

Academic Journal of Sukuna – AJoS, A Peer-reviewed Interdisciplinary Journal
Volume 6 (Issue 1), 2026 July, Pp. 81 – 110 ISSN 2594-3138 (Print)
Research Management Cell (RMC – Sukuna), Sundarharaincha, Morang

Fermenting Livelihoods: Exploring the Role of Millet Liquor Production in Rural Household Economies

Doi: <https://doi.org/10.3126/ajos.v6i1.98110>

Hom Bahadur Magar

Sukuna Multiple Campus

Sundarharaincha, Morang, Nepal

homthapa2@gmail.com

Abstract

Millet liquor (*kodo ko rakshi*) is a traditional household production process and an integral part of the traditions among rural people of Nepal which plays a significant role in their livelihood. But little study has focused on its total economic value, the gender of workers involved in its organization and intergenerational transfer of knowledge within rural household economies. The socioeconomic, cultural, gender and livelihood importance of millet liquor production in Kanepokhari Rural Municipality, Morang, Nepal has been studied. It is based on the descriptive analytical research design following method of qualitative techniques. The methodology involves a purposive sampling, Semi- structured, in-depth interview, participant observation, field notes of seven participants aged 38-52 years. The results indicated that the production of millet liquor provided 35% – 75% of the household income while supplying the food, education and healthcare needs, and other requirements of the household. Women were at the core of the brewing process, earning income, decision making and the passing down of indigenous knowledge. Capabilities to do with climate, communication inside the home, trust, and social networking within the community strengthened livelihood

Magar (2026). Fermenting Livelihoods: Exploring

resilience, while important limitations were high input prices, shortage of fuel, climate sensitivity during fermentation, and market and policy limitations. The study demonstrates that the production of “millet liquor” is an important rural livelihood system in the cultural context, and the need to regulate it with sensitivity to the local context, to establish producer cooperatives, to strengthen linkages with markets and to acknowledge women's economic and cultural value.

Keywords: Millet liquor, rural livelihoods, informal economy, feminist economics, Indigenous knowledge

Introduction

Rural households have a lot of different livelihood activities to deal with low pay, seasonal income, and economic uncertainty. In agriculture, the family combines farming, wage labour, livestock rearing, petty trade, and home-based production to meet daily requirements in villages. The Sustainable Livelihoods Approach is based on the use of human, social, natural, physical, and financial resources social and institutional contexts, as well as how people can use and make use of these resources in this way (Scoones, 1998; Bebbington, 1999). Small-scale household production can be a key factor for income diversification and rural economic sustainability.

Millet is related to the rural food system and the indigenous livelihood practices. Finger millet (*Eleusine coracana*), known locally as kodo, is widely used in Nepal for food and traditional beverages. The Food and Agriculture Organization (FAO, 2023) cites millet as a climate-resilient food source that could contribute to sustainable food security, smallholder livelihoods and local value addition. In some indigenous communities of Nepal, millet is distilled into kodo ko rakshi, a popular distilled liquor associated with festivals, rituals, marriage ceremonies, hospitality, and community meetings. So, millet liquor is cultural and economic.

Millet liquor production is also an important home-based business. In this research, millet liquor production is the small-scale household processing of millet into traditional alcoholic beverages for local consumption and exchange. The rural household economy consists of the income sources, labour, assets, social relations, and expenditure strategies families use to sustain their livelihoods. Because the production of traditional liquor is often carried out outside official business systems, it is part of the informal rural economy. Women frequently do home-based productive work that is rarely reported in formal employment statistics (Chant & Pedwell, 2008).

The Sustainable Livelihoods Approach provides a useful tool for understanding this activity. Scoones (1998) contends that rural households develop livelihood strategies by combining resources in response to vulnerability and changing economic circumstances to meet their needs. Bebbington (1999) also argues that livelihoods are not merely a source of income but also individual capabilities and participation in social and institutional life. These views suggest that millet liquor production can be not only alcohol production but also an income generation strategy in the home, and hence a way for the family to be able to make money and handle economic insecurity.

The study of traditional beverage production indicates that traditional beverage production may contribute to household income and financial participation in the lives of women. Kayodé et al (2011), in a study of the production of household sorghum beer in Benin, found that traditional beverages were found to have social and income-generating functions. In the same spirit, McCoy et al. (2013) identified alcohol production as an adaptive livelihood strategy for women farmers in Tanzania. Their study also pointed out the health and social effects of traditional alcohol production and the need for a careful study of economic benefits and wider threats.

In Nepal, Rajbanshi A (2005) investigated the livelihoods of women who made homemade chhyang and raksi and pointed out the economic benefits of traditional
Magar (2026). Fermenting Livelihoods: Exploring

beverage production. Shrestha (2021) also explored traditional alcohol making as a source of sustainable rural livelihood and found both job prospects and institutional challenges. But there is another prominent stream of Nepalese research which focuses mainly on the types, ingredients, and ethanol content of homebrewed alcoholic beverages (Thapa et al., 2015). While these studies are important from a public health perspective, they do not have much to do with household economic relationships for traditional liquor production.

Although millet has gained a lot of attention as a climate-resilient and economically crucial crop, studies have often focused on cultivation, nutrition, food security, and formal farming value chains. Little is known about how rural communities turn millet into culturally relevant products such as traditional liquor and use it to supplement their income. Other studies have also discussed women's involvement and the chance of homemade alcohol being a source of income, yet few studies have combined household income and livelihood diversification, gendered labor, indigenous knowledge, and institutional challenges in Nepal.

In addition, it is not known how millet liquor production income impacts food expenditure, education of children, health, and home economy. Previous research did not focus on the role of who oversees production, income, and how technical knowledge flows between generations. In addition, rural producers with the challenges experienced by market access, regulatory uncertainty, ecological constraints, and changing social attitudes are not well-studied. The situation is particularly acute in Kanepokhari Rural Municipality in Morang District, where indigenous communities have always made millet liquor as part of their traditional culture and economy.

Therefore, this study looks at millet liquor production as a culturally embedded, gendered, and informal rural livelihood activity. The purpose of this study is to understand the socioeconomic and cultural nature of millet liquor production in rural

Magar (2026). *Fermenting Livelihoods: Exploring*

household economies and its impacts on household income and livelihood diversification. This research also investigates labour and economic decision making in the gender perspective, indigenous and intergenerational knowledge and market, environmental and institutional and regulatory problems faced by producing households.

The study answers four research questions: What is the contribution of millet liquor production to household income, livelihood diversification and economic security? What are the gender divisions of production responsibilities, income control and household decision making? How does indigenous knowledge and knowledge from elders contribute to the sustainability of millet liquor production? Which market, environmental, institutional and oversight problems do households encounter in this activity?

This research adds to rural livelihood research by examining an informal economic activity that is not adequately explored in the mainstream rural development literature. It connects the Sustainable Livelihoods Approach to a culturally embedded form of household production and focuses on women's labour, indigenous knowledge, and informal economic participation. The investigation provides context-specific evidence from Kanepokhari Rural Municipality and is an addition to the limited Nepalese scholarship on traditional millet liquor as a livelihood activity. Traditional beverages such as rakshi in Nepal, tella in Ethiopia, handia in India, and chang'aa in Kenya demonstrate how craft beverages can make a shift from commerce to cultural articulation and social unity (Huang et al., 2020; Sangappa et al., 2023). They may work alongside livelihood to assist families in dealing with social and economic adversity (Yadav et al., 2024; Tiwari et al., 2022).

The research has been conducted on millet in the literature due to its adaptability and versatility. However, the emphasis on cereals, such as maize and rice, has been Magar (2026). Fermenting Livelihoods: Exploring

decreasing the interest in millet and traditional farming systems relevant to agrobiodiversity and food security (Abid et al., 2024; Kalpana et al., 2024). Gender also plays an important role in the production and processing of millets. Women are frequently involved in processing and selling millet products such as kodo ko rakshi, and their labor is still undervalued and under-celebrated (Rawat et al., 2021). This intersection of gender, agriculture and culture indicates the necessity for policy responses in which women are recognized for their role in the welfare of families and socio-economic development (Peine, 2023; Otieno et al., 2022).

Traditional fermentation practices also reflect cultural and social resilience (Douyon et al., 2022; Jackson et al., 2024). Households might derive a significant part of their income from small-scale alcohol production, and reciprocity during rituals and ceremonies can help to preserve social relationships and communal cohesion (Miller et al., 2023). Craft liquor production can be seasonally volatile, and market entry is often limited by economic and legal barriers (Kaphle et al., 2022; Gao et al., 2022; Pathak et al., 2023).

Gender and the informal economy of alcohol show gendered opportunities for economic empowerment and also social powerlessness. Informal liquor production can generate income and give women more agency and autonomy in the decision-making of household business and the life of their household, yet this work is not well considered in the formal social, legal, and economic framework (Wang et al., 2021; Abid et al., 2024). So, producers are vulnerable to health, economic, and regulatory failure. In addition, recent research has shown that informality should not be seen only as evidence of poor economic performance or lack of regulation but rather as an informal system that helps rural communities' buffer against economic threats in places where the formal world is weak (Frosch, 2024; Xheneti & Madden, 2024).

The impact of rural artisans with respect to regulation of alcohol manufacturing is quite complex taxation and authorizations, along with licensing and prohibition, market entry barriers and loss of activities licenses and case studies (Frosch, 2024) Health of the general public and local customs is a delicate matter and therefore regulation lacks focus and is only a cursory response towards the prevailing social and the even more complicated economic realities (Laudien et al, 2022, Frosch, 2024).

Although substantial literature exists on millet and artisanal liquor production, notable gaps continue. Most rural economy research is conducted by urban-based academics, which can distance them from direct engagement (Huang et al., 2020). Little research examines the income potential of liquor production over time, especially from a female perspective (Laudien et al., 2022). A few studies also link economic impact to millet processes, such as sewing, drying, and storage. This spotlights the requirement for thorough research on the millet value chain. An evident lack of in-depth studies on class, caste, and youth agency in millet and liquor production is also evident. This weakens the analysis of the rural socioeconomic dynamics of millet liquor production.

The study “Fermenting Livelihoods” aims to fill these gaps by exploring the socio-economic and gender relations of millet liquor production in Nepal. It will highlight the economic value of kodo ko rakshi and the contributions of women to the brewing process, as well as the sociolegal structures that the producers navigate. Ultimately, the study intends to demonstrate the significance of millet liquor production and expand the understanding of its capacity to boost rural economies.

The Sustainable Livelihoods Approach (SLA), Feminist Economics, Native Knowledge Systems, and the informal economy perspectives that are employed in this study are integrated. The SLA describes how rural households depend on human, financial, natural, physical, and social resources to sustain livelihoods and respond to vulnerability (Scoones, 1998; Bebbington, 1999). From this perspective, millet liquor Magar (2026). Fermenting Livelihoods: Exploring

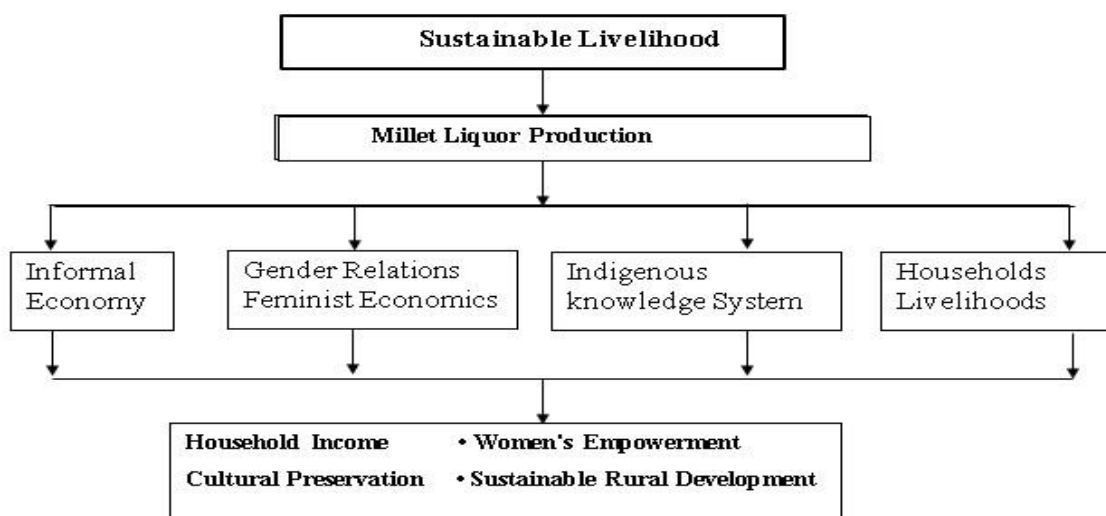
production can be seen as a livelihood diversification strategy that utilizes local resources, family labour and community networks to build income for the family and strengthen household resilience. Feminist Economics additionally underscores the often-under-seen contribution of women to household and informal economic activities such as unpaid labour, home-based production, and care work (Nussbaum, 2011; Hesse-Biber, 2013). This is a perspective that allows for a better understanding of women's roles in millet liquor production, income generation and household decision-making.

Native Knowledge Systems explain how traditional brewing knowledge, local fermentation techniques, and culturally embedded production practices are developed and transmitted from generation to generation (Tamang, 2022). The informal economy perspective provides insights into the production process of millet liquor, practically outside of the formal regulatory and statistical frameworks, where community cooperation, trust, reciprocity and networks play a significant role. The conceptual frameworks collectively developed, provide a broad picture of the millet liquor industry as a rural livelihood system, which is dependent on household incomes, gendered livelihoods, transfer of local knowledge, community engagement and policy concerns in rural Nepal.

In this research we have linked the Sustainable Livelihoods Approach (SLA), Feminist Economics, Local Knowledge Systems and the Informal Economy with the concept of framework to understand the socio-economic importance of production of millet liquor in rural Nepal. The framework emphasizes on the production of millet liquor as a multi-dimensional livelihood approach that provides livelihood income and generates indigenous cultural knowledge, women's economic participation and an informal institutional structure.

Figure 1

Integrated Conceptual Framework of Millet Liquor Production and Sustainable Rural Livelihoods



Methods and Materials

This study employed a descriptive and qualitative research design to understand the socio-cultural and socio-economic importance of Kodo Ko Rakshi (millet production). The qualitative approach was chosen to investigate the lives, practices, and livelihood strategies of the inhabitants, and the meanings they attach to their daily activities, as well as to provide a greater understanding of their livelihoods (Creswell & Poth, 2016).

The sampling method used in this study was purposive sampling, a non-probability sampling method used in qualitative research to identify knowledge-rich and experienced participants. Seven people with at least 5 years of experience in producing Kodo Ko Rakshi from Wards 4 and 6 of Kanepokhari Rural Municipality were included in the sample. They include producers, sellers, elderly people, and local knowledge of the production process. The eligibility criteria were to (i) have at least five years of

Magar (2026). Fermenting Livelihoods: Exploring

experience in millet liquor production or marketing, (ii) live in the region of study, and (iii) be willing to participate voluntarily in the study. The sample size was chosen by considering the concept of data saturation, which states that there would be no new data collected through further interviewing (Palinkas et al., 2015). The sample included males and females with different household structure, occupation and experience in liquor production by men and women in the millet industry. Some were household producers and others were local sellers, and their age ranged from 38 to 52 years. In addition, there were also experts and elders in the traditional brewing methods who were well-known in the community.

Semi-structured, in-depth interviews in the Nepali language were carried out to collect the data. Interviews lasted about 35–50 minutes and mainly discussed production practices, cultural meaning, economic role, gender roles, and challenges of Kodo Ko Rakshi production. An interview guide with open-ended questions was designed to provide a common template of open-ended questions and allow the participants to be able to discuss their experiences and perspectives. Follow-up probing questions were asked when clarification as well as additional information was needed. Interviews were audio-recorded, transcribed verbatim, and translated into English with the consent of participants. Fieldwork was conducted over a period of two months, from August to September 2025. During this time, repeated visits to participants' homes were made to see brewing activities and establish rapport with participants, which increased the credibility of the collected data.

Thematic analysis with the help of the software ATLAS. Friese (2019) was used to analyze the gathered data. Analysis included the repeated reading of transcripts, coding of meaningful statements, and identification of themes. Themes emerged from the narratives of the participants and were linked with the study objectives for gaining a

comprehensive understanding of the socio-cultural and socio-economic significance of the production of Kodo ko Rakshi.

In order to provide trustworthy findings, the qualitative quality of the study was established (Lincoln & Guba, 1985). To achieve credibility, long-term interaction with participants, triangulation of interview data with field observations and field notes, and member checks were conducted to identify what was being said in the interviews. Data collection and analysis records were documented clearly to be more reliable. Confirmability was built on reflexive notetaking as well as an audit trail that was maintained throughout the research. Transferability was achieved through providing detailed descriptions of the study setting, participants, and research procedure so that readers can assess how relevant the findings are for a similar situation.

Results and Discussion

The findings fall into five major themes which include demographic and household characteristics of the respondents; millet liquor production; their economic contributions and earnings; their labour organization and problems and future possibilities. These findings can be related to the themes of traditional production, economic needs of the households, gender relations, generational knowledge and community ties in the rural livelihood systems.

Respondents' Household and Demographic Features

The age range of participants was 38-52 years and they were actively engaged in supporting their families. Male and female producers were involved in the study and this indicates the gendered but inclusive nature of millet liquor production. Men were more likely to be located in joint family systems, while women, especially widows and women headed households, were more likely to have primary control over household economic activities.

The size of a nuclear household was typically three to four people and the size of a joint household was often six or more, covering several generations. Within a joint family, the family members worked together in the production process and also shared the earnings for household expenses, education of children etc. In contrast, women who headed small families and were widows were likely to have multiple roles of head of household and breadwinner.

The majority of the participants had finished primary or secondary school and some up to 12th grade. There was a higher likelihood of college/University education for the children of the participants. Proceeds from millet liquor making were often used to send children to school, signifying a family investment. Producers depended more on practical intergenerational knowledge than formal education to brew and these earnings allowed for higher levels of education for children.

The participants ranged from 8 to over 20 years' experience in millet liquor production. The length of this engagement was due to its economic and cultural significance. One participant explained: *I have been making rakshi for over 15 years; now my husband passed away, this is how I support my kids in their schooling.*

(Participant 3)

Millet liquor making was the main or only livelihood and source of income for some female headed and widowed households. Other participants engaged in both production and subsistence farming and/or vegetable farming or other farming activities, which resulted in more diversified family livelihoods.

Millet liquor revenue was used for food security, household consumption and education of children. In joint households pooled production income was beneficial for covering key expenses. Women's involvement in production was correlated with economic autonomy and decision-making in female-headed households. The participants also saw the production of millet liquor as cultural heritage passed down

from generation to generation. Community pride and a sense of cultural tradition remained with continued cultivation and production.

These results are consistent with the theory of SLA, which views households in the rural setting as formulating their livelihoods through combinations of assets and activities rather than having one livelihood strategy (Scoones, 1998; Bebbington, 1999). The situation in relation to female-headed households underscores the importance of Feminist Economics where economic activity at home may have an economic value even if it does not appear in the labor market figures.

Millet Liquor Production Practices

Practices of millets liquor production differed at household level regarding equipment, scale, and fermentation process. But producers used to integrate the two; that is, stability of culture and adaptability of practices. The traditional methods of preparation involved hot and cold water soaking of millet followed by cooking of millet till it burst; and adding *marcha*, local herbal starter which contains herbs and microorganisms that are used for fermentation. Information on adequate *marcha*, fermentation time, odor and nature of the product was often shared within families. As Participant 1 stated:

“Particularly with the *marcha*, which we still use at home; my mother showed me how much to mix up and when to smell.

It was stored in clay pots or drums and the mixture fermented for 15 days to three weeks. Those who continued to do so found importance in being genuine and connected to rituals, festivals and a body of inherited knowledge.

Respondents indicated a traditional distillation configuration with 3 vessels or layers. The base thick fermented millet, called *Foshi*, was fermented in the bottom layer. The middle layer, *Paini*, was a semi-liquid. The “steam and condensation chamber” (upper vessel – Baata) was used to cool the alcohol and condense the vapor.

Magar (2026). Fermenting Livelihoods: Exploring

This technology developed as a productive one and became culturally transmitted practice. Its use is one of the best examples of the transmission of technological information

Meanwhile, some households switched to blending production techniques to address increased efficiency, hygiene, storage capacity and/or production scale. Clay pots were replaced by plastic or large fermentation containers in some homes owing to their easier maintenance. Others used modern grinders, plastic sieves, and improved temperature regulation techniques. Due to scarcity of firewood and instability, LPG gas is increasingly being used for boiling.

“It was only clay pots and firewood before but as Participant 4 said, it is the same use gas for earlier they only used clay pots and firewood.

Some sources indicated production levels of between 50 and 100 litres per month, others mentioned production volumes in excess of 400–/–500 litres per year. Liquor was being distilled by small producers for their own consumption and for limited local market; large producers were distilling liquor for traders, events and community meetings. During weddings, festivals and winter months, production got increased due to increased demand. It included earthen vessels, traditional sieves and grinders as well as modern processing equipment and plastic fermentation containers.

Those producers who improved machines highlighted better storage, better hygiene conditions, more efficiency in labour use and less spoilage. Traditional clay pots and charcoal or firewood heating was appreciated by those who still use them while enjoying eating food of different taste and cultural uniqueness. The results thus show a spectrum of the high level of traditional production to a semi-modern level of production. Household resources and market objectives influenced the choice of methods.

The mix of traditional and modern technological elements should not be regarded as the end result of indigenous production being superseded. In its place, people picked and chose modern machinery, while clinging on to traditional knowledge on fermentation and distillation. This flexibility of continuity is made meaningful by Native Knowledge Systems: traditional knowledge is reproduced amongst generations, but also has the capacity to adapt to changing material and economic conditions (Tamang, 2022).

Economic Aspect and Income Generation

Household economic security was very closely related to the production of millet liquor. Few, if any, of the respondents were willing to accept the notion of production as a "sideline" activity. Instead, it was considered as an activity carried out from the household center and the income was at about 35-75% of the household income. Participant 2 highlighted, *“This rakshi is not additional work, this is our main income, otherwise there is no provision of living here.”*

Income from liquor money was found to be a bigger source of income as compared to income through agriculture and wage employment and this income was used to buy food, pay school fees, health expenditure and household expenditure, especially in a drought when the income through farm goes down. This means that income produced was a stable source of income, and provided a way of managing the seasonality risk.

The relative prices in the local market have a significant feature of stability. The respondents indicated the higher input cost had been price reflected for quite some time of about 2 years or more at the price of NPR150 per litre. So local production costs were not necessarily the only factor that determined local pricing, as a relationship and community market use also influenced the pricing. The conditions of long-term

production and consumption seemed to help in continuation of pricing and market confidence building.

There were differences between participants in sales networks. The producers, some of whom were compelled to sell their produce to their friends and relatives in the same village or locality, produced sold them to traders, hotels, outlets and restaurants. Some producers were able to liaise directly with hotels or retailers and curb the reliance on intermediaries and gain the control in the distribution process. Additionally, producers changed product units -- for instance, "litres" to the larger group and/or institutional group and "sheets" to the household.

About 40% - 45% add-on production costs were reported for raw materials, such as millet. Other costs that were incurred were packaging, electric costs and moving. Despite all these costs participants indicated profit margins that enable them to cover the basic costs of household. When not on the farm it was nice to have a year-round income earner. The findings herein suggest that this share of 35%–75% of household income is not just the fringe informal livelihood of liquor production by millets. A pragmatic livelihood mode which underlies SLA approach, and involves inhabitants or households' use of local knowledge, family labour, their social network, property of production to manage vulnerability. Another piece of evidence that suggests the relation between home production and well-being of the family is income spent on food and education.

The conclusions are also contradictions to the idea that all informal economic relations are necessarily relations of impersonal exchange of market. Local markets operated due to stable customer relations, trust of the community as well as frequent exchange. This is in line with studies showing the importance of social capital and community relations within informal economies. In the absence of formal institutional and market structures, social relationships can offer a range of protection and continuity.

Magar (2026). Fermenting Livelihoods: Exploring

Stable prices, however, also imposed pressures at those raw-material cost increases. Current circumstances of production costs indicate that selling NPR 150 per litre of water while maintaining those prices might jeopardise customer relationship while at the same time it may slacken producer margins. So, social stability in local markets, provides at the same time both on the one hand, a social place of strength and on the other, economic constraints.

Labor and Social Organization

The production of millet liquor involved much household group labour and cooperation. Typically, each origin centered on the familiar area in which family members engaged in various tasks involved in the production and processing of raw material, in fermentation, in distillation, and in packing and sale of the goods. There was at times some difference in the way labour was distinguished, based on sex, age, physical capacity and experience. Sometimes, the role of preparing the brew and service was left to females and more difficult chores like grain grinding, boat lifting or trips to the markets were undertaken by men. Other homes were more adaptable and cooperative in sharing the responsibilities. Evidently these differences indicate that there was no uniform and fixed technique of working, nor was there any uniform and fixed technique for all types of working. Here is one woman's example of a division of labor at home: *"I take care of the brewing, cleaning, and let the man lift the pots."* (Participant 5)

In another home the husband did much work and took care of the customers, a younger brother-in-law helped to grind and package the product and the daughters helped during the school holidays. The entire family was sometimes employed in these sorts of set-ups. By collaborating, other people were able to expand their contact with others across generations and share with them technical expertise.

Sometimes the producers didn't use permanent workers, instead they used temporary workers for 1-2 months depending upon the situation of the festivals and marriages. Some other producers did the same regardless of the intensity of the season, among the process as a whole. Labour Organization was ranged from being completely withdrawn from the workforce to complete family integration, but at times also temporary workers. It was not only in the households that cooperation was limited. The producers discussed with each other the production processes and shared information concerning the production techniques; in some cases, the producers purchased raw materials from the farmers together so that they could obtain them by paying at a lower price. Material shortages and demand peaks were especially important occasions in which informal networks were important. Some cross over transactions with neighboring villagers with rice and maize, in terms of labour, liquor and/or money were reported. The practices tell us that there have been traditional, and even 'monetary' alternative ways of exchange that have existed together.

The social capital that underlies informal production is referred to as community coordination. Trust and support for each other allowed households to make use of the support in accessing and/or reordering resources. Social interactions and communities' networks can reinforce resilience to economic instability, as Putnam (1995) says. In the context of the millet liquor industries, these relationships were not distinct from economically-related activity, rather they were part of the production system.

Besides, the role of women is not just to contribute in the economic aspect, but also to preserve the cultural values, as can be seen in the outcomes. In most cases, the women traditionally carried out the main brewing process and women had greater participation in managing household activities and livelihoods in the participatory aspects of the brewing process. This confirms Feminist Economics argument that we have to give credit to the women's informal work and domestic work that contributes to

Magar (2026). Fermenting Livelihoods: Exploring

the welfare of the household, but is not represented in the formal economy (Nussbaum, 2011; Hesse-Biber, 2014).

Women's involvement in economic activities was not only income generation but also in other ways. This knowledge, breaking, supervising and organizing skills in household labour, farming and the transfer of skills lent them to the perception of being cultural bearers. The economic/cultural roles were thus associated with women's work. The findings reinforce the emphasis laid on the role of women in informal productive activity by Chant and Pedwell (2008) and show that the process of empowerment in terms of economic agency can be one that is rooted in the culture.

Overall, labour relations in the production of millet liquor was dynamic, rather than rigid. Household structure, economic needs, gender relations, and productive ability as well as level of production affected work allocation. The concept of reciprocity at the community level coupled with intra-household cooperation indicates social capital is not just an important source of livelihood but can also be a basis for a collective producer initiative.

Struggles and Prospects

Financial, environmental, market and institutional factors, however, hampered mill production of millet liquor. Common challenges mentioned were high inputs costs, particularly that of millet. In some cases, those producers who had no option of buying in bulk may have had to purchase the raw materials and whoever sold them they may have not priced them lower than retail. Another significant issue was the lack of fuel. Working would be more difficult in times of high production, since there is infrequent wood required for the traditional distillation process. Such limitations on forest utilization and problems with accessing firewood added to these pressures. To facilitate this, some households opted for 'LPG' gas, which too proved to be cost intensive.

Product quality was directly impacted by eco-variation as was fermentation. High temperature, extreme cold and heavy rainfall were reported to be interfering with fermentation, causing spoilage and/or causing production to be inconsistent. Participant 6 explained that it was easy to change *rakshi* during the summer, and took a long time to ferment in the winter.

Small household producers were especially vulnerable as they had no protected production and storage areas. Fermentation will be unstable at a high temperature, and longer at cooler times. The storage problem added to the risk of loss of products and due to the storage period, the shelf life was enhanced. The findings have implications for the possible livelihood threats to the farmers whose livelihoods depend heavily on the success of fermentation due to these ecological withers. Market access was another issue that was raised. A number of producers were not in direct contact with the larger buyers and were dependent on intermediaries resulting in less bargaining power, and less profit margin for them. Sales/deliveries appeared to be handled better by producers directly involved in the hotel/retail trade and traders (direct link) than by the other producers. Traders and producers with direct relation to the hotel/retail trade had some improvement in controlling their sales/deliveries compared to those not directly involved. This contrast indicates the importance of the market links in the economic scope of production of household.

The added vulnerability was a level of uncertainty in the regulatory framework. There was no recognition of millet liquor production among the participants, with some participants stating they feared that the authorities would 'punish' them for producing the liquor. Investors were not confident to invest in technology and/or business growth because of the uncertainty. Where legal and institutional impacts upon producers were ambiguous, negative or neutral, their readiness to support production expansion or some significant change was not high.

Magar (2026). Fermenting Livelihoods: Exploring

Although these were their challenges, a positivity was expressed and felt, and there were identified opportunities for improvement in the process. The interventions that were recommended were technical, training intervention, modernization of machines, cost support for raw materials, market linkage and support for producers' organizations. Cooperative structures in the insights of the participants are of most importance. A few of the producers were already engaging in discussions or planning about the formation of Cooperative Groups where they could buy supplies together, share their resources, collectively bargain for prices and market their goods together. It was believed that, group production and marketing might provide a viable option to economic empowerment and bargaining position. That formal cooperative structure was also correlated with lawyers, it was also reported to create more opportunities for enhancing Q, and participants noted more legitimacy. C is one among the producers.

Based on these results, it might be possible to develop an approach that would enable producer cooperatives to build on the existing forms of reciprocity and resource sharing, rather than develop a totally new model. Exchange of macha, knowledge of production, labour and raw material is already taking place in the informal sector. Such links and improvements in inputs for production and including markets may be facilitated through formal / semi-formal linkages between agro-farmers and farmers' associations.

The study along with the results shows that Kodo Ko Rakshi cultivation is economically and socially important with the rural people of Kanepokhari Rural Municipality. It makes up 35-75% of the total home income and buys food, education, health and other house necessities. Many homes also engage their women in beer production and/or in income generation or decision making. Inherited methods have been interwoven with new technology to meet labor, fuel, storage and production issues. This is in alignment with livelihood diversification - a vector for household resilience

Magar (2026). Fermenting Livelihoods: Exploring

(Scoones, 1998) - and that helps ensure long-term resilience in the face of ongoing climatic change. Millet liquor production is a source of income during agricultural off-seasons and curb dependence on a single activity for livelihood. The importance is even greater for women-headed households, as the production may be most vital means of achieving their economic security.

The results also add to the debates on the informal economy and gender. Women's informal productive work (Chant & Pedwell, 2008) is emphasized by women in leadership roles in brewing, production management and household expenditure. But women's role should not be limited to the economic sphere. Women also hold indigenous fermentation skills and cultural practices that result from the interaction between economy, culture and social organization of the household. The mix of traditional and modern production practices suggests a move from a replacement to a substitution, and not just a new kind of production. Producers continued to ferment from marcha and gained technical experience in the use of plastic fermentation vessels or modern grinders or LPG stoves in their production. In this way, the traditional and modern aspects of production are merged: industry can respond to the challenges and limitations and keep the cultural production practices and production practices as close as possible and they are compatible and can be merged.

The social relations in the local informal markets are also being stressed and the selling price of NPR 150 per litre of produce though at high prices is also being strengthened. Local networks, long-term customers and trust are being affected by market practices. These findings are in line with the larger view that social capital can be a reliable source of economic resilience in the absence of formal market institutions (Putnam, 1995). A price decrease in the absence of a change in production costs would be unprofitable and can be viewed as an economic loss. The integrated theory can explain these results. The SLA gives a picture of the relationship between human

Magar (2026). Fermenting Livelihoods: Exploring

knowledge, family labour, local materials and social networks and household financial strategies in millet liquor production. Feminist Economics is to demonstrate the value of women's productive and reproductive work to society and how they make decisions for income and household decisions. Indigenous knowledge systems (IKS) explain fermentation and distillation by generations. The informal economy perspective helps to understand the importance of trust, reciprocity and community values in production and exchange when formal institutions are not well known and widespread. Some implications for rural development policy. While it is a traditional marginal activity that is not regulated, also it is a culturally located livelihood. Small scale regulation or micro-licensing mechanisms that are context sensitive will be better served if we have more institutional clarity and product hygiene and quality. Quality control, hygiene and business management training can be improved in the products and the market opportunities.

Producer cooperation would also help them to build their purchasing, selling, and bargaining power. Social networks already exist and provide a base for cooperative structures. Better market relations can ensure that producers do not have to depend on middlemen and more favourable returns can be achieved. Gender responsive activities should be clear about the role of women in production, the economy management of a household and the transmission of indigenous knowledge. The qualitative nature of the study was the most convincing for the study, and allowed to investigate the participants' experiences and socio-cultural and economic impact of millet liquor production. The contextual detail reported with the interviews, repeated household visits, observation and field notes may not be provided by quantitative methods alone.

But the study also has its drawbacks. The number of participants was small ($n = 7$) and the participants recruited from one rural municipality only, which limited the generalizability of the results. A lot of self-reported information is also collected in the

study - such as income contribution estimates and production experiences. More systematic economic measurement in conjunction with qualitative research will be important for future research. That is why multi-site and mixed methods studies with producers from different regions and social groups are needed. Further research will be needed on the aspiration of younger generations to pass on traditional brewing knowledge and the impact in the future on production and livelihoods of climate, market and regulatory changes from the long run in the context of climate change, and how these will affect production and livelihoods. Longitudinal studies will be particularly useful in assessing economic contributions and production practices. Systematic policy and regulatory studies can also provide evidence for policy options to facilitate traditionally entrenched livelihood activities and enhance formal recognition and quality governance.

Conclusion and Implication

The results show that the production of kodo ko rakshi is not only an activity within the households but it is also an important livelihood strategy for rural households in Kanepokhari Rural Municipality. It plays a significant role in household income, providing about 35-75% of household total income to those involved and helps to finance household food consumption, children's schooling, health care and other basic needs. It plays an especially important economic role when agricultural production is secondary to other livelihood activities and where in female headed households, farming could be the main income generating activity.

Women play a pivotal role in the production system as brewers, income earners, household decision makers and custodians of indigenous brewing knowledge. Their participation illustrates the contribution informal homebased work can have in providing significant economic and social value, and yet is still under-represented in formal economic systems. The production of millet liquor is another example of

Magar (2026). Fermenting Livelihoods: Exploring

indigenous knowledge continuity, where skills and knowledge are passed from one generation to another and are then chosen and integrated with current technologies.

Producers nevertheless face rising raw-material and fuel costs, firewood scarcity, climate-sensitive fermentation, inadequate storage, restricted market access, dependence on intermediaries, and regulatory uncertainty. Household cooperation, community trust, reciprocity, and resource sharing enable producers to manage some of these pressures and demonstrate the central importance of social capital to informal rural livelihoods.

The findings suggest that local governments and rural development agencies should recognize millet liquor production as a culturally embedded livelihood activity. Context-sensitive regulation, producer cooperatives, hygiene and quality control training, market access, and appropriate technologies will enhance livelihood security and bargaining power. And women's home-based labour and indigenous brewing knowledge also need to be better considered for inclusive rural development. In the end, culturally appropriate support for millet liquor production could build up rural resilience and preserve indigenous knowledge and cultural practices.

Conflict of Interest

The author declares no conflict of interest.

References

- Abid, M., Sekrafi, H., Gheraia, Z., & Abdelli, H. (2024). Regulating the unobservable: The impact of the environmental regulation on informal economy and pollution. *Energy & Environment*, 35(7), 3463–3482.
- Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods and poverty. *World Development*, 27(12), 2021–2044. [https://doi.org/10.1016/S0305-750X\(99\)00104-7](https://doi.org/10.1016/S0305-750X(99)00104-7)

Magar (2026). Fermenting Livelihoods: Exploring

- Chant, S., & Pedwell, C. (2008). *Women, gender and the informal economy: An assessment of ILO research and suggested ways forward*. International Labour Organization.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.
- Douyon, A., Worou, O. N., Diama, A., Badolo, F., Denou, R. K., Touré, S., ... & Tabo, R. (2022). Impact of crop diversification on household food and nutrition security in southern and central Mali. *Frontiers in Sustainable Food Systems*, 5, 751349. <https://doi.org/10.3389/fsufs.2021.751349>
- Food and Agriculture Organization. (2023). *International Year of Millets 2023*. <https://www.fao.org/millets-2023>
- Friese, S. (2019). *Qualitative data analysis with ATLAS.ti*. SAGE Publications.
- Frosch, M. (2024). Revealing the unseen: The 21st ICLS statistical standards on the informal economy. *Statistical Journal of the IAOS*, 40(4), 767–785.
- Gao, J., Wang, Y., Zhang, M., & Huo, Z. (2022). Group heterogeneity of rural households' satisfaction with good life from the perspective of rural revitalization: A case study from Zhejiang Province of China. *Sustainability*, 14(9), 5432. <https://doi.org/10.3390/su14095432>
- Hesse-Biber, S. N. (Ed.). (2013). *Feminist research practice: A primer*. SAGE Publications.
- Huang, G., Xue, D., & Wang, B. (2020). Integrating theories on informal economies: An examination of causes of urban informal economies in China. *Sustainability*, 12(7), 2738. <https://doi.org/10.3390/su12072738>
- Jackson, S. E., Oldham, M., Angus, C., Holmes, J., & Brown, J. (2024). Trends in purchasing cross-border, illicit and home-brewed alcohol: A population study in

Great Britain, 2020–2023. *Drug and Alcohol Review*, 43(5), 1160–1171.

<https://doi.org/10.1111/dar.13838>

Kalpana, M., Balakrishnan, N., Rajavel, M., & Divya, M. (2024). A review on value chain analysis of millets. *Journal of Basic and Applied Research International*, 30(3), 76–85.

Kaphle, S., Acharya, A., Shakya, A., & Aryal, B. (2022). Determination of alcoholic concentration in four different home brewed alcoholic beverages using gas chromatography. *Nepal Journal of Health Sciences*, 2(2), 56–59.

<https://doi.org/10.3126/njhs.v2i2.56804>

Kayodé, A. P., Nout, M. R., Linnemann, A. R., Hounhouigan, J. D., Berghofer, E., & Siebenhandl-Ehn, S. (2011). Uncommonly high levels of 3-deoxyanthocyanidins and antioxidant capacity in the leaf sheaths of dye sorghum. *Journal of agricultural and food chemistry*, 59(4), 1178–1184.

Kovachevikj, M. G., Dimitrov, L., & Stojanov, D. P. (2023). The structure of rural households' income in North Macedonia: A case study in Polog and Pelagonija. *Agroznanje*, 24(2), 117–131. <https://doi.org/10.7251/agren2303117gj>

Laudien, R., Schauburger, B., Waid, J., & Gornott, C. (2022). A forecast of staple crop production in Burkina Faso to enable early warnings of shortages in domestic food availability. *Scientific Reports*, 12(1), 1638.

<https://doi.org/10.1038/s41598-021-04591-5>

Lincoln, Y. S. (1985). i Egon G. Guba. *Naturalistic inquiry*.

McCoy, D. C. (2013). Early violence exposure and self-regulatory development: A bioecological systems perspective. *Human Development*, 56(4), 254–273.

Miller, A. V., Wilkin, S., Smithers, R., Larson, K., Spengler, R. N., Haruda, A., ... & Roberts, P. (2023). Adaptability of millets and landscapes: Ancient cultivation in

north-central Asia. *Agronomy*, 13(11), 2848.

<https://doi.org/10.3390/agronomy13112848>

Nussbaum, M. (2011). *Creating capabilities: The human development approach*.

Harvard University Press.

Otieno, G., Ogola, R. J. O., Recha, T., Mohammed, J. N., & Fadda, C. (2022). Climate change and seed system interventions impact on food security and incomes in East Africa. *Sustainability*, 14(11), 6519. <https://doi.org/10.3390/su14116519>

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), 533–544.

<https://doi.org/10.1007/s10488-013-0528-y>

Pathak, H., Kiran, K. N. M., & Gauraha, A. (2023). Consumer awareness and consumption pattern of millets and millet-based products in Raipur City, Chhattisgarh. *Indian Journal of Agricultural Economics*, 78(3), 486–500.

<https://doi.org/10.63040/ijae.vol.78.issue.03.012>

Peine, E. (2023). Trans-mountain moonshine: Liquor, identity, and resistance in the Appalachian and Carpathian Mountains. *Bulletin of the Transilvania University of Braşov, Series IV: Philology & Cultural Studies*, 15(Suppl.), 65–74.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1), 65–78. <https://doi.org/10.1353/jod.1995.0002>

Rajbanshi, A. (2005). Women's livelihood from Homemade Beer (Chhyang) & Whisky (Raksi) in Peri-Urban Village: A case study of Ghumrachok in Bajryogini Village Development Committee, Kathmandu District. *Tribhuvan University Journal*, 25(1), 61-78.

Magar (2026). Fermenting Livelihoods: Exploring

- Rawat, J. M., Pandey, S., Debbarma, P., & Rawat, B. (2021). Preparation of alcoholic beverages by tribal communities in the Indian Himalayan region: A review on traditional and ethnic consideration. *Frontiers in Sustainable Food Systems*, 5, 672411. <https://doi.org/10.3389/fsufs.2021.672411>
- Sangappa, Charishma, E., Babu, K. S., Rafi, D., & Laxmi, B. (2023). Strengthening millet value chain through farmer producer organizations. *Journal of Food Systems Research*, 30(2), 1–12.
- Scoones, I. (1998). Sustainable rural livelihoods: a framework for analysis.
- Sen, A., Ashraf, S. A. H., Sarkar, K., Bhardwaj, Y., Sinha, A. K., Shiddamallayya, N., Walsan, K. V., & Bora, D. (2025). Exploring the traditional knowledge on tongba: A review of the unique fermented beverage of the Himalayas. *Journal of Drug Research in Ayurvedic Sciences*, 10(1), 22–31.
https://doi.org/10.4103/jdras.jdras_297_23
- Shrestha, M., & Raj, S. (2021). Exploring the prospects of Traditional Alcohol Making as a Sustainable Rural Livelihood: A case of Burunchuli, Lalitpur. In *Proceedings of 10th IOE Graduate Conference* (pp. 855-864).
- Tamang, J. P. (2022). Dietary culture and antiquity of the Himalayan fermented foods and beverages. *Journal of Ethnic Foods*, 9, 34. <https://doi.org/10.1186/s42779-022-00146-3>
- Thapa, N., Aryal, K. K., Paudel, M., Puri, R., Thapa, P., Shrestha, S., & Stray-Pedersen, B. (2015). Nepalese homebrewed alcoholic beverages: Types, ingredients, and ethanol concentration from a nation-wide survey. *Journal of Nepal Health Research Council*, 13(29), 59-65.
- Tiwari, A., Bana, R. S., Rana, K. S., Singh, R., Godara, S., Grover, M., ... & Yogi, A. K. (2022). No-tillage with residue retention and foliar sulphur nutrition enhances productivity, mineral biofortification and crude protein in rainfed pearl millet
Magar (2026). Fermenting Livelihoods: Exploring

under Typic Haplustepts: Elucidating the responses imposed on an eight-year long-term experiment. *Plants*, 11(7), 943.

<https://doi.org/10.3390/plants11070943>

Wang, Y., Wei, W., Wu, W., Sun, J., Xu, Q., Wang, D., ... & Ni, B. J. (2021).

Improving medium-chain fatty acid production from anaerobic fermentation of waste activated sludge using free ammonia. *ACS ES&T Engineering*, 1(3), 478–489. <https://doi.org/10.1021/acsestengg.1c00104>

Xheneti, M., & Madden, T. (2024). Women's entrepreneurship in the informal economy: A socio-spatial perspective (Nepal case study). *Work, Employment and Society*. Advance online publication.

<https://doi.org/10.1177/00187267241288661>

Yadav, O. P., Singh, D., Kumari, V., Prasad, M., Seni, S., Singh, R. K., ... &

Mohapatra, T. (2024). Production and cultivation dynamics of millets in India. *Crop Science*. <https://doi.org/10.1002/csc2.21207>