helped to improve the economic and social status of women members. Women were actively involved in commercial vegetable farming and local business. Shrestha (2019) revealed that cooperatives in Nepal have been offering various schemes and services rendered by the private and public sectors. Further, the working or administrative procedures are quite easy and simple compared to banks and other financial institutions. Neupane et al. (2015) found a significant impact of agricultural cooperatives in farming practices making positive changes on the livelihood of the farmers involved in cooperatives in Devdaha and Manpakadi village development committees of Rupandehi District.

The above preview shows cooperative development is essential in Nepal's grassroots and national economy. The overall performance of financial institutions, including cooperatives, will further institutionalize the growth of this sector. In this context, it is important to understand the perceived performance of cooperatives for their institutional development.

Hypothesis on Membership Specific Measurement Indicators

The performance of cooperatives can be measured through five specific indicators such as relevancy, efficiency, effectiveness, impact, and sustainability (Tang, 2011). This study hypothesized that the performance of the cooperative measured in terms of relevancy, efficiency, effectiveness, impact, and sustainability is perceived differently by board vs. general members and also varies by their characteristics such as age, sex/gender, caste/ethnicity, employment status (daily wages), involvement in business, education and capacity development training (Tang, 2011).

Methodology

The Study Context: Devisthan Agriculture Cooperative

Pokhara Metropolitan is the second most populous city of Nepal. It has 513,504 population with 1,106 km^2 population density (NSO, 2021). The study area Hemja region is located in Ward no. 27 of Pokhara metropolitan city. The ward has a 12,262 total population with 70,062 females and 5,200 males (CBS, 2011). It is located near the Annapurna Conservation Area Project (ACAP), which is the largest wildlife-protected area in Nepal. Hemja has cultural and ethnic diversity. Brahmin, Chhetri, Janjati, and Dalits are living in mutual relationships. This region is famous for fresh vegetables, crops, and dairy production. Potato is the brand product of this region.

A cooperative vegetable farming movement, a unique agriculture development practice, has been started in this area by uniting 12 cooperatives of the region. The 12 cooperatives include 3 saving and credit cooperatives -Himalayan, Gauri Shankar, and Hemja. The other 8 are agriculture cooperatives (Devisthan, Multipurpose, Ex-Army, Anabarat, Tibrikot, Mulpani, Kalika, Diyalo, and Bikalpa Jadibuti). This research evaluates the performance of the Devisthan Agriculture Cooperative Limited only.

Data

This study used deductive logic and a cross-sectional survey to describe the perceived performance of the DACL members (Creswell & Creswell, 2018). We selected the DACL purposively. A total of 138 members were randomly sampled from among 224 members. The sample size is estimated based on a 95% confidence level and 5% margin of error (Krejcie & Morgan, 1970). The respondents included both board and general members.

The survey questionnaires included the characteristics of members and five performance measurement indicators - relevancy, efficiency, effectiveness, impact, and sustainability as recommended/referred/used by OECD (2021). The performance indicators measured two conceptual dimensions (efficiency and effectiveness) of performance (Lekovic & Maric, 2015) and three indicators of member profitability, social influence in the local community, and overall performance, as used for measuring the performance of cooperatives in China (Peng et al., 2020). These five performance indicators were measured using the Likert scale measured in a five-point Likert scale (1: strongly agree, 2: agree, 3: neutral, 4: disagree and 5: strongly disagree), and member characteristics were measured as nominal, interval, and scale variables.

To ensure the internal consistency of the tools (particularly the performance indicators), Cronbach alpha was used which we found reliable (0.63). The person correlation coefficients were: 0.27 between relevancy and efficiency 0.27, 0.24 between relevancy and sustainability, 0.25 between relevancy and impact), 0.41 between efficiency and sustainability, and 0.17 between effectiveness and sustainability, which were statistically significant.

This study utilized five composite indexes of performance - relevancy, efficiency, effectiveness, impact, and sustainability of the cooperative, as perceived by the DACL members –computed as a composite/summated scale of items within each indicator. The items within each indicator and their means are provided in Table 2.

Analytical strategy

The analysis included the descriptive statistics, simple frequency tabulation of studied variables related to characteristics of the respondents (Table 1). The Likert scale summative analysis method (Chakrabartty, 2014; Subedi, 2016) described about 40 items (8 items for each) which were developed based on five measurement indicators (Table 2). The study uses composite indexing method (Sava, 2016) for obtaining measurement indices. The study also used multiple regression models (Field, 2009) to examine whether each of the five performance indicators were associated with respondent characteristics (Table 3).

In order to theorize research issues, we brought insights from theories of social capital and agriculture modernization. We obtained a permission letter from the Devisthan Agriculture Cooperative Limited to undertake this research. We received the informed consent from the respondents to participate in this study. To begin our study, we discussed on several rounds with the gatekeepers and board members of the DACL to have the preliminary ideas of the field and respondents.

Findings

The findings of the study are presented in three sections. The first section's results present the characteristics of the respondents. The second section highlights a summative analysis of measurement indicators perceived by its members. The third section analyzes the association between indices of measurement indicators and the characteristics of the respondents.

Characteristics of the Respondents

This section presents a comparative analysis of board members and general members across various demographic and professional characteristics, including age, sex, caste, involvement in agro entrepreneurship and business enterprises, educational attainment, participation in capacity/skill development training, and membership duration (Table 1). It provides a detailed breakdown of these attributes by percentage, highlighting the distinctions and commonalities between the two groups. This analysis aims to elucidate the profile differences between board members and general members within the organization.

Table 1 depicts the information about respondents' characteristics. The results reveal that the members are from different strata of the society. The data shows that board members and general members differ significantly in several key areas. Board members are predominantly older, with 34.80% over 60 years old and 31.80% between 40-59 years, compared to general members, who are younger, with 29.00% over 60 years and 27.50% between 40-59 years. Gender disparity is evident, with only 0.70% of board members being female versus 50.70% of general members. Educational attainment also varies, as 71.70% of board members have secondary or higher education compared to 45.60% of general members. Regarding professional involvement, 79.00% of general members are involved in agro entrepreneurship, compared to 13.80% of board members, and 58.70% of general members are engaged in business enterprises, versus 23.90% of board members. Additionally, 64.50% of general members have not participated in skill development training compared to 71.00% of board members, reflecting a greater emphasis on training among general members.

The above facts indicate that board members are generally older, predominantly male, and have higher educational qualifications than general members. In contrast, general members are younger, have a more balanced gender distribution, and have a wider range of educational backgrounds. Board members are less involved in agro-entrepreneurship and business enterprises than general members who are more engaged in these areas. The data highlights key demographic and professional characteristics differences between the two groups.

Table 1.
Social-demography related Information

Predictors	Response	Board member		General member		Total %
		N	%	N	%	
Age group (Years)	40-59	6	4.30	38	27.50	31.80
	≥60	8	5.80	40	29.00	34.80
	<40	10	7.20	36	26.10	33.40
Sex group	Female	1	0.70	70	50.70	51.40
	Male	23	16.70	44	31.90	48.60
Caste group	Tagadhari	24	17.40	0	0.00	17.40
	Matawali	99	71.70	15	10.90	82.60
Agro entrepreneurships	Yes	19	13.80	90	65.20	79.00
	No	5	3.60	24	17.40	21.00
Business enterprises	Yes	7	5.10	33	23.90	29.00
	No	17	12.30	81	58.70	71.00
Educational attainment	Illiterate	0	0.00	19	13.80	13.80
	Primary	4	2.90	32	23.20	26.10
	Secondary	14	10.10	37	26.80	36.90
	Higher education	6	4.30	26	18.80	23.10
Participated in capacity/skill development training	Yes	15	10.90	25	18.10	29.00
	No	9	6.50	89	64.50	71.00
Membership duration (years)	>3	13	9.40	32	23.20	32.60
	<3	11	8.00	82	59.40	67.40
Total		24	17.40	114	82.60	100.00

Perceived Performance Measurement through Summative Measure

The average values of performance measurement indicators, including efficiency, effectiveness, impact, and sustainability indicators, are highlighted below (Table 2). The means of each item within each performance indicator are provided. Each indicator is assessed based on mean values, offering insights into how well different aspects of the cooperative's activities align with its goals and contribute to its overall performance.

The highest mean value (2.71) in the relevancy index is for "Implementing vegetable pocket project". This score indicates strong support and perceived importance from the members, reflecting that this initiative is relevant for the cooperative. The statements "Offering fair services" and "Minimizing monthly administrative expenses" got

Table 2.
Indicators wise Average Value (n=138)

Relevancy	Mean	Efficiency	Mean	Effectiveness	Mean	Impact	Mean	Sustainability	Mean
Increased access to saving and credit facilities	1.77	Offering fairness services	2.11	Increasing saving amount	1.91	Increased saving and credits activities		Conducting meeting regularly	1.93
Increased family income	1.91	Satisfactory rate of interest	2.32	Improving family lives	2.65	Increased capital amount of cooperative	2.77	All the members attend general assembly	2.22
Increased investment in productive sector	1.99	Minimizing monthly administrative expenses	2.53	Participating in exposure visits	2.65	Cooperative created self-employment in local level	1.96	Practicing internal audits	1.96
Increasing number of general members	2.46	Cooperative got support from local level	2.84	Investing in agriculture	1.39	Improving monthly family income of the members	1.95	Collecting grievances of the members	2.33
National identity of cooperative vegetable farm	2.19	Cooperative farm received subsidy timely from super zone project	2.00	Investing in child education	1.37	Improving livelihoods of the members	1.17	Regularity of subsidy to farm	1.76
Implementing vegetable pocket project	2.71	Farm got technical support from super zone project	3.12	Investing in business enterprises	2.95	Cooperative farm becoming learning centers	1.38	Planning to offer cooperative vegetable shops	1.87
Using modern high tech green houses	2.43	Farm got technical support from Province	3.10	Increasing earnings from vegetable farm	1.79	Farm creating self-employment	1.65	Planning to extend animal farm	2.18
Supplying off seasonal vegetables	2.28	Minimizing recurring cost of cooperative farm	2.62	Decreasing expense in cooperative farm	2.11	Regularly supplying fresh vegetables	2.08	Sustainability through cooperation among cooperative	2.86

the highest mean scores, 2.11 and 2.53, for the efficiency index. These scores suggest that the cooperative is well-regarded for its transparent and cost-effective operations, which are essential for maintaining smooth and effective business processes. Likewise, the highest (2.65) mean values in the effectiveness index are for "Improving family lives" and "Participating in exposure visits". This suggests that these initiatives are highly effective in achieving significant positive outcomes for the cooperative members. The statements "Cooperative farm received subsidy timely from super zone project" and "Technical support from Province" got the highest (3.12 & 3.10) mean values for the impact index. The external assistance is perceived as highly beneficial for maximizing the cooperative's broader influence and effectiveness, reflecting its critical role in the cooperative's success. In the sustainability index, "Sustainability through cooperation among cooperative members" scores the highest (2.86) mean value. The high score underscores the importance of collaborative efforts and shared responsibility in maintaining and building upon the cooperative's achievements.

Overall, performance measurement indicator items such as the vegetable pocket project and timely technical support, are highly relevant and impactful, reflecting their critical role in the cooperative's success. In contrast, initiatives like investing in child education and business enterprises are perceived as less central, indicating a need for greater focus on activities that deliver immediate and measurable benefits. Efficiency is achieved through effective cost management and fair service provision, while sustainability is bolstered by fostering member cooperation. However, efforts like planning for new

ventures are seen as less crucial for long-term viability, suggesting that strategic focus should remain on core activities that directly contribute to the cooperative's ongoing success and stability.

Measurement of Association

The study used multivariate analysis (multiple linear regression) to assess the associations between member characteristics and performance indicators. For this purpose, we obtained five measurement indexes by computing their item variables (Chakrabartty, 2014). We tested the normality of the indexes which are normally and non-normally distributed among the board members and general members (Das & Imon, 2016). The relevancy index is not normally distributed among board and general members. The efficiency index is normally distributed among board members but not for general members. The effectiveness index is not normally distributed among board members but is normally distributed among general members. The impact index is normally distributed among the board and general members. The sustainability index is normally distributed for board members, but not for general members.

Then, we used a multiple regression model (MRM) for assessing the linear relationship between the independent variables and the dependent variable. The results of MRMs for relevancy (Model I), efficiency (Model II), effectiveness (Model III), impact (Model IV), and sustainability (Model V) concerning 8 independent variables are provided below (Table 3):

Table 3

Multiple regression results show the influence of member characteristics on various performance indicators (n=138)

	Relevancy	Efficiency	Effectiveness	Impact	Sustainability
	Model I	Model II	Model III	Model IV	Model V
Measures	*B*	*B*	*B*	*B*	*B*
(Constant)	.574**	.462**	.757**	.402**	.343**
Respondent's category[a]	-.016	.026*	-.043	.073**	.040*
Age group[b]	-.009	.008	-.005	-.004	-.006
Sex group[c]	.050*	.004	.031*	-.023	.003
Caste and ethnicity[d]	.019	-.038*	-.005	-.013	-.024
Daily wages[e]	-.001	.015	.000	-.004	-4.66
Involvement in business[f]	.004	.015	.008	.027*	.035*
Formal education[g]	-.011	.015*	.023*	-.011	.011
Capacity devt. training[h]	.041*	-.022*	-.002	-.002	-.033*
Adjusted R^2 value	9%	11%	10%	14%	18%

*p< .05, **p< .01; a. 0=board member, 1=general member; b. 1=<40 years, 2=40-59 years, 3=≥6o years; c. 0=male, 1=female; d. 0=tagadhari, 1=matwali; e. 0=no, 1=yes; f.0=no, 1=yes; g. 1=illiterate, 2=primary,3=secondary,4=higher education; h.0=no, 1=yes.

Relevancy. Table 3 shows that the sex of respondents (*B=0.050; t*= -2.342, p<0.05) and participation in capacity and skill development training (*B=0.041; t*= -2.025, p<0.05) are significant predictors of relevancy in the first model (Relevancy). This means, that females and those who participated in capacity-building training reported that the cooperative was relevant as compared to their male counterparts or those who did not participate in the training. The variable "monthly earning from cooperative vegetable farming" also has the highest relevance score compared to other variables. In contrast, the variables "business occupation" and "respondents' category" were found negatively associated with the relevancy index. This suggests that few cooperative members are involved in business, most members have a short membership duration, and the cooperative's relevance is increasing across all respondent categories.

Efficiency. General members assessed the cooperated as efficient by 0.026 units as compared to the board members (B=0.026; p<0.5) [This means board members reported less efficient]. Caste/ethnicity (*B=-0.038; t*= -1.93, p<0.05), formal educational status (*B=0.015; t*= 1.87 p<0.05) and involvement of capacity/skill development trainings (*B=-0.22; t*= -1.45, p<0.05) are significant predictors of Efficiency (Model II). Adjusting for other characteristics, Matawali members had 0.022 units lower in reporting efficiency index as compared Tagadhari, implying that Tagadhari reported efficient cooperative as compared to Matawali.

Effectiveness. Likewise, sex group (*t*= 1.48, p<0.05) and educational status (*t*= 1.91, p<0.05) are significant predictors in the third model. This means the effectiveness index is highly described by the male groups and educated members. However, the variables agriculture occupation, business and respondents' category are negatively associated with the efficiency index.

Impact. The board members vs. general members (*t*= 3.75, p<0.01) and involvement in business entrepreneurship (*t*= 1.67, p<0.05) are significant predictors in the fourth model. This means the impact index is highly associated with the general members and local shopkeepers involved in entrepreneurship development.

Sustainability. Respondents' category (t= 1.83, $p<0.05$), involvement in business entrepreneurship (t=1.87, $p<0.05$) and involvement in capacity development trainings (t=-1.79, $p<0.05$) are significant predictors in the fifth model. This means the sustainability index is positively associated with general members, local shopkeepers and those members who are not involved in capacity/skill development trainings.

The varying significance of characteristics across the different indicators (relevancy, efficiency, effectiveness, impact, and sustainability) suggests that specific characteristics have a stronger influence on outcome measures. For instance, sex group and participation in capacity/skill development training are significant predictors of the relevancy index but not of the efficiency or sustainability indices. In contrast, caste/ethnicity, educational status, and business involvement emerge as significant predictors for the efficiency index, while respondents' category and business entrepreneurship are more relevant for the impact and sustainability indices. These differences highlight the distinct relationships between characteristics and each indicator, indicating that certain variables have a positive association with the outcome measures of performance evaluation.

Theoretical Reflections

The cooperative vegetable farming movement in the Hemja region formed by uniting 12 cooperatives, including savings, credit, and agriculture cooperatives is the key aspect of the study. This study thus brought insights from theoretical viewpoints on social capital and agriculture modernization. The cooperative members demonstrate participatory and collaborative approaches that build social capital (Sorheim, 2003; Ponthieux, 2004). Access to central and provincial networks enabled the implementation of the vegetable pocket project under the Prime Minister Agriculture Modernization Project in the study area. Previous studies (Thabethe et al., 2012; Bhandari & Yasunobu, 2009) also underscored that social relationships, networks, and trust are key to social capital.

The DACL has established productive cooperation among the cooperatives in the region. It has also established mutual relationships between/among the same ethnic group, multi-ethnic groups and local politicians, bureaucrats, and development experts. The members have presented participatory and collaborative working approaches, which are essential components to form social capital (Ponthieux, 2004; Sorheim, 2003). The board members of the cooperative have established good relationships with the central-level politicians and bureaucrats. These engagements contributed to forming social and human capitals (Bourdieu, 1986; Coleman, 1993), which helped them to implement the vegetable pocket farm under the PMAMP. The individual's amount of social capital depends on how large a network of relations they effectively mobilize (Bourdieu, 1986). Thabethe et al. (2012), in a study in South Africa, also discovered that cooperative efforts generated social capital in the mobilization of abilities, information, and resources, which ultimately supported social development. The members of the DACL expressed their social harmony and mutual coordination on the development of their cooperative and securing their livelihood. Bhandari and Yasunobu (2009) pointed out that social capital is centered on social relationships that promote social networks, civic engagements, and generalized trust.

In reference to agriculture modernization theory, this research explored that a specialized and mechanized farming system has been initiated under the cooperative efforts and the PMAMP. The cooperative's board members established strong ties with politicians and bureaucrats, fostering social and human capital (Bourdieu, 1986; Coleman, 1993) and contributing to the success of the PMAMP, which has spurred a revolution in vegetable production (Tang, 2011). However, the DACL seems unable to encourage people on a massive scale to get involved in the Vegetable Super Zone Program of the Central Government which encourages cooperative vegetable farming. There was no significant difference among the members (either board or general) in believing that the role of cooperative vegetable farming is gaining popularity across the country. People had some dissatisfaction with getting sufficient technical support from the central government to implement the vegetable super zone project in the Hemja region. The supportive environment from the government agencies in promoting the vegetable super zone was found to be very weak. People have expressed some reservations regarding the role of cooperative vegetable farms in increasing the capital amount of this cooperative due to the ineffective marketing of the products. The DACL needs to extend both crop and vegetable farming practices to promote market commercialization and generate capital in the near future. This initiation will enhance agricultural modernization to promote the spontaneous revolution in agricultural production (Tang, 2011). The role of the DACL is praiseworthy to help farmers in increasing sustainable vegetable farming through a mutual effort of the cooperative members. The cooperative has even contributed to bringing a positive impact on the family income of its members. The sustainable engagement of the members in the DACL is proven by their committed engagement in the past five years.

Conclusions and Implication

The study concludes that cooperation among the cooperative members helps to perform agro-entrepreneurship development activities in Hemja region. The cooperative vegetable farming project of DACL is becoming a learning center for farmers, students, and researchers. However, members' perceived performance, relevancy, efficiency, effectiveness, impact,

and sustainability of the cooperative are influenced by their characteristics. Relevancy is higher among females and those who participated in capacity/skill development training, with monthly earnings from cooperative farming also contributing positively. Business occupation and membership category negatively impact relevancy. For efficiency, general members report higher efficiency than board members and caste/ethnicity and education also influence efficiency, with Tagadhari members perceiving greater efficiency than Matawali members. Effectiveness is linked to gender and education, while agriculture occupation and business involvement are poorly perceived effectiveness**.** The impact is higher among general members and local shopkeepers involved in entrepreneurship, and general members more positively perceive sustainability and those not involved in capacity-building training. To ensure quality performances, DACL must shape its strategies to address the distinct needs of the board and general member groups, considering factors such as gender, education, occupation, and training participation for enhancing relevancy, efficiency, effectiveness, impact, and sustainability of the cooperative performances.

Declarations

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References

Agriculture Development Strategy [ADS]. (2013). *Preparation of the agriculture development strategy (ADS) - Assessment Report.*

Aini, Y. M., Hafizah, H. A. K. &Zuraini, Y. (2012). Factors affecting cooperatives' performance in relation to strategic planning and members' participation. *Procedia-Social and Behavioral Sciences, 65*, 100-105

Alajid, I. R. M. & Base, R. L. (2021)**.**Towards a theory of coop-members satisfaction. *IJRP 2021, 69*(1), 235-244. https://doi:.10.47119/IJRP100691120211663

Annapurna Conservation Area Project [ACAP]. (2019). *Annual progress report, national trust for nature conservation-ACAP, 2017/18*.

Bhandar, H. & Yasunobu, K. (2009). *What is social capital? A comprehensive review of the concept*. https://bit.ly/3hl8kM8

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-58).Greenwood Press.

Budha, R. (2017). *Impact evaluation of cooperative on rural development* (Unpublished MA Thesis, Tribhuvan University). Central Department of Economics.

Central Bureau of Statistics [CBS]. (2011). *National census of agricultural raw statistical estimate*. Government of Nepal.

Cechin, A., Bijman, J., Pascucci, S., Zylbersztajn, D & Omta, O. (2013). Quality in cooperatives versus investor-owned firms: Evidence from broiler production in Parana, Brazil. *Managerial and Decision Economics, 34*(3/5), 230-243. https://www.jstor.org/stable/23464303

Chakrabartty, S. N. (2014). Scoring and analysis of likert scale: Few approaches. *Journal of Knowledge Management & Information Technology, 1*(2), 31-44. https://www.researchgate.net/publication/321268871

Chareonwongsa, K. (2017). Enhancing board motivation for competitive performance of Thailand's cooperatives. *Journal of Cooperative Organization and Management,* 5(1), 1-13.https://doi.org/10.1016/j.jcom.2017.01.001

Chukwukere. O. A & Baharuddin, A. H. (2012). *Risk and poverty in agriculture: expanding roles for agricultural cooperatives in Malaysia. Malaysian Journal of Society and Space, 8*(4). pp. 1-11.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology (Supplement), 94*, S95-S120. http://dx.doi.org/10.1086/228943

Constitutional Assembly Secretariat [CAS]. (2015). *New constitution of Nepal*, 2072 BS. Lumbini Pustak Pasal.

Copestake, J. (1995). Conference report on finance against poverty. *Development in Practice, 5*, 264-265.

Creswell, J.W. & Creswell, J.D. (2018) *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publication.

Das, K. D. & Imon, A. H. M. R. (2016). A brief review of tests for normality. American Journal of Theoretical and Applied Statistics, 5(1), 5-12. https://doi.org/10.11648/j.ajtas.20160501.12 Nationals Statistics Office [NSO, 2021]. (2021). *Population census of Pokhara metropolitan city.* https://citypopulation.de/en/nepal/mun/admin/kaski/4004__pokhara/

Department of National Park and Wildlife Conservation

[DNPWC]. (2017). *Annual report Chi conservation outlook assessment*. IUCN World Heritage Outlook. https://www.worldheritageoutlook.iucn.org

Department of Cooperative [DoC]. (2017). *Annual report*, 2016. Government of Nepal.

Department of Cooperative [DoC]. (2019). *Annual report*, 2018. Government of Nepal.

Fairbairn, B. (1994). The meaning of Rochdale: The Rochdale pioneers and the co-operative principles (Occasional Paper No. 31778). University of Saskatchewan, Centre for the Study of Co-operatives. https://ideas.repec.org/p/ags/uscoop/31778.html

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Sage Publication. https://bit.ly/382el8p

Grashuis, J. (2020). Agricultural firm survival: The case of farmer cooperatives in the United States. *Agribusiness*, *36*(1), 79–93. https://doi.org/10.1002/agr.21612

Ganbolds, S. (2023). *Value of remittances received Nepal 2013-2022. https://www.statista.com/statistics/880745/nepal-value-of-remittances/#:~:text=In%202022%2C%20the%20personal%20remittances,between%20immigrants%20and%20their%20relatives*.

Gulli, H. & Berger, M. (1999). Microfinance and poverty reduction: Evidence from Latin America. *Small Enterprise Development, 10*(3), 16-28.

Hamann, M. P., Schiemann, F., Bellora,L. & Guenther, T. W. (2013). Exploring the dimensions of organizational performance: A construct validity study. *Organizational Research Methods, 16*(1), 67–87. https://doi.org/10.1177/1094428112470007

International Cooperative Alliance [ICA]. (2011). *Global 300 report, 2010: The world's major cooperatives and mutual businesses*. https://bit.ly/3FVr4do

International Cooperative Alliance [ICA]. (2018a). *Fact and figures* https://bit.ly/3t6Uik1

International Cooperative Alliance [ICA]. (2018b). *Nepal: Key figures*. https://bit.ly/3yzXSa0

International Fund for Agricultural Development [IFAD] & Global Dairy Platform [GDP]. (2023). *Supporting the development of the dairy sustainability framework for smallholder dairy operations in India: Case study of Amul.* https://www.dairysustainabilityframework.org/wp-content/uploads/2023/08/DSF-IFAD-Case-Study-Amul-Dairies.pdf

Ishak, S., Omar, A. R. C.Sum, S. M., Othman, A. S. & Jaafar, J. (2020). Smallholder agriculture cooperatives' performance: what is in the minds of management? *Journal of Cooperative Organization and Management, 8*(2). https://doi.org/10.1016/j.jcom.2020.100110

Ismaila, M. Y., Yanda, A. M. & Nassir, B. A. (2017). Comparative analysis of service quality and customers' satisfaction of interest and non-interest based cooperative societies in Ilorin Emirate. *Jordan Journal of Business Administration, 13*(4), 537-556. https://www.researchgate.net/publication/322245403

Iuliana, E. & Maria, C. (2016). *Organizational performance – A concept that self-seeks to find itself. Annals - Economy Series, Vol. 4*, 179-183. Constant in Brancusi University, Faculty of Economics.

Khatiwada, Y. R. (2019). *Cooperatives, economic democracy and human security: Perspectives from Nepal.* https://www.nrb.org.np/contents/uploads/2019/12/Governors_Speeches-Governors_Presentation_Paper_at_1st_National_Cooperative_Congress_a.pdf

Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607-610. https://doi.org/10.1177/001316447003000308

Lama, K. (2018). *Performance evaluation of Mahilamilan cooperative of Hetauda sub metropolitan city, Makwanpur* (Unpublisehed MA Thesis, Tribhuvan University). Central Department of Rural Development.

Leder, S., Sugden, F., Raut, M. Ray, D. & Saikia, P. (2019). Ambivalences of collective farming feminist political ecologies from Eastern India and Nepal. *International Journal of the Commons, 13*(1), 105-129. https://doi.10.18352/ijc.917

Lekovic, B. & Maric, S. (2015). Measures of small business success/performance: Importance, reliability and usability. *Industrija, 43*(2), 1-26. https://www.researchgate.net/publication/283283832

Liang, Q. & Hendrikse, G. (2013). Core and common members in the genesis of farmer cooperatives in China. *Managerial and Decision Economics, 34*(3/5), 244-257. https://www.jstor.org/stable/23464304

Maharjan, P. (2016). *Economic impact of cooperative in Nepal: A case study of Kirtipur multipurpose cooperative limited* (Unpublished MA Thesis, Tribhuvan University). Central Department of Economics.

Ministry of Agricultural Development [MoAD]. (2014). *Twenty year's agriculture development strategy* (2014-34). Government of Nepal.

Ministry of Agricultural Development [MoAD]. (2017). *Agri-business promotion and statistics*. Government of Nepal.

Ministry of Finance [MoF]. (2021). *Economic survey 2020/21*. Government of Nepal.

Ministry of Finance [MoF]. (2018). *Macroeconomic update Nepal*, (Volume 6 [1]). Government of Nepal.

Ministry of Finance [MoF]. (2024). *Economic survey 2079/80*. Government of Nepal.

Ministry of Finance. (2019). Budget speech of fiscal year 2019/20. https://www.mof.gov.np/uploads/document/file/Budget%20Speech%202019_20201118044510.pdf

National Cooperative Development Board [NCDB]. (2019). *Annual report*, 2019. Government of Nepal.

National Planning Commission [NPC]. (2021). *Preliminary report of national population census 2021.* Government of Nepal. https://bit.ly/3DqIIpN

Nepal Federation of Savings and Credit Cooperative

Unions [NFSCCU]. (2017). *Annual report*, 2016. Government of Nepal.

Nepal Rastra Bank [NRB]. (2017). *Current macroeconomic and financial situation of Nepal* (Based on Six Months' Data of 2017/89).

Nepal Rastra Bank [NRB]. (2019). *Current macroeconomic and financial situation of Nepal* (Based on Six Months' Data of 2018/19).

Nepal, C. (2014). *Report of first national cooperatives congress*. National Cooperatives Congress.

Neupane, H., Adhikari, M. & Rauniyar, P. B. (2015). Farmers' perception on role of cooperatives in agriculture practices of major cereal crops in western Tarai of Nepal. *Inst. J. Agric. Anim. Sci*, *33-34*, 177-186.

Organization for Economic Cooperation and Development [OECD]. (2021).*The six criteria: Their purpose and role within evaluation*. https://bit.ly/3zMdjMn

Organization for Economic Cooperation and Development [OECD] – Food and Agriculture Organization [FAO]. (2013). *Agricultural outlook*, 2013-2022. Corrigenda OECD Publication.

Peng, X., Liang, Q., Deng, W. &Hendrikse, G. (2020). CEOs versus members' evaluation of cooperative performance: Evidence from China. *The Social Science Journal, 57*(2), 219-229. https://doi.org/10.1016/j.soscij.2019.01.006

Ponthieux, S. (2004). *The concept of social capital: a critical review*. 10th ACN Conference. Paris: 21-23 January.

Rafat A. M. E., Alfons, S. Lansink, O., Giesen, G. & Dijk, G. V. (2009). Performance measurement of the agricultural marketing cooperatives: The gap between theory and practice. *Review of Agriculture economics, 31*(3), 446-469. https://doi.org/10.1111/j.1467-9353.2009.01448.x

Ramanauskas, J. & Stasys, R. (2011).*Cooperative performance assessment based on the sustainable development aspect. The opportunities and challenges for agriculture and rural development.* 5th International Scientific Conference on Rural Development. 14-25 November Klaipeda University, Lithuania. https://www.researchgate.net/publication/280080888

Rogaly, B. (1996). Micro-finance evangelism, destitute women, and the hard selling of a new anti-poverty formula. *Development in Practice Journal Oxfam, 6*(2), 100-113

Sarmila, M. S., Ramli, Z., Ramly, R., Lyndon, N., Che Rose, R. A., Mansor, N. H., Aman, Z., Jaafar, N., & Isnin, K. A. (2017). Sumbangan koperasi terhadap pembangunan sosial komuniti pekebun kecil sawit. Geografia: Malaysian Journal of Society and Space, 13(3), 19–28. https://journalarticle.ukm.my/12532/1/20255-57860-1-PB.pdf

Sava, A. M. (2016). Weighting method for developing composite indices: Application for measuring sectoral specialization. *Journal of Applied Quantitative Methods, 11*(3), 77-84.https://bit.ly/3swl9or

Shah, T. (2012). *Economic and political Weekly, 47*(39), 29-31. https://www.jstor.org/stable/41720185

Shrestha, M. (2019). *Customer satisfaction survey: A study of Shree Kileshwor saving and credit cooperative Ltd*. (Unpublished BA Thesis). Central University of Applied Sciences. Finland.

Shrestha, N. (2016). *Socio economic impact on women of cooperatives in Khalanga*. (Unpublished MA Thesis). Tribhuvan University, Central Department of Economics.Nepal.

Sigdel, T. S. & Sakya, N. (2009). Traditional indigenous technology of mustard oil pressing in Nepal: A case study of Khokana VDC in Lalitpur District. *Nepalese Journal of Development and Rural Studies, 6*(1), 94-111.

Sorheim, R. (2003). The pre-investment behavior of business angels: a social capital approach. *Venture capital*, *5*(4), 337-364.https://doi.org/10.1080/1369106032000152443

Subedi, B. P. (2016). Using likert type data in social science research: Confusion, issues and challenges. *International Journal of Contemporary Applied Sciences, 3*(2), 36-49.

Taber, K. S. (2017). *The use of cronbach's alpha when developing and reporting research instruments in science education.* https://doi.org/10.1007/s11165-016-9602-2

Tang, K. (2011). Industrial-organization-transformation-oriented agricultural modernization with Chinese characteristics: From the perspective of industrial and agricultural interaction. *International Journal of Business and Management, 6* (5), 211-216.

Thabethe, N., Magezi, V. & Nyuswa, M. (2012). Micro-credit as a community development strategy a South African case study. *Community Development Journal, 47*(3), 423-435. Oxford University Press. http://www.jstor.org/stable/26166042

UnitedNations[UN].(2015).*The2030agendaforsustainable development*. https://sustainabledevelopment.un.org/post2015/transformingourworld

United Nations Bureau of Labor Statistics [UNBLS]. (1944). International aspects of the cooperative movement. *Monthly Labor Review, 58*(6), 1159-1168. https://www.jstor.org/stable/41817443

Venkatesh, R. (2009). Micro finance and self-help groups: Catalyst for rural transformation. *The Indian Journal of Political Science, 70*(1), 131-138. http://www.jstor.org/stable/41856501

Zikalala, M. J. (2016). *The role of savings and credit cooperatives in promoting access to credit in Swaziland.* FinancialEconomicsTeaching/Communication/Extension/Profession. https://ageconsearch.umn.edu/record/265678

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