Family Farmers' Cooperatives
Ending Poverty and Hunger
in South Asia

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SAARC Regional Experts Consultation Meeting on "Family Farmers' Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia", 22-24 July 2019, Anand, Gujarat, India.

Edited by

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Freeing the world of hunger and extreme poverty is our fight. No one must be left behind.

José Graziano da Silva
Former Director General, FAO

The way out of hunger and poverty is hand-in-hand with farmers.

International Cooperative Alliance

Foreword

Family Farming is the main feature of agriculture in South Asia that integrates agriculture, forestry, fisheries, pastoral and aquaculture, which is largely managed and operated by a family labour. Family farmers are smallholders, and frequently handicapped with lack of access to inputs (improved seeds, irrigation, equipment, and pesticide), extension services, input and output markets, and weak value chain development.

The South Asia region, endowed with large arable land and large number of economically active population, possesses huge potentiality for achieving the targets of the Sustainable Development Goals (SDGs), particularly ending extreme poverty and hunger in the region. Nonetheless, the population under extreme poverty line in the South Asia is still high (headcount ratio 31.3%), and the Prevalence of Undernourishment (POU) is about 20%. In order to address these challenges, the SAARC Agriculture Center (SAC) based in Dhaka, Bangladesh, in collaboration with the Asian Farmers Association and the National Dairy Development Board, India, organized a regional experts' consultation meeting on "Family Farmers' Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia" during 22-24 July 2019, Anand, Gujarat, India. As an output of this meeting, this book entitled "Family Farmers' Cooperatives: Ending Poverty and Hunger in South Asia" has been published. I am sure that it would be very much useful for formulating policies at the country level and at the South Asia regional level to attain SDG targets, particularly ending poverty and hunger.

I appreciate the Asian Farmers' Association (AFA), the National Dairy Development Board (NDDB), the Member States of SAARC, thematic experts, authors, and reviewers for their outstanding contributions.

I would like to express my sincere gratitude to Dr. Rudra Bahadur Shrestha, Senior Program Specialist (Policy Planning), SAC; Dr. Younus Ali, STO, SAC; Dr. Humnath Bhandari, Country Representative, IRRI Bangladesh; and Md. Amirul Islam, Operation Manager, AFA for their untiring efforts with intellectual ideas and constructive step taking from the initiating the program up to publishing this valuable Volume.

Dr. S. M. Bokhtiar
Director, SAARC Agriculture Center
Dhaka, Bangladesh

राष्ट्रीय डेरी विकास बोर्ड
National Dairy Development Board

CHAIRMAN

12th February, 2020

MESSAGE

I am happy to note that SAARC Agriculture Centre (SAC), Dhaka is bringing out a publication based on deliberations held during Regional Experts Consultation on "Family Farmers Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia" which was jointly organized by SAARC Agriculture Centre (SAC), Asian Farmers' Association for Sustainable Rural Development (AFA) and National Dairy Development Board (NDDB) from 22nd to 24th July 2019 at NDDB, Anand.

Despite making substantial economic progress, large sections of our population particularly in South Asian countries continue to remain below the poverty line and significant proportion of our children – the future generation – remains malnourished.

In India, as a tool of socio-economic development, animal husbandry and dairying has been contributing to the livelihoods and reduction in poverty and hunger. Today, India has a dairy cooperative network covering 190 thousand villages with about 17 million milk producer members who collectively receive about US$ 8 billion per annum as the value of milk.

In South Asia, animal husbandry and dairying, coupled with allied activities using cooperative strategy has the potential to play a significant role in driving growth, employment and incomes in rural areas and at the same time strengthening food security and nutrition.

NDDB stands committed to proactively support the endeavors of the South Asian countries by strengthening small holder dairying and would be happy to provide support and work together to bring about socio-economic progress of our farming communities.

I am confident that this publication will be very helpful in designing strategies and roadmaps for smallholder farmer development in South Asian region.

(**Dilip Rath**)

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Preface

The Asian Farmers' Association for Sustainable Rural Development (AFA) is pleased to co-organize the event Regional Experts' Consultation Meeting on "Family Farmers Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia", with the SAARC Agriculture Center (SAC) and with India's National Dairy Development Board (NDDB) as country host. AFA shares the recognition of SAARC leaders, in its 2005 Summit, of the potential of cooperatives in achieving inclusive, broad based and sustainable economic growth and development, as well as of the SAC, in its Vision 2020, of the importance of cooperatives in strengthening smallholder farmer organizations and sustaining their improved livelihoods in South Asia. One of AFA's basis of unity among its 20 member organizations in 16 countries with 13M members, is the building and strengthening of family farmers' cooperatives and their enterprises, that will give farmers stronger involvement in the value chains and increase their market power.

AFA, together with its consortium partner La Via Campesina, is implementing a regional program called Medium Term Cooperation Program (Phase 2) or MTCP2, which aims to build the capacities of Farmers Organizations (FOs) in Asia Pacific to deliver economic services to its members and engage in policy work. In South Asia, the program is being implemented with key FOs in Bangladesh, India, Nepal, Pakistan and Sri Lanka.

Family farmers are known to be risk-averse, and one of the better ways to facilitate change in mindset and behavior is to have them SEE results: "To see is to believe". Thus, we are very pleased to note that this meeting is hosted by NDDB, that we are on the very grounds of one, if not the, most successful milk marketing cooperatives of family farmers, the AMUL, where seventy-five of its profits go to the farmers in terms of dividends, patronage refunds, bonuses, and technical assistance, where members have verbalized the improvements in their living conditions, confidence and self-esteem because of the good services provided by Amul and NDDB, starting from guaranteed collection centers and on-time payments, training and extension.

We thank MTCP2 development partner IFAD for supporting this Meeting, and SAARC Agriculture Center for leading the program successfully. We thank the NDDB for graciously hosting us, attending to the learning and physical needs of every participant, from the government and FO sides. Our take-home were some key action points and ways forward on how to promote family farmers' cooperatives in our own countries, with a stronger Government-FO representative.

Ma. Estrella "Esther" Penunia
Secretary General
Asian Farmers' Association for Sustainable Rural Development

Acknowledgment

The present Volume "Family Farmers' Cooperatives: Ending Poverty and Hunger in South Asia" is the output of a regional consultative meeting on "Family Farmers' Cooperatives to End Poverty and Hunger through Integrated Farming in South Asia" organized by the SAARC Agriculture Center (SAC), the Asian Farmers Association (AFA) and the National Dairy Development Board (NDDB) during 22-24 July 2019, Anand, Gujarat, India.

This was an important forum where government representatives from SAARC Member States, experts, academicians, researchers, farmers' organizations, and cooperatives participated in the program along with innovative ideas and experiences. We are delighted to publish this Volume, which would be useful to formulate policies on strengthening the farmers' cooperatives for reducing the poverty and hunger in the South Asian countries.

We would like to express our sincere gratitude to the SAARC Agriculture Center (SAC); the Asian Farmers Association (AFA); the National Dairy Development Board (NDDB); the SAARC Member States, particularly the Ministry of Foreign/ External Affairs and Ministry of Agriculture; SAARC Secretariat; National Focal Point Experts; Cooperative Leaders; and Farmers Organizations for their contribution. We appreciate to Dr. S. M. Bokhtiar, Director, SAARC Agriculture Center (SAC) and the SAC team; Ma. Estrella "Esther" Penunia, Secretary General, AFA and the AFA team; Shri Dilip Rath, Chairman, NDDB; Shri. Meenesh C Shah, Executive Director, NDDB and NDDB team for their outstanding contributions.

Last but not the least, we would like to express our gracious appreciations to Shri Hrishikesh Kumar, Manager, NDDB for his outstanding and untiring contributions in coordinating and organizing the program successfully.

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Acronyms

ADS	Agriculture Development Strategy
AFA	Asian Farmers' Association for Sustainable Rural Development
AMCU	Automatic Milk Collection Units
AMUL	Anand Milk Union Limited
AOI	Agriculture Orientation Index
APP	Agriculture Perspective Plan
BMC	Bulk Milk Coolers
CERES	Certification of Environmental Standards
CFMG	Community Forest Management Groups
CGIAR	Consultative Group for International Agricultural Research
CSA	Climate Smart Agriculture
CSISAC	Central Sector Integrated Scheme on Agricultural Cooperation
CSO	Civil Society Organizations
DACP	District Agriculture Contingency Plan
DALY	Disability Adjusted Life Years
DCS	Dairy Cooperative Society
DES	Dietary Energy Supply
E-NAM	Electronic National Agricultural Market
FBC	Federal Bank of Cooperative
FDI	Foreign Direct Investment
FF	Family Farming
FG	Farmer Groups
FG/Coop	Farmers' Group and Cooperatives
FSC	Farmers' Specialized Cooperatives
FSF	Future Smart Food
GAP	Global Action Plan
GCMMF	Gujarat Cooperative Milk Marketing Federation
GESI	Gender Equality and Social Inclusion
GFSS	Global Food Security Strategy
GHG	Greenhouse Gases
GNH	Gross National Happiness
HGM	High Genetic Merit
HiHi	Hand in Hand Initiative
HYV	High Yielding Varieties
ICA	International Cooperative Alliance
ICT	Information and Communication Technology
IFFCO	Indian Farmers' Fertilizer Cooperative Limited
IFS	Integrated Farming System
IMO	International Marketecology Organization

INAPH	Information Network for Animal Productivity and Health
IRR	Internal Rate of Return
LRP	Local Resource Persons
MDG	Millennium Development Goal
MPCS	Milk Producing Cooperatives Societies
MPI	Multidimensional Poverty Index
MSP	Minimum Support Price
NACCFL	Nepal Agriculture Cooperative Central Federation Limited
NACMF	National Agricultural Cooperative Marketing Federation
NCDC	National Cooperative Development Corporation
NDDB	National Dairy Development Board
NITI	National Institution for Transforming India
NUS	Neglected and Underutilized Species
NWFP	Non Wood Firewood Products
OF	Operation Flood
OPHI	Oxford Poverty and Human Development Initiative
PACS	Primary Agricultural Credit Societies
PCP	Public Cooperative Partnership
PHR	Poverty Headcount Ratio
PKSF	Palli Karma Sahayak Foundation
PODF	Producer Organization Development Fund
POs	Producer Organizations
POU	Prevalence of Undernourishment
PS	Pedigree Selection
PT	Progeny Testing
RNR	Renewable Natural Resource
SAARC	South Asian Association for Regional Cooperation
SAC	SAARC Agriculture Center
SAP	Structural Adjustment Program
SCCC	Seikatsu Club Consumers' Cooperative
SDGs	Sustainable Development Goals
SEWA	Self Employed Women's Association
SFAC	Small Farmer Agribusiness Consortium
SHG	Self -Help Groups
SME	Small and Medium Enterprise
SOP	Standard Operating Procedures
UHT	Ultra- High Temperature Processing
UNDFF	UN Decade of Family Farming
URS	Use Right System
VBMPS	Village Based Milk Procurement Systems
WUA	Water Users' Associations

Highlights of the Book

This book is an output of a regional experts' consultation meeting on "Family Farmers' Cooperatives to End Poverty and Hunger through Integrated Farming in South Asia" organized by the SAARC Agriculture Center (SAC), the Asian Farmers Association (AFA), and the National Dairy Development Board (NDDB) during 22-24 July 2019, Anand, Gujarat, India.

This book has ownership of the SAARC Member States' National Focal Point Experts, invited thematic experts, authors, and publishers.

This book focuses on the family farmers' cooperatives, agricultural development, poverty and hunger, constraints and challenges in farmers' cooperatives, and country-specific opportunities, prospects and policies in family farmers' cooperatives.

This book emphases on attaining the targets of Sustainable Development Goals (SDGs), particularly ending Poverty (SDG-1) and Hunger (SDG-2) in South Asia through strengthening the farmers' cooperatives.

The key suggested interventions include: i) Implementation of the South Asia Regional Action Plan of UN Decade of Family Farming; ii) Increase the public and private sectors' investment in the family farming and farmers' cooperatives; iii) Emphasize the multidimensional approach of program implementation to the poor and marginalized people; iv) Promote the Future Smart Food System such as nutrition sensitive agriculture and the utilization of the neglected and underutilized nutrition rich crops; and v) Effective cooperation among different agencies in the country (local, sub-national, and national levels), farmers' cooperatives, development partners, South- South countries, and North- South countries.

This book will be useful for the farmers' cooperatives, researchers, academicians, development professionals, policymakers, governments, international organizations, development partners, and civil societies to gain the synergetic efforts for strengthening farmers' cooperatives and attaining the SDGs in South Asia.

Contents

Theme Paper–Regional Perspective

Chapter 1

Family Farmers' Cooperatives and Integrated Farming Approach for Ending Poverty and Hunger in South Asia

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Abstract

Family farming is an integrated farming system, which produces diverse agricultural commodities that significantly contribute to improve food and nutrition security and income of the poor and marginalized group of people in the rural areas. As the reduced level of the economies of scale is a major challenge encountered by family farmers in the South Asia that could be addressed by farmers' cooperatives approach. Strengthening the farmers' cooperatives would increase the economies of scale that reduce the cost per unit in production and marketing of the products, and eventually support to improve food security, increase income and reduce poverty. This paper is based on the secondary data and literature review. Ending poverty and hunger targets of the Sustainable Development Goals (SDGs) by 2030 is possible through strengthening the family farmers' cooperatives in South Asia by adopting some major policy interventions. Such interventions include: i) Effective implementation of the South Asia regional plan of action of UN Decade of Family Farming (UNDFF); ii) Increase the public and private investment in family farming and farmers' cooperatives; iii) Emphasize the multidimensional approach of program implementation to the poor and marginalized people; iv) Promotion of Future Smart Food System such as nutrition sensitive agriculture and the utilization of neglected and underutilized nutrition rich crops; and v) Effective coordination and cooperation among different agencies at the country level (local, sub-national, and national levels), development partners, South-South counties, and North-South countries to contribute in attaining the targets of Sustainable Development Goals, particularly the No Poverty and Zero Hunger through farmers' cooperatives in South Asia.

Keywords: Family farming, integrated farming, cooperatives, no poverty, zero hunger, South Asia

1. Introduction

Family Farming is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labour, both women's and men's (FAO & IFAD, 2019). The family and the farm are linked, co-evolve and combine economic, environmental, reproductive, social and cultural functions (Garner & Campos, 2014). Agriculture is the leading foundation of economy, source of livelihoods for 40% of the global population, and largest means of income and generate employment for rural poor households and marginalized group of people in the world. More than 500 million small farms are rainfed, and they are handicapped with poor access to inputs (irrigation, improved seeds, fertilizers and equipment) and output markets of their products, particularly in the developing world including South Asia. This region posed the intertwining issues and challenges of higher rate of poverty and hunger. About one fourth (1.891 billion) of the world population (7.8 billion) (UN, 2019b) residing in the South Asia of which about 65% live in rural areas, and more than 50% of them relying their livelihoods on agriculture (FAOSTAT, 2019). The agriculture value added per worker in the region is estimated to be US$ 2452.63 (constant US$) in 2016, which is lower than in the world average (US$ 3,542) that could be one of the reasons that younger people are not interested to engage in agriculture. The South Asian agriculture is faced with a task of modernizations to augment agri-foods and non-foods for its populations (1.82 billons, growing by 1.34%), and increases its agriculture Gross Value Added (GVA) per worker to US$ 3,118 in the world from US$ 1,595 in South Asia in 2018 (Thapa & Shrestha, 2019).

South Asian agriculture is smallholding with less than 2 ha of land size per farmer and adopting integrated farming system consisting of crops, vegetables, fruits, cash crops, livestock, fisheries; weak technological advancement; poor marketing and value chain developments; and less competitiveness of the products. The smallholding agriculture with integrated farming system is an appropriate approach for securing food and nutrition as the integrated farm supply various kinds of nutrition to the people. Contrastingly, because of smallholding farming system, the economies of scale is reduced-that increase the cost per unit of the products, which is unable to compete with the products produced in larger scale farms. In addition, the availability of family labors in agriculture is declining over years. Thus, family farmers are facing difficulties to sustain their agriculture. Farmers' cooperatives therefore could be the best approach to the smallholder family farmers that improve the food and nutrition security, and increase economies of scale that reduce the price of the products per unit, which eventually

contribute to attain the targets of Sustainable Development Goals, particularly SDG-1 (No Poverty) and SDG-2 (Zero Hunger) in South Asian countries.

The SAARC Agriculture Center (SAC) is one of the regional centers of South Asian countries (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) responsible for policy facilitation in agriculture sector. As agriculture is the main source of livelihoods for such family farmers operating in a small parcel of land, the whole region compelled to sustain with lower levels of agriculture income that embraced to higher rates of poverty, hunger and malnutrition. In order to assess the existing situation and come up with common areas of interventions, SAC conducted a regional expert's consultation meeting in Gujarat, India in 2019. This paper presents a summary of the information described in the remaining papers in this volume and particularly endorses a common framework to address the challenges of small holder family farmers and attain the targets of Sustainable Development Goals, particularly SDG-1 and SDG-2 in South Asia.

2. Family Farming and Farmers' Cooperatives

2.1 Smallholding Agriculture

Agriculture in the South Asia region is smallholding. The majority of the small farmers (87%) (less than 2 ha) of the world's 500 million small farms are in Asia and the Pacific region (Thapa, 2010). The smallholding farmers are more dominance in the Asian countries; for example, in China 193 million followed by India 93 million, Indonesia 17 million, Bangladesh 17 million, and Vietnam 10 million (Thapa, 2009). In fact, South Asian agriculture is handicapped by small scale farming, consisting of different crops, horticulture, livestock and fisheries. The average size of farm is too small in South Asian countries; for instance, Bangladesh 0.5 ha, India 1.4 ha, Nepal and Sri Lanka 0.7 ha, and Pakistan 3.0 ha (Thapa, 2010). In India, about 81% of farms have land holdings of less than 2 ha, whereas their share in total cultivated area is about 44%. The trend of farm size has been decreasing; in India it dropped from 2.2 ha in 1950 to 1.8 ha in 1980, to 1.4 ha in 1996 and to 1.33 ha in 2001 (Thapa, 2010). Similarly, the trend of fragmenting land and the farm size has been declining over time. For example, in China, the farm size declined from 0.56 ha in 1980 to 0.4 ha in 1999 (Fan & Chan-Kang, 2003); in Pakistan it decreased from 5.3 ha in 1973 to 3.1 ha in 2000; and in Philippines it reduced from 3.6 ha in 1971 to 2 ha in 1991. Lowder et al. (2016) estimated that there are more than 570 million farms worldwide, most of which are small and family-operated; small farms (less than 2 ha) operate about 12% and family farms about 75% of the world's agricultural land. The average farm size decreased in most low-and lower-middle income countries, whereas average farm sizes increased in some upper middle-income countries.

The average size of the land is much higher in Australia, followed by North America, South America, Central America, Europe, and Sub-Saharan Africa, while it is far behind in Asia (Figure 1). About 80% of the farmland in Sub-Saharan Africa and Asia is managed by smallholders (< 10 ha), and 75% of the world's food is generated from only 12 plants and 5 animal species, which makes the global food system highly vulnerable to shocks (FAO, 2012). About 1.5 billion people (out of the 2.5 billion people) are smallholders in least developed and developing countries and their source of livelihoods in agriculture.

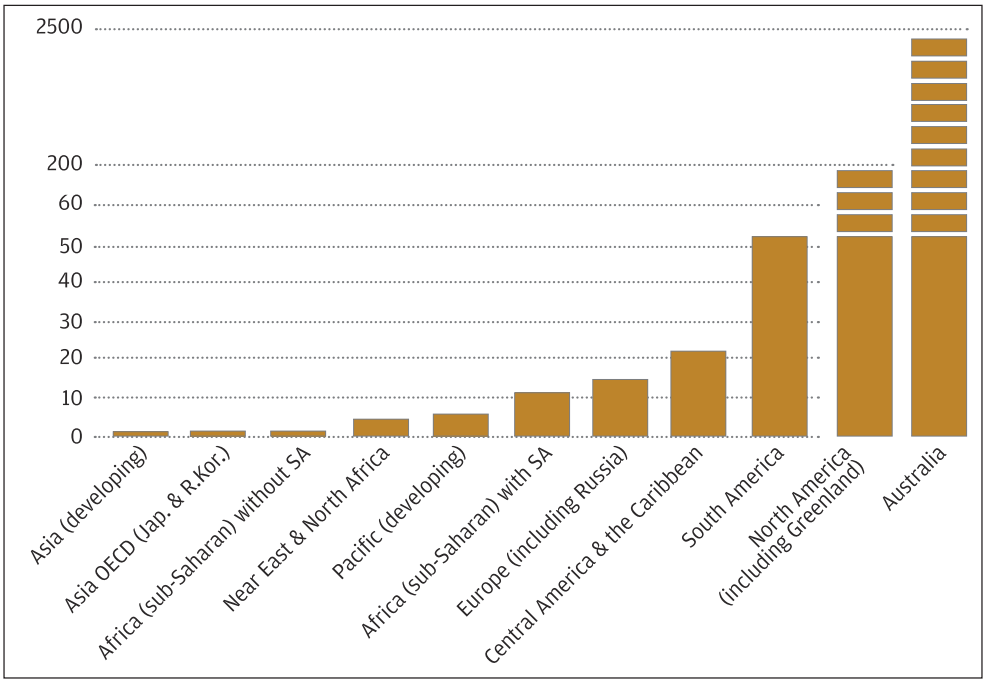

Figure 1. Average size of agricultural land holdings (ha)

Source: FAO (2012)

In the total agricultural labour force, women comprise of 43% in developing countries and about 50% in Eastern and Southeastern Asia and Sub-Saharan Africa (FAO, 2012). If women farmers have the same access to productive resources as men, they could increase yields on their farms by 20-30% that could contribute to uplift 100-150 million people out of hunger and extreme poverty.

The smallholder farmers have significant contributions to the total value of agricultural outputs in South Asian countries. For instance, in India their contribution to total farm output exceeds 50% although they cultivate only 44% of land (Thapa, 2010). In the scientific communities, there is a big debate whether the small farms are more efficient than the big farms. Some evidences (Shrestha et al.,

2014; Shrestha et al., 2016) showed the direct relationship between the small-scale farm size and the efficiency in production. The small scale farms are more efficient in production than the larger farm due to the application of smaller capital but higher use of labour and use of family-owned inputs, and smaller farms get higher index of cropping intensity and diversification that contribute to increase the efficiency level in agricultural production (Shrestha et al., 2016; Thapa, 2009). The direct relationship between the small-scale farms size and the efficiency is a powerful rationale for land reform policies, including land redistribution for both efficiency and equity gains. Family farms having integrated farming system tend to grow a wide variety of cultivars, many of which are landraces. These landraces are genetically more heterogeneous than modern varieties, offer greater resilience against vulnerability and enhance harvest security in the midst of diseases, pests, droughts and other stresses.

The public role in providing basic needs of the farmers including inputs, ensuring efficient marketing systems of their products and institutionalizing the innovations are crucial for small scale agriculture. Hazell et al. (2007) argued that **contemporary agenda for smallholder development to promote growth and equity would have three central elements:** i) Getting the basics in place consisting of ensuring stable macro-economy and public goods–rural roads, rural education and health care, agricultural research and extension, good governance and rural development (ensuring the rule of law in the country; providing opportunities for resolving disputes, especially over land; and making public interventions in food and credit markets as transparent and predictable as possible); ii) Encouraging farmers to follow the market demand and improving marketing systems. Policy incentives in improving marketing systems help the farmers receive a greater share of market prices, and providing credit to farmers, traders and processors, and forming farmer associations for bulk marketing could contribute to increase the agriculture production; and iii) Institutionalizing innovation in providing inputs and services. The markets however much liberalized-often fail in rural areas where small scale farmers living because of inefficient marketing system. It is more common in the condition when neither public sector provide services nor private sectors are competitively involved in the business. The market is failed in the rural areas because of lack of information and coordination problems in the efficient delivery of inputs, financial arrangement, technical backstopping, and efficient output marketing services needed for small farm. Institutional innovations are needed to overcome these failures, where public policy environment and the private sector engagement with policy incentives, particularly related to the smallholder farmers is imperative. Hazell et al. (2007) emphasized to overcome market failures by improving the markets for outputs, inputs, and financial services where government role is crucial. Innovations in institutions, joint work

between farmers, private companies, NGOs, and improved role of public agencies need to be considered to improve farm efficiency of the smallholder family farmers.

2.2 Family Farming-An Integrated Farming Approach

United Nations (UN) proclaimed the "United Nations Decade of Family Farming (UNDFF) for 2019-2028" along with Global Action Plan. FAO (2019a) prioritized the **Eight Major Thematic Areas for Family Farming**: i) Agroecology; ii) Forest farming; iii) Indigenous People; iv) Mountain Farming; v) Pastoralism; vi) Rural Women; vii) Small Family Farmers; and viii) Small Scale Fisheries and Aquaculture. FAO (2019a) highlighted these themes, which are more pivotal for promoting family farming towards eradicating poverty and ending hunger, which are discussed below. **First, Agroecology**–the family farmers are the keys elements for sustainably producing food in an agroecological approach. The sustainable farming systems optimize and stabilize yields by pursuing multifunctional roles for agriculture, promotes social justice, nurtures identity and culture, and strengthens the economic viability of rural areas. **Second, Forest Farming**–more than a billion of the world's poorest people rely on forests and trees to provide food, fuel and income. The forest and farm resources have the inimitable amalgamation to create a complex agroecological and natural resource management systems, particularly with the family farming in the rural communities. The forest family approach contributes for promoting nutrition, genetic materials, fuel and energy, fodder and building materials, water retention and recharge, pollination and pest control, green manure and biological and cultural diversity. **Third, Indigenous Peoples**–is the wealth of traditional knowledge, spirituality and understanding of ecosystem management, which could contribute to the environment friendly food systems relying on communal resources like forests, lakes, rivers, lands and pastures. **Fourth, Mountain Farming**–is small-scale by nature along with diversification of crops in diverse altitudes, integration of forests and husbandry activities, low carbon footprint and contribute to sustainable development. **Fifth, Pastoralism**–millions of pastoralists manage rangelands for herding livestock including cattle, goats, sheep, camels, yaks, llamas, buffalos, horses, donkeys and reindeer in the harshest environments and produce food where no rain-fed crops can grow. They produce meat, milk, eggs and non-food products such as hides, fiber and wool. **Sixth, Rural Women**–are more engaged to cultivate the family land for household consumption, care for small livestock, and process or sell part of their production in local markets, engage in farm and off-farm activities to ensure food security and to diversify income sources for their families. FAOSAT (2019) estimated that the average employment of women in agriculture in the South Asia is 56%, which is much

higher than the world average (28%). **Seven, Small Family Farmers**–about 90% of the world's 570 million farms are owned and operated by families, particularly in developing countries. They are characterized as poor and food insecure, have limited access to markets and services, and they farm their own land and produce food for a substantial proportion of the world's population. **Eight, Small Scale Fisheries and Aquaculture**–the small-scale fisheries are self-employed and usually provide fish for direct consumption within their households or communities. Small-scale fisheries contribute about half of global fish catches.

Agriculture greatly differs by geography, demography, climate, soil, crops, socio-economic condition, and policy. However, the general characteristics of agriculture in the South Asian countries are almost similar in terms of size of land holdings, technologies adopted, practices, and policies. The United Nations declared the UNDFF along with the Global Action Plan for its effective implementation. The most of the regional centers have also formulated the Regional Action Plan of the UNDFF, while it is yet to be developed in the South Asian Region. In order to strengthen the family farmers' cooperatives in attaining the set forth targets, the SAARC Agriculture Center (SAC) need to formulate a Plan of Action for UNDFF in collaboration with concerned stakeholders for the South Asia region.

2.3 Small Scale Farming and Farmers' Cooperatives

Cooperatives-an autonomous association of people united voluntarily to meet their common economic, social and cultural needs and aspirations through jointly-owned and democratically-controlled enterprises (ICA, 1995; 2013a). The core values of cooperatives are self-empowerment, democratic, equality, fairness and unity, ownership, control and benefits to the members. The cooperatives are voluntary associations, democratically managed and mutually beneficial economic organizations made up of producers of similar agricultural products or providers or users or operation services. In this Volume, we focused on farmers' cooperatives and associated value chain actors engaged in agriculture. The cooperatives' movement is governed by **Seven Cooperative Principles***:* i) Voluntary and open membership; ii) Democratic member control; iii) Members' economic participation; iv) Autonomy and independence; v) Education, training and information; vi) Cooperation among cooperatives; and vi) Concern for community (ICA, 2013a).

International Cooperative Alliance (ICA) highlighted that **"the way out of hunger and poverty is hand-in-hand with farmers"** (ICA, 2013a). Cooperatives is the best approach for the small-scale family farmers to work together as a group approach that certainly increase the economics of scale in production and marketing. **The cooperative approach could benefit the small scale farmers through:** i) Wider impact of technology dissemination by a single technician to the groups of

farmers; ii) One member of the cooperative could lead to purchase agriculture inputs for all the members of the cooperative that reduce the cost per unit; iii) One member of the cooperatives could lead to sell the agriculture outputs for all the members of the cooperative that reduce the cost per unit; iv) Members of the cooperatives might have wider linkage with wider range of markets, business societies, policy making bodies, development partner institutions; v) Increase bargaining power of the smallholders so they could get higher price of their products; vi) Institutional development of the smallholder farmers; and vii) Ownership building, improve social unity and enhance social harmony of the farmers in the society. Additionally, cooperatives exercise three types of power: structural power such that they control parts of a market or an economy; movement power based on the networked links, member densities and collective capacities inside the movement; and direct power which refers to the capacity of the movement to shape public opinion through advocacy, mass campaigning and marketing (ICA, 2013b). **Ban Ki-moon** (Former UN Secretary General) emphasized that the cooperatives are a reminder to the international community to pursue economic viability and social responsibility.

The cooperatives have been established for the sustainable development in all its economic, social and environmental dimensions, beyond quantitative growth. In this respect, the triple-bottom line analysis offers a great historical opportunity to the cooperative movement. About 3 million cooperatives are established in the world where at least 12% of people are cooperators and provides job opportunities to 10% of the employed population, and the three hundred top cooperatives of cooperative groups generate US$ 2.1 trillion in turnover (ICA, 2018). On the basis of turnover/ GDP per capita, there are top 300 cooperatives in the world; the majority are related to agriculture and food industries (35%) followed by insurance cooperatives and mutuals (32%), wholesale and retaion trade (19%), banking and financial services (8%), industry and utilities (2%), and other services (2%) (ICA, 2018).

2.4 Investment in Agriculture

Investment in the agricultural sectors is key to eradicating poverty, hunger and malnutrition by 2030, particularly in rural areas where most of the world's poorest live and to feed an additional two billion people by 2050 (FAO, 2017). Indeed, public sector investment is imperative in eradicating poverty and hunger because it provides public goods (for example, agricultural research and extension, education, infrastructure and services), provides policy incentives for sustainable management of natural resources, and encourage private sectors. The central government expenditure on agriculture has been fluctuated around 1.6% per year between 2001 and 2017 in the world. Allocating the higher percentage of central

government spending to agriculture is higher in Asia & Pacific, followed by Africa regions. In the South Asian context, the government expenditure on agriculture is 5.95% of the total outlay (Table 1). In 2016, Bhutan had a higher share of government expenditure on agriculture (12.6%), followed by Nepal (9.5%), Bangladesh (7.8%), India (6%), Sri Lank (5.6%), Afghanistan (4.9%), Pakistan (1.1%) and Maldives (0.1%).

Table 1. Public expenditure on agriculture in South Asia (% of total outlays)

Country	**Year 2005**	**Year 2016**
Afghanistan	4.7	4.9
Bangladesh	5.4	7.8
Bhutan	11.0	12.6
India	5.0	6.0
Maldives	1.1	0.1
Nepal	8.2	9.5
Pakistan	0.3	1.1
Sri Lanka	4.0	5.6
Average	4.96	5.95

Source: FAOSTAT (2019)

The investment in agriculture could have significant multiplier impacts on socio-economic improvements. The potential for agricultural investments to have significant and observable effects on health and nutrition is great, through access to own-produced food, by lowering food prices, and by raising incomes with which to buy more and more nutritious food and health services (Mogues et al., 2012). For example, the internal rate of return (IRR) of bio-fortification investments range from 66 to 133% for golden rice in Philippines, and the costs of averting loss of Disability Adjusted Life Years (DALYs) through zinc and iron bio-fortification of wheat and rice in many cases meet standards of high cost effectiveness (Mogues et al., 2012). The scientific competence of South Asia's agricultural R&D agencies is high, particularly in India, but as in many developing regions of the world, stronger linkages are needed to connect agricultural research agencies and their staff with the end users of their research to improve the relevance, effectiveness, and efficiency of research outputs (Stads, 2019). Investment in agriculture and rural areas will need to increase substantially to achieve the Sustainable Development Goals (SDGs) of eradicating poverty and hunger by 2030 and to feed an additional two billion people by 2050 (FAO, 2017). Thus, the investment in agriculture is more effective than investment in non-agricultural sectors in reducing poverty. Such investments should focus on: increase small-scale farmers' productivity and income; diversify farmers' income through value chain

development; improve access to markets; and create more and better jobs for the rural poor.

3. Sustainable Development Goals: No Poverty and Zero Hunger

United Nations declared the Sustainable Development Goals (SDGs)–Agenda 2030 (17 SDGs) with their 169 targets balancing the economic, social and ecological dimensions for sustainable development in the world envisaging main impacts on **5Ps (**people, planet, prosperity, peace, and partnership). The SDG is for the shared prosperity in a sustainable world-a world where all people can live productive, vibrant and peaceful lives on a healthy planet (UN, 2019a). All the SDGs are interconnected and intertwined each other, however because of the geographical specialty and technical suitability, some SDGs are more emphasized for agricultural development in the South Asia region. Thus, among the 17 SDGs, the **South Asian agriculture is more aligned on**: End poverty in all its forms everywhere (SDG-1); Zero hunger (SDG-2); Promote inclusive and sustainable economic growth, employment and decent work for all (SDG-8); Build resilient infrastructure, promote sustainable industrialization and foster innovation (SDG-9); Ensure sustainable consumption and production patterns (SDG-12); Take urgent action to combat climate change and its impact (SDG-13); and Revitalize the global partnership for sustainable development (SDG-17). Effective collaboration among the North-South, South-South, and multi-stakeholders is imperative to attain the targets set forth for achieving the SDG indicators collectively in the South Asia (Shrestha & Thapa, 2019).

In this Volume, our work is more focused on **SDG-1 (No Poverty) and SDG-2 (Zero Hunger)** aligning with family farmers' cooperatives. The FAO along with UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific) and UNDP, prepared the "Regional Guiding Framework for Achieving Zero Hunger in Asia and the Pacific" (FAO, 2019b). This framework calls for all stakeholders to support and carry the momentum forward with concrete action at the country level. Under this framework, **regional initiative on zero hunger (RIZH) established three major programmatic areas:** i) Creating environments for food security and nutrition; ii) Data collection, analysis, and monitoring on food security and nutrition; and iii) Strengthening sustainable agriculture and food systems.

Meanwhile, FAO (FAO, 2019c) released a New Global Initiative, **the Hand in Hand Initiative (HiHi)**, which is given the highest priority and attention for sustainable food system. This global initiative aims for food systems transformation towards achievement of SDGs, particularly SDG-1 and SDG-2 through multi-sectoral integrated rural development plan to improve the

livelihoods of rural poor living. It emphasizes to leveraging innovations for smallholders, promote agriculture digitalization, food systems transformation and engagement of youth. This is a framework that envisions FAO supporting countries to identify what is needed and then bring all necessary contributors on board (matchmaking) to support the country, including donors, technical partners, private sector, international finance institutions, banks, innovators, etc.

3.1 No Poverty (SDG-1)

The SDG-1 targets to end poverty in all its forms everywhere. The set forth indicators includes: 1.1) Eradicate extreme poverty for all people everywhere, currently measured as people living on less than US$ 1.25 a day; 1.2) Reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions; 1.3) Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable; 1.4) Ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance; 1.5) Build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters. Additionally, the No Poverty target indicators includes: 1.a) Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programs and policies to end poverty in all its dimensions; and 1.b) Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions (UN, 2015).

UN (2019) estimated that more than 700 million people (10%) of the world population still live in extreme poverty, surviving on less than US$ 1.90 a day, and it is more pronounced in women (122 women out of 100 men) and children (1 out of 5) group and majority of them living in Sub-Saharan Africa and South Asia. Poverty affects disproportionately to women, children and marginalized group of people. The World Bank (2019) defined the Poverty Headcount Ratio (PHR) is the percentage of the population living below the national poverty lines. According to the World Bank (2019) estimated PHR for Afghanistan 54.5% (2016), Bangladesh 24.3% (2016), Bhutan 8.2%, India 21.9% (2011), Maldives 8.2% (2016), Nepal 25.2%

(2010), Pakistan 24.3% (2015), Sri Lanka 4.1% (2016). It shows that the extreme poverty is more prevalent in Afghanistan, Nepal, Bangladesh, and India.

3.1.1 Global Multidimensional Poverty Index

The Global Multidimensional Poverty Index (MPI) is an internationally comparable measure of income and acute poverty as the MPI captures the simultaneous deprivations that each person experiences in ten indicators as developed in 2010 by the UNDP and the Oxford Poverty and Human Development Initiative (OPHI) at the University of Oxford for the UNDP (OPHDI, 2018). It measures the progress toward Sustainable Development Goal-1– to end poverty in all its forms and to help achieve the principle of leaving no one behind (OPHDI, 2018). Estimating the MPI, ten indicators under three themes have been considered namely, education, health and living standard. The education has been considered the year of schooling and school attendance; health on nutrition and child mortality; and living standards on cooking fuel, sanitation, drinking water, electricity, housing and assets.

The report estimated that 1.3 billion people (23% of the 105 countries) live in multidimensional poverty in the 105 developing countries and acute in Sub-Saharan Africa and South Asia (account these two regions together for 83% of all multidimensional poor people in the world– more than 1.1 billion) (OPHDI, 2018). The global MPI covers seven countries in South Asia, representing more than 1.7 billion people of whom 546 million are poor. Additionally, 11% of people in South Asia are severely poor, being deprived in at least half of the weighted indicators, and 19% are vulnerable to poverty, meaning that they are deprived in 20% to 33% of the weighted indicators (OPHDI, 2018). It infers that these two regions are destitute in at least one-third of overlapping deprivations in health, education, and living standards-lacking clean water, sanitation, adequate nutrition, or primary education (OPHDI, 2018). More than 665 million children live in multidimensional poverty in the world of which 39% of children are multidimensional poor in South Asia.

The MPI in the South Asia is 0.143, which is lower than that those in Sub-Saharan Africa (0.317), while higher than in the developing countries (0.115). The MPI indicates that the poverty level is much higher in the South Asia region (OPHDI, 2018; Shrestha & Thapa, 2019). The Poverty Headcount Ratio (HCR) is the proportion of a population that exists below the poverty line. The Poverty HCR in the South Asia is 31.3%, Sub-Saharan Africa 57.7%, and Global MPI (developing regions) 23.2%, indicating that the poverty level is much higher in Sub-Saharan Africa than those that of South Asia and rest of the developing countries. The ratio of intensity of the poverty in South Asia is 45.8% (545.9 million people), implied that integrated approach consisting of multidimensional programs to be rendered

from the bottom level of the society with demand based and impactful service mechanism.

The MPI in the South Asian countries is very high. It is highest in Afghanistan (0.273) followed by Pakistan (0.228), Bangladesh (0.194), Bhutan (0.175), Nepal (0.154), India (0.1221), and Maldives (0.007) (Table 2), implied that the extreme poverty is because of the lack of access to education, health and living standard in the region. The priority should be given to the children for their better schooling and control the drop out ratio; improve the child mortality rate, hygiene environment, sanitation and provide facilities safe drinking water; and promote nutrition sensitive agriculture along with improved and sustainable natural resource management in the rural communities.

Table 2. Multidimensional Poverty Index (MPI) in South Asian countries

Country	MPI (MPI = H×A)[1]	Headcount ratio (H)[2]	Intensity (A)[3]	Number of poor people[4]	Vulnerable to poverty[5]
Maldives	0.007	1.9	36.6	8,020	5.3
India	0.121	27.5	43.9	364,225,000	19.1
Nepal	0.154	35.3	43.6	10,217,460	24.3
Bhutan	0.175	37.3	46.8	297,894	17.7
Bangladesh	0.194	41.1	47.3	66,916,352	21.5
Pakistan	0.228	43.9	52.0	84,772,711	14.5
Afghanistan	0.273	56.1	48.7	19,442,025	18.0
South Asia	0.143	31.3	45.8	545,900,000	-

Source: OPHI (2018, P. 48)

Note: [1]The Multidimensional Poverty Index (MPI) ranges from 0 to 1; [2]The headcount ratio is the percentage of the population with deprivation score of 1/3 or above; [3]The intensity is the average percentage of weighted deprivations among the poor; [4]The number of poor people uses 2016 population figures; [5]Vulnerable to poverty shows the percentage of the population that experiences 20%–33.32% of weighted deprivations.

3.1.2 GDP per Capita

The GDP per capita (US$, PPP) is one of the major indicators for determining poverty and hunger as higher the per capita GDP, lower the poverty and vice versa. The GDP per capita at PPP is much higher in Maldives (US$ 14,232) and Sri Lanka (US$ 11,446) and much lower in Afghanistan (US$ 1,803) (Figure 2). During 11 years (2005 to 2016), the average per capita GDP increased by 42% with much higher rate in India (47.85%) and Bhutan (45.21%). The increased GDP per capita in Maldives is mainly contributed by tourism industries; in Bhutan by hydropower; and in India and Sri Lanka by agriculture sector. Cooperatives have significantly contributed to poverty reduction by the mobilization and distribution of financial capital; created employment and income-generating opportunities; constituted a

forum for education and training; and set up solidarity schemes to cater the unexpected expenses related to illness, social welfare, death and other socio-economic problems (Wanyama et al., 2008). Thus, strengthening the farmers' cooperatives could be the better approach for increasing income, alleviating poverty, improving food security and reducing the hunger and malnutrition.

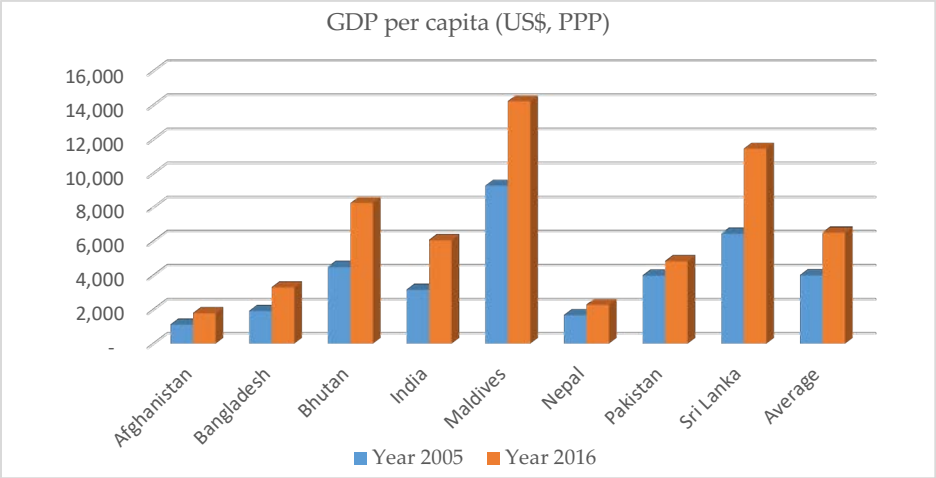

Figure 2. GDP per capita (US$, PPP) in South Asia

Source: FAOSTAT (2019)

3.2 Zero Hunger (SDG-2)

The SDG-2 targets to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. The SDG-2 set forth targets with indicators includes: 2.1) end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round; 2.2) end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons; 2.3) double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment; 2.4) ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality; 2.5) maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related

wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed. Furthermore, the Zero Hunger targets includes: 2.a) increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries; 2.b) correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round; 2.c) adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

The SDGs Agenda 2030 is being four years of its implementation since 2015, however as the countries have aligned their national and sub-national plans, policies and programs with global and regional agenda, and the progress have been in favorable trend in general (UN, 2019a). For instance, Nepal government has undertaken Zero Hunger Challenge (ZHC) (MOAD, 2015) to end hunger, food insecurity and malnutrition by 2025 as a vision to create a hunger less society for all people living in the country. This strategy consolidate ongoing poverty and hunger eradication efforts of all the national and international development partners working within the country, which focused on making the best use of available resources for the prioritized program initiatives for filling the gaps in eradicating hunger in a sustainable manner. The ZHC initiative prioritized the **Nepal's Five Strategic Pillars**: i) 100 % Equitable access to adequate, nutritious and affordable food all year round; ii) Zero stunted children less than 2 years of age; iii) All food systems are sustainable; iv) 100% increase in smallholder productivity and income; and v) Zero loss or waste of food. These Pillars emphasize on addressing the issue of food insecurity and malnutrition and improvement for sustainable agriculture and food systems to overcome hunger and malnutrition. The report showed that the extreme poverty has declined considerably, the under 5 mortality rates fell by 49% between 2000 and 2017, immunizations have saved millions of lives, and the vast majority of the world's population now has access to electricity. However, the world is not on track to end poverty by 2030 (predicted to be 6%), and still 821 million undernourished where two thirds of them live in two regions (Sub-Saharan Africa: 237 million and Southern Asia: 277 million) in 2017 (UN, 2019a). About 821 million people (12.9%)

were undernourished in 2017 and the majority of the world's hungry people live in developing countries, and Sub-Saharan Africa. Poor nutrition causes nearly half (45%) of deaths (3.1 million children each year) in children under five, and 149 million (22%) children under 5 years of age of the global under 5 population—were still chronically undernourished in 2018.

The hunger dynamics are analyzed with average dietary energy supply (kcal/cap/day); average dietary energy supply adequacy (%); dietary energy supply of cereals/ roots/ tubers (%); Prevalence of Undernutrition (POU) (%); prevalence of severe food insecurity (%); GDP per capita (US$, PPP); cereal import dependency ratio (%); stunting, children under 5 (%); wasting, children under 5 (%); and safely managed drinking water (% pop using). Hunger and malnutrition are the major challenges in South Asia that can be address by promoting horticulture including vegetable sector (Kuo et al., 2019) and fisheries sector (Hossain & Shrestha, 2019) with appropriate policies and programs. In the following sections, we briefly discuss on the major indicators of huger in South Asian region.

3.2.1 Prevalence of Undernutrition

The Prevalence of Undernourishment (POU) in South Asia has been decreasing since 2000 to 2018 (considering the 3-year moving average); the average of the POU in the region is 19.44% (Figure 3). However, the POU in the region is still higher (data set of Bhutan and Maldives not available), which is one of the most important challenges in South Asia. It is much higher in Afghanistan (30.95%) followed by Pakistan (22.26%), India (18.44%), Bangladesh (16.87%), Sri Lanka (14.66%) and Nepal (13.46%).

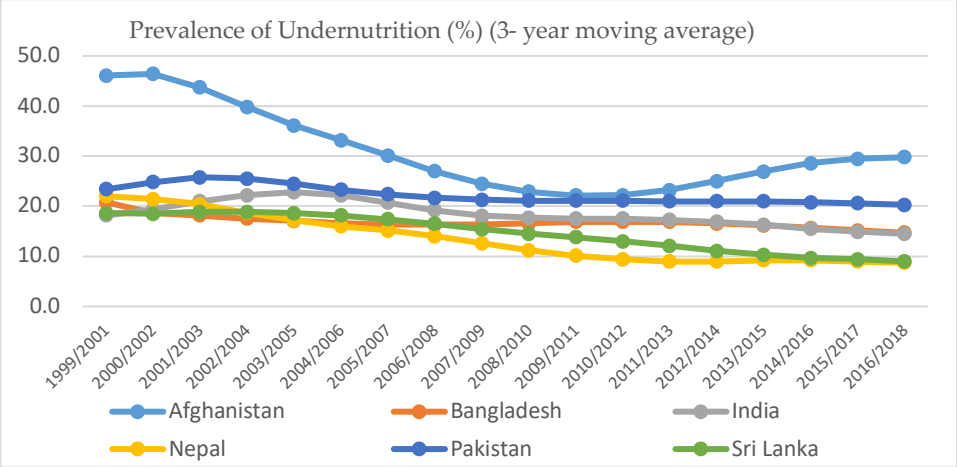

Figure 3. Prevalence of Undernutrition (%) in South Asia

Source: FAOSTAT (2019)

3.2.2 Dietary Energy Supply

The Dietary Energy Supply (DES) (kcal/capita/day) is an indicator calculated at the national level that serves as an estimate of the amount of calories from foods available for human consumption (FAO, 2008). It is useful for determining whether a country's food supply contains enough dietary energy to meet aggregate population needs, and whether measures need to be taken to improve the amount of dietary energy available for the population. The average dietary energy supply in South Asia is 2,488.71 kcal/cap/day, which is lower than that of the world average (2,904 kcal/cap/day) (Figure 4). DES is much lower in Afghanistan (2024 kcal/capita/day), followed by Pakistan (2,432), Bangladesh (2,487), India (2,492), Sri Lanka (2,577), Nepal (2,666), and Maldives (2,743). However, the quantity of dietary requirement differs by age and sex of the people, the FAO standardized the normal dietary requirement is 1800 kcal/cap/day. The DES indices indicate that the people in Afghanistan are more suffering by hunger and undernutrition, followed by Pakistan, Bangladesh and India.

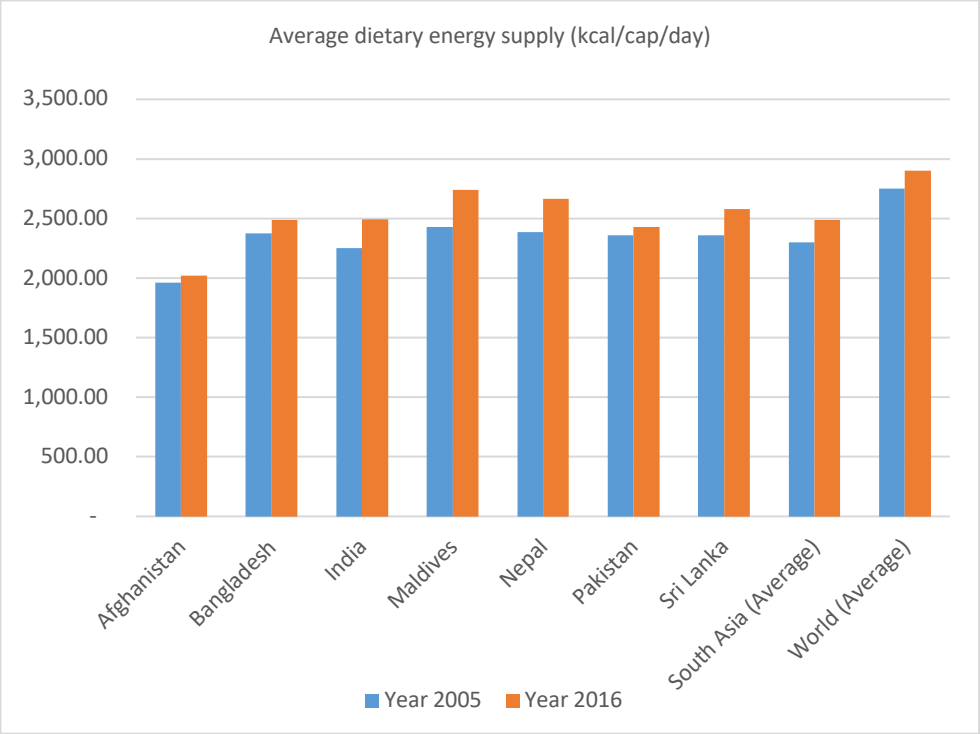

Figure 4. Average dietary energy supply (kcal/cap/day)

Source: FAOSTAT (2019)

3.2.3 Stunting, Wasting and Underweight

Stunting and wasting indicators are the major means of measuring nutritional imbalance resulting in undernutrition (assessed from underweight, wasting and stunting) and overweight. Child growth is internationally recognized as an important indicator of nutritional status and health in populations (Parris & Leiserowitz, 2005). Stunting is the percentage of children with a low height for age reflects the cumulative effects of undernutrition and infections since and even before birth. It indicates the poor environmental conditions or long-term restriction of a child's growth potential because of shortage of food intake. Similarly, underweight is the percentage of children who have low weight for age can reflect 'wasting' (i.e. low weight for height), indicating acute weight loss, 'stunting', or both. Thus, 'underweight' is a composite indicator and may therefore be difficult to interpret (WHO, 2010). The status of undernourishment in South Asia is severe; the stunting under 5 years of children is 33.67%, which is much higher than that of the average of developing countries (25%) and the world average (22.7%) (Table 3). The situation of wasting in the south Asia is also severe estimated to be 17.82%, which is much higher than of the developing countries (8.9%) and the mean of the world average (7.5%).

Table 3. Stunting and wasting under 5 years in South Asia

Country	Stunting (%)	Wasting (%)
Afghanistan	40.90	40.90
Bangladesh	36.10	14.30
Bhutan	33.50	5.90
India	38.40	21.00
Nepal	35.80	9.70
Sri Lanka	17.30	15.10
South Asia Average	**33.67**	**17.82**
Developing Country's Average	25.00	8.90
World Average	22.70	7.50

Source: FAOSTAT (2019)

The nutrition rich agriculture commodities, particularly the Neglected and Underutilized Species (NUS) as the entry points for addressing malnutrition from a food system perspective (Li & Siddique, 2018). Potential **Future Smart Food (FSF) in South and Southeast Asia**: cereals (amaranth, buckwheat, finger millet, foxtail millet, grain amaranth, proso millet, quinoa, sorghum, specialty rice, tartary buckwheat); roots and tubers (elephant foot yam, fancy yam, purple yam, swamp taro, sweet potato, taro); pulse (black gram, cow pea, faba bean, grass pea, horse gram, lentil, mung bean, rice bean, soybean); fruits and vegetables (chayote,

drumstick, fenugreek, Indian gooseberry, jackfruit, pumpkin, roselle, snake gourd, wood apple); nuts, seeds and spices (linseed, Nepali butter tree, Nepali pepper, perilla, walnut) (Li & Siddique, 2018).

Achieving SDG targets require instantaneously increased public spending on agriculture, health and education and reforms improving state capacity; such a combination of interventions would deliver significant benefits in the region, particularly in the areas of 'No Poverty', 'Quality Education', 'Gender Equality', and 'Inclusive Growth' (Asadullah et al., 2019). The success of multilevel governance and coherent SDG implementation can be fostered by effectively integrating the SDGs into the mandates of institutions and promoting cross-sector collaboration at all levels (Oosterhof, 2018). He argued that increasing the role of LRGs (Local and Regional Governments) , communities, and local stakeholders is essential for accelerating progress on the SDGs to meet the principle of **"leaving no one behind."** Achieving conducive policy environment was widely promoted by the Organization for Economic Cooperation and Development (OECD) as well the Global Partnership for Effective Development Cooperation (OECD, 2018). The **key building blocks for ensuring a coherent and effective implementation of the SDGs**: i) Political commitment and leadership; ii) Integrated approaches to implementation; iii) Intergenerational timeframe; iv) Analysis and assessments of potential policy effects; v) Policy and institutional coordination; vi) Local and regional involvements; vii) Stakeholder participation; and viii) Effective monitoring and reporting. The agriculture program is imperative to encourage women farmers since women account for 43% of those working in agriculture in developing countries, if those women had fair access to training, funds and technology, it is estimated that those going hungry would drop by nearly 20% (ICA, 2013a).

FAO et al. (2015) reported that the ending poverty and hunger by 2030 is possible but we need a new approach that results in much higher level of resources mobilization towards hunger eradication than in a "business-as-usual" scenario. Such an approach combines public investment in social protection with public and private investment in productive sectors-especially in rural agriculture sector. More specifically, additional resources amounting to an annual average of US$ 265 billion per year during 2016–2030, i.e. 0.3% of the average projected world income for that period, are required to fund both additional investment in social protection and additional targeted pro-poor investments in productive areas, of which rural areas would receive US$ 181 billion annually. FAO et al. (2015) emphasized governments and the international community need to build on approaches of **combined three important elements**: i) Ensuring food access; ii) Increasing incomes; and iii) Ensuring sustainability. **Ensuring food access–** through promoting access to food and nutrition-related services to hungry people

through social protection programs (for example, transfers of food and/or cash to immediately relieve hunger and to increase human productive potential. **Increasing incomes–**by improving livelihoods of pro-poor and hunger people with increasing labor productivity, creating decent work, and increasing investments to productive sector (for example, in infrastructure, market access, knowledge generation, and information and communications technologies). **Ensuring sustainability–**of food systems by conserving natural resources; adopting sustainable agricultural practices; reducing food waste and losses in production, storage and consumption; dropping greenhouse gas emissions in agriculture and other sectors; and adapting climate smart agriculture. The cooperative has clear and direct relationship with sustainability in social, environmental and economic dimension (Dale et al., 2013).

4. Theory of Change on Family Farmers' Cooperatives for Ending Poverty and Hunger

The smaller the farm size–reduced the economies of scale–increased the cost of products–increased the consumer price–reduced the food and nutrition intake–increased malnutrition and poverty. Smallholder farming is the consequences of continuous increasing trend of the population density, migration and subsequent effects on land fragmentation. As about 65% people are living in the rural areas in the South Asia (worldwide 45%), more than 45% of the total population employed in agriculture sector (FAOSTAT, 2019), and most of them are smallholders. These smallholder farming is characterized by scattered households, long distance from the public services for extension services, long distance from the markets that hindered farmers to purchase inputs (improved seeds, fertilizers, equipment, pesticides/ herbicides, and technical supports) and to sell products. Consequently, the cost of doing business (inputs and outputs) will be increased that force to increase the consumer price index of the products-that reduce the purchasing parity power (unless increase the income), reduce the saving of producers and consumers, reduce the investment of the entrepreneurs, reduce the nutrition intake of people, then eventually increased the poverty and hunger. Therefore, this paper intended to formulate a model to explain how the smallholder family farmers' cooperatives contribute to reduce the poverty and hunger in South Asia (Figure 5).

As cooperative is an autonomous organization that bring smallholder family farmers together to meet their common economic, social and cultural needs through jointly-owned and democratically-controlled enterprises, decide them-self, create self-empowerment, and socially harmonized. Under the farmers' cooperative approach, the decision-making process is democratically, particularly to purchase inputs (improved seeds, fertilizers, pesticide/ fungicide, irrigation,

labor management, etc.), and sell outputs in the markets. It has **Six Fold Implications:** i) Cooperative representative purchase inputs and outputs for all the smallholder family farmers-dealing with the bulk volume instead of small quantity that reduce the cost per unit; ii) Cooperative members have linkage with wider market options and value chain actors-choosing the best market inlets for purchasing the inputs and outlets for selling their products; iii) Access and availability of Market Information Services (MIS) for inputs and outputs; iv) Cooperatives members lobbying with policy makers and service providers (public and private sectors)-policy and program incentives in favor of the smallholder family farmers; v) Cooperative members have different capacities and knowledge-innovate and adopt improved technologies; and vi) Increase the bargaining power to purchase inputs and sell their products with traders and service providers.

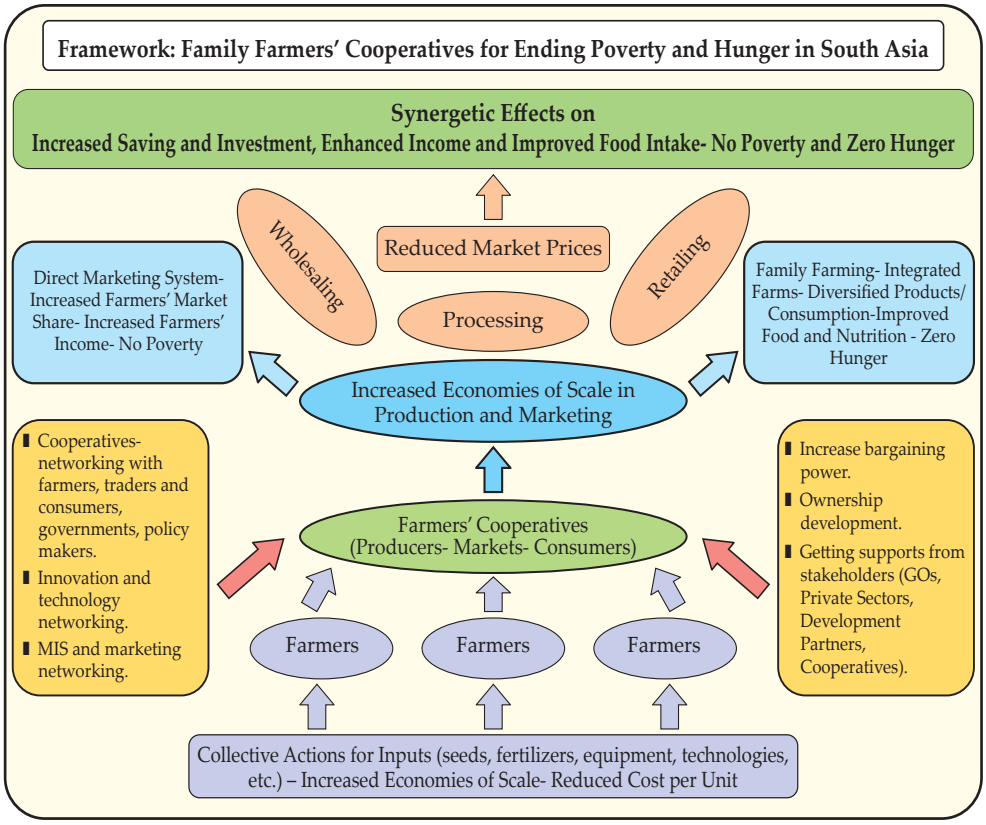

Figure 5. Framework for family farmers' cooperatives for ending poverty and hunger
Source: Author's Synthesis (2020)

Such collective action would be much helpful to increase the economies of scale in production and marketing-that reduce the cost per unit, reduce the market price of the products, increase the consumption of nutrients, increase saving and

investment, increase income of the people, and eventually contribute to the SDG-1 and SDG-2 targets. Furthermore, integrated farming of smallholder family farmers grows wider ranges of nutrition rich crops in a small piece of lands that supply abundant dietary energy and nutrition to the farm families and consumers. The whole process of cooperativism of the farm families is instrumental for ending poverty and hunger in South Asia.

5. Policy Review on Agricultural Cooperatives towards Ending Poverty and Hunger

The agricultural development policies and programs are based on the country's specific technical feasibility, available resources, geographical settings, and socio-economic condition. Further, there could have various values, principles and school of thoughts. Thapa & Shrestha (2019) suggested the major themes for South Asian agricultural development: natural resources/ input management; risk, uncertainty and insurance; inclusive development; marketing, agro-processing and trade; agrarian structure; and economic policy and advocacy. The national policies of SAARC Member States on family farmers' cooperatives towards ending hunger and poverty are discussed in the following section.

The Government of **Afghanistan** formulated a National Comprehensive Agriculture Priority Program Framework (MAIL, 2016) incorporating: food and nutrition security, good governance and economic development to achieve the core national objectives of self-reliance, increased income and employment generation. **The framework set forth six key priorities**: i) Climate-change sensitive natural resource management; ii) Wheat and cereal production; iii) Development of industrial and high value horticulture crops and vegetables; iv) Livestock development; v) Food and nutrition security; and vi) Institutional reform.

In Bangladesh, the *National Cooperative Policy-2014* (MOLGRDC, 2014) is in place of implementation, which emphasized the role of farmers' cooperatives to execute the whole value chain from input to production and marketing of agricultural products; institutionalization of technology dissemination through the cooperatives; ensuring priority and privilege for cooperative farmers regarding loans and subsidies, and collecting crops (paddy, rice and wheat) by the government for appropriate management of food systems.

The Government of **Bhutan** put in the pace of implementation of *Cooperative Act – 2009* (RGoB, 2009) to promote cooperatives includes: i) Raise the voice and shape the local development agenda of the local communities; ii) Establish the networks of cooperatives; iii) Creates conducive environment for developing acts and policies; iv) Access business opportunities; v) Making linkage of farmers to the

market (inputs and outputs); vi) Generate agriculture based enterprise developments; and vii) Encourage farmers to produce quality of agricultural products. The Bhutan's community institutions thus have potential to generate entrepreneurial farmers in the future.

In India, the *Multi-state Cooperatives Act, 2002* (DAC, 2002a) and the *National Policy on Cooperatives* (DAC, 2002b) are the major policy provisions to incentivize farmers through cooperatives, provide supports and encouragement for making cooperatives self-reliant, autonomous, and democratically managed institutions and accountable to their members. The National Cooperative Development Corporation (NCDC) is the apex body facilitate and control the cooperatives, and supports the policy makers for policy formulation. There are three layers of cooperatives management systems; Village, Union and Federation that made the cooperatives more successful in India. Within the broader act and policy framework, the farmers' cooperatives are incentivized with many more scheme, missions and programs by commodities and sectors in India. In order to alleviate poverty and ending hunger, the government of India initiated some major policy initiatives such as National Mission on Sustainable Agriculture (NMSA); Rainfed Area Development (RAD) Schemes; National Agroforestry Policy (NAP); Pradhan Mantri Krishi Sinchai Yojana (PMKSY); Agriculture Contingency Plan; and National Initiative for Climate Resilient Agriculture (NICRA).

In Maldives, the government endorsed *Strategic Action Plan* (2008-2013) (MOFA, 2009) supported farmers' cooperatives in terms of subsidies for agriculture production, financial and technical assistance, processing and marketing.

In Nepal, the *Constitution of Nepal* (2015) (GON, 2015) has clear provision that **cooperative is one of the 3 pillars after public and private sector for economic prosperity** of the country. Moreover, the cooperative sector has been strengthened by a policy framework of the "*National Cooperative Policy-2017*" (DoC, 2017) aims to promote agricultural cooperatives through saving and credit scheme, subsidies for agricultural production, technology dissemination, processing and marketing of agricultural commodities. In addition, there are other more policies (for example, *Agriculture Development Strategy 2014 (2015-2035), National Agriculture Policy 2004, Agribusiness Promotion Policy 2005, Dairy Development Policy 2007, and National Tea Policy 2000*, etc.), all of those are consistent to achieve the National Vision **"Prosperous Nepal, Happy Nepali"**.

In Pakistan, has long hisory of coopertive scheme started from the *Cooperative Credit Societies Act, 1904* and *All India Cooperative Societies Act 1912* (during unified India) aiming to support small farmers with subsidized credit for agricultural purposes. During different spam of time, small farmers have been supported by banking policies and commissions. In 1962, a Cooperative Development Board was

established with the objective of developing the capacity on planning, implementation and monitoring and evaluation of the program and projects to achieve the set forth objectives of the institutions. Similarly, the *Cooperative Societies Reforms Order, 1972* was issued to manage the cooperatives (including agricultural cooperatives) in Pakistan. Recently, different policies including *National Food Security Policy (2018)* is being implemented to encourage farmers in increasing foods and reducing hunger and poverty in the country.

In Sri Lanka, the *Cooperative Societies Act–1972* is in place of implementation where farmers are incentivized with subsidized credit supports, extension services of the improved technology, and promote in processing and marketing of the agricultural products. Moreover, in order to promote farmers' cooperatives in agriculture development along with alleviating poverty and hunger, the Government of Sri Lanka has some important policies: *Agriculture Crop Insurance Act-1994; National Agriculture Policy -2000; Agrarian Development Act-20000* and the N*ational Co-operative Policy–2019*. The *National Co-operative Policy-2019* focused on introducing & developing enterprises to increase employment opportunities; facilitating new technology & market opportunities to the farmers; and increase the youth farmers' in agriculture and contribute to the economy.

6. Challenges and Opportunities on Family Farmers' Cooperatives towards Ending Poverty and Hunger

Smallholder family farmers frequently encountering challenges include small land holding; farms in the remote areas; limited access to quality inputs; dearth of access to credit; ineffective market information system (food prices in national and international markets); weak transportation and market infrastructure; and lack of processing, storage, packaging and branding facilities. Agricultural cooperatives bring opportunities to end poverty and hunger. Agricultural cooperatives help farmers to overcome these challenges by offering their members a variety of services such as group purchasing and marketing, input markets for collective purchases, warehouse receipt systems for collective access to credit and market outlets (ICA, 2013a). Cooperatives build small producers' skills, provide them with knowledge and information, and help them to innovate and adapt to changing markets. Importantly, they facilitate farmers' participation in decision-making processes and help smallholder producers' voice their concerns and interests, and increase their negotiating power to influence policy making processes.

Agricultural cooperatives is the key to ending hunger and feeding the world (ICA, 2013a). Cooperatives bring small scale farmers together under a cooperative umbrella, farmers can improve their production through better extension education, increase access to better inputs and equipment, and improve their

marketing power thus ensuring higher prices for their products (ICA, 2013a). It gives farmers access to finance through cooperative banking system along with associated extension services in terms of training, exposure visit, and backstopping that direct impact on farmer livelihoods and boosting the rural economy. Cooperatives contribute to food security by helping small farmers, fisher folk, livestock keepers, forest holders and other producers to solve numerous challenges that confront them in their endeavors to produce food.

Generating employment opportunities in the rural areas is the major challenges for smallholder family farmers. **Agricultural cooperatives play a pivotal role to generate employment and increase income through:** i) Direct employment opportunity; ii) Indirectly they promote employment and self-employment through creating marketing opportunities and improving marketing conditions; and iii) Spillover effect to non-members whose professional activities are closely related to transactions with cooperatives (FAO, 2017). Evolving huge numbers of cooperatives worldwide, however there are questions for efficient functioning: i) All the cooperatives are not functioning; ii) Diverted their functions beyond the set forth objectives; iii) Established cooperatives with vested interest; iv) Most of the cooperatives are centered towards saving and credit; v) Rarely cooperatives works towards increasing economics of scale in agricultural production and marketing (even if the cooperatives established for agriculture); vi) Cooperatives try to do all things regardless of the scope and capacity of the cooperatives. Stanford & Hogeland (2004) argued that cooperatives cannot be "all things to all people", so one identity must be chosen or one objective function should be achieved optimally.

7. Model Farmers' Cooperatives–Lessons for South Asia

Learning from model farmers' cooperatives within the South Asia region or across the world for ending poverty and hunger., and improving the prosperity of the society is imperative. Following are the example of model farmers' cooperatives in the South Asia region and across the world.

7.1 AMUL to Green Gujarat, India

A New Green Revolution in Gujarat have taken up by Gujarat Dairy Cooperatives, AMUL, aiming to save the environment by planting trees, making India green and thereby reducing the effects of global warming. As the natural resources have been exploited at a faster pace due to intensive agriculture and dairying, the dairy farmers in Gujarat formulated an ambitious plan for giving back to nature: a "one member, one tree" plantation on the 60th Independence Day 15 August 2007. In this plan, saplings were provided in each district where dairy cooperatives located,

village by village and farmer by farmer, and an oath was taken to ensure that the sapling grew into trees and tree planting was carried out in 14,000 villages all across Gujarat. The main thrust of this program is that it was initiated by milk producer members of the dairy cooperatives, tree plantation is complementary with agriculture and dairy, and contributed to the environment, making the city greenery beautiful.

7.2 Self Employed Women's Association (SEWA), India

Self Employed Women's Association (SEWA), a member-based organization established in 1972 having over 1.7 million poor women workers are associated across 18 states in India. Over 2/3rd of SEWA's memberships are from the rural and, 50% members are from agriculture/ farming communities. The main objectives of this cooperative were to provide full employment (work security, income security, food security and social security) and self –reliance (women should be autonomous and self-reliant, individually and collectively, both economically and in terms of their decision-making ability). SEWA conducts programs including campaigns on agriculture, water and forestry integrated, need-based and demand driven approach. The impact of SEWA found: increased income by 20% due to direct market linkages to small/ marginal farmers eliminating role of middlemen; create multiple employment opportunities for 3000+ women at village level as rural distributors in range of IRs. 5,000 - 25,000/month; ensures nutrition food security for rural households at affordable price to 100,000 households from rural areas and urban slums; and total 12 processing centre and 3 restaurants have been set up in Asia.

7.3 Seikatsu Club Consumers' Cooperative of Japan

The Seikatsu Club Consumers' Cooperative (SCCC) of Japan established in 1965 with moto "safe food at reasonable prices", is a unique in its combination of forbidding business and professional skills with strict social and ecological principles, and a strategic vision of a community-and people-centred economy. SCCC was initiated in Tokyo from housewife organized 200 women to buy 300 bottles of milk. Since then, Seikatsu Club's activities have expanded to include production, distribution, consumption and disposal, environment, social services, and politics. Seikatsu's goal is to create a new lifestyle that protects the environment and overall health of the Earth. By doing this, Seikatsu is dedicated to the environment, the empowerment of women and improvement of workers' conditions. There were 400,000 members with more than 770 million US$ transaction in 2018. It produces milk and soap at an adequate quality to meet its ecological or social standards, and having direct linkages between producers and consumers. In their campaigns against synthetic detergents, Club members

realized the importance of the political process and formed independent networks in different prefectures to run in local elections.

7.4 Environmental Agricultural Cooperatives in the Netherlands

According to Renting & Ploeg (2001) & Dale et al. (2013), the Netherlands has more than 125 environmental agricultural cooperatives and all of them allow the Dutch conservation agencies to develop environmental management contracts with groups of land managers, so that landscapes can be worked whole instead of piecemeal. In the Fryslan Woodlands in the early 1990s, small-scale farmers could not remain viable with pressure for dairy farming with low production costs and reducing farm sizes, and faced increasing environmental rules and regulations on soil pollution. Environmental cooperatives became a means for farmers to self-regulate and develop locally effective means to realize environmental objectives in their farming.

7.5 Farmapine Model in Sub-Saharan Africa

Yeboah (2005) reported that the Farmapine Model, has been proved more successful than conventional one for making higher profits and face lower risks. The model has been successful in increasing farmers' income; generating employment; stemming migration to the cities in search of jobs; cooperative members have been active in their communities for funding the building of schools, providing other basic amenities, and established as a sustainable model for rural development in Sub-Saharan Africa.

8. Recommendations for Strengthening Family Farmers' Cooperatives to End Poverty and Hunger

Based on various experiences discussed in this paper, we derived the following major recommendations to strengthen the family farmers' cooperatives for ending poverty and hunger in South Asia:

i) **Farmers' cooperative** is one of the best approaches for eradicating poverty and hunger of the smallholder farmers. So, strengthening the family farmers' cooperatives and rural community organizations with policy and program incentives to promote integrated farming system is imperative.

ii) **Family farming** is an integrated farming approach of the smallholder farmers, which should focus on agroecology and sustainability; agroforestry and forest farming; hill and mountain farming; pastoralism; extreme poor and rural women; small family farmers and marginalized group of people; and small scale fisheries and aquaculture.

iii) **Formulation and effective implementation** of South Asia Regional Action Plan of UN Decade of Family Farming (UNDFF) 2019 -2028 to promote family farming in attaining the targets of No Poverty and Zero Hunger in the region is warranted.

iv) **Increase the public investment** in strategic public-private-cooperative-partnership in agriculture towards rural areas focusing extreme poor, women and vulnerable group of people along with labour saving technologies.

v) **Family farmers' cooperatives** should be specialised with specific areas and commodities because of the fact that "cooperatives cannot be-all things to all people" and subsequently to be focussed on increasing economies of scale in production and marketing.

vi) **Multidimensional approach policies** should be emphasized for ending extreme poverty in consistent with Multidimensional Poverty Index (MPI) approach consisting of improve education system; better access to health and nutrition facilities; combat child mortality; and enhance the living standards of the poor and vulnerable people in the rural areas.

vii) **Zero hunger policies** should emphasize on increasing the dietary energy supply; reducing the prevalence of undernutrition; eradicating the prevalence of severe food insecurity; enhancing the GDP per capita; improving the stunting, children under 5; reducing the wasting, children under 5; and improving the safely managed drinking water. Promoting **Future Smart Food-**nutrition sensitive agriculture and neglected and underutilized nutrition rich crops in the rural areas.

viii) Sharing of lessons from other countries. There are many success stories across the world about how family farmers' cooperatives contributed towards increasing agricultural productivity and reducing poverty and hunger. Such success stories should be shared and replicated among countries.

References

Asadullah, M. N., Savoia, A., Sen, K. (2019). Will South Asia Achieve the Sustainable Development Goals by 2030? Learning from the MDGs Experience. ESID Working Paper No. 126.

DAC. (2002a). Multi-state Cooperative Societies Act 2002. Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Government of India, New Delhi. 77 pp.

DAC. (2002b). National Policy on Cooperatives. Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Government of India, New Delhi. 16 pp.

Dale, A., Duguid, F., Lamarca, M. G., Hough, P., Tyson, P., Foon, R., Newell, R., & Herbert, Y. (2013). Co-operatives and Sustainability: An Investigation into the Relationship. International Cooperative Alliance, Sustainability Solutions Group and Sustainable Community Development. Discussion Paper 42, May 2007. IFPRI, Washington D.C.

DoC. (2017). Statistics on Cooperatives, 2017. Department of Cooperatives, Kathmandu

Fan, S. and Chan-Kang, C. (2003). Is Small Beautiful? Farm Size, Productivity, and Poverty in Asian Agriculture. *Agricultural Economics*. 32 (1): 135-146.

FAO and IFAD. (2019). United Nations Decade of Family Farming 2019-2028 Global Action Plan. Rome, Italy.

FAO, IFAD and WFP. (2015). Achieving Zero Hunger: The Critical Role of Investments in Social Protection and Agriculture. FAO, Rome, Italy.

FAO. (2008). FAO Methodology for the Measurement of Food Deprivation. FAO Statistics Division, FAO, Rome.

FAO. (2012). Smallholders and Family Farmers. Food and Agriculture Organization of the United Nations (FAO), Rome. Retrieved on 12 January 2020 from http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Factsheet_SMALLHOLDERS.pdf.

FAO. (2017). Ending Poverty and Hunger by Investing in Agriculture and Rural Areas. FAO, Rome.

FAO. (2019a). Family Farming Knowledge Platform. FAO, Rome. Retrieved from http://www.fao.org/family-farming/themes/en/ (December 27, 2019).

FAO. (2019b). Mountain Agriculture: Opportunities for Harnessing Zero Hunger in Asia. FAO Regional Office for Asia and Pacific, Bangkok.

FAO. (2019c). The Hand-in-Hand Initiative. CL 163/6- Information Note 1. Food and Agriculture Organization, Rome, Italy.

FAOSTAT. (2019). Suite of Food Security Indicators. Retrieved on 24 December 2019 from http://www.fao.org/faostat/en/#data/FS.

Garner, E., & Campos, Ana Paula de la O. (2014). Identifying the "Family Farm": An Informal Discussion of the Concepts and Definitions. ESA Working Paper No. 14-10. FAO, Rome.

GON. (2015). The Constitution of Nepal. The Government of Nepal, Kathmandu.

Hazell, P. (2009). The Asian Green Revolution. IFPRI Discussion Paper 00911, November 2009. IFPRI, Washington D.C.

Hossain, M.A.R., & Shrestha, R. B. (2019). Fisheries in South Asia: Trends, Challenges, and Policy Implications (P 332-346). (Shrestha, R.B., Bokhtiar, S.M., Khetarpal, R., & Thapa, Y. B. (eds.). 2019. Agricultural Policy and Program Framework: Priority Areas for Research & Development in South Asia. SAARC Agriculture Center, Dhaka, Bangladesh, and Asia Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand.

ICA. (1995). Statement on the Cooperative Identity in Review of International Cooperation, International Cooperative Alliance, 88 (3).

ICA. (2013a). Blueprint for Cooperative Decade. International Co-operative Alliance, Geneva, Switzerland.

ICA. (2013b). Cooperative Growth for 21st Century. International Cooperative Alliance 2013, Geneva, Switzerland.

ICA. (2018). World Cooperative Monitor. International Cooperative Alliance, Switzerland.

Kuo, C. G., Ramasamy, S., Nair, R.M. and Wopereis, M.C.S. (2019). Horticultural Research and Development in SAARC Region Towards 2030 (P 288-319). (Shrestha, R.B., Bokhtiar, S.M., Khetarpal, R., & Thapa, Y. B. (eds.). 2019. Agricultural Policy and Program Framework: Priority Areas for Research & Development in South Asia. SAARC Agriculture Center, Dhaka, Bangladesh, and Asia Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand.

Kurien, V. (2004). India's Milk Revolution: Investing in Rural Producer Organizations. Scaling Up Poverty Reduction: A Global Learning Process and Conference. Shanghai, May 25.27, 2004.

Li, X. and Siddique, K.H.M. (2018). Future Smart Food -Rediscovering Hidden Treasures of Neglected and Underutilized Species for Zero Hunger in Asia, Bangkok, 242 pp.

Lowder, S. K., Skoet, J. & Raney, T. (2016). The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide. *World Development 87:16–29*.

MAIL. (2016). National Comprehensive Agriculture Development Priority Program. A Strategic Framework for Agriculture Sector Development and Reform. Ministry of Agriculture, Irrigation and Livestock, Government of Afghanistan.

MOAD. (2016). Nepal: Zero Hunger Challenge National Action Plan (2016 -2025). Ministry of Agricultural Development, Government of Nepal, Kathmandu.

MOFA. (2009). Strategic Action Plan 2008 -2013, Agriculture Sector. President's Office of the Republic of Maldives, Male'.

Mogues, T., Yu, B., Fan, S. & McBride, L. (2012). The Impacts of Public Investment in and for Agriculture: Synthesis of the Existing Evidence. Food and Agriculture Organization (FAO), ESA Working Paper No. 12-07, Rome.

MOLGRDC. (2014). National Cooperative Policy (2014). Department of Rural Development and cooperative, Ministry of Local Government, Rural Development and Cooperative, Agargon, Dhaka, Bangladesh.

OECD. (2017). Policy Coherence for Sustainable Development 2017: Eradicating Poverty and Promoting Prosperity. Organization for Economic Co-operation and Development.

OECD. (2018). Policy Coherence for Sustainable Development 2018: Towards Sustainable and Resilient Societies, Paris.

Oosterhof, P. D. (2018). Localizing the Sustainable Development Goals to Accelerate Implementation of the 2030 Agenda for Sustainable Development. Asian Development Bank, Manila.

OPHDI. (2018). Global Multidimensional Poverty Index 2018: The Most Detailed Picture to Date of the World's Poorest People. Oxford Poverty and Human Development Initiative, University of Oxford, UK.

Parris, T. M. & Leiserowitz, A. (2005). What is Sustainable Development? Goals, Indicators, Values, and Practice. *Environment: Science and Policy for Sustainable Development*, 47(3).

Rashid, S., and X. Zhang, eds. (2019). The Making of a Blue Revolution in Bangladesh: Enablers, Impacts, and the Path Ahead for Aquaculture. Washington, DC: International Food Policy Research Institute. https://doi.org/10.2499/9780896293618.

Renting, Henk & Ploeg, Jan Douwe Van Der. (2001). "Reconnecting Nature, Farming and Society: Environmental Cooperatives in the Netherlands as Institutional Arrangements for Creating Coherence." *Journal of Environmental Policy and Planning* 3: 85-101.

RGoB. (2009). The Cooperative Act of Bhutan (Amended, 2009). Royal Government of Bhutan.

Shrestha, R. B., & Thapa, Y.B. (2019). Policy and Program Priorities in Agricultural Research & Development in South Asia (P 1-29). (Shrestha, R.B., Bokhtiar, S.M., Khetarpal, R., & Thapa, Y. B. (eds.). 2019. Agricultural Policy and Program Framework: Priority Areas for Research & Development in South Asia. SAARC Agriculture Center, Bangladesh, and Asia Pacific Association of Agricultural Research Institutions, Thailand.

Shrestha, R. B., Huang, Wen-Chi and Ghimire, R. (2014). Production Efficiency of Smallholder Vegetable Farms in Ilam District, Eastern Hill, Nepal. *American-Eurasian J. Agric. & Environ. Sci*., 14 (2): 150-154.

Shrestha, R. B., Huang, Wen-Chi and Pradhan, U. (2016). Evaluating the Technical Efficiency of Smallholder Vegetable Farms in Diverse Agroecological Regions of Nepal. *International Journal of Food and Agricultural Economics*, 4(4): 97-112.

Stads, Gert-Jan. (2019). Resource Allocation for Agricultural Research in South Asia: Trends, Challenges, and Policy Implications (p242-266). (Shrestha, R.B., Bokhtiar, S.M., Khetarpal, R., & Thapa, Y. B. (eds.). 2019. Agricultural Policy and Program Framework: Priority Areas for Research & Development in South Asia, SAARC Agriculture Center, Dhaka, Bangladesh, and Asia Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand.

Stanford, L. & Hogeland, J. A. (2004). Designing Organizations for a Globalized World: Calavo's Transition from Cooperative to Cooperation. *Amer. J. Agr. Econ*., 86(5).

Thapa, G. (2009). Smallholder Farming in Transforming Economies of Asia and the Pacific: Challenges and Opportunities. Discussion Paper of IFAD.

Thapa, G. (2010). Smallholder or Family Farming in Transforming Economies of Asia and Latin America: Challenges, and Opportunities. International Conference on Dynamics of Rural Transformation in Emerging Economies. New Delhi, India.

Thapa, Y.B. and Shrestha, R.B. (2019). Agricultural Policy in South Asia: Pathways for 2020-30. (Shrestha, R.B., Bokhtiar, S.M., Khetarpal, R., & Thapa, Y. B. (eds.). 2019. Agricultural Policy and Program Framework: Priority Areas for Research & Development in South Asia. SAARC Agriculture Center, Dhaka, Bangladesh, and Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand.

UN. (2015). Resolution Adopted by the General Assembly on 25 September 2015. General Assembly. Seventieth session Agenda items 15 and 116. United Nations.

UN. (2019a). The Sustainable Development Goals Report 2019. United Nations, USA.

UN. (2019b). World Population Prospects 2019. Department of Economic and Social Affairs Population Division, New York, USA.

Wanyama, F. O., Develtere, P., & Pollet, I. (2008). Encountering the Evidence: Co-operatives and Poverty Reduction in Africa.

WHO. (2010). Nutrition Landscape Information System (NLIS) Country Profile Indicators: Interpretation Guide. World Health Organization.

World Bank. (2019). World Development Indicators 2019. The World Bank, USA.

Yeboah, G. (2005). The Farmapine Model: A Cooperative Marketing Strategy and a Market-Based Development Approach in Sub-Saharan Africa. The Magzin of Food, Farm, and Resource Issue, American Agricultural Economics Association.

Country Perspective Paper

Chapter 2

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Bangladesh

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Abstract

Cooperative is a social enterprise dealing with the specific or group of social problems as the social entrepreneurs are always looking for social benefits rather than profit maximization. This study analyzed the family farmers' cooperatives towards ending poverty and hunger in Bangladesh from different perspectives. For description of the situation of the farmers' cooperatives with regard to end poverty and hunger, secondary data were collected from different sources. Present situation, role of cooperatives in economic development, challenges, and opportunities have been discussed in this paper. In order to reduce hunger and poverty, government should provide supports to strengthen the cooperative organizations towards sustainable agriculture and food system that could lead to achieve the targets of Sustainable Development Goals (SDGs), particularly the SDG-1, and SDG-2 in Bangladesh.

Keywords: Cooperative, family farming, hunger, poverty, SDGs, Bangladesh

1. Introduction

Cooperative is a social enterprise defined by the International Cooperative Alliances (ICA) as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise. Social enterprise intends for the social benefit rather than profitability in numerical values. Cooperative is originated and cooperated by the people of similar class or society to protect their interest and for the socio-economic development collectively. Cooperative plays

role in improving the socio-economic condition of rural smallholder family farmers. Though there are some dishonest people trying to take the advantages of social enterprise's good will doing microfinance and other financial activities for personal or family benefits in Bangladesh, the law has been developed by the government and its proper implantation is imperative. The overall performance of cooperatives in Bangladesh is mixed. Indeed, Bangladesh economy draws its main strength from agriculture sector. This sector contributes 14.74% to GDP and employs 45% of the labor force having growth rate 4.19% in crop sector, 1.54% in livestock sector, and 3.61% in fishery sector (BBS, 2017). Thus, the agriculture sector is the major means of creating employment opportunities and helps to reduce poverty in the country. Cooperative management and sustainability aligning with agriculture can play a vital role to improve livelihood of poor people. According to World Bank (2018) & Jannatul et al. (2018), Bangladesh has done much to reduce vulnerability of the poor. It has the largest system of targeted food transfer programs in the world, which are generally considered to be reasonably well. However, there is critical need to address the specific problems of chronic poverty and socially disadvantaged groups. The Sustainable Development Goal (SDG) is linked to upholding the sustainability in the growth of agriculture through cooperatives in Bangladesh. In this chapter, we analyzed the agricultural cooperatives aligning the poverty and hunger, and recommend some major policies for strengthening agricultural cooperatives that could contribute for improving food security and reducing poverty in Bangladesh.

2. Farmers' Cooperatives and Sustainable Development Goals

The SDGs known as the Global Goals are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. In this paper, among 17 SDGs, we emphasized SDG-1 (No Poverty) and SDG-2 (Zero Hunger) through farmers' cooperatives in Bangladesh.

2.1 Poverty Dimension in Bangladesh

The SDG-1, calls for an end to poverty in all its manifestations by 2030. It also aims to ensure social protection for the poor and vulnerable people, increase access to basic services and support people affected by climate-related extreme events and other economic, social and environmental shocks and disasters. Poverty can be reduced as a result of government policies such as investment and job creation; distribution of wealth through social protection schemes; access to services, education and health care; mitigation of the effects of climate change and disasters; and peace and security. In Asia and Pacific, while many countries have made enormous progress in reducing the number and percentage of people living in extreme poverty, millions of people are still unable to meet their basic needs.

Poverty in Bangladesh has declined remarkably since the early- 2000s, as a result of decades of accelerated economic growth. The remarkable progress in poverty alleviation has been recognized by international institutions (World Bank, 2019). Bangladesh's poverty rate has been reduced from 82% in 1972; 18.5% in 2010; 13.8% in 2016; and below 9% in 2018, as measured by the percentage of people living below the international extreme poverty line (World Bank, 2018). In Bangladesh, the proportion of employed population below US$ 1.90 (purchasing power parity) a day dropped from 73.5% in 2010 to 14.8% in 2016. For every 1,000 babies born in Bangladesh 32 die before their 5th birth day in 2017 (ADB, 2018). Based on the current rate of poverty reduction, Bangladesh is projected to eliminate extreme poverty by 2021.

2.2 Hunger Dimension in Bangladesh

The SDG-2, Zero Hunger, achieving food security, improved nutrition and promoting sustainable agriculture are some of the major challenges in Bangladesh. This entail improving the productivity and incomes of small-scale farmers by promoting equal access to land, technology and markets, sustainable food production systems and resilient agricultural practices. Considerable progress has been made in reducing hunger in the Asia-Pacific region. However, it is estimated 11.9% of the population is still undernourished (BBS, 2017). There has been notable progress in the fight against hunger since the early 1990s when more than 1 billion people worldwide or 18.6% of the global population were undernourished. The estimated proportion of the global population undernourished has fallen to 11% during 2014-2016, despite a population increased by nearly 2 billion globally over the last 25 years. Hunger in Bangladesh is an important issue as reflected in malnutrition, under nutrition, child stunting and child wasting (UNICEF, 2016). Bangladesh has improved economically but still faces national huge hunger problem (GHI, 2018).

3. Situation of Cooperatives in Bangladesh

The Department of Cooperative (DOC, 2018) estimated that there are about 174,604 cooperative societies in Bangladesh operating in different parts of the country. The primary cooperatives society are 173,396 (comprising 20 members at primary level), central cooperatives societies are 1,186 (comprising at least 10 primary cooperative societies) and national cooperatives society are 22 (comprising at least 10 central cooperative societies) in Bangladesh are functioning (Table 1). The total numbers of members are 10,834,750 consisting of male 8,401,409 and female 10,834,750 (DOC, 2018).

Table 1. Major statistics of the cooperative societies in Bangladesh

Description	National Cooperative Society	Central Cooperative Society	Primary Cooperative Society	Total Cooperative Society
Number of the cooperative society	22	1,186	173,396	174,604

Source: DOC (2018)

Government plays a vital role in facilitating access to credit, procurement and storage, distribution of input and marketing of products. They create employment opportunities particularly in the rural areas and allow disadvantaged groups to be organized for social and economic benefits. The Department of Cooperatives (DOC, 2018) estimated that the total of 127,744 government sponsored cooperative societies have been established in Bangladesh till 2018. As Bangladesh is an agriculture-based country, number of agricultural cooperatives societies are the highest compared to other government sponsored cooperative societies (Table 2).

Table 2. Number of the government sponsored cooperative society in Bangladesh

Category	Numbers
Land Mortgage Bank	59
Union Multipurpose Cooperatives	3,403
Farmers' Cooperatives (430,252 Individual member)	14,556
Sugar cane Growers' Cooperatives	559
Weavers Cooperatives	1,192
Ansar & VDP Cooperatives	654
Auto-rickshaw Drivers' Cooperatives	538
Water Management Cooperatives	1,993
Ashrayon	1,456
Agricultural Cooperatives (BRDB) (1,686,870 member)	55,547
Women's Cooperative (BRDB)	7,911
Bittaheen Cooperatives (BRDB)	28,749
Primary CIG Cooperatives (MOA)	11,127
Total	**127,744**

Source: DOC (2018)

Self-Initiated cooperatives societies are build due to common economic, social, and cultural needs and aspirations through a jointly-owned enterprise. A total of

45,652 self-initiated cooperatives societies exist in Bangladesh. Among them the highest number is multi-purpose cooperatives societies (11,400) (Table 3).

Table 3. Number of the self-initiated cooperatives societies

Category	Numbers
Multi-purpose Cooperatives	11,400
Savings and Credit Cooperative.	12,389
Employees Cooperatives	461
Youth Cooperatives	1,432
Businessmen's Cooperatives	5,999
Small Traders' Cooperatives	491
Women's Cooperatives	1,150
Milk Producers' Cooperatives	2,125
Rickshaw Poolers' Cooperatives	466
Housing Cooperatives	223
Credit Cooperatives	113
Others	9,403
Total	**45,652**

Source: DOC (2018)

There are different types of cooperatives in industrial sector in Bangladesh like development of cooperative industrial union, development of weaver's cooperatives, development of sericulture industry, development of brass and bell metal industries, salt industries, cane industries, jute mill, cotton mill, sugar mill, etc. This helps to increase production of raw materials, ensure better price and increase industrial production and employment.

4. Farmers' Cooperatives and Economic Development

In connection with the Constitutional obligation of the government to ensure betterment of the backward people, and in recognition of uniqueness that make cooperatives different from other forms of institutions, cooperative ownership came to be constitutionally recognized as the second sector. Accordingly, cooperatives were viewed as the most useful platform for increasing production and delivering services for the restoration, rehabilitation and development of the war-torn economy, and priority was placed in plan documents. Since then the cooperative sector has been an important partner in the process of economic growth of Bangladesh.

Agricultural cooperatives contribute to increasing food production, providing working capital and marketing supports. For example, sugarcane growers' cooperatives help to increase sugarcane production and lobbying with decision making bodies and higher authorities to ensure fair price of sugarcane. Fishermen's cooperatives, establish freezing plants, increase production, fish exports and thereby improve the living condition of this particular socio-economic group of people. Similarly, milk producers' cooperatives are functioning to increase milk production, and networking with input suppliers and processing plant. Establishment and operation of Bangladesh Academy for Rural Development (BARD) and emergence of famous Comilla Approach through Kotwali Thana Central Cooperative Association (KTCCA) introduced modern agriculture for the first time in the region. We have precisely discussed on the following commodity/ sector wise cooperatives.

4.1 Crop Sector's Cooperatives

Government's policy of agricultural development has so far been the most successful poverty alleviation strategy in Bangladesh. It has enhanced rural wages, created synergies for diversifying the rural economy, and enabled the supply of low-cost food to improve nutritional status and food security of the poor people mainly propelled by the expansion of high yielding varieties (HYV) of rice and wheat production during the winter season. Table 4 shows the Boro rice, wheat and potato production has got dramatic increase while wet season crop (Aus) has got gradual decrease in terms of area cultivated and production.

Table 4. Trend in main crop production and land acreage ('000 acres and '000 tons)

Year	Aus		Aman		Boro		Wheat		Potato	
	Acre	Production	Acre	Production	Acre	Production	Acre	Production	Acre	Production
2000/01	3,274	1,916	14,110	11,249	9,295	11,920	1,909	1,673	615	3,216
2005/06	2,556	1,745	13,416	10,810	10,047	13,975	1,183	735	744	4,161
2010/11	2,750	2,133	13,951	12,792	11,788	18,617	923	972	1,137	8,326
2015/16	2,516	2,281	13,814	13,483	11,794	18,937	1,099	1,348	1,175	9,474
2017/18	2,657	2,710	14,035	13,993	12,008	19,576	868	1,099	1,180	9,744

Source: BBS (2017)

This remarkable achievement has been possible due to the introduction of irrigation, HYV, and application of fertilizer where the cooperative sector has been the pioneer actor. It was the cooperative sector that came first to organize farmers to introduce and make modern agricultural technology acceptable through motivation and training, which got momentum in 1980s through the expansion of famous Comilla Approach by the Bangladesh Rural Development Board (BRDB).

The agricultural cooperative societies were provided with irrigation equipment, working capital, and necessary training, which helped increase production with manifold positive impact. Currently, there are two national societies, 535 central societies with forward and backward linkage and 70,662 primary societies with 2,790,259 individual members operating in the agriculture sector. In the year 1988/89, there were 18,460 deep tube wells; 44,523 shallow tube wells; 19,405 low lift pumps in possession of agricultural societies against 22,436 deep tube wells; 47,122 shallow tube wells and 25,000 low lift pumps being operated in 2018, which means that about 88% irrigated area has been under the network of cooperatives. The agricultural societies have been provided with 13,733.12 million Taka[1] loan as working capital to buy HYV seeds and required fertilizer which helped increase productivity (DOC, 2018).

For the last few years, there has been a new dimension of cooperatives in the areas of agricultural and rural development known as Water Management Cooperative Association under different development projects of the Local Government Engineering Department (LGED) and the Bangladesh Water Development Board (BWDB) where DOC is a co-partner as per the Memorandum of Understanding (MOU). At present, there are 1,141 societies organized by LGED and 255 by BWDB (BWDB, 2018). Under these comprehensive projects, the beneficiaries are provided with opportunities of optimum use of water resources since the projects consist of structural measures to effectively control flooding, river erosion and water reservation for the dry season. The DOC is intervening in the areas of non-structural measures by motivation, training, capital formation, and planning income generating activities (IGA) to make the institutions commercially viable and sustainable.

The increase in productivity has, however, not been translated into higher farm incomes as was anticipated due to slower adoption of agriculture technologies including high yielding varieties, crop management practices, weaker market linkage and lower paddy prices compared to the wage rate and fertilizer prices. It appeared, therefore, that while agricultural growth would continue to play a major role in rural poverty reduction process, its quantitative impact on poverty reduction would be contingent on diversifying to high-value added crops as well as non-crop agriculture such as poultry, livestock and fishery sectors.

4.2 Fishermen's Cooperatives

The annual fish production in Bangladesh is 4.2 million tons in 2017 (DoF, 2018). But the absence of available data of fish production by the cooperatives, it is very

[1] Bangladesh currency is Taka equivalent 1 USD to 86.22 Taka

hard to quantify the exact amount of fish production. However, total number of fishermen's cooperative societies are 78 at the central and 9,649 at the primary category with altogether 385,678 individual members involved. These societies are given priority by the government to take lease of public water bodies for fish cultivation which are the main sources of sweet water fish. Moreover, there are 28,749 Bittaheen (asset less) cooperatives organised by BRDB, 1432 youth development societies and thousands of Self-initiated multi-purpose cooperatives for carrying out different income generating activities where pond fish cultivation is one of the main occupations. For harvesting of marine fish, there are 600 fishing trawlers with annual fishing capacity of 0.032 million tons, which accounts for 9.55% of total marine fish production (DoF, 2018).

4.3 Cooperatives in Livestock and Industry Sector

At present, 2125 primary milk producers' cooperative societies with about 100,000 individual members are involved under the **Bangladesh Milk Producers' Cooperative Union (MILK VITA)** producing 4.13% (0.074 million tons) of the total national milk production of 1.79 million tons. These societies have 205,000 cattle heads worth 5125 million Taka. These societies help farmers for livestock development and milk production through extension and demonstration services. Moreover, there are 27,067 Bittaheen Cooperatives with 796,815 individual members organised by BRDB, 6210 youth development societies, 596 Asrayon and 41 Abason Cooperatives and many other self-initiated multi-purpose cooperatives for carrying out different income generating activities where beef fattening and milk production, goat rearing and poultry farming are the main occupations, which add significantly to national production.

Since the independence of the country, the presence of cooperatives in the industrial sector has not been significantly increased, except in the areas where it is cost effective and has comparative advantage. This consideration best suited the areas of agro-based industry where Milk Vita has been the most successful. At present, it has three manufacturing plants, 48 milk chilling plants with some more under the process of establishment. It has wide range of dairy products, which include pasteurized milk, cream, ice-cream, butter, instant full cream milk powder, instant skimmed milk powder, sweet card, ghee and rashamalai, sweetened condensed milk, chocolate, Ultra- High Temperature Processing (UHT) liquid milk and mineral water. Milk Vita has been a successful endeavour with a track record of earning profit. It employs 899 persons in formal position, 400 in informal position. Moreover, it saves 17.3 million Taka worth of foreign currency, which is 30% of total powder milk import cost. The other industrial ventures operating in the cooperative sector include cold storages, fish freezing plants, ice plants, one cotton mill, one jute mill, one sugar mill, some printing presses etc.

4.4 Cooperatives in Forestry

Over the last two decades, there has been a revolution in the areas of social forestry where cooperatives of all classes have been active partners. Report published by DOC (2018) & BRDB (2018), about 158 million trees have been planted by the members of different cooperatives related to forestry.

4.5 Cooperatives in Informal Sector

In the context of growing labour force, limited employment capacity of the formal sector, and resultant widespread underemployment, the informal sector is now playing the pivotal role in employment creation. The formal sector employs only 12% of the total labour force, which has been static from the last decade. About 88% of the total labour force along with total incremental labour force is now getting employed in the informal sector where **rural non-farm activities and urban informal sector** playing the vital role due to overburdened agricultural sector. In 1983/84, some 34% of the rural labour force was engaged in non-farm activities (for example, rural transport services, small-scale manufacturing, repairing works, petty trading, food processing), while in the year 2000, this figure stood at 39%. The Household Income & Expenditure Survey (HIES) data shows a sharp increase in the share of non-farm income out of total rural household income in the 1990s– from 26% in 1991/92 to 41% in 1999/00 (Mahmud, 2002).

4.6 Micro-credit Cooperatives–Means of Self-employment

Bangladesh has been the pioneer in extending micro credit facility to the asset less poor households since 1980s, almost 90% of whom were women and were considered "non-bankable." Since then the rapid expansion of micro-credit along with its social development package has been the cornerstone of self-employment generating strategy in the country. Though a large number of NGOs have been working, government agencies like BRDB, and thousands of self-initiated cooperative societies have adopted the micro-credit model in extending credit supports to the cooperative members. Government has also set-up an umbrella organization, Palli Karma Sahayak Foundation (PKSF) under the public sector for providing funding to mainly local level small and medium sized NGOs in order to expand the credit reach for the poor where some cooperatives are also partners. According to the World Bank (2018), the total number of women micro-credit borrowers have reached 12 million, with a total micro-credit debt of US$ 1.2 billion (2.4% of GDP) and a loan repayment rate of above 90%. The share of Bittaheen cooperatives organized by BRDB and credit cooperative societies under The Cooperative Credit Union League of Bangladesh LTD (CCULB), Abason and Ashrayon cooperative societies promoted by the Government of Bangladesh are listed in Table 5.

Table 5. Micro-credit operation in the cooperative sector

Categories	No. of Societies	No. of Members	Credit Disbursed (Million Taka)
Bittaheen Cooperatives	27,067	796,815	9,996.70
Credit Cooperatives (CCULB)	411	124,156	1,200.00
Ashrayon Cooperatives	596	64,952	214.00
Abashon Cooperatives	41	3007	5.70
Total	**28,115**	**988,930**	**11,416.00**

Source: DOC (2018)

The micro-credit programs are implementing to create self-employment opportunities and promote entrepreneurship in agriculture. The dominant approach is the target group strategy under which the poor with similar socio-economic interest are organized into cooperatives to promote their social and economic empowerment by taking various income generating activities. A significant advantage of the cooperative approach is its apparent ability to bypass the distributional concerns by offering the poor access to collateral-free credit to generate employment and income. These programs have also various non-credit components, which help receiving social awareness training, often packaged with health, education and skill development.

4.7 Self-Initiated Cooperatives and Service Sector Development

Since Bangladesh came under the World Bank's Structural Adjustment Program (SAP) in the mid 80s, there have been series of economic and financial reforms in the country. Besides, the government's policy of liberalization and privatisation opened new avenues to cooperatives. So, the signal was mixed with an indication that cooperatives in future might lose its status of state protected conducive environment and would have to compete at the field level condition with other economic actors, which need business acumen and professionalism for sustainability. On the other hand, in Bangladesh's financial system, there is a "missing middle" between micro-credit and formal banking, so small-scale enterprises constitute the most credit-starved part of the economy. It is against that backdrop that the self-initiated cooperatives are emerging under the active guidance of the DOC and have been very successful. Present government's action of making the Cooperative Act more liberalized, democratic and cooperative friendly has also been a contributory factor in the way of development of these cooperatives. At present, there are about 37,370 cooperative societies which are self-initiated, self-reliant and commercially viable. These are operating in the service sector both in rural and urban areas covering different types of socio-

economic activities like small trading, marketing, transportation, savings and credit, housing, and different types of service delivery. DOC (2018) published a directory of such 1000 self-initiated cooperative societies to examine their performance in terms of following indicators (Table 6).

Table 6. Contribution (Million Taka: m) of 1000 societies in the service sector

Members	Direct Beneficiaries	Employment	Share (m)	Savings (m)	Reserved Fund (m)	Net Profit (m)	Total Asset (m)	Total Investment (m)
445,644	602,112	6,924 (direct) 70,336 (Self-employment)	1,315.90	3,037.60	287.35	290.37	8,654.30	5,407.57

Source: DOC (2018)

Indeed, the contribution of the service sector's cooperatives in Bangladesh are: i) Reduced the scope of money lending by informal money lenders at exorbitant interest rate; ii) Farmers are availing loan from cooperative's credit program; iii) Developed habit of savings and formation of capital; iv) Some cooperatives have charitable programs and finance schools, dispensaries, stipends out of their profit; v) National Marketing Society can maintain the forward and backward linkage of marketing of different products and fix the prices on the basis of production cost and consumer accessibility; vi) Transport cooperatives play the significant role to maintain the balance of owners of the transports and customers of transport service; and vi) Provide trainings to the different levels.

The cooperatives have an important role in generating employment opportunities as the unemployment rate in Bangladesh is 4.31% in 2018 (as of December 2018). Self-employment through cooperative societies is 697,934 out of total employment 881,504 in 2018 (DOC, 2018). Cooperatives have been imperative for capital formation in Bangladesh. The amount of total capital formed by cooperatives was 100,200 million Taka at the end of 2018 while the total working capital was 131,029 million Taka. At the same time, the value of total asset in the cooperative sector was estimated to be 60,755 million Taka (DOC, 2018).

4.8 Sustainability of Cooperatives

Amar Bari Amar Khamar is the biggest poverty reduction program of the government where formal association exists like other organizations to create different types of enterprises among the beneficiaries. But after the completion of program/ project, most of the organizations do not work properly. For sustainability point of view, cooperative association is necessary to make organizations as enterprise and buildup linkage among the cooperative societies. In agriculture, now a days, is not always profitable because of high cost of production. So integrated farming is one of the options under the cooperative

umbrella. Every member of the farmer may engage themselves in the cooperative society and they can make plan from tillage to harvesting operation.

5. Government's Policies and Programmatic Incentives

Agriculture in Bangladesh is, however, constrained by a number of challenges. Major challenges include: i) Small farm size and fragmentation of land; ii) Low engagement of youth in agriculture; iii) Climate changes effects; iv) Improper management of inputs (fertilizer, water, and pests &diseases); v) Volatile agricultural markets; vi) Long marketing channel; vi) Poor access to quality seeds; vii) Inadequate and farmers friendly credit supports; viii) Inadequate farmers organization; and ix) Ineffective farmers' cooperative association.

Cooperative in Bangladesh has passed its century on its way. In initial stage though it functioned with agriculture only, now it is working with wider economic spheres. Considering its competency and effective utility in post-independent Bangladesh, cooperative society is constitutionally recognized as one of the most important sectors of the economy. Cooperative is established as a social enterprise. Due to taking different initiatives of the government of Bangladesh, we observed the continuous growth in the cooperatives sector towards the peasants adopting integrated agriculture at the grass roots level where farmers grow crops, vegetables, fruits, livestock, fisheries, etc.

Bangladesh Rural Development Board (BRDB), Department of Cooperatives (DoC), Palli Daridro Bimochon Foundation (PDBF), Small Farmers Development Foundation (SFDF), Rural Development Academy (RDA), Bangladesh Academy for Rural Development (BARD), Bangladesh Milk Producers Cooperative Union Limited (Milk Vita) are working to form associations on formal and informal basis. With an objective of reducing poverty and hunger, these organizations are giving training, IGA match credit and other supports for livelihood improvement of poor people.

The total numbers of registered cooperatives are 174,604 (DOC, 2018). Compared with the fiscal 2010/11, the share capital increased from 512.95 crore Taka to 1699.40 crore Taka in the fiscal year 2017/18 (DOC, 2018). In the fiscal year 2017/18, cooperatives total saving scheme deposit is 7764.65 crore Taka and current capital 13670.76 crore Taka (DOC, 2018). The government of Bangladesh formulated *National Cooperative Policy, 2014* emphasized to increase the production of crops, aquaculture, and livestock and other sectors by combating the climate change and to ensure the processing, preservation and fair price of selling (MOLGRDC, 2014). Some important provisions have been emphasized in the *National Cooperative Policy, 2014*, which are:

- Building up cooperative based chain from inputs to production and marketing of agricultural produces.
- Institutionalization of training activities for farmers through cooperatives for extension of modern agricultural technology.
- Expansion of cooperative activities for increasing agricultural products, non-traditional agricultural products and spices.
- Provide materials and technology to the cooperative farmers through easy procedure.
- Ensuring priority and privilege for cooperative farmers regarding loans and subsidies.
- Ensuring priority and privilege for cooperative farmers with regard to collecting crops (paddy, rice and wheat) by the government.

6. Challenges of Farmers' Cooperatives

The farmers' cooperatives are encountered by several constraints and challenges towards ending poverty and hunger in Bangladesh. They are:

- Most of the cooperatives have not been registered. People don't know how to register as a cooperative society from the concerned authority. On the other hand, there is difficulty in the registration of farmers' cooperatives from the concerned authority because of the bureaucratic registration process.
- Female's participation as a member of cooperative is comparatively less than male participation, which is an impediment to speedy socio-economic benefit.
- Internal conflict between the members of a cooperative are very common that act as a tailback for the development of cooperative.
- Predominance of vested interest of a particular person or class in the cooperatives.
- Lack of professional capacity in cooperative management because members are ignorant about how to operate a cooperative successfully.
- Sometimes political interference becomes a crucial threat for the progress of this sector.
- Limited supply of capital by the members creates financial problems, which disable them to take advantages of new opportunities.
- Lack of motivation to highlight the opportunities for starting cooperatives and to provide guidance in getting relative assistance from the concerned authority.

7. Opportunities of Farmers' Cooperatives

In Bangladesh, there is a wider scope and opportunities for increasing cooperative approach for agriculture and rural development, rural poverty alleviation, improving food security and reducing hunger, and economic development. The opportunities of cooperatives, particularly in agriculture sector are as follows:

- Cooperatives societies are proved to be ensured for resource allocation including land use. Since Bangladesh is agriculture- based country, there is a wider opportunity to maximize the use of land.
- Different types of entrepreneurs are created from agriculture cooperatives that can generate employment opportunities for youth, women & farmers.
- Agricultural cooperatives can create off-farm activities and contribute to enterprise development through processing, marketing and preservation.
- Adaptation and mitigation to climate change is easy to understand in a structured group rather than by an individual.
- Production cost of agriculture is increasing over time. There is a huge scope of availing agricultural inputs like fertilizer, water, seeds under cooperatives management that could contribute to increase the economies of scale in production and marketing.
- Government gives privilege and incentives in credit support to structured groups under cooperatives management.
- Production and marketing cooperative societies fix the product price on the basis of the production cost and consumer acceptability. As a result, fair price of produces can be ensured by a cooperative societies.
- Agriculture cooperatives can make profit through different on and off-farm activities and share the profit among the members. Thus, cooperative societies can play an important role in the social and economic development of Bangladesh.
- Periodical campaign program regarding the advantages of cooperatives can motivate the mass people to organize suitable cooperatives in the areas of agriculture, food distribution and retailing, childcare, credit unions, purchasing, worker-owned, housing, healthcare, energy and tele communications, and etc.
- Proper education and training for development of management and business skill can strengthen the members to maintain the sector in a sustainable way.
- Relevant advisory services and assistance in arranging finances will help the cooperatives to protect themselves from financial problems.

8. Recommendations

Based on the discussion above, we derive the following policy and program recommendations to strengthen the farmers' cooperatives in light of ending poverty and hunger in Bangladesh.

- Agricultural cooperatives should be used as means to improved food security and poverty alleviation. The government should ensure production sustainability and food security through proper policy incentives and supports to farmers' cooperatives. It needs to be categorically spelled out in the new National Agricultural Policy (NAP) of the Government of Bangladesh.
- The government should support the cooperative organizations in the areas of cooperative cultivation, mechanization, commercialization, marketing, processing and credit supports at the grass root levels of village and the apex levels of the country to reduce the hunger and poverty.
- Effective monitoring and evaluation mechanism of the cooperative organizations should be formulated and place in implementation.

9. Conclusions

Cooperative approach is pivotal for the family farming communities for improving the livelihoods, economic development and social transformation. Different types of social enterprises intend to work for the social benefit rather than profitability in numerical values. Over the years, cooperative enterprises have successfully operated serving as catalysts for social organization and cohesion. With their concern for their members and communities, they represent a model of economic enterprise that places high regard for democratic and human values and respect for the environment. Cooperatives can ensure the full possible participation in the economic and social development of the people. It should be considered as a powerful business model in the developing country like Bangladesh. It is proved to be an imperative approach for generating employment opportunities that contribute to increase income, and eventually support to alleviate poverty. Meanwhile, farmers cooperatives contribute to supply various types of nutrition required for healthy human life that would be helpful for improving food and nutrition security. The government should ensure that the concerned authority is performing their role to develop this sector giving the higher priority to the cooperative development approach in the country. Therefore, building up an ethical, honest and skilled administration is necessary in the cooperative sector to achieve the desired levels of results. The government

should take proper initiatives to increase Public Cooperative Partnership (PCP) in its development activities enacting laws to boost the country's cooperative sector.

References

ADB. (2018). Poverty in Bangladesh. Asian Development Bank, Metro Manila, Philippines.

BBS. (2017). Yearbook of Agricultural Statistics 2017. Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Government of the People's Republic of Bangladesh.

BWDB. (2018). Annual Report 2018. Bangladesh Water Development Board (BWDB), Bangladesh.

DOC. (2018). Annual Report- 2018. Department of Cooperative, Ministry of Local Government, Rural Development and Cooperative, Agargon, Dhaka.

DoF. (2018). Yearbook of Fisheries Statistics of Bangladesh 2016/17. Fisheries Resources Survey System (FRSS), Department of Fisheries. Bangladesh.

GHI. (2018). Annual Report. Global Hunger Index. Dublin, Ireland.

Jannatul, I., Azim, K. M. M., Begum, M. A. (2014). An Overview on Cooperative Societies in Bangladesh. *European Journal of Business and Management*, 6: 33-41.

Mahmud, W. (2002). Macro Economics of Poverty Reduction: The Case of Bangladesh, Paper prepared for UNDP, Dhaka.

MOLGRDC. (2014). National Cooperative Policy 2014. Department of Rural Development and Cooperative, Ministry of Local Government, Rural Development and Cooperative, Dhaka.

UNICEF. (2016). Malnutrition in Bangladesh. UNICEF Division of Communication, United Nations Plaza, New York, NY 10017, USA.

World Bank. (2018). Annual Report 2018. World Bank Group, Washington, D.C. http://documents.worldbank.org/curated/en/630671538158537244/The-World-Bank-Annual-Report-201.

World Bank. (2019). The World Bank DOC 2019. The Changing Nature of Work. DOI: 10.1596/978-1-4648-1328-3.

Country Perspective Paper

Chapter 3

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Bhutan

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Abstract

Majority of Bhutanese farmers are smallholders with an average farm size of 3 acres with subsistence integrated farming systems. Almost 70% of the rural populations are engaged in subsistence farming, and they are suffering from dismal poverty and food insecurity. In the 12th Plan, the Ministry of Agriculture and Forests adopted "Landscape Management, Production and Commercialization" to accelerate the growth and development of the Renewable Natural Resource (RNR) sector. Drawing from this approach, the government of Bhutan is putting its substantial efforts to foster cooperatives and farmers groups as a means of enhancing the livelihoods of agriculture producers, particularly small farmers, by enabling them to create business enterprises and optimize their economic returns collectively. The farmers groups and cooperatives are identified as an effective extension approach for technology dissemination on agro-ecological potentials for crops and livestock production, value addition and marketing to contribute in alleviating livelihood of small farmers in Bhutan.

Keywords: Farmers' cooperatives, poverty, hunger, happiness index, Bhutan

1. Background

Bhutan is a small landlocked mountainous country located in the southern slopes of Eastern Himalayas situated between China and India. The country has a total geographical area of 38,394 km^2 with a population of 735,553 (NSB, 2017). About 70% of the Kingdom is covered with forests; 7% year-round snow and glaciers; nearly 3% is cultivated land (out of 8% arable land); and 4% as meadows and pastures, while rest of the land is either barren, rocky or scrubland (NSB, 2018). Agriculture is the mainstay of the people with an estimated 49.10% of the

population engaged in farming. Rice, maize, wheat, barley, buckwheat and millets are the major cereal crops cultivated in Bhutan and rice is by far the most important and preferred food crop of the Bhutanese. Therefore, Bhutan is 64% self-sufficient in staple cereals, and 47% in rice (Katwal, 2016). Exports of fruits and seasonal vegetables have increased, food and nutrition security remain as the key challenge with a food trade deficit where it imports six times the value of food exported. Agriculture is very important to the Bhutanese economy as it engages over 49.10% of the population directly depending on it for their livelihood (NSB, 2017). In 2018, agriculture sector accounted for about 17.37% of the total GDP of the country (NSB, 2018).

Bhutan is predominantly an agriculture-based society. Majority of the Bhutanese farmers continue to practice self-sustaining, integrated and subsistence agricultural production system with small land holdings where farmers grow a variety of crops under different farming practices and rear livestock to meet their household food security. The average cultivated agriculture land holding size is 3 acres per household (NSB, 2012). The productivity per unit area of food crops is generally low due to lack of assured irrigation, rough terrain, poor soil quality, limited extent of arable land, lack of improved quality seeds for cereals, oilseeds, vegetable crops, fertilizers, farm machinery and agricultural experts.

The country's unique mountainous topographical terrain makes it difficult for the commercialization, and reduce poverty and food insecurity in lagging regions. More than 30% of Bhutan's poor live in rural areas compared to around 2% poor living in urban areas. Almost 70% of the rural population are engaged in subsistence farming, where they suffer from lack of improved seed varieties, traditional technology, lack of mechanization and weak value chain development (RGoB, 2012). The Ministry of Agriculture & Forests (MoAF) has been consistently putting efforts to increase self-sufficiency in food commodities through increase in domestic production to address issues like rural urban migration. Formation of Farmers Groups and Cooperatives (FGs and Coops) are the major approaches for agricultural development which will contribute in reducing poverty in the country. The importance of cooperatives lies in its principles of self-help and mutual help, the method of democratic administration and control, and economic system based on justice in business. Cooperatives make important contribution to socio-economic development. The capacity of cooperatives needs to be developed for creating viable and sustainable enterprises, secures productive employment, and generate income, thereby contributing to poverty reduction.

The development and promotion of FGs and Coops in the country have been recognized as an important means for the promotion of agricultural production and marketing since *9th Five Year Plan* (2002-2007). Although the government

enacted the *Cooperative Act in 2001* to create an enabling environment for cooperatives, it remained largely dormant till its amendment in 2009 and entrusting the implementation role to the MoAF (DAMC 2016). This paper is more focused on country situation in farmers' cooperatives, poverty and hunger, challenges and opportunities, policies and programs, and recommendations to strengthen farmers' cooperatives towards ending poverty and hunger in Bhutan.

2. Family Farming in Bhutan

Family farming (FF) is a mode of agriculture, forestry, fisheries, livestock and aquaculture production, which is managed and operated by a family and predominantly reliant on family labour, including both women and men (FAO, 2018). The family and the farm are linked, co-evolved and combined with the economic, environmental, social and cultural functions (FAO, 2018). Women play a significant role in agriculture, including in the production of high-value crops such as vegetables, home garden cultivation, and in the raising of animals. For example, in Bhutan 62% of the women are engaged in agriculture; in India, the agriculture sector employs 4/5 of all economically active women; and in Sri Lanka, 41.5% of women work in agriculture (ILO, 2014). Almost all the countries in the world, family farming is key to enhance food security, sustainable growth, fight against rural poverty and environmental degradation, particularly in the rural areas.

In Bhutan, farmers are organized in farmers' groups and cooperatives to enhance their livelihood and income. The effectiveness of group approach through farmers groups and cooperatives will resolve the current and future farming issues and socio-economic challenges (DAMC, 2010a). Poverty is predominantly a rural phenomenon and hence we need to give a greater focus on agriculture and rural development. Most Bhutanese live in highly scattered villages and do not have large farmlands that made difficulty to work in the groups. Bhutan's agriculture development is challenged by terrain, fragmented land holdings, labour shortage, human-wildlife conflict, lack of access to markets and credits and coupled with frequent erratic weather patterns. The Royal Government of Bhutan (RGoB) has given high priority to rural development and has provided most of the essential services that are required for the prosperity of rural people. Schools, health facilities, water and sanitation, telecommunication, agricultural extension services and credit have been provided to all Gewogs (Block). Rural electrification is accessed to more than 90% of the households and almost all the Gewog (Block) centres are connected with roads with the exception of only a few. All infrastructures are now in place for rural prosperity. What is needed is to enhance agricultural production in cereals, vegetables, fruits, poultry and dairy products. Rural-urban migration is another issue in Bhutan where the farmer's groups and cooperatives are faced with a shortage of labour in the villages (MoEA, 2015).

3. Agricultural Cooperatives in Bhutan

In Bhutan, agriculture including farming, forestry and livestock is the main source of generating employments and increase income of the people in rural areas, where the majority of the poor people live. Agricultural cooperatives have become one of the most important approaches for agricultural development in Bhutan. It plays an important role in supporting small agricultural producers and marginalized groups such as young people and women. They empower their members economically and socially and create sustainable rural employment through business models that are more resilient to economic and environmental shocks. The effective and efficient functioning of agricultural cooperatives is therefore the major issues of rural development, and elimination of hunger and poverty. It is important that the RGoB and Civil Society Organizations (CSOs) play their role in mobilizing and supporting small-scale farmers to organize. However, this must go hand in hand with infrastructure development in order to achieve greater results and ensure sustainability.

RGoB has been promoting the formation and strengthening of FGs and Coops in order to overcome the challenges of poverty and hunger in the country. Bhutan managed significantly to reduce the number of people living in poverty in the MDG era (2000-2015) through various means of which farmers groups and cooperatives is also a contributor to it. The percentage of people living below national poverty rate was reduced from 23.2% in 2007 to 8.2% in 2017 (NSB, 2017). While the progress on poverty reduction has been commendable, Bhutan is confronted with the last-mile challenge of eradicating poverty in all its forms. Additionally, it is of utmost importance to ensure vulnerable section of the population do not fall back into poverty due to disaster or any other external shocks and continue to support farmers' groups and cooperatives to enhance the livelihood of the farmers.

To strengthen market access and quality improvement by small-holder farmers, the government began to promote farmer associations and farmer cooperatives in the 1990s. The first serious effort to promote farmer cooperatives came in 2009 with enactment of the *Cooperatives Act, 2009* (initially enacted in 2001 and amended in 2009). The amended law, endowed cooperatives with legal status, put them under the leadership of the MoAF at the national level and required the cooperatives register with the MoAF, which has delegated the mandate to the Department of Agriculture Marketing and Cooperatives (DAMC). Over the years, there has been a concerted effort in establishment of cooperatives and farmer groups although focus on enterprise (product or service) around which a farmer group or a cooperative could be established has not received proportionate attention (DAMC, 2010a). With the intervention from the government to promote

farmers' groups and cooperatives, the poverty has been reduced drastically in the country where the income level of farmers has been enhanced and employment were generated in the rural areas. As of 1st July 2019, the DAMC has registered a total of 582 farmers' groups and cooperatives comprising of 511 farmer groups and 71 cooperatives related to agriculture, livestock, forestry, integrated RNR and non-RNR (Table 1 and 2).

Table 1. Distribution of farmer groups by sectors

Category of Farmers' Group	No. of FG	Male Members	Female Members	Total Members
Agriculture	290	1,866	2,238	4,104
Forestry	42	936	505	1,441
Livestock	171	2,379	1,812	4,027
Integrated RNR	1	0	5	5
Non RNR	7	48	29	77
Total	**511**	**5,229**	**4,589**	**9,818**

Source: DAMC (2019)

Table 2. Distribution of cooperatives by sectors

Category of Cooperatives	No. of Coops	Male Members	Female Members	Total Members
Agriculture	11	259	219	247
Forestry	4	205	92	297
Livestock	42	993	737	1,730
Integrated RNR	1	9	7	16
Non RNR	13	153	317	470
Total	**71**	**1,619**	**1,372**	**2,760**

Source: DAMC (2019)

FGs and Coops are popular in the agriculture sector and comprise of 52% of all registered farmers' groups and cooperatives. The livestock sector has 37% of all registered farmer groups and cooperatives, while 8% have been registered as the forestry group. Primary cooperatives are more popular in the livestock sector comprising of 59% of cooperatives. It must, however, be noted that the forestry groups are registered with the Department of Forests and Parks Services (DoFPS). Out of about 700 Community Forest Management Groups (CFMGS), only 42 groups and 4 primary cooperatives related to the forestry sector have registered with the DAMC. While majority of the registered farmer groups and cooperatives are associated with the farming sector, there are also non-farm or non-RNR cooperatives such as the Youth Business Cooperative, which focuses on marketing of RNR products and not on production. In addition, there are also new generation

cooperatives such as the Youth Cooperative, which aspire to sustain on emerging opportunities such as social media, tourism, events management and modern technologies. These all farmers' groups and cooperatives had enhanced the livelihood and income of farmers and generated employments for the youths which directly contributed to reduce poverty in the country.

4. Sustainable Development Goals: No Poverty and Zero Hunger

End poverty in its all forms everywhere, aims to eradicate extreme poverty defined as people living below US$ 1.25 a day. Anchored on the development philosophy of Gross National Happiness (GNH), the RGoB has placed poverty reduction at the heart of development programs, implemented through the Five-Year Plans. As of 2017, the percentage of people living below national poverty rate reduced to 8.2% from 12% in 2012 (Table 3). Multidimensional poverty also decreased from 12.7% to 5.8% between 2012 and 2017. This progress points to the government's clear strategic direction over time: poverty reduction was the overarching objectives of the 10th FYP (2008-2013) and the 11th FYP (2013-2018).

Bhutan is largely an agrarian country and hence food security and self-sufficiency are both important. Agriculture is the major source of employment for Bhutanese with 49.1% of the population dependent on this sector for their livelihood. According to latest survey (BNS, 2017), about 97% of the households in Bhutan are reported to be food sufficient, with urban residents rarely experiencing food insufficiency. Approximately, 4% of people in rural areas report experiencing food insufficiency. However, the high percentage of food sufficiency is because of Bhutan's import-dependency. Much of Bhutan's food requirements, such as cereals, vegetables, meat items and other essentials commodities, are imported. Table 3 shows the progress status of the SDGs and brief highlights of some of the positive attributes in terms of interventions and concerns related to each goal.

Table 3. Progress status of SDGs in Bhutan

Goals	Rationale
No Poverty	▪ National income poverty rate reduced to 8.2% in 2017 from 23.2% in 2007. ▪ Multidimensional poverty of 5.8%, down from 12.7% in 2012. ▪ Effective targeted interventions by government and CSOs are: rural economy advancement programme; targeted household poverty programme; and national rehabilitation programme in addition to regular broad-based development programs. ▪ Land reform program underway since 2007. ▪ High coverage of free basic health, education services, and communication services.

Goals	Rationale
No Poverty	However, ▪ Poverty levels in rural areas are significantly higher (93%) of the country's multi-dimensionally poor are in rural areas. ▪ Climate change, human wildlife conflict, biodiversity loss further threatening rural poor –amongst the 60% of Bhutan's population whose lives depend on agriculture. ▪ Rural-urban inequality is increasing, and urbanization is giving rise to new vulnerabilities.
Zero Hunger	▪ *Food Security & Nutrition Policy* 2014 in the pace of implementation. ▪ High level of food sufficiency (more than 97%). ▪ Variety of interventions initiated to improve nutrition (SAP, 3 Eggs a Week program, etc.). However, ▪ High prevalence of malnutrition with stunting rate for children below the age of five at 21%, and 4.3% wasting. ▪ Low agriculture productivity. ▪ Feminization of agriculture. ▪ Climate change impacts damage essential agricultural infrastructure and limit access to market and scalability.

Source: RGoB (2018)

5. Government's Policy and Programmatic Incentives

Bhutan remained isolated until the early 1960s and it didn't have much international cooperation. As a result, it maintained numerous social assets, including the values of togetherness, amity, reciprocity, helpfulness and care for other living beings. These values are highlighted in Bhutan labour exchange system, which exists in rural communities during peak farming seasons, local festivals and rituals, as well as in the country's northern tradition, the shared ownership of cattle and herding responsibilities. Bhutanese communities depended on these informal social institutions, characterized by kinship and neighborhood relationships. Although these informal institutions still exist today, they are on the decline. For instance, traditional rituals and ceremonies have declined both in frequency and in intensity because younger generations are less interested in them than were their forbearers. The cooperatives existed in Bhutan as early as 1960s in the form of informal community groups for the community resource management such as *Resups* (forest caretaker) and *Chusups* (water caretaker). As the Bhutan's socio-economic development progressed, more farmers

groups and cooperatives were formed informally to manage income generating activities. Envisaging more cooperatives for economic activities and the need to have legal umbrella to support these cooperatives, the Royal Government of Bhutan took the first step to create enabling environment with the enactment of *Cooperative Act 2001*, which was further amended in 2009 to include the farmers' groups.

5.1 Cooperative Act of Bhutan, 2001 (Amendment 2009)

Agricultural marketing services has also been upgraded at the full-fledged since 2009 as the DMAC was assigned to implement the *Cooperative Act - 2009*. The amendment of *Cooperative Act of Bhutan (CAB), 2009* has created conducive policy environment for the development of FGs/Coops in Bhutan. The CAB provides the provisions for the development and registration of farmer' groups, cooperatives and federations, the cooperative rules and regulations of Bhutan, 2010 provides provision for registration of FGs/Coops and provide the legal framework within which they can operate (DAMC, 2010c).

The *Cooperative Act - 2009* promotes the development of opportunities for local communities to raise their voice and shape the local development agenda (Article 9) and mandates the formation of FGs and Coops and establish the networks of cooperatives. Since the start of cooperative movement in Bhutan, 71 cooperatives and 511 farmers' groups were registered under this Act (DAMC, 2019). These FGs and Coops are playing crucial role in enhancing the rural income and livelihood which had reduced the poverty in the rural villages. Therefore, scholars generally regard formal community institutions as a vehicle of development. The RGoB has enormous faith in the benefits of these institutions and creates an environment conducive to their success by developing acts and policies that support them. Today Bhutan's institutions are transforming from traditional kinship and neighborhood social networks to formal community institutions that allow marginalized farmers to group together and access business opportunities that would otherwise be unavailable to them. These formal institutions guarantee farmers' market inputs and outputs, thereby encouraging them to produce a greater quality of agricultural products. Thus, Bhutan's community institutions have potential to generate entrepreneurial farmers in the future.

The DAMC is working on revising the *Cooperative Act, 2009* (RGoB, 2009). The revision is being carried out in light of the many flaws and discrepancies and the challenges in implementing the Act. The revision intends to:

- Bring in coordinated approach for all the FGs and Coops and amongst stakeholder agencies.

- Harmonize and realign the standards and requirements as per international norms, in due consideration to national context.
- Incorporate sanctions and administrative measures for non-compliance.
- Strengthen the criteria for formation of FGs and Coops.
- Institute proper monitoring and evaluation mechanisms with accountability.

With more than 49.10% of the population engaged in agriculture, economic development policy of the Kingdom of Bhutan, 2016 emphasized for balanced and equitable development for poverty alleviation through several developmental strategies, amongst which some are targeted and benefitting farmers' groups and cooperatives. Moreover, the Article 3 of the *Cooperative Act, 2009*, states the State's policy as "It is the declared policy of the RGoB to promote cooperatives for the wellbeing of members and communities. The RGoB shall facilitate the development of cooperatives as strong and sustainable pillar of the private sector that will contribute to the economic development of the Bhutanese society, especially the poor". Towards this end, the RGOB shall create the legal environment, through this Act, for the regulation of cooperatives on registration and monitoring, mediation and conciliation, and the provision of legal services on research, education and information. Complementary to regulation, government shall provide support for the economic development of cooperatives.

The RGoB recognizes cooperatives as private enterprises with economic purposes. Thus, its support aims to help cooperatives realize their purposes and to help strengthen and sustain their capacity for self-reliance and self-management so that cooperatives will grow to stand on their own as autonomous enterprises and as partners of government in development. Mutual agreement shall be the basis of partnership between cooperatives and government.

5.2 Programmatic Incentives to Support Farmer's Cooperatives

The formation of FGS/Coops has started very recently in Bhutan. The MoAF has identified that FGs/Coops plays an important role in uplifting the poverty of rural farmers, whereby different agencies provide following support to strengthen and encourage the FGs/Coops in the Bhutan. The RGoB has been implementing following programmatic incentives for promoting smallholder farmers and farmers' cooperatives.

5.2.1 Rural Economy Enhancement and Targeted Household Poverty Program

The government had initiated the Rural Economy Enhancement Program (REAP) and Targeted Household Poverty Program (THPP) in *10th Five Year Plan* (FYP), a more poverty reduction targeted program with interventions aimed at enhancing livelihood at household level especially focusing on the farmers groups and

cooperatives. Through this program, the percentage of people living below national poverty rate was reduced from 23.2% in 2007 to 8.2% in 2017.

5.2.2 National Rehabilitation Program

The National Rehabilitation Program (NRP) has enhanced sustainable agriculture practice with the vulnerable landless populace allotted with feasible and economically viable farming land on freehold. Under the program, more than 6,536 landless households were allotted with 23,800.87 acres (3.6% of total arable land) of farming land with inclusive resettlement package. The Use Right System (URS) is an innovative landholding system introduced recently to enhance livelihood opportunities for the farmers and youth. The URS allows farmers and youths to use state land as long as the land is being used productively for the purpose for which the land is allotted through payment of taxes at par with existing land tax. Through these programmatic incentives to the farmers groups and cooperatives, the poverty at the household level had reduced drastically. Apart from this, the government also provides tax exemption and other incentives to farmers' groups and cooperatives, which are as follows:

- Promotion of commercial farming.
- Establishment of marketing outlets to support agro-based cottages and small industries.
- Promote assured markets for farm produces while strengthening storage capabilities.
- Export earnings of business enterprises established during 2010 - 2015 is exempted from corporate or business tax for a period of 10 years.
- Rent free incubation facilities for a maximum period of three years shall be provided where available for both land and structure for development of cottage and small industries.
- A ten years tax holiday is given to new cooperatives established during 2010 - 2015 in outside Thimphu and Phuentsholing municipal areas.
- Sales tax and custom duty are exempted for agricultural inputs.
- Income tax holiday for 10 years is provided for commercial farming and related processing of its products for enterprises established during 2010 - 2015 and an additional tax holiday of 5 years is provided for commercial farming on organic produces.

5.3 Production Support

To boost up the production of vegetables, fruits and cereals crops, the Dzongkhag (districts) agriculture sector and research centres have been supporting with

production quality inputs and the supply besides the technical supports. On the other hand, Agriculture Machinery Centre (AMC) has also helped the farmers in mechanization of farm through hiring of farm machineries, provision of subsidized machineries and technical backstopping. Similarly, the livestock sector supports FGs/Coops in breed improvement, animal health care, feed and fodder and input supply. The forestry sector supports in development of management plan, setting up of trails and domestication of Non-Wood Firewood Products (NWFPs).

5.4 Marketing Support

- For a consistent and reliable market, a Memorandum of Understanding (MoU) was signed on 19th April 2012, between the Ministry of Education and the Ministry of Agriculture and Forests on a pilot basis to buy locally produced RNR products from the groups. As of January 2019, the DAMC in collaboration with 20 districts has facilitated in linking 60 schools/ institutions with 120 FGs to supply RNR products for the academic year 2019. Moreover, traders were also linked with the farmers group/ cooperatives to buy the RNR products from the groups.
- The DAMC provide timely market information, conducted internal and external market research, and carried out marketing trails of RNR products.
- Increase the shelf life and add value to the products packaging materials, plastic crates, and bottles, value addition equipment like orange pulping machine, potato chips machine, stitching machine, deep freezer, electric dryers, digital weighing balance, milk can and dairy processing equipment were provided.
- When the FGs/Coops are not able to get market facilities due to unavoidable circumstance, DAMC facilitate and provide transportation support from farm gate till end market. Transportation support is also provided for trail marketing for RNR produce.
- The Minimum Support Price (MSP) support is provided when the producer suffers by getting lower the price of the local vegetables than that of cost of production. The MSP are provided for 8 selected vegetables; namely, cabbage, cauliflower, broccoli, beans, chilli, tomato, peas and carrot. The DAMC also support in the event of fluctuation of price and price gap in the linkage program.
- Facilitate the smooth marketing of RNR products, market infrastructure like market sheds for Sunday market, sales counter, milk processing unit, collection shed was in place. For timely auctioning and to minimize the

postharvest loses of vegetables and fruits, superstructure was built in the strategic locations across the country.

- In times of extreme market failure, the ministry has also provision of buying back all the farmers' produce so that the farmers get at least their cost of production.

5.5 Capacity Building Support

Strengthening of FGs/Coops has been recognized as an important component by DAMC framework (DAMC, 2010b). So far DAMC in collaboration with development partners such as SNV, EU, IFAD, UNDP and concerned stakeholders have contributed to build the capacity in production, marketing, enterprise development, leadership and management training. Beside awareness on CAB-2009, the Cooperative Rules and Regulation- 2010, Guidelines for Registration of Primary Cooperatives, post-harvest management, book and record keeping, exposure visit and consultative meeting with relevant stakeholders are regularly conducted.

6. Constraints and Challenges on Farmers' Cooperatives

The greatest impediments to enhance production are mainly the high cost of production, improved quality standard and efficient marketing system. The farmers are individually too small that reduced the economies of scale in production and marketing. They face problems of timely information on inputs (fertilizers, improved seeds, markets, price of the products in the alternative markets, etc.), transport bottlenecks, weak bargaining power and a lot of uncertainty all of which discourage production beyond subsistence levels. Our farmers need to be properly organized and should have sufficient quantity of goods and to work together and not individually. The major challenges to our domestic production and marketing is the availability of comparatively cheaper import produce from the neighboring countries.

The earlier experiences have shown that low literacy among farmers and their preference for individual approaches have made the group mobilization processes difficult. The lack of experienced group promoters has been cited also a major constraint to the progress of farmers groups in this country. Other hindering factors for Bhutanese cooperatives could be limited access to credit, long distance markets; and limited access to financial resources and technical supports, which are all essential ingredients in the formation and development of such groups. The following are some of the constraints and challenges in farmers' cooperatives.

i) Cooperatives Members Not Working in Group Approach

Past experience has shown that the group approach works only when the member of the group is homogenous and have similar problems. While the purpose of FGs and Coops is resource pooling and improving the scale of production and find markets through collective marketing/ increasing bargaining power, the rules and regulations of the cooperatives in Bhutan has not been compliance. The earlier group approach has not worked well in Bhutan and thus clustering was seen as the best approach. However, over the years both production and marketing is carried out individually. So, it is better to work in a group collectively which will reduce the cost to market their produce.

ii) Poor Management

To enable the growth of an enterprise and meeting the common needs of members of an enterprise, it demands different skills to manage the operations of the enterprise. The owners (members of FGs and Coops) may not have all of the necessary skills and experience needed for certain managerial roles. Majority of cooperatives and farmers group leaders lack knowledge on the development of strategic plan and financial plan. The FGs and Coops members lack the ability and capacity to plan and pursue supply chain management and market orientation. That is why most cooperative enterprises elsewhere hire external planners and managers who are made accountable to the farmer groups and cooperative governance. Creating a management team separate from the ownership enables the enterprise to be run by professionals with diverse skills such as in products development, marketing, resources and assets management, financial management, instituting a system of checks and balance, planning and business strategizing, reporting, public relations, etc.

iii) Limited Capacity of Office Bearers/ Board of Directors

Weak governance of FGs and Coops is another constraint, owing to inadequate leadership and associated commitment from the members. This has led to heavy dependency on the government officials, even for decision making, more compounded in groups with illiterate members only. Weak governance has led to weak group cohesion, weak trusts amongst the members and lack of strong commitment from the members (weaker commitments is also related to groups formed without assessing profitability and business feasibility, and without considering underlying constraints within the households). This had led to improper management of the groups where leaders among farmers and cooperatives do not always agree on objectives, policies and approaches, which lead to intense competition and duplication of services and facilities between

cooperatives serving the same area that limits their efficiency, market power and member benefits.

iv. Lack of Communication and Participation among the Members

Interaction between the members and management committee of cooperative is very less and it takes place when there are only economic activities. This has caused difficulty in understanding their problems and issues. The by-laws clearly state that every member should cooperate each other to fulfil their common goals and objectives. It is evident that members do not always participate in annual meetings, provide adequate capital or fully support the cooperative with their patronage. A lack of commitment by members greatly limits a cooperatives ability to fully develop its potential for serving farmers.

v. Farmers' Groups and Cooperatives Formed only for the Sake of Getting Supports from Outsiders

FGs and Coops should be managed in more business-like manner. These are not social clubs or charity organizations. Earlier, the government had been providing support to the groups in the form of subsides and grants for various inputs to encourage farmers groups and cooperatives. Over the years, the farmers groups and cooperatives had become too dependent on the government and the group does not function as per their mandate. This had caused the groups to dissolve in few cases. Therefore, full grant financing for Cooperative business development does not contribute to promoting self-help principles and Cooperative culture within Cooperatives rather, it risks rendering cooperatives inactive once the initial grant is exhausted.

7. Successful Stories and Best Cooperative Models in Bhutan

The success of the FGs and Coops depend on the cooperation from every members of the group. The FGs and Coops should be governed by properly to have equal benefit to members and rural communities. The lesson can be learnt from the successful cooperatives (for example, Japan and India). Japan's best practices of agricultural cooperatives have become a model to many agricultural cooperatives in Asia. There are some common factors and characteristics regardless of any countries which lead to the success of cooperatives. The history of Japan's cooperatives dates back to the late 1870s, which has undergone many reforms and changes. Similarly, in India, The AMUL's (Anand Milk Union Limited) story is another successful and best model of cooperatives. In Bhutan, the Gomdar Milk Marketing Cooperative in the east is one of the best practices of model cooperatives, which changed the life of many farmers in the village. It has become the model for many farmers groups and cooperatives in the east. Moreover, there

are good successful stories, which changed the lives of many farmers in Bhutan (Box 1 and 2).

Box 1. A Successful Stories of Women Group in Kengkhar Village

Kengkhar village is one of the remotest villages in the eastern part of Bhutan, which is one the poverty-stricken village located in Mongar district. Handicraft is one the major cash income for the farmers besides agriculture. The village faces acute shortage of water, where the cultivation of crops is quite minimal. The women in the villages spend majority of the time in the care economy, running household chores and maintaining kitchen garden. Women were deprived of earning the cash income.

In September, 2016, three women farmers group consisting of 13 members started commercial onion cultivation, with the input supply from the Government and technical guidance from the research centres. The group cultivated onion in two acres of fallow dry land. Similarly, several other individual women also started onion cultivation in a small scale.

In the first year of cultivation, they produced about 1,584 kg of onion where 797 kgs of onion were sold at a price ranging from Nu. 40-50/kg[1], earning a total amount of Nu. 34,780. The income earned from the onion had motivated the other farmers and every household had started cultivating on large commercial scale. The women feel that onion cultivation is not labour intensive and requires less water compared to other high value vegetables. Moreover, it is less prone to diseases and infections. The distance to the market cost them huge expenditure as the village is located in the remote area.

To minimize the cost on transportation to reach to the market, the DAMC made a linkage of women group to the trader. The group were able to produce the required quantities demanded in the market. Today, the women groups are progressing well and their income from the sale of onion has increased by many folds in a household level. Now, they were able to meet their income to buy their necessities at home and save the surplus amount. Moreover, they are able to substitute the import of onion from India in the east.

Therefore, onion cultivation had provided an opportunity for rural women in Kengkhar to earn cash income independently. The ability to earn cash income gives a woman more decision-making authority in the household.

Box 2. Gomdar Milk Marketing Cooperative

Gomdar Milk Marketing Cooperatives is one of the progressive model cooperatives in the eastern Bhutan. It was formed by Brongkashing village with 18 members under Gomdar Gewog SamdrupJongkhar in the year 2012 as an informal group. In

[1] Bhutanese currency (Nu) is equivalent: 1 US$ = 70.89Nu.

the same year they are registered as Gomdar Om Mar-Datse Thuendrel Detshen farmers' group and issued certificate by DAMC.

After running consecutively for three years from registration, nearby communities too joined the group since it gave good source of income towards them. As the size of the group increases, they have applied for land lease to the Government for expansion of the firm and got 20 decimals of land to build five huts for operation of the firm. They had built five huts with the labor and cash contribution from the individual group member. At present three huts are given as rental to generate group revenue and other remaining are used for main milk processing unit.

In the year 2017, the group was upgraded as a primary cooperative by merging five communities of Rechanglu, Narphung, Denchi Khoyer, Khandoma Perung and Chethongkhar Fremi with 211 group members of which 139 are male and 82 are female. To run successful cooperatives they have elected Board of Directors as the policy making body. The powers, duties and responsibilities of the Board of Directors are prescribed in their By-Laws. The board is composed of five members who are elected during General Assembly for the duration of one year. Yearly milk production had increased and as of now the Gomdar milk cooperatives produce an average of 600 liters of milk on a daily basis.

At present there are 12 Milk collection centers and members are responsible to take their milk till collection center. Milk is collected by milk marketing van towards Milk Processing Unit. From the Milk Processing Unit, the milk is directly transported to B-Coop shop at Samdrup Jongkhar. The B-Coop shop pays Nu. 30 per liter to the group members and sells fresh milk at Nu. 40 per liter. The balance of Nu. 10 per liter is retained in group to meet the operational expenditure and group saving. The monthly gross income of a group amounts to Nu. 720,000. After deducting all expenditure, the Net Income for Gomdar Milk Cooperatives in an average amount to Nu. 60,000 per month. At present cooperative have an accumulated group saving of Nu.700, 000.

Besides their board, the cooperative had also employed an accountant and two drivers for the daily operation and management of the firm. They are paid a monthly salary of Nu. 15,000 each from the group. Today, the cooperatives had transformed lives of its members in terms of income and livelihood. Within a short span of time, the dairy farmers could generate cash income to buy basic commodities for individual household. Their economic hours are used for meaningful household activities rather than marketing individually and looking for alternative source of income. As the group evolves with time, the members are equipped with the tools of lessons and experiences that only make them better at planning the next stages of endeavors they undertake in expanding their horizons of production out of comfort zones into economies of scale that they never dared to dream about.

8. Policy and Program Recommendations

For a successful cooperative enterprise, there is definite need for proper and effective policy and regulatory framework in practice. It is crucial to have rigorous consultations while formulating policies, regulations and legislative frameworks.

Cooperatives may continue to require a more favorable policy environment, at least until such time as they become self-reliant and operationally viable. Theoretically, public policy on cooperatives can be categorized into: policies covering development of cooperatives; regulating cooperatives; defining the role and responsibility of Government/Registrar; financing of cooperatives; and providing support services to them. It is also important for the government to coordinate with NGOs, civil societies and non-state sectors as they work to support the poorest people in developing countries in fields such as social development, education, health, better livelihoods and rural development.

The following are the overall policy and program recommendations:

i) Capacity building of FGs/Coops need to be continued until they become sustainable and capable of operating the business by themselves.

ii) The marketing system of vegetables and dairy products are complex due to perishable in nature. DAMC has explored additional schools and institutions to link those FGs/Coops to meet the demand of school. There is need for policy intervention and enforcement to some institutions to buy locally produced commodities for their requirement.

iii) As the FGs/Coops are located far from the markets, transportation of RNR products to the market is one of the major constraints faced by the farmers. So, the farmers have to be supported with revolving fund for transportation at least in the initial phase of one to two years. Beside this DAMC has to conduct feasibility study to establish collection shed and sales outlets at community level.

iv) Increase awareness and education programmes on a continuing basis in order to sensitize members regarding their rights, benefits, responsibilities, and obligations of the cooperative organization to which they belong. Further it is felt imperative to incorporate cooperatives in school curriculum to educate children on the importance of cooperatives. Most of the members of the FGs/Coops are not aware of the importance of group saving and credit, so they need to be educated on financial literacy, benefits of saving and lending cash in order to increase the share capital.

v) In some of the FGs/Coops, the executive member were never changed and have become monopoly in decision making, as such it should be made compulsory to rotate among the members as per their bylaws.

vi) Technical support should be combined with an assessment of the FGs/Coops financial needs. Support grant financing should be provided only on the basis of clear business cases and on evidence of commitment to implement a business plan. Full grant financing for cooperative business development does not contribute to promoting self-help principles and cooperative culture within cooperatives rather, it risks rendering cooperatives inactive once the initial grant is exhausted.

vii) Coordination among stakeholders should be strengthened to upscale FGs/Coops governance and business capacities. Donor support should preferably be directed towards existing cooperatives, rather than the formation of new FGs/Coops. Stakeholders involve in forming FGs/Coops should focused on quality rather than measuring achievements through the numbers of FGs/Coops formed for long term sustainability.

viii) The CAB- 2009, Article No 2 section (20) states a group of not less than three members can form farmers group have to be amended since three members in the community cannot produce the required volume for transporting as demanded by the end markets. Thus, the minimum members are suggested to be increased from three to seven to form registered FGs.

ix) Increase the production of NWFPs and minimize pressure on environment, forestry sector has to carry out research and trail to domesticate NWFPs in agriculture land. The forestry rules and regulation be simplified and the royalty structure need to be revisited.

x) Priorities need to be taken in order to help members of the registered and other informal FGs to improve their economies of scale, membership, and governance, and register as primary cooperatives. It is recommended that priorities is to be given to improve the group dynamics in terms of their ability to improve governance in compliance the cooperative values and principles.

9. Conclusions

Cooperative is considered as the fastest growing and resilient enterprise for sustainable development in the world. Cooperatives in general have a major role not only to help give farmers' access to the resources for production, but also to market their products. It gives farmers the opportunity to participate in the decision-making process, giving them greater access to land ownership and greater negotiating powers. In this way, cooperatives will ultimately help to reduce poverty, ensure greater food security and eradicate hunger across the globe. More successes can be achieved if people work together as a cooperative because of cost effectiveness. Therefore, promotion and strengthening of the

identity of cooperatives should be encouraged for the development and promotion of all types of cooperative enterprises which in turn will enhance the livelihood and income of the farmers thereby reducing the poverty in the rural villages. The FGs and Coops implement wide range of integrated commercial farming activities such as poultry, vegetable, dairy, cereals, NWFPs, etc. Today, the establishment of FGs and Coops has covered all the districts and Gewogs (Block) within this short span of time where the national poverty has been reduced to 8.2% in 2017.

Bhutan being one of the latest to join the global cooperative movement, there are lot of challenges and issues. There is huge gap in cooperative development, which needs capacity development and financial resources. It is therefore imperative to have strong supports from the public, private and international organization to take forward the Bhutan's cooperative movement. The cooperative as the development strategy is not only apt to enhance income and reduce poverty; it will surely contribute towards building Bhutan a Gross National Happiness.

Reference

BNS. (2017). Bhutan Poverty Analysis Report. Bhutan National Bureau, Thimphu.

DAMC. (2010a). Comprehensive Development Strategy for Farmers Groups and Cooperatives in Bhutan. Department of Agriculture Marketing and Cooperatives, Bhutan.

DAMC. (2010b). Master Plan for Capacity Building of Registered Farmers Groups and Cooperatives. Department of Agriculture Marketing and Cooperatives, Bhutan.

DAMC. (2010c). The Cooperatives Rules and Regulations of Bhutan. Department of Agriculture Marketing and Cooperatives, Bhutan.

DAMC. (2012). International Seminar on Cooperatives: Empowering Communities towards Gross National Happiness. Department of Agriculture Marketing and Cooperatives, Thimphu, Bhutan.

DAMC. (2016). Institutional Study on Farmers Groups and Cooperatives. Department of Agriculture Marketing and Cooperatives, Thimphu, Bhutan.

DAMC. (2019). Annual Report - 2018/2019. Department of Agriculture Marketing and Cooperatives, Thimphu.

FAO. (2018). FAO's Work on Family Farming. Food and Agriculture Organization, Bhutan.

ILO. (2014). Findings of the Assessment of Agricultural Cooperatives in West Bank: Challenges and Opportunities. International Labour Organization, Switzerland.

Katwal, T. (2016). Multiple Cropping in Bhutanese Agriculture - Present Status and Opportunities. Peradeniya, Kandy, Srilanka. SAARC Agriculture Centre.

MoEA. (2015). Cottage, Small and Medium Industry Action Plan (2015-2018). Ministry of Economic Affairs, Bhutan.

NSB. (2012). RNR Statistical Report. National Statistical Bereau, Thimphu.

NSB. (2017). National Statistical Year Book. National Statistical Bereau, Thimphu, Bhutan.

NSB. (2018). National Statistical Year Book. National Statistical Bereau, Thimphu, Bhutan.

RGoB. (2009). The Cooperative Act of Bhutan (Amended, 2009). Royal Government of Bhutan, Bhutan.

RGoB. (2012). Cottage, Small and Medium Industry Policy of Kingdom of Bhutan. Royal Government of Bhutan.

RGoB. (2018). Sustainable Development and Happiness (Bhutan's Voluntary National Review Report on the Implementation of the 2030 Agenda for Sustainable Development). Royan Government of Bhutan.

SAC and AFA. (2018). 1st SAARC Agri Cooperative Business Forum (Strengthening Family Farmers Cooperatives to attain SDG- 1 and SDG- 2 in South Asia). SAARC Agriculture center (SAC) and Asian Farmers Association (AFA).

Country Perspective Paper

Chapter 4

Family Farmers' Cooperatives towards Ending Poverty and Hunger in India

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Abstract

A majority of people (55%) of total work force in India depend on agriculture for their livelihood contributing about 15% of country's GDP. Performance of agriculture is critical to achieve the economic growth to reduce poverty, hunger and malnutrition. Along with technological, infrastructural and policy measures, institutional arrangements are also needed to achieve rapid and inclusive growth in agriculture. Farming in India is largely managed by family with a majority of farmers being small and marginal with farms less than 1 ha in size. In an economic environment characterized by globalization, privatization and increasing competition, it is imperative that small farmers are organized to harness economies of scale, protect from exploitation, access markets and come out of poverty. Cooperatives have been recognized as one of such farmers' institutions that are founded on the principles of cooperation with emphasis on self help, self reliance, self organization and democratic functioning. There is a National Cooperative Policy and states have separate policies on cooperatives. Though cooperatives are playing a significant role in various sectors in agriculture, their success has remained as islands of success for reasons related to internal organizational features, interference from political and bureaucracy, lack of participation from members, technological laggardness, absence of partnerships and linkages, capital inadequacies, etc. The recent constitutional amendment will go some way in addressing the organization aspects, the capacity building and capital needs will only increase in the time ahead. Cooperatives thus have to evolve into more vibrant, responsive, effective and efficient institution and find a place for themselves along with other institutional arrangements evolving. The governments at the centre and at the state level have to play a more proactive role in strengthening the cooperative institutions and spirit and philosophy that continue to remain relevant in the current economic environment.

Keywords: Agriculture, cooperatives, poverty, hunger, polices, India

1. Background

The Indian Union is comprised of 28 states and nine Union Territories and is the largest among the SAARC countries. It is one of the least developing countries in the world. The structural composition of country's gross domestic product witnessed noticeable change as the contribution of agriculture declined rapidly and that of secondary and tertiary sectors grew fast. However, the structure of employment did not reflect those changes. Agriculture still remains the largest source of employment with about 55% of workforce engaged in agriculture as a source of livelihood (Rama Rao et al., 2018). This has important implications in terms of income inequalities across sectors and the persistent lower incomes in agriculture as reflected in poverty. Thus, the performance of agriculture is key to achieving the goals of poverty reduction, inclusive growth and reduction of hunger and malnutrition. Pursuit of these goals is at the centre of development planning at various levels in the country – at national, state and local levels – and is also the focus of Sustainable Development Goals (SDGs). Perhaps, it is time to give more emphasis on the employment dimensions while analyzing the performance of any sector. Agriculture should be able to release people while the other sectors should be able to absorb more labour. Enabling and driving the structural change of employment is, for sure, more daunting but it is the need of the hour in India.

The National Institution for Transforming India (NITI) Aayog, which is the apex think tank institution for development planning in the country, is monitoring the progress towards achieving various SDGs at the country and state level. There has been considerable variation across states and union territories. Figure 1 and 2 present current status of different states with respect to the first two SDGs—SDG-1 (no poverty) and SDG-2 (zero hunger). The initial status is measured in the form of an index that aggregate selected indicators from the National Indicators Framework that re relevant to the particular SDG (NITI Aayog, 2018). For example, the index for SDG-1 is based on indicators such as the proportion of population below the national poverty line, percent households with any usual member covered by any health scheme or insurance, percent individuals provided employment in relation to those demanded as part of Mahatma Gandhi Rural Employment Programme, percent households covered under social protection scheme of maternity benefit and percent homeless households. The gap between the country's goal for 2030 and the present status of each state with respect of each of these indicators was considered while computing the respective index.

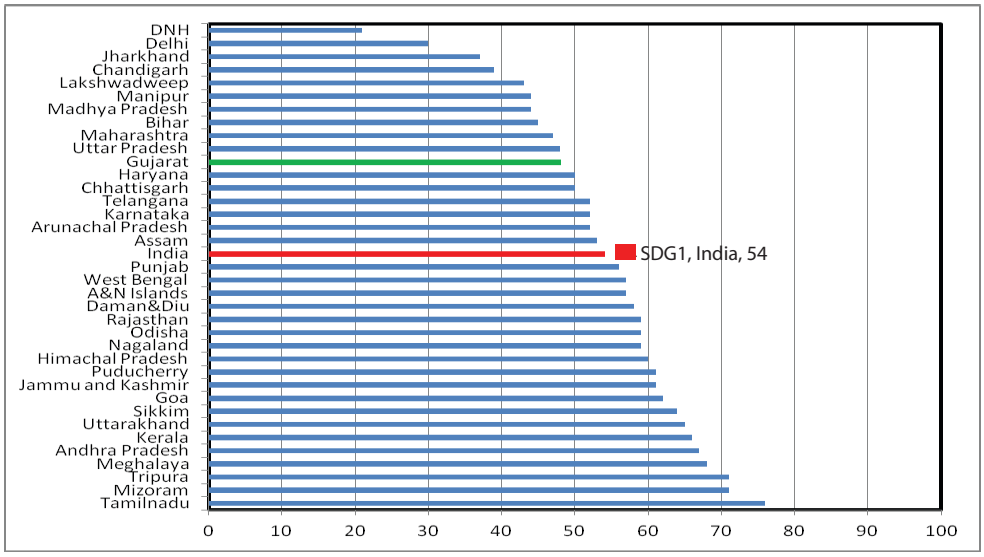

Figure 1. Status with respect to SDG-1 in different states of India

Source: NITI Ayog (2018)

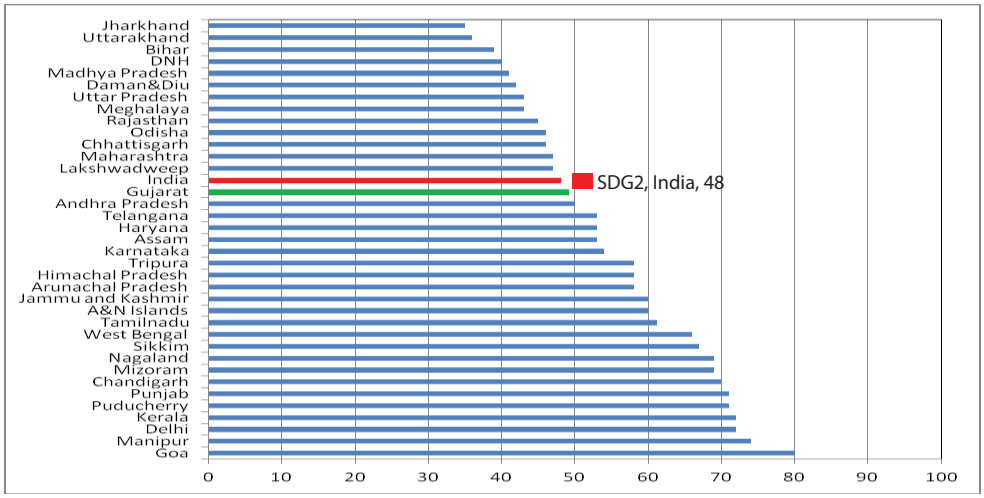

Figure 2. Status with respect to SDG-2 in different states

Source: NITI Ayog (2018)

Similarly, the index for SDG-2 was computed by combining indicators related to ratio of households covered by the public distribution system, prevalence of stunting among the children aged below 5 years, prevalence of anemia among pregnant women and production of rice, wheat and coarse cereals, which are major food grains in the country.

2. Country's Situation of Family Farmers

The Food and Agriculture Organization (FAO) of the United Nations defines a "family farm" as one that relies primarily on family members for labour and management. Thus, in India almost all the farmers can be considered as family farmers. About 85% of farms in India are less than 2 ha in size (Figure 3) and depend on family sources for labour and management. But, the small and marginal farmers[1] together own only about 45% of area. However, the dominance of small and marginal farmers varies across districts in India (Figure 4). Even in the larger farms, management is done by family entirely and sometimes a part of labour is also sourced from the family. More than 90 million farms are small in India. In the world, 500 million farms are considered as family farms out of 570 million farms and thus India can be considered as home to at least 10% of world's family farms. The average farm size deceased from 2.23 ha in 1970/71 to 1.12 ha in 2010/11.

Small farm size is considered as one of the potent limitations to raising farm incomes and to accelerating agricultural growth. The average farm size in India is declining over time as land is an inherited property. Smalls farms are more irrigated, use higher doses of inputs and are more productive compared to larger farms. However, the smaller size limits the quantum of production and level of incomes achievable, limits the opportunities to diversify and the smaller marketable surplus put them in a disadvantageous position to access markets near and far. World's most productive farms are family owned, larger in size and mechanized. In case of India, farms are family owned but neither large nor adequately mechanized.

The decade 2019-2028 is declared as the United Nations Decade of Family Farming (UNDFF) considering the role that the family farms play towards more sustainable food systems and in the pursuit of Sustainable Development Goals by 2030. Earlier, the FAO also declared the year 2014 as Year of Family Farming in order to guide policies for sustainable food systems and agriculture to have family farming at the focus.

[1] In India, the farm holdings are categorized into marginal (< 1ha), small (1 – 2 ha), medium (2 – 4 ha), semi-medium (4 – 10 ha) and large (>10 ha) based on the size of the holding.

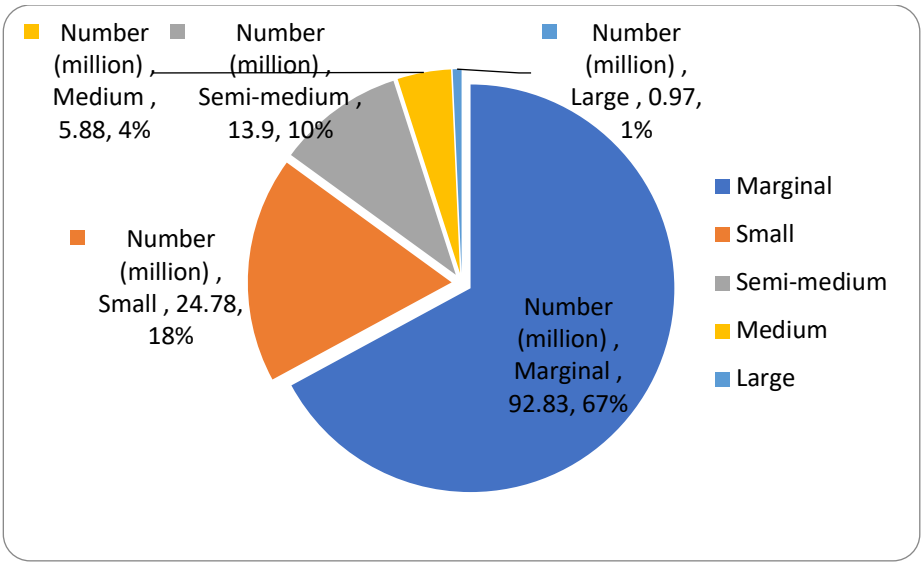

Figure 3. Distribution of farm holdings in India, 2010/11

Source: GoI (2015)

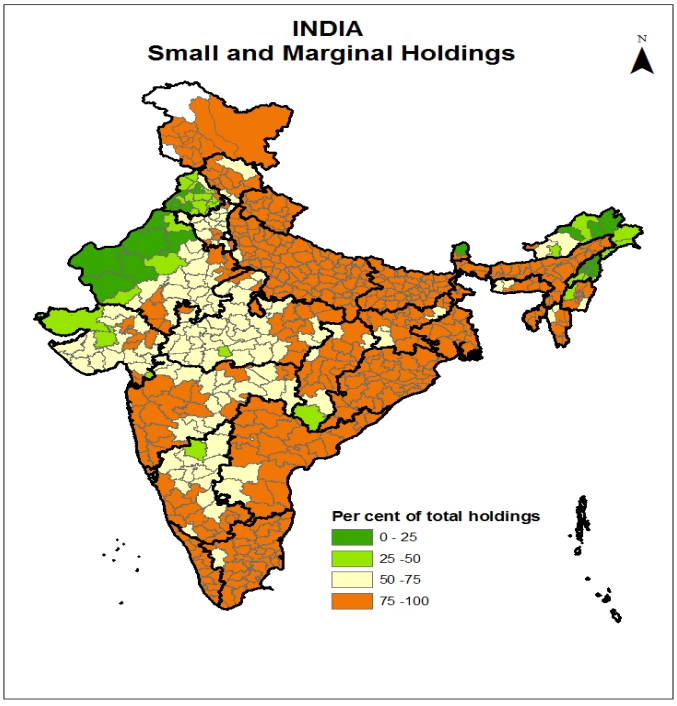

Figure 4. Percent of small and marginal farmers by districts in India

Source: Rama Rao et al. (2013)

3. Country Situation of Agricultural Cooperatives

The cooperative movement in India is more than a century old with the first act on Cooperative Credit Societies enacted during 1904 with the purpose of relieving the small and poor farmers from the clutches of money lenders. Since then, the cooperative movement underwent various phases that represented varying emphasis on different aspects and also reflected learning as the movement progressed. Each of the first seven Five Year Plans of the country dealt with cooperatives explicitly and thus cooperatives became a part of development planning. Though the initial emphasis was on credit delivery to the farmers, the scope of cooperatives expanded to production, marketing, input supply and to other services over time. The cooperatives in agriculture sector can be broadly categorized into the following four: Production cooperatives, Processing cooperatives, Service cooperatives and Allied sector cooperatives. There are a number of cooperatives outside agriculture in the areas related to housing, credit, consumer interests, textile and cottage industries, industrial production, etc.

3.1 Farming Cooperatives

The initial priority, after independence to the country, was development of agricultural sector considering the food situation in the country. A number of measures were initiated to increase production and productivity. Land reforms was one of the key policy steps taken to achieve a more equitable distribution of land, which is the most important factor of production. The problems associated with small farms in terms of lack of economies of scale, inadequate access to credit/capital, high transaction costs, etc. were recognized and the planning efforts took to cooperatives as an important means of addressing such issues. Attempts were made to organize in the form of better forming societies, joint farming societies, tenant farming societies and collective farming societies. However, only a few the joint farming societies could be formed and other forms did not really take off (Singh, 2019). There were about 9,473 farming cooperatives with about 257 thousand members operating about 488 thousand ha of land (Hegde, 2013). Because of reasons such as lack of awareness among the farmers, lack of motivating leadership, over emphasis on the size of membership rather than on participation, lack of vision among the executives, these societies could not really meet the objectives.

3.2 Processing Cooperatives

These are concerned with post-harvest aspects of agricultural production. The first processing cooperative society was established in India for setting up of a ginning factory in 1917. Subsequently, cooperatives for sugar processing, paddy milling, groundnut decorticating, copra and oil seed crushing, processing of fruit,

vegetables, tea and jute were established. These processing cooperatives with individual farmers, cooperative marketing societies and local service cooperatives as members are regulated by cooperative rules and by-laws. Among them, sugar processing cooperatives and cooperative dairy industries are more successful. In fact, the AMUL (Anand Milk Union Limited) is one of the most successful cooperative efforts. Similar efforts in the areas of *dal* mills, fruit and vegetable processing did not meet as much success.

3.3 Marketing Cooperatives

Marketing is an area where the small farmers tend to be exploited or have weak negotiating power resulting from low volumes of marketable surplus from the output of view and low volumes of input demand. In addition, they also incur high transaction costs. In order to enable small farmers deal with such issues, marketing cooperative societies were promoted. These societies were to aggregate input demand and production and thus help farmers realize better prices. There are two types of output cooperatives which differ in their vertical hierarchy: one is a two-tier system with local *mandis* and the state level apex society and the other one having an additional tier at the district level making it a three- tier structure. However, the state level elements of these structures did not perform well for various reasons such as inadequate working capital, influence of traditional methods of marketing, lack of technical support, lack of processing facilities, untrained personnel, high operational cost and not much emphasis was given to them after 2002/03. There are 28 state level marketing federations and 378 district cooperative marketing societies with thousands of village level cooperative societies.

Two large structured cooperative efforts are prominent in the Indian cooperative movement in the areas related to inputs and output marketing. One is IFFCO (Indian Farmers' Fertiliser Cooperative Limited) which is affiliated by a number of cooperative societies and is active in production and distribution of chemical fertilisers, an important input in agriculture. IFFCO is a multi-unit co-operative society and has made strategic investments in several joint ventures across India and the world, with the sole view of benefiting farmers in India. The entire activities of distribution, sales and promotion are coordinate by Marketing Central Office (MKCO) through over 39824 cooperative societies. In addition, essential agro-inputs for crop production are made available to the farmers through a chain of 158 Farmers Service Centres (FSCs). IFFCO has promoted several institutions and organizations to work for the welfare of farmers, strengthening cooperative movement, improve Indian agriculture.

Similarly, the National Agricultural Cooperative Marketing Federation (NACMF) of India was established in 1958 and is involved in procurement of cereals, pulses,

oilseeds, spices, cotton, forest produce, jute products, eggs, fresh fruits and vegetables from farmers through its cooperative network in selected areas whenever farmers faced problems of marking their produce. In addition to procurement, they are active providing market intelligence, supplementing storage facilities, supporting grading and standardization services, etc.

3.4 Service Cooperatives

Capital is one of the most limiting factors of production to small farmers. Both availability and cost of credit are major issues the small farmers are confronting. Providing credit at the local was though as important in helping farmers and hence cooperative institutes came into being. At present, there is a three- tier system that deals with short and medium-term credit needs of farmers. At the village level, there are Primary Agricultural Credit Societies (PACS). They are supported and governed by the Cooperative Central Bank at district level and Apex Cooperative Bank at the state level. There are 31 state cooperative banks and nearly 400 district cooperative banks and 120 million PACs forming a large network of institutions for delivering credit to farmers. In order to meet the long-term investment needs of farmers, there are similar organizations at district and state level. Table 1 presents the growth in the PACS in India over time. The PACS in addition to attending to credit delivery are also involved in distribution of agricultural inputs such as seed, chemical fertilisers, farm implements, etc.

Table 1. Status of primary agricultural credit societies in India

Particulars	**1950/ 51**	**1960/ 61**	**1974/ 75**	**1980/ 81**	**1990/ 91**	**1999/2000**	**2010/11**	**2016/17**
No. of societies	115,000	212,000	153,000	94,000	88,000	94,950	93,413	95,595
No. of members	0.54	1.70	3.60	5.75	8.40	10.84	12.12	11.36
Average membership per society	47	80	239	610	848	1,084	1,298	1,229
Share capital (INR* billion)	0.08	0.57	2.96	5.71	13.00	35.18	75.57	82.8
Working capital (INR billion)	0.41	2.71	15.35	85.62	85.62	424.95	1,442.22	1,605.08
Loans issued (INR billion)	0.22	2.03	9.01	18.86	46.79	232.97	913.04	1073
Loan outstanding (INR billion)	0.29	2.18	11.77	26.21	68.77	517.86	877.68	912.43
Over dues (INR billion)	0.06	0.44	5.03	10.85	31.39	154.76	226.98	243.04

Source: Sinha (1998), Ganesan (2014) and www.nafscob.org

*Note: *1 US$ = INR 4. 76 (1950-51, 1960-61), 8.10 (1974-75), 7.86 (1980-81), 17.5 (1990-91), 43.06 (1999-2000), 45.73 (2010-11) and 66.46 (2016-17) approximately.*

3.5 Allied Sector Cooperatives

These are related to the sectors such as dairy, poultry, fish production etc. associated with agriculture. The biggest example is the AMUL mentioned earlier which has actually provided inspiration to set up National Dairy Development Board (NDDB). There are a number of cooperative poultry farms but the stakeholders in this case are generally non-poor. Organization of individuals in the form of cooperatives is also significant in the fish production, agricultural labour supply, etc. At present, more than 98% villages in the country with cooperative societies though not all rural households are members in these societies. Cooperatives are conspicuously present in sugar production, oil marketing, dairy, etc. Together, the cooperatives are providing employment for more than a million people. Cooperatives are also active in processing of oil seeds, fruits and vegetables, plantation crops, jute, rice mills, cotton ginning and also in creation of cold storage facilities for agricultural produce. Table 2 presents the contribution of cooperatives to different agricultural related functions in the country. It can be seen that the cooperatives penetrated into most of rural India with 98% of villages covered by cooperatives. The PACs accounted for 19.13% of short -term credit and about half of the kisan credit cards issued. The presence of cooperatives is significant in sugar production, fertilizer distribution, milk procurement, etc.

To sum up, the cooperative movement in India has been driven from the top, the government, since beginning. The presence is variable across sectors and functions with in agriculture and across states as cooperation is a state subject under the constitution of India. The success during the initial phases was a result of financial support from the government, protection from competition of against private industry (e.g., sugarcane cooperative societies in Uttar Pradesh and Maharashtra) and favourable policies. However, the success could not be sustained for long, albeit there are numerous successful examples, and wide due to reasons such as lack of awareness and enthusiasm from the farmers, political interference, slow decision making, inadequate capital, rigid provisions, untrained manpower, etc. Other developments such as rising private industry, removal of protection, technological advances etc. also caused the cooperative sector lag behind in meeting the objectives they were supposed to serve.

Table 2. Share of cooperatives in different activities

Particular	**Percent (%)**
Rural network covered by cooperatives	98.00
Rural network (villages covered by PACS)	90.80
Total agricultural credit disbursed by cooperatives (2016/2017)	13.40
Short term agricultural credit disbursed by cooperatives to small and marginal farmers	19.13

Particular	Percent (%)
Kisan Credit Cards Issued by cooperatives (as at end- March, 2017)	50.20
Fertilizer distributed (2016/2017) (estimated)	35.00
Fertilizer production capacity (5.35 million tones for the year 2016/2017)	24.92
Installed number of sugar factories (284 as on 31.3.2017)	38.63
Sugar produced (5.654 million tones as on 31.3.2017)	30.60
Liquid milk marketed out of total milk procured by cooperatives	84.17
Milk procurement to total production (2016/17)	9.50
PACS having storage facility (at village level) (2016/17)	55.50
Total storage capacity of cooperative sector (2016/17) 22.77 million tons	14.79
Fishermen in cooperatives (active)	20.05
Wheat procurement (4.4 million tons during 2017/18)	13.30
Paddy procurement (7.5 million tons during 2016/17)	20.40

Source: NCUI (2018)

Cooperative movement in India is led from the bottom by people's enthusiasm in the states such as Gujarat, Maharashtra and is state led in states like Kerala, Tamilnadu. However, the elite principles of cooperation, based on which cooperatives have become relevant, continue to keep the cooperatives relevant and useful in the emerging institutional canvas in the context of agricultural development. There is emerging a spectrum of community based institutional innovations in the form of self-help groups (SHGs), Water Users' Associations (WUAs), watershed committees (WCs), etc. which are also based on the principles of shared vision, interest, voluntary action and democratic functioning. Producer Organizations (POs) are other form of farmers' organization with similar objectives as of cooperatives but more focussed on marketing and are registered under the Companies Act. Thus, the cooperatives also have to find a niche place among the vast and diverse social settings in the country and have to play an enabling and complementary role towards more sustainable agriculture and livelihoods of farmers, especially of the small farmers.

Recognizing the need for expanding the scale, scope and nature of operations beyond the geographic boundaries in the emerging marketing and trade environment, the government enabled the Multi State Cooperative Societies by amending the cooperatives Act. There are 1,445 such societies as on October 2018 (DACFW, 2018) out of which 227 are related to agriculture and 94 to dairy.

4. Government's Policy and Programmatic Incentives

Nurturing cooperative principles and cooperation is included as one of the Directive Principles of State Policy in the constitution of India. Cooperation was

recognized as one the drivers of agricultural growth considering the dominance of small holdings in the country.

The Government of India has set up several committees between 1990 and 2005 to review the functioning of cooperatives. The spirit of the recommendations of such committees is to enable cooperatives to transform into more democratic, self reliant, autonomous and modern institutional entities. The *Multi-state Cooperatives Act, 2002* (DAC, 2002 a) and the *National Policy on Cooperatives* (DAC, 2002b) are the outcomes of the recommendations of such committees. The objective of the policy is to provide support, encouragement and assistance for making cooperatives autonomous, self reliant and democratically managed institutions and accountable to their members (DAC, 2002b). An important objective of the policy is to withdraw the government's contribution to the share capital by increasing the equity of the members. The government allowed cooperatives operate in procurement of food grains, insurance and also provided financial support to the ailing societies.

There is an apex body called the National Cooperative Development Corporation (NCDC), a statutory body through an act of Parliament in 1962, under the Ministry of Agriculture, Cooperation and Farmers' Welfare (DACFW), Government of India that provides planning, promotional and financial support to a variety of agriculture related programmes undertaken by the cooperatives. The body is also providing support in the areas of rural industrial and other services such as irrigation, water conservation, agricultural insurance, sanitation, animal health etc. It advances loans and grants to the state governments for financing primary and secondary level cooperative societies. During 2017/18, NCDC has extended INR 217.7 billion[2] as loan and INR 2 billion as subsidy. The NCDC classifies states, based on the status of cooperatives into cooperatively 'developed', 'under developed' and 'least developed' in order to accord priorities in resource allocation and programme planning (NCDC, 2018).

The DACFW has launched schemes such as the Central Sector Integrated Scheme on Agricultural Cooperation (CSISAC) that provides financial resources, through the state government, to cooperative societies with the objectives of assistance for improving the economic conditions of cooperatives, remove regional imbalances and to speed up cooperative development in agricultural and allied sectors, help cotton growers to fetch remunerative price for their produce through value addition besides ensuring supply of quality yarn at reasonable rates to the decentralized weavers, overall development of selected districts in the country through cooperative efforts in agriculture and allied sectors and to assist National

[2] Indian currency (INR) equivalent: US$ 1 = INR 70.81 as of 2018

Level Cooperative Federation/ Multi State Cooperative Societies (MSCS) in the agriculture and allied sector to undertake promotional and skill development activities. There are provisions under the Differential Rate of Interest scheme to subsidize interest rates on loans taken by the selected groups of poor or social groups from the cooperatives. Interest rates above 4% are subsidized in such scheme.

The programme of Integrated Dairy Development Scheme was launched in 1993 to promote integrated dairy development for sustainable livelihoods of livestock owners. The programme created and nurtured village dairy cooperatives and provided support in terms of creating infrastructure, improved inputs, extension, product development and federation into district level bodies. The programme was implemented in 22 states through complete financial support from the Government of India.

Cooperation is included in the 'state list' of governing issues meaning that it is responsibility of the states to formulate appropriate policies, programmes and other means of support to the cooperative as they see fit given the state specific environment. Thus, different states have different policies and programmes for development of cooperatives. For example, the state of Andhra Pradesh promulgated a more liberal *Andhra Pradesh Mutually Aided Cooperative Societies Act* during 1995 in addition to the *Andhra Pradesh Cooperative Act of 1964*. However, the federal government does support the activities by planning programmes of her own and implements them either through the state government or directly supporting them. For example, the National Bank for Agriculture and Rural Development (NABARD), which is an apex rural and agricultural financial body at the highest level, supports cooperatives and other farmer's collectives in different ways.

NABARD's Producer Organization Development Fund (PODF) provides financial support to cooperatives, among others, to support capital needs including share, investment and working capital needs, infrastructure development, human resource development and technological up gradation of cooperative institutions. NABARD refinances the short and long-term credit disbursed by the credit cooperative societies, viz., PACS, SCBs, State Co-operative Agriculture & Rural Development Banks (SCARDBs). NABARD is also investing in research and development, monitoring and supervision, and human resource development of cooperative banking institutions in agricultural and rural sector.

The Small Farmer Agribusiness Consortium (SFAC), an autonomous society also financially supports various producer organization and producer companies. The federal government recognized the strong need for human resource development of those involved in and connected to cooperative development. Therefore, a

strong network of institutions for capacity building comprising of one central institution, five regional institutions and 22 state level institutions catering to the needs of human resource strengthening. These institutes work with other stakeholder organizations in planning and implementing various capacity building programmes for personnel at different levels.

In the recent budget 2019, an explicit focus was given to farmer cooperatives and other forms of farmers' collectives such as producer companies wherein about 10,000 producer companies were to be created and nurtured. A law was also enacted permitting farmers to do cooperative farming more freely. The objective of this initiative is to ensure economies of scale to small farmers in production and marketing. The recently created E-NAM (Electronic National Agricultural Market), which connects all the primary agricultural market committees across the country, and direct marketing of farm produce to consumers are to be better harnessed by farmers cooperatives.

5. Constraints and Challenges in Farmers' Cooperatives

It cannot be denied that cooperatives have played a significant role in agricultural development in the country by addressing the issues of small farmers. However, the success has been much less than the desired or expected and suffered from poor efficiency. The isolated success stories remained islands of success and did not spread to a scale that is required. While some of the global developments such as globalization of agricultural trade and rise of private sector as a strong competitor played some roles for the failure of cooperatives (Singh, 2019), the internal and systemic deficiencies are the major reasons why the potential utility of cooperatives could not be realized more fully. These reasons include lack of enthusiasm among the members, absence of dedicated and able leadership, lack of technical know-how, political interference in management, bureaucratic control and vested interests among the so called 'elite' members and Board of Directors. Mounting over dues are also an important reason in case of failure of credit cooperatives (Ebrahim, 2000). Inadequate capital, slow decision- making processes, inability to catch up with changing markets, and lack of modernization are some other reasons for the failure of cooperatives. The structural features of cooperatives like absence of provisions for transferability/ tradability of equity shares, distribution of profits based on patronage rather than on investment also discourages members to invest in cooperatives also constrain societies from borrowing (Rosairo et al., 2012).

The 97th amendment to the Constitution of India during 2011 attempted to address some of these crippling issues by making unambiguous provisions related to election and tenure of the Board of Directors, audit and monitoring of accounts by

the state government, independent audit, inclusion of SC/ST and woman members in the Board of Directors, right of information to the general members, etc. More importantly, the amendment made the formation of cooperatives a fundamental right and also provided for closure of defunct cooperatives based on democratic practices. However, how the act is implemented is left to the states.

One policy challenge in making cooperatives vibrant and viable is implementation of cooperative acts and provisions at the state level as the subject of cooperation is within the jurisdiction of the state government. States are best equipped to develop and strengthen cooperative institutions as these institutions are essentially 'local' in nature. However, the federal government can still give a framework based on the basic principles of cooperation as given by the International Cooperation Alliance (ICA) which should invariably be followed to allow states to access resources from the centre. As the principles of privatisation, decentralization and participation are increasingly becoming prominent in the pursuit of economic growth at different levels, it is important and critical that the implications of such trends are proactively considered and acted upon to preserve and strengthen the spirit of cooperation. Recognizing the emerging opportunities early and converting them into plans and action for common good of the members, which includes mobilizing the potential stakeholders, is one such issue. Equally important is the ability of cooperatives to forge partnerships with other organizations horizontally or vertically for maximizing the gains to the primary stakeholders. How the emerging policies and programmes address such issues remains a challenge. It is also needed to consolidate or reorganize the smaller societies into relatively larger ones so that the resources needed to be viable can be acquired. The wider presence of cooperatives can be utilized by the government in implementing programmes such as agricultural insurance, financial inclusion, etc.

6. Successful Stories and Best Model Cooperatives

There are a number of cooperatives that performed in a way that fulfilled the objectives of coming together. Such successful examples of cooperatives spread across sector and states in the country.

6.1 Gujarat Cooperative Milk Marketing Federation (GCMMF)

The Gujarat Cooperative Milk Marketing Federation (GCMMF) is one of the most successful cooperatives efforts in the sphere of milk production. Started with the inspiring words of Sardar Vallabha Bhai Patel in 1946 in Kaira district of Gujarat, India as a small group of small milk producers, it now grew into a huge society with about three million producers from more than 15,000 village cooperative societies in 15 districts handling about 9.4 million litres of milk every day. Apart

from the inspiring and visionary leadership of Dr. Verghese Kurien, investments in forward and backward linkages, careful efforts to build brand image and diversified product portfolio and accessing distant markets were behind the spectacular success of this cooperative. The brand 'Amul' is now popular in every household in the country. This cooperative played a key role in India's white revolution and in establishing the National Dairy Development Board. Transparent and efficient administration also played a key role. The cooperative is structured as a three- tier system, which is now followed by the dairy cooperatives in India (Rajendran & Mohanty, 2004), with village cooperatives and the apex state level body at the bottom and top level and the district level federations at the middle level. Though the society is now present across the country with numerous outlets and linkages with retailers and is also present in 37 different countries exporting milk and milk products worth INR 1,500 million every year, the society has always the interests of the primary producers at the centre of their focus. The society was recognized with National Quality Award. The society has a shared capital of more than INR 411 million and reserve fund of more than 873 million as on March 31, 2016 and has earned a post-tax income of about than INR 154 million for the financial year.

6.2 Indian Farmers Fertilizer Cooperative Limited (IFFCO)

The Indian Farmers Fertilizer Co-operative Limited (IFFCO) was established in 1967. Distribution of fertiliser inputs was one of the key areas where the cooperative societies were involved in the earlier phases. However, they were procuring the fertiliser from the public or private sector units. In their efforts to improve efficiency, a new society was established in the form of IFFCO which is now one of the largest producers and marketer of fertilizers in India. It was registered as a multistate co operative society on 3rd November 1967 with an authorized capital of INR 2,000 million. The society has developed into a premier organization in the capital- intensive fertilizer industry in India. The number of cooperative societies associated with IFFCO has risen from 57 in 1967 to more than 39,800 at present. It was a unique venture in which the farmers of the country through their own cooperative societies created this new institution to safeguard their interests. IFFCOs four most modern plants are located at Kalol, Kandla in Gujarat, Phulpur and Aonla in Uttar Pradesh having total annual production capacity of 8.5 million tonnes of fertilizers.

Some of the reasons for IFFCO's success include: i) Engagement in provision of services on agricultural, social and community aspects to the farmers and cooperatives along with production and distribution of fertilisers; ii) Ability to reach remote rural areas across the country through its network of cooperatives; and iii) Implementation of area specific agricultural development projects to

extend benefit of technology to the farmers through demonstration approach and to bring about overall development in the area. The cooperative is operating 158 farmers' service centres throughout the country. It has also been active in taking up projects in soil health improvement, rainwater management, watershed management, transfer of technology, farm mechanization, rural development (health, housing for poor and infrastructure creation, etc.), insurance, etc. through joint ventures with private sector as well as through creating subsidiaries and trusts.

6.3 MAHAGRAPES

Traditionally, the activities of the farmer cooperatives were limited to areas within the proximity of their location and largely limited to domestic and nearby markets. This was coming in the way of expanding operations to maximize the returns to the participating farmer members. Another reason for this is lack of forward integration in the value chain. Setting up of MAHAGRAPES, a cooperative effort of grape producing farmer societies in Maharashtra state of India is an example of how such barriers could be overcome by arranging for processing through a private industry and accessing export market (Singh, 2011). The society was established in 1991 with the help of Maharashtra State Agricultural Marketing Board and with the contribution of the National Cooperative Development Corporation. The initiative helped small grape growers' access profitable markets. However, the journey was not without problems in the form of poor quality of grapes resulting in rejection of the consignments. Farmers were then trained in adopting better technologies. This coupled with negotiating power helped farmers earn better incomes.

6.4 Mulkanoor Cooperative Society

Two independent but related successful efforts in cooperative movement emerging from a same village are worth mentioning. One is Mulkanoor Cooperative Rural Bank and Marketing Society Ltd. Started in 1956/57 with 373 members and INR 2,300 as share capital, the society is now advancing crop loans to the tune of INR 800 million and achieving more than 90% loan recovery. The society is also giving a dividend of 15% on share capital to the members. The society started with lending but gradually expanded into many activities such as distribution of agricultural inputs including machinery, seed production, seed processing, term lending, watershed development and also into social sector such as lending for non-crop loans, shopping complex, etc. It is even providing scholarships to the children of the members and conducting health camps. Transparent and efficient conduct of society's affairs, regular elections to the board of directors and emphasis on members' education are some of the key reasons

behind the success of this cooperative society. Seed production is helping its member farmers earn very decent incomes. The society procures foundation seed from the Agricultural University in the state and provides them to the member farmers, who are trained and have access to irrigation, to multiply them into certified seed which is then sold in the market. The society invested in training farmers in technical aspects of seed production and close monitoring by trained man power. The society earned trust among the farming community for the quality of its seed through diligent efforts, sometimes even replacing the seed if it fails to germinate on farmers' fields or compensating them for the loss. The society did not deliberately go into production of seed material of other crops where there is competition or farmers are not well trained and thus avoiding risk (Joshi, 2015).

There is also another woman cooperative dairy which has had its roots in the thrift based self help group. When the group has accumulated a sizeable amount of savings, they have desired to invest the savings in an activity that brings income to the members. They got a market survey done which showed a supply-demand gap for milk in the smaller towns in the region which are getting milk from outside to meet the local consumer demand. They hired local people to work for the society which became cost effective as well as brought emotional attachment with society and diversified their products. Thus, the society became effective and turned out to be successful.

Cooperatives have been successful in sugar production in states such as Gujarat and Uttar Pradesh. Some successful and exemplary cooperative efforts in non-agricultural sector were documented by National Cooperative Union of India to celebrate the year 2012 as Year of Cooperatives (NCUI, 2012).

The following are some of the features of successful cooperative efforts:

- Support to the primary stakeholders to adopt the improved technological practices.
- Diversified portfolio of products and activities.
- Transparent management and able administration with the interests of the stakeholders at the centre.
- Regular elections to the board of management.
- Use of state of art technologies and methods in managing the society.
- Effecting synergistic forward and backward linkages related to product portfolio.
- Eliciting and enabling active participation by the members.
- Contribution to social and community welfare to gain trust among the community.
- Able, committed and strong leadership.

7. Policy and Programme Recommendations

Cooperatives have been considered as important means of organizing small farmers in India to address the limitations associated with small farm size. Connecting the small farmers with markets has been one of the important functions of cooperatives. However, only a small fraction of them could succeed. The reasons for such failure are many as indicated in the previous section. However, the successful cases of cooperatives and other collective institutions did show that it was possible to bring together farmer members to help themselves through their collective action and move on the path towards higher incomes and better welfare. However, the success is dependent on the prevalence of favourable conditions group making followed by sound management practices, able leadership, democratic functioning, capacity building, ability to access markets, forging partnerships with other stakeholders across value chain, etc. Some of the features of cooperatives do limit the ability of these institutions as a vibrant and wealth creating structure in an environment of fast changing markets, increasing competition from private industry with profit maximization as a motive rather than welfare orientation of cooperatives, decentralized planning. The policy challenge then is to create conditions for cooperatives without losing the spirit of self help and self reliance to be able to thrive in the emerging environment and help small holders achieve their economic goals.

The cooperatives can imbibe some of the features of the producer companies that give more emphasis on profit maximization. Like producer companies, the cooperatives may be given a legal status so that they can borrow from the market. This provision has, however, to be preceded by other reforms related to tradability or transferability of shares. It is desirable to have the share values assessed periodically and permit transfer of shares at their recently assessed values within the membership (NRCRL, 2009). Other policy intervention is in the area of obligation to buy the entire produce from members. The cooperatives should be enabled to forge partnerships horizontally and with informal community organizations like SHGs. The governments will do well to not interfere with the management and even consider providing capital as grant or on subsidy rather than through the route of contribution to share capital. Cooperatives need to be supported by other resource organizations such as civil society organizations that can help adopt better technologies (Hegde, 2013), add value to the produce, bring business skills and provide legal support. Programmes should provide for hand holding during the initial phases through financial support, capacity building of the members and executives in business management, market research, group working dynamics, etc. In fact, such orientation should start even during the formation of cooperatives so that the initial problems can be resolved quickly.

8. Conclusions

Farming in India is largely managed by family with a majority of farmers being small and marginal with farms less than 1 ha in size. In an economic environment characterized by globalization, privatization and increasing competition, it is imperative that small farmers are organized to harness economies of scale, protect from exploitation, access markets and come out of poverty. Cooperatives have been recognized as one of such farmers' institutions that are founded on the principles of cooperation with emphasis on self help, self reliance, self organization and democratic functioning. Cooperative movement in India is more than 100 years old and evolved over time with government support and are nurtured by people's movement in some cases. Though they are playing a significant role in various sectors in agriculture, their success has remained as islands of success for reasons related to internal organizational features, interference from political and bureaucracy, lack of participation from members, technological laggardness, absence of partnerships and linkages, capital inadequacies, etc. The recent constitutional amendment will go some way in addressing the organization aspects, the capacity building and capital needs will only increase in the time ahead. Cooperatives thus have to evolve into more vibrant, responsive, effective and efficient institution and find a place for themselves along with other institutional arrangements evolving. The governments at the centre and at the state level have to play a more proactive role in strengthening the cooperative institutions and spirit and philosophy that continue to remain relevant in the current economic environment.

References

DAC. (2002a). Multi-state Cooperative Societies Act 2002. Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Government of India, New Delhi. 77 pp.

DAC. (2002b). National Policy on Cooperatives. Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Government of India, New Delhi. 16 pp.

DACFW. (2018). List of Registered Societies under MSCS Act. Available at https://mscs.dac.gov.in/SummaryList.aspx (viewed on 15 July 2019).

Ebrahim, A. (2000). Agricultural Cooperatives in Gujarat, India: Agents of equity or differentiation? Development in Practice. 20: 178-188.

FAO. (2019). Food and Agricultural Organization of the United Nations (http://www.fao.org/news/story/en/item/207544/icode). Accessed on 12 July 2019.

Ganesan, P. (2014). A Study on Mobilization and Deployment of Funds by the Primary Agricultural Cooperative Banks in Salem District. PhD Thesis.

GoI. (2015). All India Report on Agricultural Census, 2010/11. Agricultural Census Division, Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture, Cooperation and Farmers' Welfare, Government of India. P. 441.

Hegde, N.G. (2013). Agricultural Cooperatives can Improve Livelihood Security of Rural Poor. Indian Farming. 62 (10): 1-10.

Joshi, S. (2015). Mulakanoor Guiding Light of India's Cooperative Movement. Down to Earth.

NCDC. (2018). Annual Report 2017/18. National Cooperative Development Corporation, Government of India, New Delhi.120pp.

NCUI. (2012). Cooperatives Surge Ahead: Tales of Success and Achievement. National Cooperative Union of India, New Delhi. 169 p.

NCUI. (2018). Indian Cooperative Movement: A Statistical Profile. National Cooperative Union of India, New Delhi. 167 p.

NITI Aayog. (2018). SDG India Index: Baseline Report 2018. National Institution for Transforming India, NITI Aayog, Government of India, New Delhi. Pp.270.

NRCRL. (2009). Report of the Working Group on Producer Companies. National Resource Centre for Rural Livelihoods (NRCRL), PRADAN.

Rajendran, K. and Mohanty, S. (2004). Dairy Marketing and Milk Cooperatives in India: Constraints and Opportunities. *Journal of Food Distribution Research*. 35(2): 34-41.

Rama Rao CA, Raju BMK, Subba Rao AVM et al. (2013). Atlas on Vulnerability of Indian Agriculture to Climate Change. Central Research Institute for Dryland Agriculture, Hyderabad P 116.

Rama Rao, C. A., Raju, B. M. K., Samuel, J., Kumar, R. N., Satish, G., Meghana, Y. L., Swapna, N. and Reddy, P. Sudhakara (2018). Mapping Natural Resources and Agricultural Performance for Targeting Interventions and Investments in India. *Agricultural Economics Research Review*, 31 (conference): 65-77.

Rosairo, H.S.R., Lyne, M.C., Martin, S.K. and Moore, K. (2012). Factors Affecting the Performance of Farmer Companies in Sri Lanka: Lessons for Farmer-owned Marketing Firms. *Agribusiness* 28(4) pp. 505-517.

Singh, S (2019). Community and Collective Organizations for Sustainable Agricultural Development in India: Experience, Challenges and Policy. *Indian Journal of Agricultural Economics*, 74 (1), 96-122.

Singh, S. (2011). Public Private Partnerships for Agribusiness Development in Thailand and India: Experiences, Issues and Strategies. In: C.A. da Dilva and N. Mhalanga (Eds) (2011) Innovative policies and institutions to support agro-industries development, FAO, Rome, Chapter 3, pp.41-62.

Sinha, S. K. (1998). Rural Credit and Cooperatives in India. Suneja Publishers, New Delhi. 79.

Country Perspective Paper

Chapter 5

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Maldives

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Abstract

Agriculture used to be the main source of domestic food supply in Maldives. Product from coconut, copra was one among the few commodities exported during 1970s. During 1990s, several new crops were introduced by farmers and the agriculture sector has been transformed significantly. However, the engagement of family members in farming started to decline due to the increased employment opportunities in non- farm sectors. Cooperative model was introduced to the agriculture sector in Maldives since 2011 along with the implementation of a three-year UNDP supported project "Support to Integrated Farming". Although cooperatives are helpful to attain several economic, social and environmental indicators of SDGs, the concept is not widely utilized and the benefits are not shared enough within the island communities. Addu Meedhoo Cooperative Society (AMCS) is one the most successful cooperatives engaging in agriculture sector and is under the full functioning. The role of AMCS in the development of agriculture in Addu City is recognised and appreciated by the people as well as the government. We suggest to adopt cooperative approach; use of improved technologies; access to inputs; and effective coordination and cooperation of farming communities, public, private and development partners in the country.

Keywords: Agricultural cooperative, family farming, poverty, hunger, Maldives

1. Background

The Republic of Maldives is a small island developing state (SIDS) located in the vast Indian Ocean isolated from the Asian mainland. The nation consists of 1,190 coral islands that are scattered into an area of 90,000 km^2 (MOFMRA, 2006). Despite the isolated nature of these islands and its small size, the total population

of 407,660 of the country resides in only 186 islands that are spread across the country (NBS, 2015). In addition to the small size, the natural resources available in these islands are limited. Nonetheless the country achieved significant economic growth in the past few decades by increased development of tourism after the realization of the unique beauty of its islands. Fishing used to be the major industry of the Maldives and the only source of foreign currency until 1972 (Linton & Shareef, 2011), while recently it became the second largest contributor to the economy after the tourism sector.

Before 1972, coconut, maize, sorghum, finger millets, sweet potato and breadfruits grown within the island and fish caught within a close distance from the islands, were the main sources of food of the island communities. At that time, crop cultivation and its trade were not easy due to the geographic isolation and transportation difficulties between the islands. The agriculture sector has transformed significantly over the past few decades. However, the contribution of agriculture to the GDP continued to decline because of increased share of tourism sector in the country.

Back yard gardening is the most common in Maldives. Entire families used to engage in farming and a variety of crops are cultivated in a small piece of land at the backyard. Coconut is cultivated in almost all the islands. Exchange of agricultural goods to dried fish between fishing and farming islands was a common practice until 1970s. Official trade of agricultural produce started during the first quarter of 1970s. Copra, a product produced from coconut was the major agricultural commodity exported. Coconut palms were very close to the hearts of Maldivians and hence considered as the **"tree of life"**. Apart from the income generated from copra trade, coconut palms were the main source to fulfil basic needs of the island communities. Palm leaves were used for thatching and the wood from the trunk of palms were utilized to build almost everything from basic shelter, furniture and household utilities to boats which were used as vessels to travel in between islands. The coconut husk was used to make rope.

Coconut growers were of a priority by the governments then as regular pest control programs were conducted by the government to control rats damaging coconut groves. These programs gained attention and were cherished by the public. The first biological control introduced in Maldives was oryctes virus to control the crop-devastating pest rhinoceros beetle that was attacking coconut palms during the 1980s (Rasheedh, 2019).

Transportation from one island to the other gradually started to improve during 1990s that opened better opportunities for agricultural trade. The in-charge of the household, the men, handed over the farm operation's responsibilities to their housewives, started travelling to Male' with their agricultural produce to sell the

products in the local market. Women played a pivotal role in the development of Maldivian agriculture. Although women's primary responsibility in developing countries, like Maldives has been traditionally about managing home and taking care of children, their engagement in agriculture related activities like managing farm operations, taking care of plants, harvesting, processing and selling are remarkable.

A significant development in agriculture were seen during 1990s. Several new crops and varieties were introduced to farmers along with the provision of technical support services through then the newly established government extension service system. Compared to the earlier days, agriculture industry in the country has transformed and today the main staples being rice and wheat, while it is surprising enough to know that none of these crops are being cultivated locally. The list of commonly cultivated crops has changed over the past few decades. Presently, the most popular crops among Maldivian farmers are coconut, breadfruit, guava, wax apple, custard apple, pond apple, mango, banana, papaya, betel nut, betel leaves and cash crops like, chili, eggplant, passion fruit, collard greens, pumpkin and watermelon. Moreover, some root crops including sweet potato, cassava, yam and taro are still common in few islands.

The major challenges in agriculture is the allocation of resources; less than 1% of the total budget towards development of agriculture sector in the country. Similarly, easy access to inputs at island level (improved seeds, fertilizers, pesticides, etc.) and marketing of agricultural produce are some of the main challenges for the farming communities. Farmers obtain necessary inputs from the retail shops operated mainly in the capital city, Male'. Central market located in Male' is the main hub where most of the agricultural products are sold. It is extremely difficult and costly for the farmers to bring their produce from far distances as they have to compete with similar produce coming from islands near Male' with lower cost of transportation.

According to the statistics of the National Bureau of Statistics (NBS, 2017), the agriculture shared only 1.8% of the GDP in Maldives. Official records of the Ministry of Fisheries Marine Resources and Agriculture (MOFMRA, 2019) shows that 7,536 registered farmers are active in agricultural operations in 77 inhabited islands. Furthermore in 2019, commercial agriculture production is underway in 50 uninhabited islands (MOFMRA, 2019).

2. Country's Situation of Family Farming

Before the introduction of tourism, fishing and farming were the only sources to generate food for the households living in islands. Males are dominant in fishing activities as in Maldivian tradition, fishing has been considered as a men's activity.

When fish are brought home, the processing activities like cooking, cleaning, sun drying, sorting and packing of fish is handled by women. Unlike fishing, the involvement of men and women are slightly equal in farming activities.

In the recent history, extended families used to live together under the same roof and almost everyone wishes to have as many children as possible. Until 1980s, it was normal to find families with 6-10 children. People believed that more children would bring more hands for them to expand their farming business. What they did not realize was the food they could produce from the poor genetic resources and with limited land available was merely enough for the families to survive than to make an adequate business out of it. The earning from agriculture was not enough to spend on basic necessities of the families such as education, medical and most importantly to meet the essential nutritional requirements. Poor living conditions of these families made them more vulnerable to the diseases and it hindered the overall development of country. The trend of having more children came to an end with the nationwide awareness campaigns on wellbeing and birth control in the late 1980s (Rasheedh, 2019).

The overall economic development achieved during the past few decades have had tremendous impact on the family farming activities of the islands. People in the islands started to move away from homes for better employment opportunities that came along with the opening of new tourist resorts. At the same time, fishing industry flourished with the inauguration of new tuna canning factory. Furthermore, the employment opportunities opened up in the capital city Male', pulled huge number of people away from their farm lands.

The working age group contributes 68% of the total population (NBS, 2015). The typical mind-set of youth made more challenging to retain young working force in farming activities. On the other hand, it became an excellent opportunity for other employment sectors to grow their businesses. Today, majority of the people engaged in agricultural activities are old age pension holders. Very few people from working age group also practice farming to supplement their income. Family members that used to work together in farms have been replaced by foreign laborers. It is disappointing to mention that in some major agricultural islands, farming activities have been completely left on the hands of foreign workers.

3. Country's Situation on Agricultural Cooperatives

Cooperative society is a registered, democratically controlled business entity owned by people to unite together voluntarily for the purpose of achieving common economic, social and cultural goals. Apart from economic benefits, members of cooperative societies can enjoy a range of services and opportunities. It is evident that cooperative societies could play a vital role in the development of

agriculture by supporting small scale producers (FAO, 2012). The business model of "cooperative societies" is a relatively new concept for Maldives. It was introduced during a three-year project funded by UNDP from 2011 to 2013, "Support to Integrated Farming" (SIF). Later, new cooperatives were emerged under the support of Fisheries and Agriculture Diversification Program (FADIP), IFAD funded project that was effective in 2009. FADIP project aims to support farmers living in distant islands to overcome their challenges through cooperative societies. Under the assistance of this project, value chain cooperatives were in established in six islands (Table 1). Six of these value chain cooperatives were agriculture whereas the other two were related to fishery. Upon establishment, capacities of these cooperatives were built on areas of business management, accounting, value addition of specific commodities and marketing. In addition to all the technical support, financial assistance was also provided to all the six cooperatives. This project was successful in increasing community involvement in the agricultural production systems through the establishment of agricultural cooperatives.

Table 1. Cooperative societies developed under the assistance of FADIP project

Name of the Cooperative	**Sector**	**Major Areas Interventions**
Addu Meedhoo Cooperative Society.	Agriculture	Business administration, financial management, farm management, processing of agricultural produce, value addition and packaging, marketing.
Funaadu Development Cooperative Society.	Agriculture	
Faafu Magoodhoo Cooperative Society.	Agriculture	
Laamu Farmers Development Cooperative Society	Agriculture	
Tribia Cooperative Society.	Agriculture	
Bizville Maldives Cooperative Society.	Agriculture	
Gemanafushi Cooperative Society.	Fisheries	Business administration, financial management, processing value addition and packaging of fishery products, marketing.
Naifaru Cooperative Society.	Fisheries	

Source: MOFA (2018)

4. Sustainable Development Goals–No Poverty and Zero Hunger

Maldives is the first MDG+ country in South Asia, attaining MDG goals ahead of its schedule. Soon after SDGs became effective in September 2015, necessary steps were taken by the government to outline the country specific SDG agenda. Under the initiative of the Ministry of Environment and Energy (MEE) in 2016, nation-

wide consultations on the topics of SDG took place, public awareness and SDG coordination mechanism was established at the institutional level (Sobir, 2017).

Although reliable and up-to-date data is an essential element to make firm decisions especially in resource allocation, agriculture data collection mechanism is not well established in the country. In order to understand the country's situation and readiness of the country for the implementation of SDG goals, a report on "Data Updates on Sustainable Development Goals" was published (NBS, 2018). The report estimated the progress on SDG-1 (Table 2) and SDG-2 (Table 3).

Table 2. Indicators and its achievement updates for SDG-1 at country level

SDG-1. End poverty in all its forms everywhere. All people nation-wide, including the poorest and most vulnerable, should enjoy a basic standard of living and social protection benefits.	
Indicator	**Achievement (2016)**
1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than US$ 1.25 a day.	Proportion of the population below international poverty line US$ 1.25 is 6.6%.
1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.	Proportion of the population below national poverty line (MVR 74[1]) is 8.2%.
1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.	10% of the total population is benefiting from one of the national social protection schemes.
1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	82 people died and 26 went missing in the Tsunami (December 2004).
1.a: Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programs and policies to end poverty in all its dimensions.	Proportion of total government spending on essential services during 2016, Education 13%, Health 17%, Social Protection Services 12%.

Source: NBS (2018)

[1] Maldivian currency (MVR) is equivalent: 1 US$=15.42 MVR

Table 3. Indicators and its achievement updates for SDG-2 at country level

SDG-2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.	
Indicators	**Achievement (2016)**
2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	▪ Data not available.
2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	▪ 19% of children under age 5 are stunted and 6% severely stunted. ▪ 20% of children under age 5 in atolls are stunted.
2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	▪ Data not available.
2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	▪ Data not available.
2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.	▪ Data not available.
2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in least developed countries.	The Agriculture Orientation Index (AOI) for government expenditures is 0.17 in 2014.
2.b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.	▪ Data not available.
2.c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.	▪ Data not available.

Source: NBS (2018)

5. Government's Policies and Programmatic Incentives

The government elected in November 2008 came with a manifesto that transformed the Ministry's long-standing engagement with groups of farmers. Long history of providing ad hoc support to individual farmers came to end. Supporting the establishment of new cooperatives and providing financial and technical support to strengthen the existing cooperatives were included in the *Strategic Action Plan* (2008-2013) of the Ministry (MOFA, 2009; MOFA, 2014). Apart from input subsidies, which was targeted for individual farmers, priority was given for cooperative societies during the provision of all other financial and technical assistance.

An unprecedented opening of a Small and Medium Enterprise (SME) development bank in Maldives this year intends to promote and support small businesses. Soft loan schemes to support fisheries and agriculture activities were among the first that were made available from this bank. These loans are targeted for individuals, cooperative societies and SMEs. Cooperatives can apply for loans up to MVR 2,000,000 while the maximum allocated for individuals are MVR 500,000 (SDFC, 2020).

The *Business Registration Act* (Law No. 18/2014) requires all business operations to be registered with the Ministry of Economic Development as a company, partnership, cooperative society or as a sole proprietorship (MED, 2019). Since farming activities are generally conducted in a relatively small-scale, the registration process is kept very lenient as compared to other businesses. Farmers' registration process is governed by MOFMRA and unlike other businesses it is voluntary for farmers to register with the Ministry. In order to encourage farmers to register, incentives are provided such as giving priority for registered farmers in case of technical and other assistance.

The *Cooperative Societies Act* (Law No.3/2007) came into effect in 2007. The formation, registration and operation of cooperative societies in Maldives is governed by this Act. Unlike other business entities the membership of cooperative societies is strictly limited to Maldivian citizens and are open to engage in various community-based socio-economic developmental activities (MED, 2019).

6. Constraints and Challenges in Farmers' Cooperatives

Since it is very difficult for the government to make individual beneficiaries accountable for the assistance provided, the government encourages farmers to establish and register cooperatives as a formal business entity. It was believed that they would utilize the available resources and assistance provided by the

government more responsibly. Unfortunately, this was not the case. The government encountered several challenges in making cooperatives accountable, as many become non-functional when key personnel left the team or due to mismanagement of administration and financial practices.

The role of well-established successful cooperatives can have significant impact in achieving SDGs as cooperatives are an enterprise with the principle objective of serving the communities to achieve economic benefits while caring the nature and ensuring that socio-cultural interests are addressed (ILO, 2015).

As the already existing cooperatives are still in its infant stage, they are in need of more attention and support by the government through well designed policies and strategies. The new policy document and strategic action plan is well aligned with SDG indicators. However, current policy document and strategic action plan is not designed towards taking full advantage of the cooperative model in order to achieve SDGs.

Sharing resources and trusting members within the cooperative and its management is essential in every cooperative society. It is difficult to change the mind-set of farmers who have a long history and tradition of working independently. Currently, several challenges are faced when convincing a farmer to join a cooperative society. Another challenge is the limited human capacity to establish and operate a cooperative society. In an island community, it is difficult to find people with the entrepreneurial mind set and capable to manage cooperative society. Those who take initiatives to form cooperatives are often well educated and often there is a mismatch between his/ her job and the functions of cooperative societies. This could be the main reason behind the top personnel in cooperative societies losing interest soon after the business operations begin.

Some of the main challenges on achieving SDG-1 and SDG-2 include poor coordination and monitoring mechanism within institutions, lack of proper mechanisms for data collection and sharing, and poor human resource capacity. The government officials and policy makers in most of the institutes are not well aware of how SDGs fit in the mandates of what they execute. *National Development Plan* (NDP) normally reflects SDGs however it is challenging to successfully implement such plans due to lack of proper understanding of the priorities at different levels: island, atoll and national level.

7. Successful Stories and Best Model Cooperatives

Several cooperatives came into operation soon after the governments' policy initiatives began to promote cooperatives. Some of the cooperatives established under FADIP project are still well functioning and therefore, can be considered as

model cooperatives. AMCS is one of the most successful cooperative operating today. Addu Meedhoo Island, where AMCS belongs to is located at the far end of the south of Maldives being completely isolated from the main markets. This has limited the islands' access to markets, discouraging farmers to expand their production for a very long time. AMCS has created market opportunities for the farming community. The cooperative also offers several other services including credit facilities, easy access to farm inputs as well as technical support for crop producers.

Unlike other cooperatives, within a short period of its establishment, the efforts of the energetic members in the management established trust among farmers towards this new business enterprise. Farmers who have stopped commercial cultivation and people completely new to agriculture started farming within the second year of the cooperative's operation. With the new comers, 130 new plots of 20,000 square feet in each were allocated for crop cultivation by the island council (MOFA, 2017).

The dedicated cooperative societies demonstrated that agriculture has the potential in rest of the islands in the Maldives. Also, they were the first cooperative that formed a contract with a tourist resort to supply their agricultural produce. In order to maintain quality of the produce and consistent supply, collection centers were established near farming area. Sorting, grading and packaging started to take place within this centre.

The engagement of cooperative societies in the whole food value chain from production to marketing is exemplary for others. Members of the cooperatives were constantly advised on what crops to cultivate during the certain period and in order to avoid market flooding, several new crops were introduced to farmers including micro herbs, red cherry tomato, yellow cherry tomato, asparagus, zucchini which are not commonly grown in other parts of the country. During the third year, the cooperative expanded its market coverage by forming agreements with two additional resorts. With this expansion, the cooperative societies started buying agricultural produce from farming islands located in farther atolls. Today, AMCS is a well-known and reputable agriculture business enterprise in the Maldives.

8. Policy and Program Recommendations

Agricultural development requires a sustainable business model. The business model must ensure the sustainability of environment, respect the social norms, and assist the community to achieve economic benefits. Since cooperative is a perfect fit for this model, it is recommended:

- Involve cooperatives in the national dialogues and provide opportunities for them to share their experiences with potential island communities.
- Facilitate cooperative societies to engage in agricultural development with increasing economies of scale in production and marketing.
- The government should support cooperative societies at the early stage in terms of technical, financial, and institutional capacity development; formulate clear exit strategies; and let cooperatives function on their own.
- Conduct awareness campaigns to local government officials in various regions to share benefits of cooperative societies such that they themselves can start promoting and assist in establishment and operation of cooperative societies in their own islands.

In order to achieve the targets of SDG-1 and SDG-2, it is important to identify the key policy interventions that are well integrated with these two goals and which are prioritized in the process of budget allocation. Extra attention should be given on:

- The government officials, policymakers and general public should advocate on the need of aligning their work to SDG and increase SDG based dialogues during the formulation of government's long-term plans and annual budgets.
- Develop skills and capacities of individuals to collect meaningful data that can be used to analyse SDGs achievements.
- Invest in establishing data collection and sharing mechanism with easy access to the stakeholders.
- Develop mechanisms to monitor achievements of SDGs, regularly review progress, and address constraints.

9. Conclusions

Rapid economic growth that the Maldives achieved in the last few decades have transformed all economic sectors including agriculture. Today farming seems to be an activity for pension holders and foreigners rather than for families working together like it used to be. Complete dependence on food grown at the backyard has now become a part of the history for the island communities. Cooperatives were introduced in Maldives not long ago and most of the people are quite unfamiliar about this business concept. With policy initiatives and assistance from international development partners, few agriculture cooperatives have been developed and are in function. AMCS is considered as a role model and is one of the best cooperatives under operation today. Maldives, being the first MDG+ country in South Asia, has continued its efforts in coordinating the programs, projects and activities run by various government institutions in alignment with

the SDGs. Yet, the shortage of essential data that is required to understand SDG's achievements is an obstacle that needs to be tackled with appropriate mechanism in the country. The success stories of AMCS show that the promotion of farmers' cooperatives can contribute towards achieving SDG-1 and SDG-2 in Maldives.

References

FAO. (2012). Agricultural Cooperatives: Paving the Way for Food Security and Rural Development. Food and Agriculture Organization of the United Nations, International Fund for Agriculture Development, and World Food Program, Rome.

ILO. (2015). Cooperatives and the Sustainable Developmet Goals: A Contribution to the Post- 2015 Development Debate. A Policy Brief. International Labour Organization, Geneve.

Linton, J. & Shareef, F. (2011). Finanacial Services for the Fisheries Sector. Maldives Case Study. German Agency Technical Corporation (GTZ), and Natural Resource Institute, The University of Greenwich.

MED. (2019). Doing Business in Maldives. Ministry of Economic Development, Male.

MOFA. (2009). Strategic Action Plan 2008 – 2013 in Agriculture Sector. Presidents Office of the Republic of Maldives, Male'.

MOFA. (2014). Strategic Action Plan 2013 – 2018 in Agriculture Sector. Presidents office of the Republic of Maldives, Male'.

MOFA. (2017). FADIP Project Update Report. Ministry of Fisheries and Agriculture, Maldives.

MOFA. (2018). FADIP Project Update Report. Ministry of Fisheries and Agriculture, Maldives.

MOFMRA. (2006). Atolls of the Maldives. Retrieved from Atolls of the Maldives: Retrieved from http://www.atollsofmaldives.gov.mv/.

MOFMRA. (2019). Internal Records, Uninhabited Islands and Lagoons Section. Ministry of Fisheries Marine Resources and Agriculture, Maldives, Male'.

NBS. (2015). Maldives - Population and Housing Census 2014. National Bureau of Statistics, Male'.

NBS. (2017). Statistical Yearbook of Maldives 2017. National Bureau of Statistics, Department of National Planning, Male'.

NBS. (2018). Data Updates on Sustainable Development Goals. National Bureau of Statistics of the Republic of Maldives, Male'.

Rasheedh, I. (2019). Agricultural Development in Maldives. Retired Senior Agriculture Officer of the Ministry of Fisheries Agriculture and Marine Resources.

SDFC. (2020). Dhanduveri Nafaa. Retrieved from SME Development Finance Corporation Pvt Ltd: https://sdfc.mv/Home/En.

Sobir, R. (2017). Rapid Integrated Assessment (RIA) to Assess the Maldives Readiness to implement the SDGs. Ministry of Environment and Energy and UNDP, Male.

Country Perspective Paper

Chapter 6

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Nepal

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Abstract

Agriculture is the main source of the Nepal's economy. A large number of people are under the absolute poverty line (18.7%) and multi-dimensional poverty index (28.6%). Achieving the Sustainable Development Goals (SDGs), particularly the SDG-1 (No Poverty) and SDG-2 (Zero Hunger) targets, is a major challenge for the country. As Nepal has committed to meet the SDGs, the role of cooperatives is identified by the government's plans and policies. The constitution of Nepal has recognized cooperatives, as one of the three pillars for economic development. This paper discusses the current situation of poverty and hunger, national targets of SDGs, farmers' cooperatives and their challenges, and policy options for achieving efficiency of the farmers' cooperatives towards ending poverty and hunger in Nepal. By recognizing and utilizing the potentiality of agriculture-based cooperatives, it would contribute to eradicate poverty and hunger in the country.

Keywords: Farmer' cooperatives, family farming, hunger, poverty, Nepal

1. Background

Nepal is a bordered with India and China, and has 147,181 km^2 area, 885 km west to east and is non- uniform (average 193 km) north to south. The total population of the country is 26,494,504 (CBS, 2011a), the majority of the people (65.2%) depends on agriculture for their livelihood (AITC, 2019), the number of household engaged in farming is 3,831 thousands (CBS, 2011b), and agriculture sector along with forestry has 26.98% contribution to Gross Domestic Product (GDP) (MoF, 2019). NPC (2019) estimated that 18.7% people are still under absolute poverty and 28.6% of the total population are under the multidimensional poverty. The distribution of poverty is not even across provinces (Table 1); Province 2 and Province 6 (*Karnali* Province) have a high rate of poverty than others (NRB, 2018). Similarly, Nepal Labor Force Survey III shows 11.6% of the people are

unemployed (CBS, 2019). According to NPC (2019), per capita national income is US$ 1,047, which is much lower than two neighbor countries India (more than US$ 2,000) and China (more than US$ 9,500).

Nepalese agriculture is mostly small- scale subsistence and integrated farming system consisting of crop and livestock and with reduced economies of scale in production and marketing. The average size of land holding is 0.68 ha and the average number of parcels of land is 3.2 (CBS, 2011b). Average agriculture land holding per individual is 0.2 ha (Basnet & Pandey, 2018). Majority of the rural dwellers are farmers, adopting subsistence farming in fragmented land. Farming in the small plot of land has become the major bottleneck in agriculture, which in turn have resulted the high cost of production, pushing farmers to earn less from the given area of land. In this context, agriculture cooperatives become a crucial means to ensure the needs of small farmers for agriculture transformation.

In Nepal, the movement of cooperative was initiated in 1946. Thereafter, the establishment of different types of cooperatives are in rapid trend. Bulk buying of inputs keeps costs down since cooperatives can get better deals with suppliers than individual farmers can. Selling output in bulk also means better prices. Particularly, if the cooperatives can consistently supply buyers with the amounts need. The Constitution of Nepal has emphasis and place cooperatives as an important means of socio-economic development. Realizing the importance of the cooperative, the government has celebrated 2012 as the year of cooperatives.

The National Planning Commission (NPC) of Nepal has prioritized cooperatives through its periodic plan for economic development towards achieving the targets of SDGs (CTCF, 2019). Furthermore, the country encountering constraints to integrate its development goals due to lack of ample human and financial resources. The promotion of cooperatives can be a golden step in reduction of poverty and hunger in Nepal. This sector contributes to increase the financial access to rural peasants, women empowerment, leadership and capacity development, and promote for social integration and entrepreneurship promotion (NPC, 2019). This paper therefore intends to explain the current situation of farmers' cooperatives, constraints encountered by small holding farmers and way out to attain the set forth targets of ending poverty and hunger in Nepal.

2. Country's Situation on Poverty and Hunger

Poverty, food insecurity, under nutrition and morbidity in Nepal varies by regions. Factors such as prone to natural disaster, quality of land, access to education and health facilities, level of infrastructure development, employment opportunities, and dietary and hygiene practices provide possible explanations for this variation (CBS, 2014). However, the absolute poverty rate has been decreased

to 18.7% (NPC, 2019), which differs by gender, social group and geographical area. The poverty situation by province is presented in Table 1.

Table 1. Demographic, social, economic and financial status of Nepal

Province	Multi-Dimensional Poverty (%)	Poverty Rate (%)	Poverty Vulnerability (%)	Poverty Intensity (%)	No. People under Poverty
Province 1	19.7	16.0	3.6	1.1	718,362
Province 2	47.9	27.7	7.1	2.4	1,483,884
Province 3	12.2	15.3	4.8	1.6	834,797
Province 4 (*Gandaki*)	14.2	15.2	4.2	1.4	410,032
Province 5	29.9	25.8	6.5	2.3	1,053,379
Province 6 (Karnali)	51.2	36.5	10.1	3.7	586,683
Province 7	33.6	42	12.1	4.6	1,060,738
Nepal	**28.6**	**25.2**	**5.43**	**1.81**	**6,147,875**

Source: NRB (2018)

3. National Targets to Reduce Poverty and Hunger

Nepal government set forth targets to reduce extreme poverty to less than 5% and increase per capita income to US$ 2,500 in 2030. Similarly, the target for nationally defined poverty in 2030 is to be on less than five percent. MPI is targeted to decline to less than 7% in 2030. To address the poverty reduction at the faster rate at the given income growth, the consumption share of bottom 20% household is targeted to increase by 12% in 2030 from 7.6% in 2015. Similarly, social protection expenditure is targeted to reach 15% of the federal budget in 2030 (NPC, 2017). The Government of Nepal (NPC, 2019) set forth targets in reducing poverty and hunger along with long-term vision for 2043 (BS) in its 15th Five Year Plan (2019/20 to 2023/24) (Table 2).

Table 2. Major targets of 15th Five Year Plan (2019/20-2023/24) and long-term vision for 2043/44

Indicator	Status of 2017/18	Target for 2023/24	Target for 2043
Economic growth (%)	6.80	10.30	10.50
National income (per capita) (US$)	1,047.00	1,595.00	12,100.00
People under absolute poverty line (%)	18.70	11.00	0.00
People under MPI (%)	28.60	13.00	3.00
Palma Ratio*	1.30	1.25	1.10
Gini** Coefficient	0.31	0.29	0.25
Unemployment rate	11.40	6.00	3.00
Productivity of major crops (tons/ha)	2.97	4.00	-
Underweight % (child below 5 years)	27.00	15.00	2.00

Source: NPC (2019)

*Note: *Palma ratio of the richest 10% of the population's share of gross national income (GNI) divided by the poorest 40%'s share. ** Gini coefficient is a measure of statistical dispersion intended to represent the income or wealth distribution of a nation's residents.*

The SDG-2 targets include achieve food security, improve nutrition, and promote sustainable agriculture. It contains five specific targets: i) End hunger and ensure food access for all, especially the most vulnerable; ii) End malnutrition, including stunting and wasting in children under five as well as provide sufficient to adolescent girls, pregnant and lactating women, and older people; iii) Double agriculture productivity and incomes for smallholders, especially indigenous people and women; iv) Food system to be sustainable and resilient to climate change and weather-related disasters; and v) Maintain genetic diversity in both farmed and wild plants and animals. However, these targets are lofty, challenging, and ambitious, still be feasible and achievable. The targets for SDG-2 include reduction in prevalence of undernourishment to 3% and prevalence of underweight children under five years of age to 9% in 2030. The other targets are to reduce the prevalence of anemia among women of reproductive age and children both targeted to reach 10% by 2030. The target for per capita food production is to increase by at least 66% by 2030 (NPC, 2017). The government of Nepal set forth targets and achievement related to SDG-1 (Table 3) and SDG-2 (Table 4) are presented.

Table 3. Major indicators of the SDG-1 (No Poverty) in all its forms everywhere

Indicators	**Targets 2030**	**Achievement (Year)**	**References/ Sources**
1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than US$ 1.25 a day.	5%	23.7% (2017)	NPC (2017)
1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.	5%	18.7% (2019)	NPC (2019)
1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.	15%	11.3% (2019) (Social protection expenditure in total budget %).	NPC (2019)
1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.	12%	7.6% (2017) (Share of bottom quintile in national consumption).	NPC (2017)
1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	18.9	26.8 (2017) (Economic Vulnerability Index- EVI)	NPC (2017)
1.a: Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programs and policies to end poverty in all its dimensions.	Not available	55.2 (2015) (Proportion of domestic resources to poverty reduction program)	NPC (2017)
1.b: Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions.	Not available	38% (2019) (Gender sensitive budget).	MoF (2019)

Source: NPC (2019) and MoF (2019)

Table 4. Major indicators of the SDG-2 (Zero Hunger), achieve food security and improved nutrition and promote sustainable agriculture

Indicators	**Targets 2030**	**Achievement (Year)**	**References**
2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	3%	36.1% (2015) (Prevalence of undernourishment).	NPC (2017)
2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	15%	36% (2015) (Stunting, Height for Age).	NPC (2017)
2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	US$ 7,018	US$ 3,278 (2015) (Land productivity per ha).	NPC (2017)
2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	80%	25.2% (2015) (Year -Round Irrigation Facility).	NPC (2017)
2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the	Not available	115. (2015) (Number of community seed bank).	NPC (2017)

Indicators	Targets 2030	Achievement (Year)	References
national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.			
2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.	Not available	3.3% (2015) (Percentage of Agriculture budget to total allocated budget).	NPC (2017)
2.b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.	Not available	Not available	
2.c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.	Not available	Not available	

Source: NPC (2019) and MoF (2019)

4. Agricultural Cooperatives in Nepal

The cooperative sector in Nepal is growing very fast. Cooperatives are involved in diverse facets of the Nepalese economy including agricultural production, dairy, manufacturing, financial services, communication, energy, and health and consumer services business. These are an important part of the Nepalese economy and society (Khatiwada, 2014). At present, there are 34,512 primary cooperatives, 77 district cooperative federation, 328 subject wise District Cooperative Federation, and 20 Central Cooperative Union. About 6.3 million people are affiliated in 34,512 cooperatives (DoC, 2017) and more than 61,000 people are directly employed in

this sector (NPC, 2019). Though there are almost 32 thousands cooperatives across the country with more than six millions members and the sector has been ever growing, a majority of cooperatives are saving and credit based, while they are less focused on production and employment creation.

In general, five types of agricultural cooperatives exist in Nepal includes: marketing, farm supply, service provider, production and processing cooperative. The statistical report of DoC (2017) shows that 13,407 cooperatives (38.28%) are directly involved in agriculture sector consisting of agriculture 10,921; milk producer cooperatives 1,658 (NDDB, 2017); tea 108; coffee 155; herbal plants 186; bee keeping 93; sugarcane 48; mandarin 45; and total cooperatives in the country 34,512 (Figure 1). Many agricultural cooperatives are merely to be the dealer of agriculture input company limited. However, the commodity specific and task specific cooperatives are emerging. The cooperatives of dairy, tea, coffee, beekeeping, fisheries have set a good exemplary. The improved seed production cooperatives have also been increased in Nepal. They have made the members feel proud and helping the members come out of poverty. Majority members (52%) in the cooperatives are female and about 40% female members have the role in management committee (NPC, 2019).

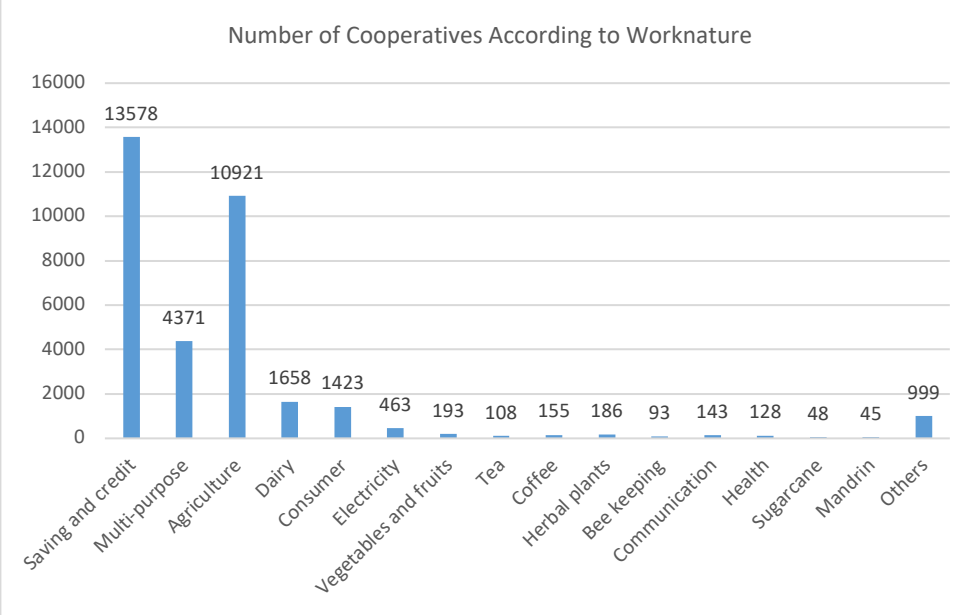

Figure 1. Number of cooperatives according to work nature

Source: DoC (2017)

5. Government's Policies and Programmatic Incentives

5.1 Policies for Farmers' Cooperatives

5.1.1 Constitution of Nepal

In the Constitution of Nepal (2015), in the chapter of directive principles, policies and responsibilities of the state (Article 50, 2). it has stated that "It shall be the economic objective of the state to make the national economy self –reliant, independent, and developing towards socialism oriented economy with equitable distribution of resources and means, by ending all forms of economic exploitation and inequality, with maximum utilization of available resources and means through the participation of cooperatives, and public and private sector for sustainable development, and to build an exploitation– free society by fair distribution of the achievements made". Constitution has made strong commitments to foster agriculture through cooperative approach.

5.1.2 National Cooperative Policy, 2017

The National Cooperative Policy (DoC, 2017) aims to promote non-profit cooperatives, particularly related to agriculture sector, while controlling profit-oriented ones such as saving and credit, and multipurpose cooperatives. This policy has made provision to provide a number of facilities for non-profit cooperatives. The revised version of the previous cooperative policy keeps provision to control cooperatives in urban areas and encourage them to go to rural areas with low financial access. Due to the existence of single person taking membership of different cooperatives promoting cross interest, this new policy seeks to adopt one member one cooperative policy.

In order to promote agriculture cooperative related to dairy, tea, vegetable and fruits, bee keeping and sugarcane, among others, the policy has made facility of encouraging cooperatives to production of agriculture good, imports and exports. It has also assured soft loans and grants for such cooperatives. Department of Cooperatives have prepared procedure for the unification and division of cooperatives societies and unions. In addition, the subsidy guidance prepared by the ministry has become the milestone to develop transparent and fair subsidy distribution scheme.

5.1.3 National Agriculture Policy, 2004

The *National Agriculture Policy 2004* (NAP, 2004) is the major guiding policy for agricultural development in Nepal. The main feature of this policy in view of agricultural cooperative development are as follows:

- Capacity development of the cooperatives and their association and value chain actors.
- Priority to be given for the promotion of cooperative based agricultural industries and enterprises.
- Commodity/ subject specific policies equipped with incentives to be developed in order to attract cooperatives to make investment in commercial production, processing and marketing of agricultural products.
- Developing and extending the market information system and disseminating such information shall be carried out in partnership with private and cooperatives sectors and the local bodies.
- Wholesale and seasonal markets to be developed by encouraging cooperatives.
- Institutional development of cooperatives through mobilizing and promoting local small capital and resources.
- Cooperatives societies in rural areas shall to be developed as local delivery points to provide production inputs and services to farmers' groups and send their productions to market system.

5.1.4 Agriculture Development Strategy (2015–2035)

In the previous agriculture plan of Nepal, the key stakeholders of the agriculture sector, namely farmers, cooperatives and private agro enterprises have often been left in the backstage of development, with front stage taken by the government of sector (ADS, 2015), which made the plan to underperform as expected. Realizing this, Agriculture Development Strategy (ADS) has given due attention for the active participation in promotion of the agriculture sector. Due to the dominance of smallholder farmers agrarian structure of Nepal, promotion of farmer organization and cooperatives will be fundamental to achieve economic of scale in marketing, finance and logistic. ADS is a twenty year road map to drive the agriculture sector in Nepal envisioning of self-reliant, sustainable, competitive, and inclusive agriculture sector that drives economic growth, and contributes to improved livelihoods and food and nutrition security leading to food sovereignty. Cooperatives are identified as the major stakeholders to achieve the targets set forth by the ADS.

5.1.5 National Tea Policy, 2000

Government of Nepal has adopted the *National Tea Policy 2000* (MOALD, 2000) in line with the *National Tea and Coffee Development Board Act 1992* for the development of tea as a sustainable source of income for the enhancement of employment opportunities and earning of foreign currencies with increased

participation of private sector in the production, processing and commercial transaction of tea through the sustainable and systematic utilization of available resources and opportunities in the country. Major provisions related to cooperatives in this policy are: first, a Tea Research and Training Centre shall be established with the participation of Nepal Agriculture Research Council, international cooperation and private sector; and second, manage training at the national and international level under Tea Development Fund for small tea farmers and the manpower working in tea cooperatives.

5.2 Programmatic Incentives for Farmers' Cooperatives

Government of Nepal has given special attention for the promotion of agro-based cooperatives. It has identified agricultural cooperatives as one of the vehicle for the economic transformation. Many of the agricultural development programs are implemented through the mobilization of cooperative sector. Some of the incentives provided to this sector are as follows:

- Subsidy for the acquisition of necessary equipment for milk, meat, fruit and vegetables processing industries operating through cooperatives.
- Subsidy for the establishment of feed industries for fish and livestock.
- Provision of incentive for exportable commodities based on value of products.
- Special grant for establishing factories producing organic fertilizers and agriculture equipment for the supply of agricultural inputs.
- Agriculture cooperatives are encouraged to produce improved seeds. Quality maintenance of seed is achieved by the technical assistance of government officer, seed inspectors.
- Collaboration of government, private sector, NGOS, cooperatives and communities for biodiversity preservation and climate change adaptation is in good pace. The government has given focus on public private partnership model in the implementation of the programs.
- Agricultural cooperatives are provided subsidy in the establishment of agri-related infrastructure, and buying the agriculture related machinery and equipment.
- Incentive on establishment of community postharvest center, dairy and market related infrastructure, processing industry of tea and coffee and others are provided in grant through the Prime Minister Agriculture modernization Project.
- Cooperatives members are empowered and made self-reliant giving different need based training.

- Many projects have provision in providing subsidy to cooperative farming and marketing.
- The subsidized fertilizer is distributed to the farmers through the cooperatives.
- Federal government has assisted the conditional subsidy to every local government to provide subsidy on cooperative based irrigation and farming system (MoALD, 2019).

6. Successful Stories and Best Model Cooperatives

Farmer's cooperatives in the country has set examples in many fields. They are the institution to empower women, reach the poor, organize the peasants and be a partner in value chain of the farmers' products. Especially cooperatives engaged in seed, tea, coffee and dairy have a strong networks from production to export of the products. The subsector and the success of Nepalese cooperatives in respective field is described below:

6.1 Seed Sector

Seed is the fundamental and basic source of production. Empirical evidences show that the use of improved seeds increases crop yield by 20-30% (SQCC, 2013). Many cooperatives are now involved in the production of improved seeds. They have established processing unit and have been distributing improved seeds in the brand names of the cooperatives. For example, the foundation seed producing cooperatives in various crops is shown in the Table 5.

Table 5. Cooperatives successfully producing foundation seed in Nepal

Name of the cooperative	**Address**
Annapurna Seed Producer Cooperative Ltd.	Manpakadi, Rupandehi
Sivasakti Seed Cooperatives Ltd.	Chatiwan, Palpa
Aditya Agriculture Cooperatives Ltd.	Dhakdhai, Rupandehi
Gupteswori Agi-coperatives Ltd.	Hetauda-13
Pabitrajanakalyan Agri-cooperatives Ltd.	Surkhet
Simrik Agriculture Cooperatives Ltd.	Rupandehi

Source: SQCC (2018)

6.2 Dairy Sector

The cooperatives and their role in dairy development has been significant in Nepal. The milk producers association where converted into milk producers cooperative society in 1989 where the Dairy Development Corporation (DDC) took the initiation. Smallholder's farmer's milk is collected by the cooperatives from the

self-run milk collection center. Support and investment as needed for these smallholders family farmers who are mostly confounded in the rural areas and are poor and food insecure. Milk Producing Cooperatives Societies (MPCS) have become one of the major actors in the present day dairy sector of Nepal by being a strong channel between the rural milk producers and the milk processing industries (FAO, 2010). For most of the milk producer farmers the market place for their milk production is milk collection center established by cooperatives. More than one third of the farmers (37.17%) sold their milk in the local market, quarter of them sold milk to the milk producer cooperatives and one fifth (17.28%) sold milk both in the local market and to the MPCS (DDB, 2017).

6.3 Tea Sector

Tea is one of the exportable commodities in Nepal. Both the government and private sector of Nepal has identified tea as priority sector. According to Central Tea Cooperative Federation (CTCF, 2019) the Nepal government initiated a program in 2018 to increase the production of high quality tea with 50% subsidies to construct tea processing plants. Four small farmers' cooperatives received US$ 1.2 million from the Ministry of Agricultural Development to enhance their capabilities in 2016. Combined they process 60,000 tons of green leaves resulting 12 tons of tea per day. As per Central Tea Cooperative Federation Ltd., currently there are 101 registered small primary tea cooperatives in the federation having 7500 small holders' farmers. Among 101 cooperatives, 31 cooperatives have established tea industry themselves. They are involved from production to marketing. The investment of processing factory is from NRs 2-2.5 million to 110 million NRs[1]. The quality certification is done by National Association for Sustainable Agriculture Australia (NASAA), International Market ecology Organization (IMO) and Certification of Environmental Standards (CERES) certified product. The most important is that price determination is done by the cooperatives themselves. Furthermore, all government plans and policies recognize that tea as an important export commodity (Thapa, 2005).

6.4 Fish Sector

Though there are not many cooperatives related to the fish sector in Nepal, performance of some fish cooperatives is excellent and are the best epitome. The fish cooperatives have initiate the one stop aqua shop concept where the lime, fertilizer, feed, medicine and other inputs are readily available for the members and other fish farmers on concessional rate. These cooperatives have also made

[1] Nepali currency (NRs) equivalent: 1 US$= 110 NRs as of 2016.

their efforts providing credit facility and monthly saving to members. Some cooperatives have already started producing floating feed.

6.5 Coffee Sector

Umbrella organization for all the Nepalese coffee organization, businessman and cooperatives involved in coffee industry is "Nepal Coffee Producers Association". There are a total of 12 coffee cooperative unions throughout the country, following cooperatives principles and working on behalf of their farmer member (Crncich, 2018). Some coffee cooperative union has direct market links with international buyers. Exporting of coffee to America, Korea, Japan, China and Germany is managed by these cooperative themselves. Cooperatives have managed for organic certification and made Nepalese coffee a brand in global arena.

6.6 Input Supply and Postharvest Center

Majority of the agriculture cooperatives are playing a significant role in the supply of agriculture inputs to farmers. In Nepal, agricultural cooperatives can only sell the subsidized fertilizer. Service rendered to seed supply, plant protection measures, small machinery are nowadays being run by cooperatives. They are the only source of agri-inputs especially in rural areas of Nepal. Many cooperatives have established community postharvest service center where the farmers can derive multiple of benefits ranging from agriculture machines in rent to cold storage facility of the agriculture products. The above mentioned are some of the examples where the farmers cooperatives have performed satisfactory in Nepal. Still a lot of management has to be done so as to link their capacity and strength to agriculture production and export promotion.

7. Challenges and Constraints in Farmers' Cooperatives

7.1 Challenges

The major challenges related to the farmer cooperatives in Nepal are:

- Mobilizing the cooperative fund in agriculture production, processing, value addition and export promotion.
- Successful implementation of newly promulgated *Cooperatives Act 2074* (BC) and *Regulation 2075* (BC) to better governance of the cooperatives, strengthen regulatory offices and effectively monitor their activities.
- Mainstreaming of cooperatives into the national development strategies as development partners.
- Enhancing the economies of scale in production and marketing through cooperative approach.
- Enhancing the institutional capacity of all the three tiers of government.

- Maintaining the good governance and fiscal discipline in cooperative sector.
- Merging the similar cooperatives having the same objectives and mostly locating in the same geographical area.
- Identification of needy cooperatives and providing subsidy in efficient and effective way so that they can play a greater role in agriculture activities.
- Employment generation by establishing agro- based industries.
- Motivating rural cooperatives in agribusiness by providing special facility.
- Monitoring and evaluation of the huge number of cooperatives by governmental organization so as to ensure that they are working as per the principle of cooperatives.

7.2 Constraints

The hurdles for the effective mobilization of the cooperative sector in agricultural development are from both sides i.e. from governmental and the cooperative itself. Some of the constraints are listed below:

- Lack of clarity to the cooperative leaders about the national policy, mission, vision, and dearth of adequate monitoring mechanism from the government with respect to cooperative activities.
- Limited managerial skills and lack of professional knowhow on planning, implementation and monitoring in the cooperatives.
- Limited knowledge and sense of responsibility among the cooperatives managers to carry the agriculture business in the true sprite of cooperatives.
- Incapability of the managers and poor financial literacy among the members.
- Dearth of knowledge about the importance of value chain development of agriculture products.
- Limited funds to run the agro-based industry.
- Many cooperatives are urban based. Establishing cooperatives in rural areas and mobilizing them in agriculture promotion is a big challenge.

8. Policy and Program Recommendations

Some recommendations for the establishment, effective utilization and mobilization of farmers' cooperatives are as follows:

- Package of incentives should be provided for those cooperatives, which are willing to merge each other based on similar objectives. For this the local government should act as a facilitator.
- Many farmers' cooperatives are still unaware of the new *Cooperative Act 2017* and *Regulation 2018*. The provision included in this act and regulation should be made known to each cooperative. For this, mass communication method can be used in collaboration with all the three tiers of government.

- Subsidized agriculture loan and insurance scheme should be made ease access to every agriculture cooperative whether they are in rural or urban areas. The mechanism to monitor the cooperatives to ensure that the subsidized loan has been used in agriculture production system should be established.
- Governmental support systems should be established in accordance to the need of the cooperatives. The support system and facilities should be based on the value of their contribution to the agriculture production.
- Government strategies should be focused to establish and efficiently mobilize rural social capital in agriculture production rather than crowding in urban.
- Malpractice of being membership in different cooperatives for unethical gain should be discouraged.
- Capacity building program such as training, visit and providing guidelines for the existing cooperatives should be enhanced.
- Mechanism of reward and punishment system should be established. The criteria for the evaluation of cooperatives should be made transparent.
- Federal level program should be planned in collaboration with all the three tiers of government. For designing the programs participation from the rural cooperatives should be made compulsory.
- Agricultural cooperatives should be promoted to work in the complete value chain concept. For this, the government needs to bring special subsidy and capacity building programs. As many of the agriculture cooperatives today are engaged only in distribution of agriculture inputs, they should be uplifted and supported to the production sector.
- For the members of the milk and fish producer cooperatives, regular supply of electricity in concession loan should be established and scientific milk pricing system need to be introduced in every cooperative.
- Strengthening the capacity and understanding of the cooperative member in cooperative principle, cooperative execution, business plan preparation, financial management and agriculture product diversification is urgent.
- Cooperatives' capacity enhancement in ICT should be strengthened. The financial transaction of every cooperative should be made transparent.

9. Conclusions

The number of the cooperatives in Nepal has risen over years. The majority of the cooperatives are saving and credit related, and only 38.28% of the total cooperatives are for agriculture purpose. All the agricultural cooperatives are not actually performing the agriculture related business. Constitution of Nepal have

clearly stated cooperative as one of the pillars of economy. Various policies and strategies have given huge importance to the cooperatives. Various acts, regulation, guidelines and working procedure have been approved to guide, help and promote the cooperative sector in the country. Some seed, dairy, tea, coffee, fish industry has shown a best epitome in contributing to economy. The farmer cooperative members are supported from inputs availability to marketing of the products by the government, as a result contributed to reduce the hunger and poverty in the country especially of rural areas. The success stories of farmers' cooperatives discussed in the previous section are case in points.

Poor implementation of cooperatives acts and regulation has resulted in poor performance of this sector. The elite capture the membership in multiple cooperatives just for the financial gain is still in practice. Cooperative elite managers are driving the cooperative fund as per their interest. Lack of sense of responsibility and bad governance are the other challenges that most of the cooperatives are facing today.

Policy designing with the active participation of all stakeholders, providing incentive to the cooperatives working in the agriculture sector, way of making self-reliant cooperatives are the areas where the concern authority needs to be intervened. Certainly, agriculture cooperatives can help farmers to raise productivity and incomes through jointly purchasing inputs and increase investment in productive areas such as capacity building, production, storage, processing, and marketing facilities of the products of prioritized commodities. This in turn contributes to increase land productivity and farm income and help to reduce poverty and hunger.

References

ADS. (2015). Agriculture Development Strategy (2015-2035). Ministry of Agriculture and Livestock Development, Nepal.

AITC. (2019). Krishi Diary 2076. Agriculture Information and Communication Center. Hariharvawan, Lalitpur, Nepal.

Basnet, S., and Pandey, G. (2018). Objective Agriculture Book at a Glance. 1st edition. Kopil Group and Company Pvt. Ltd., Kathmandu.

CBS. (2011a). National Population and Housing Census 2011 (National Report). National Planning Commission Secretariat, Nepal.

CBS. (2011b). Agriculture Census 2011. National Planning Commission Secretariat, Government of Nepal, Kathmandu.

CBS. (2014). Small Area Estimation of Food Insecurity and Undernutrition in Nepal. Central Bureau of Statistics, Nepal.

CBS. (2019). Nepal Labour Force Survey III 2017/2018. Center Bureau of Statistics, Kathmandu, Nepal.

Crncich, P. J. D. (2018). Income Disparities between Coffee Cooperatives in Nepal. Retrieved from http://volunteer-blog.ca/income-disparities-between-coffee-cooperatives-in-nepal/ on 23rd, December, 2019.

CTCF. (2019). Glimpse of Tea Sector in Nepal. Central Tea Cooperative Federation Ltd. Nepal.

DDB. (2017. Dairy Value Chain in Nepal. Dairy development board, Pulchok, Lalitpur.

DoC. (2017). Statistics on Cooperatives 2017. Department of Cooperatives, Kathmandu.

FAO. (2010). Dairy Sector Study in Nepal. Food and Agriculture organization of the United Nations, Pulchowk, Nepal.

Khatiwada, Y. (2014). Cooperatives, Economic Democracy and Human Security: Perspective from Nepal. Paper Presented at 1st National Cooperative Congress, March 27, 2014. Kathmandu, Nepal.

MOALD. (2000). National Tea Policy 2000. Ministry of Agriculture and Livestock Development, Nepal.

MoALD. (2019). Yearly Development Program for Federal, Province and Local Level. Fiscal Year 2019/2020. Ministry of Agriculture and Livestock, Kathmandu, Nepal.

MoF. (2019). Red Book. Fiscal Year 2019/2020. Ministry of Finance, Kathmandu Nepal.

NAP. (2004). National Agriculture Policy. Ministry of Agriculture and Livestock Development, Nepal.

NDDB. (2017). Study on the Milk Producers' Cooperatives with Special Reference to Knowledge, Attitude and Practice (KAP) of Cooperative Management. National Dairy Development Board, Hariharvawan, Lalitpur.

NLC. (2015). Constitution of Nepal 2015. Nepal Law Commission, Nepal.

NPC. (2017). Nepal Sustainable Development Goals, Status and Roadmap (2016/2017). National Planning Commission, Nepal.

NPC. (2019). Fifteenth Plan (Fiscal year 2076/77 - 2080/81) - A Draft Report. National Planning commission, Kathmandu, Nepal.

NRB. (2018). Demographic, Social, Economic and Financial Status of Nepal (Province Profile). Department of Investigation, Nepal Rastraya Bank, Nepal.

SQCC. (2013). National Seed Vision (2013-2025). Seed Quality Control Center, Hariharbhwan, Lalitpur.

SQCC. (2018). Foundation Seed Producing Cooperatives. Seed Quality Control Center, Lalitpur, Nepal.

Thapa, A.N. (2005). Concept Paper on Nepalese Tea Industry-Vision 2020. Nepal Tree Crop Global Development Alliance (NTCGDA), Winrock International, Kathmandu.

Country Perspective Paper

Chapter 7

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Pakistan

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Abstract

Cooperative networks play a significant role in farm operations starting from cultivation, weeding, irrigation, harvesting, and other farm related activities. The history of cooperatives in Pakistan traces back to Cooperative Credit Societies Act of 1904. Since then, the cooperative movement passed through transformation during different regimes in the country. The cooperative movement in Pakistan rendered very useful services to the rural dwellers and rehabilitating the landless farmers/artisans. However, the movement crippled down with the passage of time for many reasons. For the last three decades, no services were available and these societies are inactive. While, potentialities still exists in different sectors of the agricultural economy and cooperatives can be reactivated through proper planning and its diversification to other sectors of the economy by addressing the weaknesses including high degree of dependency, lack of entrepreneurial culture, poor leadership and management, inequality in the distribution benefits to the members, the costly and unsustainable co-operative structure, inadequate member participation, and lack of own financial resources. In the milk sector, Idara-e-Kissan (IK) family milk cooperative farm model has been working successfully in the Punjab province of Pakistan. Small livestock farmers are getting higher productivity, reaping dividends by availing premium prices for supplying high fat content milk and having higher access to IK provided services and usage of inputs. Milk branding and value addition has also been introduced to deal with flushing season.

Keywords: Family farmers, cooperative, credit system, poverty, hunger, Pakistan

1. Background

The United Nations (UN) celebrated the year 2014 as an International Year of Family Farming and has declared 2019-2028 as UN Decade of Family Farming. These declarations aimed to reflect the status of family-based agriculture globally

in the context of food security, equitable economic development, and socio-ecological sustainability (Graeub et al., 2016). However, different farm characteristics across the globe pose challenges for progression and logical strategy to expanding food and nutrition security, its environmental sustainability, secure livelihoods, and socioeconomic development. In the future, farmers will find more difficulties - faced with environmental degradation, climate change, and other threats. Unless they can produce food not just efficiently, but also in ways that respect the environment, the food security outlook will be bleak. Sustainable agriculture integrates the goals of environmental health, economic profitability, and social and economic equity. The overriding principle is to meet current food needs without compromising the rights of future generations.

A majority of rural inhabitants (70%) in Pakistan still depend on agriculture either directly or indirectly. These rural farmers are mostly small holders. Because of limited access to land and other resources and small income they are unable to regulate the situations that form their livelihoods. Their voice-lessness and lack of a collective organization further aggravate the situation and take away authority to impact the decisions that shape their lives (Gonzalez, 2007). Food insecure family farmers face a number of shocks. In rural areas, these peculiar shocks are easier to tackle at the community level. To cope with these shocks, these farmers have formed systems of mutual assistance, through cooperatives, like microcredit schemes to support in times of economic risks or adopt different measuresfor food security, early warning system, etc., because it is difficult for an individual farmer especially for a small farmer to cope with these shocks.

In this case, small farmers' organizations or cooperatives are the only viable platforms for combined efforts to cope with barriers that limit their access to resources. Efforts to trim down rural poverty can be successful only if sound plans are prepared to appeal the poor into cooperative action (Köbrich et al, 2003). These cooperatives are helpful because:

i) **Influencing social capital:** In Pakistan, cooperatives are described by common norms and believes, helping in mobilizing their scant resources to expand the base of social capital, enabling small farmers to interact efficiently onissues of mutual interests.

ii) **Transforming rural poor into agents of change:** The goal of rural development is achieved by changing the resource poor farmers of rural areas in agent of change instead of recipients.

iii) **Integrating culture and the environment:** Clusters formed of natives can perform vital rolesin protecting biodiversity and natural resources in a perspective of their conventional knowledge.

1.1 Country's Situation in Family Farming

Pakistan is currently sixth most populated country in the world having estimated population of 212 million. Pakistan is predominantly an agricultural country with 19.5% GDP contribution (GOP, 2019) and agriculture is considered to be a rural phenomenon. Majority of the family farmers living in rural domain, cultivate small and fragmented parcels of land. Hitherto these farmers produce the major chunk of foods for the country, this makes the smallholder family farmers a central player in rural economy. The family farmers contribute more than 80% of the world's food and cultivate around 70 to 80% of the farmland globally. It is also reported that above 90% of farms are operated by an individual or a family who rely primarily on family labour and there are more than 600 million farms in the world today (Ahmed, 2019).

In Pakistan, the farming pattern is determined by the socio-cultural values and norms of the family. The interaction of human and social capital may lead to higher productivity if the family farmers are organized in cooperative networks. Family members are mutually involved in farming through exchange of seed, knowledge, labor, local agriculture technology, and sometimes produce and it is rightly said that farming arrays communication amongst the family farmers in particular and other farmers living in the same village in general. The cooperative networks play a significant role in farm operations starting from sowing/ cultivation, weeding, irrigation, harvesting, and other farm related activities (Rasheed & Mahmood, 2018).

Family farming is common in the rural areas of the country and has been a part of the socio-cultural tradition. Nierenberg & Salshutz (2013) estimated 3.8 million farms in the country are family farms, with land holdings less than two hectares. Family farmers share specific attributes which distinguish them from profit-driven, large scale farming enterprises. These attributes include limited access to financial capital and inputs, high levels of vulnerability and low market participation. However, these constraints are molded by frequent interface in the context of local, social and biophysical environment. This brings a diversity based on resource endowment, dynamism and multidimensionality of production and consumption decisions. Supporting family farmers with the resources they require to produce food for themselves and their communities.

Majority of the small family farmers experience extreme poverty. About 27% of the population living in the rural areas of Pakistan are below the national rural poverty line. Though holdings of family farmers are mostly small in size, however there is huge potentiality to expand sustainable agricultural production. Because, small family farmers possess knowledge of their lands and local climates, and with adequate backing of technology and resources they can bring change to enhance

output. Small family farmers use their traditional knowledge and practices and depend less on limited natural resources, produce less greenhouse gases than commercial large farms. As agriculture practices on large farms are particularly resource-intensive and can hurt the environment (Nierenberg & Salshutz, 2013). Small family farms have thecapacity to feed the starving, protect the environment, and stimulate the economy. Research reveals that financing small farmers have a 'multiplier' effect that outspreads beyond the farming sector- small farmers spend a major portion of their income in construction, infrastructure, and manufacturing. In the light of forgoing, attention of the donors, governments, and non-profit organizations is required to finance programs that focus and empower small family farmers (Nierenberg & Salshutz, 2013).

1.2 Country's Situation on Agricultural Cooperatives

A cooperative farm by definition is controlled by the members of the cooperative. This is necessary for the cooperative to be able to serve the interests of the members. The principle of democracy has been a core element of cooperative business ever since the inception of the cooperative business form (Österberg & Nilsson, 2009). The cooperative movement in Pakistan rendered very useful services to the shattered rural economy and rehabilitating the landless farmers/artisans. However, history of cooperative movement in Pakistan is not encouraging. As stated above, the focus of the cooperative activities has remained on the agriculture sector with special attention on provision of the agriculture credit to the farming community. The credit and microfinance activities were later taken up by the Agricultural Development Bank of Pakistan (ADBP) now known as Zarai Taraqiati Bank Limited (ZTBL), commercial banks both in public and private sectors, and the NGOs. The cooperative credit system has crippled down with the passage of time. For the last two to three decades and no cooperative loaning services are available and as a result these societies are inactive. The collapse of this cooperative credit system has almost vanished the cooperative movement. However, potential still exists in the different sectors of the economy and cooperatives can be reactivated through proper planning and its diversification to other sectors of the economy.

2. Government's Policies and Programmatic Incentives

2.1 Cooperative Movement in Pakistan

Cooperatives have played a major role in agricultural production, processing and marketing and resources mobilization. They also contributed significantly in poverty alleviation, mitigating the problem of financial leakages, ensuring environmental sustainability, improving food security, providing employment,

and mainstreaming gender. The cooperatives, therefore, offered enormous potential for delivering growth by providing opportunities and empowering the vulnerable to participate in the development process. A sizeable population derived its livelihood directly or indirectly through cooperatives.

The history of cooperatives in Pakistan traces back to the British rule in sub-continent with formulation of *Cooperative Credit Societies Act, 1904*. This Act aimed to support small farmers on self-help basis by offering credit on low interest rate for agricultural purposes. This initiative failed to meet the credit requirements of small farmers. In 1912, an *All India Cooperative Societies Act* was passed to address the primary units by providing financial and administrative support. An Act promulgated the scope of cooperative movement for contribution in other than credit activities of the members. Afterwards, in 1914 and 1945, committees–chaired by Edward Maclagan and R.G. Saraiya, respectively, reviewed the status of the cooperatives and proposed a strategy for development of the cooperative movement.

After independence from the British rule, the cooperative movement divided into commercial activities including handling of agricultural output, purchasing and supply of grains and other consumer goods and sponsoring trade at retail and wholesale. Due to inefficiency in commercial operations and complaints about willful mismanagement, in 1953-54, the government renounced the commercial activities of the cooperatives and ordered for its customary duty of assisting farmers in production and marketing. While the Punjab government assigned the task of review of cooperative movement to a committee in 1952, this committee came with the recommendations that the Central Cooperative Bank should progressively retract from commercial loaning.

The cooperative movements amalgamated after the transformation of government entities into one unit in the late 1950s. This created concerns about the working of the movement because of the differences in the structure of movements across all provinces. A Credit Inquiry Commission was formed under the chairmanship of the Governor of the State Bank of Pakistan in 1959. The commission recommended conferring more power with the Registrar, and to simplify the process the Central Cooperative Banks were merged into Provincial Cooperative Bank. Consequently, the cooperatives not only channelized the disbursement of credit to the farmers, but also organized the distribution of seed, fertilizer and pesticides and made arrangements for the marketing of farm outputs.

The Cooperative Development Board (CDB) was created in 1962 with the objective of generating the needed capability for development planning and project preparation along with encouraging self-management. The CDB succeeded in executing a number of development schemes for agricultural credit supply,

marketing and processing. The Government of Pakistan instituted a new committee in 1963 to recommend a plan for reforms and development of the cooperative movement. The committee came forward with the recommendation of Cooperative Development Societies with the mandate to not only disbursement of credit to the farmers but to offer banking services to member farmers. In addition, the Cooperative Development Societies may perhaps carry out development work for example construction of office buildings, stores, and installation of tube wells, etc. In 1966, the government decided to abolish the Cooperative Board and the schemes executed by the Board were stopped or assigned to private businessmen. The Ordinances handed over more authorities to the Registrar to recover over dues as arrears of land revenue. The members of Managing Committees were declared to be public servants as outlined in the Pakistan Penal Code and contained in the anti-corruption laws through an additional ordinance. Resultantly, the autonomy was truncated and increased the dominancy of the bureaucracy.

The *Cooperative Societies Reforms Order, 1972*, was announced on March 15, 1972. The key points of the Order were:

- No individual would be a member of a Central Banks.
- No person would be a member of the Managing Committee of a Cooperative Bank for more than two consecutive terms.
- No trader would be a member of an agricultural credit or marketing society.

The Federal Bank of Cooperative (FBC) was inaugurated in 1976 with a capital of PKR 200 million[1]. The shareholders of this bank included the Federal Government, four provisions of Pakistan and the State Bank of Pakistan. The basic principle of this bank was "to provide credit facilities to the Provincial Cooperative Banks (PCB's) and regulate their operations". The FBC extended funds to PCB's who were responsible for extending funds to cooperative societies. Further, the government initiated a crash program to attain rapid growth in credit disbursement under cooperative. In 1978/79, the government extended mark-up free loans to small farmers. Initially, PKR 6,000 were extended to small farmers (having farm size up to 12.50 acres) under mark-up free loans and then this amount increased to PKR 10,000 for farm size up to PKR 12.50 acres.

The system of credit disbursement simplified through various interventions by the FBC and the credit increased from PKR 95.43 million to PKR 1,610.19 million during in 1976/77 to 1984/85. During this period not only the number of agricultural credit societies but their membership also increased. Similarly, the

[1] Pakistani currency: One US$ = 9.9 PKR (as of 1972)

Punjab Province also experienced a fast growth in agricultural cooperative credit. The amount of this credit in Punjab was PKR 85.94 million in 1976/77 which rose to PKR 1,495.92 million in 1984/85.

2.2 National Agricultural Policies

Recent Livestock Policies aim at increasing the private sector participation, raising the productivity of livestock and milk production systems, and enhancing the growth rates of both milk and meat products. The growth in milk and meat production was 3.0% and 2.7% in 2006 and 2007, respectively. The Medium Term Development Framework (MTDF) target for the meat production growth rate is set at 8.5% by 2010. Key policy initiatives include the deregulation of milk and meat prices, strengthening the policy and regulatory capacity, streamlining credit availability, and creating a level playing field for the local dairy industry. It is clear that unlike the livestock policies reviewed above, the current policies are more market oriented. The government seems to be moving away from directly intervening in the markets and carving a role for itself in processing and distribution. The emphasis now is on encouraging the private sector to engage in these spheres.

However, as the analysis in this paper shows, although the private sector and especially cooperatives have tremendous potential in enhancing productivity in the sector, there are critical areas where the private sector may not be able to operate on its own without government support. These areas are primarily those requiring government investments in providing public goods required by the sector. The most current *National Food Security Policy* (2018) issued by the Ministry of National Food Security and Research, Government of Pakistan is silent on any support for the furtherance of the cooperative faming. It has not given any reference of cooperatives for credit delivery, services provision and marketing of farm inputs or outputs (MNFSR, 2018).

3. Constraints and Challenges on Farmers' Cooperatives

The constraints and challenges encountered by farmers' cooperatives are described below:

- The small size of holdings, tenancy status, land types, and mechanization level are recognized as the major challenges in Pakistan.
- The structure of farm families in terms of their social status, off-farm employment, tenancy status and managerial control.
- Traditionally, cooperatives have been expected to serve a broad set of socio-political and economic objectives ranging from self-help and grass-root

participation to welfare and distribution, including economies of scale and social control over resource allocation and mobilization (Mustafa & Gill, 1998). However, these various objectives are not mutually consistent. There exists substantial trade-off in the realization of many of these goals. It is, therefore, necessary to weigh their relative importance in the felt needs and priorities of a community at any given point of time if performance of cooperatives is to be evaluated in an appropriate context. An attempt to fulfil a range of these conflicting objectives simultaneously has eventually led to a broad-based disenchantment with the cooperative movement.

- In recognition of its role, there exists a gap to create an enabling environment for cooperatives to develop and thrive. The policies failed to strengthen surviving cooperatives to promote the establishment of new marketing and financial cooperatives to reach farmers with marketing and other services that contribute to improving rural livelihoods and reducing poverty. The full potential of the cooperative enterprise in fostering development is yet to be harnessed due to internal problems related to governance and leadership, poor capitalization, inadequate knowledge, lack of management information systems and expertise in managing cooperatives.
- In addition, the regulatory framework was inadequate to ensure that the cooperatives function in the best interests of the members and the entire country. Among other interventions, policies have been announced that addressed the issues affecting the performance of the cooperatives with the view of enhancing their contribution to the wellbeing of the members and ultimately, the development of the national economy.

4. Best Model Cooperatives in Pakistan

An innovation is considered a "good practice" if such innovation has produced positive outcomes in terms of financial sustainability and improved client outreach. "Best practice" on the other hand is understood as the outstanding practice in the particular process or function, i.e. producing the best results, among those in the same industry (Riaz, 2008). Livestock having share of 60.54% in agriculture and 11.22% in GDP, appeared as the largest contributor in agriculture sector. Total estimated livestock population stood at 202 million. Pakistan is 5th largest milk producer (60 million tons gross) with 5.5% is being processed (GOP, 2019). According to Riaz (2008) **general typology of milk production systems in Pakistan include**: i) Rural subsistence small holdings; ii) Rural market oriented small holdings; iii) Rural commercial farms; and iv) Peri-urban commercial dairy farms.

Milk marketing system in Pakistan consists of two main channels: i) Traditional (market unprocessed milk); and ii) Non-traditional channels (specialized in the marketing of processed milk). There are basically two models for milk procurement in the formal sector: i) Commercial procurement; and ii) Vertically integrated cooperatives. Commercial procurement is based on relationship with the farmer. This approach relies on relatively higher prices offered for raw milk to ensure continued supplies.

The second model comprises a vertically integrated cooperative working within a participatory framework. This approach is used by the *Idara-e-Kissan*, which is a vertically integrated farmers' cooperative. The genesis of *Idara-e-Kissan* was the 1983, Pattoki Livestock Production Project initially supported by the German Government and implemented through technical assistance from GTZ. The emphasis was on extension and education of farmers with a view to improve productivity and farmers' incomes through the development of a participatory organization. Later on, service provision including animal health, reproduction, feeding, extension and social components were added.

Initially, the project model was based on collection of milk from farmers in 15 villages and selling it to private dairies in Lahore. The project guaranteed price and assurance to buy all milk offered for sale. However, difficulties raised during flush season necessitated the need for creating processing capacity and the Pattoki milk processing plant was established in 1987. This addressed the milk marketing problem. The *Idara-e-Kissan* was established under the *Pakistan Society Act* in 1989 as a means of developing a private enterprise that would generate its own funds, be financially self-sustaining, and involve members in the decision-making process of milk processing and marketing. In 1992, the Pattoki Livestock Production Project terminated. Since then *Idara-e-Kissan* has been running by its own administration.

The original *Idara-e-Kissan* model was developed in areas around Pattoki, in the milk belt along the left bank of the Ravi between Balloki and Gugera Saddar/ Akbar Chawk. This area consists of the western parts of the administrative districts Kasur and Okara. Now the IK model has been extended to more areas, IK-1: Kasur, Okara; IK-2 Syedwala (on right bank of Ravi), Sheikhupura; IK-3 Arifwala, Hujra Shah Muqeem; and IK-4 Sargodah, Layyah. The choice of operational areas is made strategically by the management of *Idara-e-Kissan* to limit membership and realize economies of scale in bulk procurement, transportation and handling of raw milk.

The initial investment (from 1984 to 1992) was PKR 200 million. The German government contributed PKR 180 million, including PKR 100 million in local expenditures for the establishment of the Pattoki milk processing plant, vehicles,

equipment and other hardware. *Idara-e-Kissan* has evolved a new strategy focusing on lower cost segments of the marketing, involving cheaper packaging to market affordable products such as un-packed pasteurized milk. Flush season milk has always been difficult to sell (*Idara-e-Kissan* faced the same problem as other dairies). To deal with strong seasonality, *Idara-e-Kissan* started a powdered milk plant (in 2001) with production capacity of 1 Mt/hour. This plant works during September-April for 8 months a year.

Despite increasing the scale and scope of operations, and greater geographic dispersion of its activities, *Idara-e-Kissan* operates under the following basic model. *Idara-e-Kissan* procures milk from geographically dispersed dairy farmers through a network of village milk collectors, transports it to processing plants andmarkets milk products under the brand name of *Hala*. *Idara-e-Kissan* membership is free and open to anyone with at least one cow or buffalo in villages where a milk collection center is in place. Members need to supply 300 liters of milk in a six months period, to become eligible for receiving member services for the next six months. A village with 15 members can form a Village Committee (VC) and elect a representative at the village level for a five-year term. The villages in the Union Council elect Council members who form the Governing Body. The Governing Body meets quarterly and makes policy decisions. In addition, there is an Executive Committee (EC) for operational decisions. The members of the EC are nominated. The Governing Body must approve any decisions made by the EC. Each operational village has a village milk collection point, where farmers deliver milk. A village milk collector is present in the mornings and the evenings to receive milk, which is tested for fat content in the farmers' presence and both the quantity of raw milk and its fat percentage are recorded. Payments are made weekly at a farmers' price on the basis of fat percentage.

The responsibility for storing and transporting milk is on the VMC, who is a self-employed person and operates under the close supervision of the village council and can be dismissed by them. The VMC does not have price-setting power. The base price of milk (containing 6% fat) is announced by the *Idara-e-Kissan* and the milk collector gets a commission (PKR 1.5/liter) for collecting, storing, and transporting the milk from the village to the Hala collection center. Upon delivery at the center, milk is again tested for fat content and quality. If the delivered milk is rejected by the center, the financial liability is of the milk collector and not of the farmers. Each center can receive milk from 35-60 villages. The milk collection centers are equipped with chillers and PHE systems for cooling milk. The chilled milk is transported in truck-mounted insulated containers to processing plants. The transporters receive a commission of PKR 0.35/liter for transporting milk.

Apart from the participatory nature of the organization, what distinguishes *Idara-e-Kissan* operations from those of the other commercial milk processing firms is the package of veterinary and other services offered to itsmembers. Because *Idara-e-Kissan* is registered under the *Pakistan Society Act*, the members cannot receive income from the organization's activities. The profits from commercial milk processing and marketing operations are used to finance a range of development services. These include services directly related to livestock activities as well as social services aimed particularly at rural women. *Idara-e-Kissan* staff members, some of whom are self-employed and stationed in villages, provide these services. Professional staff hired by the *Idara-e-Kissan* supervises service delivery.

Package Services of IK

- Free of charge artificial insemination (AI).
- Animal vaccination by the veterinary staff of *Idara-e-Kissan.*
- Animal health treatment services are provided at a nominal charge.
- Feed improvement to provide quality concentrates and a mineral mix.
- Extension services to educate farmers about animal health, fodder, and feeding practices.
- Conduct social services (a women's development program), which aimed at supporting their role in rural households and involving them in a services package.

Operations Growth of IK

The IK model has been extended to four different zones in Punjab from 1992 to 2004 and the number of villages covered has increase from 87 to 519 and the number of members has grown from 1,817 to 20,164 with milk collection raised from 4.66 to 47.10 million litters with 6% increase in the same period (Table 1). The cost of development services has also increased more than two folds from 28.54 to 62 million in the years 1998 and 2004, respectively with average of 6.4% of the turn over a year in this period. The result revealed that the higher productivity at the IK members' dairy farms are attributed to higher access to services and usage level of inputs over non-IK dairy farms (Table 2).

Table 1. Evolution of IK operations

Year	1992	1996	2000	2004
Villages under IK operations	87	139	351	519
Farmer Members	1,817	7,143	1,0753	20,164
Milk collected @ 6% fat (million liters)	4.66	9.62	37.65	47.10

Source: IK (2005)

Table 2. Comparative productivity of IK members over non-members of IK

Variables	Difference (IK over Non-IK) %
Net returns per milk buffalo (PKR/year)	+ 28.5
Milk prices received (PKR/liter)	+ 13.5
Milk yield per buffalo (Liter/year)	+ 25.3
Number of wet milk buffalo	+ 8.97
Number of dry milk buffaloes	- 6.00

Source: Riaz (2008)

5. Policy and Programme Recommendations

Based on the above discussions, the following recommendations are made to strengthen the farmers' cooperatives in Pakistan:

i) The whole cooperative movement have to be transformed by addressing constraints on higher degree of dependency, lack of entrepreneurial culture, poor leadership and management, inequality in benefits distribution to the members, costly and unsustainable cooperative structure, inadequate member participation, and lack of own financial resources.

ii) The privately motivated cooperatives are successfully working in the milk sector of the rural economy under the umbrella of *Idar-e-Kissan* Hala model indicating. This model can be multiplied in the potential areas of agriculture sector for the benefit of small and family landless rural folks including women.

iii) The Hala model should be replicated in other provinces where milk is produced and marketed in abundance.

iv) For a successful cooperative should requires good will of the cooperative's leaders and the members with cost efficient and in sustainable models.

v) Family farm cooperatives should be provided with technical, financial, policy, and institutional supports to help out poor landless in the marketing of inputs and products, provision of services, and capacity development to end hunger and poverty.

6. Conclusions

In Pakistan, the farming pattern is determined by the socio-cultural values and norms of family and number of shocks. In rural areas, these peculiar shocks to be tackled at the community level through cooperatives. These cooperatives are helpful in influencing social capital, transforming rural poor into agents of change, and integrating culture and the environment.

Family members are mutually involved in farming through exchange of seed, knowledge, labor, local agriculture technology, and sometimes produce. The cooperative networks play a significant role in farm operations starting from sowing/ cultivation, weeding, irrigation, harvesting, and other farm related activities. The cooperatives in Pakistan started during the British rule in sub-continent under *Cooperative Credit Societies Act, 1904*. After independence (1947), the cooperative movement is categorized into commercial activities including handling of agricultural output, purchasing and supply of grains and other consumer goods; and sponsoring trade at retail and wholesale. Thus, the cooperative movement in Pakistan rendered very useful services to the shattered rural economy and rehabilitating the landless farmers/ artisans. The family farmers' cooperatives are need to be strengthened by providing financial, technical and policy supports to end the poverty and hunger in Pakistan.

References

Ahmed, A. (2019). UN to Launch the Decade of Family Farming next week. Dawn, Pakistan.

Gonzalez, E. T. (2007). Developing Rural Institutions that Strengthen the Voice of the Rural Poor. Paper Presented at the Reducing Poverty and Hunger in Asia: The Role of Agricultural and Rural Development.

GOP. (2019) Economic Survey 2018-19. Finance Division, Govt. of Pakistan, Islamabad.

Graeub, B. E., Chappell, M. J., Wittman, H., Ledermann, S., Kerr, R. B., & Gemmill-Herren, B. (2016). The State of Family Farms in the World. *World Development*, 87.

IK. (2005). Annual Report. Idara-e-Kissan, Islamabad, Pakistan.

Köbrich, C., Rehman, T., & Khan, M. (2003). Typification of Farming Systems for Constructing Representative Farm Models: Two Illustrations of the Application of Multi-variate Analyses in Chile and Pakistan. *Agricultural Systems*, 76(1): 141-157.

MNFSR. (2018). National Food Security Policy - 2018. Ministry of National Food Security and Research, Govt. of Pakistan, Islamabad.

Mustafa, K., & Gill, Z. A. (1998). Cooperatives and Development: Lessons from the Punjab Experience. *The Pakistan Development Review*, 1017-1030.

Nierenberg, D., & Salshutz, E. (2013). Investing in Family Farming. DAWN, Pakistan.

Österberg, P., & Nilsson, J. (2009). Members' Perception of their Participation in the Governance of Cooperatives: The Key to Trust and Commitment in Agricultural Cooperatives. *Agribusiness*, 25(2):181-197.

Rasheed, A., & Mahmood, B. (2018). Modern Farming and Cooperation: A Sociological Analysis of Farming Families in Rural Punjab, Pakistan. *WALIA* 34(1): 198-203. Available online at www.Waliaj.com ISSN 1026-3861 © 2018 WALIA.

Riaz, K. (2008). A Case Study of Milk Processing: The Idara-e-Kissan cooperative. *Lahore Journal of Economics,* 13(1): 87-128.

Country Perspective Paper

Chapter 8

Family Farmers' Cooperatives towards Ending Poverty and Hunger in Sri Lanka

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Abstract

Sri Lanka is an agricultural country with more than half of its population depending on agriculture. Agriculture employs 28% of the labour force and about 1.65 million smallholder farmers with land holding size less than 2 ha and contribute 80% of the total annual food production. Agriculture has been an important driver of poverty reduction in the country. Meanwhile, cooperative system in Sri Lanka has more than 100 years of history, as a key player in economic development and generate employment, especially in the rural context. In Sri Lanka, there are 12,379 registered cooperative societies and total cooperative members are 8,789,507. Among them, the number of registered agriculture cooperative societies are 331 and the members of those societies are 52,000. This implies that the cooperative sector is not widely established around the agriculture sector in Sri Lanka. However, the potential for strengthening existing agriculture cooperatives and developing new agricultural cooperatives are immense and significant in the reduction of poverty and hunger to meet the Sustainable Development Goals (SDG) by 2030 in the country. The conducive policy formulation and effective implementation of farmers' cooperatives with improved coordination among concerned institutions is crucial for eradicating poverty and ending hunger in Sri Lanka.

Keywords: Cooperatives, family farming, poverty, hunger, Sri Lanka

1. Country's Situation on Family Farming

Since the end of Sri Lanka's 26-year conflict in 2009, it has made significant economic and social transformation. The agriculture sector contributes about 7% to the national GDP out of which the fisheries sector contributes around 1.2% and the livestock sector accounts for 0.6%. Over 25% of Sri Lankans are employed in the agriculture sector. Economic growth has been rapid, with a GDP growth rate of 7.7% in 2018. Human Development Index (HDI) 2016 of Sri Lanka 0.766, ranked 73rd out of 168 countries (UNDP, 2016). The poverty headcount was cut by more than half to 6% during last 10 years. In Sri Lanka, 4.1% of the population lives

below the national poverty line in 2016. The proportion of employed population below US$ 1.90 (purchasing power parity) a day is 0.8% in 2016 (DCS, 2016). More than 80% of Sri Lanka's population resides in rural areas, and agriculture remains the backbone of the economy. Almost half of poor rural people are small-scale farmers (IFAD, 2015).

Sri Lanka's agricultural sector is dominated by mainly tea, rubber and coconut, rice, maize, fruits, vegetables and other crops and most of them are small holders. At present, 65% of the total land area of the country have been utilized for agriculture comprising rice farming 40%, plantation crops 38%, and other field crops 22%.

Organic farming or ecological farming is newly growing concept in agriculture sector, basically growing crops without agrochemical and hybrid seeds. Some of the major issues in agriculture sector in the country are low productivity, less competitiveness, land fragmentation, and conflict of ownership claims. Post-harvest losses of fruits and vegetables due to improper handling and packing have been significant in the Sri Lanka. Environment degradation and soil erosion reduces output. Rice production has been the major focus of food production expansion, and at the national level the dividends of these policies are apparent where the average national level calorie intake exceeds the recommended levels. Since the main food in Sri Lanka is rice, food availability depends predominantly on rice production and marketing. Though Sri Lanka has implemented various programs to increase rice production, the country's rice production is insufficient to meet household demand for consumption.

Geographical disparities in rice production exist among districts, with the main production areas located in the previously conflict-affected districts. Good quality rice production remains one of the key issues. Rice marketing is not well efficient due to lack of market information, quality products, and limiting access to wider markets. Low productivity and high transport costs are two major constraints to assure food supplies. National level protein intakes, for instance, are just adequate for meeting dietary guidelines and could be improved by domestic milk and fish production which seem to be far below their potential. Although the meat production has shown a significant increase since 1990s, the egg production has not shown a remarkable increase during the period. The absence of an explicit long-term strategy for agriculture, consistent with overall and rural development goals, also contributes to the multiplicity and relatively weak performance of various government programs. The agriculture sector and the overall economy and the multitude of challenges and opportunities arising from increased globalization and international competition will require new and innovative approaches.

The rural landscape in terms of the organization, organizational structure and cohesion amongst farmers/ producers is mixed. Officially, more than 15,000 farmer organizations (FOs) have been established nationally, registered under the *Agrarian Development Act, 2000* (No. 46) and falling under the mandate of the Department of Agrarian Development; a further 1,007 organizations have been established under the Mahaweli irrigation scheme (which covers more than 450,000 ha or 30% of Sri Lanka's land mass), initially with the primary purpose of managing water use, and are registered by the Mahaweli Authority of Sri Lanka (MASL). There are several other organizations registered under the *Companies Act* 2007 (No. 7) as limited liability companies and farmers' / traders' associations. Also, there are few farmers/ traders' cooperatives registered under the *Cooperative Societies Act*. As well, there exist countless forms of 'groups' or 'societies' at village and community levels, some of whom are registered under the Voluntary Social Service Organizations (Registration and Supervision) Act No. 31 of 1980 (amended Act No. 8 of 1998), though many of whom remain informal and un registered (IFAD, 2015).

2. Country's Situation in Agricultural Cooperatives

2.1 Cooperative's Historical Movements

Cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned enterprise accordance with specific purposes. Cooperatives were introduced in Sri Lanka (then Ceylon) in 1906 by the British colonial government as a solution to growing indebtedness among village community, which has caused rebellion earlier. The promoter was the Ceylon Agricultural Society headed by the colonial Governor for Sri Lanka. Main objective of the cooperative system was to provide credit facilities to farmers for their paddy cultivation and related activities. Repayment was settled as installments or as paddy with an interest. Hence, the beginning of the cooperative movement had an agricultural base. Cooperative legislation was established in 1911 with the *Credit Cooperative Ordinance*. With the amendment made to the legislation in 1921 in order to give recognition to other types of cooperatives other than credit cooperatives, there was a movement to organize different types of Agri cooperatives. Farm producers, agricultural sales, land development, milk supply, cooperative Societies were formed during 1940s.

With the promulgation of *Agricultural Production Ordinance in 1941*, and due to the 2nd World War, agricultural cooperatives were encouraged to boost food production. Government purchased excess production of paddy and other food commodities from the farmers through cooperatives and provided a guaranteed

price. The government also promoted agricultural production and sales societies in 1947 and provided agricultural inputs such as fertilizer, agro-chemicals and implements. It has also purchased agri-products under a guaranteed price. These cooperatives became strong and were organized into a federal structure with secondary unions at the district level and also a national federation. There were young farmers' clubs and cooperative villages formed for young farmers by allocating land from the government during 1960s. In 1987, cooperative societies established to help the agricultural activities in Mahaweli Zones supported by Mahaweli Project. In 1970, reorganized the cooperative movement to form large primaries in all sectors other than credit cooperatives, which caused the agricultural cooperatives to merge with the new structure with Multi-purpose Cooperative Societies. There was a two-tier structure formed–the primary cooperatives and the national federation titled Sri Lanka Cooperative Marketing Federation.

Agriculture was a significant component of multi-purpose cooperatives, so long as they enjoyed the guarantee given by the Central Bank for agricultural credit scheme of the government was in place and also the purchase of paddy and other agricultural commodities by "Paddy Marketing Board" under the guaranteed price. During this time, the MARKFED did a great service to farmers by purchasing not only the vegetables and fruit through their collection centers, but also procuring minor export crops such as cloves, cardamom, nutmeg and turmeric etc. for export.

2.2 Emergence of New Generation of Agricultural Cooperatives

With the *Land Reform Act 1972*, the government took over excess land allowing only 50 acres per person, there was a substantial portion of the land in the country which was vested with the Land Reform Commission. Due to the insurrection of youth in 1971, the government provided land to landless youth through different types of agricultural cooperatives such as Collective Settlements, Young Farmers Agricultural Cooperatives, Cooperative Villages, and Electoral Agri Cooperatives. With the introduction of open market economy in 1977, the single purpose agricultural cooperatives were neglected and the production and marketing chains collapsed. Still few are surviving with the MARKFED, but the contribution to the national economy is marginal. Service cooperatives have become more dominant in cooperative business operations.

In Sri Lanka, there are 9 major provinces and structured with 9 provincial level Departments of Cooperatives. Primary cooperatives are governed under the provincial levels. Secondary cooperative can be formulated by representatives of primary cooperatives and such cooperatives further can formulated as apex

organizations as national level. Therefore, national level cooperatives represent the island wide by secondary level coops representatives and it's governed by Central Department Cooperatives. The number of cooperatives under primary, secondary and national are presented in Table 1.

Table 1. Number of cooperative societies in Sri Lanka

Type of Cooperatives	**No. of Organizations**	**No. of Members**	**No. of Employees**
Total Primary coop	12,189	8,789,507	36,527
Provincial Level Cooperatives	12,130	8,380,964	35,373
All Island Level Cooperatives	59	408,543	1,154
Secondary level coop	174	9,443 (societies)	2,064
National (Apex) level coop	16	1,447	364
Total	**12, 379**	**8,789,507** (Individuals)	**38, 952**

Source: DoCD (2019)

Table 2 indicate the provincial level various types of cooperatives. All those cooperatives are formed as primary cooperatives and addition to that secondary cooperative unions too. The secondary level cooperatives unions, which are formed by representing primary cooperatives. Apex level or National level cooperatives are not mentioned here since there are functioning as national level.

Table 2. Types of cooperatives at the provincial level

Nature of Cooperatives	**Number**	**Examples/ Explanation**
Multi-purpose Cooperative Societies	308	Whenever a cooperative society is established to attain multi-purpose objectives is called multi-purpose cooperative society. It is an organization which is owned and operated by a group of individuals for their mutual benefit.
Agricultural Cooperative Societies	331	A farmers' cooperatives where farmers pool their resources in certain areas of activity. For example, marketing cooperatives established by farmers to undertake transportation, packaging, distribution, and marketing of farm products.
Fisheries Cooperative Societies.	997	A group of fishermen who jointly formed a society specially focusing on fish marketing and credit purpose in Sri Lanka.
Livestock Cooperative Societies.	303	Reconstructing the livestock industry focus on milk production and enhance production by making value added products.
Women Cooperative Societies.	170	A cooperative type responsible to build, owned and operated by and for poor women in Sri Lanka.
Industries Cooperative Societies.	475	An association of workers & craftsmen involved in cottage or village industries, who come to gather to undertake collective production, processing & marketing of goods manufactured by the members & provide them with the necessary services & assistance.

Nature of Cooperatives	Number	Examples/ Explanation
School Cooperative Societies.	858	Obtaining youth power for the cooperative field.
Labor (workers) Cooperative Societies.	50	Organizations managed by the people who work there.
Youth Services Cooperative Societies.	25	To provide an opportunity to school leavers and unemployed youth to engage in a gainful activity through the provision of the necessary training, required capital and other services.
Thrift & Credit Cooperative Society	7,224	Dealing in microfinance especially in rural areas, oldest and popular cooperative types in Sri Lanka.
Secondary Level Cooperative Unions.	174	Formed secondary level service providing coops by representatives of primary coops.
Others	1,389	
Total	**12,304**	

Source: DoCD (2019)

The government continues to buy paddy through multipurpose cooperatives with the guaranteed price as and when they decide. This is particularly referred when the government decides to purchase paddy from the farmers in order to control the price, government does that through the multipurpose cooperatives and provides credits to those societies. Sometimes the government also purchases onion and other grains with similar procedure. In this case the government sometimes appoints third parties such as Paddy Marketing Board.

2.3 Relevance of Agricultural Cooperatives in Sri Lanka

Food security has become an issue to be addressed by the government as well as the cooperative movement in Sri Lanka, as the agricultural production is unplanned activity, giving preference to export oriented commodities in the commercial production. Rural subsistent farming is predominant still in Sri Lanka. Due to the climatic change playing havoc in the country, the farmers are losing their livelihood through drought, floods and also epidemics attacking their crops. Sustainable livelihood is an issue under the Sustainable Development Goals (SDGs). The government has launched many activities in this direction and some of the areas have been allocated to cooperatives. SANASA Bank's credit cooperative movement has launched a Thousand Green Villages through cooperatives. Cooperatives is the main financier of agricultural production through their credit activities in the Cooperative Rural Banks and SANASA banks are affected by this as well as market conditions where local and overseas companies have in a big way to catch the market and to monopolize in the export market. Encouragement given by the government for commercial farming through leasing out some government farms as well as alienating huge areas of land for

commercial cultivation, has further aggravated the vulnerability for cooperatives in the export market. The government has maintained paddy seed supply and also provision of subsidized fertilizer for paddy cultivation.

A limited number of agricultural cooperatives, specially focus on plantation secter such as tea, rubber, coconut and palmira crops (Table 3). The majority of agricultural coopertives are representing mixed crops items such as vegetable, fruits, rice, seed producers etc. Livestock base socities are consisting a dairy and poultry producers. There are 12,304 provincial agricultural cooperative societies in which 54,782 are members (DoCD, 2016). About 42,912 of them are male and 11,870 are female. About 2,584 workers are in these cooperatives, out of them 1,903 are male and 681 are female. Annual production value of provincial agricultural cooperative societies' is LKR 963.21million[1].

Table 3. Types of agricultural cooperative societies in Sri Lanka

Cooperative's Category	**No. of Coops**	**People Involved (No.)**	**Name of Products**
Tea production.	04	7164	Tea for export market.
Rubber production.	27	96	Household items, raw rubber, rubber mattress.
Coconut production.	38	3496	Desiccated coconut and coconut oil.
Palmira production.	40	26628	Hand bags, hats and ornaments (made of Palmira leaves).
Livestock.	43	62918	Flesh, eggs, dairy productions.
Top level agricultural cooperative societies.	12	*	Rice, dairy, fresh vegetable, Fresh flowers, plant nurseries, bee honey, organic fertilizer.
Societies engage with agricultural activities	02	**	Rice, spices, fresh vegetable and fruits, fresh flowers, plant nurseries, bee honey, organic fertilizer.
Other agricultural	214	17398	Seeds, rice, fresh vegetable and fruits, bee honey.

Source: DoCD (2019)

*Note: *This category includes the federations, which members are primary societies and top-level societies. ** Approximately 30% of the Women Development Services Cooperative societies, which have more than 183,000 members engaged in agriculture. The majority of the members of the Environment protector's society, which has more than 100 small groups.*

[1] Sri Lankan currency LKR: US$ 1 = LKR 181.83 as of 2019.

3. Situation of Poverty and Hunger in Sri Lanka

Sri Lanka is a lower middle-income country with a total population of 21.3 million people and a per capita income of US$ 4,103 in 2018. Following a 25-year-long civil war that ended in 2009, Sri Lanka's economy grew at an average of 6.4% between 2010-2015, reflecting a peace dividend and a determined policy thrust towards reconstruction and growth. Sri Lanka's economy has transitioned from a predominantly rural, agricultural economy towards a more urbanized economy driven by services. Sri Lanka's economy grew only by around 3.1% in 2017 well below the envisaged levels of the Central Bank of Sri Lanka (CBSL), as a result of disruptions from droughts and floods, and policy tightening. In 2018, the service sector accounted for 55.8% of Gross Domestic Product (GDP), followed by manufacturing (27.2%), and agriculture (7.7%). In Sri Lanka, 4.1% of the population lives below the national poverty line in 2016 (WB, 2017). The proportion of employed population below US$ 1.90 purchasing power parity a day in 2016 is 0.8%. In 2012/13, nearly 15% of the population lived on less than US$ 3.10 per day. Pockets of poverty persist in the North, East, Estate Sector and Moneragala district where equality of opportunity in terms of access to services and linkages to the labor market are weaker.

As Sri Lanka aspires to become a higher middle-income country, it will need to adjust its development model. Growth in the last five years is in substantial part due to a "peace dividend". Going forward, economic growth will likely require continued structural changes towards greater diversification and productivity increases and a reduction in the role of agricultural employment from its present share of a third of the population. Although Sri Lanka has excelled in overcoming human development challenges typical to a low-income country, its service delivery systems in education, health and other areas must now adjust to face the new and changing demands typical of a middle-income country.

Food insecurity is the severe problem in Mulative district (47.3%), followed by Vavniya (28.6%), Ampara (24.8%), and Anuradhapura (21.6%). The stunting rate among children under five years of age of 15% and a wasting rate in the same age group of 21%. Therefore, farmers' cooperatives could play pivotal role for ending poverty and hunger in Sri Lanka.

4. Government's Policies and Programmatic Incentives

The *Cooperative Societies Act No. 5 of 1972*, *National Cooperative Policy - 2019, National Agriculture Policy- 2000, Agriculture Crop Insurance Act- 1994, and Agrarian Development Act- 20000* are the major policies to encourage farmers through

cooperatives and to upgrade their living standards. We discuss briefly on the provision of some major polices for promoting farmers' cooperatives:

4.1 National Cooperative Policy- 2019

- Introducing & developing enterprises to increase employment opportunities and services relating to milk, fisheries, agricultural crops, livestock & traditional industries.
- Facilitating new technologies & market opportunities to the farmers for developing agriculture.
- Implement fair market policies in cooperative sector.
- Enforce to increase the youth farmers' contribution to the economy.

4.2 Cooperative Societies Act (Article 5) of 1972

- Article (11) (2): where a member of registered societies has not made such payment to the society or acquired such interest in the society as is referred to in subsection (1). It shall be lawful for the society to such member in respect of the purchase of any scheduled agricultural product as an agent of the Paddy Marketing Board, to deduct any sum of money due to the society from such member in respect of such payment or such interest as is referred to in sub section (1).
- Article (21) (1): A registered society which has one of its objects the disposal of any article which is the produce of agriculture or animal husbandry or any other industry, may provide in its by-laws or may contract with its members. (a) that every such member who produces any such article, shall dispose of the whole or of any specified amount, proportion or description thereof to or through the society, and (b) that any who member who is proved or adjudged, in such manner as may be prescribed by rules, to be guilty of a breach of the by-laws or contract.
- *Cooperative Societies Act* No.5 of 1972 allows having Associate members, to make societies enable market their products, especially members' harvest. Associated membership has been introduced in 1970's with the new act to accommodate the persons who are not eligible under the by-laws but has economic interest in their operations. By granting this membership they could enter the society's businesses or agreements to sell their produces or undertake contracts. The Presidential Secretariat office has a mass national program with agricultural cooperatives to rehabilitate irrigation systems, to widen organic cultivation, to develop farm mechanization etc.
- The Department of Cooperative Development has launched long-term plan to form an Apex body to agriculture cooperatives, to establish a food processing

factory for cooperative sector and a one stop business center for farmers' cooperatives. As an initiative step for this, the Department has structured an island wide agricultural cooperative with farmers' societies under Agrarian Services Department.

5. Success Stories of Agricultural Cooperatives in Sri Lanka

5.1 All Island Agriculture Cooperative Society

Commercial farmers, family farmers' groups and small-scale agriculture cooperative societies are members of this society. There are 51 commercial farmers, 201 small agricultural societies and many more beneficiary members. They have mainly 9 business areas: vegetable cultivation and marketing; environment friendly organic agricultural production center; nurseries, livestock, fish curry, training and tours; fresh fruit; green tourism center; supply and use of machinery & equipment. The society's market share during the year 2015 is LKR 190 million for fresh vegetables and cut vegetables, and LKR 7.7 million for fruit and organic vegetable sales.

5.2 National Environment Protectors Cooperative Society

This cooperative society is made up of self-help groups whose members are mostly small scale farmers. It has more than 100 small groups of family farmers and 10 commercial organic producers. Their activities are cultivation, producing organic fertilizer, value added food processing, bee keeping, training farmers, bee keepers and fertilizer producers and conducting workshops for farmers and school children. This society promotes organic farming successfully in the rural areas.

5.3 Women's Development Services Cooperative Society (Women's Bank)

This cooperative society is made up of women groups having women members. There are more than 183,000 members in this society all over the Island and 30% of them are family farmers. They have many divisions, and agriculture division is the most important one of them. They cultivate organic vegetables, fruits and spices, grant loans for women farmers, maintain selling centers, bee keeping and train their members for farming and bee keeping. This division has LKR 50 million fund for their activities and it was mainly used mobilize members such as providing agriculture loans and other facilities so that members never mortgage their paddy fields. The income generated by working as farmers, agro-entrepreneurs and service providers has significantly increased the living standards these members. In 2018, the total assets of the society are LKR 20 billion.

5.4 Exotic and Orchids Cooperative Society

This is an Island-wide primary society, which has ornamental plant cultivators as members. Their activities are wholesale and retail sale of flowers and plants, flower arrangements, import orchid plants, maintain plant nurseries, conducting training programs and seminars. Profit is shared according to the contribution.

5.5 Vavuniya North Fruit Cooperative Society (Northern Province)

This society has both commercial farmers and small-scale farmers as members. Their main production is papaya, but they cultivate other fruits too. Papaya productions, granting agriculture loans, maintain fertilizer and pesticides sales centers, value added fruit productions, maintain nurseries and seed banking are their main activities. There are more than 400 direct beneficiaries. So far, they have raised more than LKR 23 million earned assets.

6. Constraints and Challenges in Farmers' Cooperatives

i) In the absence of organized government support for the small farmer, withdrawal of the Central Bank Guarantee for agricultural loans, lack of consistency in guaranteed price for agricultural commodities and purchase with a guaranteed price through cooperatives, the cooperatives have encountered to organize the small farmers and support for increasing the agricultural products.

ii) Crop failures due to the climatic change and also lack of proper crop insurance schemes, the cooperatives have faced many difficulties in recovering the credit provided to their members.

iii) Export market enjoyed by the agricultural cooperatives in dealing with minor export crops and beetle as well as exotic flowers has more or less collapsed due to the entrance of private companies including international companies. Encouragement given by the government for commercial farming through leasing out some government farms as well as alienating huge areas of land for commercial cultivation, has further aggravated the vulnerability for cooperatives in the export market.

iv) The government has maintained seed paddy supply and also provision of subsidized fertilizer for paddy cultivation. Agricultural processing has virtually been taken over by the private companies. Therefore, the cooperatives have no control over the value chain in the agricultural field.

v) Absence of single purpose agricultural cooperative sector. Multipurpose cooperatives were expected to undertake the role played by earlier Agricultural Production and Sales Societies, but the priorities have been given

to service sector such as consumer and financial services. Agricultural credit represents a very low position in the credit portfolio of cooperatives.

7. Policy and Program Recommendations

i) The government should promote specialized single purpose agricultural cooperatives with specific commodities– paddy, fruits, horticulture etc. Encourage cooperatives for innovating new technologies in production and processing and marketing.

ii) Promote group buying of inputs and selling of outputs that could help competing in the open market as well as export market.

iii) Use the Agricultural Cooperative Apex Body as a catalyst to transform the agricultural cooperatives into a competitive and gear towards eradication of poverty, creation of employment and business opportunities and upgrading quality of life of farmers.

iv) Strengthen National Cooperative Council's role as a liaison body between cooperatives and stakeholders such as the government, private sector and international institutions.

v) Promotion of agricultural cooperatives for generating employment coordination with the government for lands availability and policy incentives. For this purpose, the National Cooperative Council and business federations should come into partnership with the government for attaining the SDGs.

vi) Provide suitable infrastructure environment to form strong and wide cooperative network among agriculture cooperatives and all other types of cooperatives covering transport, wholesaling, stores, processing and sales centers and to encourage consolidation of cooperatives in various types of the agriculture sector.

vii) Stakeholders' consultation on family farmer cooperatives with the participation of the representatives from Department of Cooperative Development, Department of Agrarian Development, Department of Agriculture and other organizations and institutes including fisheries and livestock.

viii) Provide technical, financial, institutional, and policy support to agricultural cooperatives to empower them.

ix) Prepare a national strategic plan to foster agriculture sector through cooperatives towards addressing the extreme poverty and hunger in Sri Lanka.

8. Conclusions

The potential for strengthening existing agriculture cooperatives and developing new agriculture cooperatives are immense and significant in reduction of poverty and hunger in Sri Lanka to meet the SDG-1 and SDG-2 by 2030. Sound policy formulation, improvements and effective implementation is critical in this journey with improved coordination among different institutional and organizational structures. Programs should be designed and implemented effectively, transfer of appropriate and sustainable technologies, skills and knowledge development for capacity building of farmers and staff of cooperative societies are the crucial issues to be addressed. The cooperative movement is the best approach for reducing poverty and hunger of the rural poor people.

References

DCS. (2016). Agriculture Statistics 2016. Department of Census and Statistics, Government of Sri Lanka.

DoCD. (2016). Statistical Report 2016. Department of Cooperative Development, Government of Sri Lanka.

DoCD. (2019). Annual Report 2019. Department of Cooperatives Development, Government of Sri Lanka.

DoS. (2014). Economic Survey 2014. Department of Statistics, Sri Lanka.

IFAD. (2015). Country Strategic Opportunities Program. International Fund for Agricultural Development, Rome.

UNDP. (2016). Human Development Index 2016. United Nations Development Program, Sri Lanka.

WB. (2017). Country Report 2017. The World Bank, Sri Lanka.

Invited Technical Paper

Chapter 9

Policies and Programs of National Dairy Development Board in India–Lessons for Smallholder Farmers in South Asia

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Abstract

The dairy cooperative movement brought about a paradigm shift in the Indian dairy industry. From being a milk deficient nation earlier, India today is world's largest producer of milk. This transformation is largely attributed to replication of "Anand Model" in different States of India by the National Dairy Development Board (NDDB) under its "Operation Flood" program (1970-96). The underlying philosophy behind "Anand Model" was establishment of a vertically integrated three-tier structure, which created a direct link between milk producers and the ultimate consumers. 'Operation Flood' created a new policy environment in the dairy sector and linked rural and urban populations, introduced market orientation and technological advancements, developed extension services and supported the growth of cooperatives in a sustainable manner. The strong dairy cooperative framework left behind by 'Operation Flood' was further consolidated by 'Perspective 2010' program (2001-09) launched by NDDB to strengthen the milk business of dairy cooperatives in key areas. Subsequently growing domestic demand necessitated the increase in the pace of milk production in India and NDDB addressed the same by introduction of 'National Dairy Plan Phase I' (NDP I) in 2011/12. NDP I is helping in growth of milk production by productivity enhancement measures and improved genetics of milch animals. Efforts to increase milk production through increase in productivity are also being supported by expanding the coverage of village based milk procurement systems to collect milk in a fair and transparent manner and ensure timely payments. This paper presents an overview of dairying scenario of India, its unique characteristics, challenges and constraints faced by farmers. Subsequently, it describes different policies and programs implemented by NDDB, which has contributed to growth of milk production and small farmers' cooperative institutional structure in India. Finally, it provides set of policy recommendations for growth of small holder milk production systems based on the experience of NDDB in implementing such programs.

Keywords: Operation flood, national dairy plan, dairy cooperatives, Anand model, small farmers, India

1. Background

India occupies about 2.4% of the world's land area and share about 18% of the world's population. Close to 70% of the population lives in about 0.6 million villages and majority of them lead lives centered on agriculture and allied activities in which livestock rearing especially dairying occupies prominent place. Out of 156 million rural households, 63 million are milch animal owning households (GoI, 2013). Dairying in India is an occupation of small and marginal farmers. For many, it is the sole source of livelihood bringing cash into their hands, twice a day every day of the year. In India, dairying is a production that results from the efforts of individuals that constitute masses rather than mass production. It is the effort of these millions of milk producers, which has helped India emerging as the largest milk producing country in the world.

The Indian dairy system has certain characteristics, common to many developing countries in Asia. Indian dairy farmers are predominantly smallholder producers with a majority of them owning less than two hectares of land and rearing one to three animals. Unlike many major developed dairying countries where grain/ pasture is used for feeding, the dairy animals in India are largely fed on agricultural by-products and crop residues. Household members carry out most of the dairy farming operations by themselves, with women contributing significantly to these operations. With availability of inputs at farm level itself the occupation remains self-sustainable and eco-friendly. More than 90% of India's farmers either don't possess any operational land or have less than 2 ha of land. While these small farmers own about half of the total operational land in the country, they own about 80% of the female bovines. Dairying in India, therefore, represents a more equitable distribution of productive assets, income and wealth than crop husbandry. Given the similarity of conditions the dairy development trajectory of India offers valuable lessons for designing suitable intervention in South Asian region.

2. Milk Production in India

The livestock sector contributes about 4.5% to the country's Gross Domestic Product (GDP) and about 26% to the output from agriculture & allied activities at current prices. Although the contribution of agriculture & allied sectors to the national GDP has been declining during past few decades, the contribution of the livestock sector in agriculture GDP is increasing (CSO, 2019). Milk and milk products constitute a major share of the value of output from the livestock sector; their share increased from less than 50% in 1950/51 to 66% in 2019. Milk has become the single largest agricultural commodity in terms of the value of

commodity produced. The value of milk output for 2016/17 was INR 6,144 billion[1] (US$ 90.58 billion), which was higher than combined value of paddy, wheat and sugarcane (INR 4,192 billion ~ US$ 61.80 billion) (CSO, 2019). Dairying is a major source of rural employment particularly for women. Women contribute more than 60% of the labour for rearing of bovines (CSO, 2019).

In the last five decades, national milk production grew by eighth-fold, from about 22 million tons in 1970 to 187 million tons in 2018/19. This caused a consistent and upward shift in the per capita availability of milk from 112 grams/day in 1970/71 to 394 grams/day in 2018/19 and contributed towards the nutritional self-reliance through domestic production (DoAHD, 2019).

3. Dairy Cooperative Movement in India

The seeds of dairy cooperative movement were sown more than 70 years ago in Anand, a small town in the state of Gujarat in western India. The exploitative trade practices followed by the local trade cartel triggered off the consolidation of farmers and milk became a symbol of protest. Angered by unfair and manipulative practices followed by the trade, the farmers of the district approached the great Indian patriot Sardar Vallabhbhai Patel for a solution. He advised them to get rid of middlemen and form their own milk cooperative, which would have procurement, processing and marketing under their control.

In 1946, the farmers of this area went on a milk strike refusing to be cowed down by the cartel. Under the inspiration of Sardar Patel, and the guidance of leaders like Morarji Desai and Tribhuvandas Patel, they formed their own cooperative named "Kaira District Cooperative Milk Producers Union Ltd" in 1946 at Anand. It began with just two village dairy cooperative societies and 247 litres of milk and is today better known as **Amul Dairy**. Amul grew from strength to strength thanks to the inspired leadership of Shri Tribhuvandas Patel, the founder Chairman and the committed professionalism of Dr Verghese Kurien, who was entrusted the task of running the dairy from 1950.

The Anand Model, envisages creation of cooperative institutions at the village level, district level and state level to procure, process and market the milk produced by member producer farmers. These institutions are owned and controlled by the milk producers, which have provided them with the necessary support structure to carve out a viable livelihood source for themselves.

[1] Indian currency (INR) equivalent: 1 US$= 67.82 INR

4. Evolution of NDDB

During the 1950s and 1960s, Indian dairy sector was characterized by stagnant domestic milk production and declining per capita availability. There was heavy dependence on imports of dairy commodities and domestic milk production was highly unorganized. Milk processing and cold chain infrastructure was absent and dairying was not practiced as commercial activity. The rich dairying heritage of India was being eroded.

In 1964, India's then Prime Minister Shri Lal Bahadur Shastri visited Anand to inaugurate Amul's cattle feed plant. He spent a night in a village and had detailed discussions with the farmers to understand the reasons for the success of the cooperative. Convinced about the true development through cooperative, he desired that the 'Anand Model' be replicated all over India. To achieve this, the Government of India decided to put in place a national organization to assume this responsibility – the National Dairy Development Board (NDDB) – which would give the farmers the best chance of succeeding in organizing themselves into cooperatives.

NDDB was set up in 1964 as a registered society. In 1987 the society, NDDB, was merged with the Indian Dairy Corporation, which was a Government of India undertaking incorporated to receive and monetize commodities from abroad. The new body, which succeeded the two merged entities, was set up through an Act of the Parliament and retained the name NDDB.

The significant functions entrusted to NDDB are to: i) Promote, plan and organize programs for development of dairy and other agriculture allied industries and biologicals; ii) Promote and set up dairy industries; iii) Finance any scheme in the cooperative or public sector to stimulate production and marketing of milk; iv) Develop and preserve high yielding cattle; v) Adopt the cooperative strategy in an effective manner; vi) Cooperate with international organizations; and vii) Conduct research and development.

5. Implementation of "Operation Flood" (1970-96)

NDDB was instrumental in implementing "Operation Flood" (OF) program. The OF program was the most comprehensive dairy development project undertaken – it was executed in three phases between 1970 and 1996. Its objective was the development of rural milk production through an extensive network of village milk producers' cooperatives to meet the growing urban demand for milk.

The project was financed through commodity aid and loans from the World Bank. In all, about US$ 1 billion was spent. There were mounting surpluses of dairy

commodities (Skim milk powder and butter oil) in Europe, part of which was received by India under World Food Programme. These donated commodities were converted into liquid milk and sold through existing metro dairies in Delhi, Kolkata, Mumbai and Chennai. The reconstituted milk powder and butter-oil helped the dairies to capture a dominant share of the market. The proceeds thus obtained, combined with World Bank assistance, funded the establishment of a vast infrastructure required to link millions of farmer producers to processing plants and markets.

The OF Program contributed to establish 73,000 village milk cooperative societies in 170 milk sheds, covering more than 250 districts in 22 states. About 9 million milk producing households came under the fold of operation flood program. As a result of operation flood program, the milk production increased from 21.2 million tons in 1968/69 to 69.1 million tons by the end of 1996/1997. During this period, the per capita milk availability increased from 112 gram per day to 202 gram per day despite a substantial increase in population.

The implementation of the OF Program by NDDB created a new policy environment in the dairy sector and linked rural and urban populations, introduced market orientation and technological advancements, developed extension services and supported the growth of cooperatives in a sustainable manner.

The OF program was the world's largest food aid program and most beneficial project funded by the World Bank anywhere in the world. It invested INR 20 billion (USD 1.9 Billion) in the OF programme and it provided net return into India's rural economy INR 2400 billion (US$ 10.4 Billion) each year – which was remarkably highest input-output ratio. No other development programme, either before or since, has matched this. This contributed to an increase in milk production by 40 MMT (Candler & Kumar, 1998).

6. Perspective Plan of NDDB (2001–2009)

The OF program had already put a dairy cooperative framework in place. It paved the way to take up new initiatives and create new conditions to firm up India's world leadership in milk production. The new challenge for the dairy industry was to explore ways to emerge stronger using the network created under OF. The response was Perspective Plan, a plan that attempted to take the dairy cooperative movement to its highest potential. To take this work forward, NDDB along with the dairy cooperatives evolved 'Perspective 2010' in 2001. The State Milk Marketing Federations and the Milk Producers' Cooperative Unions, the architects and key beneficiaries identified the thrust areas. The plan was designed keeping at helm the benefit to farmers at large. NDDB facilitated the planning process and

provided technical supports and need-based finance for implementing the Perspective Plan.

To set goals for the next decade, dairy cooperatives worked with NDDB to evolve Perspective Plan. The plan covered **Four Thrust Areas: i)** Cooperatives business, which includes procurement and marketing of milk; ii) Productivity enhancement, which would include feeding, breeding and animal health; iii) Quality assurance of milk; and iv) National information network.

7. National Dairy Plan (2011/12-2018/19)

In 2007/08, India produced about 105 million tons of milk with an average incremental addition of about 3 million tons per year in the last 15 years. Demand for milk was growing much faster. Amongst others, the **key drivers for growth in demand for milk were**: i) Rising incomes due to high GDP growth; ii) Growing urbanization and changing food habits; iii) Increase in population; iv) Export opportunities; and v) Increase in incomes of village households through rural employment programs.

Emerging trends indicated that milk demand in India is likely to be 210 million tons in 2021/2022. This required incremental milk production of 6 million tons per year failing which there was a possibility of a widening gap in supply of milk and the dependence on imports. On the other hand, some milk producers were not finding milk production to be sufficiently remunerative consequently they were disengaging from dairying as a source of income and looking at other alternatives.

Meeting projected demand from domestic sources and ensuring that dairying remains a remunerative livelihood option required a focused national initiative; therefore, *National Dairy Plan Phase I* (NDP I) was conceptualized by NDDB. A multi-state initiative was undertaken to accelerate the genetic progress through a mixed approach of breeding and feeding for increasing milk production. Simultaneously, efforts were made to tap this increased milk production by expanding village-based milk procurement systems.

NDP I focused on 18 major milk producing states, which accounts for more than 90% of the country's milk production, over 87% of the breedable cattle and buffalo population and 98% of the country's fodder resources. Benefits of NDP I will be however across the country.

7.1 Financial Outlays of National Dairy Plan Phase–I (NDP-I)

NDP- I envisaged three components (DRS, 2013): Component A, Component B, and Component C, along with specific financial outlays (Table 1) and physical targets (Table 2).

Table 1. Financial outlays of National Dairy Plan Phase-I

Component	Activity	Outlay (in INR million)	Outlay (in million US$) (1 US$=49 INR)
Component A	Breed Improvement	7,150	146
	Animal Nutrition	4,250	86
Component B	Village Based Milk Procurement System	4,880	100
Component C	Project Management and Learning	1,320	27
Sub Total*		**17,600**	**359**
End Implementing Agencies (EIA) Contribution		2,820	57
Grand Total		**20,420**	**416**

**Source of Funds: World Bank-IDA: INR 15,840 million (323 million US$, Govt. of India's contribution: INR 1,760 million (36 million US$), NDDB INR 2000 million (41million US$)*

7.2 Physical Targets of National Dairy Plan Phase–I (NDP-I)

Table 2. Physical targets of component A and B under National Dairy Plan I

Component A: Productivity Enhancement
Production of High Genetic Merit (HGM) cattle and buffalo bulls ▪ Production of 2,500 HGM bulls. ▪ Import of 400 exotic bulls/equivalent embryos.
Strengthening of "A" and "B" graded Semen Stations ▪ Production of 100 million semen doses annually in the terminal year.
Pilot Model for Viable Doorstep AI delivery Services ▪ 3,000 Mobile Artificial Insemination Technicians (MAITs) carrying out annual 4 million doorstep AIs by the terminal year.
Ration Balancing Programme (RBP) ▪ Coverage of 2.7 million milch animals in 40,000 villages.
Fodder Development Programme ▪ Production of 7,500 tons of certified/ truthfully labeled fodder seed. ▪ 1,365 silage making/ fodder conservation demonstrations.
Component B: Village Based Milk Procurement System
Strengthening and Expanding Milk Procurement System at Village level ▪ 23,800 additional villages to be covered. ▪ 1.2 million additional milk producers.

7.2.1 Component A: Productivity Enhancement

i) Production of High Genetic Merit Bulls

When breedable animals are bred through Artificial Insemination (AI), it becomes possible to use the semen of a few top bulls of high genetic merit over a much larger population and achieve genetic progress. Presently, only 20% of the breedable animals are bred through AI in India, which needs to be increased to 35% to accelerate genetic progress.

For achieving this NDP-I has emphasized upon increasing the number of High Genetic Merit (HGM) bulls used for semen production through Progeny Testing (PT) and Pedigree Selection (PS) program and import of HGM bulls. The breeds covered are: Cattle (Rathi, Kankrej, Tharparkar, Gir, Sahiwal, Hariana, CB-HF, CB-Jersey) and Buffalo (Pandharpuri, Nili Ravi, Jaffarabadi, Murrah and Mehsana).

For production of HGM Bulls, Standard Operating Procedures (SOPs) and Minimum Standard Protocol (MSP) is being followed. Each animal is ear tagged and its data is being captured through Information Network for Animal Productivity and Health (INAPH) software. Male calves born with confirm parentage and disease free status are being procured. As on March, 2019, more than 2,100 HGM bulls have been made available through PT program and 248 HGM bulls have been made available through PS program. Implementation of PT & PS programs have led to establishment of systems for genetic improvement programs at field level and development of experienced pool of manpower.

ii) Strengthening of Semen Stations

In order to raise the proportion of milch animals raised through AI, the demand for quality semen dose is estimated at 100 million doses of the required breeds. A total of 22 semen stations have been strengthened under NDP-I to meet the demand. The semen station strengthening projects have triggered the development of infrastructure, especially for biosecurity and for production and processing of high genetic, disease free semen doses complying with Minimum Standards as laid down by Government of India. As on March 2019, about 88 million semen doses have been produced.

iii) Pilot Project for Doorstep AI

A scientific approach to the delivery of Artificial Insemination (AI) services at the doorstep of milk producer is needed to ensure animal conceiving at better conception rate without spread of disease and the production of a genetically superior calf. NDP- I envisaged setting up the viable model for AI delivery services by inducting about 3000 trained mobile AI technicians (MAITs) in a financially self-sustainable manner.

iv) Ration Balancing Programme (RBP)

Breed Improvement Programme need to be supported by feeding a balanced diet so as to have a higher productivity commensurate with their genetic potential. Imbalanced feeding impacts the health of animal and income from milk production, since 70% of the total milk production cost is on account of feed. A need was felt to educate milk producers on ration balancing through trained village based Local Resource Persons (LRPs) so that the nutrients required by a milch animal is fulfilled in an optimum manner, thereby improving milk production efficiency, economic returns from dairying and reduction of methane emission.

In RBP program of NDP-I, LRPs are providing ration balancing advisory services to farmers based on centrally developed and standardized user-friendly computerized software. Average milk yield per animal before and after RBP advisory has gone up from 5.2 liters per day to 6.3 liters per day. Average per animal feeding cost before and after RBP advisory has declined from INR 143 per day to INR 136 per day. An increase of about INR 25 per animal net daily income is reported. By March 2019, around 2.8 million animals from 33,364 villages have been covered and 14% reduction in methane emission has been observed.

v) Fodder Development

There is about 50% deficit of green fodder in the country, and dry fodder is deficit by 20%. Enhancing green fodder availability and securing available bio-mass from farmers' feed is needed to reduce the deficit. NDP-I has provided fodder seed production support of 13,000 tons of certified/ truthfully labeled fodder seeds and 2,253 silage making/ fodder conservation demonstrations. Assistance is also being provided to dairy cooperatives in establishing fodder seed production, processing and marketing units. Till now 587,280 ha area has been covered under fodder production due to fodder seed sale.

Due to increase in use of combine harvesters, a significant part of the crop residue is left in farmers' fields and usually burnt to prepare the field for next crop thereby causing not only environmental pollution but also affecting quality of soil and reducing availability of feed and fodder resources. Under NDP-I appropriate mower ranges are being introduced in various milk unions for securing crop residue from fields. In all, 667 sets of mowers and pick up devices were introduced by March, 2019. To create awareness on dry fodder storage, construction of biomass bunkers, each of 50 tons capacity, was organized at 118 locations.

7.2.2 Component B: Village Based Milk Procurement Systems (VBMPS)

Efforts to increase milk production through increase in productivity is being supported by expansion of the coverage and strengthening of the village based milk procurement systems to collect milk.

Investments in village level infrastructure for milk collection and bulking such as Automatic Milk Collection Units (AMCUs) have ensured fairness and transparency in milk transactions and installation of Bulk Milk Coolers (BMCs) is improving the milk quality. This is leading to greater interest among milk producers to take up dairying as a source of additional income in the intervention villages.

VBMPS is helping the dairy cooperatives in the country to reach out to the hither to uncovered areas and increase coverage of cooperative dairying. A large number of women members have been covered under VBMPS, which has helped to improve their confidence and economic self-reliance. By March 2019, 1.6 million additional milk producers from 47,250 villages have been covered, of which 44% are women. Around 2.22 million milk producers, village level functionaries and officials have been trained.

In terms of overall benefits, the NDP-I has promoted a scientific approach and systematic process, which is putting India on a path of improved genetics of milk producing animals in a consistent and continuous manner. It contributes: i) Make prudent use of country's scarce natural resources; ii) Impact on reducing methane emissions; iii) Contribute to disease control; iv) Help strengthen regulatory and policy measures that will provide an enabling environment for future growth of dairying in the country; and v) Contribute to strengthening livelihoods of small holder and marginal milk producers that form the majority of India's milk production system.

8. Recommendations for South Asian Dairy Cooperatives

Based on experience of NDDB and given the similarity of conditions, following aspects are noteworthy for small holder dairy development in South Asia.

i) Institutional Development

The central approach of dairy development in India has been on building farmers' owned institutions. The dairy cooperatives approach dairying not merely as milk collection activity but as an integrated production, processing and marketing operation culminating in improving the farmer's income and productivity. Increasing the economy of scale and vertical integration that strengthen the bargaining power of the milk producers are some of the basic features of dairy

cooperatives. Globally, cooperatives are the dominant organizational form in the dairy sector. In Indian context, successfully run producer-controlled organisations have proven to address issues related to inclusion irrespective of gender, caste, creed and religion to augment incomes and livelihoods while contributing to increasing the supply of safe milk to consumers. The milk cooperatives have played a vital role in the progress of the Indian Dairy Industry.

ii) Market Orientation

One of the most visible impacts of dairy development programmes in India has been in providing market linkages to millions of rural milk producers. The market stimuli provided by cooperatives have resulted in an increased supply of milk and milk products into urban centres and resultant financial benefits are shared with milk producers.

iii) Provision of Input Services

Enhancement of milk production calls for effective input delivery system and substantial extension systems. Apart from providing market linkage, the various programmes and policies of NDDB have emphasized upon providing better AI facilities, veterinary care, fodder development and cattle feed services to the farmers. Various training and capacity building programmes are also organised for the farmers. All these help in boosting milk production which ultimately helps in growing the milk business of a milk producer.

iv) Professional Management

The expansion of dairying in India has led to cooperative unions and federations' activities becoming more and more complex requiring professional management. NDDB has been continuously supporting the dairy cooperatives for induction of professional manpower and their capacity building. The successes of such programmes have also attracted the attention of other developing countries; they also send their participants in such programmes.

v) Leadership Awareness and Capacity Building Initiatives

NDDB has always emphasized organisation of leadership development programmes to establish and propagate good governance and ethical business practices in cooperative enterprises. It is necessary to undertake capacity building initiatives to inculcate ethical values, cooperative spirit and techno-managerial competencies among the professionals working in cooperative enterprises. Mass campaign initiatives using social media and champions to create rights awareness among members, potential customers and general public are very helpful.

vi) Women Participation

Dairying has been a traditional family activity in Indian households done mostly by women. Women in rural households are primarily responsible for managing their animals as part of household activities**.** Encouraging women participation is felt highly desirable and necessary for the successful functioning of dairy cooperatives. NDDB has promoted an enhanced role for women in the membership and leadership of dairy cooperative societies, milk unions and federations for over four decades now. Specific activities have been taken up by the dairy cooperatives with technical and financial support of the NDDB included a focus on enhancing women's leadership skills, promoting thrift & credit groups and economic activities that contribute to women empowerment.

9. Conclusions

To sum it up, since its inception, NDDB has made continuous efforts to create the space to enable smallholder milk producers become productive and to help them find the means to a better life. The implementation of various strategies and programs such as institutional development, market orientation, provision of input services, professional management, leadership awareness and capacity building initiatives, and women's participation, would help to develop the dairy industry in South Asia. NDDB will be happy to provide support for any effort to improve the conditions of farmers particularly milk producers in South Asia with its experience and expertise.

References

Candler, W., and Kumar, N. (1998). India: The Dairy Revolution 1998: The impact of Dairy Development in India and the World Bank's Contribution. The World Bank, Washington DC., USA.

CSO. (2019). National Accounts Statistics. Central Statistics Office, Ministry of Statistics and Programme Implementation, India.

DoAHD. (2019). Basic Animal Husbandry Statistics 2019. Department of Animal Husbandry and Dairying, Ministry of Animal Husbandry, India.

DRS (2013). External Monitoring and Evaluation for NDP I (National Dairy Support Project), Baseline Study. Development & Research Services Pvt. Ltd., India

GoI. (2013). Key Indicators of Land and Livestock Holding in India: NSS 70th Round. Ministry of Statistics and Programme Implementation, Government of India.

NDDB. (2019). National Dairy Plan (2011/12 to 2018/19). National Dairy Development Board, Gujarat, India.

Invited Technical Paper

Chapter 10

Governance of Dairy Cooperatives in India

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Abstract

This paper is organized in the following manner. First, it provides a rationale of promoting cooperatives for dairy development in India. Next, it talks about how the governance structure of three tier cooperatives supports the growth of dairying in India. Third section points out that some of the issues, which hamper the governance of dairy cooperatives stem from the very nature of cooperative principles and cooperative structure itself. How cooperatives are dealing with such emerging issues in India is presented in the fourth section. The paper concludes by outlining specific suggestions for better governance, which can contribute in building, growing, and sustaining a vibrant cooperative organization in the context of South Asian Farmers' Cooperatives.

Keywords: Dairy cooperatives, governance, vertical integration, income, India

1. Background

Dairying in India is characterized by two broad sets of factors, which make dairy development a complex activity. First is very small relative size of individual dairy enterprise and the second is highly fragmented structure of production at primary level. Average herd size of dairy farmers in India ranges from 2-5 animals. Milk production in India has been a subsidiary activity rather than commercial activity. It largely continues to be household and subsistence activity.

All this coupled with highly perishable nature of milk makes the efficient and remunerative disposal of milk for the village level farmer a hugely challenging task. Thus, policies and institutional structures vis-à-vis the dairy economy will have to be conceived creatively and tailored to these highly structured requirements. Unlike other advanced dairying nations where dairying is like any other profit-oriented industry with fewer sources of supply, in India it involves aggregation of milk from millions of small and marginal farmers (NDDB, 1990). Thus, deep investments and long-term commitment is required for developing a supply chain of milk, which necessitates a strong connection with primary milk

producers. Naturally this advantage is available to producer owned institutions i.e. dairy cooperatives and milk producer companies by virtue of their design.

Organizing small milk producers in the form of dairy cooperatives has led to correction of natural bargaining weakness of small dairy farmers in India. The primary milk producer is also provided an opportunity to share in the financial benefits resulting from the value added through processing and marketing of milk (Samar, 2012). Profits which would have otherwise gone to urban shareholders are ploughed back to primary producers. The overall result is a moderate shift in the distribution of income in favor of rural sector, which in a country like India is highly justified. Therefore, cooperatives owned and managed by milk producers are best suited to promote the growth of dairying and uphold the interest of small holder farmers in India.

2. Governance of the Three Tier Dairy Cooperative Structure

As explained earlier, the complexity of dairying in India requires some sort of vertical integration from farmer to consumer. The cooperative structure of Farmer-Primary Dairy Cooperative Society- Milk Union- Federation has been evolved on similar lines (Figure 1). Primary milk producers come together and form a Dairy Cooperative Society (DCS) in a village. The governance of DCS is handled by a management committee elected by milk producers. Secretary/ Sahayak is also employed for handling day to day activities of the DCSs. Village level primary milk producers' cooperatives being closer to the members, is usually more responsive and sensitive to their needs and demands. It provides the required input services, milk collection and payment to milk producers. It acts as effective link between the milk union and the farmer members.

Many such DCSs come together and form a Milk Union. Milk Union is basically responsible for collection and transportation of milk from primary dairy cooperative society, milk processing, milk products manufacturing, technology to the dairy farmer and most importantly supervision of primary co-operatives and member education program. Similar to DCS, they are also governed by an elected board. Milk Federation is formed by coming together of different milk unions. It is responsible for marketing of milk products, co-ordinate inter-districts liquid milk marketing and production scheduling and supply of required materials.

In this way, the cooperatives achieve functional integration, operational efficiency and responsive delivery system at ground level. This has led to different kinds of strengths being built at various levels: adequate selling strength at Federation level, technical efficiency and high productivity performance at Union level, and widespread confidence and trust among farmers at Primary DCS level.

Development of production capabilities in case of perishable item like milk is not likely to yield any benefits, if it is not linked to a comprehensive procurement, processing and marketing system. At the same time, enhancement of milk production itself calls for effective input delivery system and substantial extension services. Dairy cooperatives have tended to make small holder milk production viable by investing in technical input program for member farmers as their governance structure sees little conflict in raising the productive capacity of farmers.

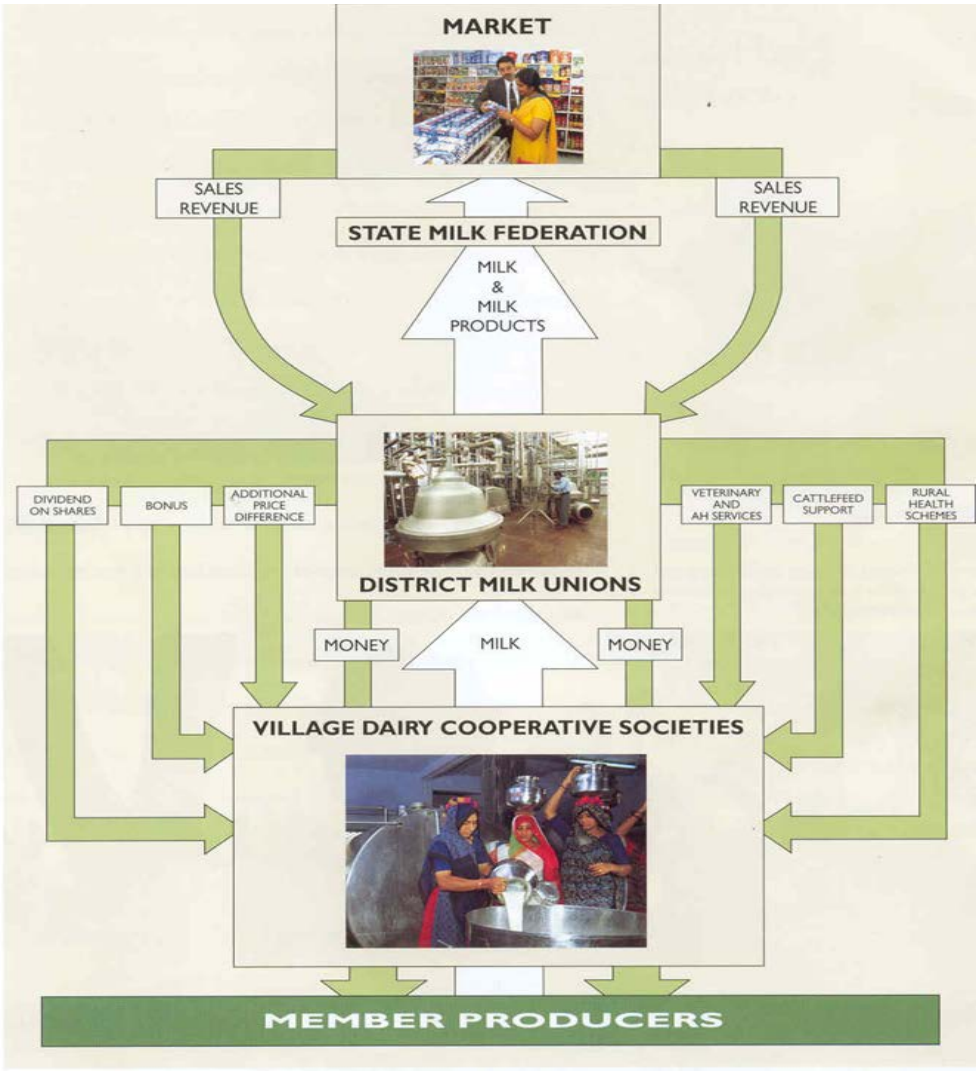

Figure 1. Cooperative governance structure

Source: NDDB (2019)

3. Challenges and Constraints of Dairy Cooperatives

An analysis of the various problems faced by dairy cooperatives in India reveals that many of them have stemmed from the very nature of cooperative structure and cooperative principles itself (Samar, 2012). The challenges and constraints of dairy cooperatives are as follows:

i) Voluntary and Open Membership and Free-rider Problem

Free-riders are cooperative members who make use of the capital of the cooperative by supplying produce, but without contributing their full share of that capital. Free-riders receive the same price for their produce as long standing members. While the long-standing members may receive bit more in terms of dividends paid on shares held. During flush season, DCS members who were not supplying milk or supplying very less quantity start supplying milk in full measure leading to oversupply. While in lean season they are attracted towards vendors or other private players who are paying more. This affects the commercial viability of dairy cooperative society and milk unions.

ii) Horizon Problem and Member Economic Participation

Members who plan to be long term suppliers of milk will favor continuing investments in dairy cooperatives at a rate necessary to sustain their economic activity and the cooperative. Retiring members resist such investments. Members with shorter horizons will not agree for continued investments or retained earnings in societies for capital formation. Lack of capital, both equity and debt, are key constraints to the development and growth of cooperatives. In the case of value added businesses like milk the problem is further compounded due to high capital requirements. Most dairy cooperatives suffer from lack of member capital and consequently low leverage in raising debt required for the growth of the business.

iii) Control Problem and Democratic Member Control

Milk producers who supply a large volume of produce and have a major stake in the cooperative have no more say over its direction than minor suppliers and even dry shareholders. Dry shareholders continue to be in the cooperatives bodies and indulge in politicking; cooperative bodies are used as stepping stone for furthering the political careers. The business aspect is lost and vested interest prevails.

iv) Role of State, Autonomy and Independence

While role of state is important for furthering an enabling environment, it is found that sometimes state government influence policy decisions, which may not be in best interest of dairy cooperatives. Grant, loan or any other financial assistance

provides state government with such leverage to influence policies. There are also certain restrictive clauses in state cooperative Acts, which also affect autonomous functioning of dairy cooperatives.

V) Education, Training, Information and Member Education

There are two components of member education: a) Owner education; and b) Extension education. Owner education is designed to make the member play the role as an owner of cooperative, and the second is called extension education meant to provide the knowledge to the members in managing his/her own economic enterprise. Investment on both components of member education can only ensure creation of a viable, resilient, and sustainable cooperative. Lack of education, training and information hampers member participation in cooperative activities which erodes the collective strength.

vi) Cooperation among Cooperatives and Lack of Unifying Identity

It is observed that sometimes there is poor co-ordination across tiers i.e. federation, union and dairy cooperative society, which hampers the efficient functioning of cooperatives. In each tier, the management committee of co-operatives consists of elected milk producer members. Thus, a management committee member is both owner as well as member of the cooperative society. This imparts a certain degree of duality to his role and sometimes it also leads to conflict of interest. For example, increasing milk price may be in his interest as a member but it may not be in the best interest of milk union if his role as management committee member of milk union is taken into account.

vii) Role Clarity

Striking a balance between board and executive functions is a crucial element which determines the success of a co-operative enterprise. Sometimes there is no clear demarcation of board and executive functions, which hampers the efficient functioning of dairy cooperatives.

4. Steps Being Taken to Address above Issues

In the wake of liberalized economic policies introduced in India since 1990s and consequently increased competition in both sourcing of milk and marketing of milk and milk products, dairy cooperatives are expected to be as efficient as their counterparts in private sector to better serve the interests of their member producers (NDDB, 2015). Dairy cooperatives are responding to some of the above mentioned issues in following manner:

i) Free-Rider Problem

The Free-rider problem is being addressed by putting in minimum patronage criteria of members i.e. minimum number of days of milk pouring and minimum volume of milk in bylaws of dairy cooperatives. Many cooperatives have also come up with lean-flush ratio of milk pouring. Such provisions are helping in increasing the number of active members and only such members are allowed in governance of dairy cooperatives.

ii) Horizon Problem

Cooperatives are putting in provisions to raise member capital and consequently member stake by linking equity to milk pouring. A member has to provide equity in proportion to milk poured by him. There is appreciation of share capital as well and members can retire at appreciated value of share capital.

iii) Control Problem

Milk producer companies promoted by NDDB have addressed this issue by dividing voting members into patronage classes A, B and C, each class sends to the board elected members in proportion to its share in business. By-laws of milk producer companies are also forbidding its elected members to contest any political post and in case they do so, then they have to resign from their membership.

iv) State Interference

97th Constitutional Amendment in India has provided for enabling provisions in state cooperative Acts for autonomous functioning of the dairy cooperatives. This includes fixed term of board, conduct of audit and election by state election authority. Parallel cooperative Act provide an enabling framework for freshly registered co-operatives, as well as for co-operatives under the earlier cooperative law, which wished to return to government its share capital. Milk Producer Companies promoted by NDDB under companies Act have greater autonomy in their functioning yet retain cooperative ethos of traditional cooperatives.

v) Member Education

Use of technology is helping in promoting education, training and information in dairy cooperatives. Under *National Dairy Plan I* (NDP I), Government of India scheme being implemented by NDDB, large number of farmers, cooperative officials and board members were brought to Anand and other regional training centers and provided orientation in different aspects of milk business (NDDB, 2015). Peer to Peer learning, Cross learning and Interstate visits are being

organized to enhance the capacity of stakeholders. Special programs are being conducted for Board members for improved governance of dairy cooperatives.

vi) Policy Based Governance

In order to avoid role conflicts and impart a degree of objectivity to their functioning, NDDB is working to promote policy- based governance systems in dairy co-operatives (NDDB, 2015). Cooperatives are encouraged and helped to formulate policies in different areas of their functioning such as finance, purchase, recruitment and human resource development.

5. Conclusions

Governance of dairy cooperatives in India is evolving with respect to changing times and cooperatives are taking steps to equip themselves with in-built mechanism for robust governance, superior business model and transparent, efficient and objective operating systems. Based on Indian experience following features can be helpful for **good governance of cooperatives in South Asia**: i) Ensuring mechanisms for control by active user membership; ii) Linking economic participation with patronage; iii) Promoting capital formation/ building member equity in proportion to patronage; iv) Good governance orientation to board/ management committee; and v) Use of Information and Communication Technologies (ICT) to ensure transparency in transactions. Emphasizing these features would be helpful in building, growing, and sustaining a vibrant producer organization.

References

NDDB. (1990). Proceedings of International Seminar on Dairying as an Instrument of Progress: The Indian Experience. Anand, Gujarat, India, 16-21 January 1989.

NDDB. (2015). Proceedings of Workshop on Governance Issues in Producers' Organizations. Anand, Gujarat, India, 8th October 2015.

Samar, K. D. (2012). State of the Indian Farmer- A Millennium Study, A SWOT Analysis of Agriculture Cooperatives. Ministry of Agriculture, Government of India.

Invited Technical Paper

Chapter 11

Farmers' Cooperative Initiatives with Integrated Farming System to Enhance Farmers' Income in India

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Abstract

Indian agriculture is predominated with small landholdings estimated to be 87% of total farmers. Income enhancement is crucial for poverty eradication and zero hunger, the goals set under SDG by 2030. India has also been focussing on doubling the income of farmers by 2022 through a programme launched in 2016. A study was conducted in Chhurriya block, Rajnandgaon district in Chhattisgarh, India to assess how to enhance farmers' income by adopting Integrated Farming System (IFS) models being implemented by farmers and its replicability with due modifications to suit the specific conditions of other regions of the country. The study showed that the net income of farmers cultivating only a single paddy crop in a year ranged from INR 12,000 to INR 16,500 per acre, while the income from paddy crops cultivated in two seasons ranged from INR 22,000 to INR 26,500 per acre (0.4 ha). Total income from IFS was found to be much higher, as compared to income from single crop. Based on the study, four IFS models of 1 ha (2.5 acre) size were prepared for popularising in Chhattisgarh State and other States. These models can provide income ranging from INR 0.124 million to INR 0.495 million per acre per annum depending upon the combination of IFS activities and cultivated area. The study recommends various policy initiatives for promoting suitable IFS model in different areas through farmers' cooperatives to realise the goal of enhancing income, poverty eradication and doubling farmers income of Government of India (GOI) mission.

Keywords: Poverty, integrated farming systems, income enhancement, farmers' cooperatives, India

1. Background

Income enhancement of farmers in India and other SAARC countries is very essential, particularly in view of attaining the goals for poverty reduction and zero

hunger under SDG by 2030. Initiatives are being taken by all countries and also in India. Now more focus is given for income enhancement of farmers in India. The South Asian sub-continent is a home to world's one fourth population, a region that is geographically knit together and has socio-cultural, political, historical, and economical homogenous characteristics (Joshi, 2012). The South Asia region has a population of 183 crore, 23.7% of world population. Of these, 72% live in rural areas. The percentage of rural population in the SAARC countries is very high, implying the agrarian nature of these economies. Agriculture accounts for a significant part of GDP throughout the region, and has grown at a remarkable pace during the past 30 years as a consequence of the Green Revolution. The region has still a good number of undernourished and poor people than any other developing region, and more than two-thirds of this population reside in rural areas. The recent Global Hunger Index has also indicated the utmost necessity for South Asia to work towards increasing the per capita income and achieve food and nutritional security. In India, initiatives have been taken in the past and also are being taken on continuous basis in this direction. Recently with a view to attain SDG goals and farmers' prosperity, the Government of India launched a program in 2016 on doubling the farmers income by 2022 and a number of initiatives are being taken to achieve this goal.

Concentrating on the farmers income enhancement, since the last half of the century, after the adoption of the **Green Revolution**, India's food production up to 2015 has multiplied by 3.7 times. The population of India has grown at an annual rate of 1.76% from 2001 to 2011 and stands at 1212 million, and is estimated to increase further to 1530 million by 2030. The NSSO data on Consumption Expenditure Survey for the year 2011-2012 reveals that around one fifth of the rural households, with agriculture as their primary occupation have income levels below the poverty line.

India has attained food self-sufficiency and the production of food grain has reached to 277 million tonnes and the production of fruits and vegetable were around 95 million tons and 186 million tons respectively. The demand for high value commodities such as fruits, vegetables, livestock products, fish, poultry, etc., is increasing. Livestock has traditionally been an integral part of farmers' household, augmenting rural economy and is an excellent source of supplementing family income and generating gainful employment in the rural sector, particularly amongst the landless labourers and rural women. According to Livestock Census (GOI, 2012), India's current livestock population is 512.5 million (with 191.2 million cattle and 102.4 million buffalo) and their contribution accounts for 26% of the agricultural GDP and has close links with crop production.

The production of milk has also increased from 127.9 million tons in 2011/12 to 176.3 million tons in 2017/18. The poultry produces 55.64 billion eggs and 1401 thousand tons of meat and contributes approximately to INR 220 billion. It also supports the livelihood of about 2 million people. Fishery is another very important source of protein and gives high return. The total fish production during 2017-18 was estimated to be 12.60 million metric tonnes, of which nearly 65% is from inland sector. About 50% of the total production is from culture fisheries and constitutes about 6.3% of the global fish production. These allied activities are having very high potential for income and employment generation.

Keeping in view the GOI's goal of doubling farmers' income by 2022, a study was undertaken in Chhurriya block of Rajnandgaon district in Chhattisgarh state to analyze the IFS models being implemented by the farmers so that the same could be replicated with suitable modifications to suit the specific agro-climatic conditions prevailing in different districts of the country. It was intended to study existing practices, including various farm models and integrated farming system (IFS) of individuals etc. and document them as also to suggest model IFS for substantial income enhancement as goal for farmers.

2. Study Area

The study was conducted in Rajnandgaon district of Chhattisgarh State of India, which is located in the central part of India, between the latitudes of 17°46'N - 24°5'N and the longitudes of 80° 15' E 84°20'E. Its proximate position with the tropic of cancer has a major influence on its climate. The agro-ecological situations of these regions are different and hence there is variation in the crops and cropping systems of these regions. Rajnandgaon district falls under the Chhattisgarh plains agro-climatic Zone. The main kharif and rabi cereal crops sown are paddy, wheat, maize, and millets. The main pulse crops grown arepigeon pea, gram, green gram, black gram, horse gram, etc. The important oilseeds that are grown are soya bean, linseed, sesame and rapeseed/ mustard. Total geographical area and population of this district is 802.252 (000 ha) and 1,283,224, respectively. Tropical climate condition is found in this district with maximum temperature 42-45° in summer and minimum 10-12° in winter season with annual rainfall of 1274 mm. The agriculture land consists of 66% low land and 34% under upland and cropping intensity of the district is 137% at present. As per operational land holding status. About 75% of the farmers comes under marginal and small categories (having land up to 2 ha).

3. Challenges and Programs

Indian agriculture passed through difficult times due to two consecutive drought situations in 2012/13 and 2013/14, thereby resulting in widespread agrarian distress among the farmers. The rural areas in these parts faced food and livelihood crisis, more specifically, the shortage of fodder and drinking water. The government needs to proactively address the situation and make long term farmer centric policies related to irrigation, farm diversification, farm profitability, and community support programs so as to socially and economically empower farmers.

It is important to measure agricultural progress by the real income of farmers and not by gross production of agricultural commodities. In this background, the Finance Minister of India mentioned in his Budget Speech (2016) for "doubling farmers income" to realize the vision of the Prime Minister of India for doubling farmers income by 2022. The Government of India announced a multi-pronged strategy covering following broad areas:

- Big focus on irrigation with large budgets, with the aim of "per drop, more crop."
- Provision of quality seeds and nutrients based on soil health of each field.
- Large investments in warehousing and cold chains to prevent post-harvest crop losses.
- Promotion of value addition through food processing.
- Creation of a national farm market and e-platform across 585 stations by removing distortions.
- Introduction of a new crop insurance scheme to mitigate risks at an affordable cost.
- Promotion of ancillary activities like poultry, beekeeping, fisheries and integrating schemes under horticulture, irrigation, livestock in particular.

4. Integrated Farming Systems for Higher Income

One of the options available for doubling of farmers' income and mitigating risk is the adoption of Integrated Farming Systems (IFS). The IFS refers to agriculture systems that integrate livestock, crop production, horticulture, fishery, apiary, sericulture and such other related activities as products or byproducts as integrated bio-systems (Ramrao, 2006; Channabasavanna, 2009). In this system, an inter-related set of activities is used so that the "waste" from one component becomes an input for another part of the system, which aims at reducing the cost, improving the production and increasing the income. Since it utilizes waste as

resources, IFS would eliminate waste by using the waste gainfully to ensure overall increase in productivity for the entire agricultural system. It also avoids the environmental impact caused by waste from intensive activities. In the IFS approach, all the components and activities that affect each other are linked. IFS is defined as a unique and reasonably stable arrangement of farm activities that the household manages according to its physical, biological, economic and socio-cultural environment in accordance with the household goals, preferences, and resources.

At the center of the interaction is the farmer exercising control and choice regarding the type of element and result of the interaction. It is a resource management strategy to achieve economic and sustained production to meet diverse requirements of farm household while preserving resource base and maintaining a high level of environmental quality. It also represents integration of farm activities such as cropping systems, animal husbandry, fisheries, forestry, sericulture, poultry, etc., for optimal utilization of resources bringing prosperity to the farmer. The farm products other than the economic products, for which the crops are grown, can be better utilized for productive purposes in this farming system approach.

This system combines livestock, aquaculture, agriculture and agro-industry in an expanded symbiotic or synergistic manner, so that the wastes of one process become the input for other, with or without treatment to provide the means of production, such as energy, fertilizer, and feed for optimum productivity at minimum costs. The IFS is part of the strategy to ensure sustainable use of the natural resources for the benefit of present and future generations while it also enhances income substantially.

Implementation of IFS would ensure minimization of risk, recycling of wastes and residues, integration of two or more activities, optimum utilization of all resources, maximization of productivity and profitability, maintenance of ecological balance, generation of employment, increased input use efficiency and use of end products from one activity as input in other activity. It has been seen that farmers who practice IFS have significantly higher net income and are also protected from risks on account of crop failure to a larger extent than those who do not practice it. Sustainability is the objective of the IFS where production process is optimized through efficient utilization of inputs without infringing up on the quality of environment with which it interacts.

The practice of IFS has a positive impact on productivity by providing an opportunity to increase economic yield per unit area, per unit time by virtue of intensification of crop and allied activities. Besides, it increases profitability by reducing the cost of production. The benefit-cost ratio works out to be high.

Further, IFS results in various environmental benefits such as improved soil health, savings in the use of energy, reducing deforestation, etc. The IFS has the potential to give a boost to employment generation by facilitating the establishment of downstream farm enterprises such as livestock, allied enterprises, food, agro-processing etc. Hydroponics is one of the techniques that is being used commercially successfully in Satara and Warna Dairy at Kolhapur districts of Maharashtra to produce green fodder at a reasonably cheaper rate with less water and time. In the following section, we briefly discuss on hydroponic technique adopted by dairy farmers.

4.1 Hydroponics

Hydroponics is a scientific way of growing plants/ crops in water without any soil, generally in controlled conditions/ environment. In this method, the water is generally enriched with or incorporated with a well-balanced nutrients that are essential for plant growth. The diagram 1 shows green fodder cultivation using Hydroponics in controlled condition.

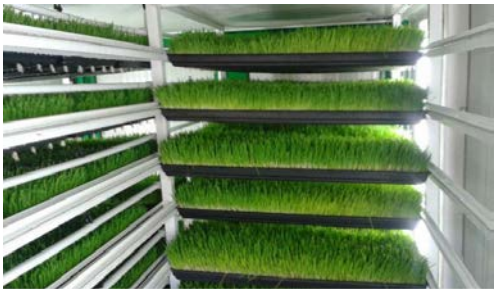

Figure 1. Hydrophonic farming system

4.2 Technique of cultivation

An automated hydroponic system has chambers in which foggers are installed (Figure 2). These foggers spray a fine mist of water on the trays so as to keep the seeds moist and maintain the RH between 70% and 80%. GI trays of various size were used in tier system and water is sprinkled over trays. Excess water is taken out by draining and harvesting for reuse. The systems are hi-tech and fully automated. By using the basic principle of the seed germination and growing for about 7 to 8 days, farmers are being trained for simple construction of system to grow fodder by using water to small sized plants of about 20 cm tall. There are large number of benefits of hydroponics such as minimal losses of fodder, high nutritional value, more appetizing quality, higher

Figure 2. Technique of cultivation of hydrophonic farming system

bio-mass conversion rate, water and time saving production of green fodder, easily scalable, less labour requirement and round the year production system.

5. Field Observations and Case Studies

The study conducted in Chhattisgarh used the interview method for data collection from the respondent farmers. A sample of farmers who were reluctant to adopt IFS despite being aware of the benefits, were also contacted to understand the reasons for their reluctance. The study team visited 22 farmers undertaking different types of integrated farming and also administered questionnaire through field level workers to obtain feedback from other farmers both practicing IFS and those who were not (control farmers). The predominant models of integration practiced by the farmers were:

i. Cultivation of paddy in Kharif season followed by growing vegetables in winter and summer season.
ii. Cultivation of paddy in Kharif season with livestock rearing throughout the year.
iii. Cultivation of paddy in Kharif season along with livestock rearing, fish farming and cultivation of vegetable in winter & summer seasons.
iv. Cultivation of paddy in both Kharif & Rabi seasons, with livestock and fish farming as supplementary activities.

The study team also observed that the net income of farmers cultivating only single paddy crop in a year from an acre of paddy field ranges from INR 12,000 to INR 16,500 while that of farmers undertaking cultivation of paddy in two seasons was in the range of INR 22,000 to INR 26,500 per acre. Further, during the study, the team visited the farmers in different villages of Rajnandgaon district of the state of Chhattisgarh. The focus was to see whether the farmers started following the Integrated Farming System (IFS) based on their own understanding of the concept. A comparative analysis showed that the net income of farmers undertaking IFS was significantly higher than those not adopted IFS.

Many farmers have incorporated the IFS in their own personal and unique ways based on their availability of resources, their farming situation and have modified it according to their needs and have received great results. These specific examples include farmers with 5 – 10 members in their households, engaging themselves in a variety of activities which yielded very high level of incomes. These activities include

- Rearing chicken and establishing poultry systems.
- Constructing bore wells to get enough water for irrigation followed by fish ponds and also making own fertilizers to increase crop yield.

- Trying other activities such as rice mills or lending out agricultural assets.
- Setting up broiler poultry farms.
- Adopting and engaging in traditional farming practices for the cultivation of paddy or vegetables.
- Becoming a part of the WADI project that helps you cultivate mangoes along with the cultivation of vegetables.

The activities that the farmers adopted were in addition to the regular farming activity of cultivating paddy. All these activities are a result of profound observation of the environment and how the environment reacts to everything. The initial success in these activities encouraged the farmers to proceed further with these activities and thus increase their individual household incomes. The earnings from these six models are given in Table 1.

Table 1. Annual income - expenditure of the household adopted IFS

Particulars	**Model I**	**Model II**	**Model III**	**Model IV**	**Model V**	**Model VI**
Gross income of the family (INR)	1,840,200	1,795,000	1,060,000	1,925,000	2,000,000	420,000
Expenditure (INR)	381,550	1,111,000	470,000	1,300,000	1,310,000	290,000
Net income (INR)	1,458,650	684,000	590,000	615,000	690,000	130,000
Land area (Acre)	5	13	14	5	11	8.5
Net income (INR) per acre land	291,730	52,615	42,140	123,000	62,730	15,290

Based on the farm models that were being traditionally practiced by the 22 farmers studied, the study has recommended four farming models on the basis on the Integrated Farming Systems (IFS), which can be adopted/ modified in different parts of the country depending on the agro-climatic conditions, farmers capability and adaptability in the respective areas. A few most suitable IFS practices are recommended by Channabasavanna et al (2009) for a small and marginal farmers (SF/ MF) to double the income: i) Increasing the productivity per unit area; ii) Reducing the cost of cultivation by judicious use of inputs and resources; iii) Providing with an insurance blanket or safety net to ensure a steady sources of income even during the times of adverse situation arising on account of climate change or other causes.

The study observed extremely successful examples of progressive farmers who had adopted IFS and increased their production and productivity significantly. There were farmers who had reduced the area under paddy by increasing area under vegetables. They were growing paddy only to meet the food requirements of their family. This was adopted despite the fact that Chhattisgarh state has a sound system of providing Minimum Support Price (MSP) system announced by

Government of India for paddy. There were a large number of farmers who were cultivating paddy twice or even three times a year. Some of these had a dairy, vegetables, gram or allied activities as well. Farmers, undertaking allied activities, along with cultivation of paddy, had much better returns.

6. Field Level Constraints for IFS

Some of the constraints of IFS seen from farmers' feedback and literature are:

- Lack of own resources for initial capital investment.
- Psychological barrier in farmers for approaching banks for credit (especially term credit).
- Lack of credit worthiness of small farmers as per set banking rules.
- Lack of enthusiasm in bankers towards the farming community.
- Un-availability of clear entitlement of land with the cultivator.
- Un-availability of labour on hire due to social security programmes of government.
- Un-availability of family labour due to unwillingness of younger members of the family to continue with agriculture beyond sustenance level.
- Fatigue amongst the older generation towards farming, un-availability of assured irrigation, prevalent practice of open grazing, etc.
- Lack of awareness amongst farmers on various governmental developmental schemes, etc.

Based on the field study, farm models of four integrated farming systems were formulated, which can be popularized in the 11 districts covered under the AEZ-VII (Agro-ecological Zones) of Chhattisgarh State and also other potential districts of the country. The inspiration for IFS comes from Tribal Farmers who cultivate small patches of multiple crops while relying on paddy to meet their food requirement. They cultivate oilseeds, pulses, onion, chili, turmeric, brinjal, tomato, ladies fingers, rearing a few poultry birds etc. only to meet their own family dietary requirements . They normally do not rear cattle or fish.

It was also observed that the native tribal farmers of this region, traditionally incorporated all these activities in their farming pattern, but in an unplanned and unsystematic nature. The field insights proved to be beneficial and served as the foundation for this study and helped construct four farm models along the same lines, which suggest a combination of various activities that can be undertaken by the farmer, to make optimal use of the resources, as illustrated with few examples in the following paragraph.

The practices can be modified with various activities which form a circle with waste or by product from one activity becoming the input for the next activity. It involved planting trees, bamboo, fruit trees, vegetables, agriculture (cereals, oilseeds and pulses). The waste from these namely, straw leaves oilcake, shells hulls etc. go as animal feed or as input for vermi-compost. A related activity like mushroom cultivation can also be considered depending upon inclination of farmer and of course market. They make their own pesticides and manures using NADEP, vermi-compost etc. The Agri-waste is used in dairy and manure. Poultry birds are kept and the waste from same goes to feed fish in the farm pond. The waste from fish farm and silt is used as excellent manure as is poultry waste. The water is used for irrigation. The cattle dung used as fish feed and manure. The urine is used to make pesticide. The different types of vegetables are planted to make maximum use of the available land.

Based on the principles of IFS and resources/ residues utilization depending on agro-climatic conditions and farmers capability, four models have been devised (Patil et al., 2013; Yadav et al., 2019). These models would help implementing and/or adopting gradually depending on farmers own understanding and capacity. The models devised and suggested in this study are provided as Appendix-I.

In all these four models, wire mesh fencing has been included as an integral component so as to enable the farmer to protect the field from stray/ grazing animals and undertake cultivation of fruits and vegetables during Rabi and summer seasons. Also since most fields are dry in the summer and sometimes and some places even in the rabi season, fencing with barbed wire is an essential component of IFS to prevent crop damage by stray cattle and even wild animals. In models III and IV, as commercial crops are also to be taken up, a bore well has been included to cover a command area of about 2.5 acres. The information with respect to the capital investment to be made, the costs incurred and the incomes generated is given in the Figure 3.

We have estimated the Internal Rate of Return (IRR) of each model. The repayment period is 6 years, with additional 1 year moratorium period. The IRR is defined as the discount rate at which one can ensure that any particular investment will have ability to generate more return than its actual cost. In other words, it is the rate at which the Net Present Value (NPV) of the investment is actually zero.

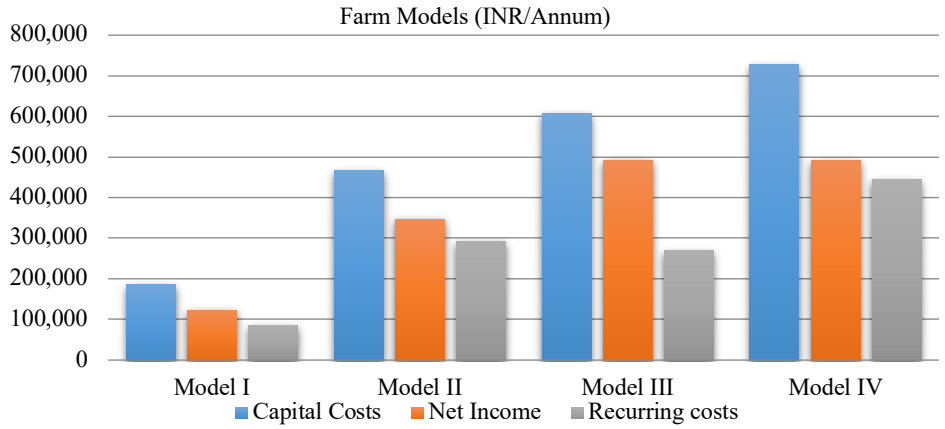

Figure 3. Capital cost, net income, and recurring cost of four models

The IRR states that if the internal rate of return for a particular project or investment is greater than the minimum required rate of return or the capital cost of the project, then the investment must be pursued as viable. Conversely if the IRR is lower than the cost of capital then the ideal decision would be to discontinue the investment for the project. For the four models of our study, the initial IRR, taking into the incomes and expenses is in Figure 4.

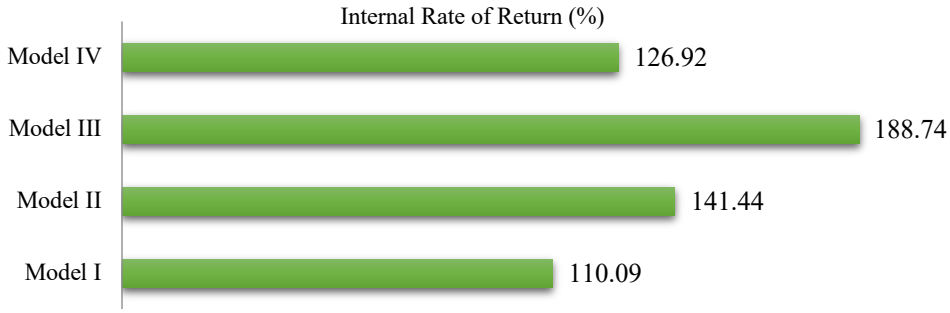

Figure 4. Internal Rate of Return of four models

All the four models, exhibit a high Internal Rate of Return and thus, given the capital costs, annual instalments and the total incomes and expenses incurred during the time frame of each project, each of these investments will be profitable to the farmer and hence the farmers can engage in either of the models. Based on the rule that greater the IRR and greater the amount by which the IRR exceeds the capital costs the higher will be the net cash flows to the investor. The result reveals that all the four above mentioned models are financially viable to undertake them. Suppose we consider the capital costs to be 15%, the IRR for all the four models is thus very high as compared to the capital cost.

7. Sensitivity Analysis

In this study, we have also carried out the sensitivity analysis for the calculation and changes in the IRR, by taking two particular cases.

i) Case 1: Reducing the income by 10% and increase the expenses by 10%.

ii) Case 2: Reducing the income by 20% without any changes in the expenses.

From the above sensitivity analysis, we can conclude that the four models will still be viable and profitable. In Case I – where the income is reduced by 10% and the expenses is increased by 10% and in Case II – where the income is reduced by 20%, without making any changes in the expenses, to facilitate taking better decision in both cases. The risk of both input – outputs prices were taken at 10% each in case 1, while in case 2, as it reduces the risk of huge sudden price reduction of outputs and the project would still be financially viable (IRR is higher than 15% in both cases). The results of the above mentioned two cases of sensitivity analysis and IRR are presented in Figure 5.

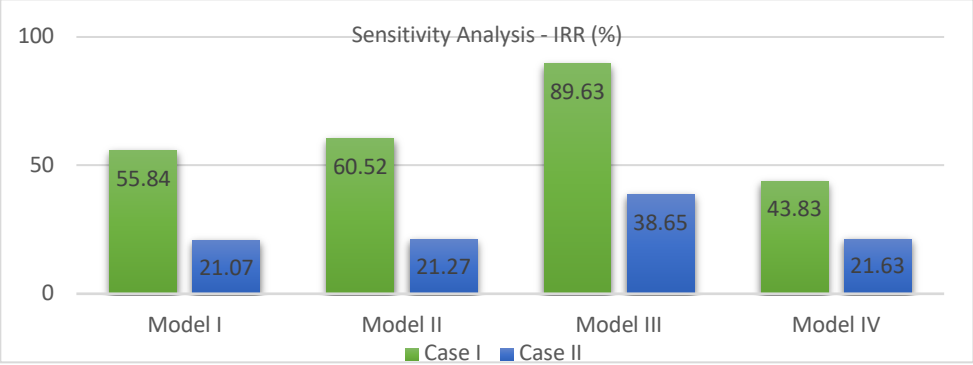

Figure 5. Sensitive analysis

8. Role of Cooperatives in Popularizing IFS

The most common types of cooperative societies are producers' cooperatives, industrial service cooperatives, manufacturing cooperatives, marketing cooperatives, cooperative farming societies, housing cooperatives, credit cooperatives. In India, agricultural cooperatives undertake input supply covering maintaining and operating common service centres for agricultural equipment and machinery like power tillers, tractors, etc., supply of seeds, fertilizers, marketing of produce, processing of produce, credit etc. Recently, Govt of India has been promoting formation of Farmers Produces Organisation (FPO). Besides, there are other forms of informal cooperatives such as Self-Help Groups (SHG) and Joint liability groups under micro finance initiatives in India. The bankability and credit

worthiness were found to be most acceptable as it is evidenced from the progress over the year The repayment level was found to be also high. Women farmers can participate in SHGs, and SF/MF and tenant farmers can form JLGs who can implement the IFS model more effectively.

9. Recommendation for Enhancing Income

i) Holistic Approach in Government Support

The practice of IFS models requires undertaking various interlinked activities mostly on a scale much less than that presently advocated by planners and agricultural scientists. Consequently, although subsidies are available for most of these activities, the farmer practising IFS is not able to access these as he is not undertaking the activity on a scale envisaged in the guidelines of the scheme drafted for the same. Further, it is not possible for a farmer, undertaking integrated farming to move around various departments scouting for activity based subsidy. It is recommended that the government may consider providing subsidy for IFS models in a holistic way through a single window approach for IFS.

ii) Integrated Project Approach for Lending

The activities under IFS are multiple and most bank branch managers are unable to visualize a project with multiple activities undertaken on a small scale. Consequently, bank finance is unavailable in most instances for farmers undertaking IFS. Even the KCC limit may not be suitable for IFS as the crop cultivation is undertaken by the farmer on a small patch of land, generally in about 0.4 hectare or less. It is, therefore, recommended that bankable IFS models on Integrated Project Approach may be developed in each state and provided to the banks for financing. Training and capacity building of Bank officials would help successful implementation of IFS project.

iii) High Value Key Components for Higher Income

There are a certain key or critical components necessary for increasing farmer's income and bringing stability to agricultural operations. The key components like livestock farming, vegetable cultivation, farm pond, hydroponics, vermicomposting, bio-pesticides, etc., have been covered in detail. It is recommended that these key components should be integrated across all the models so that the farmers are able to have a steady and sustainable source of income.

iv) Stoppage of Free Grazing

Similarly, since IFS involves undertaking agriculture operations all throughout the year, there is a critical need to ensure that stray grazing and wild animals are not

able to enter the farm. Hence there is a need to provide for appropriate fencing for the plot of land preferably with barbed wire fencing and social fencing through local self govnment institution.

v) Water Efficient Devices

The IFS models should promote the use of water saving devices like drip and sprinkler irrigation. It should also lay emphasis on the creation of community-based bore well or open well and also water budgeting through the formation of Water User Groups (WUGs), etc.

vi) Formation of Dedicated Fund

Since IFS is undertaken by the small and marginal farmers, the bankable models would require funding support. It is suggested that a dedicated fund for popularizing IFS through bank credit may be established, which will take upon itself the task of popularizing IFS models and purveying the subsidy.

vii) Monitoring Mechanism

A review mechanism may be established to monitor the progress of the credit linked IFS. Such mechanism may be set from national, state and district appropriately with all major stakeholders including national level financial institution and also State level key concerned Departments. The Committee will also sanction applications received for grant of subsidy /financial support.

viii) Promotion of Cooperative Approaches

The Study recommends that cooperatives engaged in proving credit, input supply, rural consumer stores, market access (PACS, LAMPS, etc.)., be encouraged to promote IFS amongst their members This will provide for stability in the income levels of the members and also give a fillip to doubling of farm income in lesser time frame. Further, women farmers as SHGs and SF/MF and tenant farmers as JLGs may also be encouraged to take up such IFSactivities. These groups may be federated into a bigger group and for farmers producers organisation for both backward and forward linkages.

With the implementation of the above recommendations, it is expected that the IFS model can be promoted in bigger ways in different parts of the State and the country successfully for enhancing the farmer's income substantially. It is further expected that similar model can also be implemented in other SAARC countries where similar agro-climatic conditions prevail and also by adopting appropriate strategies to promote this approach with investment required for various purposes to adopt IFS so as to help enhancing farmers' income. It is expected that the IFS approach would positively help in attaining the goals of SDG, i.e., poverty

eradication and zero hunger and also realizing the goal of doubling farmers' income in India.

10. Conclusions

The Study showed that an integration of the practice of IFS with cooperatives, will provide a boost to SF/ MF in doubling of farm income in lesser time frame. These cooperatives help make inputs available in time at much lower costs than that in the market, marketing of outputs as also jointly farmers can cultivate as smaller informal group as per convenience of farmers in each area. The IFS models can be replicated to other countries of South Asia. The farmers' cooperatives can be used as a vehicle to replicate IFS in South Asia.

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Disclaimer

Views expressed in this paper are strictly those of the authors and not attributable to the RBI and orgaisation the authors attached to.

References

Channabasavanna, A.S., Biradar, D.P., Prabhudev, K.N. and Hegde, M. (2009). Development of Profitable Integrated Farming System Model for Small and Medium Farmers of Tungabhadra Project Area of Karnataka. *Karnataka Journal of Agricultural Sciences,* 22(1):25-27.

GOI. (2012). Livestock Census 2012. Government of India.

Joshi, P. (2012). Greening Agriculture in South Asia. International Food Policy Research Institute (IFPRI), Washington, USA.

Patil, S.K., Urkurkar, J.S., Rathore, A.L., Nandeha, K.L. (2013). Integrated Farming System Models for Marginal and Small Farm INR. Directorate of Extension Services, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Ramrao, W.Y., Tiwari, S. P. and Singh, P. (2006). Crop-livestock Integrated Farming System for the Marginal Farmers in Rain-fed Regions of Chhattisgarh in Central India. *Livestock Research for Rural Development.*

Yadav, A. K., Nalini, R. and Singh, D. (2019). Integrated Farming Systems Approach: Increase Food Security, Agricultural Farm Income and Rural Economy. *International Journal of Current Microbiology and Applied Sciences*, 8(2).

Appendix –I

Model I

Variables	Areas
Total land available for integrated farming	2.5 acre
Paddy cultivation in kharif season	2.0 acre
Fish farming/ farm pond	0.25 acre
Dairy farming (1+1)	0.2 acre
Cultivation of gram in rabi season	1.0 acre
Free space for homestead/ other activities	0.05 acre

Model II

Variables	Areas
Total land available for integrated farming	2.5 acres
Paddy cultivation in kharif season	1.0 acre
Fish farming/ farm pond	0.25 acre
Dairy farming, vermi-compost, hydroponics	0.2 acre
Vegetable cultivation in kharif season	0.9 acres
Vegetable cultivation in rabi season	1.9 acres
Vegetable cultivation in summer season	0.5 acres
Free space for homestead/ other activities	0.15 acre

Model III

Variables	Areas
Total land available for integrated farming	2.5 acres
Paddy cultivation in kharif season	1.0 acre
Fish farming/ farm pond	0.25 acre
Dairy farming, vermi-compost, hydroponics	0.2 acre
Papaya cultivation under drip	0.5 acres
Vegetable cultivation during kharif season	0.4 acres
Vegetable cultivation during rabi season	1.4 acres
Vegetable cultivation during summer season	0.5 acres
Free space for homestead/ other activities	0.15 acre

Model IV

Variables	Areas
Total land available for integrated farming	2.5 acres
Paddy cultivation in kharif season	**0.5 acre**
Fish farming/ farm pond	0.25 acre
Dairy farming, vermi-compost, hydroponics	0.2 acre
Papaya cultivation under drip	0.5 acre
Vegetable cultivation during kharif season	**0.4 acre**
Vegetable cultivation during rabi season	0.9 acres
Vegetable cultivation during summer season	0.5 acre
Broiler poultry farming in 0.5 acre throughout the year	0.5 acre
Free space for homestead/ other activities	0.15 acre

Invited Technical Paper

Chapter 12

Ending Poverty and Hunger Challenges through Family Farmers' Cooperatives in Nepal

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Abstract

Nepal's agriculture is dominated by smallholder farmers and subsistence-oriented farming. Although its agriculture productivity has grown during the last 20 years, it is still lagging behind to most of its SAARC counterparts and immediate neighbours. Land fragmentation and small farm size constitute an important challenge to improve agriculture productivity. Immigration, mostly male, has resulted in women carrying much of the burden of agriculture. Therefore, rural women and children, notably, in remote areas and amongst marginalized groups, tend to suffer from inferior health. Moreover, Nepalese farmers are isolated from the agriculture value chain and see much of their profit margins taken by intermediaries. Cooperatives can play a key role in breaking the poverty cycle through providing access to resources, group purchasing and group marketing of products directly from producers to customers. To that aim, the Nepal Agriculture Cooperative Federation Limited (NACCFL), has grown into a network of over one thousand small farmers' cooperatives with nearly one million members. Nonetheless the NACCFL faces the challenges of unequal development between cooperatives, mobilization of small farmer members within cooperatives, and receptiveness on the part of government officials.

Keywords: Family farming, small-scale farmers, agricultural cooperatives, NACCFL, Nepal

1. Background

Nepal is a country of 147.181 thousand km^2, with a population of 29.7 million inhabitants ranking 96th and 47th, respectively in the world (CIA, 2019). It is landlocked between two giant neighbors, India, to the South, East and West, and

China, to the North. With a Human Development Index (HDI) of 0.574 Nepal is ranked 149th out of 189 countries listed by the UNDP, making it 6th out of 8 (UNDP, 2018a) within the South Asian Association for Regional Cooperation (SAARC). While 80% of Nepal's population lives in rural areas, agriculture provides 70% of employment (World Bank, 2019). Moreover, during fiscal year 2018/2019, the agriculture sector contributed 27.0% to the GDP (MoF, 2019). In 2017, Nepal had a Gender Development Index (GDI) of 0.925 and a Gender Inequality Index (GII) of 0.480, ranking 149th out of 189 and relegating it to Group 4 out of 5 of the Human Development Indicator, and 6th within the SAARC (UNDP, 2018a). In terms of multidimensional poverty, Nepal fares better in the SAARC with an index of 0,148 making it 4th within the SAARC but 58th amongst the 101 developing countries. Yet, in 2016, 34.0% of Nepalese people were suffering from multidimensional poverty and 22.3% were in a state of vulnerability to multidimensional poverty. There were 25.2% of the people living below the national poverty line and 15.0% living with US$ 1.90 a day or less in Purchasing Power Parity (OPHDI & UNDP, 2019), which is one of the thresholds under which the UNDP defines poverty. The factor contributing the most to multidimensional poverty in Nepal is nutritional deficiency, which is directly linked to food security and agriculture production (UNDP, 2019). Furthermore, according to the Ministry of Finance of Nepal (MoF, 2012), only 27% of Nepal's total national area is arable land, 39.6% is forest, 12% is grassland and pasture and 2.6% is water. This land is apportioned unequally between three major agro-ecological zones: The *Terai* plains corresponding to 23% of Nepalese lands, 40% of which are available for agriculture; the Hilly region with 42% of landmass and 20% under cultivation; and, the Mountain region with 35% of landmass and only 5% being under culture (OIBN, 2017). Needless to say, improving yields per area and total revenues through agriculture, would go a long way in improving Nepal's overall livelihood.

Table 1 compares key indicators of food production capacity between the eight SAARC countries along with China (World Bank, 2019). In terms of arable land per capita (ha/capita), Nepal ranks 6 out of 9 with 0.078. Noting that the archipelago of Maldives is, understandably, a distant 9th, Nepal is one of the least endowed countries of the group. Nepal's ratio compares to China's 0.086 ha/capita, ranking it 5th. Yet, China, with a cereal yield of 6029 kg/ha (1st), surpasses Nepal's 2795 kg/ha (6th) by 116%. This would indicate that Nepal still has much scope for increasing its agriculture production despite its small arable land endowment. Indeed, compared to the 2004 - 2006 reference period, Nepal managed to steadily increase its cereal yield, reaching over 131% of the reference period in 2017, outpacing all but India and Bangladesh. Therefore, Nepal can and has increased agriculture production and, if China is a reference, could very well attain its avowed goal of self-reliance in cereal while resorbing its trade deficit in agriculture

products in 20 years. Indeed, in 2013/14, Nepal imported US$ 1.298 billions of agriculture products while its exports totaled US$ 268.91 million (MoAD, 2014).

Table 1. Comparative land/capita, yields/ha and food production index amongst SAARC countries and China (ranking is in parenthesis)

Country	Arable Land/ Capita (ha) (2016)	Cereal Yield (kg/ha) (2017)	Food Production Index (2004-2006 = 100) (2016)
Afghanistan	0.218(1)	2,024(9)	123.66(7)
Bangladesh	0.049(8)	4,411(2)	140.96(2)
Bhutan	0.136(3)	3,371(3)	98.65(8)
India	0.118(4)	3,160(5)	144.39(1)
Maldives	0.008(9)	2,568(7)	67.32(9)
Nepal	0.078(6)	2,795(6)	137.83(3)
Pakistan	0.152(2)	3,170(4)	130.37(5)
Sri Lanka	0.061(7)	2,146 (8)	125.25(6)
China	0.086(5)	6,029(1)	131.86(4)

Source: World Bank (2019); Open Data (https://data.worldbank.org/)

2. Country's Situation of Family Farming

In Nepal, over 80% of arable land is cultivated by families (CBS, 2013) and about 2.7 million smallholder farms produce 70% of the food in the country (FAO, 2015). Yet, over 55% of Nepalese farms are operating on a subsistence basis and smallholder farmers have difficulty to get good returns on their produce as only 12% of them are able to sell directly to markets. This is due to a combination of remote location, lack of transportation and a deficient road system (FAO, 2015). Meanwhile, Nepalese family farms are characterized by the integration of crops, livestock and forestry and tend to operate in autarky as inputs such as fertilizers are provided by household animals, seeds are self-produced, and labour is provided by hand or livestock. Therefore, most family farms are, by default, organic, an opportunity that has yet to be fully pursued (ANSAB, 2013).

The family farm is central to Nepal's rural life from a social, economic, environmental and cultural perspective. Indeed, the farm unites family and community members around a goal that is critical to their livelihood, instilling a sense of solidarity and loyalty. Nepalese families ensure their lands and surrounding landscapes provide environmental services through maintenance of biodiversity, soil conservation, carbon sequestration, erosion prevention or water cleanliness, as traditions and spiritual beliefs makes them stewards of the land (Kaini, 2016). Nevertheless, family farming is plagued by a precarious access to infrastructures- including roads, energy and public services, impairing productivity and entrenching poverty. Difficulty of access is notable in the case of

mountain family farmers and families living in remote hills, many of whom are already part of marginalized groups such as *Dalits and Janjatis*. This not only limits their access to finance, inputs, technology and knowledge, but it also makes it difficult for them to assume basics needs such as clean water, health care and education, furthering their struggle to farm and ensure a decent livelihood (FAO, 2019). In fact, the challenges caused by remote location makes it hard for these families to express their democratic rights and perform advocacy towards governments, whether local, provincial or federal. This is illustrated by a poverty rate reaching 45.6% in Far Western Nepal in 2011 (ADB, 2013). Therefore, poverty and its intense effects on women are the tragic realities of rural Nepal that cooperatives are meant to be instrumental in alleviating.

3. Poverty in Rural Nepal

According to CBS (2011), with demographic increase, land holdings in Nepal have shrunk from an average of 1.1 ha to an average of 0.7 ha between 1995/96 and 2010/11. Furthermore, according to CBS (2011), 51.6% of holdings were operating with less than 0.5 ha, representing 18% of the total cultivated land while farms between 0.5 and 2 ha represented 60% of total cultivated land in Nepal. Hence, according to the FAO's threshold size of 2 ha (FAO, 2015), 78% of Nepal's farmers are smallholder farmers. Moreover, amongst the holdings with less than 0.5 ha, the average area was 0.25 ha. As Nepal's Agriculture Development Strategy (ADS) states that agricultural land productivity for farms with 0.5 ha or less is US$ 1,804 per ha, 18% of Nepal's smallholder farmers' households would earn an average of US$ 450 per year or US$ 1.23 a day (MoAD, 2014). This is well below the income poverty line of US$ 1.90 *per capita per* day set by UNDP's Sustainable Development Goal 1. Low agriculture productivity also means a sharp discrepancy between rural and urban areas, further aggravating urban exodus: while one agriculture labour unit generates earnings of US$ 794 per year, one non-agriculture labour unit generates US$ 3,130 per year in earnings. This, in part, can be explained by low production per ha in Nepal, but also to a deficient integration to the agriculture value chain, resulting in low returns on sold products. Low productivity is also related to factors such as difficulty of access to credit and, therefore, inputs like fertilizers and seeds–only one fifth of smallholders had access to improved seeds in 2010/11 and capital investments in transportation, storage and other post-harvest infrastructure and equipment; lack of access to irrigation as 55% of Nepal's lands was irrigated but only 67% of smallholder farmers had irrigated lands; limited access to knowledge as only 11% of very small farmers from the bottom quarter in farm size had access to extension services; and fragmentation, whereby the number of contiguous parcels per land has declined from an average of 3.8 to an average of 2.9 parcels per land between 1995/96 and

2010/11. Fragmentation causes a number of additional problems such as increased traveling burden to go from plot to plot, making irrigation systems cumbersome to create while making it challenging to produce and sell in bulk and generating economies of scale. Land fragmentation can also lead to local conflicts (FAO, 2015; CBS, 2011; Dhakal & Khanal, 2018). Cooperatives are uniquely positioned to help remedy most, if not all, of the aforementioned problems by pooling resources, making credit accessible, create bulk and economies of scales, while enhancing their marketing abilities. Productivity and general socio-economic conditions are further impacted by the effects of climate change on monsoon's regularity and rate while causing droughts, forest fires and flooding; and natural disasters (Dixit, 2013) such as earthquake displacing the water table, making water suddenly unavailable. Political instability and outright civil war have also caused major socio-economic trauma, especially in the countryside, which Nepal is only beginning to recover from.

The consequence of these realities is substantial inequalities between rural and urban areas. While, 51% of households in urban areas are part of the two highest wealth quintiles of Nepal, 53% of rural households are part of the two lowest quintiles. This is further aggravated by geography as 69% of households–rural and urban- in Province 6 in North-West Nepal, fall into the lowest quintile. Furthermore, 61% of households in rural areas are likely to be food insecure as compared to 46% in urban areas (MoH et al, 2017). Disparity between rural and urban areas is also recognizable in children's nutrition and health: 44% of children in rural areas are stunted as compared to 28.0% in urban areas. Moreover, there are almost twice as many underweight children in rural areas than in urban areas, rural central Terai having the highest rate at 43% while the Kathmandu valley urban area has the lowest at 9% (CBS, 2011). This results in the depopulation of rural areas as, according to Nepal's Ministry of Labour and Employments' Status Report 2015/16 - 2016/17; about 786,564 foreign employment permits were issued over the course of that 2-years period. The report states that over 3.5 million labour permits had been issued during the 9-year period starting in 2007; about 95% of which were for men. Additionally, according to MoF (2018), 1300 youth would leave Nepal for foreign employment every day. Simultaneously, at 37.7%, migration is the highest contributor to the growth of urban population. According to CBS (2012), 85.1% international migrants were from rural areas and 77% of urban migrants were born in rural areas (MoUD, 2017). Therefore, inadequate rural wealth in Nepal creates a vicious circle through which limited on-farm opportunities lead men and youth to emigrate *en masse*, leading to labour shortage, further aggravating farm productivity, profitability and food security, while adding pressure to already strained urban infrastructures.

4. Plight of Rural Women

The average share of women labour in family farms around the developing world ranges from 20% in Latin America to 50% in most of Africa and Asia (FAO, 2019). In Nepal over 50% of women are part of the agriculture labour force, a number that raised from 36% in 1981 due to the aforementioned exodus of men and youth (Joshi, 2018). In fact, agriculture provides 80% of women's employment in Nepal (FAO, 2019) and exodus pressurizes the women and elder population into working the land. Despite their omnipresence in the field, women constitute only one-fifth of landholders and receive revenues that are 25% lower than those of men (FAO, 2019). This lower share of revenues is the combined result of discrimination in accessing technologies and knowledge as well as the triple-work burden of productive, reproductive and community work (FAO, 2019). This can be explained by multiple causes:

i) In order to access inputs and technologies, farmers require capital but most financial institutions are either located in urban areas or difficult to access from villages that are remote from banks and cooperatives' service centres. Therefore, 69% of farmers access capital through informal sources.

ii) Due to lack of collateral (land), lower education and pure discrimination, rural women are in the least favourable position when seeking capital.

iii) As most extension officers are men, men tend to get most of the technical support. Only 31% of women receive extension services which greatly limits their capacity to acquire knowledge and technologies that would make them more productive and facilitate their lives.

iv) Women are underrepresented in decision making positions. Though bylaws ensure women representation in decision-making positions of 33% with encouraging results, in many areas, such representation can be much lower. For instance, only 4% of women were involved in decision and planning in the forestry sector in 2019 (FAO, 2019).

Hard labour and malnutrition take a toll on Nepalese rural women as over 18% were found to have a low body mass index while more than 35% are suffering from anemia. This is compounded by the use of firewood, cow dung and other forms of biomass for cooking in often confined areas by 80% of rural women, leading to respiratory diseases (FAO, 2019).

5. Country's Situation of Agricultural Cooperatives

The idea of cooperation is deeply ingrained in Nepalese culture. Indeed, long before any formalized efforts to institute cooperatives took a foothold in the country, Nepalese people were pooling and sharing credit through *Dhukuti*, while

saving grains, coordinating labour and carrying socio-cultural practices through the Parma, Dharma Bhakari and Guthi systems. Nowadays, these traditional institutions can still be found in rural Nepal (NFSCCUL, 2015). The establishment of the Department of Cooperatives in 1953 was the first effort to formalize cooperatives in Nepal, following a first attempt at democracy. Given past traditions and the new-found democratic momentum, it was only natural that cooperatives would sprawl. Consequently, the first *Cooperative Act* was ratified in 1960 and subsequently amended during the 70's, 80's, 90's and, lastly, in 2017 (NLC, 2017). Despite governance instability and civil war, politicization, cooptation and corruption, cooperatives remained a mainstay of the Nepalese economic landscape. Through the 2015 declaration of the Federal Democratic Republic along with a new constitution, Nepal recognized that cooperatives, together with the state and the private sector, are one of the three pillars of the economy. Currently, federal responsibility for cooperatives is vested in the Department of Cooperatives under the Ministry of Land Management, Cooperatives and Poverty Alleviation. The Department plays a leading role in providing regulatory, promotional, training and educational services to the cooperative movement. According to the Department of Cooperative (DoC, 2011), there are over 34,000 cooperatives in Nepal, boasting a membership of 6.3 million people and providing direct employment to over 60,000 people.

Making economic policies that are people centric and driven by the principle of economic democracy is critical if the current political democracy is to be sustained. To that end, cooperatives play a central role. Cooperatives can help entrench economic democracy, protect basic economic rights, promote food security and, therefore, human security as inequalities and despair are fertile grounds for criminality, revolts and civil wars. Moreover, cooperatives can play a determinant role in the provision of services and the maintenance of socio-political integrity during financial, economic and social crisis. Cooperatives are credited for facilitating food trade and developing modern markets in rural areas. Agricultural cooperatives, by fostering food security through higher production and bigger incomes, helps rural households improve their livelihood through housing, schooling, health insurance, capacity building and the provision of a forum where farmers can have a voice (Khatiwada, 2014). This assessment is supported by field studies. For instance, cereal farmers from Western Terai belonging to cooperatives were shown to perform better than their non-cooperative counterparts due, notably, to better access to farm inputs and subsidy (Neupane et al., 2015).

Nepal Agriculture Cooperative Central Federation Limited (NACCFL)

The NACCFL was created in 2008 and is one of Nepal's 20 central level cooperative unions that are members of the National Cooperative Federation of

Nepal (NCF), their apex body (NACCFL, 2017; NCF, 2019). The central cooperative unions cover different productions and services such as, dairy, bee keeping, vegetable and fruits, citrus, tea, sugarcane, coffee, herbal, or credits and savings. NACCFL's cooperatives are oriented towards the wide array of productions that small farmers may engage in: field crops like rice, wheat and maize, livestock such as goats and water buffaloes, but also other types of productions including fruits and vegetables, tea, process products or craft. They also provide services such as credits and loans to farmers, and health services to pregnant mothers. In fact, NACCFL stems from the Small Farmers Development Program of Nepal (SFDP) that was initiated in 1975 by the Agricultural Development Bank Limited to provide credit and social welfare services to small farmers. In 1993, the SFDP morphed into the Small Farmer Agriculture Cooperative Limited (SFACLs), individual small farmers' agriculture cooperatives that are member-owned and managed. The organizational structure of a single SFACL is a grassroots' level three-tiered structure starting with small farmer groups of 5 to 9 Members at the *Gaunpalika* (Rural Municipality) level, inter-groups united at the Ward level and a main committee that acts as a Board of Directors elected by members. In 2008, the SFACL opted to unite into a national federation, hence, the NACCFL. The Federation itself is structured along Nepal's geo-political map: Primary cooperatives at the Rural Municipality level, district level cooperatives, provincial level cooperatives and the NACCFL at the central level. The NACCFL has 1030 member cooperatives spanning 71 of the 77 districts of Nepal, and almost a million farmer members, 82% of whom are women. It is governed by a Board of Directors comprising 15 members representing all 7 provinces.

The NACCFL performs the following functions to the benefit of its members:

Policy Lobby & Advocacy towards governmental policy makers, the international communities, and development partners. Markedly, it provided input to the 2017 amended version of the *Cooperative Act and Regulations* in order to better address the needs of small farmer members. As the Secretariat to the UN Decade of Family Farming (FAO, 2019) in Nepal, the NACCFL promotes family farming programs.

Capacity Building to cooperatives as democratic institutions through training in finance; loan management; institutional development; grant proposals' writing, market systems and computer skills; and the creation of a multi-purpose training centre.

Network Expansion of cooperatives and the membership of individual cooperatives while ensuring that accession criteria are met.

Increase Agricultural Production through training in agriculture and agro-techniques; technology dissemination; organization of soil testing camps; support for quality seed production and distribution; enhanced livestock production.

Value Chain and Market Promotion support to farmers in reaching markets and getting better returns by using cooperatives to bulk, store, package and transport produce to markets; the creation of the *Kisan Ko Poko* farmers' products outlets; and, support to small and medium businesses' development such as tea and oil production units.

Contribution to Sustainable Development Goals. The NACCFL network is contributing to the achievement of most, if not all, of the SDGs, including, No Poverty (SDG-1) and Zero Hunger (SDG-2). By facilitating the pooling of resources, agriculture cooperatives allow small farmers to obtain credit and access to knowledge and inputs (seeds, fertilizers, pest control, machinery) that translate into higher production per area of land. Furthermore, access to capital and bulking of produces, allows economies of scale and investments into value chain functions such as storage, post-harvest facilities and transportation. Ensues reduction in produce losses, direct access to markets without middlemen and a vantage negotiation position for higher margins on products.

Higher production and higher margins combine to increase food security and revenues, hence, general livelihood, triggering a positive domino effect on other SDGs. The NACCFL and its network of cooperatives have also been instrumental in alleviating hunger through targeted actions such as the promotion of family farming and kitchen gardening; the distribution of improved seeds to communities victim of natural disaster; and inclusion initiative focusing on indigenous people such as the Route, Bankariya, Dom, Chamar, Mushahar, and Sukumbasi, by facilitating their grouping into cooperatives. In the long haul, cooperatives in Nepal will help alleviate hunger through the maintenance of the genetic diversity of plants and the promotion of productive, climate-resilient agricultural practices that conserves soil, protects water, sequester carbon and care to the environment.

Moreover, given its capacity, credibility and reach across Nepal, the NACCFL is mandated to deliver programs from the Government of Nepal, international organizations such as the FAO and IFAD. Whether through training, technical or credit delivery provision programs, cooperatives under the NACCFL's banner aim at the betterment of small farmers' livelihood with a focus on gender equality, the creation of opportunities for youth and the integration of marginalized groups of society such as Dalits. Cooperatives have also been instrumental in mobilizing funding and relief efforts in response to draught, fires, floods and earthquake (ICA, 2015). Therefore, as a testimony to the crucial role played by cooperatives in meeting SDGs, the NCF and the UNDP have signed, in February 2019, a

partnership agreement aiming at supporting communities meeting SGDs by 2030 (UNDP, 2019).

6. Government's Policies and Programmatic Supports

The mission and work of Nepalese agricultural cooperative is framed and influenced by various legal, policies and programs stemming from the Government of Nepal generally, in collaboration with international organization and in light of the UN Sustainable Development Goals. The following are, currently, the most consequential ones.

6.1 Government Policies on Farmers' Cooperatives

6.1.1 Nepal Constitution

Nepal's current Constitution promulgated in 2015 makes explicit and multiple references to cooperatives, both in terms of the general role they can play and of jurisdictional responsibilities. Articles 50 and 51 of Part 4 of the Constitution indicates that, through the participation of cooperatives, the State aims at "equitable distribution of resources and means, by ending all forms of economic exploitation and inequality, with maximum utilization of available resources and means".

The Constitution features Schedules that seek to define the legal prerogatives of the different levels of Government: Federal, Provincial and Local. Hence, Schedule 5 identifies "cooperative regulations" as being under Federal jurisdiction but Schedule 6 indicates that operations of financial institutions such as cooperatives falls under Provincial jurisdiction "with consent of the center". Schedule 7 makes "Matters related to contracts, cooperatives, collaborations and agencies", concurrent Federal and Provincial powers. Yet, Schedules 8 and 9 makes "Cooperatives" respectively a Local jurisdiction matter and a Federal, Provincial and Local concurrent jurisdiction without further specification.

Jurisdiction over agriculture is a similarly defined and overlapping jurisdiction as Article 25 of Part 3 of the constitution gives the State the power to carry "land reforms, management and regulation by law in order to increase the production and productivity of land, modernize the agriculture and make it professional, environment protection and managed housing and urban development." Article 51 of Part 4 further specifies that the State shall pursue policies regarding agriculture and land reform, which includes ending dual ownership of land; increasing produce and productivity notably, by ending absentee land ownership; protecting and promoting rights and interests of peasants; making policies to commercialize, diversify and modernize agriculture; policies on land management

and environmental balance; ensure access to agriculture tools and markets "with appropriate price for the produce". It is remarkable that many of these functions are already being carried by cooperatives. Meanwhile, Schedule 6 identifies "agriculture and livestock development" as a Provincial jurisdiction but Schedule 8 makes "farming and livestock, agriculture production management, livestock health, cooperative", "management, operation and control of agriculture extension" and "agriculture roads" Local jurisdictions. Still, Schedule 9 indicates that agriculture, like cooperatives, environment and biodiversity, and management of landless are under concurrent Federal, Provincial and Local jurisdictions. Overall, the fact that the Constitution makes cooperatives and agriculture a shared responsibility of the three levels of government underlines their importance to achieve well-being for the people of Nepal, while creating opportunities for cooperatives to play an even greater role. However, there is a risk that sharing and overlapping responsibilities create confusion and contradictions in policies and action while the lack of clarity in said responsibilities could encourage shoveling of responsibilities from one level of government to another, to the detriment of rural communities. This is where cooperatives can play a major role by rallying its massive membership in order to advocate in favor of their needs and solutions to the representatives of all levels of government and ensure that rural development and livelihood are at the top of the political agenda throughout Nepal.

6.1.2 Cooperative Act 2017

As a testimony to the importance bequeathed upon cooperatives by the Government of Nepal for the development of the Nepalese economy, a new Cooperative Act was ratified in 2017. It allows for a wider range of activities for cooperatives that were otherwise restricted to narrow subject issues. It also sets the rules for the creation of cooperatives in a way that reflects the new Nepalese geopolitical map and system of government (local, district, province and federal). The *Cooperative Act 2017* has provided *momentum* to the cooperative movement in Nepal with greater engagement of cooperatives with provincial and local authorities.

6.1.3 Agriculture Perspective Plan (1995-2014)

In order to understand the current policy and program framework, it is important to have a retrospective view of past policies. Following efforts to make agriculture a priority through various Five-Years Plans, the *Agriculture Perspective Plan* (APP), launched in 1995 for a period of twenty years, was a first attempt at comprehensive, long term planning of agriculture in Nepal (NPC & ADB, 1995). It recognized the same shortcomings of today, namely, low productivity, low

revenues, deficient marketing and land fragmentation. The APP was developed through a top-down process involving consultants, government agencies, high-ranking officials, business leaders and donors. There is little evidence of farmers' groups, cooperatives, women, marginalized groups or rural advocacy organizations being consulted. Whether the APP was fully adapted to rural needs is questionable (Cameron, 2009) and, tragically, the ten years Civil War that begun in 1995 greatly impeded its ability to succeed. Nevertheless, later in the course of its implementation, the APP and ancillary policies such as the *National Fertilizer Policy 2002*, the *National Agricultural Policy 2004*, made a shift it the way government viewed and attempted to shape agriculture development (ADB, 2009). From a top-down, government-run stance, the evolving policy framework increasingly called for a participatory approach. Government agencies would consult farmer organizations for policy and program development while cooperatives and private companies would be the main operators. Therefore, the APP provided *momentum* to the development of the agriculture cooperative movement.

6.1.4 Agriculture Development Strategy (2015-2035)

The Agriculture Development Strategy (ADS) (MoAD, 2014) is Nepal's flagship policy framework for the development of agriculture and rural areas, ensure food security and correct trade imbalances. Launched in 2015, it plans to invest 500 million US$ per year during its first 10 years' period on strategic areas such as Research, Education and Extension (REE); inclusive growth aiming at reducing social and geographic inequalities; farmers' integration to the agriculture value chain while meeting the needs of urban populations; and rural infrastructure such as irrigation and rural roads. Funding for the ADS is meant to be shared between the Government of Nepal, international funding organizations and donors and, to a lesser extent, the private sector. Overall, the ADS aim at creating a US$ 690 trade surplus in agriculture and food in 20 years while attaining self-sufficiency in food grains.

While critical issues such as land tenancy, fragmentation, degradation and planning are to be addressed the ADS recognizes that small farmers, subsistence farming and, above all, women, are at the heart of Nepal's agriculture. The ADS signals out farmer and women organizations such as cooperatives as the spearhead of its effort and cooperatives are viewed as essential in order to achieve economies of scale, technology dissemination, marketing, financing and logistics. No longer would agriculture development be the prerogative of government agencies. Rather, farmers, cooperatives and private agro-enterprises would be the mainstay of agriculture development with support of said government agencies. Here are seven major initiatives linked to the ADS that have been announced by

the Government of Nepal or in partnership with international organizations and national cooperation programs, which will call for cooperatives to play a key role.

6.2 Programmatic Supports

6.2.1 Government of Nepal-Multi-Sector Nutrition Plan-II (2018–2022)

The *Nepal Multi-Sector Nutrition Plan-II* (2018-2022) or MSNP, was launched in December 2017 and works in coordination with the *Agriculture Development Strategy* (NPC, 2017). It aims at reducing maternal and child malnutrition. Amongst its goals is the reduction of stunting in children below 5 years old from 36% to 24% in 2025 and to 14% in 2030. It also aims at reducing the percentage of underweight children as well as the prevalence of anemia in children and women. Its five year envelop of US$ 430 million seeks to finance interventions at the local level. Again, cooperatives are singled-out as key operators in delivering measures under the MSNP including:

- Providing start-up grants (US$ 1,300- 3,950) to women cooperatives for social and economic empowerment.
- Organizing trainings for members of women cooperatives and child clubs on nutrition-sensitive services including sessions on: leadership development; gender-based violence management; social protection; entrepreneurship development; reproductive health; gender-based violence management (with male and female participation).
- Providing a grant (US$ 440) for women cooperatives to finance deprived infant nutrition program.

6.2.2 World Bank-Food and Nutrition Security Enhancement Project

The Food and Nutrition Security Enhancement Project (FANSEP) is a US$ 28.7 million, 5 years project announced in May 2018 by the World Bank and the Government of Nepal, being implemented by Ministry of Agriculture and Livestock Development in Nepal. The project is delivered under the Global Agriculture & Food Security Program (GAFSP). The GAFSP is a World Bank-administered program aiming at improving the lives of smallholder farmers and their families worldwide (GAFSP, 2018). It was initially financed by the Bill & Melinda Gates Foundation, Canada, the Republic of Korea, Spain and the USA. FANSEP commits to "enhance climate resilience, improve agricultural productivity and nutrition practices of targeted smallholder farming communities in selected areas of Nepal." The project is designed to align with existing GON programs, above all, the ADS and its Gender Equity and Social Inclusion (GESI) framework. Farmers' cooperatives are meant to play many roles within the FANSEP: building their capacity to achieve results; support efforts in increasing

citizen engagement, notably, by sitting on the Complaint Resolution Subcommittees, part of the Grievance Redress Mechanism foreseen by FANSEP to give a voice to farmers; participate in the implementation and facilitation of activities such as grants; be invited to develop and submit business plans with a view to be granted funds under a capital investment matching program for storage facilities, collection centres, cold storage and processing facilities as well as the acquisition of improved crops and livestock's genetic, etc.

6.2.3 European Union-Contribution to Agriculture and Rural Development

In July 2018, the European Union announced that it is rallying to the government of Nepal's ADS (European Union, 2018). Through a EUR 40 million Contribution to Agriculture and Rural Development in Nepal (CARD) program, the EU and the Government of Nepal intend to help farmers improve their integration to value chain, access to markets and technologies, as well as develop commercial agriculture and underdeveloped value chains. One of the shared end goals of the EU CARD program and the ADS is to double agro-production within 5 years.

6.2.4 UNDP, KOICA and MOALD–Value Chain Development of Fruits and Vegetables Project

The UNDP, Korean International Cooperation Agency (KOICA), and Ministry of Agriculture, Land Management, and Cooperatives, Nepal, launched the US$ 5.5 million, 4-year Value Chain Development of Fruits and Vegetables in Nepal Project in 2018 (UNDP, 2018b). The project singles out 8 districts of Nepal in partnership with the Nepal Agriculture Research Council, the governments of Province 3 and Province 4 and local governments. Its general aim is to reduce poverty and social inclusion by increasing incomes of farmers through the provision of extension services, postharvest management and improved market linkages. In total, the project will support some 10,000 smallholder farmers, 20 collection centres and satellite markets while training 150 cooperatives managers and operators in addition to provide a revolving fund managed by cooperatives for the purchase of inputs.

6.2.5 Food and Nutrition Security Plan of Action

On April 19, 2019, the Government of Nepal and the Food and Agriculture Organization of the United Nations (FAO), signed a five-year framework agreement on technical cooperation and partnership under the *Food and Nutrition Security Plan of Action* (FNSP) to improve food and nutrition security and the safeguard and sustainable management of natural resources (FAO, 2019). Food and nutrition security, climate change resilience, as well as reduction of maternal and child malnutrition are central to the FNSPA. Research and extension are to be

decentralized with cooperatives involvement, notably, in developing improved livestock breeds, capacity building and service delivery under the Poverty Alleviation Fund.

6.2.6. Nepal Agricultural Services Development Programme (NASDP)

The Nepal Agricultural Services Development Program aims at delivering extension services, technology innovation while supporting decentralized research and development in 4 Districts of Mid-West and Far-West Nepal and five Districts of Central Nepal (Helvetas, 2016). Launched in 2016, it is a three-year, US$ 8 million program financed by the Government of Switzerland through Helvetas Nepal and the GON. The NASDP, targets small semi-commercial and commercial farmers, farmer groups and cooperatives and aims at reaching 30,000 households.

6.2.7 USAID-Global Food Security Strategy

In April of 2018, the USAID has launched its *Global Food Security Strategy (GFSS): Nepal Country Plan* (USAID, 2018). The plan's main objective it so improves smallholder farmers access to markets and inputs. USAID targets small farmers through formal and informal groups, including cooperatives. As it recognizes the key role played by women in the household and on the farm, they will be supported by improved literacy and business skills training in order to access the value chain. Another mean to improve access to markets and inputs is to increase access to credits through cooperatives and banks. Cooperatives are also viewed as playing a key role in the provision of high-quality farm inputs. USAID also wants to support farm mechanization with access to small machinery either through purchase or lease by cooperatives and other farmers' groups. In collaboration with cooperatives and in line with their mandate, USAID aims at building capacity for women, youth and marginalized groups along the value chain with the creation of inclusive market planning committees for the purchase of inputs in bulk, access to finance, coordination of logistics, prices' negotiations, plan production and marketing.

6.2.8 A Successful Endeavour- Kisan Ko Poko

The NACCFL has taken a major step toward as serious solution to farmer's disenfranchisement from the agriculture value chain and their incapacity to reach profitable markets. Indeed, by creating the *Kisan Ko Poko* farmer cooperatives' market, they are offering cooperatives and their members two outlets in busy areas with high end potential customers. Through *Kisan Ko Poko*, farmers are able to sell directly to the market without seeing their margins taken away by intermediaries. Customers, in turn are ensured that they are supporting small farmers and buying a wide variety of pesticides-free products albeit, not certified organic. Some 3000

small farmers from more than 150 SFACLs are selling their products through these outlets. Three other such outlets have also been created elsewhere in Nepal by District/ Provincial Agriculture Federation. As outlets do not have cold storage yet, only non-perishable, long shelf life or seasonal products are being sold which still leave room for a wide array of items such as tea, honey, a large spectrum of pulses, many types of rice, spices, dried fruits, potatoes, seasonal mangoes, etc. The stores themselves employ 9 people and monthly sales are evaluated at around US$ 9,000. A website is under construction through which customers will be able to order their products for delivery. There are plans to expand the network of outlets in and outside Kathmandu. Furthermore, the NACCFL has established relationships with major hotels in Kathmandu, notably, from the Crown Plaza and Hyatt groups with a view to supply them directly, without intermediaries, with products from its small farmers' cooperatives.

7. Constraints and Challenges in Farmers' Cooperatives

In light of the previous sections of this paper, rural poverty is at the heart of Nepal's concerns, particularly when it comes to remote areas, women and marginalized groups' poverty. Its negative impact has ramifications both in rural and urban Nepal and even abroad. In order to help remedy this problem cooperatives, are facing the following challenges.

i) Political Empowerment

The existence, evolution and capacity for action of cooperatives in Nepal is largely dependent on the GON and the support of the international community. Therefore, as apolitical organizations, cooperatives need to thread a fine line between lobbying government officials and advocate in favor of their members while not catering to any political entity nor antagonizing them. Nevertheless, pusillanimous efforts could lead cooperatives' needs being neglected in favor of more politically vocal private sector interests.

ii) Distances and Isolation

Distance, bad roads and hazards between farmers and their cooperatives is an impediment to their democratic engagement, resource pooling efforts and access to services. Members have reported walking times of up to 6 hours to the cooperative center, along with dangers such as tigers, monkeys, snakes, landslide and flash floods. Cooperatives themselves can be far and away from markets and urban centers, further complicating marketing initiatives while contributing to political disempowerment.

iii) Gender Inequality and Social Exclusion

Despite representing 82% of the cooperatives' membership, women are still underrepresented in decision-making positions such as Board of Directors, managers of cooperatives' enterprises or staff. Agricultural cooperatives currently employs 59% men and 41% women while the highest gap can be observed in sugarcane cooperatives with a 70% points' difference (FAO, 2019). As stated previously, the NACCFL itself has only 4 women out of 15 members on its Board of Directors. Additionally, women receive less education; less technical support and knowledge, for instance, on dearly needed labor-saving equipment; and, lack collaterals to access credit. Overall, women's role in agriculture in Nepal is lacking in recognition, to their detriment, the detriment of rural communities and the detriment of Nepal.

iv) Effective Implementation of Legal and Policy Framework

Nepal has a robust set of legal, policy and planning pieces. However, it is largely deficient when it comes to effective implementations of said pieces. For instance, women and marginalized groups' equality is in theory, being pursued. However, in practice, profound inequalities and unequal treatment remain.

v) Management Capacity

Management capacity in cooperatives is a recognized need that has received appreciable attention in recent years but has yet to reach all cooperatives. It is also an aspect that will require recurrent training.

vi) Effective Control by Members

Control over cooperatives tend to be exercised by members that are already community leaders. Whereas this can bring the benefit of dynamism, it can also put the institution at risk of being diverted from its mission to the benefit of a few; demobilization of members; and therefore, operating with little oversight, exposing it to the gangrene of corruption.

vii) Unequal Development between Cooperatives

Due to factors such as the number of years in existence; better leadership & management capacity; political support, favorable distances and growing conditions, successful cooperatives enter the virtuous cycle of increased revenues allowing more investments and generating further revenues. These cooperatives tend to have a stronger voice and influence in attracting resources and expertise. Meanwhile, other cooperatives struggle to blossom and take their members out of the poverty trap.

viii) Growing Conditions

In addition to small land areas and fragmentation, the Nepalese landscape is characterized by diverse and irregular topography, soil types, climates and water availability. This complexity calls for a tailored approach to agriculture production whereby extension services, agronomic techniques and crops' choice needs to be adapted to both landscape and market demand.

ix) Climate Change

Climate change is bringing major challenges to Nepal as monsoons have become irregular, triggering drought, floods, landslides and forest fires. Conventional cultural practices aggravate the problem by reducing soil carbon, water infiltration and retention, while favoring erosion and drought.

x) Access to Capital

Lack of capital limits access to inputs and markets which limits agricultural productivity and inclusion into the value chain. It further impedes expansion to high-end markets as well as the production of value-added goods. Many cooperatives have organized credits and savings but the effort is not comprehensive, notably, in remote and poorer cooperatives.

xi) Value Chain Integration

If producing crops and livestock wasn't challenging enough, small farmers have difficulty accessing markets without intermediaries and generate fair returns for their efforts. Small farmers are struggling to integrate added-value chains such as transformed food products (juices, pickles, etc.), aromatic & medicinal products, or export markets, as they require know-how and capital investments. Likewise, although most farmers are not using chemical fertilizers nor pesticides, they don't benefit from the value-added organic label due to certification costs.

8. Policy and Program Recommendations

In view of their many challenges, the following recommendations are suggested for building, strengthening and sustaining for the small farmers' cooperatives in Nepal:

i) Lobbying and Advocacy

A comprehensive lobbying and advocacy approach would help alleviate the challenges related to political empowerment and effective legal and policy framework. Nepal's small farmers' cooperative movement has one formidable advantage: its number. There are almost 1 million members within the NACCFL

and over 6 million in Nepal's entire cooperative movement, a people's power that should be leveraged. Members of democratic cooperatives are as many voices and voters that can be mobilized in support of lobbying and advocacy efforts. Requesting regular official meetings with all federal, provincial and local political officials representing their respective areas would ensure cooperatives and their members to be heard and figure at the top of the political agenda throughout the country, including in the federal Parliament. With the medias' support, this could be a high profile and mutually beneficial relationship as officials would ensure cooperatives needs are met while cooperatives would ensure that officials gets recognition for their efforts.

ii) Sustainable Policy Framework

The multiplicity of often piecemeal programs and projects offered by the GON and its international partners should be inventoried, evaluated, integrated and expanded throughout Nepal in a cohesive, long term, yet, adaptable way. For instance, value chain integration programs for farmers, when proven effective, should be expanded to the whole country with adjustment for geographic, social and market specificity. This would also help in making Nepal's legal and policy framework effective.

iii) Gender Equality and Social Inclusion (GESI)

The following are recommendations that would address the challenges of gender equality and social inclusion.

- Government legislation & policy and cooperatives' by-laws should require the minimum threshold for women representation on in Boards and staff to be 50% while marginalized groups' representation should be at least proportional to the population. Said legislation, policies and by-laws should be supported by a set of incentives and penalties.
- GESI workplace policies & values should be developed, followed and regularly reminded at the cooperative level. This would include provisions for paid maternity leaves and accessibility for elderly and handicap people. It would also mean working conditions (For example, Separate and clean toilets) and occupational safety & health standards and procedures that are GESI-sensitive.
- Unpaid domestic and child care work should be compensated in cash and/or in kind, for example, through the provision of social services.
- Cooperatives' funding and loans should be linked to GESI. For instance, the Asian Development Bank has required, with success, that Nepalese commercial banks dedicate a minimum amount of its loans to agriculture and

energy. It should move one step further and require that loans be granted at least to the proportion of women and marginalized group's representation in society. Moreover, cooperatives, if not all Nepalese organizations, should operate similarly, using gender-responsive budgeting.

- Alternatives to property collaterals and education level should be used as guaranties and credit rating. Those could be collective responsibilities, already in used in some cooperatives, or payback rates, for instance, of women, which are typically higher.
- Extension workers should be required to carry meetings' log completed with pictures to ensure that they provide services to women and marginalized groups in proportion to their representation and without discrimination.
- Participation Training & Learning to all members and board, along with training on the functioning of cooperatives and members' rights, should be provided. Particular attention should be put on mobilizing women, marginalized groups and youth.

iv) Information Technology

IT can help reduce the effect of distance and isolation and provide many crucial ancillary services including increased safety (Jacob, 2018). In addition to conferencing, farmers can use mobile phones to make microcredit transactions (Hanson, 2014), getting market intelligence and receive alerts on weather, pest & diseases outbreaks and remedies (FAO, 2017). Creating Wi-Fi areas or *Net Cafés* in each Gaunpalika and at the cooperatives' centers, could go a long way in mobilizing democratic participation, share information, integrate small farmers into value chains and facilitating an equal opportunities' environment for cooperatives and farmers (Guragain, 2010). Experience in East Africa has shown that women are likely to be the one making the most out of mobile phones for natural resources and agricultural management. To that end, the GON Nepal should consider providing farmers with mobile phones on a loan basis or even free of charge (Nair, 2018).

v) Business Incubators

Inspired by the World Bank's Food and Nutrition Security Enhancement Project (FANSEP), cooperatives should become breeding grounds for innovative ideas and businesses incubators with a view to create economic & employment opportunities, in particular, for youth. Business plans' research and writing and business development could be facilitated at the cooperative level through access to funding such as FANSEP's but also through lobbying for a broader government-sponsored funding program (GAFSP, 2018). This could be inspired by the Start-up model, mobilizing the public and private sector: whereas universities

and R&D institutions could provide technology for transfer and technical advice, bodies such as the Investment Board of Nepal and the Nepal Chamber of Commerce could support networking with investors from the private sector.

vi) Productive, Sustainable and Carbon Sequestering Agriculture

Increasing agriculture productivity can work in synergy with sustainability and climate change mitigation. Indeed, through recycling of urban and on-farm organic matter and the adoption of Sustainable Agriculture Land Management (SALM) practices, it is possible to turn farmlands into organic matter recycling and carbon sequestration operations (CGIAR, 2014). In addition to reducing GHG emissions and sequestering carbon, it would increase soil structure and land stability; enhance water retention during drought and water drainage during monsoon; increase cation exchange capacity and soil fertility; stimulate plant symbiosis with growth promoting microorganisms; and help clean rivers such as the sacred Bagmati River system. Bio-intensive agriculture techniques could turn small land areas into an advantage as it succeeds in generating very high yields on small surfaces without heavy machinery (Frisch, 2015) with positive results already registered in Nepal (Rajbhandari, 2011). In the long run, Nepal and Nepalese cooperatives could potentially obtained tradable carbon credits through emissions' reduction verification (Verra, 2011).

vii) Equalizing Development between Cooperatives

Factors such as distance, weather and soil conditions cannot be changed. Although previous recommendations related to advocacy, IT and agriculture practices can help alleviate discrepancies, unequal development between neighboring cooperatives has also been reported. It would be recommendable to carry out case studies in order to better understand the inherent causes of uneven development and find remedy. Measures such as systematic sharing of best practices, training the trainers and credit lending from wealthier cooperatives to poorer ones could be coordinated at the district and/or provincial level so that more successful cooperatives be used as locomotives for a wider region.

viii) Value Chain Integration

- Successful models should be derived and replicated from initiatives such as the UNDP and KOICA-Value Chain Development of Fruits and Vegetables Project (UNDP, 2018b). Cooperatives should play a crucial role in both the provision of knowledge, credits, inputs and physical functions (Fortin, 2019) but should also play a central role in planning supply along the value chain as comprehensive planning is essential in order for the right crops to be grown at the right time and in sufficient amount and quality to capitalize on investments in physical functions (Hanf & Gagalyuk, 2017).

- Sustainable farming technologies should be transferred from universities and R&D centers, has they have proven to be effective in increasing productivity, protecting the environment and integrating farmers in value chain (World Bank, 2016).
- In order substantially improve farmer's returns and consumer's access to safe, quality products, embracing biointensive organic farming on small surfaces while eliminating middlemen has proven successful. To that end, the Community Supported Agriculture (CSA) model developed in the 1970s in Japan and Switzerland has proven successful worldwide by linking organic farmers directly with consumers in a direct partnership (IFOAM – Organics International, 2019). Cooperatives in Nepal and throughout the SAARC should be actively engaging in this model (Dorji & Surendra, 2014) while providing the means for farmers to get organic certification and introducing value-added crops such as MAPs, flowers and spices (Banjara, 2016).

ix) UN Decade of Family Farming

It is recommendable that countries from the SAARC, under the SAC's umbrella, coordinate efforts in the delivery of the UN' Decade of Family Farming 2019-2028.

9. Conclusions

Agriculture in Nepal is mainly carried out by smallholder farmers, on fragmented land cultivated and, in most part, by women. While 80% of Nepal's population is rural, rural areas and, in particular, rural women and children, are the most affected by poverty and hunger. Grouping small farmers into cooperatives under the NACCFL's umbrella has proven to be key to alleviating poverty and hunger through increase in production, integration to value chains and the delivery of a variety of social services. Cooperatives also promote political and economic democracy as well as equality and human rights, through the active participation of its members, including women, youth and marginalized people. Much still needs to be done in order to empower the small farmers of Nepal, reach gender equality and full social integration. While the improvement of cooperatives' capacity is an ever-going process, equal access to credit and knowledge is crucial to enhance land productivity and farmer's integration into the value chain, with a view to eliminate food insecurity and secure a better livelihood for the People of Nepal.

References

ADB. (2009). Evaluation Study: Agriculture and Natural Resources Sector in Nepal. Asian Development Bank, Kathmandu, Nepal.

ADB. (2013). Country Poverty Analysis in Nepal. Asian Development Bank, Kathmandu, Nepal.

ANSAB. (2013). Organic Agriculture: A Promising Sector for Income Generation in Nepal. Asia Network for Sustainable Agriculture and Bio-resources, Kathmandu, Nepal.

Banjara, R. K. (2016). Sustainable Model of Organic Agriculture: A Case Study of Nepalese Farmers. Journal of Advanced Academic Research, 3 (1): 142-163.

Cameron, J. (2009). The Agriculture Perspective Plan: The Need for Debate. Himalaya, the Journal of the Association for Nepal and Himalayan Studies, 18 (2): 10-14.

CBS. (2011). Nepal Living Standards Survey 2010/11- A Statistical Report Volume II. Central Bureau of Statistics, Kathmandu, Nepal.

CBS. (2012). National Population and Housing Census 2011. Central Bureau of Statistics, Kathmandu, Nepal.

CBS. (2013). National Sample Census of Agriculture Nepal 2011/12. Central Bureau of Statistics, Kathmandu, Nepal.

CGIAR. (2014). Sustainable Agriculture Land Management is Paying off for Kenyan Farmers. Research Program on Climate Change, Agriculture and Food Security, CGIAR, Wageningen, The Netherlands. Retrieved August 29, 2019 fromhttps://ccafs.cgiar.org/.

CIA. (2019). Nepal. The World Fact Book, Central Intelligence Agency, Washington, D.C., USA. Retrieved October 11, 2000 fromhttps://www.cia.gov/library.

Dhakal, B. N. and Khanal, N. R. (2018). Causes and Consequences of Fragmentation of Agricultural Land: A Case of Nawalparasi District, Nepal. The Geographical Journal of Nepal, 11: 95-112.

Dixit, A. (2013). Climate Change in Nepal: Impacts and Adaptive Strategies. World Resources Institute, Washington, D.C., USA. Retrieved September 5, 2019 fromhttps://www.wri.org/our-work/project/world-resources-report/climate-change-nepal-impacts-and-adaptive-strategies.

DoC. (2011). Cooperatives and Poverty Alleviation. Department of Cooperatives, Kathmandu, Nepal. Retrieved September 13, 2019 fromhttp://www.deoc.gov.np.

Dorji, T. and Joshi, R. S. (2014). Family Farming for Food Security and Prosperity in the Mountains. ICIMOD, Kathmandu, Nepal. Retrieved August 12, 2019 from http://www.icimod.org/?q=16035.

European Union. (2018). European Union: First Partner to Directly Support the Government of Nepal's Agriculture Development Strategy. European Union, Bruxelles, Belgium.

FAO. (2015). The Economic Lives of Smallholder Farmers: An Analysis Based on Household Data from Nine Countries. FAO, Rome.

FAO. (2017). Use of Mobile Phone in Rural Area for Agriculture Development. Food and Agriculture Organization of the United Nations, Rome, Italy.

FAO. (2019). Country Gender Assessment of Agriculture and the Rural Sector in Nepal. Food and Agriculture Organization of the United Nations, Kathmandu, Nepal. Retrieved August 14, 2019 fromhttp://www.fao.org/3/CA3128EN/ca3128en.pdf.

FAO. (2019). Family Farming Knowledge Platform. Food and Agriculture Organization of the United Nations, Rome, Italy. Retrieved August 20, 2019 fromhttp://www.fao.org/family-farming/themes/rural-women/en/.

FAO. (2019). The Government of Nepal and UN's FAO Announce Multi-year Framework Agreement to Improve Food and Nutrition Security. FAO, Kathmandu, Nepal.

Fortin, Christian. (2019). Looking at Agriculture and Food Marketing. Agrokhabar,22:13-15.

Frisch, T. (2015). Bio-intensive Growing for Smart-scale Farming. Eco Farming Daily.

GAFSP. (2018). Food and Nutrition Security Enhancement Project (FANSEP). Global Agriculture & Food Security Program. Retrieved September 4, 2019 fromhttps://www.gafspfund.org/projects/food-and-nutrition-security-enhancement-project-fansep.

Guragain, M. (2010). Mobile and Internet Penetration Boosting E-agriculture. MyRepublica.

Hanf, J. H. and Gagalyuk, T. (2017). Integration of Small Farmers into Value Chain: Evidence from Eastern Europe and Central Asia.

Hanson, S. (2014). Can Mobile Money Extend Financial Services to Smallholder Farmers? CGAP.

Helvetas. (2016). Nepal Agriculture Service Development Program. Helvetas, Nepal.

IFOAM Organics International. (2019). Community Supported Agriculture (CSA). France.

Jacob, D. (2018). Farmers Using Mobile Phones in the Fight Against Poverty and Hunger Across Africa. Development Education.

Joshi, A. (2018). Women in Agriculture. The Kathmandu Post, Kathmandu, Nepal. Retrieved August 19, 2019 fromhttps://kathmandupost.com/opinion/2018/08/02/women-in-agriculture.

Kaini, R. B. (2016). Farming Families. MyRepublica, Kathmandu, Nepal.

Khatiwada, Y. R. (2014). Economic Democracy and Human Security: Perspectives from Nepal. 1st National Cooperative Congress, 27 March, 2014. Kathmandu, Nepal.

MoAD. (2014). Agriculture Development Strategy. Ministry of Agricultural Development, Kathmandu, Nepal.

MoF. (2012). Economic Survey Fiscal Year 2011/2012. Ministry of Finance, Kathmandu, Nepal.

MoF. (2019). Nepal Economic Survey 2018/19. Ministry of Finance, Kathmandu, Nepal.

MoH, New ERA and ICF. (2017). Nepal Demographic and Health Survey 2016. Ministry of Health, New ERA, and ICF, Kathmandu, Nepal.

MoLE. (2018). Labor Migration for Employment: A Status Report for Nepal 2015/16-2016/17. Ministry of Labor and Employment, Kathmandu, Nepal.

MoUD. (2017). National Urban Development Strategy 2017. Ministry of Urban Development, Kathmandu.

NACCFL. (2017). Nepal Agriculture Cooperatives Central Federation Limited. Retrieved September 18, 2019 fromhttp://www.naccfl.org.np/.

Nair, S. (2018). Jharkhand to Provide Free Mobile Phones to 28 lakh Farmers. JagranJosh.com, New Delhi, India.

NCF. (2019). National Cooperative Federation of Nepal, Kathmandu, Nepal. Retrieved September 18, 2019 from https://ncfnepal.com.np/.

Neupane, H., Adhikari, M., and Rauniyar, P.B. (2015). Farmer's Perception on Role of Cooperatives in Agriculture Practices of Major Cereal Corps in Western Terai of Nepal. *Journal of the Institute of Animal Science*. 33(34): 177-186.

NFSCCUL. (2015). Cooperatives in Nepal. Nepal Federation of Savings & Credit Cooperatives Unions LTD., Kathmandu, Nepal. Retrieved September 13, 2019 fromhttps://nefscun.org.np/about-us/cooperatives-in-nepal/.

NLC. (2017). Cooperatives Act, 2017: An Act Made for Amendment and Consolidation of Laws Concerning Cooperatives. Nepal Law Commission, Kathmandu, Nepal.

NPC and ADB. (1995). Nepal Agriculture Perspective Plan 1995/96-2014/15, Summary Document. National Planning Commission and Asian Development Bank, Nepal.

NPC. (2017). Multi-Sector Nutrition Plan 2018-2022. Government of Nepal, Kathmandu.

OIBN. (2017). Agriculture Sector Profile. Office of the Investment Board Nepal.

OPHDI and UNDP. (2019). Global Multidimensional Poverty Index 2019: Illuminating Inequalities. United Nations Development Program and Oxford Poverty and Human Development Initiative, New York, USA.

Rajbhandari, B. P. (2011). Bio-intensive Farming System: Validation of Its Approaches in Increasing Food Production, Improving Food Security and Livelihoods. *Nepalese Journal of Agricultural Sciences*, 9: 112-124.

UNDP. (2018a). Human Development Reports. United Nations Development Program, New York, USA.

UNDP. (2018b). Value Chain Development of Fruit and Vegetables in Nepal. United Nations Development Program, Kathmandu, Nepal.

UNDP. (2019). Human Development Reports, 2019. MPI – Going Beyond Averages to Show Subnational Disparities. United Nations Development Program, New York, USA. Retrieved on August 28, 2019 from http://hdr.undp.org/en/content/2019-mpi-going-beyond-averages-show-subnational-disparities.

USAID. (2018). Global Food Security and Strategy: Nepal Country Plan. USAID, Kathmandu, Nepal.

VERRA. (2011).Verified Carbon Standard – V0017 Adoption of Sustainable Agricultural Land Management v1.0. Verra, Washington, USA.

World Bank. (2016).Vietnam: Sustainable Farming Increases Productivity and Improves the Environment. World Bank Group, Washington, D.C., USA.

World Bank. (2019), *Open Data*. World Bank Group. Washington, D.C., USA, Retrieved August 19,2019 from https://data.worldbank.org/.

Joint Communique on

Regional Expert Consultation Meeting on "Family Farmers Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia"

(22-24 July 2019/ National Dairy Development Board, Anand, Gujarat, India)

The South Asia region, consisting of eight countries- Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka- covers around 3% of world's landmass and represents about 24% of the world's population. Around 67% of its population are small scale family farmers[1], living on less than one hectare of land, with farms- fisheries- and forested landscapes and thus depend on agriculture, fisheries and forests for their livelihoods. Although, South Asia has good progress on attaining several targets of the Sustainable Development Goals (SDGs), more efforts should be given on meeting the targets of SDG I (No Poverty) and SDG II (Zero Hunger). In 2018, the multidimensional poverty index was estimated to be 0.143, number of poor people 545.9 million, and 14.9% of the people suffer from undernourishment in South Asia.

In its 18th Summit held in 2005, leaders of the South Asia Association for Regional Cooperation (SAARC), recognized the potentials of cooperatives in "achieving inclusive, broad-based and sustainable economic growth and development." The SAARC Agriculture Center (SAC), one of the dynamic centers of SAARC, in its Vision 2020, recognized the importance of cooperatives in strengthening smallholder farmers' organizations and sustaining their improved livelihoods in South Asia.

The SAC and the Asian Farmers Association for Sustainable Rural Development (AFA) organized the first 1st SAARC Agricultural Cooperative Forum in 28-30 August 2018, participated by representatives from the Ministries of Agriculture and Departments of Cooperatives of the Member States of SAARC, as well as from Farmers' Organizations (FOs) of the region. The Forum was a milestone as it issued a joint communique which outlined four major recommendations to strengthen family farmers cooperatives in South Asia: i) Build and strengthen the capacities of concerned government agencies and leaders of FOs in establishing and strengthening family farmers' cooperatives and their enterprises; ii) Encourage and support the strengthening of cooperatives through enabling government policies;

[1] FAO defines Family Farming as a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production that is managed and operated by a family, and is predominantly reliant on the family labor of both women and men. The family and the farm are linked, co-evolved and combined economic, environmental, social and cultural functions.

iii) Promote coop-to-coop partnerships and coop-businesses partnership at country and regional levels; and iv) Constitute and support a multi stakeholder Working Group on agriculture cooperatives within the SAC.

This second 2nd SAARC Family Farmers' Cooperatives Forum, organized by SAC, AFA and National Dairy Development Board (NDDB), held at the premises of the National Dairy Development Board, Anand, Gujarat, India, with the theme: "Regional Expert Consultation Meeting on Family Farmers Cooperatives to End Hunger and Poverty Through Integrated Farming in South Asia" is a follow through of the ongoing efforts to strengthen family farmers cooperatives in the region. In this Forum, 18 papers were presented from Country Focal Point Experts as well as from leaders of academic universities and research institutions, family farming organizations and cooperatives, and from the professionals[2]. The highlight of the Forum were the visits to Amul, which is the marketing federation of the Gujarat Milk Cooperative Limited, the Village Mukjuva Milk Producers Cooperative Society Ltd, the Anand Agriculture University, and a Parikrama visit about the history of milk cooperatives in India. From the visits and presentations, we inspired by the performance of India's milk cooperatives. Seventy-five percentage of its profits go to the farmers in terms of dividends, patronage refunds, bonuses, and technical assistance. Farmer members have verbalized the improvements in their living conditions, confidence and self-esteem because of the good services provided by Amul and NDDB, starting from guaranteed collection centers and on-time payments to members. The National Dairy Development Board, a government agency tasked to provide training and extension services for voluntary adoption of international cooperative principles. The visionary leadership of Dr Verghese Kurien, the unity and resolve of the milk farmers and the political will of the India government to support cooperatives were key factors of the success of white revolution in India.

As a result of the insights and learnings we have acquired during the three-day Forum, participants made the following **RECOMMENDATIONS** to strengthen the promotion of family farmers' cooperatives in South Asia:

i) Management, Regulation and Governance of Family Farmers Cooperatives

Family farmers (FF) cooperatives in South Asia face challenges related to lack of autonomy and independence of farmers cooperatives, inadequate capacity of cooperatives management and leaders to effectively run the cooperatives with transparency and accountability, and the complexity of cooperative rules and

[2] The 2nd SAARC Coop Forum was attended by 40 participants comprising of Country Focal Point Experts, FO leaders from Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka, University's academician and NDDB experts.

regulations and its implementation. To address these challenges, the participants recommend that the SAARC member countries work with FF cooperatives to ensure that cooperative laws and regulations are conducive to the formation and growth of small farmers cooperatives, including FF- friendly, easy and affordable registration procedures; conduct capacity building programs at all tiers (local, national, regional) to enhance the managerial, governance, financial, entrepreneurial knowledge and skills of both farmer leaders and professional managers as well; and ensuring men, women, and youth in the cooperatives are involved and empowered.

ii) Improving Value Chain on Farmers Cooperatives

Family Farmers' cooperatives engaged in value chains strive to have maximum ownership and control in production, aggregation, processing, marketing and distribution of agricultural products. In order to realize this, participants recommend that SAARC Member States support the efforts of family farmer organizations and cooperatives through raising awareness and capacity building for concerned value chain actors of agricultural commodities thereby: i) Ensuring diversity of seeds and species, especially local varieties of seeds; ii) Promoting competitiveness of the products in terms of price, quality and quantity; iii) Supporting stronger involvement in value chain processes that could reduce the marketing channel by providing post-harvest storage and handling facilities; iv) Promoting local markets for farmers' products and their value-added products; and v) Responding to gender-based constraints in value chain processes.

iii) Access to Finance, Financial Incentives and Tax Incentives for Family Farmers' Cooperatives

Family farmers have inadequate access to financial instruments and services. The participants recommend that SAARC Member States in collaboration with concerned institutions should take responsibility on: i) Provide easy access to financial services with soft- loans, particularly to tenants and landless women and youth through their organizations; ii) Formulate regulations that allow family farmers' cooperatives and organizations to raise funds from any financial institution; iii) Promote integrated farming systems for improving food and nutrition security; iv) Uphold savings and credits programs for poor and smallholder farmers; v) Scale-up agriculture insurance scheme to reduce the risk of family farmers; vi) Offer tax exemption for cooperatives in their first 3-5 years of star-up operations, especially for cooperatives led by women and young farmers; vii) Provide performance based incentives to the farmers' cooperatives; and viii) Support market incentives for inputs and outputs (for example, public procurements for products marketed by cooperatives).

iv) Formation of Working Group (WG) on Family Farmers' Coops for Coordination and Follow Up of Recommended Actions

The participants recommend the formation of a Working Group or Technical Committee on family farmers cooperatives (WG/TC on FF/Agri-coop), which will be composed of: a focal points (National Focal Point Experts- Government nominee); organization/ person in each of the SAARC Member States and representatives from regional FF/Agri-Coops such as AFA, regional CSOs like International Cooperative Alliance (ICA), intergovernmental organizations such as UN FAO, UN IFAD and UNDP, SAC; and resource institutions such as Universities and research institutions; economic entities such as the SAARC Chamber of Commerce; and SAARC commodity associations such as Tea Associations. It is important that these focal persons are decision makers coming from agencies directly relating to family farmers' agricultural cooperatives. The participants recommend that the WG/TC on FF/Agri-Coops have the following responsibilities and tasks: i) Make an assessment of the impact of the agricultural cooperatives in ending poverty and hunger as well as assessment of the agriculture policies affecting or relating to cooperatives development; ii) Develop a 10-year plan and roadmap for the strengthening of FF/agri cooperatives; iii) Develop indices or indicators for successful FF/agri cooperatives; iv) Facilitate and coordinate the various capacity building, farmer-to-farmer, coop-to-coop exchanges and partnerships; v) Develop a directory of FF cooperatives in each member country; and vi) Facilitate learning exchanges on FF coop friendly policies and practices. The participants recommend to SAC to seek approval from the SAARC Member States to mandate such WG/TC on FF/Agri Cooperatives; as well as recommend to ICA to take lead in convening this WG in the initial stages of formation, or while the official mandate is being worked out. The SAC, AFA, and ICA will work to develop SAARC Action Plan for the implementation of UN Decade on Family Farming by 2020 where the development of family farmers' cooperatives will play a crucial part.

Report of Regional Expert Consultation Meeting on "Family Farmers' Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia"

(22-24 July 2019, Anand, Gujarat, India)

Introduction

South Asian Association for Regional Cooperation (SAARC) region covers around 3% of world's landmass and represents about 24% of world population. Around 67% of its population live in rural areas and they depend on agriculture, fisheries and forest for their livelihoods. Although, South Asia has good progress on attaining several Sustainable Development Goals (SDGs) targets, more efforts to be given on meeting the targets of SDG-1 (No Poverty) and SDG-2 (End Hunger). Further increased efforts along with strong functional partnership among different development partners including governments, private sectors, international communities, cooperatives and civil societies is crucial task in the developing world. SAARC leaders recognized the potentiality of cooperatives in "achieving inclusive, broad-based and sustainable economic growth and development" at its Eighteenth SAARC Summit-2005. A regional expert's consultation meeting on "Family Farmers Cooperatives to End Hunger and Poverty through Integrated Farming in South Asia" was held during 22- 24 July 2019 in Anand, Gujarat, India. This program was jointly organized by SAARC Agriculture Centre (SAC), Asia Farmers' Association (AFA) and National Dairy Development Board, Anand, Gujarat, India.

Objectives

The main objective of this program was to strengthen the farmers' cooperatives in attaining the SDG-1 (No Poverty) and the SDG-2 (Zero Hunger) in South Asia. The specific objectives of this workshop were: to share good practice among South Asia and other countries regarding policies and programs that provide incentives for family farmers; to identify and analyze policies and programs that can help boost the formation and strengthening of family farmers cooperatives; and to identify constraints and challenges, policy gaps and recommendation for strengthening family farmers cooperatives at the country and the regional level.

Program Structure

In this 3 days program, Country Focal Point Experts from the SAARC Member Countries (Six countries: Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka), experts in different thematic areas, and farmers' leaders with their

experiences were presented related to family farmers' cooperatives for ending poverty and hunger in South Asian. Meanwhile, field visit in some of the model project areas of NDDB (for example, Amul, milk processing, slurry, gas, solar power, Biddhya dairy) were visited that made insightful on the overall integrated approach of dairy cooperative development.

Outcome of the Program

A book "Family Farmers' Cooperatives: Ending Poverty and Hunger in South Asia" is the outcome of this regional consultation meeting.

Pictures of Consultation Meeting

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