Empowering Rural Communities through Social Innovations: Social Innovation as a Design Tool in the Extension Approaches for Sustainable Agricultural Development in Nepal

Amita Kandel[1], Rabina Pandit[2], Raveenthiran Vivekanantharasa[3], Shishir Pandey[4], Manotar Tampubolon[5], Fernando Silalahi[6]

[1,2]Institute of Agriculture and Animal Science, Kirtipur, TU

[3]Faculty of Education, the Open University of Sri Lanka, Sri Lanka

[4]Institute of Agriculture and Animal Science, Tu Agriculture and Forestry University, Nepal

[5]Faculty of Law, Universiti Teknologi MARA, Shah Alam, Malaysia

[6]Faculty of Law, Universitas Kristen Indonesia, Indonesia

DOI: https://doi.org/10.51584/IJRIAS.2025.10020039

Received: 10 February 2025; Accepted: 14 February 2025; Published: 13 March 2025

ABSTRACT

This paper shows the role of social innovation as design tool in fostering sustainable development in rural Nepal. Country where two third of population are dependent on agriculture, different factor like low productivity, lack of infrastructure, climate change is being problematic. Traditional agriculture practices often lead to failure in achieving target in agriculture productivity. In counter to traditional methods, social innovation can lead farmers as empower products, through participatory approach creating co-creation by collaborating among the stakeholder. Various successful initiatives like mobile-based advisory services and farmers field school, have demonstrated effectiveness of integrating local knowledge into extension services. By utilizing community members in problem identification and solving activities, these innovations lead toward sustainable agriculture practices. Innovation also leads to acceptance of social aspects leading to the long-term solution of the problem alongside improvement in food security and rural livelihoods. Through the case study of organizations like Sustainable Agriculture Development Program (SADP), the research illustrates, how social innovation can lead to transformative changes within communities. Paper shows collaboration with different aspects, and utilizing expertise not only improves agricultural outcome but also strengthens community resilience against socio-economic challenges. Lastly, the paper advocates for a paradigm shift in agricultural extension strategies toward more inclusive and sustainable practices that empower rural communities in Nepal.

Keywords: Social innovation, Sustainable agricultural development, Rural communities, Farmers

INTRODUCTION

Ideas for solving local issues are always flowing through communities, but they are frequently modest creations. Social innovation is less common; it occurs when a local concept takes off and transforms the very structures that initially gave rise to the issue. This goes beyond temporary solutions and builds stronger communities, but it's a complex mix of people's efforts, unexpected opportunities, and the right timing. Intricate process of bringing new ideas, procedures, or programs into a social system that significantly alters its fundamental practices, power and resource dynamics, or core values is known as social innovation. These kinds of effective social innovations are long-lasting and have a wide influence(Westley & Antadze, 2018). In recent years, the idea of social innovation has grown remarkably in both

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue II February 2025

theory and practice (Editors & Idowu, 2013). Policymakers often use the term "social innovation" when discussing development and marginalization in urban and, more recently, rural environments(Bock, 2016). Development that satisfies current needs without jeopardizing the capacity of future generations to satisfy their own is known as sustainable development (Donkor et al., 2022). Societal innovation is crucial for achieving sustainable development. In contrast to conventional methods, sustainable development emphasizes the creation of multiple forms of value, not just profit, and calls for collaboration amongst all parties involved (stakeholders) in the creation of completely new systems. Social innovation can lessen environmental harm by coming up with innovative solutions that are advantageous to all parties (fair distribution of costs and benefits) external costs (Diepenmaat et al., 2020). For a nation like Nepal to guarantee food and nutrition security, sustainable agricultural growth is essential. Two-thirds of the population still directly depend on agriculture for their livelihood, and it still accounts for around one-third of the nation's GDP. Nonetheless, there are a number of issues facing Nepal's agriculture industry, such as low productivity, extreme instability, climate change-related shocks, and a lack of funding and infrastructure (IFPRI, 2016).

Nepal has several geographically diverse regions, from the densely populated Terai region at low elevation to the remote, difficult-to-reach Himalayan hills and mountains. These regions present significant environmental and socioeconomic obstacles to the growth of agriculture in Nepal (Krupnik et al., 2021). The cost of agricultural production is higher in Nepal than in other countries, which is partly due to the country's inadequate physical infrastructure, weather-dependent farming practices, limited land holdings, low per capita income, and ineffective bureaucratic procedures. There is a strong correlation between enhanced farming practices and both natural and human-caused environmental degradation (Ghimire, 2009). Socio-economic challenges, including widespread poverty and land fragmentation, exacerbate these issues, hindering investment in sustainable practices(Gautam & Andersen, 2016). Drying of water sources, erosion, and landslides in hills and mountain regions of Nepal while flooding of cultivated lands in low-lying areas of hills and Terai regions are the direct impacts of climate change in Nepalese agriculture (Giri & Dahal, 2021). All participants in the agricultural production and supply chain must be empowered and involved for sustainable agricultural development, or SAD.

SAD programs must address social aspects in addition to the widely acknowledged requirement for information and skills related to food safety, production, and capacity building in order to create long-term, sustainable change through participation (Kusnandar et al., 2019). In order to boost productivity and reduce rural poverty, agricultural training has the potential to be a successful strategy for disseminating pertinent new technology. It also enables farmers to grow crops and earn more money from them (Rasanjali et al., 2021). It becomes essential to incorporate the community at all levels, from project planning to project execution. Projects run by the community can be better maintained and controlled. In order to increase the capability of rural communities, the community can collaborate with the project developer and take on part of the project (Waridin et al., 2018). To sum up, the three main economic issues that rural residents deal with are inequality, unemployment, and poverty. Empowered rural communities can address both the issue of equitable growth and the economic crisis, which lead to successful development(Sharma, 2020).

Social Innovation as A Design Tool

Social innovation can be a powerful tool for addressing complex social challenges. Nepal is a country facing many challenges, such as poverty, inequality, and climate change. Social innovation can help Nepal to address these challenges and become a more prosperous and equitable country The results of social innovation are new ideas that meet unmet needs which are all around us. With the goal of addressing difficult social issues by coming up with creative solutions that enhance community well-being, social innovation is a potent concept and design tool for extension initiatives (Mulgan & Tucker, 2008). Insufficient food production is placing a burden on our planet, encouraging social innovation and traditional farming practices which help local community for a more accountable food system (Marchetti et al., 2020).

In the context of agricultural extension, social innovation can improve the efficacy of extension services by promoting inclusive and participatory approaches that involve local communities in the development and application of agricultural solutions. This approach highlights the significance of co-creation, in which farmers and other local stakeholders collaborate with extension agents to create practices and technologies customized to their unique needs and circumstances. By actively involving community members, extension services can

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue II February 2025

guarantee that solutions are relevant to the context and are more likely to be adopted and maintained in the long run(Bock, 2016). Co-creation is a crucial component of social innovation in extension strategies, where farmers, extension agents, and other stakeholders work together to create solutions that are suited to the demands of the local setting.

Through co-creation, agricultural methods and technology are made to be both scientifically sound and culturally and practically relevant to the community, while simultaneously emphasizing the importance of collective intelligence and local expertise. There are several steps in this cooperative process, such as problem identification, brainstorming, designing solutions, putting them into practice, and evaluating them. All participants are kept involved by ongoing feedback loops(Neumeier, 2012). Using a participatory approach to decision-making not only increases the acceptability and relevance of new practices, but it also gives communities more power. This strategy makes sure that the solutions developed are in line with the actual requirements and preferences of the community by actively including community people in all stages of the innovation process, from identifying problems to evaluating outcomes. This kind of congruence makes the innovations more likely to be implemented successfully and to last over time(Franz et al., 2010).

To sum up, the utilization of social innovation as a design tool for extension techniques presents a viable avenue for addressing the diverse issues that rural communities encounter. The impact and sustainability of agricultural extension services can be improved by social innovation through encouraging cooperation, utilizing local expertise, and creating strong networks. Social innovation is the process by which individuals work together to develop novel behaviors that promote social change. Both personal agency and societal structures have an impact on this process. We can enhance the laws and procedures that support social innovation by comprehending this interaction (Cajaiba-Santana, 2014). Many social innovations that support community development have evolved in the current context; I've mentioned a few of them here.

Mobile-Based Agricultural Advisory Services

Traditional extension services haven't been very effective, but new digital services offer personalized advice on crops, inputs, and cultivation methods. Farmers using these services see improvements in input intensity, production diversity, vegetable productivity and income (Rajkhowa & Qaim, 2021). Applications for social media, such as Facebook Messenger and WhatsApp, are thought to revolutionize agricultural extension. With the help of these free tools, farmers and extension agents can communicate with one other and with groups of people in text, audio, and video formats. Compared to previous approaches, this approach is more engaging and speedier. It also facilitates farmer-to-farmer connection, which increases the effectiveness of the dissemination of best practices and solutions(Ashraf & Hassan, 2018).

On-farm Research with and for Farmers

Gaining access to markets and diversifying their crops is helping farmers in Nepal's middle mountains increase their income, but this is causing them to consume resources like irrigation water and soil fertility excessively. A project in the Jhikhu Khola watershed is collaborating with farmers to test, demonstrate, and implement innovative sustainable techniques in order to address this. Farmers participate in the study initiative, which then disseminates these enhanced techniques across the community (Merz et al., 2003).

Farmers' Field Schools

Although it was initially a novel idea, FFS is now generally accepted by rural residents and organizations throughout Nepal. FFS methods have been embraced by the government and numerous NGOs; small NGOs and farmers themselves are acquainted with the program. In order to determine if FFS has aided in the good growth and social transformation of rural Nepal, the thesis examines what FFS has meant for these farmers (Westendorp, 2012).

Participatory Seed Exchange

Through the exchange of locally adapted seeds, a program known as Participatory Seed Exchange (PSE) assisted Nepali communities in rebuilding following an earthquake. Thousands of seed samples, especially of rare types

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue II February 2025

of vegetables and legumes, were shared by hundreds of participating farmers. In addition to ensuring access to crucial crops, this promoted biodiversity conservation. In fact, the initiative helped with research by enabling scientists to gather information and seed samples of nearby crops. PSE activities ought to be conducted on a yearly basis to encourage seed collection, conservation, and accessibility(Gautam et al., 2017).

Integrated Pest Management (IPM) Programs

Despite modest adoption rates, a Nepali survey indicated strong customer demand for organic and reduced-chemical-pesticide agriculture. Although there is a lot of interest in both Integrated Pest Management (IPM) and Organic Pest Management (OPM), there are a number of barriers to overcome, such as a lack of knowledge about the advantages, poor government backing, and restricted access to resources and alternatives. Even while chemical pesticides are still widely used, there is a growing movement towards better food production methods (Katuwal, 2011).

Climate-Smart Agriculture

Climate-smart agriculture (CSA) in Nepal consider the country's diverse farming systems, high female involvement, and social factors. The CSA Technologies have the ability to lower emissions, boost resilience, and raise agricultural productivity. In order to increase agricultural productivity and community food security, CSA provide women in agriculture greater opportunities, as they are disproportionately affected by climate change. Designing interventions specific to each location and ensuring they promote gender equality and social inclusion. Farmers and farming communities can be encouraged to invest in CSA technologies, practices, and services by using the information and incentive systems that extension services offer(Khatri- Chhetri et al., n.d.).

Biofertilizer and Biopesticide Production

Natural products containing bacteria that enhance soil health and plant growth are known as biofertilizers. They have the ability to fix nitrogen from the air and increase plant availability of nutrients. Researchers in Nepal have used the bacterium Azotobacter and Rhizobium to create biofertilizers, and there's a chance to find even more helpful microorganisms to boost agricultural output even further (Kandel et al., 2023)

For the control of insects, bio pesticides are a safe and natural substitute for chemical pesticides. They have little effect on beneficial insects and the environment because they are generated from plants, microorganisms, and other natural sources (Parajuli et al., 2022). Bio pesticides have been registered in Nepal; neem-based and but alternatives have proven particularly beneficial, although in-country testing is essential. To safeguard food security, quick research is required, particularly in light of the possibility of chemical pesticide misuse in Nepal(Science & 2021, 2021).

Plant Clinic in Nepal

Plant clinics in Nepal, introduced in 2008, offer on-site assistance to farmers. A 2013-2016 study showed an increase in clinic use until a major earthquake in 2015. While female participation is healthy at 45%, overall coverage remains limited. This suggests that while the program is promising, more needs to be done to make it widely available throughout Nepal (Adhikari et al., 2018).

Women's Agricultural Groups

Improving child nutrition requires equal opportunities for women in agriculture. According to the study, improving the status of women farmers and increasing the variety of crops grown on farms can benefit mothers' and kids' health and diets. Children's physical growth and dietary diversity were found to be improved in farms with a greater range of crops. Furthermore, better child health outcomes were linked to women in agriculture working longer hours and with greater control.

Case Study of Sustainable Agriculture Development Program (Sadp)

An NGO that is non-profit is the Sustainable Agriculture Development Program, Nepal (SADP-Nepal). Since

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue II February 2025

its founding in 2004, SADP has worked to advance sustainable agricultural systems in the nation while also enhancing the standard of living for farmers who lack resources. In order to accomplish its goal, SADP placed a strong focus on its partnerships and collaborations with academic institutions, farming communities, and other organizations at the local, national, regional, and worldwide levels that are dedicated to cooperating for adaptive research, community empowerment, and the advancement of sustainable agriculture.

Stories of Change

Here are some stories of change from Doti and Achham which I have taken from (Kallos-Lilly & Fitzgerald, 2021).

Story 1: Patuki Devi Thakulla, a 70-year-old woman living in Bardadevi of Achham District, has 11 members in her family. The family of Patuki Devi Thakulla had difficulty cultivating enough food on their property. Even her kid had to go to India for a job. However, Patuki's membership in the SADP-formed Nanda Jagaran farmer organization in 2014 brought about a change in circumstances. Patuki turned her land into a flourishing vegetable farm with the help of SADP's training and tools, increasing her income and motivating her community.

Story 2: SADP (Sustainable Agricultural Development Program) has been instrumental in transforming agriculture in Dev Bahadur Bohora's village which locate in Doti district. Through training, resources, and cooperative development, SADP has helped Dev increase his yield, income, and entrepreneurial spirit. Dev is optimistic that the newly formed cooperative will be a sustainable source of income for him and other young villagers.

Story 3: The Ghorechi canal in Dhirkamandu VDC, Doti, was renovated in large part because to the Sustainable Agricultural Development Program (SAP) and the District Agriculture Development Office (DADO). This helped 32 families and enhanced irrigation for 150 ropani of land. Consistent water flow from the refurbished canal helps farmers grow crops on schedule and lessens their maintenance needs.

Impact of these initiatives on empowerment and sustainability

The stories demonstrate how the Sustainable Agricultural Development Program (SADP) in Nepal has empowered people and advanced sustainable agriculture.

1. Enhanced Income and Livelihood Opportunities

The stories of Patuki Devi Thakulla and Dev Bahadur Bohora show how SADP gives people the skills, tools, and encouragement they need to enhance agricultural techniques and earn an income. This gives them the ability to become financially secure and possibly escape poverty.

2. Decision-making and Confidence

Being a part of farmer groups and cooperatives, which SADP facilitates, builds a feeling of community and gives people like Dev the ability to participate in decision-making processes. Training and bumper crops may give them more faith in their farming abilities.

3. Better Land Management

Stories 1 and 2 show how varied vegetable cultivation is replacing traditional cereal production. This lessens the chance of soil depletion due to monoculture techniques and enhances soil health.

4. Water Resource Management

The restoration of the Ghorechi Canal (Story 3) guarantees effective water management, reducing waste and optimizing the use of this essential resource for upcoming farming projects.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue II February 2025

Overall, SADP's efforts support a circle of sustainability and empowerment. Richer people and communities employ techniques that support the long-term sustainability of their agricultural endeavors because they have more income and expertise available to them.

DISCUSSION

Although it's a relatively new field, social innovation lacks a single accepted definition. The variables influencing social innovation are being researched. The environmental (political, economic, social, and technical), organizational (resources, strategy, management, culture, etc.), and individual (skills and attitudes of employees) levels comprise the three tiers of these elements. The ability of a nation to create and use social innovations is influenced by each of these factors(Davis & Heemskerk, 2012).

The successful transfer of technology between small firms and public research organizations was examined in (Singhai et al., 2021) research. The research concluded that while expertise and technology license were less significant elements, communication, knowledge, product quality, motivation, and innovativeness were the most crucial ones. To discuss in brief about (Singhai et al., 2021) study, it have mentioned:

1. It is essential to have strong institutional frameworks and policies that support them. Social innovations may be implemented and sustained much better with the support of community-based groups, NGOs, and effective government policies.

2. Funding availability and economic stability as another essential factor. The availability of financial resources to support early development and ongoing operations is typically a determining factor in the success of social innovations. Sustainable business structures and financial incentives might encourage participants to fund and continue social innovation projects.

3. Study consider community's social norms and cultural background to have a big influence on how well social innovations are received and work. Innovations that are in line with regional customs and values have a greater chance of being accepted and maintained throughout time.

Nepal (2019), in his finding mention Fluctuating economic growth as one of the factors. Over the past few decades, Nepal's economy has grown at a varying rate, falling short of the World Bank's average growth criteria for inclusive growth. The biggest industry, agriculture, has suffered a drop in GDP, which has an effect on rural poor farmers. The lack of competitiveness and low investment have caused the manufacturing industry to stagnate. Although the service industry has potential, its results are not always consistent. Although remittances play a significant role in the economy, questions concerning inclusion still exist.

Similarly, on a study done by (Bhattarai et al., 2015), they found Level of education wasn't a significant factor. It was an investigation on innovative local ecological agriculture which was conducted in Nepal. Resolving issues and pursuing personal interests were important sources of innovation. Obstacles included social views, hectic schedules, and a lack of networking. In general, local communities are addressing issues like poverty and climate change and enhancing agriculture through the use of their knowledge.

One of the biggest needs of social innovators is funding, particularly for early-stage. Governments need to putting more emphasis on this by sponsoring intermediary groups that assist social innovators and by giving grants and investments. A couple of instances are Portugal's use of structural funds for social innovation and the UK's Big Society Capital(Nesta, 2016).

There are several advantages for both individuals and communities when they engage in social and community activities. Participating in social activities can lower stress, increase self-esteem, and enhance general wellbeing. Communities serve as a forum for cooperation and social change, providing chances for people to get engaged in having a beneficial influence. approach facilitates community involvement in the planning and execution process. This guarantees that projects are suitable for the local environment and culture, which promotes wider acceptance(Scope Australia, 2024).

According to a study (Pandey & Malla, 2023), local administrations in Nepal lack the necessary infrastructure,

knowledge, and security protocols. This makes it more difficult for them to provide e-services and take part in economic growth. The report suggests that the federal government offer assistance by: Developing and distributing integrated software, Offering IT training and encouraging each local government to create its own IT policy

According to (Westley & Antadze, 2018), Social innovations are remedies that take aim at the very structures that gave rise to the issues they seek to solve. Conventional market theories fall short in explaining the diffusion of these technologies. The authors suggest studying how these innovations function by applying models from complex systems, such as social-ecological systems. These models take non-linearity, interruptions, and rapid and slow changes into account. The significance of "institutional entrepreneurs" in linking regional breakthroughs to more extensive policies and frameworks is also emphasized by them.

After reading all the articles, the recommendations are: Challenging Existing Systems: The government ought to place greater emphasis on innovators and adopters alike. Participatory methods**:** Incorporate local communities into the conception, execution, and assessment of social innovation initiatives by using participatory approaches. This guarantees local support and cultural relevance for programs.

Digital tools**:** To increase the effect and reach of social innovation efforts, make use of digital tools and platforms. Social media apps, mobile advice services, and other digital communication tools fall under this category.

Building networks**:** To encourage the sharing of resources and expertise, create networks and alliances among different stakeholders, such as NGOs, government organizations, academic institutions, and the commercial sector.

CONCLUSIONS

In order to address issues in rural areas such as those in Nepal, social innovation can be a very effective approach. This study examines social innovation in the agricultural setting and highlights a number of effective applications, such as mobile advisory services participatory seed exchange, and farmer-centered research. A few essential components must come together for social innovations to succeed. Community involvement, financing sources, and supportive policies are all essential. It's also critical to comprehend the social norms and cultural background, since innovations that align with community values are more likely to be embraced. Investing in social innovation has the potential to make Nepal richer and just. Social innovation may promote sustainable agriculture practices and ensure food security while addressing urgent concerns like poverty, inequality, and climate change by empowering communities and encouraging collaboration.

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