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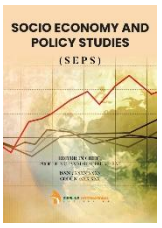

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RESEARCH ARTICLE

EXPLORING THE INDIGENOUS KNOWLEDGE OF GURUNG COMMUNITY: A CASE STUDY FROM SYANGJA, NEPAL

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ABSTRACT

People have collected knowledge based on their experience and have been using such knowledge to develop new technologies. Every invention in today's World is the result of empirical knowledge that our precedents collected which is also known as indigenous knowledge. In this paper, we have intended to study the indigenous knowledge and practices of a Nepali community. A study was conducted in Phedi Khola Rural Municipality, Syangja, Nepal to investigate indigenous knowledge and practices of the Gurung Community residing in the study area. The study covers various indigenous technologies used by the Gurung community in aspects such as seed management, crop management, disease pest management, storage, and other indigenous practices. Farmers had rich knowledge regarding the seed selection of different crop varieties. From the result, we can conclude that farmers often conserved local varieties of the crops by using their indigenous knowledge. The existing indigenous knowledge of farmers on crop insect pests and diseases management was not sufficient to secure food in the area. However, the rate of adopting new chemical pesticides and insecticides was negligible. There were various indigenous technologies of the Gurung community with great indigenous knowledge holding from generation to generation. They had both cultural and livelihood importance. The farmers possessed a great deal of local knowledge that can be documented, disseminated, and utilized. The survey provided the fact that these villages had road connections. It has been considered that once the area is totally connected or accessible to the market economy the valuable indigenous knowledge possessed by its inhabitants would be eroded forever. Hence, it was an urgent necessity to conduct a comprehensive study on the indigenous knowledge systems.

KEYWORDS

Community, Agriculture, Technology, Farmers.

1. INTRODUCTION

Nepal is a buffer country between two large countries India and China with a unique geographic position situated between latitude 26°22'N to 30°27' and longitude 80°4' to 80°12'E where altitude varies between 60m and earth's highest point Mt Everest at 8848m all within the distance 150km. It provides sub-tropical to alpine climatic conditions best owing Nepal with a variety of climates coupled with good rainfall and areas with quality soils making it possible for a variety of high-value crops to be grown (Pandey, 2007).

With continuity of resource use practices, our precedents and indigenous people possess a broad knowledge base, which is augmented and transferred through a long series of generations (Gadgil et al., 1993). Some characteristics of indigenous knowledge are given below (Boven, K. and J. Morohashi, 2002);

- It is generated within the community and is location and culture-specific.
- It is the basis for decision-making and survival tactics.
- Generally IK is not documented.
- It concerns primary production, human and animal life, natural resource management.
- It depends on innovation, adaptation, and experimentation.

According to Briggs (2005), there are several problems and tensions between indigenous knowledge and modern systems which have resulted in the unusefulness of indigenous knowledge in development projects. Indigenous knowledge has reached a dead end and thus has little effect on development practice. It is mainly because indigenous knowledge is conceptualized more as a way of knowing, with less emphasis on content (Briggs, 2013). However, indigenous knowledge is still in practice in different parts of the world and has made our life much easier. Thus, this study is focused on how indigenous knowledge of the Gurung community is still in use and has made a distinct impact on their everyday life.

2. MATERIALS AND METHODOLOGY

Syangja District, one of the 77 districts of Nepal, lies in Gandaki Province. The district covers an area of 1,164 km2 and has a population of about 289,148. There is vast ethnic diversity in Syangja. The major ethnic groups, residing in the area, are Brahmin, Chetri, Gurung, and Magar. Out of total cultivable land of 72,731 hectares, the cultivated land is 50431 hectares

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i.e. 69.34% of total cultivable land. More than 80 percent of the people of the district are farmers who sustain their livelihood through farming. Thus, the overall socio-economic development of the district solely depends on the development of agriculture.

A qualitative approach was taken to accomplish the objectives of the study. The cross-sectional survey research design was implemented since it enabled us to collect data on several pre-determined topics at a single point of time from a seemingly uniform group. Several iterative steps were taken to understand farmers' practices and experiences. To draw the useful lessons also required participating in. A group of researchers developed checklists with open-ended questions and administered to through individual interviews with key informants and farmers. Most of the respondents were elderly people. They were selected since they were assumed to have acquired sufficient information about the utilization of Indigenous Knowledge.

Interviews were conducted with 100 farmers from a randomly selected sample from the community where focus group discussions (FGD) were conducted. A total of 10 focus group discussions (FGD) were conducted. Each FGD comprised between 10-15 participants based on their time availability. This in-community approach allowed close observations of most of the practices mentioned by respondents during individual interviews and at the same time cross-checking the responses.

Observational data were backed up by secondary data. Secondary data were collected from as many sources as possible employing various techniques and methods. In most instances, the library method was employed. Other relevant information was gathered from various sources, including the Central Bureau of Statistics (CBS), the Department of Agricultural and Livestock, and the National Agricultural Research Council. Other information was collected from the district and local offices.

2.1 Conceptual Framework

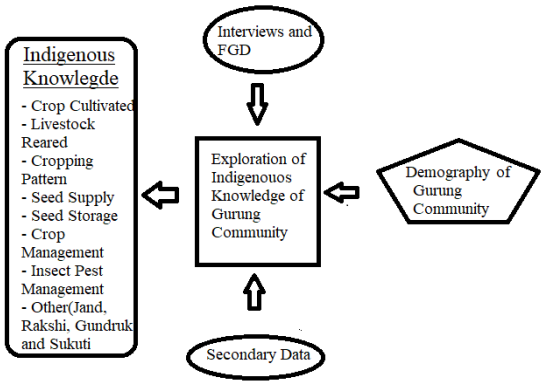

Figure 1: Conceptual Framework

3. Result and Discussion

In order to get desired information on indigenous knowledge different age groups and sex ratios of the respondents have been considered. In the survey, the number of the respondent of the age group above 50 was found to be maximum (34 %) and age group 21-30 were found to be minimum (18%). Likewise, the age group 41-50 was found to be 26 percent, and the percentage of respondents 31-40 years old, was found to be 22 percent. The study was mainly focused on the old aged group which usually holds indigenous knowledge.

The participants were categorized into four groups based on their schooling or formal/informal education. It was found that the majority of the respondents (almost 63 percent) were illiterate.

Table 1: Education Level of Respondents

Education Level	Male	Female	Total Percentage
Illiterate	24	39	**63**
Primary	5	7	**12**
Secondary	4	5	**9**
Intermediate	2	3	**5**
Bachelors	5	3	**8**
Masters	3	0	**3**
Total Percentage	**43**	**57**	**100**

The respondents were found to be engaged in various occupations in the study area. Among them, 54 percent were found engaged in farming. 25 percent were in remittance, while 7 percent were found engaged in business, 6 percent in services, and 8 percent in other activities. Under civil service, most of the respondents were engaged under the government school and offices nearby. The data on literacy and Occupation further revealed that indigenous groups gave priority to traditional farming practices. It was found that due to the abroad employment there was lack of manpower in the village; so, women and the old aged group were mostly engaged in different Working activities.

From the study of Phedi Khola Rural Municipality, it was found that 20 percent of the respondents had a family size less than 4, 62 percent of the respondents had a family size between 4-6,10 percent respondents had a family size between 7-9, and 8 percent respondents had the family size more than 9. This shows that family size 4-6 is the most common with the percentage of 62% whereas Family size more than 9 is least popular with 8 %.

The possession of land shows both social prestige and a source of wealth. Area of land owned was the major criteria for identification of the people in the village. People in the past were agriculturists. In this Rural Municipality, some Gurung farmers were still able to hold a large chunk of land for cultivation. The land tenure system was still the tradition in these villages but was affected by abroad employment. The land had been measured in Ropani and the major product was measured in muri and kilogram in these villages. The land distribution pattern in the study site shows that the average landholding was comparatively small however distribution was highly uneven. The area of cultivated land, among the farmers, was not uniform. Thus, there is a wide gap between the rich and poor farmers in terms of land ownership. In the study area, respondent households had different crops commodities placed in their land for commercial production. Out of hundred respondents, 21 percent of the respondents were found growing vegetable crops, 37 percent cash crops, 25 percent fruit crops, and 17% respondents were found growing cereal crops.

Table 2: Area under Cultivation

Crop	Percentage of respondents	Area in Ropani
Vegetable	21	870
Cash Crop	37	3500
Cereals	17	4100
Fruits	25	2300
Total	100	10770

3.1 Crops Cultivated in the Area

The major crop in this Rural Municipality includes cereals like paddy, maize, millet, potato, and wheat and cash crops like large cardamom, ginger, and coffee. Besides, paddy was a staple crop in this Rural Municipality as in other areas. Hence paddy, maize, potato, millet, and wheat were taken for detailed study. Paddy was the most important cereal crop grown by the farmers of the study site. The survey indicated that 100 percent of households were cultivating paddy. It was reported that the paddy production rate was decreasing due to the raising attraction in large cardamom cultivation and the reason behind this was an economic benefit and livelihood security.

Similarly, 47%, 70%, 75%, and 53% of households were cultivating maize, millet, and potato, respectively. A considerable portion of land had been maintained by making khetland and the cultivated area of paddy was higher in comparison to the cultivated area of maize, millet, and wheat. It seems, despite limited socio-cultural importance attached to millet and ginger. Millet and ginger had important value in Gurung culture. Millet was used for making jand (a local fermented beverage) and alcohol (raksi). Ethnic alcoholic beverages and ginger had strong ritualistic importance so it plays an important role. They were essential in every festival, ceremony, and worship in the Gurung community. The farmers had been attracted to convert sloppy lands in order t0 cultivate large cardamom, which has a higher market value. The production and productivity of maize and wheat were lower in comparison to paddy in the study site. In addition to the above-mentioned crops, every household in the study area was also growing some minor crops (pulses, and vegetables). The distribution of cultivated land and productivity of crops among the farmers was highly uneven. The uneven distribution of landholdings coupled with the pest infestation by some wards in the study site contributed to the high

unevenness in productivity. The lower productivity may be attributed to two reasons, irrigation problem and pest problem. The production was not sufficient to meet the family requirements and due to those mentioned problems, the livelihood is insecure.

Table 3: Major Local Crop Varieties Grown by Farmers

Crop	Varieties
Paddy	Aate Marsi Basmati Bhotange Bhote Marsi Black Rice Darmali Jademasi Malingeni Manshara Ram Saili Rato Chamal Taichin Takmare Tauli Thapachini
Maize	Pahelo Satiya Hocho Seto Tawali
Millet	Dhan Kodho Himali Kapre Laate Mudke Charma Nang Katuwa 46 Okhle Pangdure Seto Kodho Seti Kodho Seto Matengre Thulo Kodho
Wheat	Mudulle Rato Seti
Potato	Bhotange Karaiche Lama Karki Pangkhatale Pothre Sipiya
Ginger	Beshubate Boshe Nashe Oopa Sibili

Farmers reported that among those paddy local varieties 'Ram Saili' is good for making the traditional food called 'Chamre' and Tukmare is red in color. The Satiya Hocho variety of maize cooks fast and its color is red. The 'Mudke' variety of millet is good for making Jand and traditional food called 'Dhindo' and 'Dhaan Kodho' is good for making chapatti. Among those mentioned local varieties several varieties were going extinct.

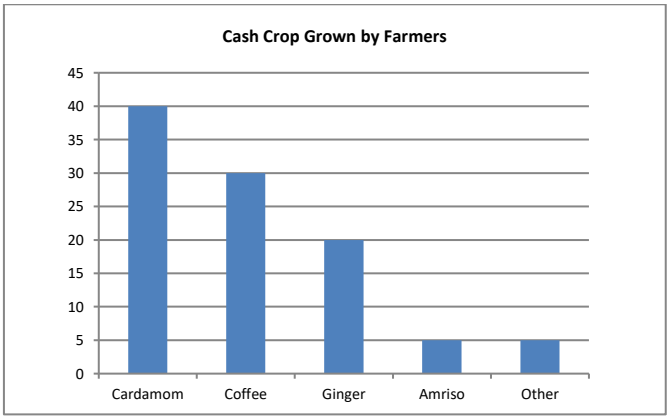

Figure 2: Percentages of Cash Crop Grown by Farmers

In the studied area, different cash crops had been grown by respondents. Most of the respondent farmers were growing cardamom rather than other cash crops. It was found that 40 percent of the respondents were growing cardamom. 20 percent were growing ginger, 30 percent people were growing coffee, 5 percent were growing amriso, and 5 percent were growing others which included medicinal plants; Majeet, Padamchal, Aklebir, Ranichap, Kanchirna. Rudrakshya, Bojho, Harrah, and Chitu. Bamboo plants were found one of the most used and locally available traditional plants. It was used for various purposes; fencing, making mats, making bridge, seed storing and housing materials, etc. Four types of bamboo species were found i.e, dhungre, mali, macharipa, and nigalo.

3.2 Cropping Pattern

The cropping pattern of a place or community depended largely upon the physical characteristics of available land, food habits, and socio-cultural tradition of that farming community. Most of the farmers were found following crop and livestock integrate farming system. Livestock reared the study area were mostly indigenous.

Table 4: Types of Livestock and Poultry Raised by Household

Types Of Animals	Breeds	Percentage
Pig	Chwanche	89
Cow	Pahadi	36
Buffalo	Lime Parkote	67
Goat	Khari Sinhal	25
Sheep	Baruwal Bhyanglung	7
Poultry	Sakini Pwak Ulte Ghanti Khuile	92

Therefore, within the same locality, the cropping patterns differed from household to household, the matwali (liquor drinkers) households used a sizable portion of their millet harvest and, to some extent, their rice used for making the local brews, Jand (local beverage) prepared by fermenting grains and local alcohol (rakshi), the two most important homes made alcohol beverages in the hills since Gurung was the dominant ethnic group in the study area, millet was the most important crop, as these ethnic groups require these crops for making local beverages. So the common cropping pattern in bari (unirrigated land) was maize-based with millet either intercropping or sole cropping and the cropping pattern in khet (irrigated land) was rice-based.

Table 5: Major Cropping Pattern in Irrigated Land

Cropping Pattern	Cropping Pattern Cropping Intensity (CI)= No Of Crops/Year*100
Rice(Soyabean+Dal)-Wheat-Rice	500
Rice(Soyabean+Dal)-Potato(Green Leafy Vagetables+Raddish)-Rice	700
Rice(Soyabean+Dal)-Potato-Vegetables	500
Rice(Soyabean+Dal)-Wheat-Vegetables	500

Table 6: Major Cropping Patterns in Unirrigated Land

Cropping Pattern	Cropping Intensity (CI)= No Of Crops/Year*100
Maize+Potato-Millet-Potato	400
Maize-Millet-Vegetables	300
Maize+Dal-Millet-Potato	400
Maize+Bean-Millet-Vegetables	400

3.3 Indigenous Seed Supply

Informal seed supply systems play a vital role in the subsistence farming system and conservation of seeds. Shrestha (1998) asserts that in Nepal almost 90 percent of seed requirements for major food crops and 100 percent for minor crops are met by farmers' seed production and supply system. The survey revealed that farmer-managed community-based seeds production and distribution systems were complex, well-used, and sustainable. Farmers produced seeds themselves and often exchanged them with borrowed seeds from neighbors. This system provided adequate supplies of good quality seed at local varieties of farmers in a

timely affordable manner. The use of improved seeds was found to be rare. The involvement of local traders and government services in seed supply in the study area was found negligible.

Famers have rich Knowledge regarding the seed selection of different crop varieties and they used different criteria for seed selection during harvesting time. They used to rogue plants slightly before harvesting to avoid admixtures and also to maintain the genetic purity of a particular variety of crops. Farmers reported that in paddy fields good Seed bearing crop spots were chosen right from the grain-filled stage, harvested, dried at the sun, and thrashed manually on the thrashing yard (Khala). In this method farmers usually followed the rule of beating the bundles only two or three times on the ground to avoid weaker seeds. Then the threshed seeds are to be winnowed, and dried under the sunshade for a couple of days before storage. This whole process is traditionally called 'daai garnu'. Farmers choose the best cobs of maize for seeds out of the heaps at home. Some first harvested maize is offered to the ancestors (pitri). While some other farmers reported that the chosen cobs are then kept above tire pit (Angena) making Jhutta (bunch of cobs made by splitting bark). Only robust seeds from the middle of the cobs were separated during the sowing season. Millet cobs were usually plucked up from the Crop field and only good and similar cobs were beaten with a stick for threshing seeds. Similar methods were adopted while selecting the seeds of legumes. Farmers preferred to keep the first laden fruit of beans and cowpeas while selecting the seeds of legumes. Farmers preferred to keep the first laden fruits of beans and cowpeas while selecting the seeds. They claimed that the first laden fruit is healthy and gives better germination. A belief selection, they said that seeds of fruit from the first harvest were treated as pure and qualitative seeds.

3.4 Seed Storage

Farmers often conserve local varieties of the crops by using their traditional knowledge. Local methods of treating seeds were varied according to crops type and depend upon the availability of the resources, tools, and techniques. In these villages, farmers were using locally available seed treatment methods for storage. Besides wooden boxes, clay pots, open floor, wooden pots, bamboo baskets (bhakari), and sacks were also used for grain and seed storage.

Rice: They keep rice grain in bamboo Bhakari (big basket). Farmers in the study site were reporting that rice grain was mixed with powdered red pepper to prevent from storage insects and kept in Bhakari pasted with cow dung helps to protect grains from insect attack.

Maize: Maize cobs hung as Jhutta and kept on Thakra (cobs hanging on bamboo cane) and also hung around the outer walls of the house which were the common practice among the farmers. Likewise, maize kept in Jutta and Thakra was well protected from rat damage. It was reported that the black-colored seed of maize does not germinate.

Millet: sometimes millet seeds were kept on wooden pots.

Wheat: wheat grains were mixed with powdered red pepper, titepati, and some farmers seem to use the malathion.

Potato: Potato seeds were stored on open and dry floors some farmers were already inclined to use plastics bags and sacks for grain storage. In the study site, the entire households surveyed were drying seed for a couple of days under the shade of sun before storage and about 87 percent of households were following pre-storage treatment either by local methods or by mixing chemical pesticides.

3.5 Crop Management

The cropping practices depend upon various factors such as the available land and types of crops grown by the farmers in an area. Farming was characterized by traditional patterns using locally available technologies and resources, Farmers of these villages were subsistence producers. The crops produced in their farmland were consumed within the villages and some amounts were sold in the market which helps to secure the livelihood. Livestock is an integral part of integrated farming. Rice-based cropping in Khet and maize-based cropping in Bari are the two major types of cropping systems practiced in these villages.

Application of manures, pesticides, and other operations like mulching, thinning, dressing, weeding, and hoeing may be defined as intercultural practices. These practices depend upon the types of technology adopted by the people in an area and Dilfer mainly with the level of agro-ecological knowledge possessed by the farmers as well. Farmers at these Villages had been identified manuring and mulching by locally available materials suitable to particular crops. Similarly, farmers reported that leaves of Titepati, Banmara, and Asuro had been used as mulching for millet, and ginger nurseries. Different types of leaf litter were widely used as mulch for moisture retention, especially in kitchen gardens and vegetable nurseries. Some farmers reported that manuring through tethering animals on fallow land would be better than applying FYM and some reported that mulching of Titepati and Banmara helps to check insect pests and diseases occurring in the field.

Rice: Land preparation was found to be given the topmost priority as it could affect the quality of soil and also play a significant role in crop yield. Farmers use foliage of banmara, asuro, bakaino, and tite-pati as green manure before transplanting paddy in the field. The Process of green manuring starts almost 20 days before actual transplantation. The use of foliage of these plants enriches soil nutrients. Farmers clean bunds and terraces before paddy transplantation for various reasons such as sanitation, removing weeds, and preventing from shades. Soybean was found to be intercropped with paddy along the sides of bunds.

Wheat: No exclusive intercultural practices were found for wheat crops. Occasional hand weeding is carried out in case of severe weed infestation.

Maize: It was reported that in-situ manuring was practiced by tethering their animals on the fallow field. Tethering animals on fallow land is a common practice in the study area. Weed removed from the field is generally incorporated into the soil so that it could decompose and enrich the soil with nutrients essential for crops. Farmers reap the green forage during intercultural operation and plowed the land. Earthing up is also practiced in maize.

Millet: Millet is considered one of the hardy crops. Generally, it is grown in poor soil conditions throughout the hill regions. Therefore, farmers do not provide manure and fertilizers for this crop. Millet growing farmers reap the green forage to feed during the weeding of the millet to feed cattle.

Potato: Potato requires deep fertile soil for better production. Therefore, land should be well prepared for planting potatoes. It showed the importance given for the land preparation for a crop like a potato.

3.6 Insect pest and Diseases Management Practices

The survey revealed the occurrence of insect pests and diseases was increasing here due to various unknown reasons. About 83 percent HHs reported that many types of insect pests and diseases were observed on the crops. Farmers were using their knowledge system to identify crop-specific diseases and insect pests. They used to inspect their crops to find out the occurrence of diseases and insects if any. It was found that there is not much indigenous knowledge on insect and pest management.

The Gurungs have indigenous methods of pest management. They heavily rely on indigenous methods in areas where external inputs (e.g., chemical pesticides) are in short supply. In remote areas, the infestation of pests such as stem borer (*Chillozonellis*) is common. Khaira leaf pulp is grounded and spread over the wheat crop to kill the pests while it is introduced through an irrigation channel in the case of paddy. Similarly, In the case of specific pest attacks, like rice moths, pests are combed out with sticks, and moths are discarded into the water. While in maize, diseased stalks are manually removed. Monkey was found to be one of the major pests on the study sites. It was reported that during crops harvesting time man along with dog is kept to look after the monkey.

3.7 Other Practices

Indigenous technologies play a very important role in the livelihood security of the indigenous people. Technologies knowledge is transmitted from one generation to another. There were various types of indigenous technologies and its method found in those communities. The indigenous technologies are explained below.

Raksi is an indigenous distilled alcoholic beverage of Gurung community. Rakshi can be made from different fruits but raksi is usually made from Kodo(millet) or bhaati (rice); different grains produce different flavors. It has both cultural and livelihood importance. It is sold around Rs 50-80 per

mana which was found to be a source of income in some households securing the livelihood.

Jand is an indigenous fermented beverage of the Gurung community. Jand or chayng is the most common fermented alcoholic beverage that can be made from any cereal crops among then from millet locally called jand and from rice locally called bhaati jand are popular. It has both cultural and livelihood importance. It is sold around Rs 40 per mana which was found to be source of income in some households securing the livelihood. It was prepared that the jand made from sweet potato and simal tarul taste is good.

Sukuti is a traditional dried meat used as a staple dish of the Gurung people. Sukuti can be consumed in different ways, directly as the main dish or as a side dish. It is prepared by cutting meat into thin strips after removing the fat layer and then drying these for several days until moisture percentage drops sufficiently.

Gundruk, popular food of Nepal particularly Gurungs, is a fermented leafy green vegetable claimed to be one of the national dishes. During the harvesting of green vegetables such as radish, mustard, etc. large quantity of leaves is accumulated. These leaves are allowed to wilt for few days and then smashed or cut into pieces with a knife. the pieces too small should not be too small while smashing. Now, the leaves are tightly packed in a pot especially earthen pot and kept in a warm place such as underground. After a week, when gundruk starts to taste acidic, it is removed and dried in the sun.

4. Conclusion

From the study, it is clear that the Gurung community in Phedi Khola Rural Municipality has a rich IK base. They have been using their knowledge in every aspect of everyday life. Some of these IK can also be utilized in the commercial field, while others are not so useful compared to modern technologies available. Thus, more researches are required to study the scope of IK in modern development projects. Besides this, a study on the relative importance of IK to modern technologies should also be done.

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