

**STUDY OF AGROFORESTRY PRACTICES AND
SOCIO-ECONOMIC ANALYSIS IN NAGRI BLOCK
OF RANCHI DISTRICT, JHARKHAND**



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**MASTER OF SCIENCE IN FORESTRY
DEPARTMENT OF SILVICULTURE & AGROFORESTRY**

**FACULTY OF FORESTRY
BIRSA AGRICULTURAL UNIVERSITY
RANCHI-834006 (JHARKHAND)**

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OF RANCHI DISTRICT, JHARKHAND**

**THESIS
SUBMITTED TO THE
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By
ROHIT KUMAR
Registration No - F/BAU/4579/2009

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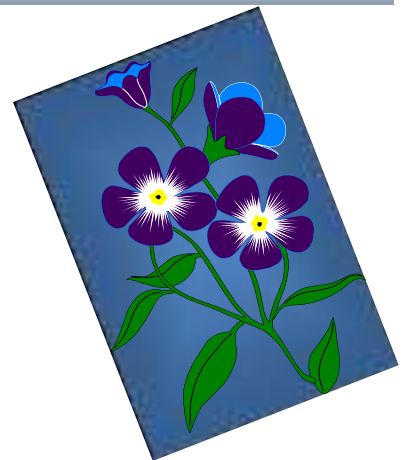


*DEDICATED TO MY
RESPECTED PARENTS*

*"Whose blessings enabled me to march
forward and sustained me to achieve
every success*

In my life"

- Rohit Kumar



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Dated

CERTIFICATE

This is to certify that thesis entitled “Study of Agroforestry Practices and Socio-economic Analysis in Nagri Block of Ranchi District, Jharkhand” submitted in partial fulfillment of the requirement for the **Degree of Master of Science in Forestry (Silviculture & Agroforestry)** of Post Graduate Studies, Birsa Agricultural University, Kanke, Ranchi (Jharkhand). It is the record of bonafide research work carried out by **Mr. Rohit Kumar** under the supervision and guidance. No part of the thesis has been submitted for any other Degree or Diploma.

It is further certified that such help or information received during the course of investigation and preparation of the thesis has been duly acknowledged.

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.....
Rohit Kumar

Place:

Date:

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ABSTRACT

The present experiment was conducted on the “Studies of agroforestry practices and socio-economic analysis in Nagri Block of Ranchi District (Jharkhand)” with the objectives 1. To survey and identify the existing agroforestry practices 2. To study the influence of agroforestry in socio economic aspects of farmers. The study was carried out Four Panchayat and Eight villages of Nagri Block these villages are Edchero and Patrachauli (Panchayat – Edchero) Khunta and Harhi (Panchayat-Saher) Lalgutuwa and Pundag (Panchayat – Lalgutuwa) Balalong and Kelende (Panchayat - Balalong).

Nagri has a humid subtropical climate. However, due to its position and the forests around the city, it is known for its pleasant climate. Ranchi used to be a preferable hill station in the past. Temperature ranges from maximum 42 to 20 °C during summer, and from 10 to 20°C during winter. December and January are the coolest months with temperature getting to freezing point in some places of the city. The annual rainfall is about 1430 mm (56.34 inches). From June to September the rainfall is about 1,100 mm. Agro climatic zone of Ranchi comes under Central and North Eastern Plateau Zone (BI-4). The lower areas provide suitable condition for paddy cultivation. The higher elevations provide condition for cultivation of pulse, vegetables and agroforestry practices. Major crops grown in the district are rice and pulses. Only 8.30 percent area of agricultural use have irrigation facility and major source of irrigations are well and canals.

The data are recorded for various parameters like Age profile, Caste profile, , Literacy status, Livestock and Poultry status, House hold status, Land holding status, and land use pattern, dependency on forest (Fuelwood and Fodder consumption pattern, annual income from agroforestry).. Average height, girth and volume measured of trees species of selected villages of Nagri Block. Economics from tree species, agriculture crop and horticulture crop under agroforestry system.

Population of male was found maximum in selected villages (75.62%) and female (24.38%). In general the trends of different caste profile are ST (60%) followed by OBC (22.5%), Gen (09.37%) and SC (08.12%). Maximum income from agriculture, horticulture, forestry, and livestock followed by private job and government service and minimum income from Remittances and Wages. People are adopting Agrisilviculture systems & few respondents adopted the Silvipasture while some other respondents are engaged in horti-pastoral activities and quite a few respondents are also having bund plantations or using tree species for boundary plantations. It is observed that maximum households are interested in adoption of agroforestry but there is lack of awareness and extension activities related to agroforestry system. There is a need for proper assistance and advance training related to agroforestry practices and modules at ground level.

India is mainly an agriculture based country and agriculture plays a great role in the national economy of the country. However, the contribution of agriculture to the GDP and incremental employment is likely to diminish day by day. The natural resources are depleting due to constant pressure by the increasing population. To feed the over increasing population appropriate production system should be developed to maximize production without deteriorating the existing resources. National Forest Policy (1988) has set a goal that 33% of the country's geographical area should be under forest and tree cover. According Forest Survey of India (2013), the forest cover in the country is 696,898km², constituting 21.23% of its total geographical area. Out of this, dense forest constitutes 2.54% and open forest 8.99%. The forest cover in the hilly district is only 38.34% compared with the desired 66% area.. India is estimated to have between 14,224 million and 24,602 million trees outside forests spread over an equivalent area of 17 million ha (Singh and Pandey, 2011). The national agriculture policy (2000) emphasized the role of agroforestry for efficient nutrient cycling, nitrogen fixation, and organic matter addition and for improving drainage and underlining the need for diversification by promoting integrated and holistic development of rainfed area on watershed basis through involvement community tegument biomass production through agroforestry and farm forestry.

Agroforestry is generally attributed to the ability to overcome problems of rural land use systems in many developing nations. The problems are mostly related to deforestation, environmental degradation, marginal crop yields, scarcity of tree products and scarcity of chemical inputs as well. Now, awareness has grown over the possibilities that agroforestry can offer to increase productivity, increase rural household security and provide regional environmental benefits. In a recent study, it is found that, the integration of tree perennials with monoculture crops, and animal rearing is considered an appropriate strategy that is capable of bringing about a balance in the ecosystem, especially in already degraded environments, and also in areas already threatened by land degradation as a result of large-scale and often uncontrolled anthropogenic activities. The combination of tree production with annual crop cultivation and sometimes with the rearing of animals on the same piece of land could enable an interaction between the combined species, which bring about stability of the soil and equally enhance increased

productivity (in terms of harvest). This system, known as agroforestry, therefore does not only ensure stability of land resources, but could also be used as a means of controlling large-scale soil erosion, reclaiming degraded lands, as well as improve food production. Agroforestry includes a wide variety of land-use systems, ranging from those in which trees are planted and managed on agricultural lands to those in which agriculture is practiced on forest lands without resulting deforestation. Many traditional systems have been developed over time through trial and error by farmers and reflect local environmental and socio-economic conditions.

Considerable work has been done over last 2-3 decades to develop agroforestry systems, by devising approaches for research and extension, and to test new systems. Agroforestry, however, is still a recent development in Forest science concerned with an integrated interdisciplinary approach to sustainable land use management system and on-farm tree management for multiple purposes. Increasing the number of tree species on farm, diversifying production and spreading crop opportunities throughout the year help to improve sustainability. Agroforestry systems go further; they lead to a more rational and complete use of soil fertility and energy, and enhance synergistic relations between crop and tree species. They also help to minimize the risk of disease and pests, and diversify economic opportunities for farmers.

“Agroforestry is a collective name for land-use system and technologies where wood interactions between their different components perennials (tree, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. (Lundgren and Raintree, 1982).”

“Agroforestry system involves basically three processes of growth, management and interactions. Growth relates to trees, crops, pastures and animals; while management refers to the effective and efficient use of climate, water, soil, plants and animals as the case may be. Interactions on the other hand refer to the tree-crop, tree-pasture, and tree-animal associations. Furthermore, when the growth of trees is combined with cultivation and sometimes with animals, it provides an essential part of an agricultural system which facilitates both productive and protective functions.(Young, 1989).”

“Agroforestry is seen by many as a solution to environmental problems, and as a sustainable enterprise that is especially suited to resource poor farmers. (Stocking, *et al*, 1990)”

“Agroforestry may be considered as ‘a woody plant revolution’ that can help in easing the destruction of the earth’s forest and woodlands, rehabilitate degraded lands, reduce deforestation and allow human beings around the world to feed themselves. (Leahey, 1994).”

“Agroforestry is an interface between forestry and agriculture and it encompasses mixed land use practices. Such practices have been developed primarily in response to the spatial needs and conditions of developing tropical countries which have not been satisfactorily addressed by advances in conventional agriculture and forestry (Spore, 2000a).”

Jharkhand is one of the youngest states of the country. The state consists of both plateau and sub-plateau region and the current agriculture scenario is quite challenging due to number of problems such as soil erosion, soil acidity, moisture deficiency and low availability of nutrients mainly phosphorus besides erratic rainfall, poor water retention capacity and permeability of soil, resulting in low agricultural productivity. Apart from this, Jharkhand is also facing the problem of increasing pressure on limited land resources especially in the rural areas. Land degradation through poor agricultural practices has greatly impacted negatively on the forest resources threatening their extinction.

Due to very small land holding and low productivity of the land most household make out a living by maintaining a diversified pattern of occupations, no single activity provide sufficient resources to entirely ensure their livelihood. To increase the agriculture productivity and to uplift the socio-economic condition of rural masses and tribal communities, there is a need of larger scale adoption of site-specific agroforestry systems along with other enterprises (like dairy, piggery, lac, apiculture, fishery, poultry, sericulture, gum, resin etc.) so that effective recycling of residue/wastes ensure better utilization of available resources and providing employment to the family labour during off season.

This study has tried to investigate how influential agroforestry practices are in terms of improving rural livelihoods. Moreover, the agroforestry systems that have been traditionally practicing only return the subsistence need of the local people and from this subsistence return; the socio-economic status has not been uplifted. The present need is the commercial and semi-commercial return from their productions and the integrated farming system so that they can get maximum benefit from the limited resources. Further agroforestry systems, identify the reasons of farmers to promote the systems, estimate

the cost-benefit analysis and assessing the impact of agroforestry system on the social as well as economic condition of the farmers.

Therefore, it is necessary to identify the existing agroforestry practices of the farmers, its relationship with socio-economic factor and identify tree species for future tree planting programmes under agroforestry at district level. Keeping these facts in view, a study is being proposed to undertake with the following objectives:

- To identify the existing agroforestry practices.
- To study the influence of agroforestry practices in the socio-economic aspect of farmers.

REVIEW OF LITERATURE

The present chapter deals with relevant literature related to the study on. A comprehensive review of literature forms the basis of scientific research. Literature on socio economic upliftment of villages through agroforestry seems to be scanty. However, literatures related to various aspects of the present study have been reviewed in this chapter under the following sub-heads.

1. Agroforestry in general
2. Economics and impact of agroforestry practices

Agroforestry in general

Kumar and Singh (2005) described the five agroforestry sites, each site was dominated by *Grewia oppositifolia*, which is the most important and common multi-purpose tree of entire region of Garhwal Himalaya. Besides other important preferred tree species in agroforestry system are *Celtis australis*, *Bauhinia* spp., *Ficus* spp., *Terminalia* spp.

Dwivedi *et al*, (2007) studied the outcome of socio-economic diagnosis of traditional as well as commercial agroforestry practices followed by farmers in western Uttar Pradesh. Tree species like *Azadirachta indica*, *Acacia nilotica*, *Dalbergia sissoo* and *Eucalyptus* spp. were dominant species in traditional system whereas, *Populus deltoides* and *Eucalyptus* spp. were the main species of commercial agroforestry. Fuel wood (50.6 %) was major driving force for agroforestry adoption followed by additional income (24.4 %) and shade (17.5 %) in traditional agroforestry region while, additional income (71.3 %) was the major factor in commercial agroforestry region.

Sharma and Sharma(2012) studied the agroforestry system ameliorated the soil by enhancing soil pH and decreasing the exchangeable aluminium content in the soil thus, helping in higher availability of native as well as applied nutrients and enhancing the crop productivity in different agroforestry systems, which ensured the livelihood security & farm income.

Chup *et al*. (2014) examined the nature of agroforestry practices, as an alternative to the conventional cropping systems. This is done not only as an alternative to the provision of food, but also as a strategy towards enhancing environmental stability. Furthermore, the study aimed at providing data on the practice of agroforestry in the

territory and therefore highlighted the extent of agroforestry in the territory as well as the socio-economic benefits derived from agroforestry, by individuals and communities at large. Data collection was done through reconnaissance survey, field observations and measurement as well as questionnaire-based interviews of 600 farmers. The study found that, more than seven out of every ten farmers were engaged in agroforestry; the agroforestry farmers were largely the indigenous populations, low income earners, of a low literate level, largely males and characterized by large family sizes; and agroforestry practices were largely the scattered tree farming (random mix), although some alley cropping and agro-silvo-pastoralism were also present.

Chakraborty *et al.* (2015) studied the socio-economic impact of cropland agroforestry in Bangladesh. 84 farmers of two sub-districts named Manirampur and Bagherpara under Jessore district in the south-west region of Bangladesh were surveyed. It follows a multistage random sampling procedure for selecting respondents, with main objective of the study is to assess the socio-economic impact of Cropland Agroforestry (CAF) on farmers' livelihood. The survey results reveal that CAF farmers' socio-economic status is better than that of Non-Cropland Agroforestry (NCAF) or monoculture farmers.

Tewari (1995) studied that man has been practicing agroforestry since he learnt the art of cultivating agricultural crops and domestication of livestock and has never stopped using trees.

Sharma (1992) observed that, in order to check the degradation of land resulting from shifting cultivation a new system called 'Taungya system' was developed and introduced in 1956 in Burma.

Nair (1993) studied that the traditional agroforestry system were practiced for a long time throughout the world. With the establishment of ICRAF(International Council of Research in Agroforestry) the ancient practice of agroforestry was institutionalised. The ICRAF with the help of global inventory contributes immensely in collecting , evaluating and disseminating information on new approaches of agroforestry system. The systems are categorized on the basis of four main criteria: these are structure, function, socio-economic aspect and ecological spread. But the primary categorization is on the basis of structure. According to the potential of agroforestry there are many different systems and the type of systems found in a particular area is determined to some extent by agro-ecological and socio-economic factors.

Vonhesmer (1966) and King (1979) reported that most of people in the tropics started their cultivation with Taungya. Taungya is said to be the start of the transition from shifting cultivation to agroforestry cultivation, and the Taungya has been developed into current diversity agroforestry methods. It is a land use system that integrates trees, field crops and animals in a way that is scientifically sound, ecologically desirable, practically feasible and socially acceptable to the farmers (Nair, 1979).

Agroforestry is a new scientific term for an old practice of land management (known as shifting agriculture) in which trees, crops, and animals interact in the same space and time (Dover & Talbot, 1987). Following shifting cultivation systems is the Taungya system. Its origin is associated with a local word of Myanmar which means mountainous cultivation. The formation of the Taungya system in the tropics is seen as a sign for later agroforestry methods (Nair, 1983).

Chauhan and Ingle (1988) studied the role of farm forestry in Akola district of Vidharba region (Maharashtra) and reported that majority of farmers have small landholding, none of the small and marginal farmers had adopted farm or agroforestry (Marwar *et al.* 1993). In Ranchi district of Chotanagpur Plateau (Bihar) the average land holding of the farmers ranges between 2.79 to 3.75 acres in all surveyed village (Jha and Ranjan, 1993).

Diagnostic survey to study awareness of farmers and existing agroforestry practices in Chotanagpur Plateau of Bihar was conducted by Jha, *et al.* (1989) and noticed that the village are increasingly realizing the importance of trees for their daily necessities and have already started planting them on agriculture and barren land and farm lands, block plantings are not being done other than tasar silkworm and lac cultivation. The survey suggested that farmers would not be averse to such innovation adopting as long as the species were multipurpose.

Saxena (1996) reported in North West India 52% of the large farmers (those owning more than 2.5 ha.) 17.5% of the small farmers (owning between 0.5 and 2.5 ha) and 5% of tiny farmers (with less than 0.5 ha) planted trees on their farm under agroforestry concept.

Oraon *et al.* (2005) observed that the people are adopting different land use practices (such as agriculture, agroforestry, home garden and fallow land) on their agricultural land, but they are not aware about the economic importance of different system. Kumharia village of Ranchi district. Agroforestry system viz. Agrisilvicultural,

sivipastoral and home garden systems and the wood volume production by *Leucaena lucocephala* under agrisilvicultural was found maximum(422.50 m³/ha).

Singh and Dagar (1996) have presented survey of agroforestry system undertaking in the Mussorie hills near Dehradun (U.P.). About 80% of landholdings were <1ha, 15% were 1-2.5 ha and 5% were 2.5-10 ha. The systems identified were agri-silviculture, agri-horticultural, agri-silvi-horticultural, silvi-pastoral and homesteads.

Agroforestry techniques offer remedy to problems affecting rural communities such as alley cropping (hedgerow intercropping of crops) or mix-intercropping with scattered *Acacia albida*, or fertilizer trees; and windbreaks or living fences (boundary planting, roadside planting, woody strips) as soil conservation measures to restore soil fertility and to provide fodder and fuel wood production (Dover & Talbot, 1987; Sanchez *et al.*, 1997).

Shah (1998) made an analysis based on data collected from the village of Bhatsan, Gujarat. The existing pattern of land use from survey data of 403 families indicated 92 families in the landless labourers category (of which about 35 were practicing agroforestry on wasteland with assistance from the Gujarat state Rural Development Corporation), and 61 families as marginal owing < 2 acre and 103 owned 2-10 acre. It is concluded that agroforestry is an ideal land-use for the rural poor.

Agroforestry as well as improved natural resources management practices has great potential to alleviate poverty, enhance food security, and solve environmental problems in developing countries (Barrett *et al.* 2002).

Agroforestry can also contribute to landscape conservation of biodiversity by creating corridors and landscape heterogeneity in multi-functional landscapes (WAC, 2006).

Agroforestry is the collective name for land use system where woody perennials and other crops and animals are deliberately used on the same unit of land in temporal and spatial arrangement for optimum crop and land productivity (Puri and Panwar, 2007). Agroforestry as a sustainable production system for food and trees products on farmland and rural development has gained importance throughout the world (Sood 2003).

Agroforestry, the word coined about two and half decades back, has made its place in the developed and the developing countries of the world. The contribution of research on agro forestry are many which include; the identification and propagation of the right trees for right environments, management practices for optimizing tree and crop

productivity, improved soil fertility, better private land management and increased tree diversity in the agricultural landscape. Research over the last 20 years has confirmed that agroforestry can be biologically more productive, more profitable and more sustainable than agriculture and forestry monoculture (Puri and Panwar, 2007).

Rasul and Thapa (2007) reported that it is essential to evaluate agricultural land-use systems from both societal and private perspectives in the pursuit of promoting particularly environmentally sustainable systems. Horticulture, timber plantation, and agroforestry, considered to be suitable land-use systems particularly for mountainous areas, held the middle ground between these two systems. Annual cash crops provided the highest financial return at the cost of a very high rate of soil erosion.

Pathak *et al.* (2013) studied that in Indo-Gangetic Plains agroforestry has played a major role in the rehabilitation of lands degraded by salinisation, ravines, gullies, and other water and wind erosion hazards in this region. The impact of agroforestry in this region is well recognized. Poplar and Eucalyptus based agroforestry and agrihorticulture systems are some of the successful models which have been adopted by farmers on large scale.

Weiwei *et al.* (2014) observed that traditional agroforestry systems already have a long history of hundreds of years in practice and still play a significant role in the world today, especially in tropical and subtropical areas. The traditional agroforestry systems have rich agricultural and associated biodiversity, multiple ecosystem services and precious socioculture values at regional and global level.

Hemrom and Nema (2015) analysed that traditional or different agroforestry systems performed by the people in different areas of Bastar region. Agroforestry models existing in Bastar region are Agrisilviculture with one of the very good combinations of trees like *Shorea robusta*, *Tectona grandis*, *Acacia* spp, *Phoenix sylvestris* etc. Agrosilvopastoral with combination of crops with trees like *Albizia* spp, *Leucaena leucocephala*, *Ficus racemosa* etc. Agri-horti-silviculture practices with many fruit trees and multipurpose trees like *Cocos nucifera*, *Caraya papaya*, *Musa acuminata*, *Mangifera indica*, *Anacardium occidentale*, *Embellica officinalis* etc.

Economics and impact of agroforestry practices

A cost-benefit analysis of some plantations with agricultural crops such as wheat, vegetables, pulses, berseams, soyabean has indicated higher profitability (Chaturvedi, 1981; Mathur and Sharma, 1983). In Indonesia, it was reported that Cassava production

per unit area increased when homegarden size decreases. The labour input was three times higher in small homegarden of 0.1 ha as compared to large homegardens of 0.3 ha (Stoler, 1978).

Several studies carried out in arid areas of Rajasthan indicated that silvipastoral system is 2 to 3.5 times more beneficial than simple grass production system (Mathana and Shankranarayan, 1978; Shankranarayan *et al.* 1987). The fodder production per unit area with the fodder grasses and fodder trees is almost always higher than fodder production from fodder grasses alone (Patil *et al.* 1979; Pathak, 1989, Deb Roy, 1990).

A cost-benefit analysis of some plantations with agricultural crops such as wheat, vegetables, pulses, berseams, soyabean has indicated higher profitability (Chaturvedi, 1981; Mathur and Sharma, 1983). In Indonesia, it was reported that Cassava production per unit area increased when homegarden size decreases. The labour input was three times higher in small homegarden of 0.1 ha as compared to large homegardens of 0.3 ha (Stoler, 1978).

Economic studies in agroforestry system have gained considerable momentum now a days, there are several factors like, demand, supply, land-use policies, marketing etc, which decides the economics of agroforestry system (Arnold, 1983, Hoekstra, 1985).

Mathur and Sharma (1983) studied the economics of poplar plantation grown by forest department on Government land and by cultivators in their own farms. The annual returns were discounted at 12%, 15%, 20% and 25%. The Net present value (NPV) per hectare in case of poplar plantation with and without agriculture in the forest land and on farmers land with agriculture at 8, 10 and 12 year rotation was calculated. The NPV and benefit/cost ratio was found maximum i.e. 11,046 and 3.22 respectively at 12% interest rate with 8 year rotation in case poplar plantation combined with agriculture on farmland as compared to Rs. 7,235 and 2.15 and Rs. 3,208 and 1.51 in case of poplar plantation with agriculture on forest land and poplar plantation without agriculture in forests land respectively. They concluded that cultivation of agriculture crop with poplar at 8 years rotation ensures high economic returns.

Sharma and Mc. Gregor (1989) found that the net socio-economic benefits from agroforestry are larger than the net financial benefits and that the socio-economic optimal tree rotation. The multiplier effects and forward & backward linkage of agroforestry in an agrarian economy such as India are enormous.

Some farmers in Gujarat obtained an income of about Rs. 3,17,500 per ha with investment of Rs. 72,500/ha giving a cost benefit ratio of 1:5. The ratio for other cash

crop, such as groundnut and cotton in the same region was only 1:2 (Jain, 1988; Sexena, 1989). In Haryana the cost benefit ratio of cultivation of *Eucalyptus* spp. was calculated as 1:33 in 1986 as against 1:1.2 for agricultural crops (Singh, 1988).

Wannawong *et al.* (1991) have studied benefit cost analysis of selected agroforestry system on Northern Thailand. The potential productivity and financial return from selected agroforestry systems and traditional monocrops located in the Phuwiang. The agroforestry system studied the combination of *Eucalyptus*, *Leucaena* and *Acacia* intercropped with *Cassava* or Mungbeans. Parameters considered were tree growth, charcoal production and crop yield. They have considered agroforestry system more preferable financially than traditional monocrops. Among the various agroforestry system, per unit area production is perhaps maximum in homegardens. Homegardens involve small land area, large labour and material inputs and usually higher return per unit area (Dwivedi, 1992).

Grewal *et al.* (1992) studied the agro-silvi-horticulture system integrating *leucaena*, lemon, papaya and turmeric on class I irrigated land provided sustainable mean net returns of Rs. 17,066 per year against from double cropped agricultural system.

Arya *et al.* (1994) have studied the beneficial and financial structure of watershed management project to rehabilitate the degraded Aravali hill area in Mohindergarh district of Haryana, India. The agriculture, animal husbandry, forestry and horticultural components of the project proved to be economically justifiable. The overall benefit-cost ratio for the whole project was 1:9.

Current *et al.* (1995) reviewed 21 agroforestry project in six Central American and two Caribbean countries and formed the empirical basis of study. The focal point of analysis was the profitability of agroforestry for farmers as a crucial incentive to adoption. The findings indicated that many agroforestry practices are profitable under a broad range of condition and are therefore, likely to be widely applicable.

The cost benefit ratio worked out by Dwivedi *et al.* (1996) in hill terrain of Nilgiris (T.N.) area for the proposed landuse is 1:2 for agrisilviculture (after 5 years). The above figures reflect that these systems are most remunerative and productive. The monocropping system like agriculture and grasses which had cost benefit ratio of 1:1.08 and 1:1.01, respectively, could not be more effective. Therefore, in such watershed agroforestry landuse system a big challenge was to raise the socio-economic status of the poor farmers.

Marawar *et al.* (1995) carried out an economic analysis of *Eucalyptus* plantation on 23.39 ha of marginal land at Central Research Farm, Akola (Maharashtra) and revealed that input output ratio was 1.04. Return was less due to sale of *Eucalyptus* as pulp wood rather than timber.

Mutnal *et al.* (2000) reported that growing of tree + fruit plants + field crops generated 46% more income compared to growing of field crops + fruit plants only. Poplar based agroforestry was economically viable and more profitable than many of the crop rotations in northern region of India. This land use system was also capable of providing employment opportunities on farms. Sensitivity analysis indicated that this system was not highly risky (Jain and Singh, 2000).

Chaturvedi and Pandey (2001) reported the economics of intercropping maize-wheat - turmeric or pigeon pea-turmeric during first 10 year of a poplar (*Populus deltoides*) plantation. The cumulative benefit -cost ratio at the end of the 10th year (after tree planting) was 5.01 with maize – wheat -turmeric and was 6.68 under pigeon pea - turmeric indicating that the latter cropping system was more profitable. However, both cropping system improve income and generate a steady cash flow for many years.

In lower Gangetic plain region, agricultural crops like paddy and wheat were grown with *Eucalyptus* hybrid under irrigated condition. 1,250 trees of *Eucalyptus* were planted per ha. Yield per ha worked out to be 1,600 kg ha⁻¹ for paddy and 1,499 kg ha⁻¹ for wheat. Sale price per kg is Rs. 4.50 for paddy and Rs. 4.00 for wheat. Expenses per ha is Rs. 5,040/- for paddy and Rs. 3,780/- for wheat. Total investment up to 10 years Rs. 86,273 per ha and total benefits is Rs. 2, 00,769 and net returns comes out to be Rs. 1,14,532. These observations depict that profits can be achieved by raising of paddy and wheat with *Eucalyptus* trees under irrigation condition Planning Commission (2003).

Planning Commission India (2003) reported that in agrihorticulture system of central Plateau & Hill regions, crops of groundnut and gram were grown with aonla (*Emblica officinalis*) under rained condition. Two hundred trees of aonla were planted per ha with intercropping of groundnut and gram, and their yield were recorded of 800 kg and 1,000 kg per ha, with sale price of Rs. 8.00 and Rs. 9.00 respectively.

Behr and Lee (2004) observed that approximately 25% of these households in Periyar Tiger Reserve Kerala also engaged in other off-farm activities. The number of persons engaged in business and government services was found very few.

Dwivedi *et al.* (2007) studied that the outcome of socio-economic diagnosis of traditional as well as commercial agroforestry practices followed by farmers in western

Uttar Pradesh. The net return from tree produce ha⁻¹ per annum in traditional system was Rs. 989, 541 and 440 for marginal, small and medium farmers, respectively. In commercial region, B: C ratio has been found higher (3.00) for poplar based agrisilviculture than poplar (2.84) and eucalyptus (2.68) based bund system. Although traditional agroforestry seems less promising as compared to commercial agroforestry, but it is also relevant to the farmers' livelihood.

Medicinal and aromatic plants are one such option, which can be introduced in existing agroforestry systems for achieving diversification and assured income. Agroforestry practices can reduce atmospheric concentration of CO₂ by increasing carbon storage in biomass, decreasing emission at source and by modifying agricultural practices to increase the quantity of carbon stored in soil organic matter (Puri and Panwar, 2007).

Anjulo (2009) studied the apple based agroforestry in Kullu district of Himachal Pradesh. It revealed that the average cost of cultivation of apple was Rs. 3,88,850.70 ha⁻¹ and the average net benefit from the orchard by selling fruit was Rs. 10,45,523 ha⁻¹. The integration of high value crop i.e. tomato, pea and French bean in the system not only offered diversification in different growing seasons but also generated surplus income without affecting the fruit yield orchard. However, there was significant loss (Rs. 57,493.92 ha⁻¹) in the old traditional system when wheat was integrated as a cereal crop under apple. The average data of two consecutive years revealed that growing of pea as a substitute crop for wheat in rabi season benefited the farmers to the tune of Rs. 2,84,676 ha⁻¹ and Rs. 5,31,966 ha⁻¹ in the kharif from the cultivation of tomato (Anjulo 2009) Hence, it is recommended that high value vegetable crops such as beans, peas, tomato, cauliflower, cabbage, broccoli as off-season vegetable can be integrated in the farm income.

Ibrahim *et al.* (2011) evaluate the tree diversity and agroforestry practices, its impact on farmer's livelihood improvement of the selected char area (Kalibari) in Mymensingh district. Ten different agroforestry practices were found under agrisilvicultural system in the char Kalibari. By the proper implementation of agroforestry practices with proper tree-crop combination the people of Kalibari Char area can improve their livelihood and socioeconomic status.

Chahal *et al.* (2012) reported that in north western gangetic plain, poplar (*Populus deltoids*) based agroforstry systems have been adopted by the farmers with wheat, oats, sorghum, maize, sugarcane, berseem, turmeric, ginger and potato. The yield

of intercrops decreases after two to three years of cultivation but this yield loss is often compensated by the sale of poplar wood at the end of rotation. In intercropping of poplar plantation with sugarcane and turmeric crops during six years of cropping period was found highly economical and resulted 2-3 times more net returns as compared to poplar sole crop as well as intercropped with wheat, oilseed/ pulses on the rabi cropping seasons.

Rahman *et al.* (2012) studied that in Padma floodplain of Bangladesh, the potential of mango-based agroforestry to improve livelihoods. Farmers with the least land were found to allocate a higher percentage of their land to agroforestry, and the increased income from agroforestry compared to other agricultural systems helps reduce relative poverty. This income maintains basic household needs, providing food security and fuelwood and contributes to healthcare, housing and sanitation conditions, and meeting educational expenses.

Natha *et al.* (2012) studied that the agroforestry system based on *Areca catechu* L. and *Piper betel* L. has been gradually developed by farmers of northern rural Bangladesh. The indigenous practices and the socio-economics of this agroforestry system, seen as a promising land use strategy in the region. Data were collected by interviewing household members and visiting their agroforestry plots as well as by focus group discussions in five villages of Panchagarh district. Results indicated that farmers allocated a portion of their farmland along with homesteads for *Areca* and *betel* - based agroforestry because they felt as it was both sustainable and profitable.

Sharma and Sharma (2012) studied that four land use system; agroforestry (LU-1), agri-horti-silvi-pastoral (LU-2), agriculture with alder (*Alnus nepalensis*) (LU-3), and shifting cultivation (slash & burn) (LU-4). Agroforestry systems ameliorated the soils by enhancing soil pH and decreasing the exchangeable aluminium content in the soil and thus, helping in higher availability of native as well as applied nutrients and enhancing the crop productivity. The agroforestry systems ensured the livelihood security and farm income.

Foysal *et al.* (2013) analysed that the homestead tree resources, their utilization pattern, economic return of major fruit and timber tree species, their management activities for sustainable production as well as constraints of homestead plantation in Fatickchari Upazila of Chittagong district. The investment analysis revealed that longer time investment on fruit and timber tree species is profitable. Lack of technical

knowledge of growing trees, unavailability of space and good quality seed / seedlings were the major constraints of homestead forestry production.

Bijalwan and Dobriyal (2014) studied in traditional Agroforestry systems in different parts of Garhwal Himalaya, India. The major traditional agroforestry systems viz. agrisilviculture (AS), agrisilvihorticulture (ASH) and agrihorticulture (AH) systems were studied with reference to change in elevation and aspects. The farmers have close relationship between the traditional agroforestry systems and their daily domestic requirements for fuel, fodder, fibre and fruits, however, the change in altitude and aspects play major role in availability of these multifarious benefits from existing agroforestry systems.

Dwivedi *et al.* (2014) studied that the outcome of socio-economic diagnosis of traditional agroforestry practices followed by farmers in Aligarh districts of Uttar Pradesh. Tree species like *Azadirachta indica*, *Acacia nilotica*, *Dalbergia sissoo* and *Eucalyptus* spp. were dominate in traditional agroforestry. Fuel wood (50.6%) was major driving force for agroforestry adoption followed by additional income (24.4%) and shade (17.5%) in traditional agroforestry region. The net return from tree produce ha⁻¹ per annum in traditional system was Rs. 989, 541 and 440 for marginal, small and medium farmers, respectively. Although traditional agroforestry seems less promising as compared to commercial agroforestry, it is much relevant to the farmers livelihood.

Gao *et al.* (2014) found that overall respondents had a neutral perception of the importance of the ecological and socio-economic benefits that agroforestry farms provide to society when compared to farms employing conventional agricultural practices. These results stress the need to increase public awareness of agroforestry practices and their benefits to more strategically position their products among the final consumer. Results also showed that females and young individuals have a greater awareness of several benefits produced by agroforestry farms. Critical marketing implications to stimulate the purchase of agroforestry products (e.g., berries, nuts) among specific groups of consumers are discussed.

Pandit and Bhattarai (2014) observed that the agroforestry has been recognized as one of the most important systems to support livelihoods of many rural farmers in the Nepalese hills. Mixed methodological approach (household survey and PRA) was used for data collection. The practice of agroforestry system has changed considerably over time, as a result of which more number of agroforestry species have appeared in private lands. The high income benefit is mainly associated with introduction of various fodder

trees and grasses in private farmlands. It is concluded that there is a great need for agroforestry system to integrate conservation benefits with livelihood of rural people.

Chakraborty *et al.* (2015) studied the socio-economic impact of cropland agroforestry in Bangladesh and surveyed 84 farmers of two sub-districts named Manirampur and Bagherpara under Jessore district in the south-west region of Bangladesh through using a questionnaire and follows a multistage random sampling procedure for selecting respondents. The main objective to assess the socio-economic impact of Cropland Agroforestry (CAF) on farmers' livelihood. The results reveal that CAF farmers' socio-economic status is better than that of Non-Cropland Agroforestry (NCAF) or monoculture farmers. The housing pattern, level of education, land and other physical assets are significantly different between CAF and NCAF farmers. The mean annual household income of the surveyed CAF farmers is Tk. 0.19 million which is significantly higher ($p < 0.05$) than that of the surveyed NCAF farmers. Household income also varies widely according to farm size and number of members in a household. The Weighted Mean Index (WMI) of five major indicators of farmer's household livelihood situation reveals that CAF farmer's household energy and food situation, affordability of education, medical and clothing expenditure is better than NCAF farmers. Therefore, this study suggests for planned expansion of cropland agroforestry for overall socio-economic development of the farmers.

MATERIALS AND METHODS

The present experiment was conducted on the “Study of agroforestry practices and socioeconomic analysis in Nagari block of Ranchi district in Jharkhand”. The technical program of the work, survey methodologies including study site, methods adopted for data analysis used in the present investigation have been discussed under the following sub heads.

3.1 General description of Ranchi

Ranchi, the capital of Jharkhand State, is located at 23.35°N latitude and 85.33°E longitude. The total geographical area of the State is 5231 sq. km. According to the 2011 census Ranchi district has a population of 2,912,022. It is located in southern part of Chotanagpur plateau. The main rivers flowing through Ranchi District are Swarnarekha, South Koel and its tributaries. There are three well-defined seasons: the hot-weather season, lasting from March to mid-June; the season of southwest monsoon rains, from mid-June to October; and the cold-weather season, from November to February. May is the hottest month. Generally, the climate of Ranchi is moderate due to hilly region and dense deciduous forest. District has 18 blocks and soil is formed from the disintegration of rocks and stones (Laterites).

3.2 Location of the site

Nagri is a small Village/hamlet near Bero Block in Ranchi District of Jharkhand State, India. It comes under Nagri Panchayath. It is located 36 KM towards west from District head quarters Ranchi. Nagri is surrounded by Mandar Block towards North, Bhandra Block towards west, Lapung Block towards South, Ratu Block towards East .

Nagri block consists of tabular landmass. It has even flat surface with isolated hillocks known as Tongri. Hills lying on west have elevation above 800 metres and those lying in east have elevation less than 75 meters. The average elevation of the district is 650 metres but western portion is relatively higher than eastern part. The entire area is full of tanrs and Dons on account of rolling topography. Tarns are the comparatively highlands and Dons are lower lands. Geologically the area is comprised with Archean granites; gneisses and schist's.

3.3 Climate

Nagri has a humid subtropical climate. However, due to its position and the forests around the city, it is known for its pleasant climate. Ranchi used to be a preferable hill station in the past. Temperature ranges from maximum 42 to 20 °C during summer, and from 10 to 20°C during winter. December and January are the coolest months with temperature getting to freezing point in some places of the city. The annual rainfall is about 1430 mm (56.34 inches). From June to September the rainfall is about 1,100 mm. Agro climatic zone of Ranchi comes under Central and North Eastern Plateau Zone (BI-4).

Agriculture and Land Use

The lower areas provide suitable condition for rice cultivation. The higher elevations provide condition for orchards and cultivation of pulse, millet and vegetables. Major crops grown in the district are rice and pulses. Only 8.30 percent area of agricultural land have irrigation facility and major sources of irrigation are well and canals.

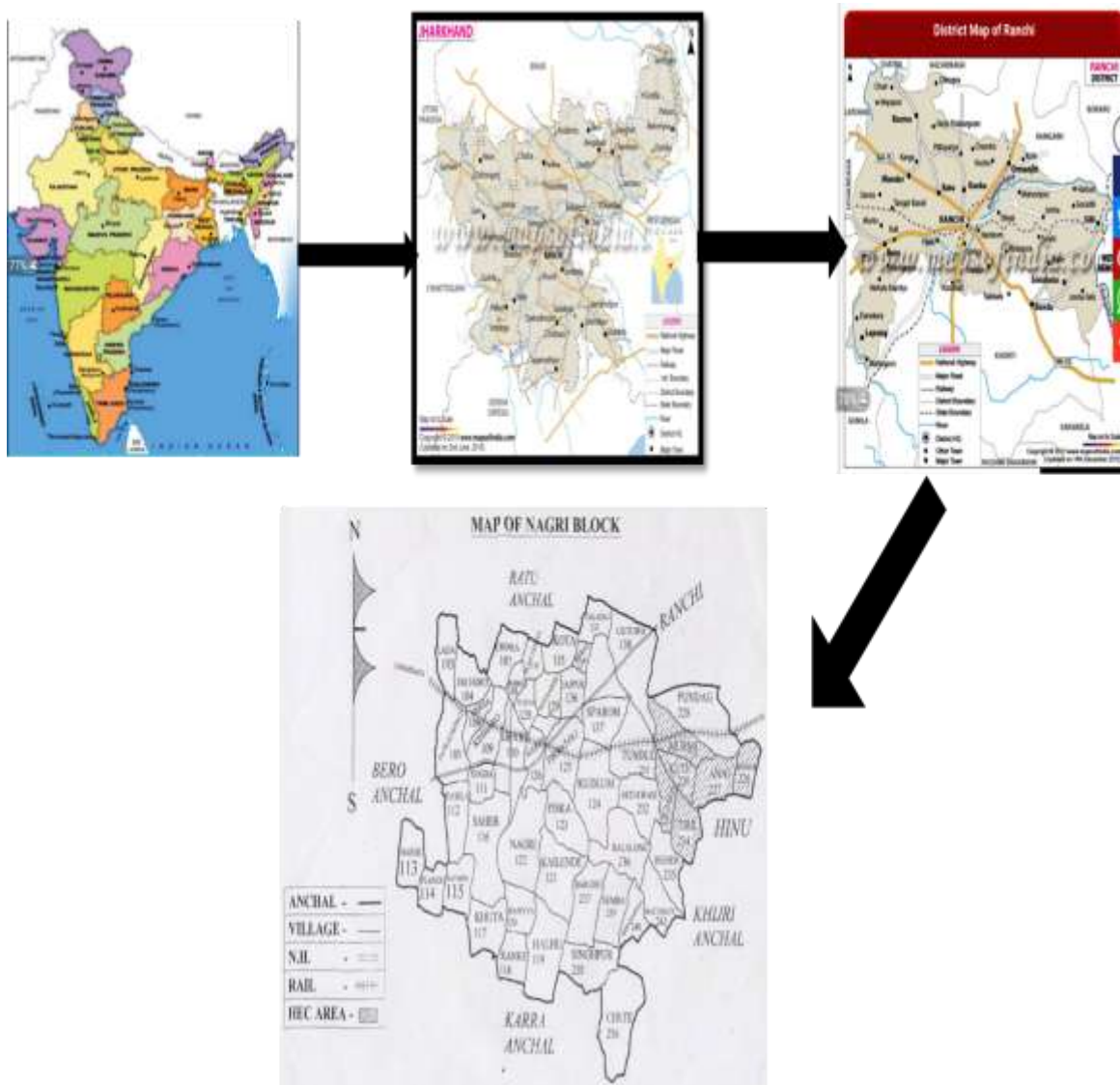
Soils:

Soils of Nagri are classified as red lateritic, loam, fine Loam and fine mixed loam soils. The soil pH ranges from 4.2 to 7.6. Majority of the area is acidic (96.4 % of TGA) in reaction. Soils of 1.2 percent area of the district are neutral whereas 0.2 percent area is slightly alkaline in reaction. The organic carbon content in the district ranges from 0.14 to 3.76 %. Soils 43.8 percent areas of the district have high organic carbon content. Medium and low organic carbon content constitutes 28.7 and 25.3 percent area respectively. Available nitrogen content in the surface soils of the district ranges between 109 and 638 kg/ha. Available phosphorus content in these soils ranges between 0.5 and 26.6 kg/ha. Soils of 40.1 percent area are low and 1.5 percent area are high in available phosphorous content. Available potassium content in these soils ranges between 49 and 941 kg/ha. Soils of 27.7 percent area are high (above 280 kg ha⁻¹) and 13.0 percent area are low (below 108kg/ha) in available potassium content.

3.8 General Profile of Nagri block

Total Area (Sq Km)	126.61
Total Urban Area (Sq Km)	22.52
Total Rural Area (Sq Km)	104.09
*Total No. of Household	14613
*Population (Total)	11189
*Population (Male)	5659
*Population (Female)	5530
*Population Below Age 7 Years (Total)	1604
*Population Below Age 7 Years (Male)	875
*Population Below Age 7 Years (Female)	729
*Literates (Total)	7490
*Literates (Male)	4217
*Literates (Female)	3273
Important River (Flowing through Circle)	Swaranrekha, Koel
Agriculture (Important Crops)	Rice, Wheat, Maize
Industries	HEC, Tasar, Rice Mills
Avg. Rain Fall Annual (In mm.)	1200
* 2011 census(Provisional data)	

3.9. Location map of the study site



3.10 Understanding the background of the problem and field investigation:

Preparation of interview schedule:

Interview schedule for respondents were prepared on the basis of literature referred, reconnaissance survey and discussion with subject mater specialist to collect information from them regarding their socio economic status, general awareness with respect to various agroforestry activities, participation in various agroforestry activities and effectiveness of motivational factors responsible for people's participation in agroforestry programmes.

Rapport building:

A good response depends to a great extent on good rapport building by researcher with respondents. The respondents were contacted and the purpose of the study was explained to them. This helped a lot in getting sincere and honest views from the respondents.

Selection of respondent:

Selection of respondents were done by multi stage random technique. Household heads were treated as respondents – engaged in agroforestry were selected as target group for the data collection.

3.11 Collection of Data

The data were collected by personal interviews of the respondents through a structured interview schedule. A part from this qualitative analysis were done on the basis of observation and interaction with the respondents. Interview was conducted preferably in isolation and the information were further cross checked by Focus Group discussion and personal observations where ever possible. Data collected on ecological characteristics, socio-economic characteristics, land use characteristics and resources/ supporting services.

3.12 Technical programme:

Number of Panchayat in the Block	:	4
Number of Villages in each Panchayat	:	2
Number of Households in each Village	:	20
Total Number of Households to be surveyed	:	$4 \times 2 \times 20 = 160$

3.13 Site of the study area

Sl. No.	Name of panchayat	Name of village -1	Name of village -2
1	EDCHERO	Edcherro	Patrachauli
2	SAHER	Khunta	Harhi
3	LALGUTUWA	Lalgutuwa	Pundag
4	BALALONG	Balalong	Kelende

3.14 Parameters studied

Various parameters for collection of data used in this survey were as follows –

3.14.1 Socio-economic characteristics of respondents

The socio-economic characters of the respondents namely total land area, population, ethnic group and religion, literacy, tenure system, source of income, farm income and infrastructure were measured. The variables were measured with the help of questionnaire developed for these purpose.

1. Age

It refers to the chronological age of the respondents at the time of data collection. Approximate age in years on the date of interview was recorded.

2. Sex

Sex was determined as per the appearance of the respondent.

3. Educational attainment

Educational attainment has been operationalized as the academic qualification of the individual which were classified into five groups namely, no schooling, elementary/primary, high school, intermediate and college. Further it is divided into gender wise i.e. male and female.

4. Ethnic group and religion

The respondents were further classified on the basis of ethnic group and religion i.e. Hindu, Muslim, Christian and others.

5. Social class :

The social class of respondents were classified as scheduled Caste, Scheduled Tribe, Backward Class and Other group.

3.14.2 Data related to income:

1. Primary occupation

The primary occupation is categories into landless agricultural labour, farming, construction worker, stone crushing, private job, government services and others (if any).

2. Secondary Occupation:

The secondary occupation was also categorized as agriculture labour, dairy, poultry, fisheries, non farm (wage carrier), stone crushing, private job, construction work and village artisans.

3. Farm size

It refers to the type of farmers on the basis of the farm size of the respondents. The farmers were classified into five groups viz. farmer having below 1ha land, 1-2 ha land, 2-4ha land, 4-10 ha land and large farmer having more than 10ha land.

4. Tenure system

It refers to ownership/users right land of the individuals respondents in the study area. It was categorized into owned land, mortgaged in/out, land sharing in/out, land sharing in/out, others (if any). The tenure systems were studied on the basis of irrigated, un-irrigated, orchard, barren land.

5. Farm labour

The type of labour employed in the farm was classified as family labour, hired labour, exchanged labour and others.

6. Livestock Utilities

This refers to the number of livestock possessed by the respondents. Different livestock are Bullock, cow, buffalo, she buffalo, goats, poultry, pigs and ducks and also mentioned the improved breeds. The utilities are expressed in term of manure, draft power, milk, meat and cash.

7. Monthly Income of the Household

Monthly income of the household has been recorded by the help of questionnaire. Income (in Rupees) was divided into seven groups namely below 1000, 1001-4000, 4001-7000, 7001-10000 and more than 10000.

8. Agricultural Crop productivity (Kg/ ha)

Agricultural crop productivity in rabi and kharif crops were recorded with the help of questionnaire. Cropping pattern in terms of sole crop, mixed crop and inter crop also mentioned as per the schedule developed for the purpose.

3.14.3 Bio-physical factors of the farm

1. Land type:

The land type i.e. percentage of total land is recorded as per the questionnaire developed. Land types are recorded in term of upland, medium land and low land. The land type of the study areas were measured by the ocular method.

2. Topography:

The topography i.e. percentage of total land in terms of flat, gentle slope, undulating and any others of the study areas were measured by ocular method. Both cultivable and uncultivable land were measured separately.

3. Land fertility class:

On the basis of productivity, the land is divided into fertile land, moderately fertile land and barren land/uncultivable land and is recorded as per questionnaire.

4. Rainfall

The percentage of land that depends on rainfall was measured in term of rainfed area and irrigated area.

5. Source of Irrigation:

The source of irrigation of the study area is categorized as river, pond, well, canal and others and it is measured as per the questionnaires.

6. Land use practices

This term refers that practices for which respondent uses his/her land. Land use practices were classified into five groups which include agriculture, horticulture, agroforestry, lac cultivation, bamboo and combination of all.

3.14.4 Agroforestry practices

The agroforestry practices in the study areas is taken as per the questionnaire developed for these purpose. The different types of queries arise are type of trees on the farm land, where the plant rise in home garden or on upland or on any others places.

1. Home garden (homestead area)

The type of trees/ crops planted in homestead areas were mentioned as per the questionnaire. These may include fruit trees (mango, jackfruit, tamarind, sahjan, jamun, sharifa, guava, ber, etc.), Vegetables (cauliflower, potato, tomato, brinjal, beans, cabbage, chilies, etc.), Timber and fodder trees/ plants (gamhar, jack-fruit, subabul, ber, shisham, fig tree, mulberry), Live hedge plants/ trees (sinduar, lantana, ratanjot, shishal), and trees for oilseed/ shade/ fuel wood (neem, karanj, akashi). Besides these, whether they planted trees and crops together in the same fields or they grow fodder crops near the tree in the field.

2. The type of crops in upland situation

The type of crops in upland situation i.e. Upland Rice / Maize / Sun hemp/ Ragi/ Black gram/ Pigeon pea, Finger millets / Small millets/ Sorghum, Kharif vegetables, and Turmeric / Ginger/ Kacchu etc. grown in the field.

3. Cropping pattern

Cropping pattern followed in the study area were recorded. It was categorized into sole crop, Mixed crop and Inter crop.

4. Crops grown as mixed/ inter crop

Crops grown as mixed/ inter crop was categorized into rice + black gram, rice + pigeon pea, rice + maize, rice + sorghum + sun hemp, maize + black gram, maize + pigeon pea, finger millet + black gram, finger millet + maize, wheat + mustard, ginger + turmeric, any other (Specify).

5. Second crop in uplands

Whether they take second crop in uplands. The type of crops in upland in Rabi season i.e. wheat/ Gram/ Tori, Pea/ Cauliflower/ Dhanial/ Tomato, any other crop (Specify) grown in their field.

6. Multipurpose tree species in fields and type of trees prefer to grow on the boundary of the field

Multipurpose tree species in fields, type of trees prefer to grow on the boundary of the field i.e. Trees for fruits (Mango, Guava, Jack fruit, Ber, Jamun, Mulberry), Trees for fodder (Mulberry, Subabool, Jack fruit), Trees for Timber purposes, Non – Timber trees for fuel, any other (Specify).

7. Purpose of Multipurpose trees

They grow multipurpose trees for fruits, fodder, timber, fuel wood, cash / income, shade for animals / men, Nitrogen fixation in the soil, any other

8. Sources of fuel at household level

Sources of fuel at household level i.e. Use cow dung, Fire wood brought from the jungles, Fire wood cut from own trees, Use coal, Use LPG gas

9. Sources of Bio-fuels

The source of bio fuels i.e. karanj, mahua, kusum, neem, jatropha and any other plants is cultivated and the use of fuel in term of cooking, lamp, massage.

10. Mode of feeding of cattle

The mode of feeding of cattle i.e. stall feeding (leaves of forest tree or agroforestry trees/ green fodder), Grazing only and both are survey as per the questionnaires developed for this purpose.

11. Sources of agricultural implements and small timber

The sources of agricultural implements and small timber from forest, own land, Purchased from the market and any other is survey as per the questionnaire.

3.14.5 Income generation from the agroforestry system

1. Availability of income generation activities at household level

The activities of farmers at household in which increase their income are measured in term of apiary, tassar rearing, lac cultivation, poultry rearing, goatery, piggery and any other.

2. Crops

In agroforestry system, the production of crops either increase or no change in production are measure as per scheduled developed.

3. Fuel wood consumption from Agroforestry

The fuel wood consumption from agroforestry system are measure in term of more than sufficient fuel wood is harvested, Moderate fuel wood is harvested and less fuel wood is harvested

4. Food Production (level of food security from Agroforestry)

The level of food security from agroforestry in term of enough food for 1 – 3 months only, enough food for 3 – 6 months only, enough food for 6 – 12 months only and enough food for > 12 months only as developed in the scheduled.

5. Fodder (duration of availability)

The duration of availability of fodder i.e. availability of green fodder for 3 months, availability of green fodder for 6 months, availability of green fodder for >6 months and availability of green fodder for > 12 months are measure as per scheduled developed.

6. Timber for the construction of house, cattle shed huts etc.

The timber for the construction of house, cattle shed huts etc. are measured in term of more than sufficient timber is produced, moderate timber is produced and timber produced is not sufficient.

7. Cash benefits received from Agroforestry system

The cash benefits received from agroforestry system are measure in term of < than Rs. 1000, 1000 to 2000, 2000 to 3000, 3000 to 4000, 4000 to 5000 and > 5000.

3.14.6 Constraints faced related to agroforestry

During practices of agroforestry system, the type of constraints faced by farmers are taken down which are in form of Non-availability of nursery in the area, Non-availability of governmental programmes to promote agroforestry practices, Non-availability of VLWs to assist in transfer of technology in the agroforestry sector and stray cattle problems.

3.15 Statistical Analysis

At the end of the survey, the relevant information was fed into the computer for analysis. Qualitative Data was analysed by using descriptive statistics and presented as means, percentages, frequency distributions, and cross tables. Statistical analyses were conducted using Microsoft Excel software. Quantitative Data Analysis was summarized into different categories to facilitate statistical analysis. The same statistical package was used and analysed by using means. Survey findings were compared on the basis of different categories.

RESULTS AND DISCUSSION

The results obtained from the study has been described and discussed separately in following parameters.

4.1 Age profile of selected Villages of Nagri block

The age profile is categorized as 20-30, 31-40, 41-50, 51-60 and more than 60 years and is shown in Table 1. Perusal of data indicated that maximum 55% respondents was found under 20-30 age profile in Balalong followed by 45% respondents were under 31-40 age profile in Edchero and least 5% were found in 51-60 age profile in Edchero, Patrachauli, Khunta, Kelende and more than 60 years in Balalong. In Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa no respondents had age profile more than 60 years. The overall data showed that 30%, 36.25%, 20.62%, 9.37%, 3.75% respondents had under 20-30, 31-40, 41-50, 51-60 and more than 60 years, respectively.

4.2. Gender classification in selected Villages of Nagri Block

The gender of the study area is shown in Table 2. Perusal of data showed that maximum respondents in all the villages were male and minimum were female respondents. The overall data showed that 75.62% respondents were male and 24.37% respondents were female.

4.3. Religion distribution in selected Villages of Nagri block

The religion of the study area is shown in Table 3. Perusal of data indicated that Hindu respondents had maximum followed Christian respondents and minimum respondents were Muslim. The overall data showed that 83.12% respondents belongs to hindu, 2.5% belongs to Muslim and 14.37% respondents belongs to Christian.

4.4. Social Class distribution in selected Villages of Nagri Block

The social class of the study area is shown in Table 4.3. The perusal of data showed that the study area was dominated by the ST category. The maximum 55%, 70%, 65%, 50%, 40%, 55%, 70%, 75% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende were belongs to ST category. The minimum 5% respondents in Patrachauli and 10% respondents in Khunta, Harhi, Lalgutuwa, Pundag, Balalong Kelende had belongs to SC whereas 15% respondents were belongs to

general category. The total data analysis also showed similar trends i.e. 9.37%, 22.50%, 60% and 8.12% respondents were belongs to General, OBC, ST and SC category, respectively.

4.5. Literacy Status in selected Villages of Nagri Block

The literacy is categories in term of no schooling, elementary, high school, intermediate and college and it is shown in Table 4.5 The perusal of data showed that among male respondents, maximum 35% male respondents had intermediate in Patrachauli and Lalgutuwa and 20% female respondents had intermediate in Pundag. Similar trends also found in case of total data analysis i.e. 6.87% (male), 5%(female), 8.12% (male), 5% (female), 25% (male), 6.87% (female), 24.37%(male), 6.25% (female) and 6.87% (male), 5% (female) respondents had no schooling, primary, high school, intermediate and college passed, respectively.

4.6. Primary Occupation status in selected Villages of Nagri Block

The primary occupation of the study area is shown in Table 6. Perusal of data showed that 95%, 90%, 100%, 85%, 60%, 70%, 65%, 75% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had primary occupation was farming whereas 5% respondents in Edchero, Patrachauli, Harhi, Kelende and 10% respondents in Balalong, 15% respondents in Lalgutuwa had primary occupation was private job. 5% respondents in Patrachauli and Harhi, 10% respondents in Lalgutuwa had primary occupation was government job. 5%, 15%, 30%, 25%, 20% respondents in Harhi, Lalgutuwa, Pundag, Balalong, Kelende had primary occupation was others (construction worker). The overall data showed that 80%, 5.62%, 2.50%, 11.87% respondents had farming, private job, government job, other (construction worker), respectively.

As per Behr and Lee (2004) approximately 25% of these households in Periyar Tiger Reserve Kerala also engaged in other off-farm activities. The number of persons engaged in business and government services was found very few.

4.7. Status of Secondary Occupation in selected Villages of Nagri Block

The secondary occupation is categorized into agri labour, dairy/poultry, artisan, private job, construction worker, stone crushin and it is shown in Table 7. The perusal of data showed that in Edchero, 25%, 25%, 10%, 40% respondents were engaged in agri labour, dairy/poultry, artisans and stone crushing respectively. In Patrachauli, 30%, 20%,

5%, 10%, 35% respondents were engaged in agri labour, dairy/poultry, artisans, private job, construction worker and stone crushing, respectively. In Khunta, 25%, 30%, 15%, 30% respondents were engaged in agri labour, dairy/poultry, private job and stone crushing, respectively. In Harhi, 35%, 40%, 10%, 15% respondents were engaged in agri labour, dairy/poultry, artisans and stone crushing, respectively. In Lalgutuwa, 30%, 35%, 5%, 15%, 15% respondents were engaged in agri labour, dairy/poultry, artisans, private job and stone crushing, respectively. In Pundag, 35%, 25%, 15%, 25% respondents were engaged in agri labour, dairy/poultry, private job and stone crushing, respectively. In Balalong, 35%, 20%, 25%, 5%, 15% respondents were engaged in agri labour, dairy/poultry, private job, construction worker and stone crushing, respectively. In Kelende, 40%, 25%, 15%, 20% respondents were engaged in agri labour, dairy/poultry, private job, construction worker, respectively. The total analysis showed that 31.87%, 27.50%, 3.75%, 11.87%, 3.12%, 21.87% respondents were engaged in agri labour, dairy/poultry, artisans, private job, construction worker and stone crushing, respectively.

4.8. Farm Size of respondents of selected Villages of Nagri Block

The farm size of the study area is shown in Table 8. Perusal of data showed that maximum respondents had 1-2 ha farm size which was followed by 3-4ha farm size and minimum respondents had below 1 ha land. 60-85% respondents had 1-2 ha land. Maximum 85% respondents in Pundag and Kelende had 1-2 ha farm size. 8.12%, 76.25%, 15.62% respondents had below 1 ha, 1-2ha, 3-4 ha farm size, respectively. Similarly study has been carried out by Dwivedi *et.al.* (2007) the marginal farmers had an average land holding of 0,71 ha, the small farmers had land holding of 3.14 ha while the medium to large farmers had land holding size of 3.46 ha, thus the overall holding size of the sample farmers in Aligarh district was 1.52 ha.

4.9. Land tenure of Farmerrs in selected Villages of Nagri Block

The land tenure of the study area is shown in Table 9. Perusal of data showed that 100%, 95%, 90%, 90%, 100%, 85%, 95%, 90% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had owned land whereas, 5% respondents in Khunta and Balalong, 10% respondents in Harhi and Kelende, 15% respondents in Pundag had land on sharing (in/out). 94.80% respondents had owned land and 5.62% respondents had land sharing (in/out).

4.10. Status of Irrigated Land in selected Villages of Nagri Block

The irrigated land of the study area is shown in Table 10. Perusal of data indicated that 45%, 35%, 60%, 10%, 5%, 5%, 20%, 25% respondent in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had below 1 ha irrigated land whereas 55%, 60%, 40%, 90%, 85%, 85%, 70%, 65% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 1-2 ha irrigated land and 5% respondent in Patrachauli and 10% respondents in Lalgutuwa, Pundag, Balalong, Kelende had 3-4 ha irrigated land. Most of the respondents had 1-2 ha irrigated land. The overall data showed that 25.63%, 70%, 4.37% respondents had below 1ha, 1-2 ha, 3-4 ha, respectively.

4.11. Unirrigated Land status in selected villages of Nagri Block

The unirrigated land of the study area is shown in Table 11. Perusal of data showed that 100% respondents in Edchero, Patrachauli, Harhi, 95% respondents in Khunta, Pundag, Balalong, Kelende and 90% respondents in Lalgutuwa had below 1ha unirrigated land whereas, 5% respondents in Khunta, Pundag, Balalong, Kelende and 10% respondent in Lalgutuwa had 1-2ha unirrigated land. The overall data showed that 96.25% respondents had below 1 ha unirrigated land and 3.75% respondents had 1-2 ha unirrigated land.

4.12. Status of Barren land in selected Villages of Nagri Block

The barren land of the study area is shown in Table 12. Perusal of data showed that 100% respondents in Edchero, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende and 95% respondents in Patrachauli had below 1ha barren land whereas 5% respondents in Patrachauli had 1-2ha barren land. The overall data showed that 98.75% respondents had below 1 ha barren land and 1.25% respondents had 1-2 ha barren land.

4.13. Labour Availability & Utilization in selected Villages of Nagri Block

The labour availability and utilization is shown in Table 13. Perusal of data showed that 85%, 90%, 80%, 75%, 75%, 80%, 85%, 70% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had family owned labour whereas 15%, 10%, 20%, 25%, 25%, 20%, 15%, 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had hired labour. The overall data showed that 80% respondents had family owned labour and 20% respondents had hired labour.

4.14. Livestock utilities in selected Villages og Nagri block

The livestock utilities of the study area is shown in Table 14. Perusal of data showed that maximum 95% respondents in Khunta had one or more than one bullock followed by 90% respondents in Harhi and Edchero and minimum 60% respondents had one or more than one bullock.

Maximum 75% respondents in Edchero had 1-5 cows followed by 70% respondents in Kelende and minimum 5% respondents in Khunta had above 5 cows. Very few respondents i.e. 15% respondent in Balalong, 10% respondents in Edchero, Harhi, Lalgutuwa, Kelende and 5% respondents in Khunta had more than 5 buffalo. The overall data showed that 32.50%, 60.00%, 7.50% respondents had 0, 1-5, and more than 5 cows, respectively.

Maximum 20% respondents in Kelende had buffaloes one and above 5 followed by 15% respondents in Edchero, Harhi, Balalong and minimum 5% respondents in Patrachauli, Khunta, Pundag had buffaloes above 5. The overall data showed that only 11.25% respondents had one and above 5 buffaloes.

Maximum 85% respondents in Edchero had 1-6 numbers of she buffalo followed by 20% respondents in Lalgutuwa, Balalong and minimum 5% respondents in Patrachauli, Kelende had 1-6 numbers of she buffaloes. The overall data showed that only 19.37% respondents had 1-6 number of she buffaloes.

Maximum 35% respondents in Edchero had 1-4 nos. of goats followed by 25% respondents in Khunta, Balalong and minimum 5% respondents in Harhi, Kelende had above 5 goats. Very few respondents i.e. 15% respondent in Patrachauli, Balalong had above 5. The overall data showed that 68.78%, 21.25%, 10% respondents had 0, 1-4, and above 5 goat, respectively.

Maximum 35% respondents in Harhi had 1-5 and above 5 nos. of poultry followed by 30% respondents in Patrachauli and minimum 10% respondents in Lalgutuwa had 1-5 and above 5 nos. of poultry. The overall data showed that only 22.50% respondents had 1-5 and above 5 poultry.

Maximum 15% respondents in Lalgutuwa had duck 1-5 and above 5 followed by 10% respondents in Khunta and minimum 5% respondents in Edchero, Harhi, Pundag, Balalong, Kelende had ducks 1-5 and above 5. The overall data showed that only 6.25% respondents had 1-5 and above 5 ducks.

4.15. Mode of Livestock Utilization in selected Villages of Nagri Block

The mode of livestock utilization in the study area is shown in Table 15. Perusal of data showed that 100% respondents had mode of livestock utilities was as manure and as draft power whereas, 95% respondents in Edchero, Patrachauli, 90% respondents in Pundag, 85% respondents in Khunta, 80% respondents in Harhi, Balalong, Kelende and 75% respondents in Lalgutuwa had used as milk. 35%, 15%, 25%, 40%, 45%, 40%, 30%, 35% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had used for meat purpose. The overall data showed that 100%, 100%, 86.25%, 33.12% respondents had mode of livestock utilities was as manure, draft power, milk, and meat, respectively.

4.16. Topography of the land in selected Villages of Nagri Block

The topography of the land is shown in Table 16. Perusal of data showed that 50% < 55%, 45%, 45%, 35%, 40%, 45%, 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had upland whereas, 35%, 40%, 40%, 55%, 25%, 45%, 45%, 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had medium land and 75%, 85%, 90%, 95%, 85%, 90%, 95%, 90% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had low land. The overall data showed that 46.25%, 40%, 90% respondents had upland, medium land and low land, respectively.

4.17. Total Rainfed Area Assumed 100% in Nagri Block

Total rainfed area of the study area is shown in Table 17. Perusal of data showed that 5% respondents in Edchero, Patrachauli, Khunta, Balalong, Kelende, 10% respondents in HARHI, and 25% respondents in Lalgutuwa had 41-60% rainfed area whereas 20%, 60%, 15%, 20%, 35%, 25%, 35%, 10% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 61-80% rainfed area and 75%, 35%, 80%, 70%, 40%, 75%, 60%, 85% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 81-100% rainfed area. The overall data showed that 7.5%, 27.50%, 65% respondents had 41-60%, 61-80%, 81-100% rainfed area whereas no respondents had 0%, 1-20%, 21-40% rainfed area in the study area.

4.18. Irrigated area Assumed 100% (% of land depend on irrigation) in Nagri Block

Total irrigated area of the study area is shown in Table 17. Perusal of data showed that 40%, 10%, 10%, 15%, 5%, 5%, 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Kelende had 0% irrigated land whereas, 50%, 50%, 75%, 75%, 45%, 75%, 70%, 60% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 1-20% irrigated land. 10%, 40%, 15%, 10%, 50%, 20%, 25%, 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 21-40% irrigated land and 5% respondents in Balalong and Kelende had irrigated land. The overall data showed that 14.37%, 62.50%, 21.87%, 1.25% respondents had 0%, 1-20%, 41-60% irrigated area, respectively.

4.19. Soil fertility class in selected villages of Nagri Block (on the basis of productivity)

The soil fertility class (on the basis of productivity) is shown in Table 19. Perusal of data showed that 60%, 65%, 60%, 60%, 55%, 25%, 65%, 50% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had fertile land whereas, 35% respondents in Edchero, Patrachauli, Khunta, Lalgutuwa, Balalong, 30% respondents in Harhi, 45% respondents in Kelende and 75% respondents in Pundag had moderately fertile land. 5% respondents in Edchero, Khunta, Kelende and 10% respondents in Harhi, Pundag had barren land / uncultivated land. The overall data showed that 55%, 40.62%, 4.37% respondents had fertile land, moderately fertile land and barren land / uncultivated land, respectively.

4.20. Source of Irrigation in selected villages of Nagri Block

The source of irrigation of the study area is shown in Table 20. Perusal of data showed that river, pond and well are the main source of irrigation in the study area. Well is available in all the villages whereas pond is source of irrigation in all the villages except in Khunta and Lalgutuwa. In Khunta, Harhi, Pundag, Kelende has no river so their source of irrigation either pond or well.

4.21. Land use practices in Agriculture in selected villages of Nagri Block

The land use practices in agriculture of the study area is shown in Table 21. Perusal of data showed that 5% respondents in Pundag, Balalong, Kelende had no land used in agriculture. 45%, 70%, 55%, 40%, 40%, 35%, 60%, 45% respondents in

Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had below 1ha land for agriculture used whereas 40%, 25%, 45%, 55%, 60%, 60%, 30%, 45% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 1-2 ha land used in agriculture. Very few respondents i.e. 10% respondent in Edchero and 5% respondents in Patrachauli, Harhi, Balalong, Kelende had above 2 ha land used for agriculture. The overall data showed that 2.50%, 48.75%, 45%, 3.75% respondents had 0ha, below 1ha, 1-2 ha and above 2 ha land used in agriculture

Almost similar observation had been reported by Rasid (2002) in Bangladesh indicated that involvement in agriculture in most household's are the primary occupation found in observation about 63% of household depend on one form of agriculture or another ranging from agriculture producing crops on their own land to selling labour for agriculture, 59% of occasionally poor household depend upon agriculture production on their own land, 23 % depend upon on a combination of production from their own land and sharecropping, while 44% of the always poor household work primarily as agriculture labourers in Bangladesh.

4.22. Land use practices in Agroforestry in selected villages of Nagri Block

The land use practices in agroforestry of the study area is shown in Table 22. Perusal of data showed that 20%, 25%, 35%, 40%, 45%, 20%, 15%, 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had no land used for agroforestry whereas 80%, 75%, 65%, 60%, 55%, 90%, 85%, 80% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had below 1 ha land used for agroforestry. The overall data showed that 27.50% respondents had no land used for agroforestry and 72.50% respondents had below 1ha land used for agroforestry.

4.23. Land use practices in Horticulture in selected villages of Nagri Block

The land use practices in horticulture of the study area is shown in Table 23. Perusal of data showed that 15%, 15%, 35%, 20%, 10%, 10%, 25%, 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had no land used for horticulture purposes whereas 85%, 80%, 65%, 75%, 90%, 85%, 75%, 65% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had 0.5-1.0ha land used in horticulture. Only 5% respondents in Patrachauli, Harhi, Pundag, Kelende had above 1 ha land used for horticulture. The overall data

showed that 20%, 77.50%, 2.50% respondents had 0 ha, 0.5-1.0 ha and above 1ha land used in horticulture.

4.24. Land use practices in Bamboo in Nagri Block

The land use practices in bamboo of the study area is shown in Table 24. Perusal of data showed that 50%, 60%, 65%, 55%, 75%, 85%, 60%, 65% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had no land used for bamboo whereas 50%, 40%, 35%, 45%, 25%, 15%, 40%, 35% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had below 1 ha land used for bamboo. The overall data showed that 64.37% respondents had no land used for bamboo and 35.63% respondents had below 1ha land used for bamboo.

4.25. Status of Fallow land in selected Villages of Nagri Block

The fallow land of the study area is shown in Table 25. Perusal of data showed that 75%, 80%, 85%, 70%, 70%, 45%, 40%, 60% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had no fallow land whereas 25%, 20%, 15%, 30%, 30%, 55%, 60%, 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, pundag, Balalong, Kelende had below 1 ha fallow land. The overall data showed that 65.62% respondents had no fallow land and 34.38% respondents had below 1ha fallow land.

4.26. Households having trees on their land in selected Villages of Nagri block

Household having trees on their land is shown in Table 26. Perusal of data showed that 100% respondents in Patrachauli, Khunta, Lalgutuwa, Balalong, Kelende had trees on their land whereas 95% respondents in Edchero and Harhi and 90% respondents in Pundag had trees on their land. The overall data showed that 97.50% respondents had trees on their land.

4.27. Tree planted by household of selected Villages of Nagri Block

The tree planted by household of the study area is shown in Table 27. Perusal of data showed that 75%, 80%, 85%, 85%, 75%, 85%, 80%, 70% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had home garden whereas 20%, 20%, 15%, 10%, 25%, 5%, 20%, 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had upland (tanr). 5% respondents in Edchero and Harhi and 10% respondents in Pundag had no tree

planted by household. The overall data showed that 79.37% respondents had home garden, 18.12% respondents had upland (tanr) and 2.50% respondents had no tree planted by household.

4.28. Fruit trees grown by household in selected Villages of Nagri Block

Fruit trees grown by household is shown in Table 28. Perusal of data showed that maximum 100% respondents in Patrachauli had mango tree followed by 95% respondents in Edchero, Khunta, Balalong had mango tree and minimum 80% respondents in Lalgutuwa had mango tree. Maximum 85% respondents in Khunta had jackfruit tree followed by 80% respondents in Patrachauli and Pundag and minimum 35% respondents in Balalong had jackfruit. Maximum 25% respondents in Patrachauli and Kelende had tamarind tree followed by 20% respondents in Edchero and minimum 5% respondents in Khunta had tamarind tree. 40%, 50%, 65%, 40%, 45%, 70%, 85%, 35% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had sahjan tree. Maximum 15% respondents in Balalong had jamun tree followed by 10% respondents in Edchero, Patrachauli, Lalgutuwa and minimum 5% respondents in Khunta, Pundag had jamun tree. Maximum 15% respondents in Patrachauli, Kelende had sharifa tree followed by 10% respondents in Edchero, Lalgutuwa and minimum 5% respondents in Pundag, Balalong had sharifa tree. 55%, 40%, 35%, 65%, 60%, 80%, 35%, 75% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had Guava tree whereas 40%, 30%, 35%, 15%, 20%, 30%, 20% respondents in Edchero, Patrachauli, Khunta, Lalgutuwa, Pundag, Balalong, Kelende had ber. The overall data showed that 91.25%, 67.50%, 12.50%, 53.75%, 6.87%, 7.50%, 55.62%, 23.75% respondents had mango, jackfruit, tamarind, sahjan, sharifa, guava, ber, respectively.

4.29. Timber and fodder tree/plant grown by households of Nagri Block

Timber and fodder tree /plant is shown in Table 29. Perusal of data showed that maximum 60% respondents in Edchero had gamhar tree followed by 55% respondents in Patrachauli, Harhi and minimum 30% respondents in Pundag had gamhar tree. Maximum 70% respondents in Edchero had kathal tree followed by 65% respondents in Patrachauli and minimum 40% respondents in Lalgutuwa had kathal tree. 15%, 10% and 5% respondents in Lalgutuwa, Edchero, Khunta had subabul respectively. Maximum 35% respondents in Edchero had ber followed 30% respondents in Patrachauli and

minimum 15% respondents in Khunta had ber tree. Maximum 55% respondents in Edchero had shisham tree followed 50% respondents in Patrachauli, Harhi and minimum 30% respondents in Lalgutuwa had shisham tree. 45%, 55%, 75%, 60%, 65%, 85% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had teak tree whereas 15% respondents in Edchero and Balalong, 10% respondents in Lalgutuwa and 5% respondents in Harhi had mulberry tree. The overall data showed that 45.62%, 57.50%, 3.75%, 18.12%, 44.37%, 63.12%, 5.62% respondents had gamhar, kathal, ber, shisham, teak, mulberry tree, respectively.

4.30. Tree for oil seed/shade/fuel wood grown by household of Nagri Block

Tree for oil seed/shade/fuel wood grown by household is shown in Table 30. Perusal of data showed that 40%, 35%, 25%, 40%, 55%, 25%, 25%, 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had neem tree whereas, 15%, 5%, 5%, 15%, 10%, 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Pundag, Kelende had karanj tree. 10% respondents in Harhi, Lalgutuwa and 5% respondents in Edchero, Khunta, Kelende had Akashi tree. The overall data showed that 33.12%, 6.57%, 4.37% had neem, karanj and Akashi tree, respectively.

4.31. Live hedge plant/tree grown by households of Nagri Block

Live hedge plant/tree grown by households is shown in Table 31. Perusal of data showed that maximum 35% respondents in Patrachauli had lantana as live hedge plant which was followed by 30% respondents in Edchero, Lalgutuwa and minimum 20% respondents in Kelende had lantana as live hedge plant whereas, 5% respondents in Edchero, Khunta, Pundag had shishal tree as live hedge plant. The overall data showed that 26.87% respondents had lantana and 1.87% respondents had shishal tree as live hedge plants.

4.32. Households growing (tree + crops together) and Fodder in Nagri Block

Households growing (tree + crops together) and Fodder of the study area is shown in Table 32. Perusal of data showed that 25%, 40%, 20%, 30%, 25%, 20%, 45%, 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, BALALONG, Kelende had households grow tree + crop together in the field whereas, 15%, 15%, 20%, 15%, 10%, 10%, 15% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong had households grow fodder crops in field. The

overall data showed that 28.12% respondents had households grow tree + crop together in the field and 12.50% respondents had households grow fodder crops in field.

4.33. Households growing Multipurpose tree in their field

Households growing Multipurpose tree in their field is shown in Table 33. Perusal of data showed that 15%, 20%, 25%, 30%, 20%, 25%, 35%, 25% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had multipurpose trees in their field. The overall data showed that 25.62% respondents had multipurpose trees in their field.

4.34. Tree for timber purpose

Tree for timber purpose is shown in Table 34. Perusal of data showed that 10% respondents in Balalong and 5% respondents in Edchero, Patrachauli, Khunta, Pundag, Kelende had shisham tree for timber purpose whereas 10% respondents in Khunta, Pundag and 5% respondents in Edchero, Patrachauli, Harhi, Lalgutuwa, Balalong, Kelende had gamhar trees and 25% respondents in Harhi, 20% respondents in Balalong, 15% respondents in Edchero, Lalgutuwa, Kelende, 10% respondents in Patrachauli, Khunta, Pundag had teak trees for timber purpose. The overall data showed that 4.37%, 6.25%, 15% respondents had shisham, gamhar and teak trees, respectively for timber purposes.

4.35. Existing Agroforestry modules in selected Villages of Nagri Block

Existing Agroforestry modules in the study area is shown in Table 35. Perusal of data showed that five types of agroforestry modules showed in the study area i.e. agri silviculture (trees in field), silvi pasture, horti pastoral, bund plantation, homestead garden. Maximum 15% respondents in Balalong had agri silviculture (trees in field) followed by 10% respondents in Edchero, Khunta, Harhi, Kelende and minimum 5% respondents in Patrachauli and Pundag had agri silviculture (trees in field) whereas, maximum 20% respondents in Khunta had silvi pasture followed by 15% respondents in Edchero, Patrachauli, Harhi and minimum 5% respondents in Lalgutuwa, Kelende had silvi pasture. 25% respondents in Edchero had horti pastoral followed by 20% respondents in Khunta, Kelende and minimum 10% respondents in Harhi, Lalgutuwa, Pundag had horti pastoral. Maximum 30% respondents in Harhi had bund plantation followed by 25% respondents in Kelende and minimum 15% respondents in Patrachauli, Lalgutuwa, Balalong had bund plantation. 85%, 80%, 80%, 85%, 60%, 75%, 75%, 75%

respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had homestead garden in the study area. The overall data showed that 8.12%, 10.62%, 15.62%, 20%, 76.87% respondents had agri silviculture (trees in field), silvi pasture, horti pastoral, bund plantation, homestead garden, respectively.

4.36. Fuel wood generated from agroforestry

Fuel wood generated from agroforestry in the study area is shown in Table 36. Perusal of data showed that maximum 85% respondents in Patrachauli, Lalgutuwa, Pundag had less fuel wood harvest followed by 75% respondents in Edchero, Balalong and minimum 15% respondents in Patrachauli, Pundag had sufficient fuel wood harvest. The overall data showed that 24.37% respondents had sufficient fuelwood harvest and 75.63% respondents had less fuel wood harvested. No respondents of the study area was found more than sufficient wood harvest.

4.37. Food production from agroforestry

Food production from agroforestry is shown in Table 37. Perusal of data showed that maximum 60% respondents in Lalgutuwa had enough food for 3-6 month only followed by 55% respondents in Pundag had enough food for 3-6 months and 55% respondents in Harhi had enough food for 3-6 month only and minimum 10% respondents in Pundag had enough food for 1-3 month only. No respondents were found for enough food for more than 12 months. The overall data showed that 10.62%, 43.12%, 46.2% respondents had enough food for 1-3 month only, 3-6 months only, 6-12 months only, respectively.

4.38. Fodder Availability in selected Villages of Nagri Block

Fodder Availability in the study area is shown in Table 38. Perusal of data showed that maximum respondents had no availability of green fodder. Maximum 65% respondents in Kelende had no fodder followed by 60% respondents in Lalgutuwa, Pundag and minimum 5% respondents in Harhi had availability of fodder for 6 month only. The overall data showed that 18.12%, 15%, 18.75%, 48.12% respondents had 3 month, 6month, more than 6 month and none availability of green fodder, respectively.

4.39. Timber production from agroforestry in Nagri Block

Timber production from agroforestry is shown in Table 39. Perusal of data showed that maximum 85% respondents in Edchero, Khunta, Lalgutuwa, Kelende had insufficient quantity of timber produces followed by 80% respondents in Patrachauli, Pundag, Balalong and minimum 15% respondents in Edchero, Khunta, Lalgutuwa, Kelende had moderate timber produce. No respondents had more than sufficient timber is produced. Overall data showed that 18.12% respondents had moderate timber produce and 81.88% respondents had insufficient timber produce.

4.40. Constraints faced (if any) related to agroforestry in selected Villages of Nagri Block

Constraints faced related to agroforestry is shown in Table 40. Perusal of data showed that maximum 45% respondents in Edchero had non availability of govt. Programme to promote agroforestry followed by 40% respondent in Patrachauli had non availability of govt. Programme to promote agroforestry and in Harhi and Balalong had non availability of VLW to assists in agroforestry and minimum 5% respondents in Lalgutuwa had non availability of nursery area. The overall data showed that 13.12%, 34.37%, 30.00% and 23.12% respondents had non availbality of nursery area, non availability of govt. Programme to promote agroforestry, non avialbility of VLW to assists in agroforestry, stray cattle problems is always there.

4.41. Crop Yield during Kharif (Kg/ha) in selected Villages of Nagri Block

Crop Yield during Kharif (Kg/ha) is shown in Table 41. Perusal of data showed that maximum 70% respondents in Patrachauli had 3751-5000 kg/ha kharif crop yield followed by 65% respondents in Harhi had 3751-5000 kg/ha kharif crop yield and minimum 5% respondents in Pundag, Balalong had 2500-3750 kg/ha kharif crop yield. The overall data showed that 7.50%, 53.75%, 38.75% respondents had 2500-3750, 3751-5000, 5001-6250 kharif crop yield (kg/ha), respectively.

4.42. Cropping pattern during Kharif crops in selected Villages of Nagri Block

Cropping pattern during Kharif crops is shown in Table 42. Perusal of data showed that 100%, 95%, 90%, 95%, 100%, 100%, 100%, 95% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had kharif sole crop only. The overall data also showed similar trends i.e. 96.87% respondents had kharif sole crops in the study area and only 3.12% respondents had kharif mixed crops.

4.43. Crop Yield during Rabi (Kg/ha) in selected Villages of Nagri Block

Crop Yield during Rabi (Kg/ha) is shown in Table 43. Perusal of data showed that maximum 80% respondents in Harhi had 5001-6250 kg/ha rabi crop yield followed by 75% respondents in Edchero and minimum 5% respondents in Edchero, Kelende had 2500-3750 kg/ha rabi crop yield and Patrachauli, Lalgutuwa, Balalong, Kelende had 6251-7500 kg/ha rabi crop yield. The overall data showed that 8.12%, 30%, 55%, 6.87% had 2500-3750, 3751-5000, 5001-6250, 6251-7500 rabi crop yield, respectively.

4.44. Cropping pattern during Rabi crops in selected Villages of Nagri Block

Cropping pattern during Rabi crops is shown in Table 44. Perusal of data showed that 75% respondents in Lalgutuwa, Pundag had sole crop followed by 60% respondents in Patrachauli, Kelende had sole crop and minimum 5% respondents in Edchero, Pundag, Kelende had inter crop. The overall data showed that 59.37%, 35% and 5.62% respondents had sole crop, mixed crop, inter crop, respectively.

4.45. Vegetables grown by household in Nagri Block

Vegetables grown by household is shown in Table 45. Perusal of data showed that 100%, 100%, 100%, 90%, 85%, 80%, 100%, 80% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had cultivated cauliflower whereas 100% respondents in Edchero, Patrachauli, Khunta, Harhi, Balalong and 95% respondents in Pundag, 90% respondents in Kelende, 80% respondents in Lalgutuwa had cultivated potato. 100% respondents in Edchero, Khunta, Harhi, Balalong, 95% respondents in Patrachauli and Pundag, 80% respondents in Lalgutuwa, 75% respondents in Kelende had cultivated tomato. 100% respondents in Edchero, Khunta, 90% respondents in Patrachauli, 85% respondents in Harhi, 80% respondents in Lalgutuwa, Kelende, 70% respondent in Pundag and 65% respondents in Balalong had cultivated brinjal. 40%, 45%, 35%, 40%, 15%, 15%, 35% and 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated bean whereas, 50%, 75%, 45%, 70%, 5%, 50%, 80% and 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag and Balalong, Kelende had cultivated cabbage. 90%, 85%, 75%, 90%, 60%, 40%, 50% and 55% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated chillies by the household. The overall data showed that 91.87%, 95.62%,

93.12%, 83.75%, 31.87%, 56.87%, 68.12% respondents had cauliflowers, potato, tomato, brinjal, bean, cabbage, chillies, respectively.

4.46. Type of crops grown in upland situations in Nagri block

Type of crops grown in upland situations is shown in Table 46. Perusal of data showed that 70%, 80%, 55%, 65%, 75%, 70%, 75% and 70% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had cultivated rice whereas 25%, 20%, 20%, 25%, 10%, 15%, 15%, 10% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had cultivated maize. 15%, 20%, 10%, 10%, 5% respondents in Edchero, Patrachauli, Khunta, Balalong, Kelende had cultivated figure millet. 25%, 15%, 15%, 20%, 10%, 15%, 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Pundag, Balalong, Kelende had cultivated pigeon pea. 20%, 25%, 15%, 20%, 15%, 20%, 10%, 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had cultivated kharif vegetable. 25%, 30%, 20%, 25%, 10%, 10% respondents in Edchero, Patrachauli, Khunta, Harhi, Pundag, Balalong had cultivated turmeric. 40%, 30%, 35%, 25%, 10%, 20%, 5%, 25% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong, Kelende had cultivated ginger and 20%, 25%, 35%, 15%, 20%, 15%, 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong had cultivated colocassia. Sunhemp, black gram, finger millet, small millets, sorghum were not cultivated in the upland situation of the study area. The overall data showed that 70%, 17.50%, 7.50%, 15%, 17.50%, 15%, 23.75%, 16.87% respondents had rice, maize, figure millet, pigeon pea, kharif vegetable, turmeric, ginger, colocassia, respectively.

4.47. Cropping pattern adopted in selected Villages of Nagri block

Cropping pattern of the study area is shown in Table 47. Perusal of data showed that 100% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had sole cropping pattern whereas 10% respondents in Edchero had mixed cropping pattern and no respondents had inter crop cropping pattern. The overall data showed that 98.75% respondents had sole cropping pattern and 1.25% respondents had mixed cropping pattern.

4.48. Crops grown as mixed/ inter crop by households in selected Villages of Nagri Block

Crops grown as mixed/ inter crop by households shown in Table 48. Perusal of data showed that 5%, 10%, 15%, 5% respondents in Edchero, Patrachauli, Harhi and Kelende had cultivated rice + pigeon pea whereas 10%, 5%, 15%, 10% and 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated. 30%, 25%, 15%, 30%, 25%, 30%, 10% and 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated wheat+mustard whereas 20%, 15%, 15%, 10%, 10%, 15%, 5% and 15% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated ginger +turmeric. Mixed or inter crop of rice+black gram, rice+sorghum+sunhemp, maize+black gram, maize+pigeon pea, finger millets+black gram, finger millet+maize were not found in the study area. The overall data showed that 4.37%, 5.62%, 23.12% and 13.12% respondents had rice + pigeon pea, rice +maize, wheat+mustard, ginger +turmeric, respectively.

4.49. Households taking second crop in uplands in selected Villages of Nagri Block

Households taking second crop in uplands is shown in Table 49. Perusal of data showed that maximum 100% respondents in Pundag and Kelende, 95% respondents in Edchero, Patrachauli, Harhi, Lalgutuwa, Balalong and 90% respondents in Khunta had taken second crop in upland. Rest were not taken second crop on uplands. The overall data showed that 95.62% respondents had taken second crop in uplands.

4.50. Crops grown in upland in Rabi season in Nagri Block

Crops grown in upland in rabi season is shown in Table 50. Perusal of data showed that 35%, 15%, 40%, 30%, 25%, 45%, 45% and 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated wheat whereas 20%, 25%, 15%, 20%, 30%, 15%, 10% and 15% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated field pea. 15%, 25%, 15%, 15%, 10%, 15%, 15% and 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated cauliflower whereas 25%, 30%, 20%, 30%, 30%, 25%, 25% and 25% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cultivated tomato in upland in rabi season. Chick pea, tori and coriander were not

cultivated in the study area. The overall data showed that 33.75%, 18.75%, 16.25% and 26.25% respondents had cultivated wheat, field pea, cauliflower, tomato, respectively.

4.51. Source of fuel at house hold level in selected Villages of Nagri Block

Source of fuel at house hold level is shown in Table 51. The data showed that 25%, 20%, 15%, 15%, 15%, 10%, 10% and 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had use cow dung whereas 30%, 25%, 35%, 35%, 5%, 10% and 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Pundag, Balalong and Kelende had taken fuel wood from forest. 5%, 10%, 10%, 25%, 30%, 20% and 25% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, pundag, Balalong and Kelende had use coal whereas, 40%, 45%, 50%, 40%, 60%, 55%, 60% and 50% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had use LPG. The overall data showed that 14.37%, 20%, 15.62%, 50% respondents had use cow dung, taken fuel wood from forest, use coal, use LPG, respectively.

4.52. Mode of feeding cattle in selected Villages of Nagri Block

Mode of feeding cattle is shown in Table 52. Perusal of data showed that maximum 95% respondents in Edchero and Lalgutuwa had both type of cattle feeding i.e. stall and grazing followed by 90% respondents in Patrachauli and 85% respondents in Pundag. Very few respondents had cattle feeding as stall feeding and grazing feeding. The perusal of data showed that 9.37%, 7.50% and 83.12% respondents had stall feeding, grazing only and both type , respectively.

4.53. Sources of agriculture implements in selected Villages of Nagri Block

Sources of agriculture implements is shown in Table 53. Perusal of data showed that 40%, 45%, 45%, 35%, 25%, 35%, 55% and 60% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had sources of agriculture implements from the forest whereas, 40%, 25%, 55%, 20%, 20% and 15% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa and Pundag had sources of agriculture implements from own land. 20%, 30%, 45%, 55%, 50%, 45% and 40% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had sources of agriculture implements from market. The overall data showed that 42.50%, 21.87%, 31.25% respondents had sources of agriculture implements from forest, own land, market, respectively.

4.54. Income generation activities at household level in selected Villages of Nagri Block

Income generation activities at household level shown in Table 4.54. Perusal of data showed that 20%, 25%, 20%, 25%, 10%, 20%, 15% and 20% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgotuwa, Pundag, Balalong and Kelende had poultry rearing whereas 20%, 15%, 15%, 5%, 10%, 10%, 25% and 5% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgotuwa, Pundag, Balalong and Kelende had goatery. 5% respondents in Edchero, Harhi and Kelende had piggery whereas, 75%, 85%, 90%, 95%, 85%, 90%, 95% and 90% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgotuwa, Pundag, Balalong and Kelende had homestead garden. Apiary, tasar rearing, lac cultivation were not found in the study area. The overall data showed that 19.37%, 13.12%, 1.87%, 90% respondents had poultry rearing, goatery, piggery, homestead garden, respectively.

4.55. Annual Income of households by from Vegetables in selected Villages of Nagri Block

Annual Income of households from vegetables is shown in Table 4.55. Perusal of data showed that maximum 80% respondents in Patrachauli and 75% respondents in Edchero had income below Rs. 20000. 20%, 15% and 5% respondents in Pundag, Khunta and Harhi had annual income above Rs.100000. Maximum 60% respondents had income below 20000 followed by 13.75% respondents had income between Rs.20001-40000 and very few respondents i.e. 5% had income above Rs.100000.

4.56. Income from Livestock (Monthly) in selected Villages of Nagri Block

Income from Livestock (Monthly) is shown in Table 56. Perusal of data showed that maximum 50% respondents in Edchero had monthly income between Rs.501-1000 from livestock followed by 35% respondents in Harhi had monthly income between Rs.501-1000. 10% respondents in Khunta and Balalong and 5% respondents in Kelende had montly income between Rs.2501-3000 from livestock. The overall data showed that 20.62%, 17.50%, 28.12%, 12.50%, 11.88%, 6.25%, 3.12% respondents had 0, 100-500, 501-1000, 1001-1500, 1501-2000, 2001-2500, 2501-3000, respectively.

4.57. Cash benefit of household from agroforestry in selected Villages of Nagri Block

Cash benefit of household from agroforestry is shown in Table 4.57. Perusal of data showed that 40%, 35%, 35%, 25%, 50%, 35%, 30% and 45% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cash received less than Rs.1000.00 from agroforestry system whereas 50%, 40%, 40%, 55%, 50%, 30%, 40% and 35% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had cash received between Rs.1000-2000 from agroforestry system. 10%, 10%, 15%, 15%, 25%, 15% and 10% respondents in Edchero, Patrachauli, Khunta, Harhi, Pundag, Balalong and Kelende had had cash received between Rs.2001-3000 from agroforestry system whereas 15%, 10%, 5%, 10%, 15 and 10% respondents in Patrachauli, Khunta, Harhi, Pundag, Balalong and Kelende had cash received between Rs.2001-3000 from agroforestry system. The overall data showed that 36.87%, 42.50%, 12.50% and 8.12% respondents had less than 1000, 1000-2000 and 2001-3000 cash received from agroforestry system, respectively.

4.58. Monthly income of Household in selected Villages of Nagri Block

Monthly income of Household is shown in Table 4.58. Perusal of data showed that 5% respondents in Patrachauli, Harhi, Balalong and Kelende and 10% respondents in Khunta had income below 1000 whereas 40%, 25%, 15%, 35%, 10%, 20%, 10% and 10% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had monthly income from Rs.1001-4000. 20%, 25%, 35%, 25%, 15%, 15%, 20% and 25% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had income between Rs.4001-7000 and 25%, 35%, 15%, 30%, 45%, 35%, 25% and 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had income between Rs.7001-10000. 15%, 10%, 25%, 55%, 30%, 30%, 40% and 30% respondents in Edchero, Patrachauli, Khunta, Harhi, Lalgutuwa, Pundag, Balalong and Kelende had income more than Rs.10000. the overall data showed that 3.75%, 20.62%, 22.50%, 30% and 23.12% respondents had below Rs.1000, 1001-4000, 4001-7000, 7001-10000 and more than Rs.10000, respectively.

Growth parameter of trees

As tree is one of the components of agro forestry system so the girth (m), height (m) and volume (m³) of the tree species was measured separately in all the villages and

panchayats of study areas. The panchayat wise growth performance of trees is described below.

4.59. Growth performance of trees in Edchero panchayat

The growth performance of trees species in Edchero panchayat is shown in Table.4.59. Perusal of data showed that five major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Bombax ceiba*, *Dalbergia sissoo*, *Melia azadirach* were found in the study area. The maximum girth was found in *Bombax ceiba* (0.64m) followed by *Tectona grandis* (0.46m), *Gmelina arborea* (0.43m) and *Melia azadirach*(0.42m) and minimum girth was found in *Dalbergia sissoo* (0.39m) whereas, the maximum height was found in *Bombax ceiba* (16.2m) followed by *Tectona grandis* (15.6m), *Melia azadirach* (14.3m) and minimum was found in *Gmelina arborea*(11.2m)..The maximum volume was found in *Bombax ceiba* followed by *Tectona grandis* and minimum was found in *Dalbergia sissoo*. Similarly Oraon *et. al.* Described that in Silvipastoral system average DBH of gamhar(13.73 cm) found more than Akashi(8.23 cm). Similarly, average height of Gamhar (10.20 m) was also found more than Akashi (6.45m). In Silvipastoral System volume production of Gamhar was noticed about 377.50 m/ha

4.60. Growth performance of trees in Saher panchayat

The growth performance of trees species in Saher panchayat is shown in Table.4.60 Perusal of data showed that three major tree species i.e. *Gmelina arborea*, *Azadirachta indica*, *Tectona grandis* were found in the study area. The maximum girth was found in *Tectona grandis* (0.56m)followed by *Azadirachta indica* (0.52m) and minimum was found in *Gmelina arborea* (0.36m) whereas, similar trend were found in case of height i.e. maximum height was found in *Tectona grandis* (16.6m) followed by *Azadirachta indica* (13.2m) and minimum was found in *Gmelina arborea* (10.2m). The maximum volume was found in *Tectona grandis* followed by *Azadirachta indica* and minimum was found in *Gmelina arborea*.

4.61. Growth performance of trees in Lalgutuwa panchayat

The growth performance of trees species in Lalgutuwa panchayat is shown in Table.4.61 Perusal of data showed that four major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Dalbergia sissoo*, *Madhuca indica* were found in the study area. The maximum girth was found in *Madhuca indica* (0.79m)followed by *Gmelina arborea* (0.63m) and minimum was found in *Tectona grandis* (0.36m) whereas, the maximum

height was found in *Gmelina arborea* (16.2m) followed by *Madhuca indica* (15.3m) and minimum was found in *Tectona grandis* (11.6m). The maximum volume was found in *Madhuca indica* followed by *Gmelina arborea* and minimum was found in *Tectona grandis*.

62. Growth performance of trees in Balalong panchayat

The growth performance of trees species in Balalong panchayat is shown in Table. Perusal of data showed that four major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Acacia auriculiformis*, *Artocarpus heterophyllus* were found in the study area. The maximum girth was found in *Tectona grandis* (0.76m) followed by *Artocarpus heterophyllus* (0.71m) and minimum girth was found in *Acacia auriculiformis* (0.65m) whereas, the maximum height was found in *Tectona grandis* (18.6m) followed by *Gmelina arborea* (17.2m) and minimum was found in *Artocarpus heterophyllus* (16.4m). The maximum volume was found in *Tectona grandis* followed by *Gmelina arborea* and minimum was found in *Artocarpus heterophyllus*.

SUMMARY AND CONCLUSIONS

5.1 SUMMARY

The present experiment was conducted on the “Study of agroforestry practices and socio-economic analysis in Nagri block of Ranchi district, Jharkhand”. The major findings of this study can be summarized in following paragraphs:

1. 30%, 36.25%, 20.62%, 9.37%, 3.75% respondents had age under 20-30, 31-40, 41-50, 51-60 and more than 60 years, respectively.
2. Maximum respondents in all the villages were male and minimum were female respondents. The overall data showed that 75.62% respondents were male and 24.37% respondents were female.
3. Hindu respondents had maximum followed Christian respondents and minimum respondents were Muslim. The overall data showed that 83.12% respondents belongs to Hindu, 2.5% belongs to Muslim and 14.37% respondents belongs to Christian.
4. 9.37%, 22.50%, 60% and 8.12% respondents were belongs to General, OBC, ST and SC category, respectively.
5. 6.87% (male), 5%(female), 8.12% (male), 5% (female), 25% (male), 6.87% (female), 24.37%(male), 6.25% (female) and 6.87% (male), 5% (female) respondents had no schooling, primary, high school, intermediate and college passed, respectively.
6. 80%, 5.62%, 2.50% and 11.87% respondents of Nagri had farming, private job, government job, other (construction worker), respectively.
7. 31.87%, 27.50%, 3.75%, 11.87%, 3.12%, 21.87% respondents were engaged in agri labour, dairy/poultry, artisans, private job, construction worker and stone crushing, respectively as a secondary occupation.
8. Maximum respondents of the study area had 1-2 ha farm size which was followed by 3-4ha farm size and minimum respondents had below 1 ha land. 60-85% respondents had 1-2 ha land. 8.12%, 76.25% and 15.62% respondents had below 1 ha, 1-2ha, 3-4 ha farm size, respectively.
9. 94.80% respondents of the study area had owned land and 5.62% respondents had land sharing (in/out).

10. 25.63%, 70% and 4.37% respondents had below 1ha, 1-2 ha, 3-4 ha, respectively.
11. 96.25% respondents had below 1 ha unirrigated land and 3.75% respondents had 1-2 ha unirrigated land.
12. 98.75% respondents of the study area had below 1 ha barren land and 1.25% respondents had 1-2 ha barren land.
13. 80% respondents of the study area were had family owned labour and 20% respondents had hired labour.
14. Maximum 95% respondents in V3 had one or more than one bullock followed by 90% respondents in V4 and V1 and minimum 60% respondents had one or more than one bullock. 32.50%, 60.00%, 7.50% respondents had 0, 1-5, and more than 5 cows, respectively. only 11.25% respondents had one and above 5 buffalo. only 19.37% respondents had 1-6 she buffalo. 68.78%, 21.25%, 10% respondents had 0, 1-4, and above 5 goat, respectively. 22.50% respondents had 1-5 and above 5 poultry. 6.25% respondents had 1-5 and above 5 ducks.
15. 100% respondents had mode of livestock utilities was as manure and as draft power. 100%, 100%, 86.25%, 33.12% respondents had mode of livestock utilities was as manure, draft power, milk, and meat, respectively.
16. 46.25%, 40%, 90% respondents had upland, medium land and low land, respectively.
17. 7.5%, 27.50%, 65% respondents had 41-60%, 61-80%, 81-100% rainfed area whereas no respondents had 0%, 1-20%, 21-40% rainfed area in the study area. 14.37%, 62.50%, 21.87%, 1.25% respondents had 0%, 1-20%, 41-60% irrigated area, respectively.
18. 55%, 40.62%, 4.37% respondents had fertile land, moderately fertile land and barren land / uncultivated land, respectively.
19. River, pond and well are the source of irrigation in the study area. Well is available in all the villages whereas pond is source of irrigation in all the villages except in V3 and V5. In V3, V4, V6, V8 has no river so their source of irrigation either pond or well.
20. 2.50%, 48.75%, 45%, 3.75% respondents had 0ha, below 1ha, 1-2ha, above 2ha land used in agriculture.
21. 27.50% respondents had no land used for agroforestry and 72.50% respondents had below 1ha land used for agroforestry. 20%, 77.50%, 2.50% respondents had

- 0 ha, 0.5-1.0ha, above 1ha land used in horticulture. 64.37% respondents had no land used for bamboo and 35.63% respondents had below 1ha land used for bamboo. 65.62% respondents had no fallow land and 34.38% respondents had below 1ha fallow land. 97.50% respondents had trees on their land.
22. 79.37% respondents had home garden, 18.12% respondents had upland (tarn) and 2.50% respondents had no tree planted by household.
 23. 91.25%, 67.50%, 12.50%, 53.75%, 6.87%, 7.50%, 55.62%, 23.75% respondents had mango, jackfruit, tamarind, sahjan, sharifa, guava, ber, respectively. 45.62%, 57.50%, 3.75%, 18.12%, 44.37%, 63.12%, 5.62% respondents had gamhar, kathal, ber, shisham, teak, mulberry tree, respectively. 33.12%, 6.57%, 4.37% had neem, karanj and Akashi tree, respectively. 26.87% respondents had lantana and 1.87% respondents had shishal tree as live hedge plants.
 24. 28.12% respondents had households grow tree + crop together in the field and 12.50% respondents had households grow fodder crops in field. 25.62% respondents had multipurpose trees in their field. 4.37%, 6.25%, 15% respondents had shisham, gamhar and teak trees, respectively for timber purposes.
 25. Five types of agroforestry modules showed in the study area i.e. agri silviculture (trees in field), silvi pasture, horti pastoral, bund plantation, homestead garden. 8.12%, 10.62%, 15.62%, 20%, 76.87% respondents had agri silviculture (trees in field), silvi pasture, horti pastoral, bund plantation, homestead garden, respectively.
 26. 24.37% respondents had sufficient fuelwood harvested and 75.63% respondents had less fuel wood harvested. No respondents of the study area was found more than sufficient wood harvested.
 27. 10.62%, 43.12%, 46.2% respondents had enough food for 1-3 month only, 3-6 months only, 6-12 months only, respectively.
 28. Maximum respondents had no availability of green fodder. 18.12%, 15%, 18.75%, 48.12% respondents had 3 month, 6month, more than 6 month and none availability of green fodder, respectively.
 29. No respondents had more than sufficient timber is produced. Overall data showed that 18.12% respondents had moderate timber is produced and 81.88% respondents had timber produced is not sufficient.

30. 13.12%, 34.37%, 30.00%, 23.12% respondents had non availability of nursery area, non availability of govt. Programme to promote agroforestry, non availability of VLW to assists in agroforestry and stray cattle problems, respectively.
31. 7.50%, 53.75%, 38.75% respondents had 2500-3750, 3751-5000, 5001-6250 kharif crop yield (kg/ha), respectively. 96.87% respondents had kharif sole crops in the study area and only 3.12% respondents had kharif mixed crops. 8.12%, 30%, 55%. 6.87% had 2500-3750, 3751-5000, 5001-6250, 6251-7500 rabi crop yield (kg/ha), respectively. 59.37%, 35%, 5.62% respondents had sole crop, mixed crop, inter crop, respectively.
32. 91.87%, 95.62%, 93.12%, 83.75%, 31.87%, 56.87%, 68.12% respondents had cauliflowers, potato, tomato, brinjal, bean, cabbage, chillies, respectively. 70%, 17.50%, 7.50%, 15%, 17.50%, 15%, 23.75%, 16.87% respondents had rice, maize, ragi, pigeon pea, kharif vegetable, turmeric, ginger, kachhu, respectively. 98.75% respondents had sole cropping pattern and 1.25% respondents had mixed cropping pattern.
33. 4.37%, 5.62%, 23.12%, 13.12% respondents had rice + pigeon pea, rice +maize, wheat+mustard, ginger +turmeric, respectively.
34. Rest were not taken second crop in upland. 95.62% respondents had taken second crop in upland.
35. 33.75%, 18.75%, 16.25%, 26.25% respondents had cultivated wheat, pea, cauliflower, tomato, respectively. Gram, tori and dhania were not cultivated in the study area.
36. 14.37%, 20%, 15.62%, 50% respondents had use cow dung, taken fuel wood from forest, use coal, use LPG, respectively.
37. 9.37%, 7.50%, 83.12% respondents had stall feeding, grazing only and both type , respectively.
38. 42.50%, 21.87%, 31.25% respondents had sources of agriculture implements from forest, own land, market, respectively.
39. 19.37%, 13.12%, 1.87%, 90% respondents had poultry rearing, goatery, piggery, homestead garden, respectively. Apiary, tasar rearing, lac cultivation were not found in the study area.
40. 20%, 15%, 5% respondents in V6, V3, V4 had annual income above 100000. Maximum 60% respondents had income below 20000 followed by 13.75%

respondents had income 20001-40000 and very few respondents i.e. 5% had income above 100000.

41. 20.62%, 17.50%, 28.12%, 12.50%, 11.88%, 6.25%, 3.12% respondents had 0, 100-500, 501-1000, 1001-1500, 1501-2000, 2001-2500, 2501-3000, respectively.
42. 36.87%, 42.50%, 12.50%, 8.12% respondents had less than 1000, 1000-2000 and 2001-3000 cash received from agroforestry system, respectively.
43. 3.75%, 20.62%, 22.50%, 30%, 23.12% respondents had below 1000, 1001-4000, 4001-7000, 7001-10000, more than 10000, respectively.
44. Five major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Bombax ceiba*, *Dalbergia sissoo*, *Melia azadirach* were found in Edchero panchayat . The maximum girth was found in *Bombax ceiba* followed by *Tectona grandis* and minimum was found in *Dalbergia sissoo* whereas the maximum height was found in *Bombax ceiba* followed by *Tectona grandis* and minimum was found in *Gmelina arborea*. The maximum volume was found in *Bombax ceiba* followed by *Tectona grandis* and minimum was found in *Dalbergia sissoo*.
45. Three major tree species i.e. *Gmelina arborea*, *Azadirachta indica*, *Tectona grandis* were found in Saher panchayat. The maximum girth was found in *Tectona grandis* followed by *Azadirachta indica* and minimum was found in *Gmelina arborea* whereas similar trend were found in case of height i.e. maximum height was found in *Tectona grandis* followed by *Azadirachta indica* and minimum was found in *Gmelina arborea*. The maximum volume was found in *Tectona grandis* followed by *Azadirachta indica* and minimum was found in *Gmelina arborea*.
46. Four major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Dalbergia sissoo*, *Madhuca indica* were found in Lalgutuwa panchayat. The maximum girth was found in *Madhuca indica* followed by *Gmelina arborea* and minimum was found in *Tectona grandis* whereas the maximum height was found in *Gmelina arborea* followed by *Madhuca indica* and minimum was found in *Tectona grandis*. The maximum volume was found in *Madhuca indica* followed by *Gmelina arborea* and minimum was found in *Tectona grandis*.
47. Four major tree species i.e. *Gmelina arborea*, *Tectona grandis*, *Acacia auriculiformis*, *Artocarpus heterophyllus* were found in Balalong panchayat. The maximum girth was found in *Tectona grandis* followed by *Artocarpus heterophyllus* and minimum was found in *Acacia auriculiformis* whereas the

maximum height was found in *Tectona grandis* followed by *Gmelina arborea* and minimum was found in *Artocarpus heterophyllus*. The maximum volume was found in *Tectona grandis* followed by *Gmelina arborea* and minimum was found in *Artocarpus heterophyllus*.

5.2 CONCLUSIONS

1. Maximum people having small land holding size and Most of the households engaged in Agriculture, Animal husbandary and homestead gardens.
2. Most of the households have adopted traditional agroforestry system & practices for the sustainable livelihood security & better economy.
3. People are adopting Agrisilviculture systems & few respondents adopted the Silviculture while some other respondents are engaged in horti-pastoral activities and quite a few respondents are also having bund plantations or using tree species for boundary plantations.
4. It is observed that maximum households are interested in adoption of agroforestry but there is lack of awareness and extension activities related to agroforestry systems.
5. There is a need for proper assistance and advance training related to agroforestry practices and modules at ground level.
6. Households were more observed more reliant on homestead gardens to fulfil their nutritional demands.
7. Most of the households shown their keen interest in adopting fruit based agroforestry system as it delivers high rate of return and fulfil nutritional demand of the family/household as well.

5.3 RECOMMENDATIONS

- People should be encouraged to adopt Fruit trees based agroforestry systems in study area.
- People should be boosted to adopt Bamboo based agroforestry/ farming systems, for which necessary inputs and training should be provided regularly.
- There were large number of homestead gardens found in study area but the condition of existing homestead gardens should be improved by planting improved variety of fruit trees.

- Govt. Extension workers should be deployed to encourage and suggests ways to the farmers for improvement of existing agroforestry practices at the ground level.
- Frequent advanced training programs on Dairy, Goatry, Poultry, Duckery etc should be organized/ conducted for the farmers so that they would be encouraged to rear improved breeds of these animals/birds.
- Farmers should be encouraged and trained to grow forage crops on their field.
- It is recommended for awareness and extension activities to the farmers about Agroforestry technologies and marketing and also information regarding the ecological and economic benefits of trees associated with farming.

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Plate- 4.1 A View of Edchero Panchayat



Plate- 4.2. A View of Saher Panchayat



Plate 4.3- A view of Lalgutuwa Panchayat



Plate 4.4- A View of Balalong Panchayat

Table- 4.1.: Age profile of selected Villages of Nagri Block

Sl. No.	Age profile	Edchero		Saher			Lalgutuwa			Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)			
1	20-30	05 (25%)	05 (25%)	04 (20%)	10 (50%)	06 (30%)	04 (20%)	11 (55%)	03 (15%)	48 (30%)		
2	31-40	09 (45%)	10 (50%)	07 (35%)	06 (30%)	07 (35%)	05 (25%)	02 (10%)	12 (60%)	58 (36.25%)		
3	41-50	05 (25%)	04 (20%)	08 (40%)	04 (20%)	04 (20%)	04 (20%)	03 (15%)	01 (5%)	33 (20.62%)		
4	51-60	01 (5%)	01 (5%)	01 (5%)	00 (0%)	03 (15%)	05 (25%)	03 (15%)	01 (5%)	15 (9.37%)		
5	>60	00 (0%)	00 (0%)	00 (0%)	00 (0%)	00 (0%)	02 (10%)	01 (5%)	03 (15%)	06 (3.75%)		

Table-4.2. Gender classification in selected Villages of Nagri Block

Sl. No.	Gender	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Male	16 (80%)	14 (70%)	17 (85%)	16 (80%)	18 (90%)	11 (55%)	15 (75%)	14 (70%)	121 (75.62%)
2	Female	04 (20%)	06 (30%)	03 (15%)	04 (20%)	02 (10%)	09 (45%)	05 (25%)	06 (30%)	39 (24.38%)

Table-4.3: Religion distribution in selected Villages of Nagri block

Sl. No.	Religion	Edchero		Saher			Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Hindu	17 (85%)	17 (85%)	16 (80%)	17 (85%)	18 (90%)	15 (75%)	16 (80%)	17 (85%)	133 (83.12%)	
2	Muslim	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	00 (00.00)	01 (5%)	01 (05%)	00 (00.00)	04 (2.5%)	
3	Christian	02 (10%)	03 (15%)	03 (15%)	03 (15%)	02 (10%)	04 (20%)	03 (15%)	03 (15%)	23 (14.37%)	

Table-4.5.: Literacy Status in selected Villages of Nagri Block

Literacy	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)
Illiterate	Male	2 (10%)	1 (5%)	2 (10%)	3 (15%)	1 (5%)	1 (5%)	0 (00)	11 (6.87%)
	Female	2 (10%)	1 (5%)	1 (5%)	1 (5%)	0 (00)	1 (5%)	1 (5%)	8 (5%)
Primary Level	Male	2 (10%)	0 (00)	2 (10%)	2 (10%)	1 (5%)	4 (20%)	1 (5%)	13 (8.12%)
	Female	0 (00)	2 (10%)	1 (5%)	1 (5%)	0 (00)	1 (5%)	2 (10%)	8 (5%)
High School	Male	5 (25%)	5 (25%)	5 (25%)	6 (30%)	5 (25%)	4 (20%)	5 (25%)	40 (25%)
	Female	1 (5%)	1 (5.00)	0 (00)	1 (5%)	1 (5%)	2 (10%)	3 (15%)	2 (10%)
Intermediate	Male	5 (25%)	7 (35%)	5 (25%)	4 (20%)	7 (35%)	4 (20%)	4 (20%)	39 (24.37%)
	Female	1 (5%)	1 (5%)	1 (5%)	1 (5%)	1 (5.00)	0 (00)	1 (5%)	10 (6.25%)
Graduate	Male	2 (10%)	1 (5%)	2 (10%)	3 (15%)	1 (5%)	1 (5%)	0 (00)	11 (6.87%)
	Female	2 (10%)	1 (5%)	1 (5%)	1 (5%)	0 (00)	1 (5%)	1 (5%)	8 (5%)

Table-4.6. Primary Occupation status in selected Villages of Nagri Block

Sl. No.	Primary occupation	Eddhero		Saher			Lalgutuwa		Balalong		Total
		Eddhero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1.	Farming	19 (95%)	18 (90%)	20 (100%)	17 (85%)	12 (60%)	14 (70%)	13 (65%)	15 (75%)	128 (80%)	
2.	Private Job	01 (5%)	01 (5%)	00 (00)	01 (5%)	03 (15%)	00 (00)	02 (10%)	01 (5%)	09 (5.62%)	
3.	Government job	00 (00)	01 (5%)	00 (00)	01 (5%)	02 (10%)	00 (00)	00 (00)	00 (00.00)	04 (2.5%)	
4.	Others (Construction Worker)	00 (00)	00 (00)	00 (00)	01 (5%)	03 (15%)	06 (30%)	05 (25%)	04 (20%)	19 (11.87%)	

Table-4.7. Status of Secondary Occupation in selected Villages of Nagri Block

Sl. No.	Secondary Occupation	Edchero		Saher		Lalgutuwa		Balalong		Total (N=160)
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Agri Labour	05 (25%)	06 (30%)	05 (25%)	07 (35%)	06 (30%)	07 (35%)	07 (35%)	08 (40%)	51 (31.87%)
2	Dairy/Poultry	05 (25%)	04 (20%)	06 (30%)	08 (40%)	07 (35%)	05 (25%)	04 (20%)	05 (25%)	44 (27.5%)
3	Artisans	02 (10%)	01 (5%)	00 (00.00)	02 (10%)	01 (5%)	00 (00.00)	00 (00.00)	00 (00.00)	06 (3.75%)
4	Private Job	00 (00.00)	02 (10%)	03 (15%)	00 (00.00)	03 (15%)	03 (15.00)	05 (25.00)	03 (15%)	19 (11.87%)
5	Construction Worker	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (5%)	04 (20%)	05 (3.12%)
6	Others (Stone Crushing)	08 (40%)	07 (35%)	06 (30%)	03 (15%)	03 (15%)	05 (25%)	03 (15%)	00 (00.00)	35 (21.87%)

Table-4.8. Farm Size of respondents of selected Villages of Nagri Block

Sl. No.	Farm size (in ha)	Edchero		Saher		Lalgutuwa			Balalong		Total
		Size of Land Holding	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Below 1	01 (05%)	02 (10%)	00 (00.00)	02 (10%)	03 (15%)	01 (05%)	03 (15%)	01 (05%)	13 (8.12%)	
2	1 – 2	12 (60%)	15 (75%)	16 (80%)	14 (70%)	15 (75%)	17 (85%)	16 (80%)	17 (85%)	122 (76.25%)	
3	3 – 4	07 (35%)	03 (15%)	04 (20%)	04 (20%)	02 (10%)	02 (10%)	01 (5%)	02 (10%)	25 (15.62%)	

Table- 4.9.: Land tenure of Farmers in selected Villages of Nagri Block

Sl. No.	Land Tenure Land Type	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Owned Land	20 (100%)	19 (95%)	18 (90%)	18 (90%)	20 (100%)	17 (85%)	19 (95%)	18 (90%)	151 (94.8%)
2	Land Sharing In/Out	00 (00.00)	00 (00.00)	01 (5%)	02 (10%)	00 (00.00)	03 (15%)	01 (5%)	02 (10%)	09 (5.62%)

Table-4.10. Status of Irrigated Land in selected Villages of Nagri Block

Sl. No.	Irrigated Land	Edchero			Saher			Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)			
1	Below 1	09 (45%)	07 (35%)	12 (60%)	02 (10%)	01 (5%)	01 (05%)	04 (20%)	05 (25.00)	41 (25.63%)		
2	1-2	11 (55%)	12 (60%)	8 (40%)	18 (90%)	17 (85%)	19 (85%)	14 (70%)	13 (65%)	112 (70%)		
3	3-4	00 (00.00)	01 (5%)	00 (00.00)	00 (00.00)	02 (10%)	00 (10.00)	02 (10%)	02 (10%)	07 (04.37%.)		

Table-4.11. Unirrigated Land status in selected villages of Nagri Block

Sl. No.	Un-Irrigated land (in ha)	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Below 1	20 (100%)	20 (100%)	19 (95%)	20 (100%)	18 (90%)	19 (95%)	19 (95%)	19 (95%)	154 (96.25%)
2	1 – 2	00 (00.00)	00 (00.00)	01 (05%)	00 (00.00)	02 (10%)	01 (5%)	01 (05%)	01 (05%)	06 (3.75%)

Table-4.12. Status of Barren land in selected Villages of Nagri Block

Sl. No.	Barren Land	Edchero			Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Below 1	20 (100.00)	19 (95.00))	20 (100.00)	20 (100.00)	19 (100.00)	20 (100.00)	20 (100.00)	20 (100.00)	158 (98.75%)	
2	1 – 2	00 (00.00)	01 (05.00)	00 (00.00)	00 (00.00)	01 (05.00)	00 (00.00)	00 (00.00)	00 (00.00)	02 (01.25%)	

Table-4.13.Labour Availability & Utilization in Nagri Block

Sl. No.	Labour Type of Labour employed in the farm	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauti (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Family Owned Labour	17 (85%)	18 (90%)	16 (80%)	15 (75%)	15 (75%)	16 (80%)	17 (85)	14 (70%)	128 (80%)
2	Hired Labour	03 (15%)	2 (10%)	04 (20%)	05 (25%)	05 (25%)	04 (20%)	03 (15%)	06 (30%)	32 (20%)

Table-4.14. Livestock utilities in selected Villages og Nagri block

Livestock utilities	Edchero		Saher		Lalgutuwa		Balalong		Total	
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
Bullock	0	02 (10%)	03 (15%)	01 (05%)	02 (10%)	05 (25%)	04 (20%)	07 (35)	08 (405)	32 (20%)
	1 & above 1	18 (80%)	17 (85%)	19 (95%)	18 (90%)	15 (75%)	16 (80%)	13 (65%)	12 (60%)	128 (80%)
Cow	0	03 (15%)	08 (40%)	09 (45%)	05 (25%)	08 (40%)	11 (55%)	04 (20%)	04 (20%)	52 (32.5%)
	1 - 5	15 (75%)	12 (60%)	10 (50%)	13 (65%)	10 (50%)	09 (45%)	13 (65%)	14 (70%)	96 (60%)
	Above 5	02 (10%)	00 (00.00)	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	03 (15%)	02 (10%)	12 (7.5%)
Buffalo	0	17 (85%)	19 (95%)	19 (95%)	17 (85%)	18 (90%)	19 (95%)	17 (85%)	16 (80%)	142 (88.75%)
	1 & above 5	3 (15%)	01 (05%)	01 (05%)	03 (15%)	02 (10%)	01 (05%)	03 (15%)	04 (20%)	18 (11.25%)
She buffalo	0	03 (15%)	19 (95%)	20 (100%)	18 (90%)	16 (80%)	18 (90%)	16 (80%)	19 (95%)	129 (80.62%)
	1 - 6	17 (85%)	01 (05%)	00 (00.00)	02 (10%)	04 (20%)	02 (10%)	04 (20%)	01 (05%)	31 (19.37%)
Goats	0	09 (75.00)	13 (85.00)	12 (80.00)	15 (75.00)	14 (85.00)	15 (85.00)	15 (95.00)	17 (75.00)	110 (68.75%)
	1 - 4	07 (35%)	04 (20%)	05 (25%)	04 (20%)	04 (20%)	03 (15%)	05 (25%)	02 (10%)	34 (21.25%)
	Above 5	04 (20%)	03 (15%)	03 (15%)	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	01 (05%)	16 (10%)
Poultry	0	15 (75%)	14 (70%)	16 (80%)	13 (65%)	18 (90%)	16 (80%)	17 (85%)	15 (75%)	124 (77.5%)
	1 - 5 & above 5	05 (25%)	06 (30%)	04 (20%)	07 (35%)	02 (10%)	04 (20%)	03 (15%)	05 (25%)	36 (22.5%)
Others (Ducks)	0	19 (95%)	20 (100.00)	18 (90%)	19 (95%)	17 (85%)	19 (95%)	19 (95%)	19 (95%)	150 (93.75%)
	1 - 5 & above 5	01 (05%)	00 (00.00)	02 (10%)	01 (05%)	03 (15%)	01 (05%)	01 (05%)	01 (05%)	10 (6.25%)

Table-4.15. Mode of Livestock Utilization in selected Villages of Nagri Block

Mode of Livestock Utilities	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 Manure	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	160 (100.00)
2 Draft power	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	160 (100.00)
3 Milk	19 (95%)	19 (95%)	17 (85%)	16 (80%)	15 (75%)	18 (90%)	18 (80%)	16 (80%)	138 (86.25%)
4 Meat	07 (35%)	03 (15%)	05 (25%)	08 (40%)	09 (45%)	08 (40%)	06 (30%)	07 (35%)	53 (33.12%)

Table-4.16. Topography of the land in selected Villages of Nagri Block

Sl. No.	Topography of the land	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Upland	10 (505%)	11 (55%)	09 (45%)	09 (45%)	07 (35%)	08 (40%)	09 (45%)	08 (40%)	74 (46.25%)
2	Medium land	07 (35%)	08 (40%)	08 (40%)	11 (55%)	05 (25%)	09 (45%)	08 (45%)	08 (40%)	64 (40%)
3	Lowland	15 (75%)	17 (85%)	18 (90%)	19 (95%)	17 (85%)	18 (90%)	19 (95%)	18 (90%)	144 (90%)

Table- 4.17. Total Rainfed Area Assumed 100% in Nagri Block

Sl. No.	Total Rainfed Area	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	41% - 60%	01 (05%)	01 (05%)	01 (05%)	02 (10%)	05 (25%)	00 (00.00)	01 (05%)	01 (05%)	12 (07.5%)
2	61% - 80%	04 (20%)	12 (60%)	03 (15%)	04 (20%)	07 (35%)	05 (25%)	07 (35%)	02 (10%)	44 (27.5%)
3	81% - 100%	15 (75%)	07 (35%)	16 (80%)	14 (70%)	08 (40%)	15 (75%)	12 (60%)	17 (85%)	104 (65%)

Table-4.18. Irrigated area Assumed 100% (% of land depend on irrigation) in Nagri Block

Total Irrigated area		Edchero		Saher		Lalgutuwa		Balalong		Total
Sl. No.	Irrigated area	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)
1	0%	08 (40%)	02 (10%)	02 (10%)	03 (15%)	01 (05%)	01 (05%)	00 (00.00)	06 (30%)	23 (14.37%)
2	01% – 20%	10 (50%)	10 (50%)	15 (75%)	15 (75%)	09 (45%)	15 (75%)	14 (70%)	12 (60%)	100 (62.5%)
3	21% - 40%	02 (10%)	08 (40%)	03 (15%)	02 (10%)	10 (50%)	04 (20%)	05 (25%)	01 (05%)	35 (21.87%)
4	41% - 60%	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (05%)	01 (05%)	02 (01.25%)

Table-4.19. Soil fertility class in selected villages of Nagri Block

Soil fertility class(On the basis of productivity)		Edchero		Saher			Lalgutuwa		Balalong		Total
Sl. No.	Land fertility class	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)	
1	Fertile land	12 (60%)	13 (65%)	12 (60%)	12 (60%)	11 (55%)	05 (25%)	13 (65%)	10 (50%)	88 (55%)	
2	Moderately fertile land	07 (35%)	07 (35%)	07 (35%)	06 (30%)	07 (35%)	15 (75%)	07 (35%)	09 (45%)	65 (40.62%)	
3	Barren land /uncultivated land	01 (05%)	00 (00.00)	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	00 (00.00)	01 (05%)	07 (4.37%)	

Table-4.21. Land use practices in selected villages of Nagri Block

Land use practices in Agriculture		Edchero		Saher		Lalgutuwa		Balalong		Total
Sl. No.	Land (in ha)	Edchero (n=20)	Patrachauti (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)
1	0	01 (05%)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	01 (05%)	01 (05%)	01 (05%)	04 (02.50%)
2	Below 1	09 (45%)	14 (70%)	11 (55%)	08 (40%)	08 (40%)	07 (35%)	12 (60%)	09 (45%)	78 (48.75%)
4	1 – 2	08 (40%)	05 (25%)	09 (45%)	11 (55%)	12 (60%)	12 (60%)	06 (30%)	09 (45%)	72 (45%)
7	Above 2	02 (10%)	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	01 (05%)	06 (03.75%)

Table-4.22. Land use practices in Agroforestry in selected villages of Nagri Block

Land use practices in Agroforestry		Edchero			Saher			Lalgutuwa		Balalong		Total
Sl. No.	Land (in Ha)	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)		
1	0	04 (20%)	05 (25%)	07 (35%)	08 (40%)	09 (45%)	04 (20%)	03 (15%)	04 (20%)	44 (27.5%)		
2	Below 1	16 (80%)	15 (75%)	13 (65%)	12 (60%)	11 (55%)	16 (90.00)	17 (85%)	16 (80%)	116 (72.5%)		

Table-4.23. Land use practices in Horticulture in selected villages of Nagri Block

Sl. No.	Land use practices in Horticulture	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	0	03 (15%)	03 (15%)	07 (35%)	04 (20%)	02 (10%)	02 (10%)	05 (25%)	06 (30%)	32 (20%)
2	0.5 – 1.0	17 (85%)	16 (80%)	13 (65%)	15 (75%)	18 (90%)	17 (85%)	15 (75%)	13 (65%)	124 (77.5%)
4	Above 1	00 (00.00)	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	01 (05%)	04 (02.5%)

Table-4.24. Land use practices in Bamboo in Nagri Block

Land use practices in Bamboo	Edchero		Saheer			Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	0 (50%)	12 (60%)	13 (65%)	11 (55%)	15 (75%)	17 (85%)	12 (60%)	13 (65%)	103 (64.37%)	
2	Below 01 (50%)	08 (40%)	07 (35%)	09 (45%)	05 (25%)	03 (15%)	08 (40%)	07 (35%)	57 (35.63%)	

Table-4.25. Status of Fallow land in selected Villages of Nagri Block

Sl. No.	Fallow Land (in Ha)	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	0	15 (75%)	16 (80%)	17 (85%)	14 (70%)	14 (70%)	09 (45%)	08 (40%)	12 (60%)	105 (65.62%)
2	Below 01	05 (25%)	04 (20%)	03 (15%)	06 (30%)	06 (30%)	11 (55%)	12 (60%)	08 (40%)	55 (34.38%)

Table-4.26. Households having trees on their land in selected Villages of Nagri Block

Households grow tree	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harti (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 Yes	19 (95%)	20 (100%)	20 (100%)	19 (95%)	20 (100%)	18 (90%)	20 (100%)	20 (100%)	156 (97.50)
2 No	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	00 (00.00)	02 (10%)	00 (00.00)	00 (00.00)	04 (02.50)

Table-4.27. Tree planted by household of selected Villages of Nagri Block

Sl. No.	Tree planted in area	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Home garden	15 (75%)	16 (80%)	17 (85%)	17 (85%)	15 (75%)	17 (85%)	16 (80%)	14 (70%)	127 (79.37%)
2	Upland (Tarn)	04 # (20%)	04 (20%)	03 (15%)	02 (10%)	05 (25%)	01 (05%)	04 (20%)	06 (30%)	29 (18.12%)
3	No tree planted by household	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	00 (00.00)	02 (10%)	00 (00.00)	00 (00.00)	04 (02.50)

Table-4.28. Fruit trees grown by household of selected Villages of Nagri Block

Fruit trees grown by household	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 Mango	19 (95%)	20 (100%)	19 (95%)	18 (90%)	16 (80%)	17 (85%)	19 (95%)	18 (90%)	146 (91.25%)
2 Jackfruit	15 (75%)	16 (80%)	17 (85%)	12 (60%)	15 (75%)	16 (80%)	07 (35%)	10 (50%)	108 (67.5%)
3 Tamarind	04 (20%)	05 (25%)	01 (05%)	00 (00.00)	03 (15%)	00 (00.00)	02 (10%)	05 (25%)	20 (12.5%)
4 Sahjan	08 (40%)	10 (50%)	13 (65%)	08 (40%)	09 (45%)	14 (70%)	17 (85%)	07 (35%)	86 (53.75%)
5 Jammun	02 (10%)	02 (10%)	01 (05%)	00 (00.00)	02 (10%)	01 (05%)	03 (15%)	00 (00.00)	11 (06.87%)
6 Sharifa	02 (10%)	03 (15%)	00 (00.00)	00 (00.00)	02 (10%)	01 (05%)	01 (05%)	03 (15%)	12 (07.5%)
7 Guava	11 (55%)	08 (40%)	07 (35%)	13 (65%)	12 (60%)	16 (80%)	07 (35%)	15 (75%)	89 (55.62%)
8 Ber	08 (40%)	06 (30%)	07 (35%)	00 (00.00)	03 (15%)	04 (20%)	06 (30%)	04 (20%)	38 (23.75%)

Table- 4.29. Timber and fodder tree/plant grown by households of Nagri Block

Sl. No.	Timber and fodder tree/plant grown by Household	Edchero		Saher			Lalgutuwa			Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)			
1	Ganhar	12 (60%)	11 (55%)	08 (40%)	11 (55%)	07 (35%)	06 (30%)	10 (50%)	08 (40%)	73 (45.62%)		
2	Jack-fruit	14 (70%)	13 (65%)	11 (55%)	09 (45%)	08 (40%)	12 (60%)	13 (65%)	12 (60%)	92 (57.5%)		
3	Subabul	02 (10%)	00 (00.00)	01 (05%)	00 (00.00)	03 (15%)	00 (00.00)	00 (00.00)	00 (00.00)	06 (03.75%)		
4	Ber	07 (35%)	06 (30%)	03 (15%)	00 (00.00)	04 (20%)	05 (25%)	00 (00.00)	04 (20%)	29 (18.12%)		
5	Shisham	11 (55%)	10 (50%)	08 (40%)	10 (50%)	06 (30%)	10 (50%)	07 (35%)	09 (45%)	71 (44.37%)		
6	Teak	09 (45%)	11 (55%)	15 (75%)	12 (60%)	13 (65%)	11 (55%)	13 (65%)	17 (85%)	101 (63.12%)		
7	Mulberry	03 (15%)	00 (00.00)	00 (00.00)	01 (05%)	02 (10%)	00 (00.00)	03 (15%)	00 (00.00)	09 (05.62%)		

Table-4.30. Tree for oil seed/shade/fuel wood grown by household of Nagri Block

Sl. No.	Tree for oil seed/shade/fuel wood grown by household	Edchero		Saher		Lalgutuwa			Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Neem	08 (40%)	07 (35%)	05 (25%)	08 (40%)	11 (55%)	05 (25%)	05 (25%)	04 (20%)	53 (33.12%)	
2	Karanj	03 (15%)	01 (05%)	01 (05%)	03 (15%)	00 (00.00)	02 (10%)	00 (00.00)	01 (05%)	11 (06.87%)	
3	Akashi	01 (05%)	00 (00.00)	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	00 (00.00)	01 (05%)	07 (04.37%)	

Table-4.31. Live hedge plant/tree grown by households of Nagri Block

Sl. No.	Live hedge plant/tree grown by households		Edchero		Saher		Lalgutuwa		Balalong		Total
	Live hedge plant tree	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Lantana	06 (30%)	07 (35%)	05 (25%)	05 (25%)	06 (30%)	05 (25%)	05 (25%)	04 (20%)	43 (26.87%)	
2	Shishal	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	00 (00.00)	00 (00.00)	03 (01.87%)	

Table- 4.32. Households growing (tree + crops together) and Fodder in Nagri Block

Households	Edchero		Saher			Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1 Households Grow tree + crop together in the field	05 (25.00)	08 (40%)	04 (20.00)	06 (30%)	05 (25%)	04 (20%)	09 (45%)	04 (20%)	45 (28.12%)	
2 Households Grow fodder crops in field	03 (15%)	03 (15%)	04 (20%)	03 (15%)	02 (10%)	02 (10%)	03 (15%)	00 (00.00)	20 (12.5%)	

Table-4.33. Households growing Multipurpose tree in their field

Households growing Multipurpose tree in their field		Edchero		Saher			Lalgutuwa		Balalong		Total
Sl. No.	Do you grow multipurpose tree in your field	Edchero (n=20)	Patrachali (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)	
1	YES	05 (15%)	04 (20%)	05 (25%)	06 (30%)	04 (20%)	05 (25%)	07 (35%)	05 (25%)	41 (25.62%)	
2	NO	15 (75%)	16 (80%)	15 (75%)	14 (70%)	16 (80%)	15 (75%)	13 (65%)	15 (75%)	119 (74.38%)	

Table-4.34. Tree for timber purpose

Sl. No.	Tree for timber purpose	Edchero		Saher			Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Shisham	01 (05%)	01 (05%)	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	02 (10%)	01 (05%)	07 (04.37%)	
2	Gamhar	01# (05%)	01 (05%)	02 (10%)	01 (05%)	01 (05%)	02 (10%)	01 (05%)	01 (05%)	10 (06.25%)	
3	Teak	03 (15%)	02 (10%)	02 (10%)	05 (25%)	03 (15%)	02 (10%)	04 (20%)	03 (15%)	24 (15%)	

Table-4.35. Existing Agroforestry modules in selected Villages of Nagri Block

Agro-forestry practices	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
Agri – silviculture (Trees in field)	02 (10%)	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	01 (05%)	03 (15%)	02 (10%)	13 (08.12%)
Silvi- pasture	03 (15%)	03 (15%)	04 (20%)	03 (15%)	01 (05%)	02 (10)	00 (00.00)	01 (05%)	17 (10.62%)
Horti – pastoral	05 (25%)	03 (15%)	04 (20%)	02 (10%)	02 (10%)	02 (10%)	03 (15%)	04 (20%)	25 (15.62%)
Bund plantation	04 (20%)	03 (15%)	04 (20%)	06 (30%)	03 (15%)	04 (20%)	03 (15%)	05 (25%)	32 (20%)
Homestead garden	17 (85%)	16 (80%)	16 (80%)	17 (85%)	12 (60%)	15 (75%)	15 (75%)	15 (75%)	123 (76.87%)

Table-4.36. Fuel wood generated from agroforestry

Fuel wood generated from agroforestry		Edchero		Saher		Lalgutuwa		Balalong		Total
Sl. No.	Fuel wood from agroforestry	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)
1	More than sufficient wood harvested	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	0 (00.00)	00 (00.00)
2	Sufficient fuel wood harvested	05 (25.00)	03 (15.00)	07 (35.00)	06 (30.00)	04 (20.00)	03 (15.00)	05 (25.00)	06 (30.00)	39 (24.37)
3	Less fuel wood harvested	15 (75.00)	17 (85.00)	13 (65.00)	14 (70.00)	16 (85.00)	17 (85.00)	15 (75.00)	14 (70.00)	121 (75.63)

Table-4.38. Fodder Availability in selected Villages of Nagri Block

Fodder Availability	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 3 month	04 (20.00)	05 (25.00)	03 (15.00)	04 (20.00)	03 (15.00)	04 (20.00)	03 (15.00)	03 (15.00)	29 (18.12)
2 6 month	03 (15.00)	02 (10.00)	02 (10.00)	01 (05.00)	05 (25.00)	04 (20.00)	03 (15.00)	04 (20.00)	24 (15.00)
3 >6 month	06 (30.00)	07 (35.00)	06 (30.00)	08 (40.00)	00 (00.00)	00 (00.00)	03 (15.00)	00 (00.00)	30 (18.75)
4 >12 month	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
5 None	07 (35.00)	06 (30.00)	09 (45.00)	07 (35.00)	12 (60.00)	12 (60.00)	11 (55.00)	13 (65.00)	77 (48.12)

Table—4.39. Timber production from agroforestry in Nagri Block

Sl. No.	Timber availability	Edchero Timber production from agroforestry in Nagri Block				Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)		
1	More than sufficient timber is produced	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
2	Moderate timber is produced	03 (15%)	04 (20%)	03 (15%)	05 (25%)	03 (15%)	04 (20%)	04 (20%)	03 (15%)	03 (15%)	29 (18.12%)	
3	Timber produced is not sufficient	17 (85%)	16 (80%)	17 (85%)	15 (75%)	17 (85%)	16 (80%)	16 (80%)	17 (85%)	17 (85%)	131 (81.88%)	

Table-4.40. Constraints faced (if any) related to agroforestry in selected Villages of Nagri Block

Constraints faced related to agroforestry		Edchero		Saher		Lalgutuwa		Balalong		Total
Sl. No.	Constraints faced	Edchero (n=20)	Patrachauli (n=20)	Khunuta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	(N=160)
1	Non availability of nursery area	03 (15%)	02 (10%)	04 (20%)	02 (10%)	01 (05%)	02 (10%)	02 (10%)	04 (20%)	21 (13.12%)
2	Non-availability of Gov. programme to promote agroforestry	09 (45%)	08 (40%)	07 (35%)	06 (30%)	05 (25%)	07 (35%)	06 (30%)	07 (35%)	55 (34.37%)
3	Non – availability of VLW to assists in agroforestry	04 (20%)	06 (30%)	04 (20%)	08 (40%)	07 (35%)	06 (30%)	08 (40%)	05 (25%)	48 (30%)
4	Stray cattle problems	04 (20%)	04 (20%)	05 (25%)	04 (20%)	07 (35%)	05 (25%)	04 (20%)	04 (20%)	37 (23.12%)

Table-4.41. Crop Yield during Kharif (Kg/ha) in selected Villages of Nagri Block

Crop Yield (Kharif)	Edchero		Saher		Lalgutuwa		Balalong		Total	
	Agricultural crophyield (kg/ha)	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)		Kelende (n=20)
1	2500 --3750 Maize)	00 (00.00)	03 (15%)	02 (10%)	00 (00.00)	03 (15%)	01 (05%)	01 (05%)	02 (10%)	12 (07.5%)
2	3751 – 5000	09 (45%)	14 (70%)	12 (60%)	13 (65%)	11 (55%)	11 (55%)	08 (40%)	08 (40%)	86 (53.75%)
3	5001 – 6250	11 (55%)	03 (15%)	06 (30%)	07 (35%)	06 (30%)	08 (40%)	11 (55%)	10 (50%)	62 (38.75%)

Table-4.42. Cropping pattern during Kharif crops in selected Villages of Nagri Block

Cropping Pattern (Kharif)	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harti (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 Sole crop	20 (100%)	19 (95%)	18 (90%)	19 (95%)	20 (100%)	20 (100%)	20 (100%)	19 (95%)	155 (96.87%)
2 Mixed crop	00 (00.00)	01 (05%)	02 (10%)	01 (05%)	00 (00.00)	00 (00.00)	00 (00.00)	01 (05%)	05 (3.12%)

Table -4.43. Crop Yield during Rabi (Kg/ha) in selected Villages of Nagri Block

Crop Yield (Rabi)	Edchero		Saher		Lalgutuwa		Balalong		Total	
	Sl. No.	Agricultural crop yield (kg/ha) Rabi crop	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa ^w a (n=20)	Pundag (n=20)		Balalong (n=20)
1	2500 – 3750	01 (05%)	02 (10%)	02 (10%)	00 (00.00)	04 (20%)	00 (00.00)	03 (15%)	01 (05%)	13 (08.12%)
2	3751 – 5000	02 (10%)	04 (20%)	05 (25%)	02 (10%)	11 (55%)	10 (50%)	08 (40%)	06 (30%)	48 (30%)
3	5001 – 6250	15 (75%)	13 (65%)	10 (50%)	16 (80%)	04 (20%)	10 (50%)	08 (40%)	12 (60%)	88 (55%)
4	6251 - 7500	02 (10%)	01 (05%)	03 (15%)	02 (10%)	01 (05%)	00 (00.00)	01 (05%)	01 (05%)	11 (06.87%)

Table-4.44. Cropping pattern during Rabi crops in selected Villages of Nagri Block

Cropping Pattern (Rabi)	Edchero			Saher			Lalgutuwa			Balalong			Total
	Edchero (n=20)	Patrachauti (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)					
1 Sole crop	10 (50%)	12 (60%)	11 (55%)	10 (50%)	15 (75%)	15 (75%)	10 (50%)	12 (60%)				95 (59.37%)	
2 Mixed crop	09 (45%)	08 (40%)	09 (45%)	08 (40%)	03 (15%)	04 (20%)	08 (40%)	07 (35%)				56 (35%)	
3 Inter crop	01 (05%)	00 (00.00)	00 (00.00)	02 (10%)	02 (10%)	01 (05%)	02 (10%)	01 (05%)				09 (05.62%)	

Table-4.45. Vegetables grown by household in Nagri Block

Sl. No.	Vegetables grown by household	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Cauliflower	20 (100%)	20 (100%)	20 (100%)	18 (90%)	17 (85%)	16 (80%)	20 (100%)	16 (80%)	147 (91.87%)
2	Potato	20 (100%)	20 (100%)	20 (100%)	20 (100%)	16 (80%)	19 (95%)	20 (100%)	18 (90%)	153 (95.62%)
3	Tomato	20 (100%)	19 (95%)	20 (100%)	20 (100%)	16 (80%)	19 (95%)	20 (100%)	15 (75%)	149 (93.12%)
4	Brinjal	20 (100%)	18 (90%)	20 (100%)	17 (85%)	16 (80%)	14 (70%)	13 (65%)	16 (80%)	134 (83.75%)
5	Bean	08 (40%)	09 (45%)	07 (35%)	08 (40%)	03 (15%)	03 (15%)	07 (35%)	06 (30%)	51 (31.87%)
6	Cabbage	10 (50%)	15 (75%)	09 (45%)	14 (70%)	09 (45%)	10 (50%)	16 (80%)	08 (40%)	91 (56.87%)
7	Chilies	18 (90%)	17 (85%)	15 (75%)	18 (90%)	12 (60%)	08 (40%)	10 (50%)	11 (55%)	109 (68.12%)

Table-4.46. Type of crops grown in upland situations in Nagri Block

Type of crops grown in upland situations	Edchero		Saher			Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauhi (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1 Rice	14 (70%)	16 (80%)	11 (55%)	13 (65%)	15 (75%)	14 (70%)	15 (75%)	14 (70%)	112 (70%)	
2 Maize	05 (25%)	04 (20%)	04 (20%)	05 (25%)	02 (10%)	03 (15%)	03 (15%)	02 (10%)	28 (17.5%)	
3 Sunhemp	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
4 Ragi	03 (15%)	04 (20%)	02 (10%)	00 (00.00)	00 (00.00)	00 (00.00)	02 (10%)	01 (05%)	12 (07.5%)	
5 Black gram	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
6 Pigeon pea	05 (25%)	03 (15%)	03 (15%)	04 (20%)	00 (00.00)	02 (10%)	03 (15%)	04 (20%)	24 (15%)	
7 Finger millets	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
8 Small millets	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
9 Sorghum	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
10 Kharif vegetable	04 (20%)	05 (25%)	03 (15%)	04 (20%)	03 (15%)	04 (20%)	02 (10%)	04 (20%)	28 (17.5%)	
11 Turmeric	05 (25%)	06 (30%)	04 (20%)	05 (25%)	00 (00.00)	02 (10%)	02 (10%)	00 (00.00)	24 (15%)	
12 Ginger	08 (40%)	06 (30%)	07 (35%)	05 (25%)	02 (10%)	04 (20%)	01 (05%)	05 (25%)	38 (23.75%)	
13 Colocassia	04 (20%)	05 (25%)	07 (35%)	03 (15%)	04 (20%)	03 (15%)	01 (05%)	00 (00.00)	27 (16.87%)	

Table – 4.48. Crops grown as mixed/ inter crop by households in selected Villages of Nagri Block

Sl. No.	Crops grown as mixed/ inter crop by households	Edchero		Saher			Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khuntia (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Rice + Black gram	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
2	Rice+ Pigeon pea	01 (05%)	02 (10%)	00 (00.00)	03 (15%)	00 (00.00)	00 (00.00)	00 (00.00)	01 (05%)	07 (4.37%)	
3	Rice + Maize	02 (10%)	01 (05%)	00 (00.00)	03 (15%)	00 (00.00)	00 (00.00)	02 (10%)	01 (05%)	09 (5.62%)	
4	Rice +sorgum +Sunhemp	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
5	Maize + Black gram	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
6	Maize + pigeon pea	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
7	Finger millets + Black gram	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
8	Finger millet +Maize	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	
9	Wheat + mustered	06 (30%)	05 (25%)	03 (15%)	06 (30%)	05 (25%)	06 (30%)	02 (10%)	04 (20%)	37 (23.12%)	
10	Ginger + Turmeric	04 (20%)	03 (15%)	03 (15%)	02 (10%)	02 (10%)	03 (15%)	01 (05%)	03 (15%)	21 (13.12%)	

Table-4.49. Households taking Second crop in uplands in selected Villages of Nagri Block

Sl. No.	Households taking 2 nd crop in upland	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	YES	19 (95%)	19 (95%)	18 (90%)	19 (95%)	19 (95%)	20 (100%)	19 (95%)	20 (100%)	153 (95.62%)
2	NO	01 (05%)	01 (05%)	02 (10%)	01 (05%)	01 (05%)	00 (00.00)	01 (05%)	00 (00.00)	07 (4.37%)

Table-4.50. Crops grown in upland in Rabi season in Nagri Block

Crops grown in upland in Rabi season	Edchero		Saber		Lalgutuwa		Balalong		Total	
	Sl. No.	Crops	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)		Balalong (n=20)
1	Wheat	07 (35%)	03 (15%)	08 (40%)	06 (30%)	05 (25%)	09 (45%)	08 (45%)	08 (40%)	54 (33.75%)
2	Gram	00 (00.00)	00 (00.00)	00 (00.00)	00 (05.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
3	Tori	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
4	Pea	04 (20%)	05 (25%)	03 (15%)	04 (20%)	06 (30%)	03 (15%)	02 (10%)	03 (15%)	30 (18.75%)
5	Cauliflower	03 (15%)	05 (25%)	03 (15%)	03 (15%)	02 (10%)	03 (15%)	03 (15%)	04 (20%)	26 (16.25%)
6	Corriander	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
7	Tomato	05 (25%)	06 (30%)	04 (20%)	06 (30%)	06 (30%)	05 (25%)	05 (25%)	05 (25%)	42 (26.25%)

Table-4.51. Source of fuel at house hold level in selected Villages of Nagri Block

Sl. No.	Source of fuel at house hold level	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa a (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Use cow dung	05 (25%)	04 (20%)	03 (15%)	03 (15%)	03 (15%)	02 (10%)	02 (10%)	01 (05%)	23 (14.37%)
2	Fuel wood from forest	06 (30%)	05 (25%)	07 (35%)	07 (35%)	00 (00.00)	01 (05%)	02 (10%)	04 (20%)	32 (20%)
3	Fuel wood from own trees	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
4	Use coal	01 (05%)	02 (10%)	00 (00.00)	02 (10)	05 (25%)	06 (30%)	04 (20%)	05 (25%)	25 (15.62%)
5	Use LPG gas	08 (40%)	09 (45%)	10 (50%)	08 (40%)	12 (60%)	11 (55%)	12 (60%)	10 (50%)	80 (50%)

Table- 4.52. Mode of feeding cattle in selected Villages of Nagri Villages

Sl. No.	Mode of feeding cattle	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	Stall feeding	00 (00.00)	01 (05%)	02 (10%)	04 (20%)	00 (00.00)	01 (05%)	03 (15%)	04 (20%)	15 (09.37%)
2	Grazing only	01 (05%)	01 (05%)	02 (10%)	02 (10%)	01 (05%)	02 (10%)	02 (10%)	01 (05%)	12 (07.5%)
3	Both	19 (95%)	18 (90%)	16 (80%)	14 (70%)	19 (95%)	17 (85%)	15 (75%)	15 (75%)	133 (83.12%)

Table—4.53. Sources of agriculture implements in selected villages of Nagri Block

Sources of agriculture implements	Edchero		Saher			Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1 From the forest	08 (40%)	09 (45%)	09 (45%)	07 (35%)	05 (25%)	07 (35%)	11 (55%)	12 (60%)	68 (42.5%)	
2 From own land	08 (40%)	05 (25%)	11 (55%)	04 (20%)	04 (20%)	03 (15%)	00 (00.00)	00 (00.00)	35 (21.87%)	
3 Purchased from market	04 (20%)	06 (30%)	00 (00.00)	09 (45%)	11 (55%)	10 (50%)	09 (45%)	08 (40%)	57 (31.25%)	

Table -4.54. Income generation activities at household level in selected villages of Nagri Block

Income generation activities at household level	Edchero		Saher		Lalgutuwa		Balalong		Total
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harti (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1 Apiary	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
2 Tassar rearing	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
3 Poultry rearing	04 (20%)	05 (25%)	04 (20%)	05 (25%)	02 (10%)	04 (20%)	03 (15%)	04 (20%)	31 (19.37%)
4 Goatery	04 (20%)	03 (15%)	03 (15%)	01 (05%)	02 (10%)	02 (10%)	05 (25%)	01 (05%)	21 (13.12%)
5 Piggery	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	00 (00.00)	00 (00.00)	00 (00.00)	01 (05%)	03 (01.87%)
6 Lac cultivation	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
7 Homestead garden	15 (75%)	17 (85%)	18 (90%)	19 (95%)	17 (85%)	18 (90%)	19 (95%)	18 (90%)	144 (90%)

Table-4.55. Annual Income of households by from Vegetables in selected Villages of Nagri Block

Income in Rs.	Edchero		Saher		Lalgutuwa		Balalong		Total N= 160 (%)
	Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
Below 20000	15 (75%)	16 (80%)	09 (45%)	08 (40%)	11 (55%)	12 (60%)	13 (65%)	12 (60%)	96 (60%)
20001 – 40000	03 (15%)	04 (20%)	03 (15%)	05 (25%)	02 (10%)	02 (10%)	01 (05%)	02 (10%)	22 (13.75%)
40001 - 60000	01 (05%)	00 (00.00)	03 (15%)	03 (15%)	05 (25%)	00 (00.00)	02 (10%)	01 (05%)	15 (09.37%)
60001 - 80000	00 (00.00)	00 (00.00)	01 (05%)	01 (05%)	01 (05%)	01 (05%)	00 (00.00)	01 (05%)	05 (3.12%)
80001 -100000	01 (05%)	00 (00.00)	01 (05%)	02 (10%)	01 (05%)	01 (05%)	04 (20%)	04 (20%)	14 (08.75%)
Above 100000	00 (00.00)	00 (00.00)	03 (15%)	01 (05%)	00 (00.00)	04 (20%)	00 (00.00)	00 (00.00)	08 (05%)

Table-4.56. Income from Livestock (Monthly) in selected Villages of Nagri Block

Sl. No.	Income from Livestocs	Edchero		Saher		Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)	
1	0	01 (05%)	03 (15%)	04 (20%)	03 (15%)	05 (25%)	07 (35%)	06 (30%)	04 (20%)	33 (20.62%)
2	100 – 500	05 (25%)	07 (35%)	03 (15%)	01 (05%)	05 (25%)	04 (20%)	02 (10%)	01 (05%)	28 (17.5%)
3	501 – 1000	10 (50%)	06 (30%)	04 (20%)	07 (35%)	04 (20%)	04 (20%)	04 (20%)	06 (30%)	45 (28.12%)
4	1001 – 1500	03 (15%)	03 (15%)	04 (20%)	02 (10%)	02 (10%)	01 (05%)	02 (10%)	03 (15%)	20 (12.5%)
5	1501 – 2000	01 (05%)	00 (00.00)	02 (10%)	04 (20%)	02 (10%)	04 (20%)	03 (15%)	03 (15%)	19 (11.88%)
6	2001 – 2500	00 (00.00)	01 (05%)	01 (05%)	03 (15%)	02 (10%)	00 (00.00)	01 (05%)	02 (10%)	10 (06.25%)
7	2501 – 3000	00 (00.00)	00 (00.00)	02 (10%)	00 (00.00)	00 (00.00)	00 (00.00)	02 (10%)	01 (05%)	05 (3.12%)

Table-4.58. Monthly income of Household of selected villages of Nagri Block

Sl. No.	Monthly income of the household	Edchero		Saher			Lalgutuwa		Balalong		Total
		Edchero (n=20)	Patrachauli (n=20)	Khunta (n=20)	Harhi (n=20)	Lalgutuwa (n=20)	Pundag (n=20)	Balalong (n=20)	Kelende (n=20)		
1	Below 1000	00 (00.00)	01 (05%)	02 (10%)	01 (05%)	00 (00.00)	00 (00.00)	01 (05%)	01 (05%)	06 (03.75%)	
2	1001-4000	08 (40%)	05 (25%)	03 (15%)	07 (35%)	02 (10%)	04 (20%)	02 (10%)	02 (10%)	33 (20.62%)	
3	4001-7000	04 (20%)	05 (25%)	07 (35%)	05 (25%)	03 (15%)	03 (15%)	04 (20%)	05 (25%)	36 (22.5%)	
4	7001 - 10000	05 (25%)	07 (35%)	03 (15%)	06 (30%)	09 (45%)	07 (35%)	05 (25%)	06 (30%)	48 (30%)	
5	>than Rs. 10000	03 (15%)	02 (10%)	05 (25%)	01 (5%)	06 (30%)	06 (30%)	08 (40%)	06 (30%)	37 (23.12%)	

Table-4.59. Volume of timber species of Edchero Panchayat

S. No.	Species	Avg Ht. (m)	Avg Girth (m)	Vol (cu.m)
1.	<i>Gmelina arborea</i>	11.2	0.43	0.162
2.	<i>Tectona grandis</i>	15.6	0.46	0.261
3.	<i>Bombax ceiba</i>	16.2	0.64	0.524
4.	<i>Dalbergia sissoo</i>	13.1	0.39	0.158
5.	<i>Melia azadirach</i>	14.3	0.42	0.198

Table-4.60. Volume of timber species of Saher Panchayat

S. No.	Species	Avg Ht. (m)	Avg Girth (m)	Vol (cu.m)
1.	<i>Gmelina arborea</i>	10.2	0.36	0.104
2.	<i>Azadirachta indica</i>	13.2	0.52	0.282
3.	<i>Tectona grandis</i>	16.6	0.56	0.412

Table-4. 61. Volume of timber species of Lalgutuwa Panchayat

S. No.	Species	Avg Ht (m)	Avg Girth (m)	Vol (cu.m)
1.	<i>Gmelina arborea</i>	16.2	0.63	0.508
2.	<i>Tectona grandis</i>	11.6	0.36	0.118
3.	<i>Dalbergia sissoo</i>	14.4	0.40	0.182
4.	<i>Madhuca indica</i>	15.3	0.79	0.756

Table- 4. 62. Volume of timber species of Balalong Panchayat

S. No.	Species	Avg Ht. (m)	Avg Girth (m)	Vol (cu.m)
1.	<i>Gmelina arborea</i>	17.2	0.69	0.647
2.	<i>Tectona grandis</i>	18.6	0.76	0.855
3.	<i>Acacia auriculiformis</i>	16.4	0.65	0.551
4.	<i>Artocarpus heterophyllus</i>	12.8	0.71	0.513