Sustainability of Local Hand-made Paper (*Nepali Kagat*) Enterprises: A Case Study of Dolakha District

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Abstract

Increasing demand of bark of Lokta (Daphne bholua and D. papyracea) and Argeli (Edgeworthia gardneri) for subsistence as well as commercial use demands more careful assessment of resource base and application of sustainable harvesting techniques to ensure the sustainability of local hand made paper enterprises. A systematic inventory of Lokta and Argeli would determine the resource availability and annual harvestable yields. Based on the case study of central hills of Nepal, this paper demonstrates the need for incorporating ecological integrity, economical viability, and social acceptability to define the sustainable management of Lokta, which can in turn ensure the sustainability of hand made paper enterprises.

Key words: Sustainability, enterprises, Lokta, Argeli, inventory, resource assessment, community forests, local hand made paper, Nepalikagat

INTRODUCTION

Among the different non-wood forest products found in the middle hills and high mountains of Nepal, *Lokta* (*Daphne bholua and D. Papyracea*) and *Argeli* (*Edgeworthia gardneri*) plants are used to produce hand made paper commonly known as 'local paper' or 'Nepali paper' or *'Nepali kagat'*. These plants grow gregariously at an elevation of 1,600 m. to 4,000 m. to the south slopes of Nepal's Himalayan forests (Biggs and Messerschmidt 2003). Barks of these species consist of strong fibre and are used for making 'local paper' with traditional technology. There are several 'hand made paper' enterprises in operation throughout Nepal and sustainability of these enterprises is in question. In other words, the enterprises could not produce 'local paper' of their potential production capacity unless the required amount of *Lokta* and *Argeli* barks are available. In addition, these species are very important for biodiversity point of view as well as in watershed and environmental conservation.

Though local handmade paper enterprises have been contributing significantly to local economy, the areas covered by these species are gradually decreasing and their potential production is declining. The adverse implication of this declined resource base is being reflected in the form of crisis of raw materials for the enterprises. Unfortunately, there has been given little attention for the management, conservation, and extension of these species.

Local hand made paper has contributed significantly to the national economy as well. Total export of local hand made paper in 2001/02 was worth about US$ 3.5 million (Biggs and Messerchmidt 2003). The white bark of *Argeli* is used for making Japanese Yen (Maharjan 1996 cited in Acharya 2003). So, there is an additional demand for the bark of *Argeli* from Japan. It is roughly estimated that only 2% of the bark required by Japan are supplied from Nepal. Hence, there is a high demand and opportunity to grow more *Argeli*.

This paper examines the sustainability of 'local paper' enterprises from the perspective of economic viability, social acceptability and ecological integrity and makes some recommendation on different aspects of harvesting and management of *'Lokta'* and *'Argeli'* with specific examples from Dolakha, a district from central hills of Nepal.

RESEARCH AREA

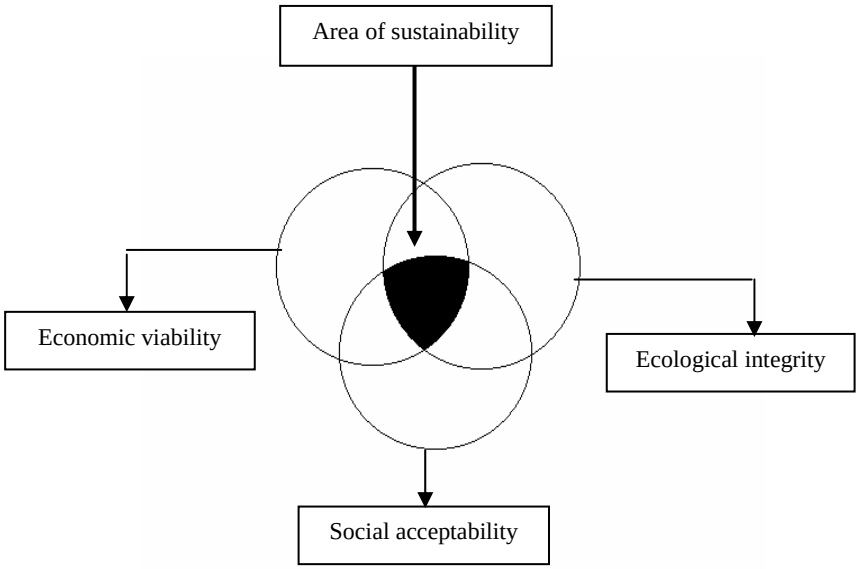
This paper is based on the experiences of Dolakha District, which harbors abundant stock of *'Lokta'* and *'Argeli'*. Dolakha is one of the districts in the central region of Nepal bordering with People's Republic of China in the North, Ramechap district in the South, Solokhumbu and Ramechap districts in the East and Sindhupalchok district in the West. It has all the climatic zones representing from subtropical to alpine as the altitude of the district varies from 700 m. in Tamakoshi river valley to 7,134 m. of Gauri-Shankar Himalayan range. Hence, with the change of altitude and climate, vegetation type is also differentiated from sub-tropical through temperate to alpine vegetation resulting in high species diversity. There are many micro and small enterprises established in the districts with abundant use of *'Lokta'* and *'Argeli'* to produce the 'local paper'. Therefore, these plants are heavily harvested to extract the bark.

SUSTAINABILITY OF 'LOCAL PAPER' ENTERPRISES: CONCEPTUAL FRAMEWORK

The sustainable development of enterprises is a function of various factors and processes. It comprises of continuous flow of raw materials without the loss of ecological functions, economically viable condition, and well-developed and acceptable social institutions (WB 1994). Apparently, the continuous flow of raw materials determines the longevity or the sustainability of the enterprises, which is based on, and the flow is determined by, various ecological and socio-economic conditions and acceptance.

The sustainable development is that which "meets the needs of present generation without compromising the needs of future generation". Integration of economic return of a natural resource based enterprise with the ecological harmony and recognition of local values, customs and systems would ensure the sustainability of the enterprise. In other words, institutions, structures and constituent parts of an enterprise must be integrated within the three pillars of sustainability viz. economic viability, ecological integrity, and social acceptability (see Figure 1).

Figure 1. Three pillars of sustainability



An enterprise should be economically viable to continue the production. The economic perspective of enterprises is based on the premise that human welfare can be optimized with maximization of production and profit. From the economic point of view, the enterprises of 'local paper' should run in 'profit' beyond the 'break even point' to achieve economic efficiency. In other words, economic return can be maximized through the increased working efficiency and quality of the output produced. The enterprises need to produce the standard quality of the goods to satisfy the need of the customers.

The economic viability is attained through natural collection, consumption and domestication of resources. With minimum cost of raw materials (here it is bark of *'Lokta'* and *'Argeli'*), its quality (including maturity, processing mechanism and sanitation), and regular supply at the optimum level ensures the return of the enterprise. It is not only the way of devising structures and functions to maximize production and profit, ensuring equity in distribution of benefit is also an important aspect to consider for the sustainability of an enterprise.

From the ecosystem perspective ecological integrity is crucial for overall stability of the ecological functions at all levels. In an ecological subsystem every species has important roles and functions to maintain certain level of stability within the system. As a part of recognition of these roles and functions, maintaining resilience and dynamic adaptability of natural life support system is important while manipulating natural renewable resources. Therefore, the harvesting of *'Lokta'* and *'Argeli'* has to be determined from their regeneration capacity and the annual harvestable yield per year. The harvestable amount can be estimated through the determination of resource availability, which is attainable from the careful and systematic resource inventory.

Sustainability of an enterprise depends on how it contributes on addressing social issues of the area. If the roles and functions of an enterprise conflict with the existing social norms, behaviors, values and customs and ignores local institutions of that place, it might be rejected from the area leading to its degeneration at least in the long run. On the other hand, building on local institutions and capacity, the enterprise may be accepted and owned by the society which is key for its sustainability.

ISSUES AND DISCUSSION

Limited Monitoring of Harvesting

District Forest Office provides permit for collection of bark of *'Lokta'* and *'Argeli'* to the local hand made paper entrepreneurs after an agreement is made between the two parties. The permit paper indicates amount and season of collection of bark. However, in practice, the entrepreneurs never go to the collection site for monitoring the harvesting, because collection sites are usually in remote areas of high mountains. Similarly, District Forest Office staff also hardly reach the collection site for monitoring. Therefore, harvesting of the bark of *Lokta* and *Argeli* entirely depends on local collectors who use traditional methods. Moreover, local people near the forest collect *Lokta* and *Argeli* barks without the permission and keep on hoarding. The local collectors are not trained for tested and recommended appropriate harvesting techniques, including minimum suitable size of plants to be harvested and the time of harvest.

In current practices, ‘middlemen’ traders approach local collectors and encourage them to collect as much as they can. This influences collectors to have immature harvesting (under size) and untimely collection, which has adverse effect both on the quality of paper and natural regeneration of the species.

Collection of sufficiently mature barks would provide higher quality paper. In addition, techniques of harvesting which assure regeneration of species will be beneficial for getting regular raw materials from the same area. If training is provided to the collectors for harvesting and processing of *Lokta* and

Argeli bark and species regeneration, that would help in sustainable production and supply of the bark.

Increasing Gap between Demand and Supply

The total amount of bark of *Lokta* and *Argeli* collected per year is not homogenous, though. The trend of royalty collected by District Forest Office from collection of bark of *Lokta* and *Argeli* shows that the total amount of *Lokta* and *Argeli* bark collected per year is decreasing (Table 1). It is partly because of the situation of slack in the production of *Lokta* and *Argeli* and partly because of immature collection. However, in the present situation of market, the demand of *Lokta* and *Argeli* bark is increasing, although supply is gradually decreasing. In this situation, the need of raw material cannot be met and its sustainability cannot be assured for the local hand made paper enterprises. Therefore, an immediate attention is needed for increased production and promotion of *Lokta* and *Argeli* in the district, otherwise local hand made paper enterprises would not be able to get the required raw materials in the near future.

In general, over exploitation is the significant factor in declining the resource availability only for these forest products for which there is commercial demand.

Table1. Consumption of *Lokta* and *Argeli* bark and collection of royalty in Dolakha district

Fiscal Year (B.S.)	Quantity of *Lokta* bark (tons)	Royalty collected (NRs.)	Quantity of *Argeli* bark (tons)	Royalty collected (NRs.)	Total Quantity (both species) (tons)	Total Royalty collected (NRs.)
055/56	17.40	52,275	10.58	52,940	27.98	1,05,215
056/57	11.30	33,900	9.33	46,635	20.63	80,535
057/58	20.90	62,700	30.56	1,54,290	51.46	2,16,990
058/59	4.50	16,200	13.29	66,475	17.79	82,675
059/60	3.39	10,170	2.60	13,000	5.99	23,170
Total	57.49	1,75,245	66.36	3,33,340	123.85	5,08,585

Source: District Forest Office, Dolakha

It is difficult to meet the increasing demand of bark only from the national forests and/or community forests. The extension of species to the private land, and if the space is available in the communal land, is desirable. Under the land suitability classification, high altitude areas are not suitable to grow agricultural crops. So, farmers can convert their highlands for cultivation of *Lokta* and *Argeli* because it could fetch better amount of return after few years[1]. In this way, it could improve rural household economy from the appropriate land use practices. The cultivation of these species really does not cost much to the farmers and does not need so much care to grow.

Absence of Inventory

Potentiality of *Lokta* and *Argeli* raising is high in Dolakha district, but their inappropriate exploitation has significantly depleted the resource base. However, actual stock of *Lokta* and *Argeli* within the district and potential annual harvestable yield has not been properly assessed yet. District Forest Office provides the collection permit to the local people on the basis of rapid appraisal of these species every year. Since there is no practice and practical method of assessing growing stock and harvest level of *Lokta* and *Argeli* bark in the district, the amount of collection might have exceeded its potential capacity of the production.

[1] *Lokta* is relatively slow growing shrub species, which attains a height of around 3 to 4 meter in eight years under suitable conditions. It can be regenerated both from seeds and coppice. It will reach at a harvestable size in six years. Comparatively, *Argeli* is fast growing species as compared to *Lokta* and can be easily propagated from cuttings. It could reach to harvestable size in four years.

Appropriate resource inventory is necessary for computation of annual yield and potential production (Poudyal 2000) of *Lokta* and *Argeli*. There are different ways and means, approaches and methods for assessment, management, and monitoring of these resources (Ojha *et al*. 2001). At the moment, because of inadequate information it is not possible to predict the *Lokta* and *Argeli* availability from the different patches of forests.

Contribution to local livelihoods

Dolakha is practicing community forestry program since its emergence from early 1980s and have shown significant success on resource and institutional development. Since that time forest user groups are formed that have been managing community forests. They are now in the process of building alliances in managing and utilizing *Lokta* and *Argeli*, particularly in the process of harvesting, transportation and papermaking.

As part of forming alliances, two or more Village Development Committees are comprised to form "group" that funnels the harvesting of *Lokta* and *Argeli*. The group is formed irrespective of caste and ethnicity rather it involves real collectors, porters and producers. The most important actors of the management and harvesting of *Lokta* and *Argeli* are collectors and producers.

The social welfare and community development activities carried out by Nepalese paper producers are remarkable (Biggs and Messerschmidt 2003). The hand made paper enterprises became aware of making substantial financial and other contribution in support of social inclusion and cohesion, cultural identity and poverty reduction. At the same time, employment opportunities are provided to low income and marginal producers mainly women and disadvantaged groups promoting safe working condition, respecting worker's culture and ethnic identities, health and quality of life and assure sustainable resource base and continued employment.

CONCLUSIONS

Dolakha district has large potentials for production of *Lokta* and *Argeli*. The market of bark of *Lokta* and *Argeli* at local, national, and global level is expanding rapidly, so does the demand of raw materials. The methods being used for harvesting, and season of collection has exerted threat to the very existence of both the species. Although, there is a high scope of propagation of these species in the private land, only limited effort has been made towards domestication and artificial regeneration. Enough support needs to be provided to the private farmers to increase the production of the bark of *Lokta* and *Argeli*. Nevertheless, if the production of the bark of these species could not be regulated to an increased level from the present status, sustainability of local hand made paper enterprises and supply of bark to Japan would be in crisis.

Sustainable harvesting of *Lokta* and *Argeli* is complex issue requiring an analysis of multi-faceted dimensions of ecological, economical, and social aspects. Indigenous knowledge has to be incorporated to prepare the harvesting plan so that it could be easy to implement and understand.

Methods of assessment and harvesting of *Lokta* and *Argeli* are site specific. However, both ecological and economic considerations must be taken into account while making any intervention for assessment, regeneration and harvesting of *Lokta* and *Argeli*. In designing the management and harvesting plan of these species community interests and the capacity of the enterprises must be considered.

An appropriate monitoring mechanism needs to be in place to regulate the production and supply of *Lokta* and *Argeli* bark. For the sake of effective control and regulation of *Lokta* and *Argeli*, the resource could be handed over to the local communities who are recognized as rational actors and good managers of common property resources (Ostrum 1992). Systematic information of abundance

and market demand have to be collected regularly either by participatory action research or by field visits periodically.

Moreover, following action could help ensure sustainability of local handmade paper enterprises:

- Empower local institutions for supervision, follow up and control over the resources.
- Entail community forestry user groups in conservation, protection, and utilization of the resources.
- Promote plantations and management of *Lokta* and *Argeli* in community forests as well as in private lands.
- Local hand made paper entrepreneurs need to be organized to participate in the management, plantations, and promotion of *Lokta* and *Argeli*, as they are the key stakeholders for the utilization of the bark.

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