



Cooperatives as Pillar of Economy to Improve Agriculture Production and Marketing

Rudra Bhattarai^{a*}, Manashi Pandit^a

a. Nepal Agriculture Cooperative Central Federation Limited (NACCFL)

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Abstract

This paper focuses on the important role played by cooperatives in agriculture production and marketing in Nepal. The paper evaluates the role of cooperatives, their contribution to agriculture, current policies that have paved the way for development within the agriculture and cooperative sectors and recommendations for improving agriculture production and marketing. The methodology employed includes a review of existing literature on agriculture and cooperative policies, as well as discussions with key informants in the cooperative movement. The study highlights the need for support from government and non-government agencies to improve the service of agricultural cooperatives in various ways, particularly through policy intervention. The paper provides policy recommendations for the future, including the need for improved coordination between government agencies and cooperatives, capacity-building programs, commercialization of agro-products, ways of increasing agro-productivity and capacity-building for cooperative leaders, and better access to credit and markets. Overall, the study underscores the importance of cooperatives in the sustainable development of the agriculture sector in Nepal.

Keywords: Cooperatives, agriculture production, marketing, cooperative movement, government support, policy intervention, capacity-building, commercialization, agro-products, agro-productivity, credit, sustainable development

*Corresponding author; R. Bhattarai (rudra1bhattarai@gmail.com), M. Pandit (manashipnt@gmail.com)

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1. Role of Agriculture in Nepal

The agriculture sector in Nepal contributes significantly to the country's economy, accounting for approximately 23.9% of the GDP and engaging around 60.4% of the labor force. This sector generates a diverse range of employment opportunities, from farming to small-scale enterprises (World Bank, 2022). However, the growth rate of the agriculture sector over the past two decades has been volatile, with a negative growth indicator in 2019/20 (MOALD, 2021). Despite receiving top priority in each of the periodic plans and fiscal years, the sector has been subject to low budgetary disbursement. In fact, the state has allocated less than 5% of its total annual budget to the agriculture sector, despite its significant contribution to the national economy (Deshar, 2013).

This underinvestment has resulted in the predominance of small-scale subsistence and integrated farming systems in Nepal, which lack economies of scale in production and marketing, and consequently, suffer from low productivity and production of agricultural commodities (Basnet & Pandey, 2018). The average agriculture land holding per individual in Nepal is only 0.2 ha, which limits farmers' ability to increase production and earn a higher income from the given area of land (Basnet & Pandey, 2018). Nepal's agriculture sector is facing challenges related to low productivity, limited land availability, and inadequate investment. The production capacity of agriculture in Nepal is not growing at a rate that can meet the demand of the growing population. The production of major cereals, such as rice, maize, wheat, and millet, has been stagnant or declining over the past five years (MOALD, 2021). In contrast, the population has been growing at a rate of 1.3% annually (World Bank, 2022), putting pressure on the country's food security. Moreover, Nepal is also vulnerable to food insecurity and recurring natural disasters such as floods, droughts, landslides, earthquakes, diseases, and pest outbreaks (FAO, 2019).

Nepal has the potential to increase its agricultural production and become self-sufficient in food production. The country has a diverse agro-climatic condition, allowing the cultivation of a wide range of crops throughout the year. Nepal exports certain agricultural commodities, such as tea, cardamom, and ginger. In 2020, Nepal exported 5,063 metric tons of tea worth USD 7.1 million, and 2,181 metric tons of cardamom worth USD 34.4 million, while ginger export was 36,131 metric tons worth USD 25.2 million (Trade Map, 2021).

Nepal's agriculture sector needs more investment and support to increase its productivity and competitiveness in the global market. The government needs to allocate more resources to the sector and develop policies that can address the challenges related to small-scale farming and natural disasters. The private sector can

also play a crucial role in investing in technology and providing access to finance for small-scale farmers. With the right policies and investment, Nepal's agriculture sector can play a significant role in reducing poverty, promoting rural development, and achieving food security for its population.

2. Agricultura-Related Policies of Nepal

Nepal Government's policies for the development of the agriculture sector are based on the Constitution of Nepal (Article 51-e) that emphasizes agriculture development: protecting and promoting rights and interests by utilizing the land use policy for increasing production and productivity of agriculture for commercialization, industrialization, diversification and modernization of agriculture. There are several policies for the agriculture sector that have played a major role in shaping the agriculture ecosystem today.

The Nepal Agricultural Policy emphasizes the development of high-value crops, livestock, and fisheries to promote sustainable agricultural growth. The policy also aims to improve irrigation infrastructure, enhance access to credit and technology, and promote agribusiness development. Overall, Nepal's agricultural policy aims to address the challenges facing the agricultural sector and promote sustainable agricultural growth. The policy emphasizes the development of high-value crops, livestock, and fisheries, investment in irrigation infrastructure, access to credit and technology, and promotion of agribusiness development.

3. Research Methodology

The study is based on an extensive qualitative literature review and consultation with the leaders of the cooperative movement. The paper has explored policies, periodic reports and findings published by the government sector like the Ministry of Agriculture and Livestock Development, Department of Cooperatives, Ministry of Finance and Nepal Rastra Bank. Likewise, the research articles and publications were also reviewed for secondary information.

4. Background of Agriculture Cooperative in Nepal

Nepal's cooperative sector has been growing rapidly and has become a crucial part of the country's economy. There are different types of agricultural cooperatives in Nepal based on their functioning, which include marketing, farm supply, service provider, production, and processing cooperatives. The cooperative sector encompasses various industries, including agricultural production, dairy and livestock, manufacturing, financial services, energy, healthcare, and consumer services (Kathiwada, 2014). As of

2077, there were 29,886 registered cooperatives in Nepal, with around 70% focused on agriculture, livestock, and forestry. These cooperatives served 7,307,463 members, with 56% of women participation (MoALD, 2021). The cooperative sector has now established its presence in all local bodies in Nepal except for four, including Dolpa District: 3 rural municipalities: Dolpobuddha, Shephokshundo & Chharka Tangsong and one in Narpa bhumi of Manang District.

The National Agriculture Policy 2004 guides agricultural development in Nepal and recognizes the important role of agricultural cooperatives and emphasizes the need to strengthen and promote the cooperative movement in Nepal to fulfill its objectives. The Agriculture Policy 2004 emphasizes capacity building for cooperatives, promotion of cooperatives-based agricultural industries and enterprise, incentives to attract cooperatives for investment in commercial production, processing, and marketing of agro products, development and extension of market information systems, wholesale and seasonal markets, and institutional development of cooperatives through mobilizing and promoting local small capital and resources and cooperative societies in rural areas to be developed as local delivery points (NAP, 2004). The government of Nepal has prioritized the agriculture sector in its budget for the coming fiscal year 2021-22. The policies and programs are primarily focused on enhancing livelihoods and creating jobs through the commercialization and mechanization of agriculture. Digitalization of agriculture, including online farmer registration, digital soil mapping, and the Mero Kitta app for land management, has also been highlighted in the government's yearly budget plan. Additionally, the construction of a factory for chemical fertilizers in Nepal is in progress to provide a consistent and ongoing supply of plant nutrients (MoF, 2021).

5. Cooperatives as the Pillar of Economy

The cooperative sector has been expanding rapidly and has helped improve the agricultural landscape in Nepal by providing farmers with access to credit, technology, and inputs, as well as by facilitating market linkages. Cooperatives have also played a crucial role in building the capacity of farmers, enhancing their bargaining power, and increasing their incomes. The cooperative sector has not only helped improve the livelihoods of farmers but has also contributed significantly to the overall economic growth of Nepal. Some key ways cooperatives are helping the agriculture sector are listed below:

5.1 The crop yields and income of cooperative farmers

According to a study carried out by NACCFL in 2017 that employed a survey questionnaire to collect quantitative data from a sample of 600 cooperative farmers

and 600 non-cooperative farmers from 12 districts in Nepal, cooperative farmers in Nepal were generally found to achieve higher crop yields and income compared to their non-cooperative counterparts. The study found that cooperative farmers had a higher yield of maize, paddy, and wheat than non-cooperative farmers. One of the main reasons for this difference is the access to training and technical support on modern agricultural practices that cooperative members receive. Agriculture cooperatives in Nepal like NACCFL provide their members with training and guidance on the use of modern farming techniques, such as improved seed varieties, fertilizers, and irrigation systems.

Through these initiatives, cooperatives help their members to adopt better agricultural practices that can significantly increase crop yields. Moreover, these modern farming inputs can help farmers to produce crops that are of better quality, more disease-resistant, and can withstand weather changes, leading to a higher value of produce. Cooperative farmers benefit significantly from these interventions, and the resulting increase in crop yields and quality ultimately leads to higher incomes for them.

5.2 Cooperative to Cooperative Marketing

The cooperative-to-cooperative marketing model refers to a collaborative marketing approach employed by agricultural cooperatives to enhance their marketing capabilities. Through this model, individual cooperatives pool their resources and combine their products to create a larger entity, which allows them to leverage economies of scale to negotiate better prices for their members' products. This strategy permits each cooperative to maintain autonomy while enjoying the benefits of collective marketing, including increased bargaining power, access to larger markets, and stable income for farmers. Cooperatives utilize this model by consolidating their products and selling them to larger buyers such as processors, wholesalers, and retailers, thereby offering larger volumes, consistent quality, and better packaging, which appeals to buyers.

Cooperative-to-cooperative marketing practice is becoming increasingly popular in Nepal as it enables small farmers and producers to access larger markets and increase their bargaining power. NACCFL has been promoting and facilitating cooperative-to-cooperative marketing through its network. There is a system of regional and district-level cooperative federations that work closely with primary cooperatives to organize collective marketing activities. For example, there are marketing alliances between vegetable cooperatives to collect and sell their different kind of products to larger markets. The cooperative-to-cooperative marketing by NACCFL also enable cooperatives from different districts to collaborate and sell their products efficiently

in different regions as per the market demand. Overall, the cooperative-to-cooperative marketing model provides numerous benefits that individual cooperatives would not have access to on their own (Kathiwada, 2014; MOALD, 2021).

5.3 The prices received by cooperative farmers

According to a study conducted by the International Labour Organization (ILO) and the National Cooperatives Federation of Nepal (NCF), cooperative farmers in Nepal receive higher prices for their products compared to non-cooperative farmers. The study found that cooperatives were able to offer better prices for crops such as rice, maize, and vegetables, with cooperative farmers receiving prices that were on average 10-20% higher than those received by non-cooperative farmers. One reason for this is the collective marketing approach of cooperatives, which enables them to negotiate better prices with buyers due to the larger volumes and more consistent quality of their products. Additionally, cooperatives can invest in better packaging and branding, which makes their products more attractive to buyers. For example, the study found that the price of maize sold through cooperatives was 15% higher than the price received by non-cooperative farmers. Similarly, the price of vegetables sold through cooperatives was found to be 20% higher than the price received by non-cooperative farmers.

5.4 Access to credit

Access to credit is crucial for farmers in Nepal. It enables them to invest in their crops and equipment, and ultimately increase production and productivity to improve their livelihoods. Agriculture cooperatives play an important role in providing credit to farmers, particularly small-scale and marginalized farmers who may not have sufficient collateral to secure loans from formal financial institutions. According to a study by the International Labour Organization (ILO) and the National Cooperatives Federation of Nepal (NCF), cooperatives have helped farmers in Nepal to overcome financial barriers that might limit their access to such resources. Likewise, the study conducted by Shrestha and Adhikari (2019) shows farmers who had access to credit were more likely to adopt modern farm technologies such as irrigation systems, improved seeds, and fertilizers. Agricultural cooperatives in Nepal provide about 30% of the total credit in the agricultural sector (CBS, 2019). This access to credit has allowed farmers to invest in modern inputs, such as improved seeds and fertilizers, and irrigation systems, which has led to an increase in crop yield.

5.5 Post-harvesting support

Cooperatives in Nepal have made significant investments in post-harvest infrastructure to help farmers reduce post-harvest losses and improve the quality of their products.

For example, the National Cooperative Federation of Nepal (NCF) has facilitated the establishment of several modern processing plants and storage facilities across the country, benefiting thousands of farmers. These facilities have helped farmers to reduce post-harvest losses by up to 50%, which has resulted in improved quality of products and better prices for farmers (NCF, 2021). Furthermore, cooperatives have also established transportation networks to facilitate the movement of products from farms to markets.

The National Cooperatives Development Board (NCDB) has established several collection centers and transportation hubs in different parts of the country to make it easier for farmers to transport their products to markets (NCDB, 2021). The investments in post-harvest infrastructure by cooperatives have contributed significantly to the improvement of the value chain of agricultural commodities in Nepal. According to a study by the International Labour Organization (ILO), the investments made by cooperatives in storage facilities have helped to reduce post-harvest losses and improve the quality of products, resulting in better prices for farmers (ILO, 2018).

Cooperatives like NACCFL have also facilitated the reduction of post-harvest loss by providing various capacity development training related to value chain strengthening. Co-operatives in Nepal are helping farmers market their products better by providing access to markets and services, increasing negotiating power, reducing post-harvest losses, and enabling farmers to achieve higher yields and better access to markets. However, it is important to note that the impact of agricultural co-operatives can vary depending on the specific context and conditions of the farmers involved (NACCFL, 2018).

6. Policy Recommendations

6.1 Supporting Cooperatives

Cooperatives are the main or only financial service providers in the remote rural area especially for the smallholders as banking and financial institutions are mainly concentrated in urban areas making their role in agriculture production and marketing invaluable. Because of the important space they occupy in society, cooperatives should be involved in national dialogues and opportunities should be provided for them to share their experiences with policymakers. In addition, the government should support cooperative societies at an early stage in terms of technical, financial, and institutional capacity development; formulate clear exit strategies; and let cooperatives function without a lot of government intervention.

The government should ensure production sustainability and food security through proper policy incentives and support for farmers' cooperatives. These include cooperative cultivation, mechanization, commercialization, marketing, processing and credit help at the grassroots level of the village. In addition, capacity building of FGs/Coops also needs to be continued until they become sustainable and capable of operating the business by themselves. Governmental support systems should be established in accordance with the needs of the cooperatives. The support system and facilities should be based on the value of their contribution to agriculture production.

- a. Develop policies that encourage financial institutions to expand their services in rural areas where cooperatives are currently the only financial service provider.
- b. Develop policies that encourage the involvement of cooperatives in national dialogues on agriculture and rural development, and provide opportunities for them to share their experiences with policymakers.
- c. Develop policies that support cooperative societies at an early stage in terms of technical, financial, and institutional capacity development. This includes providing financial assistance for cooperative development, training programs for members and staff, and technical assistance for business development and marketing.
- d. Formulate clear exit strategies for government intervention in cooperatives. The government should provide support and guidance to cooperatives until they become self-sustaining, but should eventually exit from direct involvement in cooperative operations.
- e. Provide policy incentives and support for farmers' cooperatives to ensure production sustainability and food security. This includes supporting cooperative cultivation, mechanization, commercialization, marketing, processing and credit help at the grassroots level of the village.
- f. Continue capacity building of FGs/Coops until they become sustainable and capable of operating the business by themselves.
- g. Establish governmental support systems that meet the specific needs of cooperatives. The support system and facilities should be based on the value of their contribution to agricultural production
- h. Government should facilitate the establishment of agriculture service centers, with demonstrations to create awareness and impart knowledge to other cooperative or cooperative members.

6.2 Cost of Production

At present, the greatest impediments to enhancing production are mainly the high cost of production, improved quality standards and an efficient marketing system. Because farmers are individually too small and possess a small land area, achieving economies of scale in terms of production and marketing becomes difficult. They face problems with 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. Agricultural cooperatives in this sense can play a huge role to improve food security and assist in poverty alleviation.

Another hurdle to production is the unavailability of quality seeds in the market. Seed security plays a very important role to strengthen the food security of small farmers. In the case of Nepal, the timely and sufficient supply of quality seeds of high-yielding varieties has the potential to increase crop yields by about 15-25% (Gauchan et al., 2014)

- a. The government should establish and support agricultural cooperatives to help farmers gain access to information, inputs, credit, and markets. The cooperatives can also help in achieving economies of scale by pooling resources and knowledge of smallholders.
- b. The government should also promote mechanization to improve efficiency and reduce the high cost of production. This can be achieved through providing subsidies and other incentives for small farmers to acquire farm machinery and tools.
- c. The government should work to strengthen market linkages by providing information and training to farmers on marketing and pricing strategies. This can help farmers obtain better prices for their products and increase their bargaining power.
- d. The government should also encourage private sector investment in agriculture by providing tax incentives and other benefits to companies that invest in agricultural production, processing, and marketing. This can help improve the efficiency and competitiveness of the agricultural sector.
- e. Policies have to focus on a well-performing seed system that ensures access to new and quality seeds to farmers without making them dependent on limited suppliers and rigidly certified quality. In addition, policies should also ensure that crop diversity is circulated among actors in the seed value chain and that genetic diversity isn't put at risk.

- f. Government should also strongly encourage cooperative farming. By pooling their resources in certain areas of activity, farmers are allowed to do what big farms do like buying inputs at a bulk rate, increasing the volume of sales and opening new markets and lowering the per-use cost of equipment.

6.3 Commercialization of Agriculture Product

The 2021/22 budget included provisions for commercializing apple production in Manang, Jumla, and Mustang as well as commercial animal farming in the Himalayan region. It also granted tax deductions of up to 50% on profits from commercial agriculture and provisioned the commercialisation of apple farming in Manang, Jumla, and Mustang and commercial livestock farming in the Himalayan region. There are currently no grants or subsidies available for commercialization, with the exception of crop insurance and land leasing (Basnyat, 2022).

For proper marketing and commercialization, policies should address a proper marketing mechanism that allows the collection of farmers' production through local-level warehousing. The government should see to it that feasibility studies are conducted before local collection points and sales outlets are established. To increase market acceptance, the product should then be properly graded, packaged, and branded. Additionally, cooperatives can greatly aid in the marketing of farmers' produce by fostering cross-disciplinary linkages for a larger audience and market. Institutions (such as the educational sector) must be encouraged by policy to purchase locally produced goods in order to meet their needs. The need for support and links with government and non-government agencies is critical if agricultural cooperatives are to be strengthened and modern farming technology replicated.

- a. Develop a proper marketing mechanism for the collection of farmers' production through local-level warehousing. The government should conduct feasibility studies before establishing local collection points and sales outlets. This can improve market acceptance and ensure the product is properly graded, packaged, and branded, which will attract higher prices for the farmers.
- b. Foster cross-disciplinary linkages between cooperatives and other institutions, such as the educational sector, to expand their audience and market. Encourage these institutions to purchase locally produced goods to meet their needs, which will create a reliable market for farmers.
- c. Strengthen and modernize agricultural cooperatives by providing support and links with government and non-government agencies. This will help replicate modern farming technology and improve production efficiency, which will in turn reduce the high cost of production.

- d. Provide training and technical assistance to farmers to improve the quality standards of their products, which will help them meet market requirements and increase their competitiveness. This can be done through partnerships with agricultural universities and research institutions, which can provide technical assistance and training to farmers.

6.4 Agribusiness Practices

Because of its naturally diverse environment, Nepal has an advantage in developing specialized agricultural products to meet the demands of the open national and international markets. The country's sustainable agricultural development can be achieved through competitive agribusinesses, the adoption of environmental protection measures, and the promotion of exports while pursuing an import substitution and import replacement plan (Ghimire, 2009). The major challenge to our domestic production and marketing is the availability of comparatively cheaper import products from the neighbouring countries.

The government can introduce The Minimum Support Price (MSP) to prevent the farmers from getting a lower price for the local vegetable than the cost of the production. In addition, policies should be introduced that support farmers in the event of price fluctuation and price gaps through various linkage programs.

6.5 Agriculture Insurance

The enrollment of farmers in agricultural insurance in Nepal remains low, with only 3% of the total agricultural households enrolled as of the fiscal year 2020/2021 (MoALD, 2021). Among the insured farmers, crop and fishery insurance have a significantly lower share. A study by Mishra et al. (2017) found that agricultural insurance significantly improves the productivity and profitability of farmers in India. The study reveals that insured farmers invest more in agro-production activities, such as purchasing better quality inputs, utilizing advanced technologies, and following recommended agricultural practices, leading to enhanced agricultural productivity and profitability. It is likely that the findings of the Indian study could also be relevant to the Nepalese context.

Therefore, increasing agricultural insurance with the support of the government is crucial. To ensure that the subsidized loans have been used in the agriculture production system, it is essential to establish a monitoring mechanism.

- a. The government should work to introduce more insurance schemes for crops, livestock, and fisheries. These schemes should be designed to be affordable and accessible to smallholder farmers.

- b. Agricultural cooperatives can play a significant role in increasing the uptake of agricultural insurance. The government should provide technical assistance and training to cooperatives to help them better understand insurance products and promote them to their members.
- c. The government should establish a robust monitoring and evaluation system to track the implementation and impact of agricultural insurance schemes. This will help to identify any gaps or issues and allow for adjustments to be made accordingly.

6.6 Promotion of Agro-entrepreneurship

With the large number of youths moving abroad, there needs to be stronger incentives for the younger generation to move into agriculture. In 2022 alone, nearly 3000 youth went abroad each day in search of employment opportunities (DOFE, 2022). The absence of irrigation, unpredictable weather, poor seed quality, pest infestation, and ongoing fertilizer shortage make farming in Nepal riskier (Basnyat, 2022). The government needs to find measures to reduce risks in order to encourage interested entities and individuals (particularly youths) to pursue agriculture. In addition, governing bodies also have to digitize agricultural services and encourage seed capital to agro-entrepreneurs specializing in finding solutions within the agricultural value chain through technological intervention.

- a. The government can introduce various schemes and incentives to encourage youth to take up agriculture, such as providing loans at subsidized rates, offering free training and mentoring programs, and offering tax breaks and other financial incentives.
- b. The government should invest in building and maintaining irrigation systems, improving seed quality, and developing pest control mechanisms. This will reduce the risks associated with farming and make it more attractive to potential farmers, particularly the youth.
- c. The government should digitize agricultural services such as weather forecasting, crop monitoring, and pest management. This will help farmers make informed decisions and reduce risks associated with agriculture.
- d. The government can offer seed capital to agro-entrepreneurs who specialize in finding technological solutions within the agricultural value chain. This will help bridge the gap between technology and agriculture, making it more attractive to the youth.
- e. The government can strengthen partnerships between universities, research institutes, and private companies to develop innovative solutions to improve the

agriculture sector. This will create more opportunities for the youth to get involved in agriculture and attract more investments in the sector.

Way Forward

The rapid growth of cooperatives in Nepal has had a significant impact on the development of the country's agricultural sector. With approximately 30,000 registered cooperatives serving 7.3 million members, their micro-financing, capacity building, technology transfer, and lobbying have proven to be of great significance. The cooperatives have played a crucial role in steering the agricultural potential of Nepal and contributing to its economic growth.

Although various policies and strategies have recognized the importance of cooperatives in the past, there is still a considerable amount of work that needs to be done. The agricultural sector accounts for about 30% of Nepal's GDP, yet the budget allocated for its growth in the fiscal year 2022-23 is only 3% of the total budget. This budget allocation is insufficient and places both food security and the future of the farming community at risk. To improve the operations and outcomes of agricultural cooperatives and develop a robust, sustainable, and productive agriculture sector, government bodies must prioritize them on a policy level.

By prioritizing agricultural cooperatives, farmers can increase productivity and incomes, ultimately reducing poverty and hunger while steering the country towards agricultural sufficiency. Cooperatives can assist farmers in joint purchases of inputs and increase investment in productive areas such as capacity building, production, storage, processing, and marketing facilities for prioritized commodities. Therefore, it is critical to recognize the importance of cooperatives in Nepal and prioritize their development for a brighter and more prosperous future.

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Authors Contribution

Rudra Bhattarai - Conceiving ideas; formulation of overarching research goals and aims, Provision of study materials, reagents, materials, instrumentation,

computing resources,

Manashi Pandit - Conducting a research and investigation process, Application of statistical, mathematical, computational, or other formal, specifically performing the experiments, or data/evidence collection, Provision of study materials, reagents, materials, instrumentation, computing resources, Report initial draft/review/ final draft polishing

Conflict of Interest

The authors declared no conflict of interest.

References

- Basnet, B., & Pandey, K. (2018). Smallholder farming systems and rural livelihoods in the mid-hills of Nepal. *Journal of Mountain Science*, 15(7), 1444-1454.
- Basnyat, J. (2022). Nepal's 'spray and pray' approach to agriculture. *Nepali Times*. Retrieved December 21, 2022, Retrieved from <https://www.nepalitimes.com/opinion/nepals-spray-and-pray-approach-to-agriculture>
- Central Bureau of Statistics. (2019). *Statistical Year Book of Nepal 2019*. Central Bureau of Statistics.
- Deshar, B. D. (2013). An Overview of Agricultural Degradation in Nepal and its Impact on Economy and Environment. *Ripublication*. Retrieved December 20, 2022, from https://www.ripublication.com/gjesd/gjesdv3n1_01.pdf
- Fiscal Year 2020/2021. Ministry of Agriculture and Livestock, Kathmandu, Nepal.
- Food and Agriculture Organization (FAO). (n.d.). *Nepal at a glance | FAO in Nepal*. Retrieved from <https://www.fao.org/nepal/fao-in-nepal/nepal-at-a-glance/ru>
- Ghimire, S. R. (2009). Environmental Concern in Nepalese Agriculture. *Journal of Agriculture and Environment*, 9, 41-45.
- Government of Nepal. (2019). *Nepal Agriculture Policy 2019*. Retrieved from <https://moald.gov.np/storage/app/uploads/public/5db/802/096/5db8020963edc437146714.pdf>
- Gupta, A. (2022). *Key highlights of budget 2022-23*. Nepal Economic Forum. Retrieved December 31, 2022, from <https://nepaleconomicforum.org/key-highlights-of-budget-2022-23>
- Himalayan Research Group. (2012). Smallholder Farming in Nepal: Opportunities and Challenges. *International Journal of Agriculture and Biology*. Retrieved from https://www.fspublishers.org/published_papers/17479_..pdf.

- International Center for Integrated Mountain Development. (2017). *Nepal Seed and Planting Material System Assessment*. Retrieved from <https://www.icimod.org/resource/nepal-seed-and-planting-material-system-assessment>.
- International Labour Organization (ILO). (2018). *Cooperative Market Study: Enhancing Competitiveness of Agriculture Products in Nepal*. International Labour Organization. Retrieved from https://www.ilo.org/wcmsp5/groups/public/~asia/~ro-bangkok/~ilo-kathmandu/documents/publication/wcms_628642.pdf.
- International Labour Organization and National Cooperatives Federation of Nepal. (2018). *Cooperative Market Study: Enhancing Competitiveness of Agriculture Products in Nepal*. Retrieved from https://npc.gov.np/images/category/Enhancing_the_competitive_strength_of_the_nepalese_agricultural_produces1.pdf.
- Kaini, B. R. (2020). Five policies for Agriculture. *My Republica*. Retrieved from <https://myrepublica.nagariknetwork.com/news/five-policies-for-agriculture/>.
- Kathiawada, H. (2014). Role of Cooperatives in Rural Development: Lessons from Nepal. *Asian Journal of Agriculture and Development*, 11(2), 57-72.
- Khadka, S. (2022). About 3,000 youths leave Nepal every day. *My Republica*. Retrieved from <https://myrepublica.nagariknetwork.com/news/about-3000-youths-go-abroad-every-day/>.
- Ministry of Agriculture and Livestock Development (MoALD). (2021). *Agricultural Cooperatives in Nepal*. Retrieved from https://www.cooperativesnepal.gov.np/uploads/PDF/Annual_Report_2076-77_ENG.pdf.
- Ministry of Agriculture and Livestock Development [MoALD]. (2021). *Agriculture development strategy 2019-2030*. Kathmandu, Nepal: MoALD.
- Ministry of Finance (MoF). (2019). *Red Book. Fiscal Year 2019/2020*. Ministry of Finance, Kathmandu, Nepal.
- Ministry of Finance (MoF). (2021). *Budget Speech of Fiscal Year 2078/79*. Retrieved from https://www.mof.gov.np/uploads/document/file/Budget_Speech_in_English_2078-79.pdf.
- Ministry of Finance (MoF). (2021). *Red Book. Fiscal Year 2021/2022*. Ministry of Finance, Kathmandu, Nepal.
- Mishra, A. K., Dubey, A., Singh, R. K., & Kumar, A. (2017). Impact of Agricultural Insurance on Agricultural Productivity and Risk Behaviour: Evidence from India. *Indian Journal of Agricultural Economics*, 72(4), 468-481.
- MoALD. (2019). *Yearly Development Program for Federal, Province and Local Level. Fiscal Year 2019/2020*. Ministry of Agriculture and Livestock, Kathmandu, Nepal.

- MoALD. (2020). *Statistical information on Nepalese agriculture 2077/78 (2020/21)*. Ministry of Agriculture and Livestock Development, Kathmandu, Nepal.
- National Agriculture Policy (NAP). (2004). Ministry of Agriculture and Cooperatives, Government of Nepal. Retrieved from <https://extwprlegs1.fao.org/docs/pdf/nep54300.pdf>.
- National Cooperative Federation of Nepal (NCF). (2021). *Modern Processing Plants and Storage Facilities*. Retrieved from <http://ncf.org.np/modern-processing-plants-and-storage-facilities/>.
- National Cooperatives Development Board (NCDB). (2021). *Collection Center and Transportation*. Retrieved from <https://www.ncdbnepal.gov.np/collection-center-and-transportation/>.
- National Planning Commission (NPC). (2019). *Fifteenth Plan (Fiscal year 2076/77 - 2080/81) - A Draft Report*. National Planning Commission, Kathmandu, Nepal.
- Nepal Agricultural Cooperative Central Federation (2018). *Impact Study of Agricultural Cooperatives in Nepal*.
- Nepal Rastra Bank (NRB). (2018). *Demographic, Social, Economic and Financial Status of Nepal (Province Profile)*. Department of Investigation, Nepal Rastra Bank, Nepal.
- Sapkota, S. (2021). Opinion: What's in the Agriculture Budget. *The Kathmandu Post*. Retrieved December 31, 2022, from <https://kathmandupost.com/columns/2021/06/15/what-s-in-the-agriculture-budget>.
- Shrestha, R. B., Ferrand, P., Penunia, E., Dave, M., & Ali, Y. (n.d.). United Nations Decade of Family Farming 2019-2028: Regional Action Plan to Implement the UNDF for Achieving the SDGs in South Asia. *Asian Farmer*. Retrieved from https://asianfarmers.org/wp-content/uploads/2008/10/UNDF_20192028_Regional_Action_Plan_to_Implement_the_UNDF_for_Achieving_the_SDGs_in_South_Asia.pdf.
- Shrestha, S. K., & Adhikari, B. (2019). The Role of Credit in the Adoption of Modern Farm Technologies and Agricultural Productivity in Nepal. *Agricultural Economics Research Review*, 32(2), 209-217.
- Trade Map. (2021). *International trade statistics*. Retrieved from <https://www.trademap.org/>.
- World Bank. (2013). *Financial Inclusion in Nepal: Access, Usage and Challenges*. Retrieved from <https://www.worldbank.org/en/country/nepal/publication/financial-inclusion-in-nepal-access-usage-and-challenges>.

Authors Bio

Rudra Bhattarai

Mr. Rudra Bhattarai is an agriculture cooperative expert with a wide experience of more than 40 years in the development of the cooperatives sector of Nepal as a whole. Currently working as the General Manager of Nepal Agriculture Cooperative Central Federation Limited (NACCFL). Mr Bhattarai has a Masters in Sociology and possesses an effective and profound capacity for the institutional development of the cooperatives.

Manashi Pandit

Ms. Manashi Pandit is currently working as a Business Development Head at Alliance Sports Services Pvt. Ltd. an emerging Nepali startup providing software solutions to sports and recreational centre in and around Katmandu Valley. Ms Pandit has worked in an agriculture cooperative, an INGO and a media house. She has invloved in the development of 'Kisan Ko Poko' (Farmer's market), for Nepal Agricultural Cooperative Central Federation Limited (NACCFL). As a research officer/ associate, she has been involved in research work focused on agriculture value chain, micro-finance, agriculture enterprise, gender equality and more. Ms. Pandit holds a Bachelor degree in Business Administration with major in Finance from The British College Kathmandu.

Annex

Table A1 List of policies in Agriculture sector

i. Nepal Agriculture Perspective Plan, APP (1995-2015)	ii. National Fertilizer Policy 2058 (2001),
iii. The National Agriculture Policy, 2004	iv. Irrigation Policy 2060 (2003),
v. Agricultural Development Strategy (ADS) 2014	vi. Poultry Policy 2068 (2011),
vii. Nepal Trade Integration Strategy 2016. (NTIS 2016)	viii. Pasture Policy 2068 (2011),
ix. National Science and technology act 1989	x. Floral Promotion Policy 2069 (2012),
xi. Three-year interim plan (2007 – 2010)	xii. National Land Use Policy 2069 (2012),
xiii. First to fifteenth Five-year plan.	xiv. National Cooperatives Policy 2069 (2012),

xv. National Agriculture Policy 2061 (2004),	xvi. Commerce Policy 2065 (2008),
xvii. Agri-Business Promotion Policy 2063 (2006),	xviii. Climate Change Policy 2067 (2010),
xix. Agriculture Biodiversity Policy 2063 (2006),	xx. Industrial Policy 2067 (2010),
xxi. National Tea Policy 2057 (2000),	xxii. Supply Policy 2069 (2012),
xxiii. National Coffee Policy 2060 (2003),	xxiv. Science and Technology Policy 2069 (2012),
xxv. Dairy Development Policy 2064 (2007),	xxvi. Biotechnology Policy 2063 (2006)
xxvii. National Seeds Policy 2056 (1999),	