

“Expedition From Slash And Burn To Agroforestry Plantation, A Livelihood Upliftment Subsequences Of “Bankariya Ethnics”: A Case Study Of ‘Manahari Rural Municipality’ Within Central Nepal.

Mr. Raju Chhetri, Mr. Pramod Prasad Dahal, Mr. Kalpana Pokhrel, Mr. Bishnu Maharjan, And Mr. Saurav Suman

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Corresponding Author: Mr. Raju Chhetri

ABSTRACT: Bankariyas are mostly hunters-gatherers, also known as nomadic jungle-dwellers in case of Nepal. These are the most primitive tribes who reside near the river basin of Handikhola in Makwanpur. The aim of this study is to highlight the traditional khoriya (slash and burn practice) in contrast to the modern agroforestry plantation in the study area. In addition to this, the study also aims to highlight the livelihood with market situation of agroforestry production.

The Bankariya community, residing only in the study area Musidhap has a total of 20 households (HHs) and all of them were taken as a part of the purposive sample for this study between September to November of 2017. The consultative meeting, Primary HHs data, Group discussion and other scientific methods have been applied to this study. The data revealed that 70 percent HHs are fully dependent on agroforestry plantation and among those living there, some 20 percent are dependent on the development aid from the Government and Non-government organizations while 10 percent are dependent on Social grants as their major source of livelihood in the study area. However, constraints and problems keep on occurring in the community concerning land rights, citizenship and owning property as assets, which are the challenging issues of the future. The community is in serious need of agro-technical services for the future.

KEYWORD: - Agroforestry, ethnics, livelihood, slash and burn

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I. INTRODUCTION

Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land management unit as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economic interactions between the different components (Nair, 1993). In other words, agroforestry is defined as the land use science which deals with the interaction between trees and crops, and of both with animals in the same unit of land (Wood, 1990).

As per the study by (Bugayong, 2003), it was indicated that some countries were employing agroforestry technology as a strategy to rehabilitate degraded forestlands, avoiding “slash-and-burn” farming, reducing soil erosion, improving soil quality, enhancing vegetation cover, and improving the living standards of forest-dependent communities. Nepalese agroforestry practices can be described in two broad categories: the first one is farm-based and the other is forest-based. Farm-based practices are home gardens, trees planted on and around agricultural fields, tree wood lots and commercial crops under shades of trees or agriculture crops intercropped with commercial trees. The forest-based practices involving specific agricultural practices associated with forests where farmers collect food, fruits and gums (Tejwani & Lai, 1992) describe the middle hills of Nepal which consists of mixed, subsistence and multidisciplinary community heavily dependent on forest resources. Different forms of intensive to semi-intensive land-use systems have been in practice in the hills of Nepal. Among them, slash-and-burn farming, which is also called shifting cultivation, is also practiced in middle hills of Nepal. According to (Regmi, 2003), this form of agriculture is practiced by ethnic people in hilly areas of 20 districts in Nepal. Locally this form of farming is called Khoriya farming (Aryal & Kerkhoff, 2008). Khoriya means the steep slopes where cultivation is done following slash-and-burn practices. Shifting cultivation system which needs moving from one plot to another, or slash-and-burn, refers to the system of destroying the forest land (Brady, 1996).

It is estimated that shifting cultivation accounts for about 70 percent of deforestation in Africa and 50 percent in Asia (Bandy, 1994). Exact figures about the total area under shifting cultivation are not available, but it is still applied in about 40-50 countries (Mertz, 2009) and shifting cultivators constitute an important part of the 850 million hectares of secondary forest in tropical Africa, America and Asia (FAO, 2005).

The land degradation problems and deforestation rate is higher due to increased population and fast growing timber market, the high demand of fuel wood and timber including NTFPs, which has resulted in severe forest degradation, land degradation and natural ecosystem imbalances. Agroforestry is often perceived as a way to help slow deforestation by breaking the predominating slash-and-burn cycle practiced by most farmers in the region. Although some observers are skeptical that agroforestry will have much larger impact on alleviating poverty or slowing deforestation in the region (Fearnside, 1993), it can certainly help wean farmers from production systems that are in an ecological tailspin. Different studies in Nepal have shown that agroforestry can increase the sustainability of hill farming system (Amatya & Newman, 1993) (Garfort et al., 1999). Agroforestry seems to have potential to provide options for rural livelihoods and biodiversity conservation (Gordon & Bentley, 1990); (Kidd & Pimentel, 1992).

A study on shifting cultivation areas of Bangladesh found that agroforestry provided better alternative both ecologically and economically to shifting cultivation (Rasul & Thapa, 2006). (Rahman, Rahman, Codilan, & Farhana, 2007) and (Faminow & Klein, 2001) conducted a study on on-farm testing and dissemination of agroforestry among slash and burn farmers in Nagaland, India. The study found that Nagaland appears to be on a path to intensifying its land use, based on agroforestry, which is likely to brake deforestation rates from slash-burn.

Finding alternative options to increase the supply of forest products to support rural livelihoods have become a fundamental concern for policy makers and planners. Agroforestry seems to have the potential to provide options for rural livelihoods and biodiversity conservation (Gordon & Bentley, 1990), (Kidd & Pimentel, 1992), (Brady, 1996) and (Adesina, Mbila, Nkamleu, & Endamana, 2000) studies also concluded the promise of agroforestry as an alternative to slash-and-burn agriculture in different parts of the world.

II. LITERATURE REVIEW

Agroforestry combines good attribute of agriculture (i.e. high productivity of farm crops) and forestry (decrease soil erosion and maintains fertility) deliberately in same area, internationally mixing and growing trees with crops/animals (Nair, 1993).

Weirsum (1982) viewed agroforestry as a system where with available resources, cultivators and environment interact to obtain higher and more diversified and sustainable production. As a system, it aims to utilize the land in a way that both productive and protective function of forestland are achieved i.e. woody perennial, ecological stability and agricultural component as the source of farmers immediate needs (Lasco, 1986).

Many authors (Fronzen & Oberholzer, 1984) mentioned about keeping or retaining trees of various species by mid-hill farmers in their different type of farmland. However, there has been merely any document, which suggests different patterns of retaining or keeping different tree species by farmers on various part of their land (Shrestha, 1994).

According to Nepal Planning Commission, about 60 % of the households (HHs) own 0.3 to 1.1 ha. of land and these small farmers are not able to develop farm woodlot separate from their agricultural production. AF systems are their only useful option to meet the needs of forest and agricultural produces (Thapa, Joshi, & Sherpa, 1989).

In north-western Makwanpur, shifting cultivation is observed mostly in rugged terrain on steep slopes and stony red soils in the sloping uplands. The system functioned well while the population pressure on the land was low and the livelihood of the shifting cultivators were based on subsistence (Chetry, 2014). Around 43 per cent Chepang of north-western part of Makwanpur are engaged in agroforestry plantation. Around 1015 households are engaged in agroforestry plantation. A total of 3203 HH were supported within 104 Users Committee (UC) by MDI within a period of three years, where the participation of Chepang is 1602 HH (50 per cent).

III. OBJECTIVE

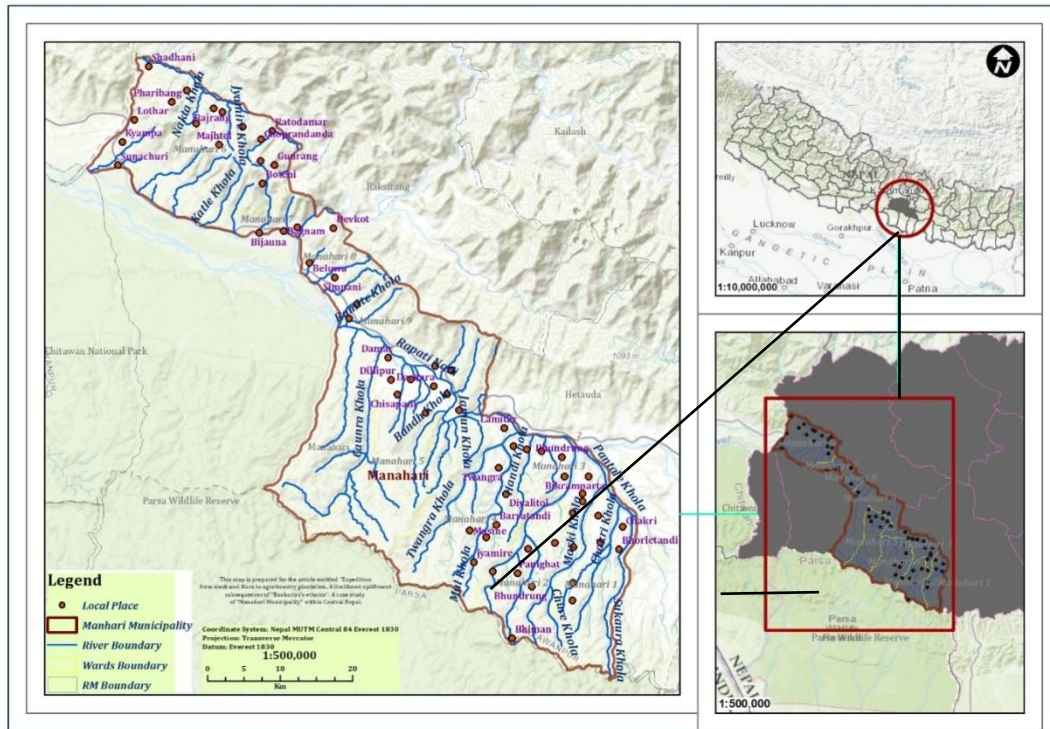
The overall objective of this study is to find out the connotation of marketization of the study area, some specific objectives are herewith: -

- To understand the socio-economic and livelihood condition of the surveyed respondents.
- To analyze the types of agroforestry plantations.
- To explore the factors related to the market participation and selling decisions.
- To identify the constraints and barriers for market and marketing of products.

IV. METHODOLOGY

Study area

Handikhola VDC’s (Currently known as Raksirang Rural Municipality as per new federal structure), Musidhap within Makwanpur district ward number 7 has been chosen as the study area.

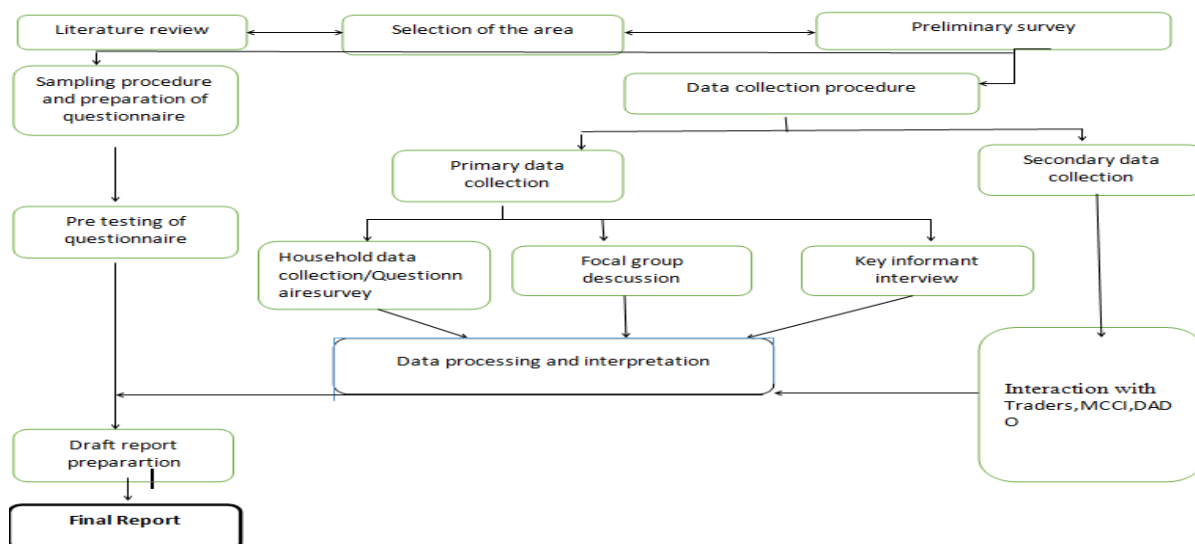


(Self-prepared GIS spatial map of the study area)

Survey method Types and analysis of data: Survey was conducted by gathering quantitative as well as qualitative data. Quantitative data was collected using a semi-structured questionnaire. Printed Primary questionnaires were presented to respondents of 20 households. Qualitative data was collected through focus group discussions (FGDs) and Key informants interview (KII). Case study and observation methods were applied as well as other consultants, stakeholders, leader farmers etc. were consulted for further information. Similarly, secondary data from published/ unpublished report, library, journals and internet was collected. The data was further analyzed using IBM SPSS vol-20 computer software package where as some data were processed through excel sheet.

Survey Outline

The research has been planned as per the flowchart mentioned below: -



V. RESULTS AND DISCUSSION

Gender and educational status of surveyed area

Study area respondents consisted of 52.38percent female and 47.6percent male. According to (Fortmann & Rocheleau, 1985), "women are traditionally important participants in both agricultural and forestry components of agroforestry production". The educational qualification of the respondents of study area is dominated by illiteracy followed by people having non-formal education.

Table no. 1: Educational status of respondents

Description	Illiterate	Literate(non-formal education)	Upto SLC
Percent(percent)	66.67	19.05	14.29

(Source: Field survey, 2017)

In contrast to the educational status, illiterate majority is higher (Table-1), whereasthe education up to SLC(School Leaving Certificate-See Glossary) level is limited (Only 14.29 percent). The intention towards study is very negligible to the surveyed respondents due to theirinterest and opportunity. The SLC pass students are those students who are going to the nearby secondary school and completing their study.Some NGOs in the sector of education are also working because of which non-formal education trend is accelerating day by day.

As per FGD interview, it was stated that; -

Bankariya students are regular on school but at home, they are not getting a sufficient environment due to non-availability of educated people in the old age.

Respondent’s source of Income

Hundreds of millions of people, mostly in developing countries, derive a significant part of their subsistence needs and income from gathered plant products (Schippmann, Leaman, & Cunningham, 2002). In our study, agriculture farming contributes to the higher source of income followed by combined agriculture and wage, followed byagriculture and livestock and so on.

Table no. 2: Source of income of respondents in study area

Source of Income	Percentage contribution (percent)
Agriculture farming*	29
Agriculture and wage	24
Agriculture and livestock	19
Agriculture, livestock and wage	19
Agriculture, wage and remittance	9
Total	100

(Source: Field survey, 2017)

(*farming - legume, cereal; wage – on/off farm, skilled / unskilled; Livestock –Egg, milk, skin, ghee meat)

In relation to the income opportunity, it was found that 29 percent of Bankariya community earn their livelihood from agriculture farming (Table-2) while wage and agriculture supports 24 percent of them. Agriculture and livestock rearing with wage supported livelihood of 19 percent of the community but only9

percent of them were dependent on remittance along with agriculture and wage works. Government of Nepal has also provided some social incentives, as allowance is also one of the sources of income.(Neupane & Thapa, 2001a) argue that integrating agricultural systems with cropland agroforestry is more profitable in the hills of Nepal. Agroforestry adoption has contributed to the increase of farmer’s income in the Philippines(Bugayong, 2003) and Nepal(Regmi, 2003).

Analysis on HHs sense of income of surveyed respondents in the study area.

Source of livelihood

A livelihood comprises of the capabilities, assets (including both material and social resources)and activities required for a means of living. A livelihood is sustainable when it can copewith and recover from stresses and shocks maintain or enhance its capabilities and assets,while not undermining the natural resource base.

Table no. 3: Descriptive analysis on major source of livelihood of Bankariya in the study area

Source of Livelihood	Percentage contribution (percent)
Agriculture farming	61.90
Livestock farming	19.05
Daily wage	14.29
Social grant from government	4.76
Total	100

(Source: Field survey, 2017)

Majority of Bankariya community (61.9 percent) depend on agriculture (Table-3) farming next to which is livestock farming (19.05 percent). In addition, daily wage supports livelihood of 14.29percent and 4.76percent of the respondents get social grant from government as livelihood support.

The use of agroforestry technologies mitigates biodiversity loss and provides opportunities for improving diversification and range of livelihood options for rural households(Akinnifesi, et al., 2008). Due to many programs focused on improved livelihood and aiming to protect forests from damage, it should be possible to move awayfrom shifting cultivation to practices that are sustainable in the longer term (El-Lakany, 2017).

(Akinnifesi, et al., 2008)reported an increase in demand in the adoption of agroforestry by farmers. The impact of agroforestry adoption on livelihoods of farmers in Malawi, Mozambique and Zambia includes increase in crop yields, increase in income, increased savings resulting in change of wealth and soil improvement.

Food self sufficiency

Food sufficiency is measured by counting the support from own farm products and purchasing with other cash income generated from the sale of household level farm produces (Garforth C. , Malla, Neupane, & Pandit, 1999).

In case of Food self-sufficiency, the own cereal production of HHs is included here only.

Table no. 4: Analysis on HHs food sufficiency of respondents in the study area

Self sufficiency	Percentage of respondents (percent)
Up to 6 months	57.1
Up to 9 months	38.1
Up to 12 months and above	4.8
Total	100

(Source: Field survey, 2017)

In contrast to the food self-sufficiency (Table-4), it was found that majority of respondents (57percent) of have food self-sufficiency up to 6 months. However only 4.8percent of them have food sufficiency for a year. The major staple cereals are Maize and Millet for this community and some 4-5 HHs have planted paddy and wheat, which are negligible for most of the houses.

As per FGD respondent stated that:

Food sufficiency is not enough to the Bankariya community due to lack of input and inadequate land support.Sometime the Bankariya are using wild food as a traditional consumption food in scars period. However, after agroforestry plantation they did not have significant amount of wild food compared to the previous few years.

Range of expenditure:

Table no. 5 represents expenditure pattern of the respondents on food, non-food and miscellaneous items. Most of the HHs spend 50 percent of their income on food items. 33.3 percent of HHs spend more than 50 percent of income on food with 20 percent each on non-food and miscellaneous items whereas HHs spend only 40 percent of their income on food and 30 percent on non-food and miscellaneous items each were also 33.3 percent. Furthermore, HHs spending 60 percent on food, 30 percent on miscellaneous items and only 10 percent on non-food were 23.8 percent. It was also observed that HHs giving first priority (50 percent) to food and then non-food (30 percent) and miscellaneous (20 percent) were 9.5 percent only.

Table no. 5: Range of expenditure in study area

Here expenditure signifies the amount of cash spend for the different domestic need in the surveyed HHs. The below table try to highlight the expenditure scenario of the surveyed area: -

Expenditure	Details	Percent(percent)
Food*	up to 50 percent	9.5
Non-food	up to 30 percent	
Miscellaneous	up to 20 percent	
Food	up to 60 percent	33.3
Non-food	up to 20 percent	
Miscellaneous	up to 20 percent	
Food	up to 60 percent	23.8
Non-food	up to 10 percent	
Miscellaneous	up to 30 percent	
Food	up to 40 percent	33.3
Non-food=	up to 30 percent	
Miscellaneous	up to 30 percent	
Total		100

(Source: Field survey, 2017)

(*: Food-Grains, vegetables, oil and Flesh, Non-foods; -Stationary, agricultural inputs, building cost, clothing, School fees, fertilizer and seed only, Miscellaneous: -Recharge card, water, electric bills, debt and others)

In relation to the expenditure, the data analysis revealed that most of the HHs spend 50 percent of their income on food items. 33.3 percent of HHs spend more than 50 percent of income on food with 20 percent each on non-food and miscellaneous (Table-5) items whereas HHs spending only 40 percent of their income on food and 30 percent on non-food and miscellaneous items each were also 33.3 percent. Furthermore, HHs spending 60 percent on food, 30 percent on miscellaneous items and only 10 percent on non-food were 23.8 percent. It was also observed that HHs giving first priority (50 percent) to food and then non-food (30 percent) and miscellaneous (20 percent) were 9.5 percent only.

The local traders as well as business men also stated the related fact that-

Bankariya are spending cash mostly on food purchase (grains), legumes, and spices as a one of the most consumable food of daily life.

(Local traders of Sananitar, Handikhola market)

Current agroforestry practices:

Households in the study area have maintained diverse on-farm trees and crops. They have been following plantation system from a decade ago. Among them 19.05 percent of the HHs have adopted agroforestry from more than 9 years ago. In addition, 52.38 and 28.57 percent HHs had adopted agroforestry for 6 and 3 years respectively. Most of the people got informed about agroforestry plantation system from different developmental organizations. Mainly farm based agroforestry practices had been adopted in the study site. They have currently adopted agroforestry in the land, which was provided by the government because the farmers have little land as farmland. Tree species at the edge of the land i.e. alley cropping was the major agroforestry practices. Farm based agroforestry system, agri-silviculture, agri-silvipasture and horto-silvo-pasture systems were adopted. Home garden, tress around the farmland, fodder and forest trees species along with agricultural crops were the major practices adopted on farmland.

The agroforestry system in the study area could be classified into three systems. First, one is an agri-silviculture consisting of trees and/or shrubs along with agricultural crops. Trees like *Leucaena leucocephala* (ipil-ipil), *Melia azadirach* (bakaino), *Ficus micrordata* (khanayo), *Bauhinia purpurea* (Taki), *Ficus hispida* (khasreto), *Dalbergiasisso* (sissoo), *Litsea monopetala* (kutmero) and *Magnifera indica* (mango) and fodder like *Thysanotanea maxima* (amriso), *Pennisetum purpureum* (napier) were grown on and around farm land while crops grown consisted of *Oryza sativa* (paddy), *Zea mays* (maize). Second system, mostly used by the community is silvi-horticulture that involves intercropping of forest trees like *Ipil Ipil*, *Bakaino*, *Khanyu* with fruit trees like *Musa paradisiaca* (banana), *Ananas comosus* (pineapple), *Citrus limon* (lemon plant). The last

system involves horti-silvi-agriculture under which trees and horticultural crops are grown in interspaces with agricultural crops, which continued simultaneously in wider spacing. It fulfilled product requirements of fruits, wood crops and fodder conserving moisture and minimizing erosion.

Advantages underlying with the Agroforestry Plantation

Household with agroforestry plantation got benefit towards food security as well as earning cash income. Agroforestry offers many benefits for agricultural producers and society at large (De Baets, Garieoi, & Vezina, 2007). Results from the farm income analysis showed that agroforestry system provided higher gross benefit than Khoriya farming (Khadka, 2010).

Result finding concludes that benefits of AF towards food security and cash earning was 24 percent each respectively. Benefits from the felting fodder for livestock and variety of crops was found 19 percent each. Very few respondents felt that time saving is the benefit of the AF system.

Market

Marketing of agriculture and small-scale forestry products plays a major role in smallholders' economy, which are both produced and consumed locally. These products are contributing to a significant role in developing countries because these products make a major contribution to the GDP, and their consumption represents an important part of rural people's expenditure (Dorward, 2003)

Demand trend

The price and demand trend of product is found to be increasing in comparison to the last three years. Majority of the respondents (57 percent) put in plain words that demand for agroforestry products had increased in comparison to the last 3 years. 19 percent of them indicated that the demand is stable, while 10 percent of them felt that demand has decreased. Based on survey data, the majority of respondents (57 percent) indicated that price for agroforestry products has increased, 24 percent of them indicated that price is stable, while only 5 percent felt that price was less.

Market Participation

Survey reveals that almost all HHs depend upon family member for the market and marketing of products. Market products include vegetables, fruits, cereals etc. Analyzing commodity for market vegetables and fruits occupies 66.7 percent of market while vegetables only occupy 23.8 percent while 9.5 percent is occupied by cereal (maize), vegetable and fruits.

Value chain

Most of the HHs (76.2 percent) used to sell their products directly to the nearby highway based market i.e. Handikhola and Hetauda market. Few of them (23.8 percent) were selling their products within the village via local markets. The traders themselves determined the price of products. In a firewood study on Nepal, (Dhital, 2004) also reported that most of the firewood/timber buying and selling operations are transacted by the wholesalers and farmers often suffered from the low price of their products.

Barriers of marketing

Focus Group Discussion and interviews with key informants concludes and prioritizes critical resource need. For well functioning of the market, production and marketing information with skills is much essential. From the questionnaires survey or responses to the survey, it is confirmed that the respondents focus on production more than marketing and the short-term rather than long-term. Tools and equipment's (28 percent) was valued most important factor of market development. Production skill (23 percent) is second on priority while production information (20 percent) is ranked third. Nearly 14 percent of respondents valued capital after production information. Access to credit (5 percent) is valued last to market knowledge (10 percent) (Babalola & Agbenyegah, 2016) researched on impeding factors influencing Micro-Entrepreneurial Growth under rural entrepreneurship at South Africa and found that operational challenge, lack of support, workforce challenge and personal factors were significant predictors of micro-entrepreneurial growth.

The results from Bankariya community reveals that the lack of access to collection center, lack of market information, inconsistency in production/price are major impediments to market of the commodity growth and development.

Some empirical data also stated that poor access and insecure rights to land discourages small producers from producing the commodity on sustainable basis and in the surveyed area insecure right of the land mainly hinders the use of the forest products. (Ngorora & Mago, 2013) studied the challenges of rural entrepreneurship in South Africa and found the problems as lack of finance, small markets, lack of networking, distant markets, lack of

electricity; poor transport system, lack of equipment and lack of marketing initiatives hinder rural entrepreneurship/market.

VI. CONCLUSION

Bankariya community are highly marginalized indigenous group of Nepal residing in Handikhola VDC(Within Raksirang Rural Municipality) of Makawanpur Districts. The majority of households of the community has adopted agroforestry system for about a decade ago. However, the volume of the production is comparatively low. Qualitative results from the key informant interviews explored that the lifestyle and the different aid provided by the government had made them less participatory towards the production.

The community was following slash and burn practices some years ago and were solely dependent on forest-based products, however the changing scenario has created environment for them to have permanent land for farming, agroforestry as source of income. Fruits, vegetables, fodder and cereals are the agroforestry products that they are growing with livestock, which is helping them to earn livelihood. However, they are facing marketing problem of their products. The agroforestry practice of rural area like Bankariya community can be made effective with land property right, access to credit, agricultural technology, better transportation, agricultural products processing industries with better government policy that promote agroforestry systems converting slash-and-burn to modified agroforestry practices.

VII. RECOMMENDATION

Following recommendations have drawn based on this study: -

- Lack of education system found from the surveyed area therefore it is suggested that a successive education system to the lower class and a grant support is necessary for the higher education for the Bankariya family.
- Agroforestry plantation need a continued training for higher production as well as for the market management. Newly established Rural Municipalities are advised to make an integrated periodic sustainable planning for the ethnic people within the area.
- It is advised to the entire development sector to make a coordination for the programme intervention within the study area. It is advised to put in more input support for the sustainable production instead of gagged and in kind grant.
- Market management is found to be too poor for the area. Therefore, it is highly recommended for the training related to market management and communication is high in demand by the surveyed community.

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GLOSSARY

SLC: -The School Leaving certificate (SLC) was the final examination system in the secondary school system of Nepal. SLC is mandatory compulsion of its pass out for the higher secondary study or any other technical related study.

AUTHORS DETAIL: -

	<p>MR. Raju Chhetri, the main author is underway of Ph. D study (Title: <u>-A study on effectiveness of Agroforestry for livelihood in relation to Chepang community</u>) from India, published more than 6 journal articles and participated in 3 international conference related to agroforestry and Livelihood, working in the field of development sector since last two decades. Completed Secondary and Higher secondary from Kolkata, West Bengal, India and Bachelor and Master degree from Tribhuvan University, Kathmandu, Nepal currently working in UNWFP, Nepal Country Office as a Regional Head in Central Region.(E mail:-raju.chhetry@gmail.com)</p>
	<p>Mr. Pramod Prasad Dahal, co-author completed his Master degree in Agriculture (Agronomy) from AFU, Chitwan, Nepal. He has initiated many research and development project within Ministry of Agriculture and Development and currently positioned as Extension Officer in Regional Agricultural Directorate, Kathmandu within Ministry of Agriculture, Land Management and Cooperative (MoALM), Nepal. He has initiated maize integrated nutrient management in Rampur as one of the innovative research activity.(E mail:-dpramodprasad@gmail.com)</p>
	<p>Mrs. Kalpana Pokharel, co-author and a research scholar of AFU who had completed his Bachelor study from AFU, Hetuuda, Makwanpur. Kalpana had initiated many research project related to agroforestry in Makwanpur. She has experience of development field and involved in many academic research activities in Nepal and contributed her effort in national, international journal article. (E mail:-kalpana.pokharel97@gmail.com)</p>

	<p>Mr. Bishnu Maharjan, co-author completed his Master in Geographical Information Science and System (GIS) from University of Salzburg, Austria. Currently, he is working as GIS Data Management Expert at United Nations World Food Programme (UNWFP) in Nepal. Actually, his research interests include the Spatial Modelling, GIS analysis, and others, which relate to Geographical Information System (GIS) and Remote Sensing (RS). He has published one peer review international journal article entitled “Geo-spatial Analysis of Habitat Suitability for Common Leopard (<i>Panthera pardus Linnaeus, 1758</i>) in Shivapuri Nagarjun National Park, Nepal”(E mail:-ichbinbishnu@gmail.com)</p>
	<p>Mr. Saurav Suman, co- author completed his M. Tech in Water Resources Engineering from Indian Institute of Technology (IIT) Bombay, Mumbai, India in 2017. Currently, he is working as a crop yield forecast specialist at United Nations World Food Programme (UNWFP) in collaboration with CGIAR (The Consultative Group for International Agricultural Research) for national yield forecasts of major crops of Nepal. His research interests include the climate change impacts on water resources, agriculture and food security.(E mail:-saurav.suman.c2017@iitbombay.org)</p>

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