

# CHAPTER ONE

## INTRODUCTION

### 1.0 Background

More than 80% Nepalese are actively engaged in farming activities for meeting basic needs (CBS, 2008). Being an agrarian country, forest resources play an important role in rural community livelihood in Nepal. Besides fulfilling basic needs, forests and its product generate income and employment in rural community. If rural people are made aware the important of forest and forest resources, and the forest resources are mobilized, they will be self-reliant in forest products. They could as well enter a new era of forestry for rural development.

Forest is one of the important natural resources of Nepal that is directly related to the livelihood of rural people. The country comprises around 4.27 millions hectares of forest which is 29% of total land area, 1.75 million hectares of grassland (12% of total land area), 3.0 million hectares of farmland (21% of total land area), and about 1.0 million hectares of uncultivated inclusions (7% of total land area) (HMGN, 2007).

Livelihood of mountain people largely depends on the collection and trade of medicinal and aromatic plants (MAPS) and other non-timber forest Products (NTFPS). Importance of Nepali MAPS can be manifested by three ways. Firstly, wild medicinal plants are an important part of local health care system due to poor access to modern health amenities.

Secondly, trade of MAPS as raw and processed material to medicine producers and the perfume industry crucial income to rural

collectors. Thirdly, MAPS are an important part of the species richness of Nepal.

Nepal has revealed that more than 50% of the household in every village are involved in collection of MAPS for sale since last 15 years, there is growing interest to study medicinal plants in search of new medicines backing up to traditional practice.

The Himalayan inhabitants have used plants since many hundred of years. Medicinal plants are found wherever in Nepal. NTFPS are crucial for the rural livelihood and for their contribution for government or national treasury. It is also source of folklore medicines or unique method of health care of almost 90% of population in remote and rural area. The usage of many more natural product in day-to-day life of public shares its importance in Nepalese economy.

Yarsagumba is one of the high value low volume organic Himalayan medicinal herbs with increasing international market thereby contributing significantly in the local economies of the mountain people.

First discovered by yak herders in the Himalaya of ancient Tibet & Nepal Yarsagumba has been or mysterious creature with appearance of half-caterpillar half-mushroom.

Yarsa Gumba is rare but highly valuable medicinal plant Yarsa Gumba more especially (sinsness) is the top most valuable non timber forest product of Nepal Himalaya. It is highly demanded in national and international market and fetches the highest price running from Rs. 150000 to Rs. 500000 lakh Nepali per kg.

Yarsagumba is a costly medicine commonly used in China. Chinese used for life aging topic & to heat, kidney, lung & heart ailments,

male & female sexual dysfunction, fatigue, headache, toothache, cancer, hiccups & serious injury to relieve pain & the symptoms of tuberculosis & hemorrhoids to restore general & appetite & to promote longevity.

Yarsagumba is endemic to Tibet plateau including the adjoining high altitude area of central & east Himalayan (Nepal, Bhutan & India such as Sikkim, Uttarakhand, Himachal, & Uttanchal Pradesh. Its generally habitat is considered in countries of central Himalayan such as; India, Nepal, Bhutan, Tibet, China etc.

The species famous as the gold rush of Nepal has its niche at alpine meadows /pasture above 3500m altitude. Its distribution is limited areas with an average annual precipitation above 3500-4500mm. In general it is not found in below 3000m area. Secondary sources reveal that Yarsagumba is available mostly in central & western Himalayan of Nepal. Especially in Darchula, Dolpa, Mugu, Jumla, Rukum, Bajhang, Dhading & Rasuwa district.

Some of the eastern Himalayan districts of Nepal stricken with acute poverty may also owe the potential for commercial extraction of Yarsagumba however exploration of availability of the species is still warranted. Since the last few years Yarsagumba has become a significant source of livelihood of mountain people especially in western region of Nepal. Dhakal 2063 from various sources has completed that trade of Yarsagumba has reached to almost Rs. 8 million from along in 2063 B.S. Scientific management for sustainable collection and marketing of these product is now felt necessary for livelihood importance of mountain people recognizing its high value in term of international marketing additional properties and contribution to local socio economics. Nepal Government has shown commitment for the resource management

through legal reformation. This study with a review to explore the recourse status collection potential marketing trade channel indigenous uses and to list out management or utilization problem including legal constant to put forth policy recommendation for sustainable management of the resources. Darchula district has been a famous (top marketing management) collection center in the country. Upper part of Darchula district mostly inside the sacred Himalayan landscape of Himal.

Series of Himalayas of Nepal, a country rich with biological diversity, considered to be famous in the world many kind of rare/scarcely and important herbs from the ancient time. The main income source of local people of hilly and mountain region is collection and selling of herbs that have important contribution in rural and national economic development. YG is an important herb among the herbs, which have high trade in Nepal. The living cost of the mountain people of Himalayan region, where YG is found, to from the collection in and selling of YG. Among the total of revenue NRs 1695592 collection from the selling of the herbs of forest product in Darchula .But only selling of YG, NRs 929500 revenue was collected in fiscal year 2063-64, which was 54.82% of total revenue. Ape and Nampa are the famous Himal of this district.

### **Name and General Description**

*Cordyceps sinensis* is the scientific name of the Yarsagumba, a medicinal herb. The Tibetan name of Yarsagumba is (dbyar rtswa dgun bu) literally means “summer grass winter warm”. Yarsa means semi animal and Gumba means semi herb. Yarsagumba has been known by various names such as YarchaGumbu in Tibet.

Dong shong xia in China.

Caterpillar fungus in English.

Cordyceps in Botanical Term.

Totsu kasu, Tochukasu in Japanese.

## **1.1 Statement of the Problem**

Developing countries in the world including Nepal are affected by vicious circle of poverty. More than 80% Nepalese are engaged in agricultural sectors and income level of such people is declining. So to break down such type of various circle of poverty, a country has to raise the income level of the people. There is no any dilemma that the Yarsa Gumba has been playing crucial role for the economic process. However, the main occupation of people in Darchula is agriculture which is hardly sufficient for 3 to 6 months in an average. Besides the income source form agriculture, YG is the main alternative source of income.

Since the last few years, Yarsagumba has become a significant source of livelihood of the mountain people especially people of the central and western Himalayan of Nepal. People of Darchula call the medicinal herb as Yarsagumba, Kira, Juga, Jeevan Buti etc. Commercial collection of Yarsa Gumba in Darchula has been started from 1987 A.D. (2044 B.S.).

Yarsagumba is the one of the high value organic Himalayan medicinal herb. It is one of the major exposable cash productions of the mountain area. There is high demand of Yarsa Gumba in international market.

But here are some problems. First of all the problem is in collection of Yarsagumba. It is very difficult to collect the Yarsa Gumba due to

cold, Sun shine, and lack of thing like gloves digging equipment, warm shoes, clothes which are used in cold and snow areas. Besides those problems, other problems in collection are due to terrible and narrow trail, poor quality of food, insufficient clothes and shoes, lack of fuel and wood, health problem as diarrhea, vomiting, jaundice, facial skin cracks etc.

Another problem is that it takes five days walk to reach the district headquarter so as to know the price of Yarsagumba and 76% of market price is taken by brokers and 24% by collectors. Thus here we can say there is no market access.

## **1.2 Objectives of the Study**

The general objective of the study is to show the contribution of Yarsagumba in Darchula district of Nepal. The specific objectives include:

1. To study the socio-economic status of local people engaged in Yarsagumba collection.
2. To show the impact of Yarsagumba collection of rural livelihood in Darchula district.
3. To study the collection trend of Yarsagumba, market chain with price variation and participation status of local people in collection of Yarsagumba.
4. To study Yarsagumba Collection Practices, Problem and Measures

### **1.3 Importance of the Study**

Nepal has been trying to achieve sustainable development through conservation and sustainable use of the natural resources. The forestry sector has been always receiving priority in every national level plan during last four decades. Since the last decade, the “Master Plan for the Forestry Sector 1988” has been implemented by HMGN to meet the people’s need of forestry based products. Keeping in view the conservation aspect, land productivity and biodiversity, and promotion of medicinal and aromatic plants processing.

Nepal has a great potential in the development of medicinal plants like Yarsagumba is an economically valuable species of country with the potential to contribute to national economy and uplift the economic condition of the rural people. However, forest managers and policy makers still know little about the production, processing and marketing of this valuable product. Although Yarsagumba has been used in China traditionally as medicine for past 2000 years but in Nepal it has been collected and sold in mountain districts people for only last 15 years (Gurung, 2003).

Yarsagumba is species out of 30 national prioritized species decided by Medicinal Plants and NTFP Coordination Committee on 14 March 2003. The ecological area of Yarsagumba lies in high mountain zone between 3500-5500 m asl. The physiographic and climate of this zone in Nepal is very harsh. Little or no attention has been paid by government official for it’s proper management of by the resources for it’s study. Yarsa Gumba gets frequent publicity in many newspaper and publications but a systematic study of Yarsagumba in Nepal is lacking.

The present study is important to assess the role of YG in rural livelihood from income of YG trading and consequences to forest diversity due to YG collection. The study has assessed the understanding of local people in ecological aspects of YG, the trend of participation of rural people in YG collection, the trend of collection amount of YG. The trend price of obtained by collectors since 1998-2008 and price of YG at different stake holder levels was also recorded the present market channel of YG in Darchula was determined with active participation of collectors and local traders. The role of YG in rural livelihood has been assessed in different livelihood assets especially physical and economical. The consequences to forest diversity due to YG collection was based on experiences of the collectors.

This study will help to understand the basic thing as below:

1. The role of Yarsagumba in increasing income for rural areas and national income.
2. The future prospects of Yarsa Gumba.
3. The facilities to be promoted to Yarsagumba collectors by government
4. The significant relationship between total production and export of Yarsagumba in Nepal.

#### **1.4 Limitations of the Study**

There was very limited time for the present study and the study site is located in very remote district of Nepal. The accessibility to Yarsagumba collection site was very poor and duration of availability was very short. In national context, Darchula district falls under poorest



districts of Nepal, so wealth ranking class, i.e. rich, medium and poor considered for this study may not be representative in the nation context.

The limitation of this study are as below:

1. Complete plants are only taken.
2. Argument could not be verified in the field because of the limited time factor and the controlled observation was impractical due to huge pressure of the collectors.
3. This study is concern with production activities of Yarsagumba in Nepal especially in Darchula.
4. Data analysis regarding the market price in the current year is based on the last year's market price.
5. Due to lack of sufficient articles in this field, it has been difficult to make study more effective with the help of literature review.
6. There are various directives of punishment and fine for those who violate the rule and go for the collection before the fixed date for the collection.

## **1.5 Organization of the Study**

The present study is divided into five chapters The first chapter deals with introduction of subject matter. The second chapter deals with the research review of literature. Third highlights the research methodology. Fourth chapter includes the analysis and interpretation and finally summary, conclusion and recommendations are dealt in fifth chapter.

## CHAPTER-TWO

### REVIEW OF LITERATURE

#### 2.1 Theoretical Literature review

FAO 'Non-Wood New', the magazine described about recent situation about NTFPs. Recently, there has been increasing awareness about importance of NTFPs as a result of many local factors such as dependence of rural communities on NTFPs, site quality, the new market preference for natural products, increasing concern about the conservation of forests and their biodiversity and occurrence of many non-wood products among the biological richness and ecological complexity of natural forest (FAO, 1994)

Zhu et al, studied 'The scientific Rediscovery of an Ancient China herbal Medicine: Cordyceps sinensis' article published on part 1 Journal of alternative complementary Medicine, his study deals about market trends of YG. Its current high international profile and demand developed only sometime in 1993 when many Chinese long distance runners broke world records. There was the initial suspicion of the use of performance enhancing drugs but this was unfounded. The Chinese instead boasted of taking Cordyceps, and it was then “presented in the popular press as a “wonder herbal”, and the last ten years has seen an increase in its market).” There has been extensive research undertaken on all aspects of the species, particularly identifying, isolating and culturing active compounds and running clinical tests. YG is consumed mixed with rice flour in boil milk. Traditionally, it has been consumed with a variety of meats of chicken, duck and pork in the form of a medicinal soup; it also used as honey and cow’s milk for tonic and aphrodisiac (Zhu et al., 1998)

Zhu, j.s, Halpern, k. Jone, “Journal of alternative complementary Medicine” study focus on the health efficacies of YG are observed and tested in asthma, allergic rhinitis, poor renal function, renal injuries, coughing, poor resistance of respiratory tract, regulating blood pressure (high and low blood pressure ), anti-aging, weakness, the declining of sex drive, lowering raised blood lipid levels, strengthening the body’s immunity, poor function of lungs and kidneys and in irregular menstruation (Zhu et al., J.S, Halpern, and K. Jone, 1998 )

Edward, “Non-timber forest products from Nepal”. The study focuses on aspects of the trade in Medicinal and Aromatic plants. Every year 10,000 to 15,000 tones of NTFPs are harvested from forestland in Central Himalayan Region of Nepal and traded to India. A limited trade of YG flows from the High Himalayan of Nepal into Tibet and China and is extremely valuable throughout the south and central Asia (Edwards, 1996).

Ojha, studied “Current policy Issues in NTFPs Development in Nepal” This book deals about Non-Timber Forest Products (NTFPs) are being increasingly recognized for their role in rural livelihoods, biodiversity conservation and export values. The market of NTFPs is expanding, and this is an opportunity and challenge for a more sustainable, efficient and equitable use of NTFP resources. However, unsustainable harvesting, inequitable benefits distribution and overall economic inefficiencies are the problems of the current NTFP practices (Ojha, 2000).

Sharma, “Trade of cordyceps sinensis from high altitudes of the Indian Himalayan; conservation and biotechnology priorities” he has focused on historical background of YG, which was discovered about

1500 years ago in Tibet by herdsmen who observed that their livestock became energetic after eating a certain mushroom. About 1000 years later, the Emperor's physicians in the Ming Dynasty learned about this Tibetan wonder and used this knowledge with their own wisdom to develop powerful and potent medicine. Initial records of Cordyceps as medicine date from the Qing Dynasty in China in 1757 (Sharma, 2004).

DFO of Darchula published a book "Yarsagumba and Darchula" which state about YG, which is found in high mountains and hilly areas, which is a major source of rural people. The study is an attempt to various aspects related with YG and analysis the effects of YG bring on the economic status of local people. The book about YG collectors, traders and its average product of Darchula. Study also deal about processing, harvest and its market chain in Darchula. Yarsagumba is main source rural mountain people, out of 21022 households 4500householdsare involved in collection of YG in 2008. The study focus on among the total revenue collected from the sailing of herb and forest product 54% revenue was collection by sailing from YG in Darchula. The study also describe about the impact of YG in rural livelihood. Besides them, the study deal its collection problem and its likely prospects are offered in conclusion and suggestion (DFO of Darchula, 2008).

HMGN, Nepal Gazette, try to control the illegal trade. Medicinal and aromatic plants are highly exploited in the mountains and traders take advantage of poverty of local people. The Department of Forest tries to control illegal trade and allows sustainable harvesting of some species with special permits (HMGN, 2002).

HMGN, "Nepal Biodiversity Strategy Ministry of Forest and Soil conservation" published the main principle of Nepal Biodiversity

Strategy (NBS) for poverty alleviation, economic and social development is to develop an effective mechanism for the sustainable use of biological resources and the conservation of biodiversity in rural areas of Nepal. The forest products have to be utilized in forest-based enterprise without depleting the forest in relation to biodiversity conservation and sustainable resource management (HMGN, 2002).

Under the Ministry of Forests and Soil conservation notification Nepal Gazette Vol. 3. Section 51, No. 36, dated BS 2058/9/16 (Jan 1<sup>st</sup>, 2002) the fungus was banned for export in crude form. Processed products could be exported after proper certification and permission from the Department of Forest (HMGN, 2002). At present as per the Ministry of Forest and Soil Conservation notification Nepal Gazette vol. 54. Section 3, No 25 dated BS 2061/6/18 (Oct 4, 2004) there is no requirement of processing (steaming and packaging) for export of YG. The HMGN present royalty rate for YG is NRS 20000/kg. Due to high royalty rate and lengthy legal procedure, the valuable product is traded illegally. To control the illegal trade of this product, action has been taken to decrease royalty of the product. Remote Area Development Committee has submitted, their suggestions to decrease royalty rate by the respective authority. The proposed royalty rate is NRs. 5000.00 per kg but the approval is awaited. Under the Forest Act, 1993 YG is considered as an endangered species, though it is not yet included as a endangered species by the IUCN, CITES and BPP (HMGN, 2004).

Science press Beijing, published the article: China had organized national Athletics competition. During those competition nine women, athletes had broken world records. It has now known that those women had used special diet made from YG. IT strengthens the lungs and enhances the power of virility (Science Press, Beijing 1993).

Dhami, in his articles on ‘Churatimes’ and ‘Rajdhani’, the articles focus on permission for collection, royalty rate and market price of YG. At that time, local people take the permission for collection from concerned authorities, i. e. Community Forest User Groups by paying royalty NRs 200 as entry fee. Trader pay NRs 5,000 royalty for per kg YG and collects YG from local people. The market price of YG is NRs 1 to 1.5 lakh per kg. There was a loss of millions of royalty to government of Nepal due to illegal trading of YG .The trading of YG was being done at vary low price in Darchula district (Dhami, 2004).

Giri, in his article on Kosheli (kantipur weekly) “Medicinal plant for livelihood”, article focus on during the collection period, household members go for collection, only child and elder people live in villages. Most members of a household camp out at the pasturelands, turning the hunt into a joyful event. In addition, some people go to collection site to serve double purpose of trading grocery items and participation in collection. At that time school are closed informally (Giri, Kosheli 2008, 2004).

## **2.2 Empirical Literature Review**

Adhikary, in his book, “Mushroom of Nepal”, deals about the different kinds of Mushroom species situated in Nepal. The Nepalese mycodiversity includes 80 families, 585 genera, 18822 species, 2 new genes and 150 new species. The fungus *cordyceps sinensis* (YG) is known as walking herb. The parasite fungus grows on the head of caterpillar commonly distributed in the central Himalayan region in the sub alpine and alpine regions between 4000-4500m (Adhikari, 2000).

Daniggelis, has done a studied on “Jungle Resource use” the report noted that Nepal has a wealth of biodiversity in Non-timber Forest

Products (NTFPs) because of its various altitudinal zones and diverse ecosystems. They are harvested not only from forest, but also pasture areas, grasslands and fallow fields. For the marginalized farmers, the biodiversity of the non- farm environment has vast utility consisting of not only timber for building, bedding, and fodder for livestock, but also many valuable nutritional, medicinal, economic (subsistence and cash), religious and cultural resources (Daniggelis, 1994).

Beattie, has done a study on “Why consume Biodiversity?” his report noted that biodiversity is often different to value in monetary terms because we still do not know all the parts that may be useful to us. Biodiversity provides directly and indirectly the material basis of human life. The optional value of biodiversity can be grouped under three value of Biodiversity can be grouped under three broad categories, utility, function and beauty (Beattie, 1995).

Watanable, a field survey of the “Medicinal plant Resources in the Himalayas and conservation” report focuses on plants have been used by the Himalayan inhabitants since many hundreds years. Medicinal plants are founded wherever people live. The number of those plants is very large; about 10 percent of the plants all over the world or 30,000 species were considered medicinal ones. Plants produce many kinds of organic compounds as secondary metabolites, which have been used as medicines and as useful chemicals for our daily life (Watanable, 2000).

Luintel, “ Identification of Researchable Issues and Intervention Options for NTFP Enterprises under Community Forestry, A study of Western Himalayan of Nepal.” The report focus on The Forest Act, 1993 and Forest Regulation, 1995 provide regulatory framework for NTFP trade in Nepal. In Community Forestry, there is the provision that CFUGs

can manage and utilize forest products including NTFPs in accordance with an approved operational plan. The steps for the collection and trade as given in Figure 2 look quite simple but are very difficult to follow in practice. A lot of bureaucratic harassments are faced at every step, such as during checking and endorsement, issuing release order, during transportation etc (Luintel, 2000).

Lama, “Medicinal Plants of Dolpa Amchis Knowledge and conservation” report published by WWF noted that according to the World Health Organization (WHO) report about 80 percent people who are living in the remotest area of the country are still dependent on the traditional medical treatment practices. YG is a non-toxic medicinal plant used as tonic and aphrodisiac and is generally collected for trade. YG is a traditional medicine used for kidney and lung problems. The YG helps in secretion of sexual hormone; there for, the ancient medical practitioners recommended this fungus. It also founded effective in reducing the aging effect in human beings (Lama et al, 2001).

Regmi, “second quarterly report of conservation of medicinal and Aromatic plants for sustainable livelihoods in Nepal, Darchula district”, his second quarterly report that Asia Network for Sustainable agriculture and Bioresearches (ANSAB)’s assessment of YG in 2003 has stated that the annual production possibility of YG in Darchula district is more than 1000kg. There might be possibility of increment in production rate annually. The annual collection of YG was 500 kg in Dolpa, 300 kg in Jumla, 200 kg in Humla, 200 kg in Kalikot and 250 kg in Darchula (Regmi, 2003).

Gurung “An assessment of management and trade practice of Yarchagumba. A case study of Annapurna region, Manang district of



Nepal”. His report states that YG in year 2001, collectors got NRs 18 per price of YG, which was later sold by local traders at Jhong at the rate of NRs 120,000,00 per kg, i. e. NRs. 34.28 per piece. While collectors got an average of NRs. 22.5 and 24.5 per piece of YG in year 2002 and 2003, respectively, the local trader sold it at a rate of NRs. 90,000 and 1,05,000 per kg, in year 2002 and 2003, respectively. According to the trader, in 2002 they had lost more than four lakh rupees due to lack of proper packing resulting in slight damage of about 4 kg of this valuable product and consequently reduced the price. However, in year 2003 the Tibetan Traders called Khamba arrived in Manang and bought all the products (Gurung, 2003).

Gautam and Karki, “Non-Timber Forest Product from Nepal” their report focus on economic status of mountain people. In Nepal, where there is food scarcity and poverty, the caterpillar fungus (YG) plays important role in the enlistment of communities. This fungus is a valuable source of income in mountain districts of Nepal (Gautam & Karki, 2003).

Gurung, “An Assessment of Management and trade practice of Yarsagumba ,A case study of Annapurna region, Manang district of Nepal” his report states that YG is an association of fungus (*Cordyceps sinensis* (Berk.) Sacc.) In addition, insect larva of *Hepialus armoricamus oberthier*. The larva hibernates underground in winter and the spore of the fungus enters the body of he larva, feeds on it, and cause its death. The spore of the fungus grows out from the anterior end of the larva and comes out of the ground like a little grass during the monsoon period. It is club-shaped with dark brown fructification and yellowish white stalk. YG is an interesting fungus, which resembles a worm, was discovered 2000 years ago in the Tibetan mountain pasture by Chinese herdsmen has been used as medicine in the Far East. YG Chinese practitioners were able to

develop a powerful medicine using YG. They found that it has a sweetish taste and a warm character (Gurung, 2003).

Kanel, “Analysis of police and regulatory constraints in Development of Non-Timber Forest Product in Nepal.” The report forecasts the YG has a good international market and is an important source of foreign exchange. Initially the collection of this product was totally banned under the Forest Regulation, 1995 and Forest Act, 1993. The initial royalty rate was NRs. 500 per piece and only processed product could be exported. The collector had to pay NRs.15000000 to 2000000 per kg of caterpillar fungus to the forest department as royalty. The forest regulation stipulated that only the processed YG could be exported. However, the form of processing in this regard was not clear at all (Kanel, 2003).

Chaudhary, has done studied “Information of medicinal plants of Magdi district” his report noted that Yarsagumbo is distributed in temperate to alpine regions of the central and western part of Nepal between 3000-6000 m. It is commonly found in Karnali zone of Nepal; this zone includes Dolpa, Jumla Humla and Kalikot districts. In 1952, the members of British Museum of London first collected it from Jumla during their vegetation collection and research period. Apart from this, other districts such as Darchula, Bajhang, Bajura, Doti, Manang, Jajarkot, Rukum, Gorkha, Rasuwa, Sidhupalchowk, Solukhumbu, and Taplejung also have their distribution .YG is usually collected in the month of May and June before yak and sheep herb graze over the places (Chaudharu,2004).

Chhetri, has done a thesis on “collection of YG in relation to rural livelihood and forest biodiversity in Darchula district of Nepal”, which

states that the YG is the main source of mountain people. Its demand was increasing international market there by contributing significantly the local economies of the mountain people in Darchula. The study focuses on the market chain of Darchula, wherever it is the main supply centre of YG. It is concluded that sustainable production and trading of YG has become instrumental part for the socio-economic enlistment of rural community as well as country. YG is an economic species, which is contributing a significant amount in nation economy of Nepal. The main objective of this study was to assess the impact of YG income on rural livelihood and consequences on forest biodiversity due to YG collection.

Yarsagumba, an insect born fungus, results from parasitism of the fungus *Cordyceps sinensis* (berk) Sacc, non-larva of moth of Hepialidae. These moths quest for mating partners during blossoming, lay eggs in the soil after courtship and die. Approximately a month later the eggs hatch to white and freshly larva, which feels hungry and eats many green grasses. During this process, Cordyceps fungus parasite finds its way inside the body of the larva and hibernates. During monsoon, the fungus bursts out of spore sac of fructification of the YG. As winter comes near larva covers its body surface with a thin white layer of substances to prevent from cold in winter. During late spring or early summer of the following year, the external appearance of the larva remains unchanged though the parasitic fungus consumes all nutrients and starts to grow in larva's abdomen. As the white larva bodies changes into yellow color and then when his changed color cover the whole body, the fructification comes out from the anterior end of the larva and later from the ground like grasses. Till the fructification sprouts out, the larva remains alive and can move within the soil (Chhetry, 2005).

Devkota and Anil, “A study on Ethno-ecology, Regeneration Pattern, Collection Techniques and Trade of Yarsagumba;” annual report noted that the YG are important component of rural livelihood, as they play critical role in natural economy and help sustain livelihoods of many rural households that include socially and economically disadvantaged groups. Most of the people in these groups collect and sell forest products to meet their hand to mouth. The explain about uses practice, harvesting methods, harvesting techniques and impact of over grazing , soil analysis, and, YG collection and its socio-economic impact in Dolpa District (Devkota and Anil, 2006).

It is concluded that Nepal has wide altitudinal variation and diverse climatic conditions within a small areas made the physiographic of the country interesting and attractive in the world. Therefore, it has a wealth of biodiversity in NTFP because of its various altitudinal zones and diverse ecosystems. It is very difficult to value in monetary term, because we do not know all the parts that may be useful to us.

Plants have been used by the Himalayan inhabitants since many hundreds years. The usage of many more natural products in day-to day life of public shares its importance in Nepalese economy. Since the last few years, YG has become a significant source of livelihood of mountain people, especially in the central and western Himalaya of Nepal. Scientific management for sustainable collection and marketing of this product is now felt necessary for livelihood improvements of mountain people. Recognizing its high value in terms of international market demand, medicinal properties and contribution to local socio-economy, Government of Nepal has shown commitment for the resource management through legal reformulation.

Theoretical study focuses the historical background of YG. In China it's used many years ago. It had been used in different disease. Mountain areas, where there are food scarcity and poverty, YG play important role in the enlistment of communities. Yarsagumba is valuable source of income in mountain districts. Yarsagumba collected in the month of May and June before yak and sheep herb graze over place.

Since this kind of study has not done yet specially in Darchula District, so I am interested in it. District represents one of the poorest and disadvantaged communities of Nepal. The study site is best suited for assessment of the impact of YG on livelihood of rural people. This district is recognized as very fertile district for YG production and this district is representative of the mountain districts of Nepal. Local people have experiences of more than 7 years in YG collection and trading. Recording of their experiences would be beneficial for all the stakeholders for further improvement and development of YG.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Research Design**

The study is exploratory and participatory in nature. The research work has been carried out with active participation of the local people. The criteria for wealth ranking and present market chain of YG were prepared with the active participation of different stakeholders. This study has described the past and present status of YG-collected/harvested quantity, status of market and market chain. This study has also assessed and explored the role of YG in rural livelihood in different economic classes of people. The after effect on forest biodiversity due to the collection of YG has also been assessed.

#### **3.2 Nature and Source of Data**

##### **3.2.1 Nature of Data**

Both quantitative and qualitative data were collected for the purpose of this study.

##### **3.2.2 Source of Data**

Both primary and secondary data were collected during this research work.

###### **3.2.2.1 Primary Data**

The primary data required for this study were taken from YG collectors using questionnaire survey at household level. Other information was obtained from, Byas & other VDCs in Darchula, DDC of Darchula, local traders, porters, social workers, NGO and GOs.

###### **3.2.2.2 Secondary Data**

The secondary data were taken from different publications, such as Yarsagumba and Darchula, thesis of Chetri, Shiva Devkota and Anil Shrestha, WWF report of 2006 and 2007 in Dolpa district, Kantipur Koshali, Yarsagumba Parichaya published by Prakashan Griha, research papers, and other sources.

### **3.3 Sampling Procedures**

Household has been taken as the unit for the present study and the information has been collecting at household level each. Of the total households (about 4500 involved in YG collection in 2008), 5% households were selected and divided into three economic classes, namely poor, medium and rich based on land, food, livestock, income and expenses criteria. The information was gathered from FECOFUN-Darchula, local traders and NGOs and CBOs during field study.

The 75 households were selected during transect walk in each economic class, rich, medium and poor in Darchula district. During the transect walk using the questionnaire, interviewee were picked up from people who were involved in the collection.

### **3.4 Data Analysis**

The numerical data were analyzed in excel spreadsheet. Each and every household data was maintained separately. The average and percentage was calculated for each economic class. The output of analysis has been presented in relevant tables and figures.

### **3.5 Wealth Ranking**

There were 90% households dependent on agricultural based industry in Darchula district. The majority of people were under poor economy class. To differentiate into three economic classes, P, M and R were assigned for poor, medium and rich, respective for each household.

Specific criteria were used to classify the respondents in three different economic groups, viz. poor, medium and rich. The ranking was based on five criteria, i.e. landholding, food sufficiency, livestock holding, annual income and annual expenses which were prepared with the active participation of respondent.

**Table 3.1 Criteria for Economic Ranking**

S. N.	Criteria	Poor	Medium	Rich
1	Land holding (Ropani)	up to 1 (53%)	10-20 (28%)	Above 20 (19%)
2	Food sufficiency (Month)	Up to 6 (43%)	7-9 (33%)	Above 9 (24%)
3	Livestock holding (Unit)	Up to 10	11-20	Above 20
4	Annual Income (NRs`000)	Up to 50	50-100	Above 100
5	Annual Expenses(NRs`000)	Up to 50	50-100	Above 100

Source: Darchula District Profile, 2008

. Out of the total population, about 53% landholders had below 1 ropani land (1 ropani =74×74 square feet), 28% had 10-20 Ropani land and only 19%had above 20 Ropani land. On the basis of food sufficiency the villagers were divided into three categories. Villagers having food grains for 6 months were considered as poor (43%), food grains lasting for 7 to 9 moths were considered as medium (33%) and those with food grains lasting for more than 9 months were considered as rich (24%)

**Table 3.2 The distribution of Respondent based on each Wealth Ranking criteria**



<b>Wealth Ranking (Class)</b>	<b>Land Holding (Ropani)</b>	<b>Food Sufficiency (Month)</b>	<b>Livestock Holding (Units)</b>	<b>Annual Income (NRs)</b>	<b>Annual Express (NRs)</b>
Poor	59 (26%)	72 (32%)	79 (35%)	50 (22%)	113 (50%)
Medium	65 (29%)	86 (38%)	74 (33%)	104(46%)	95(42%)
Rich	99 (45%)	67 (30%)	72 (32%)	71 (32%)	17 (8%)
Total	225 (100%)	225 (100%)	225(100%)	225(100%)	225(100%)

Source: Field Survey, 2008

In the study area, majority of households were possessing large amount of land but productivity of the land was very low, maximum areas were pastureland used for grass cutting and grazing cattle. Based on only single criteria, i.e. based on landholding, 45% households were under rich class, followed by 29% in medium class and only 26% households were under poor class. Based on food sufficiency, a majority of households (38%) were under medium class followed by poor class (32%) and rich (30%). Based on livestock holding, a majority of households, i.e. 35% households were poor, 33% households were medium and 32% households were rich. Based on income, majority of households (46%) were under medium class, followed by rich class (32%) and poor class (16%).Based on expenses majority of households (50%) were under poor class, followed by medium class (42%) and rich class (8%).

**Table 3.3 An average status in each wealth ranking Group**

<b>Wealth Ranking Group</b>	<b>Land Holding (Ropani)</b>	<b>Food Sufficiency (Month)</b>	<b>Livestock Holding (Units)</b>	<b>Annual Income (NRs)</b>	<b>Annual Expenses (NRs)</b>
Poor	8.8	5.0	10.8	71006.5	48247.9
Medium	20.9	9.0	20.8	87491.4	52912.5
Rich	44.3	11.6	74.8	130456.8	90104.2
Total	24.7	8.5	35.4	96318.2	63754.9

Source: Field Survey, 2008

The average land holding in poor medium and rich class was approximately 9, 21 and 44 ropani, respectively. The food sufficiency from their own production was 5, 9 and 12 months in poor, medium and rich classes, respectively. The average livestock holding was very high (75 unit) in rich class followed by medium class (21 unit) and poor class (11 unit)..

## **CHAPTER FOUR**

### **ANALYSIS AND INTERPRETATION**

#### **4.1 Introduction of Study Area**

##### **4.1.1 Nepal**

Nepal is situated on the southern slope of the central Himalayan and occupies total area of 147181 km<sup>2</sup>. The country is located between latitudes 26°22'' and 30°27''N and longitudes 8012E. The average length of the country is 885 km from east to west and the width varies from 145 km to 241 km with a mean of 193 km north to south. Altitude varies from 60m above mean sea level in Terai to Mount Everest at 8848m, the height point in the world .Nepal has the richest biodiversity due to its unique geographical features, particularly altitudinal variation from Terai to High mountains.

##### **4.1.2 Darchula**

The study was carried out in Darchula District. Darchula extends over 2,329.59 km<sup>2</sup>. area of the Mahakali zone of far-western region of the country. The latitudes and longitudes of the district range from 2936 to 3015 North and 822 to 8122 east respectively. The elevation from the mean sea level ranges from 518m to 7132m. The mean annual rainfall of the district is 2,129 mm. and the mean minimum and maximum temperatures are 5.7 and 18.6 Celsius, respectively. The district contains various climatic regions as sub-tropical, lower and upper temperature, sub-alpine and alpine A number of high mountain such as, Api (7,132m), Byas (6770), Nappa (6,754m), Likulek (5000m),etc, lies in the district. There are also small river systems as Mahakali, Chaulani, Tinkarkhola, Tusarpani, Kalagadh, Chaugadh, Thaligadh etc. Due to all

these factors, there is a wide variation in climate and micro-climatic conditions that give rise to a wide variety of forest types. Darchula is surrounded by the boundaries of the districts Bajhang (east), Pithoragadh, India (in west), Tibet(in north), Baitadi (in south).

Out of the total area of 2322 sq. km, 50% of the land lies above 3500m height. There are 41 VDCs in Darchula. Among them Byas, Rapla, Khandeshwori, Ghusa, Sitaula, Guljar are famous for Yarsa Gumba. It takes 4-6 days walk from the district headquarter to reach these VDCs.

Winter snowfall is common in Darchula study site. The study was mainly focused on the northern VDCs of Darchula . The details of Yarsagumba collection site of Darchula districts are given in table 1.

**Table 4.1 Details of Yarsagumba Collection Sites in Darchula**

S. N.	VDC	Yarsa Gumba Collection Sites
1	Byas	Kantisan, Api
2	Rapla	Dudhiban, Golkhasya, Shyakpa, Nintha, Omtunti, Ghattekhol, Sipulekha, Multi, Marmakhadu, Tapo, Tanju
3	Gusha	Satganga, Rokhapu, Lol
4	Khandeshwori	Lolkhol, Mechar, Kalagad
5	Sitola	Chaimatela
6	Guljar	Dharmaghar

Source: Field Survey, 2008

As table 4.1 there are six VDCs where Yarsagumba collected. In side these VDCs there are many places of collection sides, which we can see in the table.

### 4.1.3 VDCs Based Classification on Yarsagumba Availability

The VCDs of Darchula district have been classified on the basis of Yarsagumba availability and participation in YG collection in active participation of different stakeholders.

**Table 4.2 VDCs Based Classification on Yarsagumba Availability**

Cat.	Availability	Status	VDCs	%	Name of VDCs
1	Quality & quantity and participation	High	4	9.76	Rapla, Byas, Khadeswari & Gusha
2	Quality & quantity and participation	Medium	4	9.76	Sitola, Gurjar, Earkot & Sunsera
3	Quality & quantity and participation	Low and medium	15	36.58	Daulakot, Huti, Pipalchauri, Dhari, Chhapari, Kante, Khar, Sipli, Seri, Tapoban, Khalanga
4	Quantity & quality and participation	No	18	43.9	Dhap, Dauligada, Dathala, Gokuleshgwor, Gwani, Mallikarjan, Dattu, Bhagawati, Uku, Hunainath, Dandakot, Kharkdanda, Lali, Sarmauli, Rithachaupata, Boharigaun, Shankarpur, Ranishikhar
	Total		41	100	

Source: Based on Field Survey, 2008

From the table we see that out of total area of Darchula District, Rapla, Ghusha, Byas, Khadheswary and Gusha cover 9.76% area on the basis of Yarsagumba availability. The Yarsagumba of these area has high quality.

The maximum quantity of Yarsagumba collected from these VDCs. There is maximum participation of people as well. Similarly, the four VDCs has covers 9.76% area where there is medium quality, quantity and participation. The 15 VDCs that covers 36.58% area where there is low and medium quality, quantity and participation. Remaining 18 VDCs covers 43.9% area has no Yarsagumba availability.

#### **4.1.4 Life form**

Yarsagumba is a combination of caterpillar and fungus. In direct observation, it looks partly like animal and partly like plant. . It is locally known as Kira, meaning insect. From this study it was clear that majority of people believe that it is an insect.

#### **4.1.5 Altitudinal Level of Availability**

Availability of YG varies from 3000-5000m als. Only 28% of the respondents had an idea about the altitudinal range of YG availability. The collectors had an idea on the places of the YG availability but do not have any idea about the altitudinal ranges. The quality of YG available in 4000 m was considered of best quality based on taste and experience of the collectors. YG available between 3000-4000m is of good quality and below 3000m it was black colored and considered as useless.

#### **4.1.6 Temperature**

The temperature of study area during collection period in 2008was recorded as 0-1°C by ANSAB research team at Dumbuling community Forest YG research plot.

#### 4.1.7 Time of Snowfall and Snowmelt

In this area out of twelve month nine month was covered with snow. Early snowfall was found best suited for the growth and development of the YG. Out of the total respondents, 68% considered early snowfall as the best because early snowfall would also melt earlier and facilitate the proper collection. Generally, YG collection time starts from June and ends by July 15. In the study year (2008) due to early melting of snow, collection started from May 10, in Darchula.

#### 4.2 Socio-Economic Situation

Due to geographical complexities, the Darchula district is still facing the problems of food scarce, transportation, communication and literacy. According to the indicators developed by International Centre for Integrated mountain Development (ICIMOD) Darchula is a least developed district of the country. The economic opportunities of the people residing in Darchula are livestock, farming NTFP trade and fruit cultivation.

**Table 4.3 Demographic and Other Information of the District**

S. No.	Characteristics	Quantity
1	Population % contribution Male Female	1,21,913 49.0 51.0
2	Household number	21,062
3	Household size (Average)	5.8
4	Literacy rate (%)	42.0
5	Occupation % contribution Agriculture Labor Services Other	89.0 4.0 4.0 3.0
6	Population density (per sq. km)	157.73
7	Per capita agri. Land (ha.)	0.50
8	Population growth rate	1.81

Source: DADO Darchula, 2008

Of 121,913, the total population of district Darchula, 49% is male and 51% female. Average household size is 5.8 people. The population density is 158 in per km<sup>2</sup> and literacy rate is 42%. While agricultural land per capita and population growth rate is 0.50 and 1.81, respectively. The main occupation is agriculture, followed by labor and services.

Though the population density is low, the pressure on the resources (as indicated by low per capita agriculture land) is high; his is mainly due to less agricultural land. Again, the productivity of the land is less and thus people always depend on the external sources for food grain. The forest plays a significant role for the sustenance of the rural people. Major indicator of the socio-economic character of the farmer is the landholding.

**Table 4.4 Landholding Verses Household of the District**

<b>S. No.</b>	<b>Landholding (hectare)</b>	<b>Number of household</b>	<b>Percentage</b>
1	Less than 0.1	505	3.01
2	0.1 to 0.2	1,973	11.75
3	0.2 to 0.5	6,436	38.32
4	0.5 to 1	4,632	27.58
5	1 to 2	2,454	14.61
6	2 to 3	469	2.79
7	3 to 4	205	1.22
8	4 to 5	84	0.51
9	5 to 10	24	0.14
10	More than 10	12	0.07
	Total	16,794	100

Source: DADO Darchula 2008



From the above table, we can see that the majority of the households (53.08%) have small landholdings (less than 0.5 ha). Therefore, they depend on alternative sources of income for sustained livelihood. The main alternate income source is collection and sale of NTFPs from the land other than agricultural.

A significant amount (73.6%) of the area is under Government land as forest, pasture, shrub-land, snow covered and rocky slopes. Agricultural land is very less due to fragile and sloping mountains. Forestland including pasture, shrub land and some part of other lands are the main supportive and productive lands for the local people as most of the economically valuable NTFPs are found in these lands. The major portion of landfalls under forestland, thereby giving higher potential to the development and management of NTFPs based enterprises (Table 8).

**Table 4.5 Land Use Pattern in Darchula**

<b>S. No.</b>	<b>Land used for various purposes</b>	<b>Area (Km<sup>2</sup>)</b>	<b>Percent (%)</b>
1	Forest	729.82	31.3
2	Pasture	249.64	10.7
3	Shrub-land	65.55	2.8
4	Agriculture	612.15	26.3
5	Others (rock, snow covered)	672.43	28.9
	Total	2,329.59	100

Source: DFO Darrchula, 2008

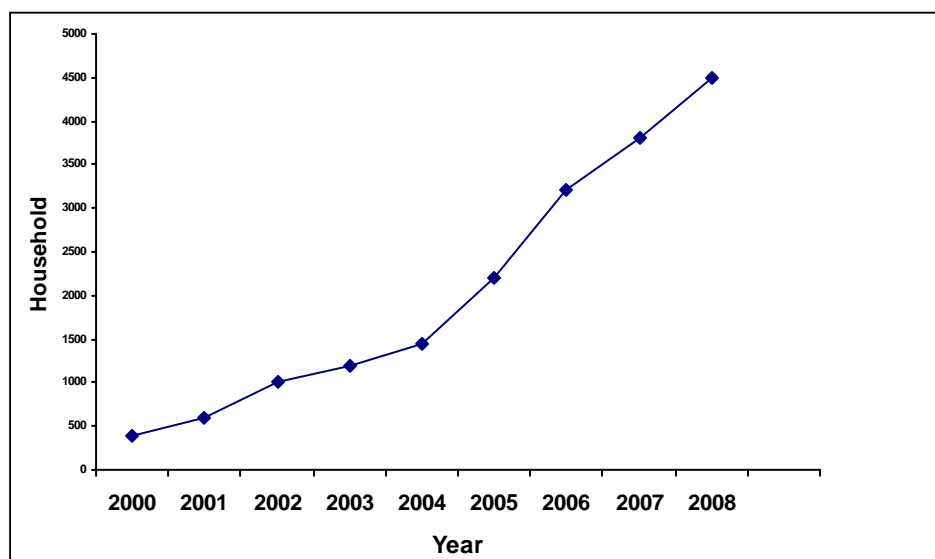
As table 4.5, out of total area of Darchula District, forest covered 31.3%, pasture covered 10.7%, agriculture covered 26.3%, shrub-land covered 2.8%, and other 28.9%.

### 4.3 Participation Status of Local People

#### 4.3.1 Household Involvement in Collection

Although Yarsagumba was identified in 1952 in Nepal, the local people of study area came known about Yarsa gumbo only in 1991. Early, the local people did not have any idea on the use and market value of YG in Nepal. Later on a trader brought a sample and showed it to the local people in 1994, subsequently since 1995 local people from Khandeshwori and sitola VDCs started collection of YG. Till that time, people from ralpa and byas VDCs also did not have knowledge about YG. In 1996, few collectors from India, collected YG from Dudhiban forest area and showed YG to local people, informed to local people about availability and market value. Later, YG collection for trading purpose started from 1997 in Ralpa and byas VDCs. Soon individuals from other VDCs also started to participate in YG collection.

**Fig. 4.1: Trends of Household's Participation in Yarsagumba Collection**



Source: Based on Field Survey, 2008

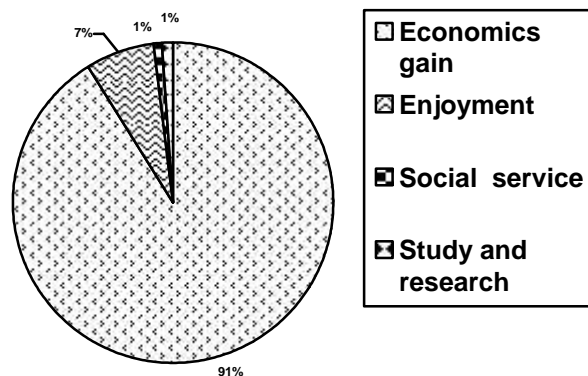
As Fig. 4.1, participation of households in Yarsagumba collection was found increasing over the years. 140 HHs participation in 1998 increased to 1440 in 2004. In 2008, 4500 HH involved in collection of

YG. The highest increment in the number of HH participation was in 2008.

### 4.3.2 Participation Based on Objectives

The study on participation based on objective of involvement has been illustrated with the help of following figure.

**Figure 4.2 : Distribution of respondents based on objectives of Participation**



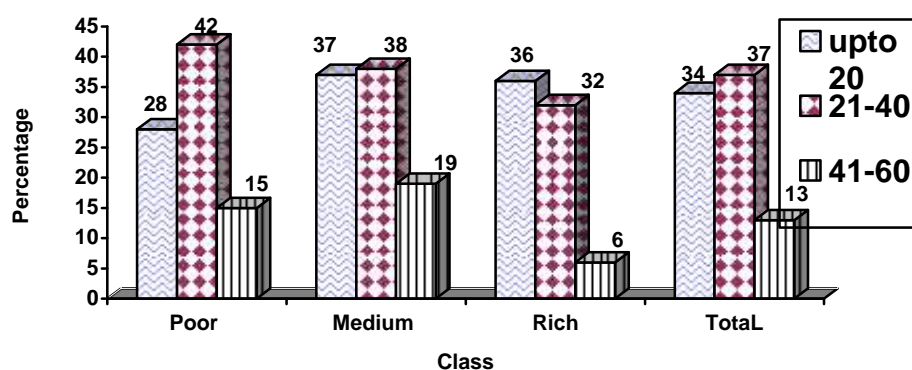
Source: Based on Field Survey, 2008

As Fig. 4.2, the study on participation based on objective of involvement has shown that out of total participants in Yarsagumba collection, 91%, had participated for economic gain. 7% has participated for enjoyment 1% for research and 1% for research and 1% for treatment.

### 4.3.3 Participation in Collection by Age

The village mainly involve in Yarsagumba collection due to lacking of alternative source. During the collection period of household members go for collection only child and elderly people live in villages.

**Fig. 4.3 : Percentage Participation from total family member by age and economic class**

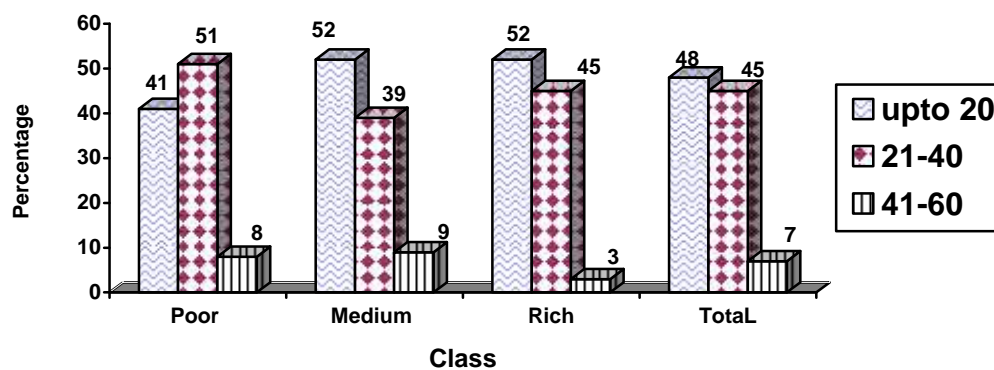


Source: Based on Field Survey, 2008

The study on participation in Yarsagumba collection from total family member by age shown that maximum percentage of participation was of the age group 21- 40 (37%). Followed by age group of up to 20 years (34%) and 41-60 years, (13%), which there was no participation from age group above 60 years.

On an average 40% of total family members participated in Yarsagumba collection from poor class 33% from medium class and 29% from rich class. The highest percentage of children participations was in medium economic class.

**Fig. 4.4 : Participation ratio in each ranking group by age and economic classes**



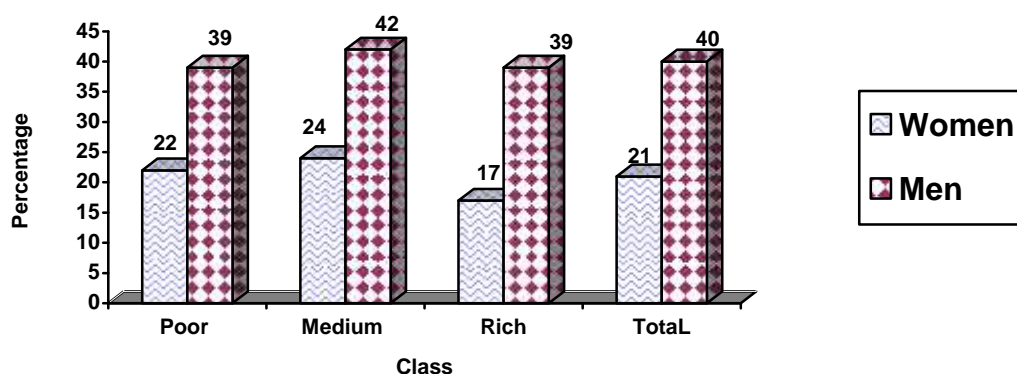
Source: Based on Field Survey, 2008

Out of a total 4500 individuals, the involvement in Yarsagumba collection from 225 households, the majority of collectors were under 20 years (48%), followed by 20- 40 years (45%). There has no involvement of individuals above 60.

#### 4.3.4 Participation in Collection by Sex

The study on participation in different sex groups has shown as below.

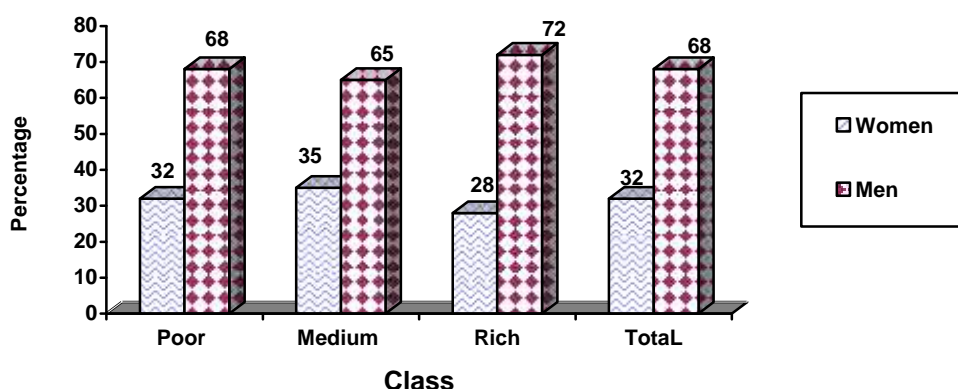
**Fig. 4.5 : Percentage Participation from Total Family Members by Sex and Economic Classes**



**Source: Based on Field Survey, 2008**

The study on participation in different sex groups has shown that percentage of women participation was maximum (24%) in medium, followed by poor (22%) and rich (17%) economic classes. Percentage participation from total male members was also the highest (42%) in medium class followed by poor and rich (39%). In total community out of total female family members 36% participated in Yarsagumba collection and out of total male members 40% participated in Yarsagumba collection.

**Fig. 4.6 : Sex Wise Participation Ratio in Each Economic Class**



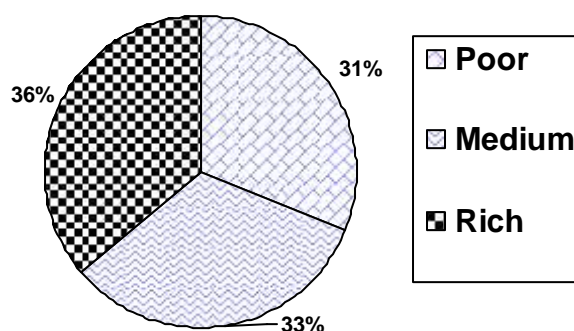
Source: Based on Field Survey, 2008

Out of total 650 individuals that participated for Yarsagumba collection in 2008, the majority of individuals (64%) were male. Out of total man-days, 13500 man-days were involved in Yarsagumba collection in 2008. Participation of female percent is 36%, in 2008.

#### **4.3.5 Participation Ratio in Each Wealth Ranking Class**

Out of total individuals participated in Yarsagumba collection in 2008, here participation ratio in each wealth class show as below.

**Fig.4.7 : Participation from Different Economic Classes**



Source: Based on Field Survey, 2008

As Fig.4.7 the highest participation was from rich economic class (36%). Followed by medium (33%) and poor class (31%) out of the 13500 man-days involved in Yarsagumba collection in 2008, 39% were from rich economic class, 34% from medium class, and only 27% from poor class.

### 4.3.6 Years Wise Trend of Participation in Different Wealth Ranking Classes

The study of trend of participation from different wealth ranking classes in Yarsagumba collection has shown that participation all economic classes has been on the rise (Table 10).

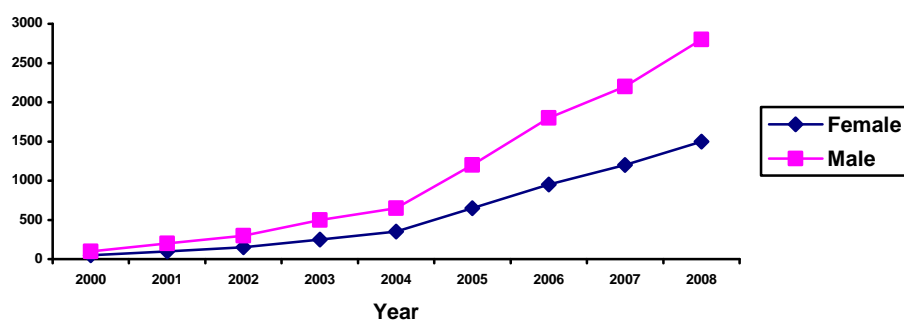
**Table 4.6 Trend Total Man-Days Involvement in Yarsagumba Collection**

Economic class	1998	1999	2000	2001	2002	2003	2004	2008
Poor	0	50	165	245	709	1036	1201	4000
Medium	130	201	325	886	1521	1558	1469	4407
Rich	60	60	340	741	1468	1535	1718	5093
Total	190	311	830	1872	3698	4129	4388	13500

Source: Field survey, 2005 and 2008

The rate of increase from 2000 to 2002 was comparatively higher than rest of the years. While there only 190 person-days involvement in 1998, it increased nearly to 4388 person-days in 2004. In 2008, it was increased 13500.

**Fig. 4.8 : Increase in yearly participation trend sex**



Source: Based on Field Survey, 2008

The study on trend of participation in Yarsagumba collection has shown that participation rate has been increasing in both sex groups from

2000 to 2008. While the male participation has shown rapid increase from 2004 to 2008, the female participation has recorded a gradual increase.

#### **4.4 Market Price and Market Chain**

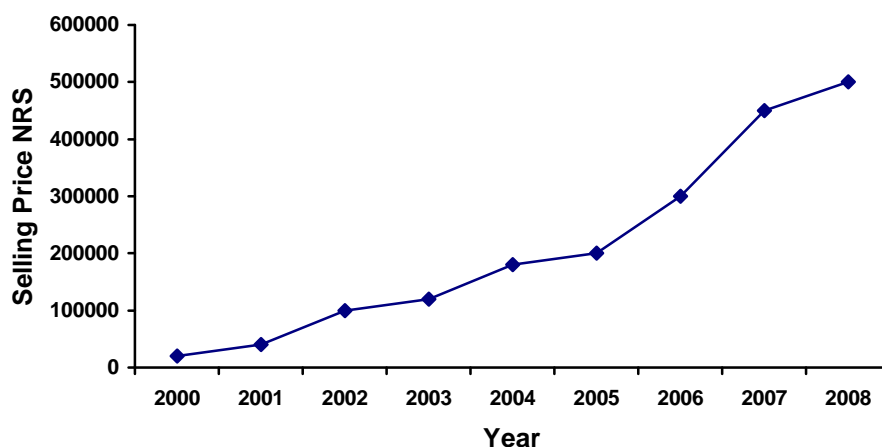
##### **4.4.1 Market Trend of Darchula**

In Darchula district, marketing of Yarsagumba started since 1986. Before that, local people did not have any idea about Yarsagumba's price and the value of the product. Basically, local people came to know about this product from Japanese study team and NTFP traders. As per trader's experience, the main market of this product is in China, Japan, Korea, Burma, Thailand and Singapore. Nowadays its use has become common also in Western countries.

For the proper marketing of this product high royalty rate and lengthy legal procedure has become a barrier. In Darchula district no trader collector came to District Forest Office to take permission for the collection, transportation and export of Yarsagumba. The trading of Yarsagumba was found to be illegal till 1998. There was no record of Yarsagumba collection and export in District Forest Office Darchula. As per DFO Darchula the collection area was out of DFO's control. If any trader wants to come to DFO to get permission for collection, transportation and export. DFO was ready to provide permission only as per legal procedure. The price trend of Yarsagumba since 2000 till 2008 has shown with the help a figure as below.



**Fig 9 : Trading of Yarsagumba (in Darchula 2008)**



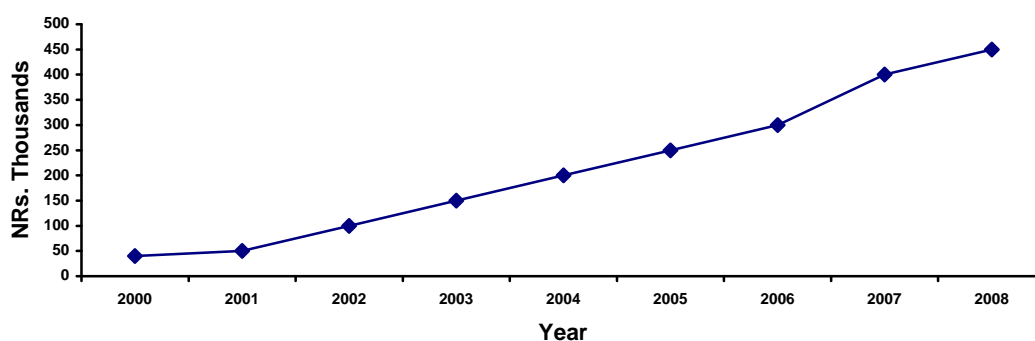
Source: Based on Field Survey, 2008

In 2000 its price was 40000/kg, the pressure in its collection has increased since 2004, its market demand was high. Due to high demand its price was rapidly high. In 2008, the trading activity started since beginning of June in 2008. In the beginning the price of Yarsagumba was NRs 450000 per kg (NRs 20 per piece), and by the end of September it was being sold for NRs 500000. The majority of collectors sold for an average of NRs 100000 per kg (NRs 25 per piece). Total Yarsagumba traded from Darchula district in 2008 was 1080 kg.

#### **4.4.2 Market Price Change in Darchula**

The information of price Yarsagomba change since 2000 to 2008 was collected from local traders and collectors and the trend of market price is given below.

**Fig. 10 Change in Market Price of Yarsagomba in Darchula from 2000-2008**



Source: Based on Field Survey, 2008

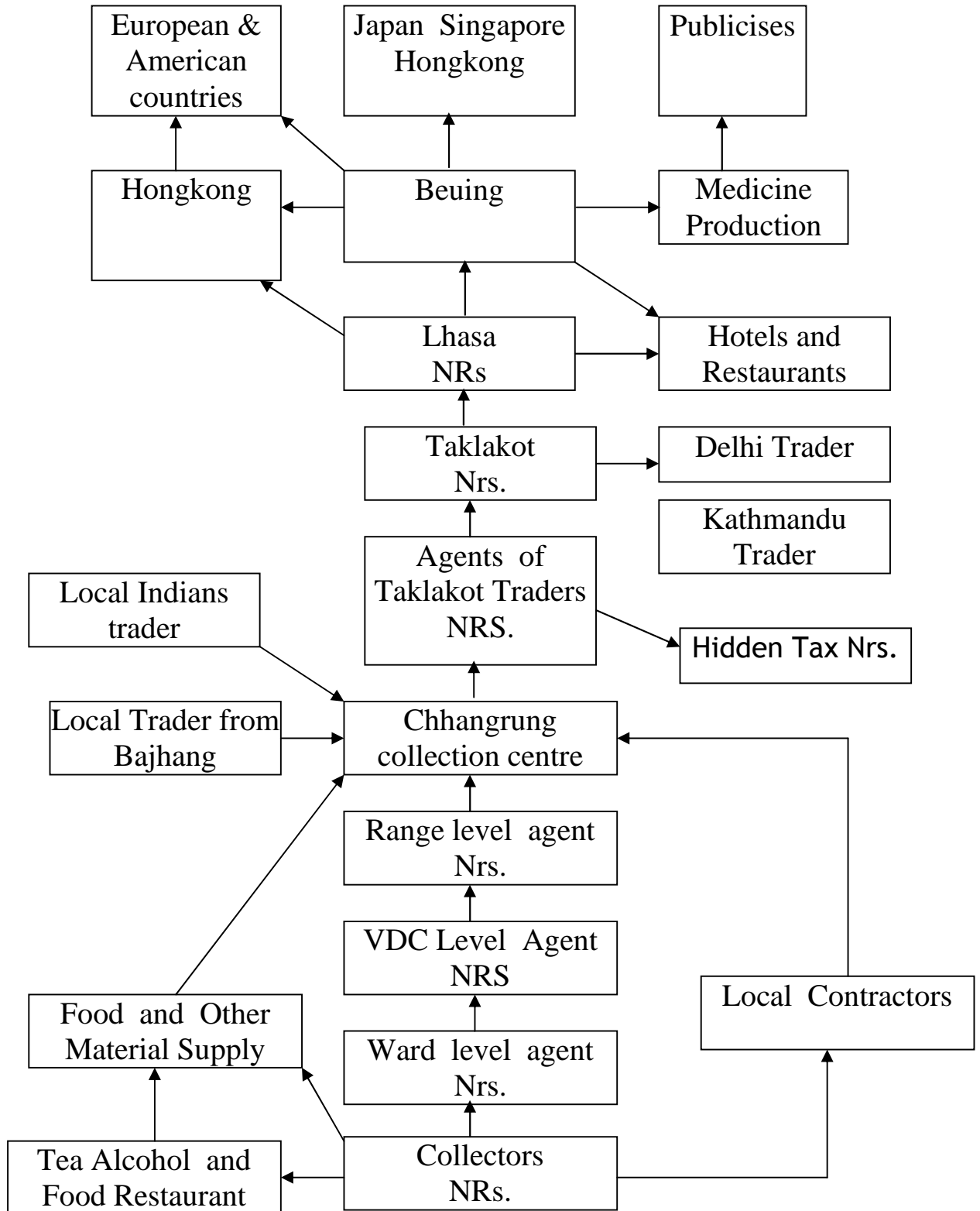
The market price at collector's level increased gradually from 2000 to 2008 except in 2001. In 2001, very few traders came to buy this product and they fixed low rates for the product. As the collectors did not have any alternative, they were forced to sell the product at a very low price. Since 2001, there is much competition among the traders to buy this product, as a result there was rapid increase in the price of Yarsagomba from 2001 to 2008, which was from NRs 2800 per kg in 2001 to increased to NRs 100000 in 2004. In 2008 it was increased 45000 lakha.

#### **4.4.5 Present Market Chain of Yarsagomba in Darchula**

In Darchula district the flow of the product was from collection sites to village level traders. Regional traders and to Taklakot (Tibet). The Dopali trader played agents of Taklakot traders. The access of local traders of Darchula district was only up to Chhagrung. There was an organized way of trading but there was no involvement of FECOFUN, FNCCI, NGO, INGO & DFO office in trading process. The main market of Yarsabumba is China, Korea, Japan, Burma, Thailand and Singapore. There was gradual increase in price of Yarsagomba at different levels of market chain.

## Present market chain of Darchula District

Chart



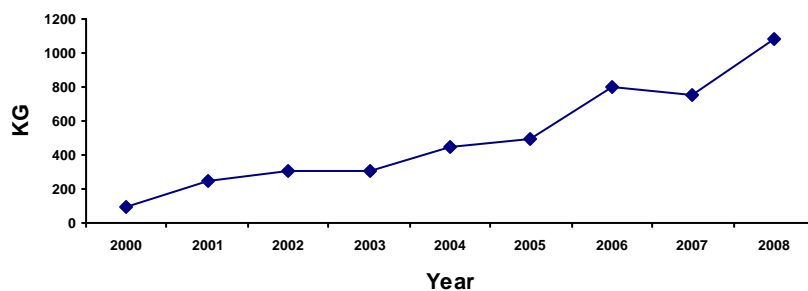
## **4.5 Amount and Trend of Yarsagumba Collection**

### **4.5.1 Trend of Yarsagumba Collection**

The collection and trading of Yarsagumba in the study area started in 1995. Yarsagumba collection period is very short; generally, it starts from 1<sup>st</sup> June and ends by 15 July in 2008. Yarsagumba collection started from May 10 due to early melting of snow and early growth of Yarsagumba.

According to the collectors, the amount of Yarsagumba collection depends on collector experience and sincerity. An experienced person would be well aware of the area of Yarsagumba availability. At the same area some collectors get many Yarsagumba but some do not that depend on collector's sincerity. The collectors also believed that availability of Yarsagumba depends on luck of a collector. After sincere observation of the ground when collectors notice brown to black tip of fruiting body, they pluck it out by fingers or a wooden peg. After extracting the first piece, they offer prayers to God. As per collector's experience, when they notice one piece of Yarsagumba it is assumed that there would be greater chances of availability of other pieces as well. After a whole day of collection, collected pieces have to be kept one day in dry-condition, then the next evening the pieces are cleaned by brush, and the following morning, they are kept in a cloth bag (there is a greater chance of decay if kept in a polyethylene bag).

**Fig.4. 11 Yearly trend of Yarsagumba Collection in Darchula**



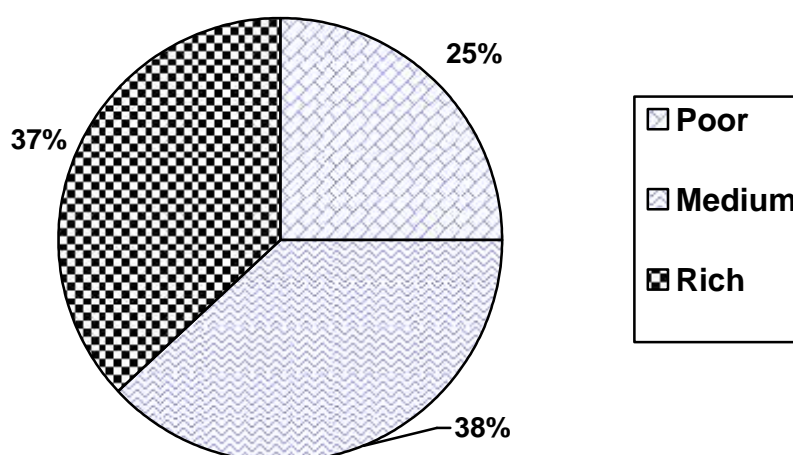
Source: Based on Field Survey, 2008

The study of annual collection trend has shown that there was an increasing pattern in total collection from 2000 to 2008 except in 2003. In 2000 the amount of collection was only 100 kg, while in 2008 it was about 1080 kg which is 100 times greater in 8 years time. In 2003, it was available in slightly less amount as compared to year 2002 and 2004. As per collectors' experience, the reason behind less amount of availability was heavy snowfall during collection time.

#### 4.5.2 Collection amount of Yarsagumba

The present study has estimated that the total amount of Yarsagumba collected was 1080 kg from the study site. The total collection of Yarsagumba was comparatively high in 2008.

**Fig. 4.12 : Amount of Collection from Different Economic Classes in 2008**



Source: Based on Field Survey, 2008

As Fig. 4.12, the total amount of collection was 1080kg. In the respondents' households of this highest proportion (38%) was by the

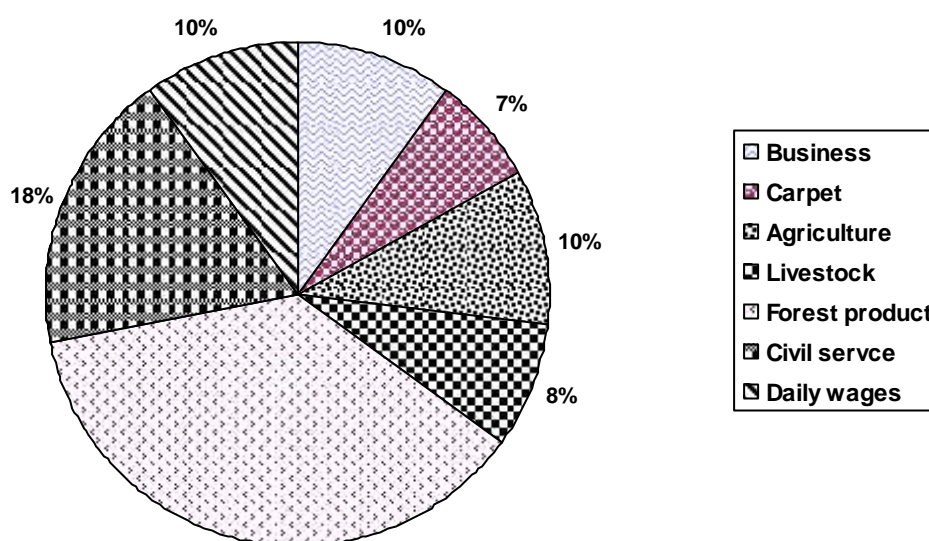
middle class, followed by rich class (37%) and poor class (25%). From this, it is clear that the middle economy class group benefited most from Yarsagomba collection and the least benefited community was the poor class .

#### 4.6 Income from Yarsagumba Collection and Its Impact on Rural Livelihood

##### 4.6.1 Contribution of Different Sources in Total Annual Income

The contribution of different source such as business, carpet, agriculture, livestock, forest product, civil service, and daily wages in total income..

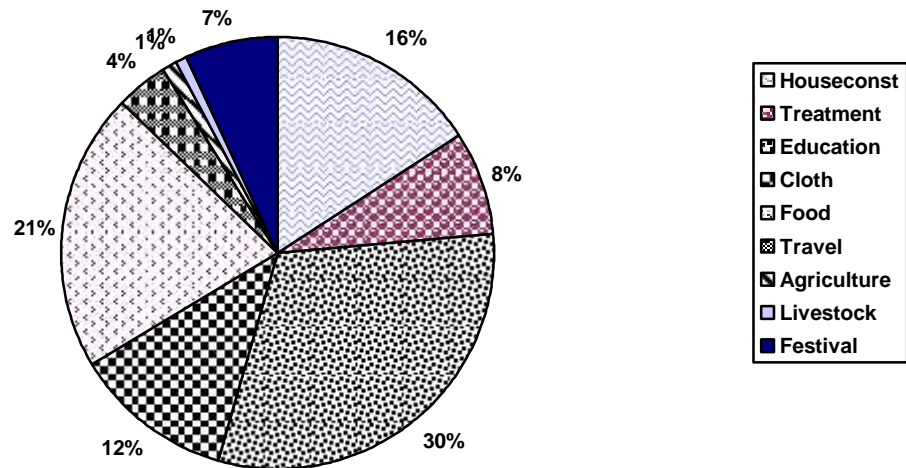
**Fig. 4.13 : Contribution of Different Income Classes**



Source: Based on Field Survey, 2008

As Fig. 4.13, the forest products contributed the highest amount (37%) to the total annual income of the community; it was followed by civil service (18%), agriculture, daily wages and business (10%), livestock (8%) and carpet weaving (7%). The contribution of income from forest products among poor, medium and rich income class was 39 %, respectively.

**Fig. 4.14 Distribution of Income of Yarsagumba**



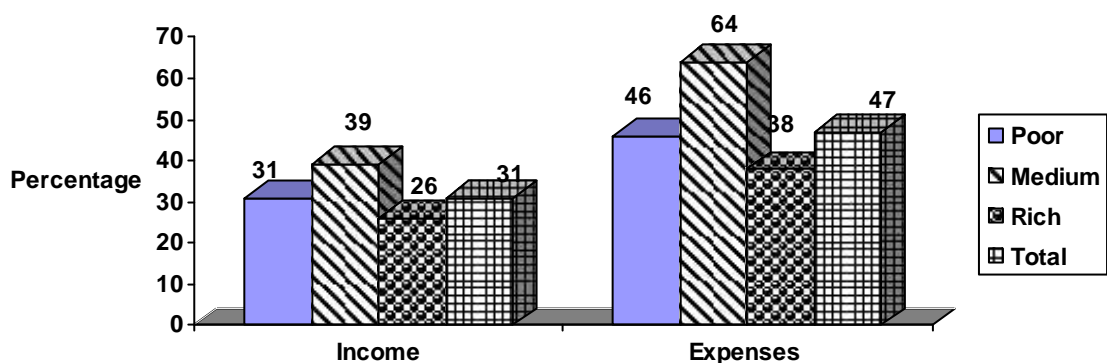
Source: Based on Field Survey, 2008

The highest amount of expenditure was in education (31%), followed by food purchasing (21%), land purchasing and house construction (16%), clothes (12%), medical treatment (8%), festival and celebrations (7%), travel (4%) and the least expenditure was on agriculture and livestock (1% in each). The highest expending was on purchasing food (29%) in the poor class, while it was on education among medium (38%) and rich class (30%).

#### 4.6.2 Contribution of Yarsagomba in total Income and Expenses

The contribution of Yarsagomba in total income and expenses in different topics as below.

**Fig 4.15 : Contribution of Yarsagomba to Income and Expenses**



Source: Based on Field Survey, 2008

The contribution of Yarsagomba to the income of community was 31% and while to expense it was 47%. The contribution Yarsagomba income

was highest (39%) in medium class followed by poor (31%) and rich (26%). The contribution of Yarsagomba to expenses was also the highest (64%) in medium class followed by poor (46%) and rich (38%) .

#### **4.6.3 Changes in Livelihood Assets**

The livelihood framework identifies five core asset categories. Which are human capital, social capital, natural capital, physical capital, financial capital? This study focused on changes in physical and financial assets between after 2000 due to income of YG.

There was a significant change in the physical assets of the rural commodity from the income of YG. Out of total respondents, 36% built new houses. The major contribution of funds to house construction was from YG income. The percentage of new house contribution of funds to house constructions in different economic classes was 50% among rich. 38% among medium and 5% among the poor. An estimated 7% of the households changed their roof from thatch to steel sheet or stone. Significant changes were seen in installation of solar system. Among the economic classes, 54% of rich, 38% of middle and 8% of poor class households installed the solar power system. Earlier there was a general practice of the local people using open areas like forest, gully, riverbank for toilet purpose, now about 35% of the respondent household have built toilet. Due to the severe cold in study area, biogas plant could not work properly and hence none of the household installed a biogas plant.

There was also a significant change in access to medical treatment, school and college because of the revenue gained by the respondents.

#### **4.6.4 Positive Impacts**



1. YG has become a major income source, contributing average 43325 thousand of annual income of the rural community.
2. In the past time, most of the households were unable to send their children to school and college at District headquarters, Kathmandu and different part of India.
3. Majority of the community people's affordance for health treatment was limited to village Baidhya and Jhakri, but now the community people are capable of buying food for whole year.
4. Previously majority of the households were dependent on labor and daily wages in India for food supply. But now the community people are capable of buying food supply, but now the community people are capable of buying food for whole year.
5. Majority of the community households were dependent on loan from rich households for many activities and the rate of interest was high, but with income of YG now the community people have more money.
6. Female collectors from rich and middle class family utilize the money from YG in buying gold ornaments.
7. The significance change was in installation of solar panels and entertainment equipment, such as TV, CD and VDC player.
8. From the additional income from the collection of YG some of the school and college students become independent in their education expenses.
9. From the income of YG some of the community people were able to save enough cash to go to foreign countries for employment.

10. In general, income from YG has become beneficial for the improvement in the socio-economic conditions of the community of the study area.
11. The collectors have locally organized to some extent to bargain to the price of their product and are sharing ideas and knowledge among themselves.
12. Awareness of local people on health care is building due to frequent interaction with knowledgeable persons.

#### **4.6.5 Negative Impacts**

1. During the YG Collection season, local schools are informally closed because the teachers & students go for YG collection .
2. Life style of collectors has become more luxurious, youths waste money on alcohol, smoking and gambling.
3. Local collectors seem neglecting agricultural activities and traditional system of farming, they pay less attention towards the agricultural activities.
4. Youth and energetic people have to leave home in the search of YG as the result small baby and old persons find less care.
5. Prices of market commodities raise very high during the collection season of YG.
6. Erosion in social norms and values are apparent.
7. Due to the harsh terrain, snow melting snow storm, slippery path, sometime accidents occur even causing the loss of life of the collectors.

## 4.7 Yarsagumba Collection Practices, Problem and Measures

### 4.7.1 Collection Practices of Yarsagumba in Darchula

People mainly involved in Yarsagumba collection due to lacking of the alternative income sources and high market demand collection during herding and for personal expenses are other reasons for Yarsagumba collection.

The Peak–harvesting season in Darchula is from mid May to mid July. This year the collection started from 25th June (11 Jestha) and people from more than a dozen VDCs participated in the collection.



**Searching of Yarsagumba**

Collectors from upper VDCs were seen more participating in the venture. Most of the collectors were from near VDCs like Byas, Rapla, Khandeshwori, Ghusa, Sitaula, Guljar. Beside that local employee in Darchula, teachers, students, almost family members took part in the collection.

A mass gathering of Yarsagumba requires an intensive but extensive search. The grassland possessing Yarsagumba are vast but the visible part of the fungus is very small often no longer than 2.5 cm. It can be spotted only with a close look,. The daily harvest quantity of Yarsagumba varied form a few specimens to several dozens, collectors in an average gathered 10 to 50 specimens in a day. After digging the first piece, collectors usually offer a pray to the God. The amount of collection in a season depends on past experience of the collectors and dedication for the collection. They also believed that availability of this treasure depends on luck of a collector. Recognizing lucrative benefits receiving

form the business of Yarsagumba, people mainly focused on the mass gathering of the product during the collection season and keeping other activities aside. Normally schools used to be closed each year during the collection season for 15-30 days and students participated for collection.

People mainly focus on the mass gathering of the peak season of Yarsagumba collection and trade in May-July. It is difficult to carry out labor intensive project community and government infrastructure project such as local route



**Digging at site**

construction come to half finding, local level also become difficult.

During the collection period of household members go for collection and only child and elder people live in the village, most member of household come out at the pastureland, turning the hunt into a joyful event. In addition, some people go to collection sites to serve double purpose of trading grocery items and participate in collection themselves. Locally Yarsagumba also serves as money substitutes and people exchange substance goods with it.

DFO of Nepal Government hold the legal right to grant collection permit by changing royalty of NRs 10,000 per kg.

According to the local information the participation of collectors is increasing year by year but the total amount of collectors have not increased significantly. Average harvesting quantity of Yarsagumba per collector has hence decreased.

People from all ethnic and religious background were participated for Yarsagumba collection. Collectors of both sex and from the lowest of age seven to the highest age of seventy-six were seen taking part in collection. Local key informants have said that about 68% of total

population including children and elderly people go for Yarsagumba collection; only disabled children, women (such as pregnant) and old people remain in the villages. However, child born cases were also found in the pastures. Some people were there to serve dual purpose of trading grocery items and also to participate in collection themselves. Locally, it was also observed that Yarsagumba served as money substitute and people exchange subsistence goods with it.

#### 4.7.1.1 collecting method

The study has revealed that Yarsagumba collectors in Darchula used the similar techniques prevalent in other part of Himalaya. The harvesting procedure itself was simple, collector usually carried small hoe (locally called “Khurma” or “Kuti”) or used their knife to lift caterpillar fungus out of the fertile mud rich dark brown topsoil. The common practices were uprooting, picking and gathering. This was done carefully, since breaking of the larva reduces the value. The larva is dug out with a pointed digger that is common tool for digging. Cotton bags are mostly used to storage the product.

Presently the function of medicinal plant collector in Darchula is more focused on Yarsagumba . People mostly consulted on collecting Yarsagumba and keeping less preference to other herbs because of better income. Some collectors have been noticed to be involved in collecting other medicinal herbs.

#### 4.7.1.2 Cleaning process

As Yarsagumba is highly priced and delicate product, its care is necessary for storage. Collectors after daylong collection come to



**Brushing of Yarsagumba after collection**

the camp at collection site and in the same evening brush, individual Yarsagumba pieces with old toothbrush and then dry in shade in cotton sack. The brushing is done to remove the outer thin membrane and earthy materials. The products are kept away from moisture/water as far as possible. Normally it takes 7-10 days to air dry the product. A fresh mass of Yarsagumba when dried for 10 days shows sixty percent less weight than its original weight.

The collectors avoid plastic bag for the product storage and instead use cotton sack to keep it long time. Regular care and brushing is necessary to maintain the good quality of product.

#### **4.7.2 Problems**

There are many problems to collect the Yarsagumba. They are as following:

##### **4.7.2.1 Transportation**

Due to lack of transportation, difficult and steep hills covered with snow, the traveling to the place of YG is very risky. As every thing including tent, foodstuffs, and clothes and cooking utensils must be taken with themselves for many days, the YG collection is expensive and difficult.

##### **4.7.2.2 Health problem**

It takes long time to collect YG. It is very cold place where YG are found. Due to unfavorable climatic condition, people are affected of various kinds of sickness. As they hardly bath, it create skin diseases as well as in case of serious. Such as diarrhea, vomiting, eyes problem, joint-ache, facial skin crack. Insufficient and poor quality of food stuff for collectors, insufficient cloths and shoes, inappropriate camping

material for the harassing high altitude, insufficient fuel woods is the cause of diseases.

#### 4.7.2.3 Advance Investment/ Poverty

The food grains produced in this area can last from 3 to 6 month to feed the people of this area. So far, the basic needs like food, cloths and other necessary things for the remaining time is concerned, they take loan from the local businessman in the condition that they would provide YG Tibetan businessman invests for YG in advance through their agents. Loan in advance has a draw back that they are liable to sell their product in relatively cheaper price. As the people are poor they cannot wait for reasonable price, to fulfill their daily requirement, they are selling their products in cheaper price.

#### 4.7.2.4 Quality and Grading

Quality of YG depends on how they have refined, that is cleaned and dried YG. The YG properly cleaned and dried get reasonable price.

It is necessary to know about the grading of YG. For example, properly cleaned and dried YG get higher price where as mixed YG get relatively lower price.

#### 4.7.2.5 Pollution

As the people who go to collect YG, take lot of foodstuffs, like biscuit, noodles etc. They throw the plastic, polithin paper and other waste materials everywhere every year. Thus, the area is being polluted.

#### 4.7.2.6 Conflict

Like previous years, the people from other area also come to collect YG in this area. However, the local people do not allow them to come to collect YG why it has created the situation of conflict in YG collection.

#### 4.7.2.7 Accident

It is very risky and difficult to collect YG. Some time they have to cross very difficult snowy mountains, which some time takes the life of people. Because of terrible and narrow foot trail, some persons lost their lives passing through the difficult trail.

#### 4.7.2.8 Low Price

As people are collecting YG, which is not mature, and lack quality, they do necessary to protect and pressure the areas where YG are abandoning. The government must make rule and regulation regarding YG collection also, so that the YG grow continually in sufficient amount not get reasonable price As the people, do not get enough information about the market prices, it lacks the bargaining power of the YG collectors. Collectors get only 24% price of international price.

#### 4.7.2.9 Natural Problem

Numbers of people go to collect YG. They required wood for cooking food and keep themselves warm from cold. They are cutting trees in unmanaged way, which has negative impact on the forest. Firing is easy to fond YG, after firing on the grassland, but it can have negative impact on the growth of YG. Poaching is the another problem. While collecting YG, they are hunting the wild animals. Therefore, this type of poaching of wild animals, it is necessary to have pressure of Government offices. As the people set fire on the grassland, cut trees, shrubs and plants, throw wastes like plastic bags, it is destroying natural habitat of that area. As the place where YG are found is mostly covered by grass and snow, it is difficult to find firewoods for cooking food and warm.

### 4.7.3 Measures

Following advices have been obtained to solve the problems that arise during YG collection, from household survey, information



discussion, group discussion and various interaction programs with the various people.

1. Construction of road or accessible route to the region where YG found.
2. Access for all the consumers to that area. Development of technology regards professional cultivation of YG.
3. Development of proper technique of collecting YG.
4. Increasing public awareness regarding deforestation, fire, poaching and pollution.
5. Facilities of health camp during collection.
6. Refining facilities inside our own country.
7. Provision of license for YG trade.
8. Mechanism of proper co-ordination among YG collectors, traders and related agencies.
9. Direct contact of YG collectors with dealers.
10. Encouraging local investment in the YG trade.
11. Proper marketing system.
12. Regular information regarding prevailing market price.
13. Apart from these, collectors should be properly trained in collection, cleaning, drying and storing techniques by the skilled trainers.



## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 Summary

Forest is one of the important natural resources in Nepal and it has direct relation to the livelihoods of the rural Nepalese people. The Non-Timber Forest Products are one of the major sources of cash income to the rural people particularly in the remote areas of Nepal.

Yarsagumba is an economic specie, which is contributing a significant amount in national economy of Nepal. Less or no attention was given by the government officials for its proper management and by researcher for study. It was lacking systematic and detailed study of Yarsagumba. The main object of this study was show the contribution of Yarsagumba in rural people. Darchula district was selected for this study because Darchula is recognized as very fertile district for production of Yarsagumba and the rural people of Darchula have more than 7 years experience in collection and trading of YG. Out of total 21022 household in Darchula district only 4500 household were found involved in collection of Yaesagumba in 2008. Of 4500 household involved in collection of Yarsagumba only 225 household were taken as sample for this study. Of the total 225 households were studied who were involved in the collection of Yarsagumba (75 households in each wealth ranking class i.e. rich medium and poor). The transect walk method was used to select respondents. The questionnaire survey was carried out to get information from collectors. Secondary information was taken from different publications.

## 5.2 Conclusion

It is concluded that sustainable production and trading of Yarsagumba has become instrumental part for the socio-economic enlistment of rural community of Darchula as well as Country because Yarsagumba is being a main income source by providing different employment opportunities for rural people. Thus, income of Yarsagumba has played a significant role in Mountain people for their livelihood. Besides this, it's collection is affecting the biodiversity of forests in the region. Therefore, it can be assumed that this species is needed a sustainable development strategy so that both the forest biodiversity and Yarsagumba can remain in their natural habitat which is a great assets of nature.

This study focuses on the Yarsagumba collection technique and the trade of Yarsagumba in Darchula. It showed that Darchula area is exceptionally rich in availability of Yarsagumba and local people have to superb knowledge regarding its business and use, the present study has been able to make the following conclusion.

- ) Out of total 40% were participated in Yarsagumba collection.
- ) The maximum participation was found below 20 years age group family members (48%).
- ) Among the participated individuals 39, 34 and 27% belongs to rich, medium and poor classes respectively in the collection of Yarsagumba.
- ) Of total collectors, the male and female were 64 and 36% respectively.

- ) The total collection of Yarsagumba was 1080kg in 2008.
- ) The trend of price changes was increased rapidly in 2004 to 2008.
- ) The collectors get only 24% market price .
- ) The contribution of forest products in the total annual cash income was 37% however the maximum contribution (31%) was of Yarsagumba.
- ) The contribution of Yarsagumba in total cash income in poor class was 33%, in medium class was 37%,. and in rich class was 30%.
- ) The highest (31%) proportion of expense was in education followed by food supply (21%).
- ) The majority of the household were dependent in labor work in India for food supply, now they become able to buy food for whole year from the Yarsagumba income.
- ) The significant changes were seen in the physical assets, some built new house some installed solar system, some bought land etc.
- ) The total income got by respondents household, distributed 25% to poor classes, 37% to medium classes, and 38% to rich classes.
- ) People from more than dozen of VDC numbering above 13500 participate in the collection of YG in Darchula.
- ) In Darchula Yarsagumba are observed from 3000- 5500m altitude, high availability of the product.

- ) The regular observation at control plot has revealed that emergency of YG diminishes or almost become nil after second or third day.
- ) Of the availability criteria, the three important factors are size, weight, and color of YG.
- ) During the collection period majority of household members go for collection and majority of village become vacant by more than 40 percent.
- ) People in Darchula normally consider Yarsagumba as tonic and sexual stimulant. Some also it as different type of medicine.
- ) Yarsagumba is important component of rural livelihood, as they play critical role in natural economy and help sustain livelihoods of many rural households that include socially and economically disadvantaged groups.
- ) Poverty is intimately related to natural resources. In the world, the poor have no access to non-natural resource and limited capacity to adopt. They rely more heavily on the direct exploitation of natural resource including forest resource than the rich, while the rich consume more resources overall. As consequences, poor people have no choice but to engage in unsustainable uses of nature resources. Most of the people in this area collect and sell Yarsagumbas to meet their hand to mouth.
- ) The Yarsagumba was distributed in pasturelands of from 3000-5500m altitude.

### 5.3 Recommendations

Based on the result of this study and suggestion received from local stakeholder the following recommendation has been made for the conservation and sustainable use of Yarsagumba.

- ) Education on conservation and campaigns among people need to be carried out to ensure that fungi are harvested after sufficient spore dispersal, environmental impact of on unscientific collection, awareness Programme on sustainable harvesting, management and utilization of Yarsagumba at local level need to be conducted for its conversation.
- ) Further study concerning iso-potential areas of Darchula is required for the availability assessment of Yarsagumba in the areas to diversity the collection sites there by contributing in the economy of the local people.
- ) Detailed scientific exploration to monitor ecological factor and regeneration pattern should be carried out in other parts of the country covering potential area for Yarsagumba in addition to Darchula.
- ) .There should be a clear cut guideline for the estimation of production and productivity of Yarsagumba.
- ) A step should be taken for maintaining proper data base on yearly production, collection and trading of Yarsagumba.
- ) A detailed international market study is required to provide maximum benefits to local collectors.

- ) Maximum trading of Yarsagumba is in raw form, there is need of value addition to give maximum income economy.
- ) Apart from these, collectors should be properly trained in collection, cleaning, drying and storing techniques by the skilled trainers.
- ) Strong monitoring of YG harvesting is strongly recommended at local level to ensure sustainable harvesting.
- ) Proactive initiative role should be played by the government for market promotion, e.g., cooperative, buy back.
- ) The present royalty rate of Yarsagumba needs further review by the government in the global context of its market.
- ) Plantation should be established in the forest for collection season.
- ) Over grazing should be checked to protect the Yarsagumba.
- ) Community ownership and mobilization should be appraised for effective management of pastures.
- ) There should be awareness rising program to effect of hunting, firing, improper harvesting of plant.



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## APPENDIX

### A Study on Yarsagumba Collection in Darchula District of Nepal

#### Questionnaire to the collectors

##### A. General Information:

1. Name of Respondent.....
2. VDC..... Ward No..... Village .....
3. Caste .....Sex .....Age .....
4. Ranking of occupation: a. Farmer b. Social worker c. Politician  
d. Business e. Service f. Other.....
5. Family size:
6. Livestock: a. Goat/sheep.....b. Cow/Oxen.....c. Buffalo.....  
d. Pig/Boar..... e. Other..... f. Total.... .....
7. Educational status:
8. Land Holding: Total .....Ropani (Irrigated.....&  
Non irrigated.....)
9. Food sufficiency: a. Surplus b. Year around  
c. 6-9 months d. 3-6 months  
e. below 3 months f. No land

##### B. Participation of CFUG in collection and uses:

10. Why do your family members goes to collect Yarsagumba?  
Household use/Economic gain/ Study / Research / Enjoyment / Others
11. When did you come to know about the collection and uses  
Yarsagumba?...Year
12. When did you start to participate in collection of Yarsagumba?  
.....Year.
13. How did you come to know about this product.  
Forest technicians / Traders / Neighboring users / Radio or  
Documentary / Others

14. When did You start to participate in Yarsagumba collection? How much did you collected annually and what is the status of gain?
15. Where do you go to collect Yarsagumba?
16. How far you go to collect the YG from your camp/station?.....km.
17. Have you used the Yarsagumba in your family? a. Yes b. No
18. Do you idea of the local use of Yarsagumba? a. Yes b. No
19. Do you know the present value of YG in the market? Yes/No
20. Collection amount and income.
21. What are the major source of your family: (2007 July- 2008June)  
Agriculture / Livestock / Forest product / Gov. service / Daily labor / Business
22. What are major expenses of your family: (2007 July- 2008June)  
Health / Education /Cloths / Foods / Travel / Agriculture / Livestock / Festivals
23. In which activity, did you spend the income gain from YG last year?
24. What is the impact of YG in your community? pos. /neg.
25. In your family generally, who take decision in use of the income.
26. Do you feel any changes in your socio-economic status from the income gain from YG? a. pos. b. Neg. c. As usual  
In which sector?
27. What is the percentage of income gain from YG in family income?  
.....%
28. Have you face any life and economic losses during the collection of YG ? Yes / No
29. Is YG collection suitable in the economic point of view? Y / N
30. What is the major problem during the collection of Yarsagumba?
31. Any suggestion if you have.

Interviewer name: .....

Date:.....