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Research Article

Financial and Institutional Analysis of Vegetable Cooperatives in Dhading District of Nepal

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Abstract

A research was carried out in 2018 in Dhading district to study the financial and institutional aspect of vegetable and fruit cooperatives. Nine cooperatives were study through FGDs and 50 farmers were interviewed through interview schedule. Eight organizational indicators were used to study institutional performance where Market linkage and membership strategy was reported poor and legal status, organization and planning had higher score. Principal component analysis was done to study the variation within components. Current ratio, profit ratio, ROE, fixed asset to total asset ratio and operating ratio was calculated. Member's opinion on cooperative management was taken in addition to the institutional analysis done through FGDs.

Keywords: Research; Vegetable; FGDs; Fruit

Acronyms and Abbreviation

APP: Agriculture Perspective Plan; ADS: Agriculture Development Strategy; DADO: District Agriculture Development Office; FY: Fiscal Year; Ha: Hectare; ICA: International Cooperative Alliance; LEE: Learning through Entrepreneurial Experience; MOAD: Ministry of Agriculture Development; Mt: Metric tons; NGOs: Non-Government Office; PMAMP: Prime Minister Agriculture Modernization Project; SDGs: Sustainable Development Goals; SWOT: Strength Weakness Opportunities Threats; VDD: Vegetable Development Directorate; %: Percentage.

Introduction

Background information

Agriculture has been the predominant profession for survival of Nepalese community since ages. Agriculture share in global economy has been decreasing even though the need of agriculture products has been increasing. This is partly due to rise of other sectors and partly due to economy of scale where few producers can produce amounts of food. This decreasing trend of agriculture share is also evident in Nepalese economy where it occupies 28.9 percent of total economy in 2016/17 [1]. This is a drop from 31.1 percent from 2015/16. The fact that two third of population still identify themselves as farmers is indicative of influence of agriculture in the way of life of people.

Nepal's agricultural status is in a low development stage. Though majority of the population is engaged in agriculture, productivity and competitiveness of the sector are low; and adoption of improved technology is limited [2]. Even though most cultivated area is devoted to cereals, there is a growing food trade deficit and malnutrition is high [3]. Some subsectors such as dairy processing, poultry, tea, vegetable seed and fisheries have shown encouraging signs, but overall, these positive signs are not yet sufficient to lift a large number of people engaged in agriculture out of poverty and make a dramatic dent in reducing malnutrition and assure food security of the nation.

Since the Agriculture Perspective Plan (APP) started in year 1995/96, the agriculture sector in Nepal has made progress in several indicators of well-being and development. For example, income per capita and productivity of agricultural labor have increased, poverty has reduced, and malnutrition has declined. The road network has considerably expanded and irrigation coverage has increased as well. In almost all agriculture subsectors (crops, livestock, fishery, and forestry) there has been progress in terms of production or/and productivity [2]. However, the sector is in a low development stage as highlighted by a number of indicators including labor productivity, productivity gaps, trade and competitiveness, poverty and malnutrition, and infrastructure. Some subsec-

tors show dynamism, but overall, these positive signs are not yet sufficient to lift a still large number of people engaged in agriculture out of poverty, reduce malnutrition and assure food security of the nation. There are, however, positive signals that show not only the potential for growth but also opportunities that the ADS should build upon. These positive signals help us to have a more balanced understanding of the complexity of the agriculture sector in Nepal.

The constitution of Nepal guarantees food sovereignty and to ensure that the promise is kept, it is of paramount importance that government's policy and program should focus on increasing total production, total productivity and value addition [1]. Annual growth rate of the Agriculture sector in FY 2016/17 at basic prices is estimated at 5.3 percent whereas such growth remained negative by 0.03 percent in the previous FY 2015/16.Growth of Agriculture depends on climatic factors and even so its growth over the last decade has been far from satisfactory [4].

Agriculture Perspective Plan (APP) spanning twenty years came to an end in 2015 A.D. and following that Agriculture Development Strategy (ADS) has been implemented for the coming 20 years. ADS have been implemented to be self-reliance on food production, increase agriculture employment and entrepreneurship, agriculture commercialization and ultimately agriculture industrialization [2]. Prime Minister Agriculture modernization project (PMAMP), a supplementary project to ADS which has been financed from internal resources since FY 2016/17. PMAMP has identified commercial agriculture production area and classified super zones of 1,000 hectare land, 30 zones of 500 hectare, and 2,100 small pocket areas of 10 hectares.

Geographically, Dhading district ranges from 27°40'E to 18°17'E and 8°17'N to 84°35'N. It occupies total land area of 1,924.9 sq.km. It is bordered by Kathmandu, Rasuwa and Nuwakot in the East, Gorkha in the West, China and Rasuwa in the North and Makwanpur and Chitwan in the west. The altitude extends from lower mid hills to high mountainous terrain, ranges from 300m at Jogimara up to 7,110m at Pawil Mountain. Topographically, the district has 72% mid hills, 20% high hills and 8% mountainous region and is endowed with basins, tars, rivulets and terraces (DADO, 2072/73) spreading across all the ecological niches found in our country. The Prithivi Highway connecting most parts of eastern and western terai passes through Dhading and due to this proximity with Kathmandu and access to national highway; the farmers at Dhading have strategic comparative advantage and makes the huge ever growing agriculture markets of Kathmandu within reach. Dhading is known widely for its supply of vegetables to the markets of Kathmandu which started in late 1970's with aubergine, capsicums, tomatoes, beans and cucumbers. The district supplies 30% of the total demand of vegetables in Kathmandu valley alone (DADO, 2072/73). These all factors play an important role in development of Dhading district as a commercial producer and supplier of fresh vegetables in whole Nepal.

A cooperative could be defined as an autonomous association of individuals who voluntarily cooperate for their mutual, social, economic, and cultural benefit through a mutually owned and democratically run enterprise. Cooperatives act as economic enterprises as well as self-help organizations can uplift the ultra-poor and uplift their socio-economic condition. Cooperatives have collective concern for the group and the welfare of their members which could be a template in current economy of the world where the rich are getting richer and poor are getting poorer. Co-operatives may very well hold the key to economic equity and long term stability. Cooperatives in developing countries open up realistic avenues for realization sustainable development goals (SDGs).

Co-operatives are built on a foundation of values which each member respects and accepts. The major seven principles of cooperatives are as follows:

- Voluntary and Open Membership
- Democratic Member Control
- Member Economic Participation
- Autonomy and independence
- Education, Training and Information
- Co-operation among Co-operatives
- Concern for Community

Problem statement and Rationale of the study

Cooperatives are at the heart of addressing farmer's problems and challenges in vegetable production in Dhading. The vision of PMAMP to commercialize and eventually industrialize vegetable production, rest on these cooperatives. However, these cooperatives aren't financially and institutionally efficient. Without properly addressing the inherent issues in financial and institutional health of cooperatives, nothing concrete can be done. That is why the following research, Study on financial and institutional analysis of vegetables cooperatives in Dhading has been proposed.

Farmers producing vegetables face different types of risks-biological risks, production risks and marketing risks; the volatility of vegetable markets decrease the bargaining power and market power of the farmer as an individual. Co-operatives believe in common liabilities and consumption, when group of farmers pool their

resources and products at a place the resulting co-operative is powerful than the sum of its parts. Not only they can fetch better price for their products, they can cost efficiently market their products and reduce the overhead costs by sharing. Cooperatives enables its members to organize their dispersed resources, skill, means, capital and yield collective welfare [5]. However it needs to be pointed out that cooperatives cannot be successful without active participation of its members. There is a lot to be gained when individual farmers think and act as a group to sustain their livelihood, agriculture product as well as their socio-economic well-being.

Problems of inefficient marketing can be solved by the promotion of the cooperative marketing and by regulating the market [6]. Cooperative marketing is emerging as and efficient marketing system in Nepal. Cooperatives help its members to raise their socio-economic status by reducing number of intermediaries providing appropriate value of their produce (Thakuri, 1999). Cooperative are involved in value addition through processing, helping the farming community indirectly by stabilizing the market place, and developing the new markets or creating new consumption by supplying newly developed processed items. In addition, it protects local farmers and consumers by checking and interfering in the business carried out by large private companies, who try to maximize their benefits in domestic markets by unfair market control. It strengthens the bargaining power of member farmers as they are not compelled to sell over-produced volume at dumping –level prices when cooperatives have the capacity to absorb this excess volume. It provides complementary banking services and other marketing activities [3].

Objectives

General objective

- Analysis of financial and institutional performance of vegetable co-operatives in Dhading

Specific objectives

- Study and analyze financial ratios of vegetable co-operatives
- Analyze institutional efficiency of cooperatives through institutional analysis
- Analyze members opinions towards cooperatives performance

Literature Review and Trend Analysis

History of cooperatives in Nepal

The cooperative movement started in Europe in the 19th century. The industrial revolution and the increasing mechanism of the economy transformed society and threatened the livelihoods of many workers. International Cooperative Alliance (ICA) (2010) defines cooperative as an autonomous association of persons unified voluntarily to meet their common economic, social and cultural needs through a jointly-owned and democratically controlled enterprise. The concurrent labor and social movements and the issues they attempted to address describe the climate at the time. The co-operative concept in the form of Guthi, Parma, Dhikuri, Dharmabhakari etc has been used from a very beginning in Nepalese societies [3]. Characteristics of these historical social institutions are almost resembled with primary form of co-operatives. Institutionally and formally government established the Department of Co-operative under the Ministry of Planning, Development and Agriculture in 1953 A.D. First modern cooperative movement started from Chitwan District as a part of flood relief and resettlement program. Thirteen credit co-operatives were established in 2013B.S. and the legal support soon followed in 2016B.S. as Cooperative Societies Act 2016B.S. was enacted. This first Co-operative Societies Act was frequently brought under revision and was replaced by the Sajha Societies Act in 2041B.S. After people's movement of 2046 B.S. the Sajha Societies Act was replaced again by the Cooperative Act 1992. The Department of Co-operative is now the body providing authority for registration and regulations of cooperatives in Nepal. The number of cooperatives is increasing, the number of people employed, number of members of cooperatives is increasing and the diversity of cooperatives in terms of working area is also getting diverse. Total number of cooperatives according to Department of Cooperatives in 2073/74 is 34,512 where total of 6309981 (3213514 female and 3092067 males) are members. There are 10921 agriculture cooperatives where 1098865 members (614716 females and 477549 males) [7]. One of the factors that have contributed to the rapid expansion in both the number and the enterprise coverage of cooperatives is the new policy and legal regime allowing grassroots based spontaneous initiatives of communities to organize themselves into cooperatives for doing business and serving the communities (Cooperatives data, 2016).

Cooperative movements have made remarkable progress and they still need to strive for the inclusion of women, dalits, poor people, and other oppressed classes of society. Some of the reasons identified for failure of the cooperative movement in the country include: lack of national vision for the cooperative movement, lack of adequate monitoring, lack of inclusion of every sector of society in the cooperative movement, lack of managerial skills and professionalism, lack of working capital, lack of technological support and development, and lack of credibility (Mali, 2005). As the govern-

mental negligence and the lack of vision and commitment appear to be the main reasons for the failure of the cooperative movement in Nepal, commitment and willingness on the part of political parties and non-profit organizations have also been insufficient [8].

Types of farmer cooperatives

Farmer cooperatives can be of different types like marketing, farm inputs supply, and related-service cooperatives. Following types of cooperatives have been found in the literature.

Marketing cooperatives

Marketing cooperatives are formed with the primary aim of marketing of agriculture produce of its members. Marketing can be a difficult job for an individual farmer due to the costs involved and lack of bargaining power. Cooperatives can achieve economy of scale in this regard and substantially reduce overhead costs and command market power. Many marketing cooperatives however have not been successful due to the fact that they could not predict the market accurately enough and couldn't make quick market decisions. The agility was lost and became uneconomic. It is therefore agriculture marketing cooperates needs agility, negotiations skills, and seer guesswork.

Farm supply cooperatives

A farmer needs many inputs in his farm for production of food. Many of the inputs are time sensitive and are required to implement at specific periods in plant life. Timely availability is one dimension and cost of these inputs is another dimension. A cooperative on this regard can be a vehicle to supply the inputs at reasonable costs and the profits still remains in the cooperative.

Service cooperatives

Service Cooperatives are institutions set to meet the member's need of credit services, processing needs, transport needs irrigation services etc.

Production cooperatives

This is group of producers who produce same or similar product and pursue it collectively. Examples are milk, vegetables, live stocks, poultry cooperatives (Bataille-Chedotel and Huntzinger, 2004).

Processing cooperatives

It would be uneconomical for individual farmers to set up processing centers of their agriculture commodities. Example could be cold storage center where the initial investment is high and thereby creating a high barrier to entry. This common need of the farmers in an area can be achieved through formation of processing cooperatives. In Nepal large portion of harvest are lost due to unavailability of processing center, it is why processing cooperatives could very well hold the key to agriculture commercialization. PMAMP focus on establishing post-harvest center and custom hiring center is justified.

Environmental cooperatives

These are group of farmers who emphasis on sustainable agriculture, natural farming and similar regarded for farming and nature. Organic growers are examples of this cooperative. This is getting popular in Europe.

Status of vegetable production in Nepal and Dhading

The short growing period of vegetables, quick high returns and geographical landscape of the country make vegetable sector extremely important for economic development and agriculture commercialization. The variation in geography enables farmers at different places to explore different comparative advantage and due to which they can produce vegetables of same or higher quality with low opportunity costs. Vegetable crops in 2016/17are cultivated in 303271ha area with total production of 4163592 Mt and productivity of 13.73Mt/ha. Total expenditure on youth targeted vegetable production by government of Nepal was 190860 thousand. Vegetable production in terai, mid hills and high hills were recorded to be 55, 40 and 5 percent respectively [4]. Though agriculture is major occupation for most of the rural people it is subsistence type. The demand for agricultural product is increasing at higher rate with increasing rate of population. Realizing the importance of production potential and increasing demand of vegetables several programs have been conducted to promote commercial vegetable farming. The area, production and productivity over 10 years is found to be increasing [1].

In last 10 years the area under cultivation is increased by 41% while production increased by 63%. Similarly, the productivity is increased by 16%. The area, production and productivity in 2014/15 is 266937 ha, 3580084 Mt and 13.41 Mt/ha. Likewise, the major vegetables which were grown in large areas are cauliflower, cabbage, tomato, bean and pea. Among vegetable crops, cauliflower is the number one vegetable in terms of area cultivated and covers about 33,172 ha, which is 14% of the total area under vegetable crops followed by cabbage, tomato, pea, and bean which is shown in Appendix. At present FY 2016/17, production of vegetable crop is estimated to total 4,164,000 MT, the production in FY 2015/16 was 3,820,000 MT. This is increment of 9 percent compared to last fiscal year 2015/16 [1]. Vegetables form the essential part of each

diet and people consume it daily. This makes cash crops vegetables important from the point of view of nutrition needs, quality of life and daily assured demand from rising population. This demand has incentivized people to pursue off season vegetable farming, explore new technological advances like plastic tunnel, drip irrigation, mulching, and green house as compared to traditional way of home gardening. Commercial vegetable production in Dhading started flourishing around 2046 B.S. (Fieldwork, 2018). This evolution was parallel to genesis and development of vegetable cooperatives in Dhading. In FY 2016/17 vegetables were grown in 5987 ha and total production was 75,839 Mt. Tomato is the most cultivated in the district with cultivation are of 766 ha with 13635 Mt production and productivity of 17.8. Second highest productivity, 14.64 was found in cabbage followed closely by cauliflower at 14.25.

S.N.	Fiscal year	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	2005/06	189832	2190100	11.53704328
2	2006/07	191922	2298689	11.97720428
3	2007/08	208108	2538904	12.19993465
4	2008/09	225154	2754406	12.23343134
5	2009/10	235098	3003821	12.77688879
6	2010/11	244102	3203563	13.12387035
7	2011/12	245037	3298816	13.46252199
8	2012/13	246391	3301683	13.40017695
9	2013/14	254931	3421035	13.41945468
10	2014/15	266937	3580084	13.41171887
11	2015/16	280806	3819809	13.6
12	2016/17	303271	4163592	13.73

Table 1: Area, production, productivity of vegetable production in Nepal FY2005/6-2016/17.

Status of vegetable co-operatives in Nepal

Vegetable Cooperative business is important in Nepal for socio-economic transformation as even the poorest can find a place in cooperatives to cater their needs. Its contribution on local leadership, employment generation, social welfare, and harmony along with community empowerment is evident in parts of Nepal [9]. Cooperates have been identified as one of the three pillars of economic policy by constitution of Nepal and its growth for capacity enhancement, governance and promotion of vegetable production as a full-fledged business to entrepreneurs need to be realized.

Agriculture cooperatives are involved in the production, processing and marketing of agricultural products like vegetables, spices and herbs, fruits, tea, coffee, cardamom, ginger, honey. Cooperatives are sustainable and equitable as it has a practice of mutuality and self-reliance [10]. Genuine efforts have been made, and a lot still needs to be done to improve the business side of farming and achieve improved living standard of farmers through realization of collective capital and integrating the limited means, resources, skill and technology lying scattered among them (Table 2).

Financial analysis of cooperatives

Financial analysis is an exercise of measuring and interpreting association between different accounts in financial statements [11]. Financial report may contain plethora of data and skimming out useful relevant data is crucial and, in that regard, financial analysis is of great value. There are many literature available in finance for analysis of data but all of the ratio analysis from finance world cannot be applied in analysis of cooperatives data, especially in context with profit-oriented ratios [12]. Ratio analysis indicates financial performance, position and assessment of its cash flow thereby indicating its financial strengths and shortcomings [11].

Functions	No of cooperative societies	Male member	Female member	Share capital ('000Rs)	Deposits ('000 Rs)	Investment ('000Rs)	Total ('000 Rs)
Saving and loan	13769	1611956	1761984	53605814	214226044	189269138	189543405
Multipurpose	4055	625845	561330	10620468	6071576	57872704	57904546
Agriculture	9965	432343	572013	4682707	15828294	36476640	36549718
Milk	1652	74911	24248	304108	1069802	721976	726748
Consumer	1461	39904	22799	276180	494439	689617	690286
Electricity	450	56158	17249	170813	91555	160885	165372
Fruits and vegetables	189	10515	10666	53423	158558	142516	142651
Tea	106	4818	2156	92689	29229	49822	51474
Coffee	148	3500	2430	11146	27598	43118	43412
Herbs	191	6006	4396	37608	41227	101174	101443
Bee keeping	107	2055	1946	6660	7241	12753	12785
Communication	136	10015	3322	273755	84431	100298	106203
Health	110	6537	5191	357801	316735	181774	181821
Sugarcane	48	1684	685	6156	17273	24685	24685
Junar	44	982	577	1147	5801	5900	5900
Others	1176	57310	91326	857407	2457999	3565800	3574592
Total	33599	2944539	3082318	71357882	240927802	289418800	289825041

Table 2: Cooperative statistics: FY 2072/73.

Financial ratios are computed to know about five financial characteristics which are solvency, liquidity, profitability, repayment capacity and financial efficiency [13]. Solvency of a cooperative is its capacity to pay debts if all its present assets were sold. Liquidity is the ability to pay the current dues and obligations. Profitability is the extra revenue generated from goods and services of the cooperatives after the cost of those goods and services are paid off. Repayment capacity of the cooperative is its ability to repay the loans taken by the institution. Significant studies on financial analysis of agricultural cooperatives have been done Lerman and Parliament (1989), Binion (1998), Ozudogru (2004), Akono., *et al*. (2005), Carlberg., *et al*. (2006), Surmeli (2006), Arslan (2007), Banaszak (2007), Boyd., *et al*. (2007), Gurung and Unterschultz (2007), Laziková., *et al*. (2008), McKee (2007), McKee (2008), Cosgun., *et al*. (2009), and Pashkova., *et al*. (2009).

Ratio	Performance indicators	Definition
Return on equity	Profitability	Income/equity (%)
Return on assets	Profitability	Income/total assets (%)
Operating margin	Profitability	Operating profit/net sales (%)
Current ratio	Liquidity	Current assets/current liabilities
Fixed asset turnover ratio	Asset efficiency	Net sales/fixed assets

Table 3: Ratios, performance indicators and definition for financial analysis.

Institutional analysis of co-operatives

Institutions refer to different types of entities, organizations, rules which are used to structure patterns of interaction between and within organizations. Institutional analysis is the part of social sciences which answers the questions which organizations perform policy reforms, its characteristics, stakeholder analysis of government, non-government organizations, firms etc. The premises of institutional analysis are that government is not a single actor, different actors compete for resources and power, and decision made in central hierarchies is modified at lower local levels. (PISA, 2009) Institutional analysis studies the behavior and capacity of organizations to bring reforms. It enables to locate constraints at the level of internal process, management, relationship within and among organization. It also evaluates formal institutions (rules, resources distribution, authorization processes).

The IAD framework is a multi-level conceptual map in which one part of the framework is the identification of an action arena, the patterns of interactions, outcomes it results and then evaluation of those outcomes. The operation tier, where actors interact driven by incentives, may harbor problems.

Cooperatives in regards of policy documents

Nepal Agriculture policy 2004 B.S. in the points no. 40, 44, 46 and 49 had mentioned about cooperative briefly. In the point 40, it is stated that priority shall be given to promote cooperatives based on agriculture industry and business.

Co-operative Act was promulgated in 2048 B.S. which was the guide for all the cooperatives. This act was criticized for its softness to punish embezzlement and no clear distinction between types of cooperatives was made.

After decade of call for new act, Cooperatives Act 2074 B.S. was passed which has tough stance and harsh penalties for mismanagement.

The sector is governed by the 1991 Co-operative Act but the new law includes harsher penalties against co-ops which misappropriate depositors' money. Fake loaners stand to face ten year of jail time. The department of cooperatives and central bank will together in supervising, regulating cooperatives through deployment of a special monitoring system, especially in relation to bigger co-ops.

Consumer co-ops and service coops have been banned from giving out loans, if they wish to do so, they have to convert into saving and credit co-ops. Co-ops have to rename themselves based on their prime role. Agriculture cooperatives solely functioning as credit-saving institution can no longer be registered under appellation of agriculture co-ops.

Limitations and challenges of farmer cooperatives

First and foremost decrease in number of family farm has become the major challenge for agriculture cooperatives. It is fair to say that global trend of vertical integration and migrating youth creating alternate source of family revenue have decreased the number of farms. This is further hindered by conversion of agriculture land into construction sites for residential area. A revolutionary national land strategy had been long due and it is eminent that be done for land consolidation, farm protection and optimum farm size. Secondly, small farmer cooperatives have resource constraints and are vulnerable to price fluctuations and market competitors

with larger resources can outcompete them. Even worse two co-operatives may even be competing with each other for the same market. So government intervention and production, marketing planning in this regard is essential. Lack of professionalism, book keeping, financial management, corruption is plague to cooperatives. Inability to build their cooperative brand does not do them any good either. The organizations working for cooperatives development are Ministry of Agriculture and Cooperatives, Department of Cooperatives, Central Cooperative Training Center, National Cooperative Development Board and many other NGOs/INGOs. A need for coherent and coordinated collaboration between these agencies is widely felt. Land rights issue is yet another challenge to cooperatives, land reform policies according to topography, land use types and productivity is the need of the hour and a farmer cooperative cannot flourish without having land rights. Dwindling number of workforce in agriculture may cause for lack of producers in production cooperatives. Communication gap within members of cooperatives affects the working of cooperatives and it is why each member of cooperative be informed of the values, vision and goals of cooperatives. This is done effectively by a good leader of the cooperative and presence of effective leadership at the helm of cooperatives management board be the difference between boom or bust of that cooperative.

Conceptual Framework

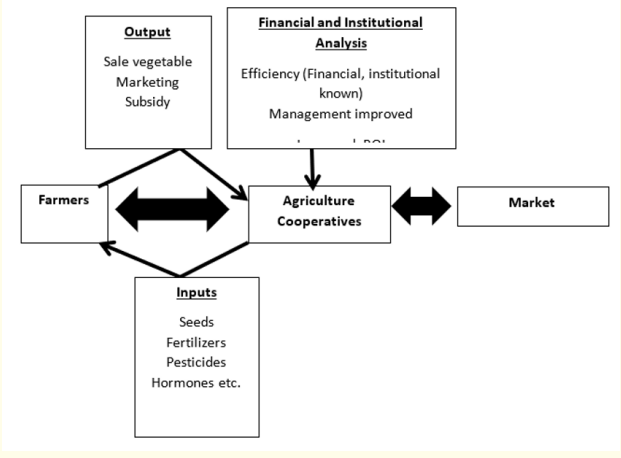

Figure 1: Conceptual framework.

Methodology

This portion includes different tools and techniques of research procedure such as selection of the study area, selection of population and sample, sources of information and data collection techniques, survey design and methods and techniques of data analysis

Selection of the study area

The research study carried out in 10 wards of Benighat, Rorang Gaupalika, 2 wards of siddha lake Gaupalika, ward 2 of Gajuri Gaupalika of Dhading and ward 7 and 8 of Gandaki Gaupalika, Gorkha.

Figure 2: Location of Dhading district in map of Nepal.

Figure 3: Map of the research site (Source: Google maps).

Sample and sampling technique

The geographical boundary of the area was selected by purposeful sampling as it is the LEE internship site of the researcher. The list of all vegetable co-operatives in the vegetable zone was listed and sampling frame prepared. The sampling frame consists of 20 co-operatives. Chairman, manager of each co-operative was purposefully selected and data from them collected by semi-structured interview schedule. Officials of PMAMP, past DADO were interview with open ended questions for the augmentation of the data. Annual report of co-operatives, financial statements, publications of DADO Dhading, VDD, MOADC were consulted for analysis and drawing conclusions.

Preliminary survey

Preliminary field visit was done to collect preliminary information on the socio-demographic structure, topography of the research area. Secondary data was also used to assess the making of the research area. The information so collected was used in design of FGD checklist, interview schedule and a sampling framework.

Data and data types

- **Primary data:** Primary data obtained from FGDs with chairman, secretary and managers involved in co-operatives, and semi-structured interview schedule of farmers.
- **Secondary data:** The annual reports of each co-operative and their financial statement was the main source of secondary data and used extensively for economic analysis of the co-operatives. Publication of DADO Dhading, VDD, MOADC, and NGOs were other secondary sources.

Data analysis technique

- **Socio-economic and demographic characteristics:** Variables like age, gender, occupation, and ethnicity were analyzed with the help of simple descriptive statistics such as frequencies, percentage, Standard deviation and percentage.
- **Ratio Analysis:** There are four categories of ratios which are commonly used in analyzing financial position of an organization. They are:
    - Liquidity ratios: Liquidity ratios calculate the ability to fulfill short-term obligations with liquid assets. Such ratios are of special interest to the cooperative's short-term creditors. Liquidity ratios compare assets that can be converted to cash quickly to fund maturing short-term obligations.
    - Solvency ratios: Solvency ratios measure the extent of the firm's "total debt" burden. They reflect the cooperative's ability to meet both short- and long-term debt obligations.
    - Activity ratios: Activity ratios show the intensity with which the firm uses assets in generating sales. These ratios indicate whether the firm's investment in current and long-term assets is too large, too small, or just right.
    - Profitability ratios: Profitability ratios measure the success of the organization in earning a net return on its operations. Profit is a crucial objective of a cooperative, so poor performance in this indicator is regarded a basic failure that, if not intervened, would likely result in the firm going out of business. Cooperatives must operate profitably, even though their consideration/definition of profitable might be different from a profit oriented organization.

In this study financial documents of cooperatives are studied for computation of following ratios:

- **Profit (loss) Ratio:** It is the ratio of net profit to sales. The main objective is to determine the overall profitability due to various factors such as operational efficiency or trading on equity.
- **Operating Ratio:** It is the ratio of operating expenses to sales. The main objective of calculating this ratio is to determine the operational efficiency with which production, purchases and selling operations are done.
- **Equity to Assets Ratio:** It is the ratio of equity to total assets. It is considered a good indicator of the level of leverage used by a company. It measures the proportion of the total assets that are financed by stockholders.
- **Fixed Assets to Total Assets:** It is the ratio of fixed assets to total assets.
- **Return on Equity (ROE):** It is the ratio of net profit to total equity. The main objective is to determine how much profit a company earned in comparison to the total amount of shareholder equity.
- **Current Ratio:** It is the ratio of current assets to current liabilities. The objective of calculating this ratio is to measure the ability of the firm to meet short term obligations and show the short term financial solvency/strength of the firm.

Cooperative performance indicators and index

Eight indicators of organizational sustainability were identified and a total of 62 questions used as a checklist in FGDs. The indicators are legal status organization and planning, cooperative planning procedure, human resource management, financial management, service to members, cooperative production, market linkage, and membership strategies. FGDs were carried out at each cooperative under study where participants were Cooperatives chairman, manager and farmers. The indicators were selected after thorough review of literature and largely based on the parameters used by United Nations worldwide for calculating cooperative performance index.

Farmer's perception to production constraint, marketing constraint, marketing constraint, and calculation of ranking was done by using five point scale comprising of very high importance, high, medium, less and the least by giving weightage on the basis of importance i.e. 5 for very high importance, 4 for high importance, 3 for medium importance, 2 for less importance and 1 for least importance Then the importance index was computed by using the formula:

$$I_{importance} = \Sigma (S_i \times f_i / 4N)$$

Where,

$I_{importance}$ = Index of importance

$\sum$ = summation

S_i = I^{th} scale value

F_i = frequency of i^{th} severity given by the respondents

N = total number of respondents

Principal component analysis (PCA)

The main objective of PCA is the reduction of number of variables into a smaller number of variables- 'components', so that it becomes easier to explain the observed data. The units which are taken in analysis are represented as graphical points and the distance between them computed; the distance is expressed on a graph through use of cluster inertia relative to its center of gravity (Bolasco, 1999). Such projections are the estimation of existing relationship with the original data. PCA determines the principal components which most accurately elucidates the space where the cluster when drawn minimizes the information loss. The principal components represent the linear combinations of original variables, correlated and classified in as such a way that first component explains the largest possible variability of the system.

In this study, the variance within the eight components was studied by principal component analysis.

Results and Discussions

Overview of Dhading district

Geographical setting

The major portion of Dhading district is hilly. The southern boundary touches Mahabharat range while northen boundary touches Tibet. The highest elevation of the district is Pavil himal at an elevation of 7110 masl and lowest point is Jogimara at 300 masl. The district headquarter Dhadingbesi is situated at an elevation of 640 m. According to DADO Dhading (2072/73) 72% of the total land cover is mid hills, 20% is high hlll and 8% is mountainous. The major rivers are Trishuli and Budi Gandaki. The tributaries of Trishuli river are Charaudi khola, Malekhu khola, Galtu khola, Belkhu khola, Mahesh khola, Thopal khola. The tributaries of Budi Gandaki are Manu khola, Kaaste khola, Maste khola, Surgandhi khola and Aankhu salyantaar.

Climatic condition

Rainy season starts in Dhading from South East monsoon however different parts of Dhading receive different amount of rainfall. Average rainfall days range from 61-138 days but 80% rainfalls between June-September. Average precipitation ranges from 1912 mm to 3535 mm. Places like Jharlang, Sertung, Tipling which are 2000 masl have rainfall for 4-5 months whereas places with even higher altitude like Lapa, Ri have rainfall for 3-4 months. Areas around budi Gandaki river basins like Baseri, Budathaam, Mulpaani, Aaginchowk, Salyantaar, Jyaamrung have rainfall for 4-5 months. According to Climatic condition Dhading district can be classified into Sub-Tropical/sub-humid climate. The warm temperate/humid climate, The cool temperate/pre-humid climate, the Alpine pre humid climate and The arctic climate.

Land utilization

The soil of Dhading can be classified into five types namely, fragmental loamy soil, fragmental sandy soil, loamy soil, boulder loamy soil, skeletal loamy soil. Overall 90% of soil of Dhading is skeletal loamy. About 88% area of Dhading has slope of 30 degree or more which makes it sensitive from point of view of soil erosion. On the basis of severity of erosion, 6% land is at very high risk, 43% at high risk, 35% at medium risk and 16% at low risk.

86.82% of family has less than one ha land in possession, 12.57% has more than one ha while 0.61% have no land holdings.

Area according to ownership	Ownership			
	Area (ha)			
	Number	Irrigated	Non-irrigated	Total
Landless	393	0	12.7	12.7
less than 0.1 ha	1371	12.5	65.8	78.3
0.1 - 0.2 ha	8070	170	928.2	1098.2
0.2 - 0.5 ha	25854	2992.7	5820.3	8813
0.5 - 1 ha	20722	5824.5	8610.7	14435.2
1 - 2 ha	7364	3657.1	5550.7	9207.8
2 - 3 ha	705	616.4	1016.3	1632.7
3 - 4 ha	39	39.9	79.7	119.6
4 - 5 ha	0	0	0	0
Total	64518	13313.1	22084.4	35397.5

Table 4: Status of Land in Dhading district.

Source: Agriculture Census 2068 B.S.

Ethnicity

Tamang caste has the highest population in Dhading district followed by Brahmin, Chhetri, Newari, Magar, Gurung respectively.

Ethnicity	Population	Percent
Tamang	74239	22.09
Brahmin	50346	14.98
chhetri	49457	14.72
Newar	31587	9.40
Magar	28644	8.52
Gurung	18632	5.54
Sarki	16242	4.83
Chepang	14492	4.31
Kaami	14061	4.18
Others	38367	11.42
Total	336067	100.00

Table 5: Ethnicity in Dhading district.

Source: DADO Dhading

Dividing the population on the basis of religion, 72.42 % are Hindu, 20.57% are Buddhist, 0.31% Islam, 6.32% Christian.

Educational status

The literacy rate in Dhading is 100%. This was declared in Bhadra, 2071 B.S. There are 1122 government educational institutions and 97 private educational institutions. The total number of primary schools, lower secondary, secondary, higher secondary and colleges are 423, 90, 93, 50, 14 respectively.

Major agriculture production

Paddy, maize, millet are the major agronomic crops of Dhading even though their productivity is below national average. Potato cultivation was also preferred by farmers. Blackgram, soyabean were among the preferred pulse crops. Mandarin and lime were popular fruits for commercial cultivation. Cattle and buffalo were reared in comparable numbers. Goat was reared more than sheep. The number of goats was also copious(Table 6).

Vegetable production

The short growing period of vegetables, quick high returns and geographical landscape of the country make vegetable sector extremely important for economic development and agriculture commercialization. The variation in geography enables farmers at different places to explore different comparative advantage and due to which they can produce vegetables of same or higher quality with low opportunity costs. Vegetable crops in 2016/17are cultivated in 303271ha area with total production of 4163592 Mt and productivity of 13.73Mt/ha. Total expenditure on youth targeted vegetable production by government of Nepal was 190860 thousand. Vegetable production in terai, mid hills and high hills were recorded to be 55, 40 and 5 percent respectively [4]. Though agriculture is major occupation for most of the rural people it is subsistence type. The demand for agricultural product is increasing at higher rate with increasing rate of population. Realizing the importance of production potential and increasing demand of vegetables several programs have been conducted to promote commercial vegetable farming. The area, production and productivity over 10 years is found to be increasing [1].

		Area	Production (Mt)	Productivity (Mt/ha)
Cereal crops	Paddy	12262	33349	2.72
	Maize	14873	24383	1.64
	Millet	6930	6445	0.93
Cash crops	Oil seeds	665	529	0.80
	Potato	1641	23466	14.30
	Sugarcane	50	1500	30.00
Spice Crops	Ginger	192	2690	14.01
	Chilli	194	194	1.00
Pulse Crops	Lentil	209	187	0.89
	Blackgram	688	544	0.79
	Soyabean	357	219	0.61
Citrus fruits	Mandarin	305	3050	10.00
	Lime	59	483	8.19
Vegetables		5872	75005	12.77
Livestock				Number
	Cattle			132806
	Buffaloes			111887
	Sheep			5755
	Goat			143487
	Pigs			21858
	Fowl			902352
	Ducks			7663

Table 6: Major Agriculture production in Dhading.

In last 10 years the area under cultivation is increased by 41% while production increased by 63%. Similarly, the productivity is increased by 16%. The area, production and productivity in 2014/15 is 266937 ha, 3580084 Mt and 13.41 Mt/ha. Likewise, the major vegetables which were grown in large areas are cauliflower, cabbage, tomato, bean and pea. Among vegetable crops, cauliflower is the number one vegetable in terms of area cultivated and covers about 33,172 ha, which is 14% of the total area under vegetable crops followed by cabbage, tomato, pea, and bean which is shown in Appendix. At present FY 2016/17, production of vegetable crop is estimated to total 4,164,000 MT, the production in FY 2015/16 was 3,820,000 MT. This is increment of 9 percent compared to last fiscal year 2015/16 [1]. Vegetables form the essential part of each diet and people consume it daily. This makes cash crops vegetables important from the point of view of nutrition needs, quality of life and daily assured demand from rising population. This demand has incentivized people to pursue off season vegetable farming,

explore new technological advances like plastic tunnel, drip irrigation, mulching, and green house as compared to traditional way of home gardening.

S.N.	Fiscal year	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	2005/06	189832	2190100	11.53704328
2	2006/07	191922	2298689	11.97720428
3	2007/08	208108	2538904	12.19993465
4	2008/09	225154	2754406	12.23343134
5	2009/10	235098	3003821	12.77688879
6	2010/11	244102	3203563	13.12387035
7	2011/12	245037	3298816	13.46252199
8	2012/13	246391	3301683	13.40017695
9	2013/14	254931	3421035	13.41945468
10	2014/15	266937	3580084	13.41171887
11	2015/16	280806	3819809	13.6
12	2016/17	303271	4163592	13.73

Table 7: Area, production, productivity of vegetable production in Nepal FY2005/6-2016/17.

Status of vegetable production in Dhading

Commercial vegetable production in Dhading started flourishing around 2046 B.S. (Fieldwork, 2018). This evolution was parallel to genesis and development of vegetable cooperatives in Dhading. In FY 2016/17 vegetables were grown in 5987 ha and total production was 75,839 Mt. The list of major vegetables with their area, production and productivity is mentioned on the table below.

	Area (ha)	Production (Mt)	Yield
Cauliflower	497	7082	14.25
Cabbage	565	8269	14.64
Tomato	766	13635	17.8
Radish	280	3976	14.2
BLM	510	3264	6.4
Carrot	30	336	11.2
Peas	77	761	9.88
French beans	35	284	8.1
Akabare chilli	10	72	7.15
Chilli	80	320	4
Okra	166	1453	8.75
Brinjal	256	2944	11.5
Onion	169	1749	10.35
Cucumber	429	6221	14.5
Pumpkin	95	1454	15.3
Bitter gourd	269	3188	11.85
Other vegetables	1753	20831	11.88
Total	5987	75836	12.67

Table 8: Area, production and yield of different vegetables in Dhading.

Transportation network and market centers

Dhading has the highway through which Kathmandu, the capital city of Nepal is connected to all major cities. Besides the highway there are many agriculture roads and gravel roads which connect remote farmer's field and the collection centers situated at the highway. Major vegetable collection center are at the nine cooperatives which are the study subject of this research. Major local markets are Jogimara, Fishling, Khatauti, Charaudi, Bishaltar, Benighat, Salanghat, Malekhu, Jaguri, Dhading besi and outside market are Kalimati, Chitwan, Pokhara, Butwal.

Cooperatives in Dhading district

All the cooperatives in Dhading district are registered under Division Cooperative Office, Dhading then under Ministry of poverty alleviation and Cooperatives now under Ministry of Agriculture, Land management and Cooperatives. The overall number of cooperatives over the period of three years has slightly increased however the number of vegetable and fruits service cooperatives has slightly decreased.

Types of cooperatives	71/72	72/73	73/74
Milk	18	17	15
Sana kisan	223	227	228
Multi purpose	38	38	41
Saving -credit	89	89	87
Vegetables-fruits	19	19	17
Others	28	29	33
Total	415	419	421

Table 9: Types of Cooperatives in Dhading.

Source: Division Cooperatives Dhading, 2018

Socio-economic and demographic information of the farmers in research area

Population characteristics of sampled household

The majority of population fell on economically active population i.e. 15-59 years. Zero to five years constituted the lowest percentage. The zone profile of vegetable zone Dhading stated the average age of the command area at 47 years. The table below shows the distribution of economically active population.

Age group	Members
0 to 5	14 (5.32)
6 to 14	63 (23.95)
15 to 59	171 (65.02)
59 above	15 (5.70)
Total	263

Table 10: Distribution of population.

Note: Figures in parentheses indicate percentage

The study of cooperative size and population in each of the nine cooperatives revealed that Krishak sudhar had the highest total population and Janbhawana had the lowest number. Highest percentage of female members was reported from Grameen bikas at 45.05 percent and lowest reported from Janbhawana at 10.75 percent. Overall male formed about eighty percent of the total membership.

S.N.	Name	General members		
		Male	Female	Total
1	Janbhawana	83 (89.25)	10 (10.75)	93
2	Krishak sudhaar	841 (74.49)	288 (25.51)	1129
3	Malekhu	317(84.99)	56 (15.01	373
4	Salanghat	226(84.330	42 (15.67)	268
5	Bhairawi	251(91.94)	22 (8.06)	273
6	Graamin bikash	100(54.95)	82 (45.05)	182
7	Samudaik	425(82.68)	89 (17.32)	514
8	Jankalyan	122(87.77)	17 (12.23)	139
9	Ako	235(78.33)	65 (21.67)	300
	Total	2600 (79.5)	671 (20.5)	3271

Table 11: Cooperative Membership by sex.

Note: Figures in parentheses indicate percentage

Gender distribution

A majority of the interview schedule (68%) were male compared to 16 percent females. The farm households generally included farmer along with his/her spouse, parents, children and other dependents. The average family size was 5.27.

			Family size		
Male	Female	Total	Average	Minimum	Maximum
34 (68)	16 (32)	50	5.27	3	15

Table 12: Population by family size and sex.

Note: Figures in parentheses indicate percentage

In Sanchalak Samiti (management committee) overall male formed about sixty percent and rest was female. The highest female representation was reported from Grammeb bikas at 54.56 percent and lowest reported from Krishak Sudhaar at 10 percent. Only four out of nine cooperative had a female employee while one cooperative Grameen bikas had no employee. The chairman and manager of all cooperatives were male.

S.N.	Name	Employees		Sanchalak Samiti			Gender of chairman	Gender of Manager
		Male	Female	Male	Female	Total		
1	Janbhawana	1	1	6 (66.67)	3 (33.33)	9	Male	Male
2	Krishak sudhaar	8	2	9 (90)	1 (10)	10	Male	Male
3	Malekhu	0	1	9 (81.82)	2 (18.18)	11	Male	Male
4	Salanghat	2	0	8 (88.89)	1 (11.11)	9	Male	Male
5	Bhairawi	2	0	9 (81.82)	2 (18.18)	11	Male	Male
6	Graamin bikash	0	0	5 (45.45)	6 (54.55)	11	Male	Male
7	Samudaik	1	1	7 (63.64)	4 (36.36)	11	Male	Male
8	Jankalyan	1	0	3 (27.27)	8 (72.73)	11	Male	Male
9	Ako	3	0	8 (72.73)	3 (27.27)	11	Male	Male
	Total	18	5	57 (60.63)	37 (39.37)	94		

Table 13: Gender in Cooperatives.

Educational status

The educational level of respondents was divide into six categories viz. illiterate, literate, primary, secondary, intermediate and university level. Illiterate referred to those who could not read or write. Literate meaning those who can perform basic reading and writing without having a formal education. Primary, secondary, college and university respectively meant completion of grade 5, grade 10, grade 12 and bachelor's degree or higher. 14 percent were found illiterate, the majority of sampled population was just literate; closely followed by 28 percent primary educated and 20 percent secondary educated with just 2 percent being university graduate. Zone profile of vegetable zone Dhading reported the average education of farmers at about completion of grade 8.

Level of Education	Frequency
Illiterate	7 (14)
Literate	16 (32)
Primary	14 (28)
Secondary	10 (20)
College	2 (4)
University	1 (2)
Total	50

Table 14: Education status of head of sampled household.

Caste/Ethnic composition

The respondents were classified into three groups based on their caste viz. Brahmins, Chhetris, and Dalit-Janjati. Janajti incorporated Newar, Gurung, Magar, Limbu, Tamang and Chepang. Dalits included Kami, Damai, Sarki. Dalits and Janjati formed the 40 percent of respondents were Dali-Janjati while 34 percent of respondents were Brahmin followed by 26 percent of Chhetris.

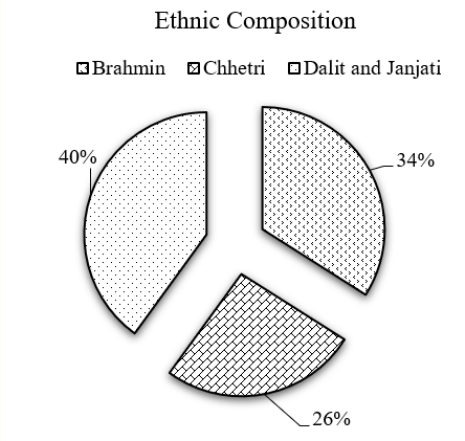

Figure 4: Ethnic composition of respondent.

Occupational status of household

Occupational status informs the nature of local society and economy, various economic avenues of income for the farmers and society. The major occupation was reported as agriculture alone at 36 percent, this was closely followed by agriculture plus abroad at 34 percent. The percent of agriculture plus labor was found lowest at 6 percent. Service here refers to governmental or non-governmental job; business means shopkeeper, hotel, trucking or homestays; labor meaning payments for work performed.

Occupation	Frequency
Agriculture	18 (36)
Agriculture + service	2 (4)
Agriculture+ Business	6 (12)
Agriculture+ Abroad	17 (34)
Agriculture+ Labor	3 (6)
Agriculture+ Business+ Abroad	4 (8)
Total	50

Table 15: Major Occupations of respondent household.

Note: Figures in parenthesis indicates percentage of the total.

Vegetables sale through cooperatives

Cooperatives themselves do not buy directly from farmers but act as a collection center where vegetables are collected and from there the farmer has the choice of selling directly to the buyers that come to collection centers or through cooperatives. Cooperatives act as a facilitator and lobby for higher price for prices. Based on the market rate that date cooperatives set a price and all the trade that day is conducted by that price. This system although sounds driven my market forces in reality what happens is that a commodity of lower grade is sold early in the morning which lowers the valuation of the higher grade products of same commodity. This has arisen chiefly due to lack of grading and differential pricing. Out of the nine cooperatives which are a part of this research, two of them didn't keep up to date record of their sale so barring them monthly total vegetable sale along with the total price fetched has been listed in the table 16.

Production problems

Farmers in the study area had numerous problems inhibiting them to achieve their full production potential. Initially a focus group discussion was conducted in each cooperative to list out the major production constraints. Based on this a list of major production problem was prepared, then, during household interview schedule each respondent was asked to rate each problem on a severity scale. The list of problem generated from FGDs are problem of pest attack, lack of irrigation, lack of quality seed, cultivars, inputs, lack of training, lack of financial resources, high price of inputs, and lack of technical facility and lack of inputs in times. Below is the index and rank of the problems. Absence of irrigation was the major challenge for production as at many places rainwater was the only source of their irrigation and despite having comparative geographical advantage (possibility of off-season production) they couldn't cultivate vegetables yearlong. Lack of quality seed and in-

puts was reported second severe problem, the sole source of these inputs were either cooperatives or agro-vets who didn't follow any quality criteria. Farmers had hardly any choice regarding the variety they planted and would plant choosing from th options available in the shop. Here agro vets and cooperatives had tremendous power in terms of farmer's adoption which made them vulnerable to commissions from seed and fertilizers manufacturers. Pest problem was found to be increasing each year and they had been using way above the recommended dose as that was the only way they saw from minimizing pest damage. Lack of technical facility was listed the least severe as most of the farmers had been part of multiple trainings and many even questioned the efficacy of trainings offered by government institutions labeling them impracticable at field level (Table 17).

Total production and price for FY 73/74		Krishak Sudhaar	Jankalyan	Ako	Saamudaik	Salangahat	Malekhu	Janbhawana
Shrawan	Production	462.42	165.00	82.37	444.79	134.67	41.94	23.81
	Price	14149.82	3720.00	2841.04	6741.14	3415.79	1227.59	286.23
Bhadra	Production	366.73	112.00	68.31	265.78	82.01	48.12	28.54
	Price	10087.71	3130.00	2454.14	4784.00	2599.79	1652.68	334.90
Ashoj	Production	344.35	39.00	26.32	101.97	114.68	35.87	23.93
	Price	13624.77	1385.00	2813.25	1835.53	4899.40	1324.21	323.60
Kartik	Production	612.73	58.00	89.93	32.86	291.56	50.18	28.46
	Price	21504.03	2160.00	3630.51	591.48	18887.16	1491.41	378.36
Mangsir	Production	833.19	76.50	71.72	414.31	220.33	54.56	17.39
	Price	5563.44	3984.00	2447.58	-	16793.41	1242.18	350.03
Poush	Production	389.13	53.00	43.30	222.69	123.00	42.49	10.25
	Price	6351.73	3165.00	1118.00	0.00	5166.94	1066.43	201.74
Magh	Production	104.50	50.00	15.00	150.28	53.55	22.11	1.53
	Price	1281.74	2250.00	425.00	-	1465.84	563.25	20.96
Falgun	Production	20.81	68.00	-	43.35	10.90	16.67	-
	Price	232.39	4325.00	-	-	272.50	396.93	-
Chhaitra	Production	45.71	22.00	-	54.22	70.85	22.59	3.53
	Price	1588.30	1180.00	-	-	3375.31	665.71	103.91
Baisakh	Production	312.78	210.50	-	217.95	146.64	55.14	25.59
	Price	10808.78	11055.00	-	-	4847.39	1707.76	677.44
Jeth	Production	642.29	210.00	2.66	325.69	116.05	48.46	25.86
	Price	12452.61	6775.00	78.86	-	4828.17	1412.79	470.15
Asar	Production	469.37	101.00	57.70	4878.40	668.05	38.70	33.63
	Price	8858.19	2680.00	2103.24	-	4363.76	970.33	431.32

Table 16: Vegetable sale through different cooperatives.

S. N	Production Problems	Index	Rank
1	Lack of Irrigation	0.728	I
2	Lack of Quality Seed, cultivars and inputs	0.684	II
3	Problem of Pest attack	0.428	III
4	High Price of Inputs	0.336	IV
5	Lack of training	0.216	V
6	Lack of financial resources	0.208	VI
7	Lack of inputs in time	0.212	VII
8	Lack of technical facility	0.188	VIII

Table 17: Production problem ranking.

Marketing problem

Production is only job half done for farmers as marketing forms the other half. Despite being connected through highway marketing was a challenge in many regards. Initially a focus group discussion was conducted in each cooperative to list out the major marketing constraints. Based on this a list of major marketing problem was prepared, then, during household interview schedule each respondent was asked to rate each problem on a severity scale. The list of problem generated from FGDs are transportation ion cost, lack of storage facility, fluctuation in price, lack of market price information, price distortion by local middlemen.

Cooperatives reported that the number of middlemen coming to the collecting centers had dwindled over the years. Earlier buyers from Pokhara, Kathmandu, Chiwtan used to come but now only local middlemen are their buyers due to which these local middlemen lower farmer's price and distort the market. The inherent volatile nature of vegetable market troubled farmers as they never knew what to expect and hardly had any idea how well off they would be in a given season. Farmers normally transported vegetables from villages, which lie at comparatively higher altitude than the collection center situated near highway, once they brought those vegetables to collection centers they have no option but to sell as taking back would not make any sense and would only incur further economic and biological losses. This tremendously decreased their bargaining power and this forced them to sell at buyer's price. The agriculture-road through which vegetables were transported wasn't pitched and would cause challenges during monsoon yet farmers agreed that this was a huge improvement to their earlier condition when they used to carry those vegetables on their backs in their Dokos. Farmers weren't up to date with the current market prices in major market however many farmers had started keeping records of their year sales with prices for comparison.

S.N	Marketing Problem	Index	Rank
1	Price distortion by local middlemen	0.868	I
2	Fluctuation in price	0.756	II
3	Lack of storage facility	0.648	III
4	Transportation cost	0.416	IV
5	Lack of market price information	0.312	V

Table 18: Ranking of Marketing problem.

Financial ratios analysis

Profit (loss) Ratio: It is the ratio of net profit to sales. Out of the nine cooperatives three had negative profit ratio i.e. loss and six had positive profit ratio. Highest profit ratio was reported from Ako Cooperative and lowest reported from Gramin bikas cooperative.

S. N.	Name of Cooperatives	Profit (loss) Ratio
1	Krishak Sudhaar	4.57%
2	Jankalyan	-0.55%
3	Ako	58.44%
4	Saamudaik	5.71%
5	Salangahat	11.57%
6	Malekhu	-0.45%
7	Bhairabi	11.06%
8	Gramin bikas	-37.09%
9	Janbhawana	17.64%

Table 19: Profit loss ratio.

Operating ratio: It is the ratio of operating expenses to sales. Graamen bikas cooperative was the only cooperative whose operating costs was more than sale. This was because majority of farmers from this cooperative sold directly to middlemen without use of cooperative in order to bypass the cooperative service charge. The lowest operating ratio was reported from krishak sudhaar cooperative.

S. N.	Name of Cooperatives	Operating Ratio
1	Krishak Sudhaar	13.32%
2	Jankalyan	56.88%
3	Ako	96.33%
4	Saamudaik	84.75%
5	Salangahat	31.19%
6	Malekhu	78.21%
7	Bhairabi	18.04%
8	Gramin bikas	107.89%
9	Janbhawana	10.92%

Table 20: Operating Ratio.

Equity to Assets Ratio: It is the ratio of equity to total assets. Bhairabi cooperative had the highest equity to assets ratio while saamudaik had the lowest; Saamudaik performed well in most institutional and financial indicators and the possible reason their equity to assets ratio was low because they had equity comparable to all other cooperatives but their asset was much larger as many of their cooperative members had donated land and other assets to the cooperative.

S. N.	Name of Cooperatives	Equity to Assets Ratio
1	Krishak Sudhaar	86.57%
2	Jankalyan	44.80%
3	Ako	80.89%
4	Saamudaik	14.08%
5	Salangahat	54.09%
6	Malekhu	52.35%
7	Bhairabi	100.00%
8	Gramin bikas	59.28%
9	Janbhawana	79.64%

Table 21: Equity to Asset ratio.

Fixed Assets to Total Assets: It is the ratio of fixed assets to total assets. Grameen bikas had the highest fixed assets to total assets ratio because almost all of their assets were fixed and had very little variable assets. Krishak sudhaar had the lowest ratio probably because they had invested heavily in cooperative run agro-vets.

S. N.	Name of Cooperatives	Fixed Assets to Total Assets
1	Krishak Sudhaar	38.40%
2	Jankalyan	59.58%
3	Ako	65.30%
4	Saamudaik	73.52%
5	Salangahat	75.05%
6	Malekhu	80.64%
7	Bhairabi	46.43%
8	Gramin bikas	90.56%
9	Janbhawana	82.77%

Table 22: Fixed assets to total assets**.**

Return on Equity (ROE): It is the ratio of net profit to total equity. Two out of nine cooperatives had negative return on equity. The highest ROE was reported from Janbhawana cooperative followed by Saamudaik cooperative. Krishak sudhaar, Ako and Salanghat cooperative had similar ROE. Jankalyan and Malekhu cooperative had negative ROE.

S. N.	Name of Cooperatives	Return on Equity (ROE)
1	Krishak Sudhaar	6.17%
2	Jankalyan	-0.71%
3	Ako	7.89%
4	Saamudaik	14.79%
5	Salangahat	6.32%
6	Malekhu	-0.17%
7	Bhairabi	4.35%
8	Gramin bikas	2.07%
9	Janbhawana	28.03%

Table 23: Return on Equity (ROE).

Current Ratio: It is the ratio of current assets to current liabilities. Two cooperatives, Bhairabi and Malekhu had no current liabilities so their current ratio was computed as nil. Highest current ratio was reported from Saamudaik cooperative. Krishak sudhaar and Janbhawana had 6.51 times and 4.71 times current ratio respectively.

S. No.	Name of Cooperatives	Current Ratio
1	Krishak Sudhaar	6.51
2	Jankalyan	2.36
3	Ako	0.42
4	Saamudaik	17.50
5	Salangahat	1.60
6	Malekhu	0.00
7	Bhairabi	0.00
8	Gramin bikas	2.21
9	Janbhawana	4.71

Table 24: Current Ratio.

Institutional analysis indicators and index

Eight indicators overseeing the functioning of organization was set. The indicators are legal status organization and planning, cooperative planning procedure, human resource management, financial management, service to members, cooperative production, market linkage, and membership strategies. FGDs were carried out at each cooperative under study where participants were Cooperatives chairman, manager and farmers. The indicators were selected after thorough review of literature and largely based on the parameters used by United Nations worldwide for calculating cooperative performance index.

Overall, Krishak sudhaar was ranked first, it scored higher in legal status, cooperative production, and financial management and membership strategies and compared relatively lower in service to members and market linkage. Graamen bikas was ranked last, it scored highest in cooperative production and ranked consistently lower in other indicators, scoring none in human resource management, as it didn't had any employees and management was almost nil, and market linkage.

Comparing indicators with each other, legal status, organization planning had the highest overall average; this was probably due to the fact that Nepal government requires them to be registered and audited every year. Market linkage was found the poorest, in all the cooperatives, the linkage with market (via middlemen) was completely informal and many fraud cases were found where the middlemen had refused to pay the farmers after taking their product or delayed payment or only half payment. Some cases were found middlemen paid only half of the initial agreed amount citing low price in wholesale markets after sale. The linkage of cooperatives and farmers were also not through contracts but through general understanding, farmers didn't have any production contracts. The service to members also reported low, as at most of the cooperatives didn't do much to farmers production than taking the commission. The cooperatives had to negotiate with middlemen and buyer for higher prices to farmer's product but many times had failed to do so. They also had the responsibility of facilitating the interaction among farmers and middlemen, one responsibility in it was to increase the number of middlemen for competitive bidding and fair pricing but they had failed to do so. Local middlemen has skewed the market as whenever buyers from outside would come, local middlemen would bid higher, rendering buying unprofitable for outside buyer and once the outside buyer was chased away, the local middlemen would have monopoly over the farmers product and bid repeatedly lower, cooperatives couldn't help farmers tackle this glaring challenge.

Human resource also didn't score high, apart from krishak sudhaar the cooperatives were understaffed, also the cooperatives had already higher operating costs making possibility of extra worker even challenging. The manager had to perform most of the du-

ties from keeping records to communication to monitoring daily transaction. None of them had computerized accounting system adding more workload on the manager. Cooperative planning procedure also didn't score higher and in all cases the decision largely depended on the cooperatives chairman and even though the decisions were consulted in general meetings, it was unlikely that a chairman decision would be over-ruled. On the other hand any purchase decision made by cooperatives were heavily scrutinized and would take longer time, even year, this made infrastructure projects and reform unattractive for chairman and management committee. Financial management was found average with cases of fraud found in the past. However, the cooperative membership was found increasing each year even in absence of clear membership growth strategies.

S. N.		Legal status organization, planning	Cooperative planning procedure	Human Resource Management	Financial Management	Service to Members	Cooperative Production	Market Linkage	Membership strategy	Index	Rank
1	Krishak Sudhaar	1	0.66	0.75	0.83	0.33	0.8	0.5	0.75	0.70	I
2	Janbhawana	0.75	0.66	0.63	0.66	0.5	0.8	0.66	0.5	0.64	II
3	Salangahat	1	0.44	0.63	0.66	0.5	0.8	0.33	0.58	0.61	III
4	Ako	0.75	0.55	0.5	0.75	0.5	1	0.33	0.41	0.598	IV
5	Saamudaik	0.75	0.44	0.5	0.75	0.5	0.8	0.5	0.5	0.592	V
6	Bhairabi	0.75	0.66	0.63	0.66	0.33	0.8	0.33	0.58	0.592	V
7	Jankalyan	0.75	0.22	0.38	0.75	0.5	0.8	0.5	0.58	0.56	VI
8	Malekhu	1	0	0.5	0.25	0.5	1	0.16	0.58	0.49	VII
9	Gramin bikas	0.5	0.33	0	0.16	0.5	0.6	0	0.5	0.32	VIII
	Mean	0.806	0.440	0.502	0.608	0.462	0.822	0.368	0.553	0.570	

Table 25: Cooperatives rank based on performance.

Principal component analysis

The principal component analysis reveals that the first component legal status, organization and planning has the highest percentage of variance even though overall mean of this component was the highest. This is probably due to the fact that all the cooperatives were legally registered in district and national center but had high degree of fluctuation in organization of meetings, keeping of records in those meeting, difference in planning standard and presence or absence of bylaws beyond what was mandatory. The lowest variance was observed in the component membership strategies; this was probably due to the reason that none of the cooperative had active membership growth strategy and the membership usually grew through individual connections rather than any conscious effort by cooperative management. The market linkage component also had low variance as none of the cooperative had strong, formal forward or backward linkage; the market channel through middlemen was informal and subject to change any time and they had no legal obligation to each other. Similarly, cooperatives also didn't have any production contract with farmers and farmers had choice to sell through cooperatives or on their own.

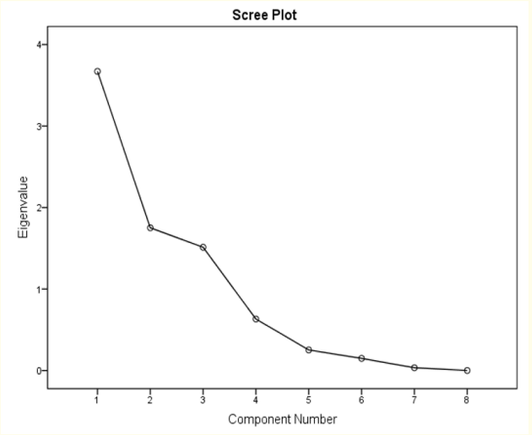

Figure 5: Total variance explained within component.

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Legal status organization and planning,	3.671	45.882	45.882	3.671	45.882	45.882
Cooperative planning procedure	1.751	21.889	67.771	1.751	21.889	67.771
Human resource management	1.512	18.903	86.674	1.512	18.903	86.674
Financial management	.631	7.892	94.566			
service to members	.252	3.152	97.717			
Cooperative production	.149	1.859	99.576			
Market linkage	.034	.422	99.998			
membership strategies	.000	.002	100.000			

Table 26: Total variance explained.

Extraction Method: Principal Component Analysis

Members opinions on cooperative governance, management and performances

A slight majority of people agreed with affirmative statements about transparent decision making, 64 percent responded positively about conflict resolution and an overwhelming majority (70%) agreed cooperative was working for members benefit.

The decision making processes of cooperatives are transparent.

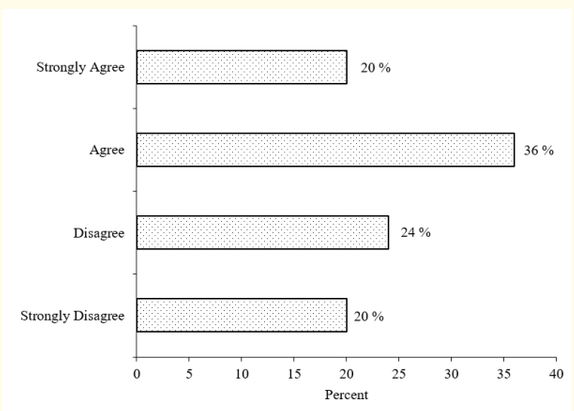

Figure 6: Opinions on Decision Making.

The organization is able to resolve conflicts among members effectively.

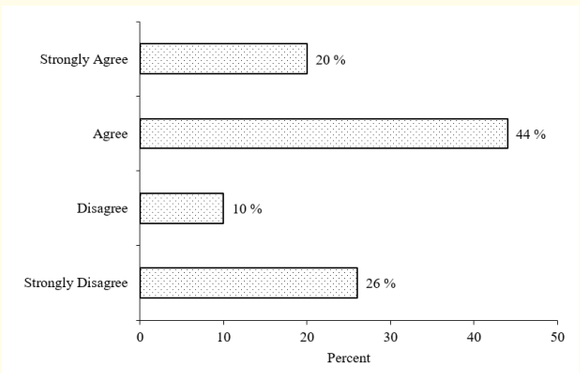

Figure 7: Opinions on Conflict resolution.

The organization is working for the benefits of its members.

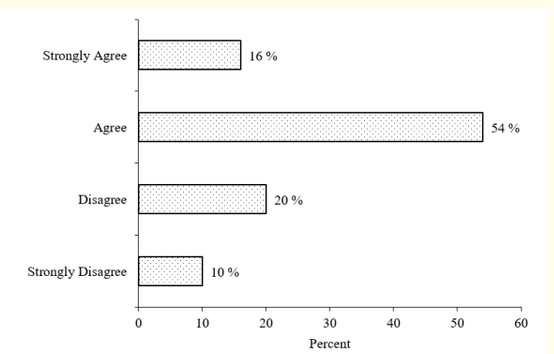

Figure 8: Opinions on Economic benefit.

This indicator reflects the members perspectives towards cooeperatives management and no cooperative manager and committee member were part of this discussion. Initially FGDs was done at the command areas of each cooperative and later further probing was done during household interview schedule and frequency calculated. Overall, members found Krishak sudhaar as most favorable as it scored the highest in all indicators except Decision m aking where Bhairabi scored highest. The overall index was highest in Krishak Sudhaar followed by bhairawi, the lowest was found in Graamin bikas followed by malekhu. Cooperatives scored higher in terms of communication, this was possibly due to the increment of communication infrastructure and close associations between cooperatives members. Resource mobilization had the lowest overall mean. Management and Decision making had similar index scores (Table 27).

Constraints ranking of cooperatives

The study the constraints of cooperatives management, functioning and performance, cooperatives manager, chairman, members were subject of a FGD where the researcher acted as a facilitator. The problems were first listed and then severity calculated. This exercise was repeated in all the cooperatives under study. Absence of direct link with final consumers i.e. lack of cooperative stalls at major markets was their main problem. Government

policy towards service cooperatives of this nature was found out as second severe problem. These two were the most severe and the rest of the problems were found with less severity and similar index scores. Poor linkage with other program reported as least followed [14-35].

S.N.	Indicator	Krishak Sudhaar	Bhairabi	Samu-daaik	Jank-alyan	Ako	Salanghat	Janbha-wana	Malekhu	Graamin	Mean
1	Management	0.88	0.84	0.84	0.76	0.76	0.76	0.84	0.72	0.52	0.77
2	Decision Making	0.87	0.93	0.87	0.93	0.67	0.73	0.67	0.67	0.67	0.78
3	Participation	0.80	0.70	0.60	0.70	0.70	0.70	0.70	0.50	0.60	0.67
4	Resource Mobilization	0.80	0.76	0.80	0.60	0.68	0.64	0.52	0.60	0.56	0.66
5	Communication	0.93	0.80	0.87	0.87	0.93	0.80	0.87	0.70	0.67	0.83
	Mean	0.86	0.81	0.79	0.77	0.75	0.73	0.72	0.64	0.60	

Table 27: Organizational Sustainability Index member's Opinion.

Constraints	Index	Rank
Lack of marketing infrastructure and cooperative stalls	0.72	I
Government policies towards cooperatives	0.62	II
Lack of technical assistance to the members both on production and marketing	0.27	III
Lack of agricultural road links to all production pockets	0.27	III
Lack of sufficient fund to provide loan to the members	0.24	IV
Lack of cooperative education and training	0.23	V
Deficiency in financial/accounting management skill	0.17	VI
Deficiency of understanding of cooperatives spirits	0.17	VI
Deficiency in operation skill	0.16	VII
Poor linkage with other related program	0.15	VIII

Table 28: Constraint Ranking of Cooperatives.

Conclusion

The total land cover of Dhading district is mid hills, 20% is high hlll and 8% is mountainous. 86.82% of family had less than one ha land in possession, 12.57% has more than one ha while 0.61% had no land holdings. Tamang caste has the highest population in Dhading district followed by Brahmin, Chhetri, Newari, Magar, Gurung respectively. The literacy rate in Dhading is 100%. This was declared in Bhadra, 2071 B.S. Paddy, maize, millet are the major agronomic crops of Dhading even though their productivity is below national average. Potato cultivation was also preferred by farmers. Blackgram, soyabean were among the preferred pulse crops. Mandarin and lime were popular fruits for commercial cultivation. Cattle and buffalo were reared in comparable numbers. Goat was reared more than sheep. The number of goats was also copious. Vegetable production in terai, mid hills and high hills were recorded to be 55, 40 and 5 percent respectively. Commercial vegetable production in Dhading started flourishing around 2046 B.S. (Fieldwork, 2018). This evolution was parallel to genesis and development of vegetable cooperatives in Dhading. In FY 2016/17 vegetables were grown in 5987 ha and total production was 75,839 Mt.

The overall number of cooperatives over the period of three years had slightly increased however the number of vegetable and fruits service cooperatives had slightly decreased. The major occupation was reported as agriculture alone at 36 percent, this was closely followed by agriculture plus abroad at 34 percent. The percent of agriculture plus labor was found lowest at 6 percent. Service here refers to governmental or non-governmental job; business means shopkeeper, hotel, trucking or homestays; labor meaning payments for work performed. Cooperatives themselves did not buy directly from farmers but act as a collection center where vegetables were collected and from there the farmer had the choice of selling directly to the buyers that come to collection centers or through cooperatives. Cooperatives acted as a facilitator and lobby for higher price for prices. Based on the market rate for that date, cooperatives set a price and all the trade that day were conducted by that price. This system although sounds driven by market forc-

es. In reality what happened was that a commodity of lower grade was sold early in the morning which lowered the valuation of the higher grade products of same commodity. This had arisen chiefly due to lack of grading and differential pricing. Out of the nine cooperatives which were a part of this research, two of them didn't keep up to date record of their sale. Absence of irrigation was the major challenge for production as at many places rainwater was the only source of their irrigation and despite having comparative geographical advantage (possibility of off-season production) they couldn't cultivate vegetables yearlong. Lack of quality seed and inputs was reported second severe problem, the sole source of these inputs were either cooperatives or agro-vets who didn't follow any quality criteria. Farmers had hardly any choice regarding the variety they planted and would plant choosing from the options available in the shop. Cooperatives reported that the number of middlemen coming to the collecting centers had dwindled over the years. Earlier buyers from Pokhara, Kathmandu, Chiwtan used to come but now only local middlemen are their buyers due to which these local middlemen lowered farmer's price and distorted the market.

Out of the nine cooperatives three had negative profit ratio i.e. loss and six had positive profit ratio. Highest profit ratio was reported from Ako Cooperative and lowest reported from Gramin bikas cooperative. Graamen bikas cooperative was the only cooperative whose operating costs was more than sale. This was because majority of farmers from this cooperative sold directly to middlemen without use of cooperative in order to bypass the cooperative service charge. The lowest operating ratio was reported from krishak sudhaar cooperative. Bhairabi cooperative had the highest equity to assets ratio while saamudaik had the lowest; Saamudaik performed well in most institutional and financial indicators and the possible reason their equity to assets ratio was low because they had equity comparable to all other cooperatives but their asset was much larger as many of their cooperative members had donated land and other assets to the cooperative. Grameen bikas had the highest fixed assets to total assets ratio because almost all of their assets were fixed and had very little variable assets. Krishak sudhaar had the lowest ratio probably because they had invested heavily in cooperative run agro-vets. Two out of nine cooperatives had negative return on equity. The highest ROE was reported from Janbhawana cooperative followed by Saamudaik cooperative. Krishak sudhaar, Ako and Salanghat cooperative had similar ROE. Jankalyan and Malekhu cooperative had negative ROE. Two cooperatives, Bhairabi and Malekhu had no current liabilities so their current ratio was computed as nil. Highest current ratio was reported from Saamudaik cooperative. Krishak sudhaar and Janbhawana had 6.51 times and 4.71 times current ratio respectively.

Overall, Krishak sudhaar was ranked first, it scored higher in legal status, cooperative production, and financial management and membership strategies and compared relatively lower in service to members and market linkage. Graamen bikas was ranked last, it scored highest in cooperative production and ranked consistently lower in other indicators, scoring none in human resource management, as it didn't had any employees and management was almost nil, and market linkage. Comparing indicators with each other, legal status, organization planning had the highest overall average; this was probably due to the fact that Nepal government requires them to be registered and audited every year. Market linkage was found the poorest, in all the cooperatives, the linkage with market (via middlemen) was completely informal and many fraud cases were found where the middlemen had refused to pay the farmers after taking their product or delayed payment or only half payment. Some cases were found middlemen paid only half of the initial agreed amount citing low price in wholesale markets after sale. Local middlemen has skewed the market as whenever buyers from outside would come, local middlemen would bid higher, rendering buying unprofitable for outside buyer and once the outside buyer was chased away, the local middlemen would have monopoly over the farmers product and bid repeatedly lower, cooperatives couldn't help farmers tackle this glaring challenge. Human resource also didn't score high, apart from krishak sudhaar the cooperatives were understaffed, also the cooperatives had already higher operating costs making possibility of extra worker even challenging. The manager had to perform most of the duties from keeping records to communication to monitoring daily transaction. None of them had computerized accounting system adding more workload on the manager. Cooperative planning procedure also didn't score higher and in all cases the decision largely depended on the cooperatives chairman and even though the decisions were consulted in general meetings, it was unlikely that a chairman decision would be over-ruled. The principal component analysis reveals that the first component legal status, organization and planning has the highest percentage of variance even though overall mean of this component was the highest. This is probably due to the fact that all the cooperatives were legally registered in district and national center but had high degree of fluctuation in organization of meetings, keeping of records in those meeting, difference in planning standard and presence or absence of bylaws beyond what was mandatory. The lowest variance was observed in the compo-

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