

Wild Edible Plants as a Food Resource among the People of the District of Kalimpong: An overview

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Abstract

The wild plants and their products make significant contributions to the human and animal food web and are often a means of survival for millions of poor rural households (Mallick et al., 2020). Many tribes in and around the world are intimately associated with forest for their habitat and ecology. The Anthropological study has highlighted many complex and intimate relationship between the two amongst which livelihood remains the most prominent and crucial. Nonetheless, their association with the forests is reflected not only in the economic sphere rather this relationship of dependency to an extent characterises the social aspect and cultural practices of the tribals. This paper attempts to understand usage of the forest resources and wild edible plants by the tribal and other communities of the Kalimpong district.

Keywords: Wild Edible Plants, Kalimpong, local diet, nutritional value, medicinal value.

Introduction

The tribals and the forest have a very intimate and symbiotic relationship since time immemorial. In the remote past forest and the wild edible plants was the main source of sustenance for indigenous tribes and communities; and they largely depended on the forest resources for their livelihood. Many tribal populations use the forest products as a significant supplement of their diet since the wild plants and their products make significant contributions to the human and animal food web and are often a means of survival for millions of poor rural households (Mallick *et al.*, 2020). According to the 12th Five Year Plan of NTFP (Non-Timber Forest Products) and their sustainable management it is estimated that at least 275 million poor rural people in India depend on non-timber forest produce as a part of their subsistence. Besides, providing food supplies to the communities living nearby, it also acts as a source of employment and livelihood, medicinal supply, raw material, etc.

In India, after agriculture the second largest land use is forest division. According to the State of Forest Report (2021) the total forest cover of India is 7,13,789 sq. km which is 21.71 percent of the total

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geographic region of the country. The state of West Bengal has 16,832 percent of total Forest Cover out of 88,752 sq. km geographical area. Kalimpong, the northernmost district of the state of West Bengal at present an area of 364.35792 sq.km of reserved forest is under the jurisdiction of Kalimpong Forest Division comprising of nine territorial Ranges: Kalimpong range with headquarters at Kalimpong, Pankhasari Range with headquarters at Algarah, Chel Range with headquarters at Chunabhati, Neora Range with headquarters at Gorubathan, Noam Range with headquarters at Manabari, Samsing Range with headquarters at Samsing, Jaldhaka Range with headquarters at Jhalong, Lava Range with headquarters at Lava and Lolegaon Range with headquarters at Lolegoan. The district of Kalimpong is located at the lower Himalayan Siwalik range, the physiography is mostly mountainous and hilly terrain except a few sq. km of flat terrain. Due to the fragility of hill areas and vulnerability to land degradation, the forest cover plays an important role in prevention of soil erosion, land degradation and also maintaining ecological balance and environmental stability (Forest Survey of India,2021).

Objective of the study

The main objective of the paper is to understand usage of the forest resources and wild edible plants by the tribal and other communities of the Kalimpong district. Most of the tribes in and around the world are intimately associated with forest for their habitat and ecology. The Anthropological study has highlighted many complex and intimate relationship between the two amongst which livelihood remains the most prominent and crucial. Nonetheless, their association with the forests is reflected not only in the economic sphere rather this relationship of dependency to an extent characterises the social aspect and cultural practices of the tribals. Tribal communities have cultural mechanism and indigenous practices that help conservation and restoration of forests and natural resources (eGyankosh). They believe in preserving and protecting the forest and the usage of the forest products is mainly for their livelihood and not for major commercial purposes.

This paper attempts to understand the use of different edible products by the communities residing in the hilly region of the district of Kalimpong and the nutritional values like potassium, iron, magnesium, phosphorous etc. provided in their diet. The analysis is based both on the primary and secondary sources.

Area of Study and the population

The district of Kalimpong is situated at 26°51' and 27°12' East longitude and 88°28' & 88°53' North latitude, at an average elevation of 4,101 ft. It is one of the northern-most districts of West Bengal (Fig.1). Physiographically, Kalimpong a hilly tract in Siwalik Hills is part of the Lesser Himalayan fore-deep

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region. it is situated on the eastern bank of River Teesta, on it west lies the Ni-chhu and Di-chhu (Jaldhaka) rivers. It is bounded by Sikkim on the north separated by river Teesta, on the south by the district of Jalpaiguri, on the west by the district of Darjeeling and on the east by Bhutan.



Fig. 1. Map showing study area.

According to 2011 census, the district of Kalimpong has the population of 251,642, out of which 74,976 (29.79%) are Scheduled tribe and 16,433 (6.53%) are Scheduled Castes and, rest of the population constitutes of other backward class communities and general category people. Bhutia, Dukpa, Lepcha, Limbu, Tamang, Tibetan and Yolmo constitutes the Schedule Tribe populace of the district. Damai, Kami, Sarki along with other sub-groups under these heads constitute the Schedule Castes of the district. The backward classes registered under West Bengal Commission for Backward Classes includes Bhujel, Dewan, Gurung, Mangar, Newar, Rai (including Chamling) and Thami. Other Nepali communities like Chettri, Sharma, Thakuri, etc, along with the people belonging to different communities of India form the population composition of the district.

Wild edible plants

Wild edible plants can be defined as the plants species that grow and reproduce naturally in the farm land, forests, outside the cultivated area, in the natural habitat without human intervention. The same has been defined by several scholars and different organisation and its importance. Food and Agriculture Organisation defined wild edible plants as ‘plants that grow spontaneously in self-maintaining populations in natural or semi-natural ecosystems and can exist independently of direct human action’. Bhatia. *et al.* (2018) wrote ‘wild edible plants refer to edible species that are not cultivated or domesticated. Wild edible plants have an important role to play in poverty eradication, security of food availability, diversification of agriculture, generation of income resources, and alleviating malnutrition’. Mentioning the properties of the wild edible plants Kallas. J. (2010) remarked ‘wild edible plants are

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endowed with one or more parts that can be used for food if gathered at the appropriate stage of growth and properly prepared'. He further added if a plant is considered edible, that means that there is at least one part of the plant that you can eat. The distinction between what is regarded as edible and inedible and the ecological systems in which people live are not just passive backdrop of life but important indications of prevailing social and cultural systems. (Gosden & Hather, 1999).

Edible wild plants play a critical role in ensuring food and livelihood security for countless families and communities around the world (Khan. F. A., *et al* 2017). Wild plants have been used for food, protein, medicine, fibre and other purposes by the people and also as fodder to the animals. Wild edible plants are consumed in the form of leafy vegetables, roots, tubers, fruits, seeds, flowers bulbs, etc. Several benefits have been attested to the usage of wild edible plants, it provides nutritional requirement and nutritional balance to those who heavily rely on the consumption of the wild plants. These plants act as a source of macro and micro nutrient like protein, vitamins, carbohydrates, fats, minerals, etc. It serves as both the staple and complimentary food as per the requirement of the people. Wild edible plants also help in maintaining the biodiversity and improving the ecosystem. It not only provides the dietary supplement to the people it also shapes the cultural history of the people of the region. The food they collect and gather, they prepare and what they consume helps in developing the tradition, identity and custom of a particular community. Food tradition is a part of the cultural identity and it asserts the diversity, organisation and heritage of a community or a society.

Wild edible food differs from domesticated ones, wild edible plants do not have a consistent flavour, taste and texture due to reasons like variation in the soil, climate, percentage of water, not harvested at the prime time, etc. There are even some hazards involved in collecting and consuming wild edible plants since identifying is always a wonderful challenge and part of the adventure of wild foods (Kallas. J. 2010). Gathering of wild plants is guided by the experience, mastery or understanding of local diversity and traditional knowledge. Plants are found everywhere and there are both edible and inedible plants. Inedible plants are ones not suitable, for one reason or another, to be used as food. Some inedible plants are poisonous. While most inedible and their parts are relatively harmless in small quantities, there are certainly a few really bad players out there (Kallas. J. 2010).

Usage of Wild edible plants and the local communities

Local Communities of the district use wild edible plants, as stated above, in the form of leafy vegetables, roots, tubers, fruits, berries, seeds, stem, flowers, bulbs, etc. Some common wild edible plants that are included in the diet of the people of the district of Kalimpong includes:

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Ban Tarul or Air potato or Wild yam (botanical name *Dioscorea Hamiltonii Hook.f*) its tubers and bulbils are boiled and eaten. Wild yam is used for treating swellings, pain, indigestion and dysentery. This tuber has a cultural significance too, during the harvest festival of Maghey Sankranti (local language) or Makar Sankranti, Nepali communities paste a small raw piece of this tuber on the forehead as the first ritual of the occasion.

Ghar Tarul or Purple yam (botanical name *Dioscorea alata*): it was first cultivated in South-east Asia (Kankolongo, A.M. 2018). It is light purplish in colour and has little sweet and nutty taste. In the district of Kalimpong it is found in the wild and is consumed after boiling or cooked as a vegetable. It is rich in carbs, potassium and vitamin C.

Pidaalu/ Pindalu or Taro (botanical name *Colocasia esculenta (L) Schott*): This root vegetable has a brown outer skin with white flesh. This is the tropical plant native to south-east Asia. Fully matured *Pindalu* are eaten as starchy vegetable, but its stem and leaves can be consumed only at its tender stage. Due to the presence of high levels of calcium oxalate, *Pindalu* leaves and tubers or corms can be toxic if eaten raw. This tuber helps improve the digestive system and it is commonly used for treating constipation by the locals. *Pindalu* or Taro roots are low in protein and low in fat but it is a good source of dietary fibre and minerals like potassium and magnesium.

Simal Tarul or Tapioca (botanical name *Manihot esculenta*): Simal Tarul is consumed after removing its outer cover, it is boiled and eaten. Unlike other parts of the world no fancy dishes are prepared out of Simal Tarul. Tapioca contains carbohydrates; rich in copper and iron; protein, fat and fibre are present at modest level.

All the above-mentioned tubers though originally found in the wild; rural communities have started cultivating these wild species for consumption and for small commercial purposes of selling it in the local market.

Tama or Bamboo Shoot (botanical name *Dendrocalamus hamiltonii Neer & Arn. ex Munro*): It is one of the most popular food items among the locals. It is a seasonal vegetable and found in the months from June to September when young bamboo shoots sprout. Young shoot is eaten as a plain vegetable or mixed with meat like pork, beef and buff. These bamboo shoots are preserved in the various form of pickle for the year-long usage. Due to its pungent smell and acidic taste, it is not a very popular vegetable besides the local communities. It has a rich content of carbohydrate, fibre, vitamin and low in fat.

Sishnu or Stinging Nettle or Burn Nettle (botanical name *Urtica dioica L.*): It is a perennial flowering plant from the nettle family. Ghario Sishnu, Thulo Sishnu or Bhangre Sishnu are the common Nepali names for edible stinging nettle. Its tender leaves are used for preparing mostly soup and vegetable. It

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controls the high blood pressure. It is a moderate-calorie leafy vegetable and contains folates, rich in vitamin B-complex group of vitamins and an excellent source of minerals.

Nakima (botanical name *Tupistra nutans* Wall. Ex Lindl): It is a wild orchid flower belonging to seasonal flowering plant with short blooming period. Its flower mildly bitter in taste is favourite among the locals. Its flower is consumed as vegetable, often cooked with meat. Nakima is also preserved and used as pickle. Several local brands are bottling this wild orchid flower and selling in the market. Nakima controls high blood pressure and blood sugar.

Ningro/ Niuro or Fiddlehead Fern (botanical name *Tectaria gemmifera* (Fee) Alston): Ningro are tender, tightly furled new growth shoots of fern family. It grows well in moisture rich soil with shady environment. It is one of the important components of the local diet. Young shoots are boiled and cooked as a vegetable. It is used for treating stomach disorders. But if it is not cooked properly it may upset ones stomach.

Simrayo or Watercress (botanical name *Nasturtium Officinale*): Simrayo is a well-accepted vegetable in the hills of North Bengal and the state of Sikkim. Watercress is a perennial, aquatic or semi-aquatic high value plant which generally prefers marshy lands (near springs and open running waterways) for its proper growth and development (Rai. S. *et al* 2021). It's leaves and tender stem is taken as vegetable and used for preparing soup. Due to its enriched nutritional and medicinal properties Simrayo holds an important place in the diet of the locals. It is low in calories, virtually fat free but rich in iron and minerals.

Latte or Amarath leaves (botanical name *Amaranthus lividus* L.): Latte is a leafy vegetable which is easily available in the study area. Its leaves are prepared as vegetables. Its leaves and stems carry good amount of dietary fibres and it is the storehouse of phytonutrients and minerals without any traces of cholesterol.

Kabra or Java Fig (botanical name *Ficus lacor* Buch-Ham): The unopened leaves of the tree is used specially for making pickle. It contains dietary fibre; minerals and it is used as an appetizer.

Chinde (botanical name *Macropanax Dispernus*): The young tender leaves are used to made appetizer.

Gande Jhar (botanical name *Houttuynia Cordata* Thunb.): Fresh roots and young stems are used for making local pickle or chutney.

Laliguras or Rhododendrons (botanical name *Rhododendron arboretum*): Rhododendron is a woody plant with a showy display of bright red flowers belongs to Ericaceae normally grows on North Temperate zone especially in the moist acid soil of the Himalayas (Swamidasan *et. al.* 2019). Magnificent flower holds medicinal properties, fresh or dried petals are used to cure dysentery, diarrhoea, throat problems. Laliguras is rich in minerals like manganese, zinc, iron, copper, sodium. Its petals are also used to make local wine, which is popular among the locals and the tourists.

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Wild fruits and especially berries are consumed by different communities around the world. Berries may be considered as versatile food that is tasty, containing important nutrients. Several wild berries and seeds have been included in the dietary food and supplement of the local communities.

Lapsi or Nepali Hog Plum (botanical name *Choerospondias axillaris*): It grows in tall subtropical tree, the tree fruits every year and the berry is harvested from the month of September to January. It is mainly used for preparing different kinds of pickle, it can be eaten raw, too. Though it grows in the wild but it can be purchased in the local market or haat mostly sold by the locals. It is rich in iron having a sticky white pulp and a tangy taste, tanginess helps in digestion.

Kusum (botanical name *Baccaurea ramiflora Lour*): Kusum is the wild berry mostly found in the forest area. It has a high source of vitamin C. Ripe berries are eaten raw. It helps in treating constipation.

Katus/ Musure Katus or Chestnut (botanical name *Castanopsis tribuloides (Sm)*): Katus is also the jungle nut containing nutritional value of carbohydrate. It can be eaten raw but roasted ones are preferred. It is used during the festival of Diwali by some Nepali communities. Besides, Musure katus there are other variety such as Patle katus and Jat Katus.

Betgera ((botanical name *Calamus erectus Roxb*): This wild berry is mostly eaten raw and it controls sugar level.

Pumsi/ kaulo or Wild Avacado (botanical name *Machulis edulis kin ex Hook. f.*): It is eaten raw, before eating you have to roll it for some time to make the pulp tender. It has the medicinal property of controlling blood sugar.

Chewri or Indian Butter Tree (botanical name *Diploknema butyracea*): Chewri is a fruit from multipurpose tree, it ripens in the month of June-July. Fruit is eaten fresh and at times it is used for alcohol distillation also. It is used by the diabetic patients and even used for stomach problem.

Musleri/ maldhero or Himalayan Silverberry (botanical name *Elaegmus Latifolia*): This fruit grows mostly in the hilly part of the district. Ripened fruits are red-orange in colour with white speckles all over. Ripe ones are eaten fresh and has a high source of vitamin C.

Ainselu or Golden Himalayan Raspberry (botanical name *Rubus ellipticus*): Ainselu, yellow berry grows in thorny fruiting bush shrub with stout stems. Berry is sweet, detachable but perishes fast after plucking from the bush. Berry is used to treat indigestion and its roots are used to treat headaches. This berry is not commonly domesticated or harvested for domestic use.

Amala or Indian Gooseberry (botanical name *Phyllanthus emblica*): The small berries are round in shape and yellowish-green in colour. Due to its several health benefits, it can be referred as superfood. Fresh or dried Amala berries are potently used for medicinal formulations to treat hyper-tension, piles,

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constipation, gastritis and common cold. Berry is a rich source of Vitamin C and it can be eaten raw. Several types of sweet and sour pickle are also prepared out of this berry by the local people.

Boke Timur or Nepalese pepper or Prickly ash (botanical name *Zanthoxylum armatum*): Dried fruit of Boke Timbur/Timur is aromatic and used as spice in pickles and curries. It also harbours a multitude of medicinal values.

Sil Timbur/Timur (botanical name *Litsea cubeba*): This berry is used for treating gastric and also for preparing some local pickles.

Bhakimlo (botanical name *Rhus chinensis* Mill.): *Rhus chinensis* Mill. Has a long history of traditional medicinal and culinary use by native people of North-eastern part of India. It is considered as a medicine for the treatment of gastrointestinal problems, urinary complaints and many other health ailments (Devi. H.M. *et al.* 2018). Even several communities in the district prepares fruit decoction out of Bhakimlo for future use.

Totola ko Phool or Indian Trumpet Flower (botanical name *Oroxylom indicum*): The fresh flower is used as vegetable and it is considered to have several health benefits. Locals believe it enhances the memory the memory power. Its flower holds a great cultural significance especially for the people belonging to the Tamang community. Any special occasion or ceremonies like marriage, funeral or religious ritual is incomplete without the use of its flower (“Ko Ko mendo” in Tamang language). Flowers petals are almost round in shape, off-white in colour having a flimsy texture. It has several health benefits too and used for the treatment of tonsilitis, sore throat and fever.

Kimbu or Mulberry (botanical name *Morus alba* L.): Ripe Mulberry fruits are juicy having a good balance of tartness and sweetness. Ripe fruits are usually eaten raw but it is also used for making jams and jelly.

Chimpring or Hogweed (botanical name *Heracleum Wallichii* DC): Chimpring is edible especially for medicinal purposes and to lesser extent as a food. Fruit decoction is used for treating stomach disorder, convulsion and inflammation.

Koirala/ Koirala ko Phool or Mountain Ebony (botanical name *Bauhinia Variegata*): Its flower varies from pink-white to light mauve-purple. Mountain Ebony also called poor-man’s orchid has both the culinary and medicinal values, flowers are either cooker or steamed and made delicacies out of it.

Philunge (botanical name *Guizotia Abyssinia*) and Silam (botanical name *Perilla frutscens*): The plant belongs to the mint family. These seeds are generously used all over the Himalayan belt. Philunge seeds

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are black, little elongated in shape whereas Silam are small round in shape of varying colour from grey-white to brown-black. Silam has a high oil content and nutty flavour.

The above-mentioned tubers, roots, berries, seeds and leaves are the commonly used wild edible products by the local people of the district of Kalimpong.

Conclusion

The considerable amount of wild edible plants is included and consumed making a major contribution to the dietary intake of the people of the district of Kalimpong. Besides food, forest resources are also used as medicine, fodder for animals, fuel, etc. The major advantage of the wild edible plants is that it is locally available, demands low input and their use is based on traditional knowledge of the locals. The key source of the indigenous knowledge on wild food are the elders of the society, they have deep knowledge on the use and hazards of wild plants. They may lack scientific knowledge, its nutritional values and so on but they have proper understanding of the habitat of the plants.

Wild edible plants provide livelihood benefits too, it helps in assisting households to cope in times of adversity manifested as sudden changes in the economic, social and bio-physical environment in which household exist and function (Shackleton, C. *et al* 2004). The sale of these wild edible plants, roots, berries and seeds in the local markets and haat bazaars supplements income to the rural people.

Small scale entrepreneurs are taking the initiative of promoting locally used wild edible plants, bringing local cuisine to culinary tourism and improve the market value of these products. Large scale cultivation and trade is yet to be initiated. Several challenges like lack of awareness of processing technique, dearth of proper storage facility, dearth of agro-technologies, marketing opportunities and many more problems need to be addressed before these wild edible plants makes its way to the global market.

Local food tradition plays a pivotal role in retaining the cultural identity of the society. one can explore the culture of any community through food. The conventional food and traditional cuisine of the society helps in the conservation and preservation of ethnic identity and culture

References

Aryal. K.P., Poudel. S., Chaudhury. R.P. *et al* (2018) Diversity and use of wild and non-cultivated plants in the Western Himalaya. *Journal of Ethnobiology and Ethnomedicine* Vol 10 No. 14

Bhattarai. K. R. (2017) Ethnomedicinal Practices of the Lepcha Community in Ilam, East Nepal. *Journal of Plant Resources*. Vol. 15 No. 1 (Online)

Research paper © 2012 IJFANS. All Rights Reserved, UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

Bhatia. H., Sharma. Y.P., Manhas. R.K. & Kumar. K. (2018) Traditionally used wild edible plants of district Udhampur, J & K, India. *Journal of Ethnobiology and Ethnomedicine*. Article No, 73.s

Bhujel. D., Chhetri. G.& Rai. Y.K. (2018) Wild Edible Plants used by ethnic communities in Kalimpong district of West Bengal, India. *NeBIO An International Journal of Environment and Biodiversity*. Vol 9 No. 4

Devi. H. M. & Singh. N. I. (2018) Traditional medicinal uses and pharmacological properties of *Rhus chinensis* Mill.: A systematic review. *European Journal of Integrative Medicine*. Vol 21.

FOA (Food and Agriculture Organisation). 2011 Forests for improved nutrition and food security. FOA, Rome (Online)

Gosden. C. & Hather. J.G. (1999) *The Prehistory of Food Appetites for Change*. Routledge

Kallas. J. (2010) *Edible Wild Plants: Wild Foods from Dirt to Plate (The Wild Food Adventure)* Gibbs M. Smith Incorporation, Layton, Utah.

Kankolongo, A.M. (2018) Food Crop Production by Smallholder Farmers in Southern Africa. Challenges and Opportunities for Improvement Chapter 9 Root and Tuber Crops. Academic Press.

Khan. F.A., Bhat. S.A. & Narayan. S. (2017) Wild edible plants as a food Resource: Traditional Knowledge. Online: ResearchGate <https://www.researchgate.net/publication/315099989>

Mallick. S.N., Sahoo. T., Naik. S.K., & Panda. P.C. (2020) Ethnobotanical Study of Wild Edible Food Plants Used by The Tribals and Rural Populations of Odisha, India for Food and Livelihood Security. *Plant Archives* (09725210), 20(1).

Nongdam, P. & Tikendra, L. (2014) The Nutritional Facts of Bamboo Shoots and Their Usage as Important Traditional Foods of North East India. *International Scholarly Research Notices* (Online).

Paty. C.K. (ed) (2007) *Forest Government and Tribe*. Concept Publishing Company, New Delhi- 110059

Rai. S., Sarkar. R.K. & Rai. U. (2021) Watercress (Simrayo) – A well acceptable plant used as a vegetable in hilly region of West Bengal and Sikkim. *Green Farming Vol 12 (5 & 6)*.

Rawat. P., Rai.N., Kumar.N. & Bachheti R. (2017) Review on *Rhododendron arboretum* – a magical tree. *Oriental Pharmacy and Experimental Medicine* 17 (2).

Shackleton, C. & Shackleton. S. (2004) The importance of non-timber forest products in rural livelihood security and as safety nets: a review from South Africa. *South African Journal of Science* 100.

Shrestha, P.M. & Dhillon. S.S. (2006) Diversity and traditional knowledge concerning wild food species in a locally managed forest in Nepal. *Agroforestry Systems* 66(1).

Shumsky, S.A., Hickey, G.M., Pelletier. B. & Johns. T. (2014) Understanding the contribution of wild edible plants to rural sociological-ecological resilience in semi-arid Kenya. *Ecology and Society*. Vol 19 No 4.

Swamidasan, Kumar.S. & Deepa. M. (2018) Medicinal values of *Rhododendron arboretum*: A Comprehensive Review. *International Journal of Science and Research (IJSR)*. Vol 9. Issue 7.

Report of Forest Survey of India, 2021. Ministry of Environment Forest and climate Change, Dehradun, Uttarakhand.

Research paper © 2012 IJFANS. All Rights Reserved, UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

Report on Value Chain Analysis of Timur Government of Nepal Ministry of Agricultural Development High Value Agriculture Project in Hill and Mountain Areas (HVAP), 2011.

District Survey Report of Kalimpong, 2022.