

A Pragmatic Methodology for Horizon Scanning of Social Innovations Linked to Inclusive Transformation of Food System: A Case of Chitwan District, Nepal

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(Received: June 6, 2024; Accepted: November 20, 2024)

ABSTRACT

A study on social innovation (SI) was done during January to December, 2023 in Chitwan district of Nepal. By reviewing existing measurement methods of SI, this study aimed to achieve clarity in conceptual understanding of social innovation at an individual level. Findings could lay the foundation for identifying social innovation at grassroots level based on actual attitude of farmers on social innovation. Under this context the main objective of this research was set to develop rational methodology for horizon scanning of social innovation at individual level. It consisted of two-step process namely; gathering of innovative activities from the study area and setting criteria for SI. Sixty (60) innovative activities were randomly explored with the discussion of the district and municipal officers of agriculture in the study area. From factor analysis; to refine the constructs in attitude scale of social innovators, thirteen items were excluded from the social innovation tendency scale due to their adverse impact on the factor structure, resulting in most determining selection criteria (11-item-scale). Based on 11 item scale; Half of the potential SIs (50%) exhibited the full characteristics of readiness towards challenges, solution and social value creation. Thus, the developed scale would be useful for selection in a specific area that meets minimum potential to become social innovation (SI).

Key words: social innovation, horizon scanning, attitude scales

INTRODUCTION

Social innovation is a field that's still new but gaining a lot of attention from people who do it, those who make policies, and researchers. More and more articles and studies are being done on this topic, showing how important it is. One reason it's getting a lot of attention is that it helps individuals and societies stay strong and solve their own problems. In Nepal not as much focus has been given to using social innovation to solve problems in agriculture compared to solving technical problems led by the governmental extension agencies. This issue about social innovation is not just important, but it is happening at the right time. There's a growing recognition among experts and policymakers regarding the pivotal role of ordinary people and their movements in reshaping society. These small-scale projects operate independently, not confined by larger systems' constraints. This freedom enables them to experiment with diverse approaches, ensuring inclusive and sustainable food system with community and individual control. Social innovation significantly contributes creating new pathways for change in agriculture (Figure 1). The objective behind adopting grassroots social innovations is to address diverse social issues experienced by residents in various localities (Pellicer-Sifres et al., 2017). These innovations encompass activities, services, and products that were previously absent in a specific area, offering an alternative to previous practices

within that realm. Their implementation is driven by the necessity to tackle local social problems (Zajda and Pasikowski, 2018).

Social innovation is recognized for its ability to elevate social entrepreneurship, a concept widely embraced within a community (Kumar, 2020). Social innovation involves devising tangible solutions for social and economic issues, aiming to genuinely impact the lives of individuals (Goldenberg, 2004b). It encompasses creating and implementing novel or enhanced strategies, services, processes, and products to tackle the challenges faced by people and communities (Goldenberg, 2004a; Tanimoto and Doi, 2007; Neamtan, 2003). Thus social innovation directly addresses current challenges, horizon scanning acts as a crucial precursor by identifying those potential challenges and solutions.

Horizon scanning encompasses collecting information from varied sources that offer different perspectives or ways of thinking. This process involves condensing this information to enhance comprehension of potential disruptions and potential solutions (Delaney, 2014). Broadly, common methods for sourcing information in public sector horizon scanning often involve desktop scanning, expert groups, and web-assisted horizon scanning. These approaches aim to facilitate the identification of pertinent items amidst a plethora of information (Delaney, 2014). The swift rise of innovation in science and technology poses a challenge for society. To address this, global adoption of horizon scanning is underway, aiming to identify, evaluate, and prioritize emerging innovations and

trends in their early stages. This empowers decision-makers with better information and readiness for upcoming changes. When executed properly, horizon scanning proves to be a versatile and potentially dependable tool, offering a wide array of methods (Hines et al., 2019).

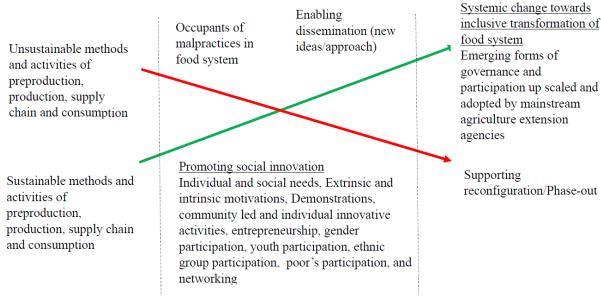


Fig. 1: Conceptualization of social innovation linked to inclusive transformation of food system in the study area (Source: author's estimation)

Within this context, the objectives of this study were set to explore the selection criteria for innovations that have potential to become social innovation regarding inclusive transformation of food system, and to develop measurement at the individual level to know how farmers perceive social innovation.

MATERIALS AND METHODS

A study of social innovation was done in Chitwan district of Bagmati province, Nepal during January to December, 2023 using face to face interview of farmers by using a checklist and standard set of questionnaires. The selected criteria to become social innovation were different dynamics of innovation through observation and innovator's responses. The method was designed to explore social innovations of Chitwan district that were contributing in inclusive transformation of food system. Desk study and literature review were done by using google scholar. Consultation with officials of Agriculture Knowledge Center (AKC) and Prime Minister Agriculture Modernization Project (PMAMP) unit and with municipal officials was carried out to make an initial idea of the presence of entrepreneurs and innovations in the district. With the discussion, horizon scanning method was identified to explore social innovations in the district. Horizon scanning is a method used to systematically identify early

indicators of potentially significant advancements (European Commission, Directorate General for Research and Innovation, 2015). Horizon scanning encompasses both extensive and targeted information searches within a specific field, shaped by the goals of a particular task. It aims to identify elements expected to remain constant, those susceptible to change, and those perpetually evolving within a selected time frame. Horizon scanning is a methodical endeavor aimed at identifying and analyzing nascent "game changers" in their early stages, foreseeing their potential substantial impact on both society and policy (ESPAS, 2023). Horizon scanning is therefore not about predicting the future, but focused on the early detection of weak signals as indicators of potential change or establishments.

For horizon scanning of social innovation, two steps were performed:

- a) Gathering of innovative activities
- b) Setting the criteria for social innovation

a) Gathering of innovative activities

Sixty (60) innovative activities were randomly identified in Chitwan district. Recognizing agri-entrepreneurs, or farmer participants in as the signals of innovative thinkers and likely social innovators, agriculture entrepreneurs and farmer participants of technical innovations in groups or cooperatives from Chitwan district were selected from four major components of food system namely preproduction, production, supply chain, and consumption. First of all, comprehensive information was provided to all the explored respondents (60). Horizon Scanning frequently relies on desk research, aiding in crafting a comprehensive overview of the topics under scrutiny. It can also involve small expert groups, comprising individuals at the forefront of the relevant field, exchanging perspectives and expertise. A specific set of criteria guides the search and/or filtration process (Cuhls et al., 2015). It was considered that explored innovation had potential to become social innovation and that could represent Chitwan district as perceived by researcher and agriculture officers of Chitwan district using information sources and filtration criteria (Table 1).

Table 1. Information sources and filtration criteria used in horizon scanning, Chitwan, Nepal

Information sources (signal detection)	Filtration criteria used to discard irrelevant signals
Literature review	Potential impact of social innovation for inclusive transformation of food system
Field visit	Expert participation for knowing strength and coverage of social innovation
Government officers (interview)	Novelty in solving farmer's social needs
Meetings with entrepreneurs	Evidences observed in the study area
Grey literature (analysis and interpretations)	Stage of development
Observation	Ethical and social issues
Key informants interview in the villages	Peer review

b) Setting the criteria for social innovation

The Likert scale was developed by following an extensive review of literature.

Users adapt and evolve the indicators for social innovation based on their needs (Gault, 2011). Advancing through the three tiers of social innovation measurement, delineated from the least to the most advanced, demonstrates the interlinkage among our analytical levels. These tiers involved factors representing (1) awareness to act, (2) intention to act, and (3) ability to act, all interconnected (Kleverbeck et al., 2019). A three-factor structure was identified within the inventory of attitudes towards social innovation. This inventory exhibited satisfactory psychometric properties in terms of factor validity, internal consistency across each subscale, and stability of test scores over time (Pasikowski and Zajda, 2018).

Drawing from various definitions and ideas, a 24-

question attitude scale was developed. This scale was crafted with input from a panel of knowledgeable experts in sociology, economics and public policy representing university, Agriculture Knowledge Center (AKC) and municipalities. Questionnaire was composed of two parts: (1) demographic characteristics, and (2) Likert type social innovation scale. In this agreement type, 5 (Strongly Agree), 4 (Agree), 3 (Neither Disagree nor Agree), 2 (Disagree), and 1 (Strongly Disagree), with negative items reverse-coded; was utilized to measure agreement levels with a statement in questionnaire. To achieve the highest possible response rate, every aspect highlighted in the literature was considered. The attitude score when calculated for every respondent, the respondents were categorized into four equal levels. As the research demands criteria to select potential social innovation be strong enough to explain its characteristics fully, only high-level score was considered for criteria to accept the particular social innovations in the district (Table 2).

Table 2. Measurement of criteria to become potential Social Innovation

S.N.	Level	Scores	Criteria Option
1.	Lowest level	<0.25	Rejected
2.	Low level	0.25 ≤ to 0.5	Rejected
3.	Medium level	0.50 < to < 0.75	Rejected
4.	High level	0.75 ≤	Accepted

Information collection was done in a month period. The collected data were analyzed by using the SPSS 20 software package. Factor analysis was done. Given that the concept spans individual and social aspects beyond innovation and entrepreneurship; experts from university, AKC and extension officer of municipalities were consulted for content validity, ensuring the appropriateness of the measure and evaluating the sufficiency of the number of items.

RESULTS AND DISCUSSION

What Sets Apart Social Innovation? In many cases, well-established methods and measures had been relied. In Nepalese context, social innovation demands adaptations compared to other forms of innovation. Metrics for social innovation needs modifying to suit its distinct features and the challenge of accurately capturing its essence. To do this effectively, characteristics of social innovation were highlighted on set of statements to qualify for becoming social innovation. Table 3 demonstrates how social innovation related statements designed to cater to these specific criteria based on innovator's attitudes.

Factor loadings were examined to know the expected relationships between latent and observed variables. For factor analysis, number of factors was determined by eigenvalue of one or higher. To refine unidimensionality, varimax rotation was employed, aiming to consolidate factors into one. Hair et al. (1998) provided rule of thumb for evaluating the practical importance of standardized factor loadings 0.75 for small sample size (n = 50). Factor loadings of 0.75 or higher were deemed acceptable, serving as our threshold. Factor analyses were repeated, removing items with loadings below 0.75.

In varimax rotation analysis, a multidimensional construct consisting of seven factors related to social innovation tendency was revealed. These seven factors collectively account for 66.21% of the overall variance. Such a high percentage of explained variance in this multifaceted construct signifies its robust measurement. To refine the construct, thirteen items were excluded from the social innovation tendency scale due to their adverse impact on the factor structure, resulting in an 11-item-scale.

Table 3. Statements related to social innovation criteria adapted from (Bulut et al., 2013)

Statements related to social innovator's attitude	Factor loadings
1. I am interested in social issues related to inclusive transformation of food system.	0.775*
2. I strive to enhance the standard of human welfare.	0.612
3. I look for solutions to bring about political and social changes in society.	0.711
4. I think the initial step towards inclusive transformation of agri-food system is changing people's mindset.	0.786*
5. I want to develop new techniques in agriculture to increase the innovative capacity of the community.	0.885*
6. I aim to enhance community life by creating better social services and innovative products.	0.662
7. I'm interested in using new technologies to address social needs and solve problems	0.928*
8. I actively seek ways to boost social participation and cooperation within society.	0.414
9. I generate new ideas aimed at creating social value and enhancing society's effectiveness.	0.879*
10. I think technological innovations alone aren't enough to improve living standards; we also need social, human, and organizational development.	0.888*
11. I believe I have the potential to bring about improvements in social areas like education, health, environment, arts, economics, and more.	0.770*
12. I believe that social innovations play a crucial role in building sustainable and healthy economies in the long term.	0.792*
13. I actively seek opportunities to challenge and transform social norms and rules.	0.712
14. I aim to contribute to the community without expecting any financial gain, simply to be of help..	0.722
15. I identify societal issues and seek suitable solutions to bring about systemic change.	0.785*
16. I consistently pursue opportunities by maximizing the resources available to me.	0.633
17. I feel a responsibility to take action on social issues.	0.621
18. I prioritize making a difference in society over individual success.	0.339
19. I enjoy discussing social issues with people, starting with those in my immediate circle	0.513
20. I actively engage in various social groups, including non-profit organizations, foundations, and politics.	0.662
21. I prefer to make a social change/creating a social value over innovations focused on trade or financial gains.	0.811*
22. I rely on empathy to support and help people.	0.755*
23. I don't think I can solve societal problems on my own. (-)	0.512
24. I don't feel responsible for addressing social problems. (-)	0.412

(Note: *indicates the loadings greater than 0.750 as cut off value, (-) indicates the negative statements)

Upon further analysis, a unidimensional factor construct emerged, explaining 61.011% of the total variance. This emphasizes the significance of the key factors, item variance, and overall scale variance in capturing the majority of the variance, consequently reinforcing the construct's validity. The reliability of the measurement instrument, vital for consistency, was assessed through the alpha coefficient (Cronbach's α). Typically, a value of 0.70 or higher is

considered reliable (Nunnally, 1978). Alpha value of 0.896 is quite satisfactory considering the criteria of above 0.70 (for items shown in Table 4). Table 4 provides a detailed overview of the varimax rotation outcomes from the principal components analysis, presenting the items constituting the final scale.

Table 4. Factor loadings of final scale developed for social innovation criteria

Statements related to social innovator's attitude	Factor loadings
1. I am interested in social issues related to inclusive transformation of food system.	0.775
4. I think the initial step towards inclusive transformation of agri-food system is changing people's mindset.	0.786
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10. I think technological innovations alone aren't enough to improve living standards; we also need social, human, and organizational development.	0.888
11. I believe I have the potential to bring about improvements in social areas like education, health, environment, arts, economics, and more.	0.770

12. I believe that social innovations play a crucial role in building sustainable and healthy economies in the long term.	0.792
15. I identify societal issues and seek suitable solutions to bring about systemic change.	0.785
21. I prefer to make a social change/creating a social value over innovations focused on trade or financial gains.	0.811
22. I rely on empathy to support and help people.	0.755

The distribution of social innovation was across all the components of food system. Majority of the SIs (60%) were from production components whereas consumption component covered the lowest (10%). This result indicated that all the SIs across different components were not evenly distributed. Production

related SIs dominated other components within the food system (Table 5).

Table 5. Distribution of social innovations based on food system components

Food System Components	Frequency
Preproduction	8
Production	36
Supply-chain	10
Consumption	6
Total	N=60

As mentioned in Table-5, all sixty (60) SIs distributed among all the components of food system was analyzed with eleven (11) item scale developed. As a result, among fifty innovative activities explored with

the help of officers of municipality and AKC; only thirty (30) SIs full-filled the criteria and were eligible to be included for the study (Table 6).

Table 6. Number of Social Innovations with different level of attitude scores

S.N.Level	Scores	Criteria Option	Number of SIs
1. Lowest level	<0.25	Rejected	6
2. Low level	$0.25 \leq$ to 0.5	Rejected	16
3. Medium level	$0.50 <$ to < 0.75	Rejected	8
4. High level	$0.75 \leq$	Accepted	30

Attitude theory asserts that the evaluative component within an attitude significantly influences its formation (Bohner and Wanke, 2002; Chaiken and Stangor, 1987; Fazio, 2007). This facet is linked to emotional significance attached to the attitude object and its retention in memory, retrievable through stimuli associated with past experiences. Consequently, some authors view attitude as an acquired and relatively enduring assessment of objects (Fazio, 2007). Attitude is demonstrated through both spatial and psychological proximity. A positive attitude is evident when an individual seeks proximity to the object, while a negative attitude is apparent when the individual avoids or creates distance from the object (Cacioppo et al., 1997; Valacher et al., 1994).

Social variables and contexts were assessed in techno-social interface of innovations to leverage special characters based on the challenges, responses towards challenge and social or economic or

environmental value created by innovative activities. Observation by researcher and innovator's response was recorded, rated and later categorized with individual score.

CONCLUSIONS

A method for selecting social innovations at the individual level was developed in this study. Developed method employed two steps horizon scanning of potential social innovations in the study area; gathering innovative activities and setting criteria. Findings revealed that particular way to detect the traits of social innovation were innovator's willingness and agreement with social innovation traits. Eleven traits of the social innovators were most determining selection criteria for the measurement of social innovation. Based on most determining selection criteria; Half of the potential SIs (50%) exhibited the full characteristics towards readiness towards challenges, solution and social value creation.

AUTHOR'S CONTRIBUTION AND

ACKNOWLEDGEMENTS:

This paper is the part of Ph.D. research work in the Department of Agricultural Extension and Rural Sociology at Institute of Agriculture and Animal Science, Tribhuvan University. First author is a Ph.D. Scholar and Co-authors are Ph.D. Supervisors.

I would like to express my sincere appreciation to university grants commission (UGC)-Nepal for their generous financial support of this research project. Their funding played a crucial role in the successful execution of this study and the attainment of our research goals.

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