Assessment of Allo Production and Enterprise Potential in Parbat District

District Forest Office
Kushma, Parbat

ANSAB
Rich Biodiversity and Prosperous Communities

Asia Network for Sustainable Agriculture and Bioresources

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Acknowledgements

One of the major challenges often encountered by forestry entrepreneurs and planners is the lack of reliable information on forest products supply potential. Such information is notably almost non-existent for Non-Timber Forest Products (NTFPs). In this context, it is our pleasure to present you an "Assessment of Allo Production and Enterprise Potential in Parbat District", which not only provide information on this resource's supply potential but also analyses related enterprise opportunities in the district. This report will be very helpful to entrepreneurs and program managers already engaged in Allo collecting and processing or thinking about getting involved in the business. We hope it will help to manage resource sustainably and to generate new wealth for many communities. The assessment reveals that the full utilization of the Allo available in the district could generate direct incomes of about NRs. 8,416,454. The potential benefits are even greater if we also count employment generated by associated activities.

I am sincerely thankful to Mr. Gopal Prasad Sharma from ANSAB who coordinated every aspect of this project, including logistical arrangements, data collection, analysis and report preparation. Contributions of Mr. Nabaraj Panta and Mr. Sushil Gyawali from the same organization were also significant in designing the assessment and preparing this report. I greatly appreciated the support provided by Mr. Kiran Paudel, MEDEP (APSO Baglung) during the process of concept design and planning. Similarly, Mr. Chandika Amgain of ANSAB and Haris Chandra Sapkota and Dayanidhi Aryal of Parbat District Forest Office actively took part in the organization of a community mapping workshop in Kushma that was essential to the realization of this assessment. My sincere thanks go to other DFO staff as well as to Ganesh Adhikari and Kopila Purja (SEEWA-Parbat) who supported data collection in the field. Most importantly, I thank all community members and respondents for their invaluable support and for sharing their knowledge and experience with us.

I am grateful to ANSAB for the technical and financial support provided to this publication. Similarly, I thank MEDEP/ SEEWA for providing partial funding for the assessment.

(Bodh Raj Subedi)
DFO, Parbat
June 2010

Contents

Summary

Non Timber Forest Products (NTFPs) are important regenerative forest products that have traditionally been extracted by rural poor for their high economic value. The sustainable collection and processing of these products is considered a promising avenue for both income generations by rural communities and biodiversity conservation. NTFP-related enterprises are especially important in the Mid Hills and High Mountain of Nepal where a large quantity of NTFPs are collected and traded in national and international markets every year.

The Parbat district does not host many enterprises in the NTFPs sector so far because of its small geographical size and the low density of NTFPs in its forests. There are nonetheless interesting opportunities for enterprises development in, among others, Lokta paper making, Allo threading and cloth weaving, essential oil production and furniture production. The local District Forest Office (DFO) is committed to support this type of enterprises with the vital support of facilitating organizations such as ANSAB, LFP, and MEDEP.

The present assessment focus exclusively on Allo and was conducted using a combination of Geographic Information System (GIS) participatory community mapping and field inventory. GIS community mapping is based on the assumption that local people are the best experts about the prevalence of natural resources because of their intricate knowledge of the area where they live and because they traditionally relied on these resources for their livelihood. Maps of Allo occurrence were thus first produced with the help of the local communities, before being validated with complementary methodologies such as cross-checking with forest cover maps and contour lines and the conduction of a stratified systematic sampling at an intensity of 0.4%.

The assessment reveals that Parbat district has moderate potential for Allo enterprises, the resource being found in sufficient quantity in 2,049 hectare of forest. In a nutshell, the district has a total estimated production capacity of 8,588 kilogram of dry Allo bark per year. This could generate 25,192 man/days of work, with 29 people employed in bark collection for 2 months every year and about 98 people employed in processing (fiber making, thread making, cloth weaving, etc.) for 8 months every year. Altogether this opportunity could provide business benefits of NRs. 8,416,454 to local communities.

CHAPTER ONE

Introduction

GENERAL BACKGROUND

Non-Timber Forest Products (NTFPs) have been used by Nepal's rural communities since ancient times and are currently the major source of income in the mountainous and Himalayan regions of the country. Due to its diversified ecology and geography, Nepal is indeed blessed with an important number of different species and a high level of availability. The sustainable management of NTFPs is thus crucial both for biodiversity conservation and for income generation in poor communities.

Various government institutions, NGO, INGOs and CBOs are involved in the establishment of Allo enterprises in Parbat district, and a few existing enterprises are already involved in thread making, cloth weaving and other related activities. This assessment was launched to study and understand the actual potential to develop more of such enterprises throughout the district.

1.2 INTRODUCTION TO ALLO

- Scientific name: Girardinia diversifolia (Link) Friis
- English name: Himalayan nettle, Giant nettle
- Nepali name: Allo, Chalne sisno
- Other names: Puwa, Thulo sisno, Lekali sisno, Bhangre sisno, BhAllo, etc.
- Family: Urticaceae

Botany, habitat and distribution

Allo (Girardinia diversifolia) is found abundantly in open forest land and river side of moist habitat in Nepal. It grows naturally from east to west within elevations of 1,200m to 3,000m. It is a shade bearing, tall, stout and erect herb growing up to 3m height with perennial roots stock. The aerial parts are armed with numerous slender stinging hairs and the leaves are deeply lobed saw-toothed with bristles and have stinging hairs. Allo has both male and female flowers in the same plant. The plant is found on clump and each clump has many stem. The stem bark contains fibers of unique quality which is strong, smooth and light.

Uses

Tender buds, leaves, bark and roots of Allo are used for various purposes. The bark is used for making clothes, ropes and domestic implements while tender shoots and buds are used as vegetable. Leaf

for curing headache, body pain, fever, tuberculosis, and urinary complaints, while root juice is beneficial for diabetics. Use as fodder is also common.

Propagation

Allo can be propagated from seed, root sucker and vegetative part.

From seed: The seed of Allo is very small, a gram containing about 550 specimens. Seeds are collected from matured plants during October-November and sown in nursery in February-March. For good results, it is better to treat seeds in dilute sulphuric acid for about 15 minutes before sowing.

From root suckers: As Allo grows on clump, the underground part has many roots attached together. The plant is propagated either by detaching the roots or cutting the longer roots into small pieces in the nursery.

From vegetative part: Vegetative propagation is also possible for the regeneration of Allo. The new stem is cut into small pieces in June-July and planted in poly-pot or nursery bed. It is better to use roots for good results. Plants are transplanted to the field from nursery in July-August.

Harvesting

To ensure better regeneration of the plant, it is recommended to harvest Allo between October and December when it grows to its maturity and seeds have become ripe and felt on the ground. The collection of Allo bark is however generally naturally sustainable as it only requisite the harvesting of the aerial part of plant, leaving the roots free to regenerate.

Processing methodology

Allo is a fiber yielding plant, meaning that its inner bark is used for the production of fiber. Allo is locally processed and made into thread, which was traditionally used to make the different products like rope, sacs, fishing net and a kind of shawl locally known as Gada. Nowadays, the uses of Allo have become wider and include cloth, carpet, hankie, table mat etc. Allo cloth is in turn sewed into jacket, cap, shawl, bag, etc. It is believed that the wearing of Allo cloth prevents skin allergy and can treat some skin diseases.

Various steps are involved during Allo processing, including soaking in water, cooking, washing and beating, softening, washing and separating of fibers, spinning, bleaching, weaving etc. These steps are described below:

Cooking: First of all, the collected barks are soaked in water for 2 to 3 days. The barks are then boiled with ash or caustic soda for about 2 hours. For 8 kg of dry bark, about 1 kg of caustic soda and 4 kg of ash is needed. The quantity of ash depends on the quantity of caustic soda used. If the caustic soda is not used, then the amount of ash must be greater than the amount of bark. To maintain organic qualities, it is recommended not to use the caustic soda. However, the use of caustic soda reduces

cooking, thus saving both time and fuel. After boiling, the boiled bark is set aside for 10-24 hours.

Washing and beating: Cooked barks are washed with fresh water, usually in a stream, while being beaten with a wooden hammer at the same time. Generally, 500-600 gm of Allo fiber is obtained from 1 kg of dry bark.

Softening, washing and separating of fibers: After washing and beating, the fiber is sun dried with maize flour, rice chaff or "Kamero" (a yellowish white soil) for half a day. This step makes the fiber soft, shining and white. The fiber is then beaten, washed and sun dried again. When ready, the fibers are separated manually or with appropriate mechanical devices if available.

Spinning: Traditionally, Allo thread is made with the help of a spinning instrument named "Katuwa", but nowadays the thread is made with the help of "Charkha". There are different kinds of Charkha available such as Manual Charkha, Paddle Charkha, Solar Charkha and Electric Charkha. These equipments are more efficient than the traditional instrument. About 400 gm of Allo thread can generally be produced from 1 kg of dry bark.

Bleaching: Allo thread is usually bleached to make it clean and shining. The thread is soaked in bleaching solution for about 24 hours and then washed with soap to remove the smell. The bleaching solution is prepared by mixing 200 gm of calcium hydroxide and 200 gm sodium bicarbonate in 20 liters of water.

Weaving: Allo cloth is normally weaved with the help of a handloom, although in some places modern machinery is also used. Cotton thread is often used as a base and weaved with Allo thread. About 7 m cloths can be weaved from 1 kg of Allo thread mixed with 0.9 kg of cotton thread.

Mapping area

Parbat district is located between the latitude 28o02′ to 28o23′N and longitude 83o33′ to 83o49′E at elevations ranging from 762 to 3309m. The total area of the district is 536.86 square kilometres (Source: DDC Parbat). Major characteristics of the districts are given in Figure 1.

The main objective of this study is to map Allo (Girardinia diversifolia) production potential areas and explore enterprise opportunities based on this resource. The specific objectives are to:

a. Map Allo potential areas using GIS.
b. Assess the volume of Allo production potential for enterprise development.
c. Explore enterprise opportunities based on the production and marketing of Allo.

Parbat District

Figure: 1

GENERAL:

1. Boundary : East: Kaski & Syangja, West: Baglung & Gulmi, North: Myagdi, South: Syangja
2. Altitude range: 520-3309 m.
3. Area : 536.86 square kilometers (53686.21 hectare)

TOPOGRAPHY:

4. Agri -cultivated area: 24171 ha.
5. Forest: 19997 ha.
6. Pasture: 9518 ha
7. Others: 9518 ha.

DEMOGRAPHIC TREND:

8. Population: 158,992 (Male: 74134, Female: 84858)
9. No. of households: 32731
10. Literacy rate: 58
11. Average household size : 5
12. Population density person/sq. km : 319

MAJOR FOREST AND VEGETATION TYPES

13. Broadleaf: 61%
14. Mixed: 7%
15. Conifer: 32%

Source: DDC and DFO monitoring report, Parbat

Chapter Two

Methodology

The study was carried out through participatory community mapping, PRA, RRA and sampling inventory. Information provided by the villagers/community, especially by Community Forest User Groups (CFUGs) and Allo entrepreneurs, is thus the basis of this research. We believe that villagers know better than outsiders about the area where they live. They are indeed very knowledgeable about local natural resources and their uses as their livelihood depend on them. The participatory approach used by this study is further detailed below.

Preparation

- The potential Allo production area of each Village Development Committee (VDC) of Parbat district was identified through consultation with concerned stakeholders, including DFO staffs working in the field, Local Resource Persons (LRPs), Community Forest (CF) chairperson and Allo entrepreneurs and collectors.
- The district sets of topographic sheets (9 sheets) were reviewed.
- The digital topographic sheets (scale 1: 25000/50000) of Parbat district were collected from Department of Survey, Government of Nepal and reviewed.
- The required data collection forms were prepared.

Defining geographical sub-units

There are 55 VDCs and 342 CFUGs in Parbat district. From the pre data collection, about 18 VDCs were identified as potential Allo production areas. These VDCs were then clustered into following four sub units considering geo-similarities, neighbourhood, accessibility and collection points. The map of each cluster is presented in Figures 3, 4, 5 and 6.

Cluster 1 (Salija): Lekhphant, Salija and Dhairing.

Cluster 2 (Kyang): Kyang, Bhuktangle, Deurali and Banau.

Cluster 3 (Chitre): Chitre and Ramja/ Aarther (the geographic location of Allo falls under the boundaries of Ramja VDC but the resource is used by residents of Aarther).

Cluster 4 (Lunkhu): Phalamkhani, Kurgha, Lunkhu, Panran, Bhoksin, Bachchha, Hosrangdi, Barrachaur and Urampokhara.

Community mapping workshop

Selection of participants and invitation

CFUGs, Allo processors/entrepreneurs and key informants from the selected VDCs were invited to a community mapping

workshop, along with representatives from concerned line agencies such as ANSAB, DFO, FECOFUN District Committee, LFP, SEEWA and MEDEP. The selection of participants was made by the District Forest Office.

Preparation of topographic map for mapping workshop

Clusters were numbered and VDCs boundaries delineated with a marker pen on topographic sheets to ensure that participants easily identify their home VDC. It ultimately helped to add legends and symbols presenting recognizable elements such as rivers, roads, forests, cultivated lands, settlement areas, contour lines, schools and other spatial objects.

Conduct workshop

Participants were oriented before starting the community mapping to impart knowledge about the use of maps and how to rank Allo in accordance with various criteria. The following topics were explained:

- What is a topographic map?
- What is the importance of maps in development planning? And in our daily life?
- What are the symbols/legends that used in a topographic map? How can information be found on a topographic map?
- What is a contour line? How can we use contour lines to draw the specific height of geographical locations?

A half an hour exercise was organized to find information on topographic sheets in group of 5-6 participants, at the end of which it was confirmed that the participants felt comfortable reading the maps.

The remaining of the workshop was organized around the following schedule:

- Presentation of the study's purpose.
- Definition of the color to be used to delineate the density of Allo as high, medium or low.
- Group discussion/work.
- Presentation/plenary discussion.

Ranking criteria for Allo in the workshop

High density: Areas where there are more than 10 clumps per 10m2 or areas from where more than 15 kg of dry bark can be harvested per hectare.

Medium density: Area from where 10-15 kg of dry bark can be harvested per hectare.

Low density: Area from where less than 10 kg of dry bark can be harvested per hectare.

The rough estimations made during the workshop were only indicative and were not used for calculating overall Allo production. It rather helped with the delineation of homogenous strata for sampling purposes. The estimation made in this report is from the field verification (sample data collection and analysis). The details of field measurements and analysis are presented in Annex 1, 2 and 3.

Delineation of potential areas of Allo

a. Color sign pens were used for delineating potential areas of Allo on topographic maps to avoid confusion and duplication.
b. Color and symbols were defined for density of Allo as "H" for high, "M" for medium and "L" for low.
c. Procedures for delineation were repeated twice and glued on the topographic map supplied to each working group. The map delineation process was moreover facilitated by professional foresters.

Mapping potential areas (location):

a. Topographic sheets delineated during the participatory community mapping workshop were digitized.
b. Digital polygons were edited and geo-referenced.
c. Areas covered by each type were calculated.
d. Geo-referenced topographic maps, contour lines maps and forest cover maps were used to verify the spatial location of Allo delineated by villagers.
e. Maps were produced using GIS software.

Orientation training for field measurement and verification

A one-day orientation training on 'field data collection procedures' was organized for field staff. The training explained both the theory and the practice field data collection to the relevant communities.

Collection of data

2.6.1 Primary data

Focus group discussions were carried out during the community mapping workshop and field visit to collect primary information such as production (harvest) of Allo per unit area, current harvesting practices and quantity, decrease in weight of Allo bark after drying, processing procedures and resulting loss of raw material, as well as demand for Allo thread by cloth weaving enterprises in Parbat district. Data were also gathered and verified by the technical staff of Parbat's DFO and ANSAB, with the help of collectors, key informants and relevant CFUGs.

2.6.2 Secondary sources

DFO Parbat, ANSAB, research documents and other related GOs/ INGOs documents.

2.6.3 Field measurement and verification

Field measurement and verification were conducted in all relevant VDCs. A random selection method identified about 8.1 hector of forest for sampling. Production capacity, distribution, number and weight of plants, loss of raw material during processing (including drying) were examined and field tested during the verification. From this field work, an average constant (conversion ratio) to calculate the Allo resource was identified, allowing the final quantity mentioned in this report to be calculated.

Tools and software

- Topographic map (1996) of scale 1:25000/50000 prepared by the Government of Nepal, Department of Survey, based on 1992 photography and 1996 field verification.
- Arc View 3.2.

Limitation

- Only representatives of relevant CFUGs and key informants (collector, traders and processors) were the source of information for this study because of time and cost limitations.
- The sampling intensity from which the average was calculated was of about 0.4%.
- This study is based on the assumption that villagers know more about the prevalence of natural resources in the area where they live than outside consultants. Field verification and data collection were done based on the information they provided and, as a result, some sites might not have been assessed.

CHAPTER THREE

Findings and Conclusion

POTENTIAL AREA AND DISTRIBUTION OF ALLO IN THE DISTRICT

The potential area of Allo for the district was calculated on the basis of VDC-level areas delineated by participants during the community mapping workshop on standard topographic maps (see methodology for details) with the help of Arc View software. Each area was ranked based on the density of available resource and a total was summed up. The total district-wide estimated area with Allo potential is of about 2,048.9 ha, out of which 19 % (395.2 ha) has high density, 27 % (540.4 ha) medium density and 54 % (1,113.3 ha) low density (see Table 1 for details).

VDCs having larger Allo producing area

VDC Name	Area (ha.)
Kyang	732
Bhuktangle	403
Salija 229	
Bhoksing	201
Urampokhara	123
Chitre	75
Bachhchha	50

Table 1: Estimated area under each cluster

S.N.	Cluster	VDCs	Area (ha)			Total area (ha)	% share of total area
			High density	Low density	Medium density		
1	Salija	Lekhphant, Salija, Dhairing	76.5	86.6	77.9	241.1	12%
2	Kyang	Kyang, Bhuktangle, Deurali, Banau	291.4	255.3	639.1	1,185.8	58%
3	Chitre	Chitre, Ramja, Aarther	27.2	50.9	21.1	99.2	5%
4	Lunkhu	Phalamkhani, Kurgha, Lunkhu, Panran, Bhoksin, Bachchha, Hosrangdi, Barrachaur, Urampokhara		147.5	375.3	522.8	26%
Total			395.2	540.4	1,113.3	2,048.9	100%
% in relation to density			19%	26%	54%	100%	

Note: Availability of Allo calculated based on areas delineated on topographic maps during community mapping workshop

Figure 2 shows that out of 55 VDCs, 3 VDCs have high potential (Bhuktangle, Kyang, Salija) while 15 VDCs have medium potential for Allo extraction and management. The details are given in Table 4.

Figure 2: Potential Location of Allo in Parbat District

3.2 Conversion ratio

Field experiments were carried out to identify the conversion ratio of Allo in order to ease data calculation. Experiments were conducted in each cluster and an average was then calculated for the district. It was observed that, in an average, one clump has about 6 stems and one stem produces 17 gram of fresh bark. About 59 stems (or 10 clumps) are thus required to produce 1 kg of fresh bark. Similarly, about 212 stems (or 35 clumps) are required to produce 1 kg of dry bark. Remaining of Allo bark after drying was found to range between 20 and 40%, while average loss was found to be about 71% of matured Allo. The loss depends on the season of harvesting and on bark moisture content during collection.

3.3 Density

The field data analysis revealed that the clumps and stems numbers in the district Allo potential area are of about 128 per hectare and 684 per hectare respectively.

3.4 Estimated volume of production:

The production of Allo was estimated from the digitized delineated areas on topographic maps during community mapping. The study revealed that the total production capacity of Allo in Parbat district is of about 8,588 kg of dry bark, from which about 3,435 kg Allo thread can be produced. The detail of production capacity for each cluster is presented in Table 3, while the output map for each cluster is presented in Figures 3, 4, 5 and 6.

Figure 3: Location of Allo Potential (Salija Cluster)

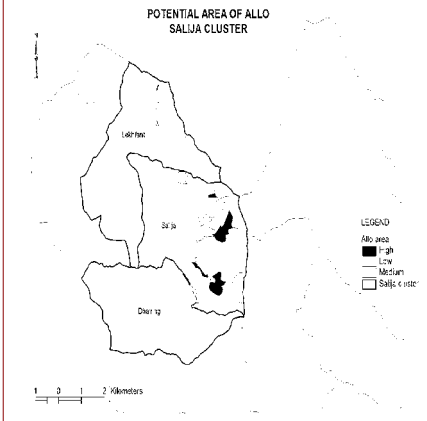


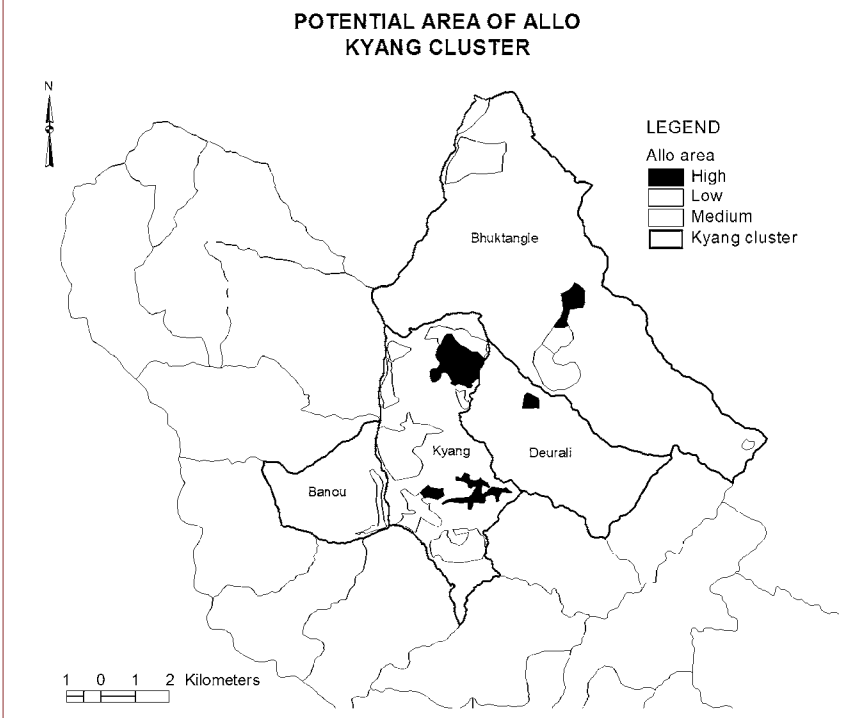
Table 2: Allo experiments results in different places

Place	Cluster	Aspect	Clump no.	Stem no.	Total bark weight (gm) per plot (100m2)		Bark weight per stem (gm)		Remains of dry Allo after loss	No. of stem required for 1 kg bark	
					Fresh	Dry	Fresh	Dry		Fresh	Dry
Tare	Salija	West	29	107	1750	420	16.36	3.93	24%	61.14	254.76
Dhairing	Salija	North	23	68	1500	300	22.06	4.41	20%	45.33	226.67
Barahthan	Kyang	South-east	30	132	2000	700	15.15	5.30	35%	66.00	188.57
Deurali	Kyang	South	27	103	1500	600	14.56	5.83	40%	68.67	171.67
Lespar	Kyang	South- east	44	163	3000	800	18.40	4.91	27%	54.33	203.75
Khuijeri	Kyang	North- east	33	123	2000	550	16.26	4.47	28%	61.50	223.64
Total			186	696	1,958.3	561.67	17.1	4.8	29%	59	212

Table 3: Cluster wise estimated volume of production

Cluster name	Total area (ha)	Total clumps (No.)	Total stems (No.)	Total stock (kg)		*Total harvestable dry bark (kg)	Production of thread (kg)
				Fresh bark	Dry bark		
Salija	241	145,563	741,369	12,701	3,564	2,673	1,069
Kyang	1,186	245,808	1,012,204	17,341	4,866	3,650	1,460
Chitre	99	35,600	342,414	5,866	1,646	1,235	494
Lunkhu	523	52,722	285,924	4,899	1,375	1,031	412
Total	2,049	479,693	2,381,912	40,808	11,451	8,588	3,435
			Conversion ratio				
			Fresh bark weight per stem (gram)		17.13		
			Dry bark weight per stem(gram)		4.81		
			Production of fiber from dry bark (%)			50%	
			Production of threads from fiber (%)			80%	

Figure 4: Location of Allo potential (Kyang Cluster)



The Table 4 shows that the highest density of Allo per hectare was recorded in Dhairing VDC (about 57 kg/ha) followed by Ramjadeurali VDC (about 23 kg/ha), while the lowest was recorded in Bachhchha VDC (about 0.8 kg/ ha).

On the basis of total quantity and area of availability, Kyang VDC holds the first position. However it falls in 8th position as per the density of Allo per hectare. Similarly, Bhuktangle VDC holds the 2nd position in terms of area, but falls in 10th position in terms of density per hectare.

Table 4: Top 10 VDCs having highest density of Allo and 1 VDC with lowest density

VDC Name	Total qty (kg.)	Area (ha.)	Density kg. per ha
Dhairing (highest density)	625	11	56.82
Ramjadeurali	541	24	22.54
Chitre	694	75	9.25
Salija	2013	222	9.07
Deurali	146	17	8.59
Kurgha	93	19	4.89
Lekhphant	35	8	4.38
Kyang	2216	732	3.03
Bhoksing	606	201	3.01
Bhuktangle	1205	403	2.99
Bachhchha (lowest density)	39	50	0.78

Figure 5: Location of Allo potential (Chitre Cluster)

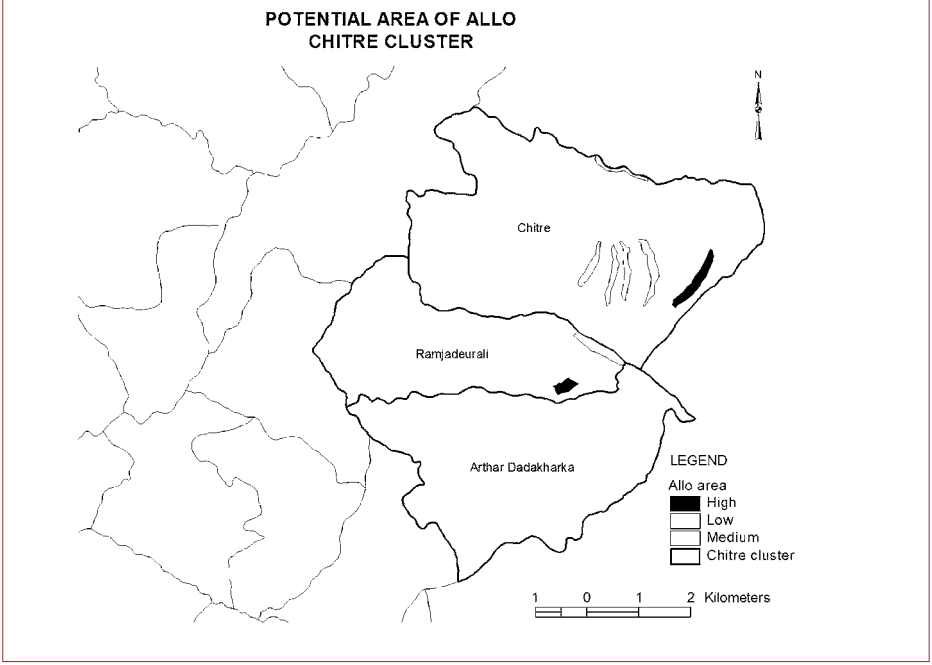
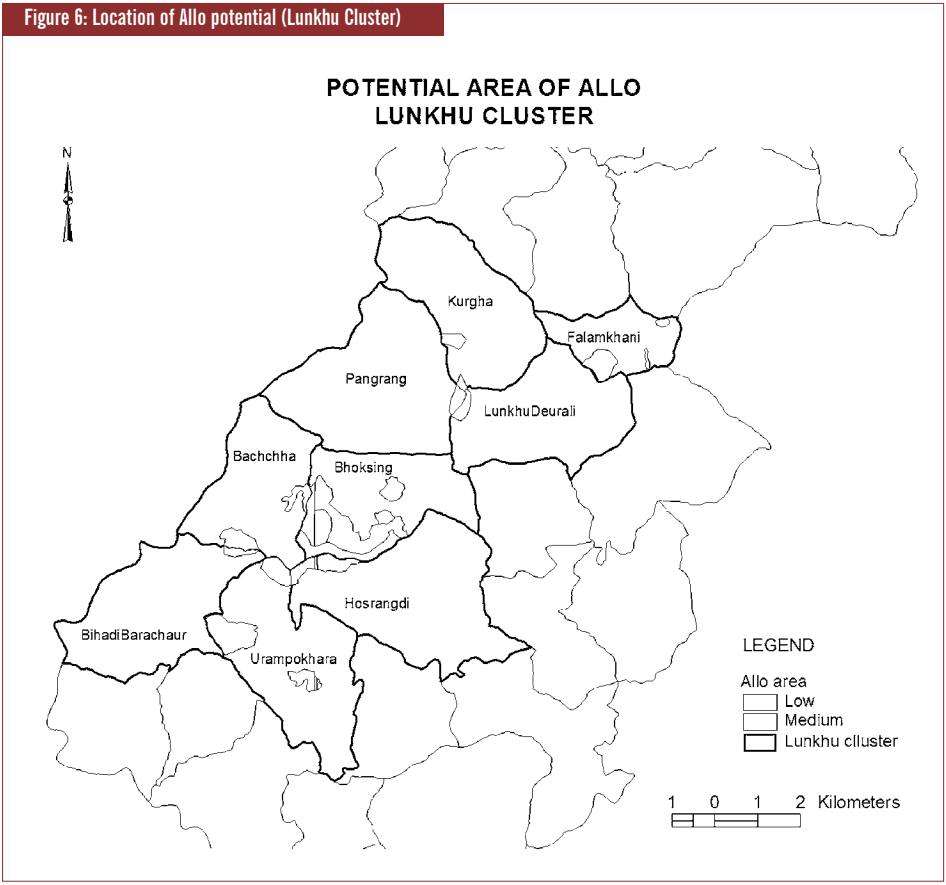


Figure 6: Location of Allo potential (Lunkhu Cluster)



3.5 Enterprise opportunities

Allo was found in about 4.1% (2049 ha) of the total forest area of Parbat district. Community mapping shows that 19%, 26% and 54% of Allo production area falls under high density; medium density and low density respectively (see Table 1). More than 70% of this potential supply comes from only 4 VDCs (Dhairing, Salija, Bhuktangle and Kyang) of the Salija and Kyang clusters. Therefore, any plans for the establishment of Allo enterprises in the district should focus first on these VDCs. That said, 63 local community members are already involved in Allo enterprises activities in these VDCs (see Table 5 below). Therefore, further analysis has to be conducted to assess existing supply chain and the surplus quantity available from these areas.

Table 5: Existing enterprises and potential for expansion

Cluster	Total harvestable quantity (kg)	Total employment generated (Person)											
		Bark collection			Bark collection			Bark collection			Bark collection		
		T*	E*	P*	T*	E*	P*	T*	E*	P*	T*	E*	P*
Chitre	1,235	4		4	2		2	5		5	7		7
Kyang	3,650	12	18	4	5	18	2	15	18	8	21	14	7
Lunkhu	1,031	3		3	1		1	4		4	6		6
Salija	2,673	9	30		4	30		11	30		16	11	5
Total	8,588	29	48**	11	12	48**	5	36	48**	17	50	25	25

* T: Total, E: Existing, P: Potential

** Same 48 entrepreneurs are involved in bark collection, fiber making and thread making.

Community mapping carried out during the study shows that there is a potential to produce 8,588 kg of dry Allo bark annually, which represents 4,294 kg of fiber and 3,435 kg of thread. This could generate 25,192 man/days of work {i.e. 29 people could be employed in bark collection during 2 months every year and about 98 people could be employed in processing (12 people for fiber making, 36 people for thread making and 50 people for cloth weaving) during 8 months every year)} (see Table 8 for details). In total, the enterprise opportunity could provide total business of Rs. 8,416,455 (Rs. 3,778,817 as employment, Rs. 801,567 as other input and a gross profit margin of Rs. 3,836,071) for local communities (see Table 7 for details).

It seems that there is a loss in production of Allo thread and minimal margin for fiber making at present market prices if the functions are carried out alone (for details see Table 7). As almost all current entrepreneurs combine functions of harvesting, fiber making and thread making, however, they are able to make fair return on their work. This analysis clearly shows that Allo enterprises cannot be viable unless these three functions are combined together. The cloth weaving enterprise could be organized separately sustainably, but when that operation is also combined with the other three, Allo enterprises become an even more attractive option.

Table 6: Potential of employment and profit in Allo business in Parbat district

VDC Name	Total qty (kg.)	Area (ha.)	Density kg. per ha
Wage-bark harvesting		Rs. 257,647	
Wage-Fiber making	Rs. 429,411		
Wage-Thread making	Rs. 1,288,233		
Wage-Cloth weaving	Rs. 1,803,526		
Total wage			
(employment generated)		Rs. 3,778,817	
(25,192 man-days of work)			
Gross profit margin	Rs. 3,836,071		
Expenses on other input		Rs. 801,567	
Total size of potential business		Rs. 8,416,455	

Table 7: Costs, revenues and margins by functions and distribution of profits

Function	Per kg Allo bark (Rs)			Per unit production (Rs per kg Allo bark, fiber, thread and cloth per m			Total production (Allo bark, fiber, thread and cloth per m)		
	Costs	Revenues	Net profit and margin	Costs	Revenues	Net profit and margin	Costs	Revenues	Net profit and margin
Harvesting of bark (Cost - wage for collection)	30*	40	10 (25%)	30*	40	10 (25%)	257,647*	343,529	85,882 (25%)
Fiber making	90	100	10 (10%)	180	200	20 (10%)	772,940	858,822	85,882 (10%)
Cost of bark	40			80			343,529		
Daily wages	50*			100*			429,411*		
Thread making	250	240	(-10)	625	600	(25)** (-4.17%)	2,147,054	2,061,172	(85,882)** (-4.17%)
Cost of fiber	100			250			858,822		
Daily wages	150*			375*			1,288,233*		
Cloth weaving	543	980	437 (44.59%)	194	350	156 (44.56%)	4,666,265	8,416,454	3,750,189 (44.56%)
Cost of Allo thread	240			86			2,061,172		
Cost of cotton thread	93			33			801,567		
Daily wages	210*			75*			1,803,526*		
Total							7,843,906	11,679,976	3,836,071 (33%)

* Calculated according to the man/days required per unit production, at the current local daily wage rate of @ Rs. 150 per day.

** This predicts a loss for enterprises exclusively devoted to thread making..

3.5.1 Collection of Allo bark

According to Allo bark collectors, this activity can only be carried out for a maximum of two months as Allo is seasonal. One person can harvest about 5 kg of dry bark per day, meaning that the maximum amount that can be collected by an individual per year is about 300 kg. The collection of 8,588 kg of Allo bark would therefore require about 29 people, which would get employment for 2 months and earn a total of about NRs. 343,529 (NRs.12, 000 per person) at the present rate of Rs. 40/kg. A detailed analysis of this estimation is presented in Table 8.

At present about 15 persons in Salija, 10 persons in Lespar of Kyang, 8 persons in Khuiseri of Kyang and 15 persons in Dhairing are involved in the collection of Allo bark. There is thus a remaining opportunity to develop 4 bark collectors in Bhuktangle, 5 in Chitre cluster and 4 in Lunkhu cluster. The collectors listed for Salija, Kyang and Dhairing VDCs are also all involved in fiber making and thread making. So although the number of entrepreneurs is high, the amount of collected bark is less than the capacity per person.

3.5.2 Fiber making

One man/day is required to produce 1.5 kg of fiber from dry bark. This includes soaking in water, cooking, washing, drying, beating and cleaning. If a person involves

him/herself for 8 months in fiber making, s/he can produce 360 kg fiber and earn Rs. 72,000/year at the present rate of Rs 200/ kg. As such, 12 people can be employed and earn about Rs. 858,822 to produce 4,294 kg of fiber.

3.5.2 Thread making

About 2.5 man/days are required to produce 1 kg of thread from fiber. If a person involves him/herself for 8 months in thread making, s/he can produce 96 kg thread and can earn Rs. 57,600/year at the present rate of Rs 600/ kg. As such, 36 persons can be employed and earn about Rs. 20, 61,000 to produce 3,435 kg of thread.

3.5.3 Cloth weaving

About 7 meters of cloth can be weaved from 1 kg of Allo thread and 0.9 kg of cotton thread. One person can weave about 2 meters of such cloth per day. If a person works for 8 months, s/he can weave about 480 meter of cloth, requiring 69 kg of Allo thread. 50

Table 8: Estimated production and economic opportunities

Raw material (bark) collection								
Per person/day collection qty (Dry bark in kg)	Total harvestable quantity (kg)	Required man days for collection	Harvestable time (days)	Per person collection qty (kg)	Total employment generated (Person)	Rate/kg	Total income generated	Income/ person/season (Rs.)
5	8,588	1,718	60	300	29	40	343,529	12,000
Fibre making								
Per person/day production (kg)	Total qty (kg)	Required man days for production	Working days 240	Per entrepreneur production	Total employment generated (Person)	Rate/kg	Total income generated	Income/ person/season (Rs.)
1.5	4,294	2,863		360	12	200	858,822	72,000
Thread Making								
Per person/day production (kg)	Total qty (kg)	Required man days for production	Working days 240	Per entrepreneur production	Total employment generated (Person)	Rate/kg	Total income generated	Income/ person/season (Rs.)
0.4	3,435	8,588		96	36	600	2,061,172	57,600
Cloth weaving (Mixing with 50% cotton thread)								
Per person/day production (m)	Total qty (m)	Required man days for production	Working days	Per entrepreneur production (m)	Total employment generated (Person)	Rate/m	Total income generated	Income/ person/season (Rs.)
2	24,047	12,024	240	480	50	350	8,416,454	168,000
Required Cotton thread								
Weight of bundle available in the market (kg)	Average production per bundle (m)	Per bundle average price (Rs.)	Per kg average production (m)	Per kg average price (Rs.)	Total employment generated (Person)	Total cloth production capacity from Allo	Total cotton required (kg)	Total cost for cotton thread 801,567
4.5	36	1200	8	266.67	36	24047	3,006	

people can thus be employed to weave 3,435 kg of Allo thread, earning about Rs. 84,16,500 from the total production. Given that they have to spend Rs. 20,61,000 on Allo thread and Rs. 8,01,500 on cotton thread, the net income would be of about Rs. 55,53,700 (Rs. 1, 11,000 per person per season).

About 25 women are currently involved in cloth weaving of Allo in Salija and Kyang, meaning that 25 additional entrepreneurs can be trained and employed. As existing cloth weaving entrepreneurs are mostly from Salija and Kyang VDC, there is potentiality to develop about 18 cloth weaving entrepreneur in Bhuktangle. Allo thread from Lunkhu and Chitre cluster could be sold to Salija and Kyang VDCs.

CHAPTER FOUR

References

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ANNEX-1 *Details of field measurement*

SN	VDC Name	Forest (Block) name	Area (ha)	Density	*No. of sample plots measured	Total clumps counted	Total counted	Total in block	
								Clumps	Stems
Salija cluster									
1	Lekhfant	Turture	0.5	High	2	11	88	277	2,213
2	Lekhfant	Dhupikhola	6.0	Medium	4	9	47	1,339	6,994
3	Lekhfant	Papakur	1.4	Low	2	3	7	215	502
4	Salija	Mudekhola	35.0	High	16	153	726	33,482	158,876
5	Salija	Kalidaha	3.5	High	2	18	83	3,167	14,604
6	Salija	Brahyani/Tare	34.8	High	18	88	489	16,989	94,404
7	Salija	Raniban Hampal	49.3	High	22	171	625	38,330	140,094
8	Salija	Patalkharka	16.3	Medium	12	12	69	1,630	9,373
9	Salija	Brahyani/Tare	3.7	Medium	3	17	71	2,099	8,766
10	Salija	Kalidaha	3.6	Medium	2	9	33	1,617	5,930
11	Salija	Dipkhola	4.5	Medium	3	14	43	2,081	6,393
12	Salija	Thotneri	2.3	Low	3	11	42	838	3,200
13	Salija	Udekharka	38.1	Low	25	52	412	7,917	62,728
14	Salija	Tare/Rainidaha	30.7	Low	25	95	439	11,651	53,839
15	Dhairing	Raniban	2.8	High	2	60	643	8,289	88,830
16	Dhairing	Raniban	3.3	Medium	2	65	343	10,754	56,749
17	Dhairing	Dadhuwa	5.4	Low	3	27	154	4,887	27,874
Total			**241**	**-**	**146**	**815**	**4,314**	**145,563**	**741,369**
Kyang cluster									
1	Kyang	Lohose	78.3	High	22	127	361	45,195	128,467
2	Kyang	Lohose	72.9	Medium	22	25	88	8,287	29,170
3	Kyang	Barahthan	110.7	Medium	40	88	249	24,346	68,888
4	Kyang	Lespar	143.7	High	35	84	450	34,483	184,729
5	Kyang	Lespar	23.8	Medium	12	22	120	4,357	23,766
6	Kyang	Lespar	114.7	Low	35	37	195	12,121	63,882
7	Kyang	Kyang	188.0	Low	40	41	246	19,269	115,616
8	Deurali	Ghurunga	17.3	High	11	56	258	8,797	40,529
9	Bhuktangle	Bhuk NF	52.2	High	18	80	273	23,186	79,123
10	Bhuktangle	Bhuk NF	45.7	Medium	16	30	148	8,562	42,240
11	Bhuktangle	Bhuktangle	41.7	Medium	14	60	210	17,871	62,550
12	Bhuktangle	Bhuk NF	105.8	Low	35	42	132	12,702	39,919
13	Bhuktangle	Bhuk pakho	7.5	Low	9	25	87	2,080	7,237
14	Bhuktangle	Bhuktangle	150.2	Low	40	52	275	19,524	103,252
15	Banou	Banau	33.5	Medium	16	24	109	5,028	22,836
Total			**1,186**	**-**	**365**	**793**	**3,201**	**245,808**	**1,012,204**

Chitre cluster									
1	Chitre	Chharchhare Khola	19.4	High	15	46	708	5,939	91,403
2	Chitre	Bathanjor Khola	16.6	Medium	14	56	309	6,629	36,577
3	Chitre	Sopre Khola	10.8	Medium	10	24	175	2,604	18,984
4	Chitre	Rati Khola	6.6	Medium	6	22	129	2,433	14,265
5	Chitre	Lokar Khola	11.1	Low	11	13	148	1,306	14,867
6	Chitre	Sandhi Khola	10.0	Low	9	47	146	5,238	16,271
7	Ramjadeurali	Tarebhir	7.9	High	8	78	1,319	7,654	129,427
8	Ramjadeurali	Duidaile	16.3	Low	15	35	190	3,798	20,620
Total		**99**		**88**	**321**	**3,124**	**35,600**	**342,414**	
Lunkhu cluster									
1	Falamkhani	Kedyani	4.6	Medium	4	8	75	928	8,700
2	Falamkhani	Dandakateri	3.4	Medium	3	8	74	901	8,337
3	Falamkhani	Ghantari	35.1	Low	25	12	46	1,685	6,458
4	Kurgha	Nuwakharka	14.2	Medium	12	11	188	1,305	22,309
5	Kurgha	Chisapani lake	5.0	Low	4	6	28	750	3,500
6	LunkhuDeurali	Chisapani lake	15.0	Low	9	17	41	2,833	6,833
7	Pangrang	Chisapani lake	15.0	Low	9	14	41	2,333	6,833
8	BihadiBarachaur	Dorma	10.8	Medium	8	6	23	810	3,105
9	Bachchha	Patikharka	18.5	Medium	12	7	34	1,080	5,247
10	Bachchha	Bhendabari	30.7	Low	22	8	40	1,115	5,575
11	Bhoksing	Betani	20.8	Medium	12	9	56	1,557	9,688
12	Bhoksing	Kaule/Gurunggaun	27.3	Medium	18	21	277	3,185	42,016
13	Bhoksing	Kaule/Gurunggaun	153.1	Low	15	24	114	24,491	116,333
14	Urampokhara	Lugrin	70.2	Low	35	15	56	3,010	11,237
15	Urampokhara	Chiurikhalta	22.9	Low	12	11	46	2,097	8,771
16	Urampokhara	Gorlyang	29.5	Medium	18	11	49	1,803	8,031
17	Hosrangdi	Gorlyang	16.5	Medium	8	8	34	1,650	7,013
18	Hosrangdi	Gorlyang	28.5	Low	12	5	25	1,188	5,938
Total		**521**	**-**	**238**	**201**	**1,247**	**52,722**	**285,924**	
Grand total		**2,047**	**-**	**837**	**2,130**	**11,886**	**479,693**	**2,381,912**	

ANNEX-2 *Estimated volume of production per VDC*

SN	VDC Name	Potential area (ha)				% of area	Total no. of stem	Total fresh bark (kg)	Total harvestable dry bark (Kg)	Prod. ratio
		High	Medium	Low	Total					
	Salija cluster									
1	Dhairing	3	3	5	11	0.2%	173,454	2,972	625	7.3%
2	Lekhfant	1	6	1	8	0.4%	9,709	166	35	0.4%
3	Salija	73	78	71	222	11.2%	558,206	9,563	2,013	23.4%
	Kyang cluster									
1	Banou	-	34	-	34	1.6%	22,836	391	82	1.0%
2	Bhuktangle	52	87	264	403	19.7%	334,321	5,728	1,205	14.0%
3	Deurali	17	-	-	17	0.8%	40,529	694	146	1.7%
4	Kyang	222	134	376	732	35.7%	614,518	10,528	2,216	25.8%
	Chitre cluster									
1	Chitre	19	34	21	75	3.6%	192,367	3,296	694	8.1%
2	Ramjadeurali	8	17	-	24	1.2%	150,047	2,571	541	6.3%
2	Arther	-	-	-	-	0.0%	-	-	-	0.0%
	Lunkhu cluster									
1	Bachchha	-	19	31	50	2.4%	10,822	185	39	0.5%
2	Bhoksing	-	49	153	201	9.8%	168,037	2,879	606	7.1%
3	BihadiBarachaur	-	11	0	11	0.5%	3,105	53	11	0.1%
4	Falamkhani	-	8	35	43	2.1%	23,496	403	85	1.0%
5	Hosrangdi	-	17	29	46	2.2%	12,950	222	47	0.5%
6	Kurgha	-	14	5	19	0.9%	25,809	442	93	1.1%
7	LunkhuDeurali	-	-	15	15	0.7%	6,833	117	25	0.3%
8	Pangrang	-	-	15	15	0.7%	6,833	117	25	0.3%
9	Urampokhara	-	30	93	123	6.0%	28,038	480	101	1.2%
	TOTAL	395	540	1,113	2,049	100%	2,381,912	40,808	8,588	100%

ANNEX-3 *Hectare clumps and stems per cluster*

S.N.	CLUSTER	VDCS	NO. OF CLUMP PER HECTARE			NO. OF STEM PER HECTARE		
			High area density area	Medium density area	Low density density	High density area	Medium density area	Low density area
1	Salija	Lekhphant, Salija, Dhairing	6,672	5,058	2,005	50,795	24,350	10,287
2	Kyang	Kyang, Bhuktangle, Deurali, Banau	1,771	1,283	736	6,789	5,129	3,203
3	Chitre	Chitre, Ramja, Aarther	1,282	1,007	874	21,208	6,107	4,234
4	Lunkhu	Phalamkhani, Kurgha, Lunkhu, Panran, Bhoksin, Bachchha, Hosrangdi, Barrachaur, Urampokhara	-	1,044	915	-	9,182	3,489
	TOTAL/AVERAGE		2,431	2,098	1,132	19,698	11,192	5,303

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