



Linking Social Innovation with Inclusive Transformation of Agri-food System in Nepal: A Review

R. Paudel ^{a*}, P. B. Nepali ^a, H. K. Panta ^a and G. D. Acharya ^a

^a *Institute of Agriculture and Animal Science, Tribhuvan University, Kirtipur, Kathmandu, Nepal.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2023/v41i81983

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/100697>

Mini-review Article

Received: 23/03/2023

Accepted: 28/05/2023

Published: 03/06/2023

ABSTRACT

The potential of social interface in agricultural innovation remains masked by extension service agencies. This review collected and studied scattered knowledge generated literature on the role of social innovation in inclusive transformation of agri-food system highlighting on preproduction, production, supply chain and consumption. Search engines; namely google scholar; Science Direct, JSTOR, Directory of Open Access Journals and Scopus were utilized to identify the articles and relevant literatures. The review provides a state of the art on knowledge related to social innovations and inclusive transformation of agri-food system. The findings show that social innovation is becoming a prevalent tool to expedite inclusive transformation of food systems in Nepal. However, there are no clear considerations on social innovations in inclusive transformation of food and agriculture system. To provision these considerations, significance of social innovations for inclusive transformation was well explored for further analysis and conclusion. This review enhances the gaining of insights into the theories and findings of past

*Corresponding author: E-mail: raj5yes@gmail.com, rajesh.paudel@iaas.tu.edu.np;

works related to social innovation, inclusiveness, food system transformation and policies which contributed to develop a strong framework of inclusive transformation of food system from social innovation perspective.

Keywords: Social innovation; social inclusion; food system; inclusive transformation.

1. BACKGROUND

Inclusive transformation of food system is sensible effort to take along socioeconomically marginalized and excluded group of people in the mainstream of the overall agricultural development process. People lacking enough marketable surpluses, assets, capacity, facility and linkages are generally deprived of the opportunities for development [1,2]. This kind of exclusion may lead to other forms of deprivations including poverty and exploitation [3]. Inclusive transformation relates to the results in extensive right of entry to available opportunities for the majority of people keeping special attention to vulnerable groups with equality, fairness and political plurality. Inclusive transformation enhances resilience of disadvantaged groups through dynamic engagement with wider social system in the given context of widening disparities between regions and socio-economic strata of the society [4]. Inclusion is not a once and for all outcome but an ongoing process of change in the development of co-operatives themselves and their relationship to the social and economic contexts in which they work [5]. There were limited know how on drivers of change for inclusive agricultural transformation. Very much efforts have been invested in identifying individual contexts and variables for agricultural transformation like income, gender, education [6]. But very little is known about impacts of the variables that could increase social innovation and technology adoption by farmer's community.

Growing concerns on food system inclusiveness and sustainability can be accompanied with food security concept that has been always explained with access, quality, utility and stability of food supply. A scenario analysis addressing the future of food systems globally, developed by the World Economic Forum and its partners in the 2017 'Shaping the Future of Global Food Systems' report, sketches four key objectives for future-proof food systems [7].

i Inclusiveness, ensuring economic and social inclusion for all food system actors, including smallholder farmers, women and youth; ii.

Sustainability, minimizing negative environmental impacts, conserving scarce natural resources and strengthening resiliency against future shocks; iii. Efficiency, producing adequate quantities of food for global needs while minimizing losses and waste; iv. Nutritious and healthy, providing and promoting consumption of diverse nutritious and safe foods for a healthy diet. Innovation is needed to foster sustainability transitions in food system from production to processing, distribution and consumption [8]. Social innovation takes place in a social-material context. It is the context that is made up of the sum-total of all actors in the society, their social and material relations and the institutional arrangements with which a social innovation interacts. Transformative change is a philosophical or practical process to bring change in the existing social, economic and technological change in the society. It occurs as a persistent adjustment in the societal values and alters the preceding situation of the society. Societal transformation should bring changes in socio-economic (Industrial revolution), socio-cultural and political situation of the society for social justice. These changes should to be related to changes in several dimensions and occur simultaneously across an array of places. The role of social innovation in transformative change can be studied by knowing the actual empirical cases where the transformative change can be readily identified and assessed. This change can be assessed by focusing on transformative change as institutional change. Institution is taken as arrangements of established social rules that cause social interaction. They provide prescriptions, models with tactic assumptions and schemas, identifies the roles, make arrangements of family, club, organization, communities etc. for providing a sense of world also identify option and take action. The institutional changes may include religious, educational, professional change or change in an established law or practice such as the institution of marriage, custom, norms, rules or value etc. Social innovation initiatives can alter the established institutions, they can continue some established institutions or sometime can alter or replace them.

2. MATERIALS AND METHODS

This review consists of detailed examination of research evidence synthesis. This review comprised of 2 steps; (1) results and discussion, (2) conclusions. In this study, the objective was to expose the proposed framework based on vigorous study of the published literatures for linking ‘social innovation’ and ‘inclusive transformation’. Also, to reveal the mechanism on how citizen or community led social innovation provokes inclusive transformation process. Google scholar; web search engine along with different electronic databases like Science Direct, JSTOR, Directory of Open Access Journals and Scopus were screened, and a total of 52 relevant studies (1971 to 2023) were included and evaluated randomly (the search was conducted in 2023). The key search terms contain “social innovation”, “social inclusion”, “food system”, “inclusive transformation”, “food system transformation”, Hence, a wide-ranging combination of past

works, published articles was performed. The literature was screened based on following criteria.

The literatures extracted included the writer’s name, year of publication, country, theoretical framework; social innovation and inclusive transformation attributes were investigated. This review was done from randomly selected articles providing solid conclusions for future direction in establishing linkage between social innovation and inclusive transformation. The search method with keywords identified 540 articles in google scholar and different databases. Duplications were eliminated resulting 300 exclusive articles. A total of 95 articles were removed based on topics screening, and further 90 articles were eliminated using abstract screening. After inspecting the full texts of remaining papers, only 52 papers were preferred for the study using three criteria linguistic, publication type and focus.

Table 1. Article selection criteria

| Particular | Conditions for preference | Conditions for elimination |
|------------------|---|---|
| Linguistic | Manuscript in English | Manuscripts other than English language |
| Publication Type | Published article type especially with original research papers, books, reports and book chapters | Published article type other than original research papers, books, reports and book chapters |
| Focus | Concentrated with ‘innovation’, ‘food system’, ‘agriculture transformation’ and ‘inclusivity’. | Not concentrated with ‘innovation’, ‘food system’, ‘agriculture transformation’ and ‘inclusivity’.. |

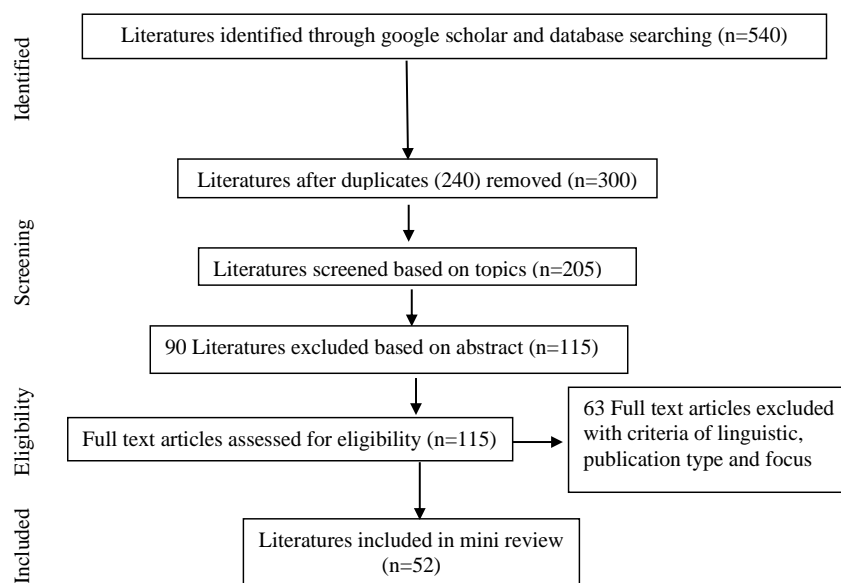


Fig. 1. Mini-review flow chart

2.1 Theoretical Framework

2.1.1 Self-determination theory (SDT)

SDT – the most accepted theory of human motivation is based upon the principle of individual's innate, natural and constructive likelihood towards detailed and consolidated feeling of self [28] where, it was aimed to explain how external rewards like salary, trophies etc. affect personal interest, self-encouragement towards particular action [29]. It is also argued that behind the different kinds of human motivation quality is a prime factor for their difference [30]. SDT is found to be in line with 3 universal psychological needs like competence, relatedness and autonomy [28] whose satisfaction creates ideal mental functionality and human prosperity [31]. Competence can be understood as an individual's need and capabilities to carry out activities efficiently while relatedness relates to need of an individual for his feeling of closeness, affection and acceptance by society and other members of society. Autonomy refers to a person's need of living with self- respect and dignity. Autonomy is the one's behavioral origination or source [32]. Autonomy is often correlated to experience of freedom, which in turn is ideal for individual performance and functionality. Despite of highest utility of SDT in motivating individual in various life domains the integration of this theory in extension education research seems negligible till date.

2.1.2 Motivational styles

Psychological needs like competence, relatedness, and autonomy are motivational orientations which when achieved lead to ultimate life satisfaction but, left unmet they lead to corresponding motivational orientations [33]. Among discussed above, autonomy holds strong position as it is related to behavioral orientation and self-determination, where it should be understood beyond the demise of dependency [34]. Moving forward to intensity of autonomous motivation, "External motivation" is the least autonomous type among human motivation where individual's behavior is guided by external forces like reward, punishments, threats, material incentives etc. where the he/she engage in behaviors determined by/for other not for self [28]. Introjection refers next type, a form of controlled intrinsic motivation where an individual is motivated to engage in a particular behavior on the contrary of his/her self or ideologies in order

gain social-approval or be safe from social avoidance, guilt etc. [34]. Another is "identified regulation" a more autonomous type where people adopt behavior as their own and perform activities based on worthiness and importance of that particular activity. In that state the individual possess the highest degree of autonomy [35]. Next is "integrated regulation" that arise when individual takes identified regulation as the part of his or her self where he/she performs behavior with more energy and interest [36]. Finally, at its highest degree of autonomy is 'intrinsic motivation' where behavior is driven by internal rewards and people involved in activity as they find it naturally satisfying to them. Individual see that action as an opportunity for actualization of his or her potential. Such statements advocate that intrinsic motivation is more internal and highly autonomous on the contrary to other styles of motivation [37].

2.1.3 Why a study on farmers' self-determined motivation?

Self-determination theory: It is a macro theory of human motivation and personality that concerns people's inherent growth tendencies and innate psychological needs. It is concerned with the motivation behind choices people make without external influence and interference. Exploring participation in a sustainable farming initiative.

Social innovation initiatives fit with self-determination theory which says that people have innate needs for autonomy, relatedness and feelings of competence (as basic psychological needs), where autonomy refers to the idea that one's actions are self-determined or self- motivated and that there is a sense of choice. Transformative social innovation involves not a single transformation but diverse transformations based on different social relations, values and ideas of progress. Diversity of directions, institutional forms, ways of funding and collaboration are an integral and inherent element of the social transformations that are enacted and aspired to as part of self-determination theory.

Different studies have been conducted to examine how human behavior can be influenced by autonomous and controlled types of motivation styles and regulation. Autonomous motivation is often correlated as intrinsic and identified/integrated motivation, while and controlled motivation is related to external and interjected regulation [38]. Research conducted

by different scholars in this area has shown that autonomous motivation leads to psychological well-being [39], self-respect, one's worthiness [40], and feeling of aliveness, longevity and energy [41] compared to controlled motivation.

State of art: It is imperative both theoretically and in practice to comprehend how social innovation relates to social change. Phenomena of social change are consistently looked at in connection with technological innovation in techno-sociology and technical research in the prevailing paradigm of a social-technical system, but not from the perspective of an independent type of innovation that can be distinguished from technological innovations. In the context of broad social debate surrounding 'sustainable development' and necessary 'social transformation' processes, the question of the relationship between social innovations and social change arises again:

- How can processes of social change be initiated and institutionalized?
- How to link social innovations from the mainstream of society with the intended social transformation processes?

2.2 Proposed Framework Linking Social Innovation with Inclusive Transformation of Agri-food System

Social innovation and inclusive transformation both arises when the existing situations, issues, systems in societies, need to transform the betterment of the future. They can be solutions to such problems, challenges in socio-economic conditions for welfare individuals. Social, political, institutional, economic and individual variables form the major constituents of social innovation. That ultimately determines the production, processing, distribution and consumption pattern of agrifood system.

Inclusive transformation in agrifood system comprises of all actors involved in the production, processing, distribution and consumption of food. Similarly, to social innovation inclusive transformation is needed to overcome inequalities, discrimination in all activities from production to consumption. Transformation is needed in income level, participation level in field, institution, market and other sectors of agrifood system. Social innovation is one of the important topics which is attracting researchers, policy makers, practitioners, governmental and nongovernmental organizations along with

different professionals/individuals as a new concept to be studied and promoted.

3. RESULTS AND DISCUSSION

3.1 Identifying the Research Gaps

Although both "social innovations" and "inclusive transformation" are important in agri-food system, there exist gap in empirical and theoretical studies on both of these concepts. From the pragmatic side, there is lack of studies on the role of social innovation on inclusive transformation of agri-food system in Nepal. Both concepts suffer from issues of interrelationship, effectiveness, impact and sustainability. Similarly, some countries had already developed theories, research and published works on the social innovations related to agriculture but Nepal still lacks literatures in inclusiveness and social innovations in agri-food system.

Currently, very few studies were found that directly address the prospects and limitations of inclusive transformation of agri-food system in Nepal. Motivation factors for social innovation can be instrumental to link with inclusive transformation but haven't been exploited rationally to study their relationships and effects. No studies have been found specifically exploring inclusive transformation of agriculture in Nepal. Systematic exclusion is reinforced by instrumental exclusion, which is embedded in the social and economic structure and policies enunciated. Members of certain groups by virtue of not having particular accessibility, capabilities, facilities and linkages are excluded from opportunities to improve their capabilities. Such exclusion leads to other kinds of deprivation, which leads to the impoverishment of human life through their causal consequences.

3.2 Factors Responsible for Social Innovation

3.2.1 Factors at policy or external environment level

Social innovation is affected by various macro-level factors. Political and legal factors include are major factors in motivating or hindering social innovation. Policy awareness about social innovation, press freedom, democracy discourse, policy agendas, and legislation are in favor of social innovation [9]. It should be stressed that the state structures and practices [10], similarly

administrative and bureaucratic barriers to authorize and execute social initiatives may sometimes hamper innovation [11]. In the EU, social innovation is a central element of the Europe 2020 10-year strategy for smart, sustainable and inclusive growth [12].

3.2.2 Economic factors

Social innovation is also dependent on some economic factors as the stat up of some new initiatives like Public social infrastructure, Private

spending, ICT and overall infrastructure that always promote social innovation [9]. While they are not profit oriented, with great interdependence on external grants, lack of technical, lack of financing structures are some barriers to social innovation [13]. Third, As social innovation is a highly complex process with the danger of getting more complicated when new decision-makers come 'on board', social innovators usually strive for less investor involvement and a high level of autonomy.

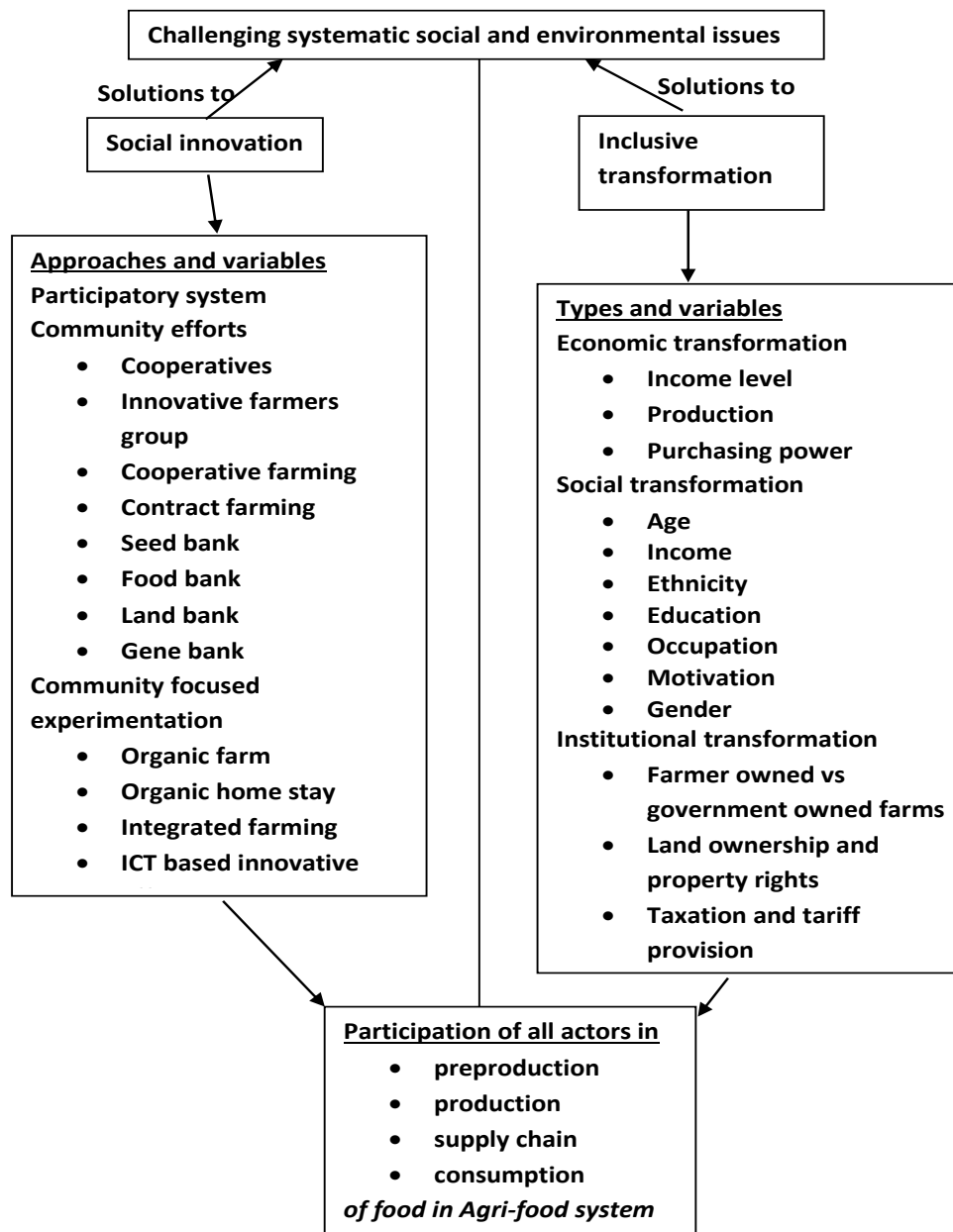


Fig. 2. Proposed framework linking social innovation with inclusive transformation of agri-food system

3.2.3 Organizational level/social and cultural factors

According to Hubert and Bund et al. [14,9], unclear definitions on social innovation, difficulty in quantifying social impact, passivity in society are some institutional and cultural aspects for barriers to social innovation. Collaboration skills between different parties are important. Different authors argue that without effective networks and intermediaries, it is very difficult to connect ideas, resources and people, which they argue is a pre-condition for the development and growth of social innovations. Gender equality, Human rights institution, Intersectoral collaboration, Social impact, Scalability and replicability of innovation, Social learning are some factors to promote social innovation has been identified [15,16].

3.2.4 Factors at the individual level

Factors affecting individuals consists of Interest in shared social needs, Citizen's openness in risk taking, Willingness towards change, Leadership and training [12]. Similarly social innovation depends on the knowledge, abilities, skills, motivation and the attitudes of individuals [17]. Resistance to change, bad attitudes, distrust to innovators, risk aversion, lack of knowledge are major barriers to social innovation [18] as compared to other barriers discussed above.

Both social innovations and inclusive transformation always challenge the existing situation for betterment of social-economic and other allied sectors, that ultimately lead to participation of farmers (other actors in production, processing, consumption and distribution of food in agri-food system. Various approaches as described in figure above can be instrumental in social innovation. They again depend on different variables for social innovativeness. While inclusive transformation mean to transform social, economic and institutional situation of agrifood system for better agri-food system.

Agriculture Development Strategy of Nepal [19] has suggested the promotion of inclusiveness and point out towards the inclusive transformation of agriculture and food system in order to achieve desirable changes in the system. The ADS has clear vision on self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth

and contributes to improved livelihoods and food and nutrition security.

More than two thirds of the population, overwhelming majority of them are small and marginal farm households, draw living on farming and farm-base enterprising. Nepal is rich in agro-ecological diversities with huge potential of niche products of higher commercial values. However, the sector has long been suffering from sluggish growth. Skewed distribution of productive resources, opportunities and thus food. Food insecurity and vulnerability is rampant specifically among socio-economically marginalized and excluded groups. So, it requires critical transformation in development interventions and approaches. Governmental and nongovernmental programs are not taking the local level small farmers issues and has not been taken enough consideration in food policies. So small farmer's perception towards existing local food system is largely unknown and understanding barriers and solutions to practice is needed for inclusive transformation.

3.2.5 Social innovation and social transformative change

Social innovators try to develop new practices that focus on need of the society by making the use of available resources and also include the institutionalized traditions or rules. Institutions help in shaping human behavior and action and at the same time they are created through human action. This relationship between actors and institutions that create and reproduce a social system and accounts for stability and continuity of social life is referred as the process of structuration. Social innovators have the potentiality to create novelty in the society by creating new institutional structures. Actors may use existing institutions and resources in novel way which may lead to transformative change. They may also create new resources or new proto- institutions. Institutionalization is referred as the process of embedding norms, rules, conventions and values etc. with an organization. Institutionalization or transformation can occur at different rate in different places. When social innovation develops, it challenges, alters or replaces the established institutions or it may also reproduces the established institutions. A variety of social innovation agents interact through a social innovation field and make a social innovation. Their action lead to change in structuration of local practices. Transformative social innovations (TSI) interact with and

influence the processes of institutionalization whose impact can be assessed by identifying the degree of institutionalization and its core elements. TSI can be also taken as a process by which social innovation changes, alters or replaces the present situation of the society. Rather than a type of innovation it can be considered as a process that changes the existing situation of the society or institution.

3.2.6 Food security and food system

As food systems transform across the spectrum from traditional to modern, government policy goals need to shift from a focus on food security to healthy, balanced diets [20]. When rural development and agriculture are concerned, social change is always implied. Changes in urban and rural lifestyles drive and demand innovations. Social innovation is then appointed as desired outcome – a renewed, revitalized society - as well as instrument and strategy to rescue rural societies through collective engagement [21]. According to the Food and Agriculture Organization of the United Nations (UN FAO), “food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs for an active and healthy life” [22]. The four dimensions of food security are 1) physical availability or supply of food, 2) economic and physical access to food, 3) food utilization and sufficient energy and nutrient intake by individuals, and 4) stability of the other three dimensions over time. All four dimensions must be fulfilled simultaneously for food security objectives to be realized [22].

Food security as a concept has focused on perspectives that follows the Right to Food movement logic. There is a tension between food security and farm security and that food localization tends to privilege farmers rather than the poor who suffer from food insecurity [23]. The idea that small-scale farmers can contribute to improved food systems through increased local food production and direct marketing has been cautioned by several scholars whose focus is to address structural injustices in the food system.

A food systems approach to food insecurity emphasizes sustainability, community food justice and public health that can impact community economic development, land preservation, and nutrition [24]. Re-localizing food systems is a way to improve overall access to healthy food in communities, while protecting the land and people involved in producing and

distributing food [24]. The food system is complex with many processes, people, and institutions. Improving community food security is no easy task. By considering the complex interactions of the entire system, health, agriculture, and rural development, food access can be improved over time. Food should be considered from the farm to the plate and indirect long-term costs associated with health and the natural environment needs to be included in improved food systems [25].

It is important to have a clear understanding of what social inclusion means as it eventually determines how to develop useful strategies for enhancing social inclusion. In the case of disadvantaged and vulnerable farmers this means: to understand the way they access agricultural services, whether through actual membership of farmers’ organizations or through indirect representation by farmers’ organizations. When talking about social inclusion one cannot escape discussing social exclusion. A social exclusion perspective focuses on two sets of barriers to alleviate poverty, namely: 1. social relations that exclude people; and, 2. restricted access to institutions and organizations that matter for poverty alleviation, citizenship and rights [26]. Hence, social exclusion might be a reason why the poorest of the poor have less access to, and participate less often in, farmers’ organizations, and thus have less access to agricultural services. The most common definition for social exclusion is probably the one used by [27]. Social exclusion is the condition of communities, groups and individuals who are economically and/or socially disadvantaged. According to this definition, categories of socially excluded people include those living on lower incomes and people from minority ethnic communities. However, a variety of different definitions for social exclusion are being used.

3.2.7 Agriculture and inclusive growth

Inclusive growth is an all-encompassing concept, which includes aspects, such as agriculture development, employment generation, poverty reduction and reduced regional inequality. Agriculture development may be deemed as the critical aspect of inclusive growth and proves to be a smooth path for achieving social and economic inclusion. Growth of agriculture sector is the key for poverty reduction and inclusive growth. Agriculture growth will enhance economic growth and reduce rural poor by increasing their productivity and incomes.

3.2.8 Various motivating factors and barriers to social innovation

Table 2. Motivating factors and barriers to social innovation

| Factors enabling/motivating social innovation | Barriers to social innovation |
|--|--|
| Conditioned by policy/ political factors | |
| Policy awareness about social innovation | Administrative and bureaucratic barriers to authorize and execute social initiatives |
| Policy awareness about social needs | |
| Government effectiveness | |
| Press freedom | |
| Political stability and democracy | |
| Economic/ resource factors | |
| Public social infrastructure | Economic situation doesn't allow generation of profit |
| Private spending | Over dependence on external donor/grant |
| ICT and overall infrastructure | Lack of technical efficiency |
| | Lack of financing structures |
| | Lack of access to information |
| Institutional/ Social/Cultural factors | |
| Gender equality | Lack of clear definition on social innovation |
| Human rights institution | Lack of confidence in social innovation building |
| Intersectoral collaboration | Passivity in society |
| Social impact | Risk aversion |
| Scalability and replicability of innovation | Lack of organizational learning and culture |
| Social learning | |
| Individual factors | |
| Interest in shared social needs | Resistance to change |
| Citizen's openness in risk taking | Distrust to innovators |
| Willingness towards change | Poorly developed skills |
| Leadership and training | Minds; Risk aversion |
| Membership in civil society | Lack of knowledge |

Source: [42,9,11]

3.3 Mechanism on how Citizen/Community Led Social Innovation Provokes Inclusive Transformation Process

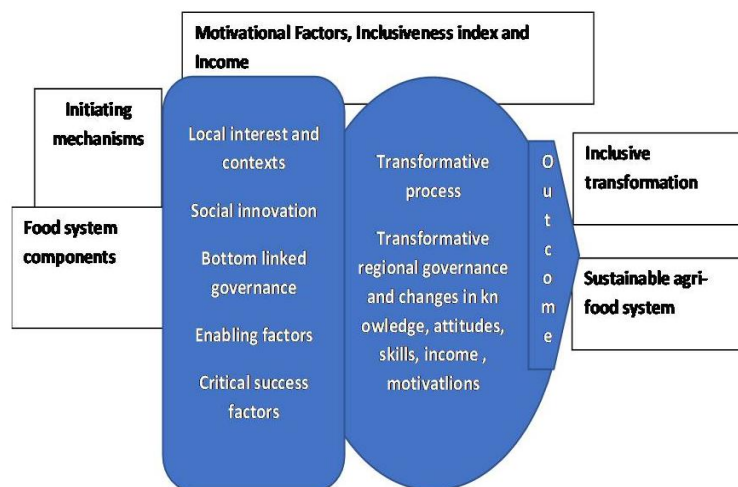


Fig. 3. Proposed mechanism on how citizen/community led Social Innovation provokes inclusive transformation process

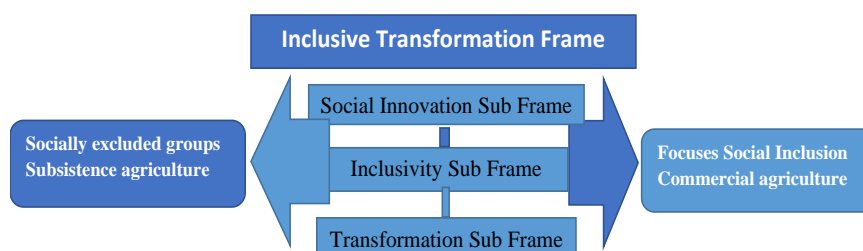


Fig. 4. Proposed frame of inclusive transformation on the basis of ADS provision in Nepal

Table 3. Major highlights of the published papers on ‘inclusive transformation of agri-food system in Nepal’

| Paper | Significant points |
|--------------|--|
| [43] | Systematic transformation of gender role missing in relation to Nepalese agriculture. Nepalese agriculture needs Support for women empowerment through special privilege to productive resources. |
| [44] | Gender, social and cultural differences influence inequity regarding access to production resource governance, income, inclusive leadership, employment and food. Women, smallholders and poor are more vulnerable in having healthy foods. Socioeconomic, Technological, environmental, demographic, cultural and physical factors are decisive in Nepalese food systems. |
| [45] | Upgrading Nepalese food system demands balance between food system and water–energy–biodiversity nexus. Agroecological system-based solutions provides more resilience in food system |
| [46] | Farm mechanization contributes to make agri-food system more sustainable and transformative through economic and social aspects like labor productivity, poverty reduction, food security and health wellbeing. As a consequence of farm mechanization; land degradation, biodiversity loss, lacking inclusiveness and growing inequalities makes sustainable food system less transformative. |
| [47] | To achieve USG Global Food Security Strategy’s objective 1 of “Inclusive agriculture-led growth”; agri-food system transformation is a principal path. |
| [48] | Nepal needs responsive citizens for socioeconomic transformation. Background of Nepal provides several opportunities of the sectoral and structural innovation. Social innovation can shape a smart and strong Nepal. Government should create the atmosphere for social enterprise sector of Nepal. |
| [49] | Local innovations have higher utility and relevancy among farming community. Local innovators gets stimuli to innovate in the adverse situation when they are facing problems. Public problems, household problems, shortages, personal ego and interests are most important forces of local innovation. |
| [50] | Active participation of farmer is most important while choosing the situation specific innovation during adoption process. |
| [51] | Agricultural innovation is mostly adopted by wealthier farmers in rural Nepal. Alternative business models, innovations and policies must be established for poor, landless and women. |
| [52] | Farm innovators with creativity and imagination should have thoughtful and open link with earth for the desirable transformation of agriculture. |

4. CONCLUSIONS

By relating social innovation with inclusive transformation of agri-food system, it’s obvious to consider the strength of farmer led roles that

drives inclusive transformation, to narrow the all kinds of divides in Nepal. In the provincial contexts and using various conceptual lenses, this review tries to find out how social innovations address inequality in agri-food system, in relation

to income, gender, ethnicity and land holding. By involving suitable social innovation policies, state can minimize the existing gaps in agri-food system in terms of income, gender, ethnicity and land holding.

ACKNOWLEDGEMENTS

The authors like to thank University Grants Commission (UGC), Nepal for Ph.D. research support and two anonymous reviewers whose useful comments have significantly improved the paper.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. IFAD. Value chains for Inclusive Transformation of Agriculture; 2020. Available:<https://webapps.ifad.org/members/eb/130/docs/EB-2020-130-R-24-Project-Desing-Report.pdf>
2. FAO. Sustainable food systems: Concept and framework; 2018. Available:<https://www.fao.org/3/ca2079en/CA2079EN.pdf>
3. UN. Rethinking Poverty Report on the World Social Situation 2010; 2009. Available:<https://www.un.org/esa/socdev/rwss/docs/2010/chapter4.pdf>
4. Tsujita, Y. Inclusive growth and development in India. In *Inclusive Growth and Development in India*; 2014. Available:<https://doi.org/10.1057/9781137408747>
5. Borda A, Hazel R. inclusive development and co- operatives. *The European Journal of Development Research*; 2019. Available:<https://doi.org/10.1057/s41287-019-00249-9>
6. Ruben R, Beekman G. Agrarian change and inclusive rural development : Gaps & challenges 1. *March*. 2019;1–11.
7. WEF. Shaping the Future of global food systems: A scenario analysis. *World Trade Organization*, January. 2017;1–28.
8. Bilali HEL. Relation between innovation and sustainability in the agro-food system. *2018*;30: 200–226.
9. Bund E et al. Blueprint of social innovation metrics: Contributions to an understanding of opportunities and challenges of social innovation measurement; 2013.
10. Glänzel G et al. Report on the feasibility and opportunities of using various instruments for capitalising social innovators-deliverable 4.3 of the project: The theoretical, empirical and policy foundations for building social innovation in Europe (TEPSIE). *European Commission–7th Framework Programme*; 2013.
11. Oganisjana K et al. Barriers to social innovation and ways of overcoming them in Latvia. *Journal of Systemics, Cybernetics and Informatics*. 2017; 15(5):33-38.
12. Dobele L. Factors which influence the development of social innovation in Latvia. *Proceedings of the 2015 International Conference. Economic Science for Rural Development*; 2015.
13. Mendes A. Framework programme, Barriers to Social Innovation. A deliverable of the project: The theoretical, empirical and policy foundations for building social innovation in Europe (TEPSIE), Brussels: *European Commission, DG Research and Innovation*; 2012.
14. Hubert A. Empowering people, driving change: Social Innovation in the European Union. Luxembourg: *Publications Office of the European Union*; 2011.
15. Rodríguez Herrera A, Alvarado H. Claves de la innovación social en América Latina y el Caribe, *Cepal*; 2008.
16. Alcaide Lozano V, Moliner LA, Murillo D, Buckland H. Understanding the effects of social capital on social innovation ecosystems in Latin America through the lens of Social Network Approach. *International Review of Sociology*. 2019;29 (1):1-35.
17. Dufour S et al. Facilitators and barriers to implementation of the AIDES initiative, a social innovation for participative assessment of children in need and for coordination of services. *Evaluation and program planning*. 2014;47 :64-70.
18. Blanco ER et al. Innovar para el cambio social, Barcelona: *Instituto de Innovación ADE Universidad Ramón Llull, PWC*; 2012.
19. GoN [Government of Nepal]. *Agriculture development strategy, 2015–2035*. Kathmandu: *Ministry of Agricultural Development*; 2015.
20. McDermott J, de Brauw A. National food systems: Inclusive transformation for healthier diets. *2020*;54–65.

21. Bock B. Social innovation and sustainability; how to disentangle the buzzword and its application in the field of agriculture and rural development. *Studies in Agricultural Economics*. 2012;114(2): 57–63.
Available:<https://doi.org/10.7896/j.1209>
22. Shaw DJ, Shaw DJ. World food summit, 1996. *World Food Security*. 2007;347–360.
Available:https://doi.org/10.1057/9780230589780_35
23. Guthman J, Morris AW, Allen P. Squaring farm security and food security in two types of alternative food institutions. *Rural Sociology*. 2006;71(4):662–684.
Available:<https://doi.org/10.1526/003601106781262034>
24. Story M, Hamm MW, Wallinga D. Food systems and public health: Linkages to achieve healthier diets and healthier communities. *Journal of Hunger and Environmental Nutrition*. 2009;4(3–4):219–224.
Available:<https://doi.org/10.1080/19320240903351463>
25. Lang T. Reshaping the food system for ecological public health. *Journal of Hunger and Environmental Nutrition*. 2009;4(3–4):315–335.
Available:<https://doi.org/10.1080/19320240903321227>
26. Beall J, Piron LH. DFID social exclusion review. The London school of economics and political science & overseas development institute, January. 2005; 71.
Available:<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2301.pdf>
27. Eames, M. Sustainable development and social inclusion. SDRN Network. 2002; 66.
28. Deci EL, Ryan RM. The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*. 2000;11(4):227–268.
Available:https://doi.org/10.1207/S15327965PLI1104_01
29. Deci EL. Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*. 1971;18(1):105–115.
Available:<https://doi.org/10.1037/h0030644>
30. Deci EL, Ryan RM. Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology*. 2008;49(3): 182–185.
Available:<https://doi.org/10.1037/a0012801>
31. D’Ailly H, Blokhuis JC. Book review: Richard M. Ryan and Edward L. Deci, *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness. Theory and Research in Education*. 2018;16(3):378–381.
Available:<https://doi.org/10.1177/1477878518807841>
32. Deci EL, Ryan RM. Facilitating optimal motivation and psychological well-being across life’s domains. *Canadian Psychology*. 2008;49(1):14–23.
Available:<https://doi.org/10.1037/0708-5591.49.1.14>
33. Sheldon KM, Gunz A. Psychological needs as basic motives, not just experiential requirements. *Journal of Personality*. 2009; 77(5):1467–1492.
Available:<https://doi.org/10.1111/j.1467-6494.2009.00589.x>
34. Deci EL, Eghrari H, Patrick BC, Leone DR. Faculting Internalization: The self-determination theory perspective. *Journal of Personality*. 1994;62:119–142.
35. Deci EL, Ryan RM. Facilitating optimal motivation and psychological well-being across life’s domains. *Canadian Psychology*. 2008;49(1):14–23.
Available:<https://doi.org/10.1037/0708-5591.49.1.14>
36. Gagné M, Deci EL. Self-determination theory and work motivation. *Journal of Organizational Behavior*. 2005;26(4): 331-62.
Available:10.1002@Job.322.Pdf
37. Deci EL, Ryan RM. Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In *The Oxford Handbook of Human Motivation* (Issue April 2018); 2012.
Available:<https://doi.org/10.1093/oxfordhb/9780195399820.013.0006>
38. Ryan RM, Huta, V., Deci, E. L. Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*. 2008;9(1):139–170.
Available:<https://doi.org/10.1007/s10902-006-9023-4>
39. Burton KD, Lydon JE, D’Alessandro DU, Koestner R. The differential effects of intrinsic and identified motivation on well-being and performance: prospective, experimental, and implicit approaches to self-determination theory. *Journal of*

- personality and social psychology. 2006; 91(4):750.
40. O'Rourke DJ, Smith RE, Smoll FL, Cumming SP. Parent-initiated motivational climate, self-esteem, and autonomous motivation in young athletes: Testing propositions from achievement goal and self-determination theories. *Child Development Research*. 2012;1–9. Available:<https://doi.org/10.1155/2012/393914>
 41. Ryan RM, Deci EL, Nix GA, Manly JB. Revitalization through self-regulation: The effects of autonomous and controlled motivation on happiness and vitality. *Journal of Experimental Social Psychology*. 1999;35:266–284.
 42. Rodríguez Herrera A, Alvarado H. Claves de la innovación social en América Latina y el Caribe. *Cepal*;2008 Available:https://repositorio.cepal.org/bitstream/handle/11362/2536/S0800540_es.pdf?sequence=1&isAllowed=y
 43. Devkota R, Pant LP, Hambly Odame H. et al. Rethinking gender mainstreaming in agricultural innovation policy in Nepal: a critical gender analysis. *Agric Hum Values*. 2022;39:1373–1390. Available:<https://doi.org/10.1007/s10460-022-10326-1>
 44. NPC. Nepal's Food systems Transformation: Context, Pathways and Actions. Outcomes of the National and Provincial Food Systems Dialogues as a part of the UN Food Systems Summit 2021. National Planning Commission, Singha Durbar, Kathmandu, Nepal; 2021.
 45. Subedi R, Karki M, Panday D. Food system and water–energy–biodiversity nexus in Nepal: A review. *Agronomy*. 2020;10(8):1129.
 46. Daum T. Mechanization and sustainable agri-food system transformation in the Global South. A review. *Agron. Sustain. Dev*. 2023;43(16). Available:<https://doi.org/10.1007/s13593-023-00868-x>
 47. International Food Policy Research Institute (IFPRI). Measuring changes in Nepal's agri-food system. *AgGDPplus Brief Nepal*. Washington, DC: International Food Policy Research Institute (IFPRI); 2023. Available:<https://doi.org/10.2499/p15738co1l2.136669>
 48. Prasad, Ghimire Rudra. Sectoral social entrepreneurship innovation opportunities in Nepal. *Business Inform*. 2020;11: 54–58. Available:<https://doi.org/10.32983/2222-4459-2020-11-54-58>
 49. Bhattarai SM, Dangol DR, Srivastav SB, Shrestha PK. Factors influencing local innovation in ecological agriculture in the central development region of Nepal. *Nepalese Journal of Agricultural Sciences*. 2015;13:69-84.
 50. Victoria Alomia-Hinojosa, Erika N. Speelman, Arun Thapa, Hsiang-En Wei, Andrew J. McDonald, Pablo Tiltonell, Jeroen CJ. Groot. Exploring farmer perceptions of agricultural innovations for maize-legume intensification in the mid-hills region of Nepal, *International Journal of Agricultural Sustainability*. 2018;16:1:74-93. DOI: 10.1080/14735903.2018.1423723
 51. Barrueto AK, Merz J, Kohler T, Hammer T. What prompts agricultural innovation in rural Nepal: A study using the example of macadamia and walnut trees as novel cash crops. *Agriculture*. 2018;8(2):21.
 52. Yadav SP, Lahutiya V, Ghimire N, Yadav B, Paudel P. Exploring innovation for sustainable agriculture: A systematic case study of permaculture in Nepal. *Heliyon*; 2023.

© 2023 Paudel et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/100697>