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Economic Importance & Valuation of Non-Timber Forest Products

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Abstract:

The economic contribution of NTFPs in incomes of forest dependent communities can be categorized firstly as gathering of NTFPs for domestic necessities, for which the gatherers pay no money however money need to be spent if such items were to be bought from the markets and secondly as collection of NTFPs for selling or commercial motive, in order to earn money which can be further used for other variant purposes. The thinkable monetary worth of non-timber forest products in terms of (a) non-cash income or direct consumption and (b) cash incomes i.e. market price as commodities is many a times undervalued or unknown. This literature survey will throw some light on how significantly NTFPs contribute to the incomes of forest dependent families and will address different valuation techniques that are used for valuing the NTFPs. Hence, it will try to answer the following research questions;

- *Why do forest dependent families count on on NTFPs for their livelihoods?*
- *What are the different ways to value the cash income and the non-cash income flows accruing from the harvesting of NTFPs?*

Key words: Economic Importance, Valuation, Non-Timber Forest Products

1. INTRODUCTION / MOTIVATION

"What makes NTFPs important and different from timber as a conservation strategy is the assumption that the forest will

remain standing and more or less biologically intact under sustained NTFP harvesting"(Hirsch & Neumann, 2000).

Cultivating and harvesting NTFPs resources supports accomplishing ecological goals like conserving watersheds, natural diversity and inherent reserves (Tejaswi, 2008). "NTFPs is a possible 'magic bullet' to solve deforestation issues and are important, ubiquitous, and culturally integral part of rural and urban lives and must continue to be considered in forest management decisions" (Clark, 2001; as cited by Tejaswi, 2008).

Case studies by Peters, Gentry, & Mendelsohn (1989) as discussed by Belcher et al. (2013) have suggested that "total NTFP values approached or exceeded timber values from the same forests".

A lot many NTFPs are collected for developing of value-added or processed goods because the financial values of such value-added goods are generally more than the raw products (Ghosal, 2011), hence, it is assumed by that "for forest products to contribute to poverty elimination—that is, to lift people out of poverty—they must generate a surplus beyond current consumption needs. This implies that the products must be traded" (Belcher et al., 2013). The owners of gardens in Karnataka's Uttar Kannada District collect green and dry plants/leaves from damp deciduous regions, which function as the main sources of manure, also huge amount of honey is dig out for selling purposes in either crude form or in value added processed form, wild mangoes for pickle production, cane, bamboo etc. are some of the main marketable NTFPs (Murthy et al., 2005).

2. ROLE OF NTFPS AS SOURCES OF LIVELIHOODS

"For non-timber forest products for which there is a strong commercial demand, cultivation or rearing of the wild species provides a sure way of relieving pressure on natural forest

stocks. At the same time it can provide income and employment in rural areas, thereby improving rural welfare and discouraging migration to urban centres" (Wickens, 1991).

As said by Pattanayak and Sills (2001), tropical forestry can act as the 'natural insurance' to forest inhabitants. In their study Pattanayak and Sills (2011) on the economic contributions of NTFPs as sources of forest derived incomes in Brazilian Amazon they concluded that there is a lot of uncertainty attached to the agricultural incomes in the forest areas and the nearby areas thus, poor locals count on the incomes from harvesting of NTFPs for subsistence. "Thus, not only the poorest interior forest dwellers but also forest fringe people, for whom the harvesting of NTFPs is not the primary occupation, place considerable dependence on the collection of NTFPs" (Pattanaik and Human, 2000; Pattanayak and Sills, 2001).

Tejaswi (2008) advocates the importance of marketable and commercial NTFPs in contributing to livelihoods and food security to forest communities as NTFPs augments the purchasing power due to augmented incomes which further leads to better food access. "Despite the globalization of the World's economy and the rise of industry, NTFPs still remains an important source of income for hundreds of millions for rural livelihoods" (Poffenberger, 2006; as cited by Tejaswi, 2008). This is mainly due to the inferiority of the forest soils that does not support irrigation and hence, restrict the forest dependent entities to choose farming as their only source of survival, thus, the collection of NTFPs have developed as a chief economic activity for them (Ghosal, 2011). In the districts of Purulia, Bankuraand, West Midnapur (West Bengal) as studied by Ghosal (2011) every year 20-50 per cent of family incomes are derived from NTFPs collection and sale. Even better results were seen in the study of Western Ghats of Karnataka by Tejaswi (2008);

Nearly 49 items of the NTFPs found to sustain the people especially landless and marginalized groups during lean season and supplement their income during other seasons. The study showed that NTFPs contributed significantly to the annual income of the households (86%). Besides the economic value of NTFPs, local communities were also enjoying several qualitative benefits from the forest such as medicinal, religious and aesthetic needs.

3. VALUING NTFPS

In economics diverse sets of action courses needed for transferring the property claims of value added goods from the producers to the potential user, accentuating the secured value that is relocated is called the 'value chain' (Schreckenberg et al., 2006). "NTFP value chains includes many different activities from harvesting of the wild resource to cultivation of the resource, various degrees of processing, storage and accumulation of the product at different points in the chain like transport, marketing and sale" (Schreckenberg et al., 2006). The succeeding questions will convey a fine image of NTFP valuation;

1. To what does value refer? 'Value' may account for value in exchange, value in use, option value (new options for use may emerge in the future if resources are maintained now), and perhaps existence value (the 'deep ecology' view that the natural habitat and its sustainability have 'value' independent of the human agent). Forests also provide positive externalities, such as preventing soil erosion and helping conserve biodiversity. Should these externalities be considered in value assessment? (Chopra, 1993 as cited by Hirsch & Neumann, 2000)

2. How is value to be measured? Market price, the cost of an alternative, the cost of labour time in collection, and the loss of productivity in alternative use may all be used to

approximate value. The question of value for NTFPs is particularly complicated because not all non-timber forest resources that have use potential are actually used, and many products that are used are not marketed. Therefore, the relationship between value and price is problematic. (Chopra, 1993 as cited by Hirsch & Neumann, 2000)

Schreckenberg et al. (2006) advocates the achievement of NTFPs value chains can be seen by the trade through indicators like price-quantity products or trade sizes, the contribution towards the income at different levels (local, national, and so on), the regulations governing the associations between various stakeholders and profit margin distribution ratios, and the viability of this chain in other words the ability of NTFP reaping to keep on supplying a regular course of goods to meet both short term and long term demands along with local, societal, commercial and conservational sustainability goals.

Estimation of the economic value for NTFPs that are collected with a marketable objective is possible; however, there are NTFPs in abundance being collected for household needs for which assessment of monetary value becomes impossible but money has to be spent for same products if purchased from a well-defined market (Ghosal, 2011). We will study the household level consumption valuation in detail in section 4.2.

3.1. Valuation of NTFPs as Commercial Commodities

The global marketplace for NTFPs, majorly for manufacturing basic raw materials is growing rapidly with a noteworthy quantity of NTFPs, mainly medicinal plants, being traded from Asia, Latin America and Africa to Europe and North America to be used as business products as well as for direct consumption (Ghosal, 2010). "The rationale for supporting NTFP commercialisation is often to improve the livelihoods of poor people, especially NTFP producers. By creating and capturing more value, it is hoped that poor people will gain from improved

income and employment opportunities" (Belcher and Schreckenberg, 2007).

Commercialisation of NTFPs can provide multiple benefits to community members. Apart from increasing financial income, it has been suggested that NTFP sale can also strengthen community organisation and improve social justice, presumably by increasing the involvement of disadvantaged members of the community in economic activity. Trade in NTFPs can also benefit a broader community of traders and consumers, who should therefore be considered in any comprehensive assessment of the impacts of NTFP commercialisation (Marshall et al., 2003).

"Fuel wood and charcoal is of high value everywhere and enormous volumes are traded annually, especially in Africa. In West African forests […] chew sticks and wrapping leaves are among the most important exports from forest. They pass through many hands and end up in their millions all over West Africa in every market" (Aggrawal et al., 2013). Then how are such commercial values estimated?

The following are the three 'direct market valuation' approaches discussed by Kumar (2012) and Best et al. (2008) and adapted and cited by Agrawal et al. (2013); (a) 'Market price-based approaches': With an assumption that the prices offered by the well-operational markets give precise information about the value of resources provided by the forests (here, NTFPs), we can take the product of market value of the goods and the marginal product of forest resource, in other words we can take the product of price and NTFP harvesting at a given time as an indicator of NTFP value. Thus, market prices can be used as important indicators for the valuation of given NTFPs. (b) 'Cost-based approaches': In this approach one can account for the costs incurred by the households in order to make profits equivalent to the profits from NTFPs commercial activities. (c) 'Production function-based approaches': This approach estimates how much the given amount of NTFPs

harvesting contributes to the value of another processed product which is transacted in prevailing market.

Deriving the NTFP value from the opportunity cost of the labour provided by the NTFP collectors in other economic activities in their nearby areas can also be considered suitable for the valuation process.

The opportunity cost of labour for the tribal is often measured using wage rate in coffee plantations (here, INR.80/day). The cost of time spent for NTFPs collection is imputed from the opportunity wage rate prevailing in the study area. The gross income per household derived from the sale of products, was calculated by considering difference between total quantities collected and sold (Tejaswi, 2008).

In the case of fodder, when well-developed sophisticated markets for fodder are not present, the fodder provided by the forests for cattle is valued through the cost of alternative land i.e. by opportunity cost of allotting alternate land to it (Munshi and Parikh 1990, as cited by Sanyal, Sinha and Sukhdev, 2005). "This is equivalent to loss in revenue from agriculture due to cultivating equivalent amount of fodder obtained from forests on agricultural land" (Sanyal et al., 2005).

Suryaprakash (1999) used the 'Social Accounting Matrix Analysis' to study the relationship of the NTFPs sectors with the other forest economy sectors. In his work the 'social accounting matrix' was explained as;

This matrix combines diverse sets of data on all aspects of an economy such as production, consumption, savings and investments, income generation and distribution, transfers and external trade and income flows. It presents these data as a set of consistent accounts in the form of a square matrix. Each row contains receipts accruing to that account, and the corresponding column shows how that account's total receipts are spent on (or distributed to) other accounts. For any account total receipts and total expenditure must tally. For each production activity the rows contain payments received by the

activities for the commodities that it produces (and sells to the commodity accounts). The corresponding column account breaks up the value of total output into value of intermediaries, payments to factors, profits accruing to the owners of the activity etc.

Now we turn to some of the methods for valuing timber and see how they can be used for NTFPs valuation. The net timber accumulation can be obtained from either of the following methods as stated by Sanyal et al. (2005);

(a) 'Present value method'

$$Y_o = \sum N_t Q_t / (1 + R)^t$$

Where, Y_o= the present value of timber which is equal to the sum of the expected net revenue flows discounted at interest rates R(either nominal or real) for the lifespan t of the resource.

(b) 'User cost method'

The discounted net revenue from the sale of the resource R-X, is:

$$R - X = R/ (1 + r)^{n+1}$$

where R = annual net revenue from the sale of the resource, (anticipated to be constant in its lifespan of n years), X = 'true income' component estimated such that R – X becomes a capital component whose collected investment at an interest rate 'r' during 'n' years will generate a perpetual stream of income 'X'. Here, N_t is the total unit value of the timber less the costs of drawing out and improvement; Q_t is the amount exploited throughout period t.

(c) Net price method

The value of the timber at the opening of the period t, is denoted by V_t which is the product of volume of the resource R_t and the difference of the average market value per unit of the

resource P_t and the per-unit marginal cost of withdrawal and growth including a normal return to the capital C_t

$$V_t = (P_t - C_t)R_t$$

In addition to the above given approaches for valuing the timber, the author also suggested that "the value accounts of NTFPs are derived by multiplying the area accounts with the discounted value per hectare of the products" (Haripriya 2001; as cited by Sanyal et al., 2005). According to them,

If timber and fuel wood are the only products obtained from forests then the asset value of timber production forest equals the discounted sum of total net rent of timber and fuel wood. As the forests are also a source of NTFPs, the asset value should also include the discounted value per hectare of these products. This implies that the asset value depends on the discount rate, age of the forest, etc. In addition when forests are logged for timber and fuel wood, the NTFPs generated from the forests are lost forever. Hence, the area subjected to logging is multiplied by the value of the NTFPs lost. The area gained due to afforestation and regeneration is multiplied with the total revenue generated per hectare by NTFPs in that particular year (as timber and fuel wood are already accounted for in the economic accounts of timber) (Sanyal, et al., 2005).

3.2. Valuation of NTFPs Used For Domestic purposes

While value of NTFPs that are collected for addressing commercial and market aims can be measured, the economic value of NTFPs that are used for domestic needs are not calculated very often but if these goods were obtained from the markets by households then a certain amount of money has to be paid (Ghosal, 2011).

Laird, McLain and Wynburg (2010) have stated that, a small number of countries have clear laws for governing NTFPs harvesting, and the task of value estimation of NTFPs at countrywide level is gigantic. According to them accounting for

all species consumed and marketed would be dreadfully expensive to carry out, and they recommend accounting for only the 'half dozen' utmost vital NTFPs sold in any location as it would be very difficult if one tries to account for the NTFPs that are collected but sold seldom. "IUCN work has shown that, depending on location, at least twice as many species are gathered for home consumption as for sale" (Shepherd 2012; as cited by Agrawal et al., 2013). Some of the reasons for this as given by Ghosal (2011) are; complications faced in bringing together the data for quantity and number of NTFPs ingathered which varies every year and each NTFP is unequally distributed among the families; further it is very challenging for an investigator to officially visit each family in isolated forest settlements to get the break up of the aggregate amount of collected NTFPs for moneymaking, consumption or both.

"In forest assessments such as FAO's five-yearly FRA, it has proven impossible so far to capture the value of the main NTFP sales (apart from fuel wood), let alone the value of NTFP consumption" (Agrawal et al., 2013). "The commercial importance of NTFPs in West Bengal has already been studied by several scholars […]. However, very little work has been done to date, to calculate the monetary value of NTFPs, used for household needs"(Ghosal, 2011).

This would be a very time consuming and uncertain task as these villages are widely scattered. It is also true that forest villagers cannot (or sometimes do not) recall the exact amount of NTFPs that they collect for domestic and/or commercial purposes and the price of collected products vary frequently. As a result, estimate of the value of collected NTFPs are primarily based on assessments of average annual collections, market price and amount of household use (Ghosal, 2011).

Sanyal et al. (2005) took aid of CSO statistics for attaining per hectare NTFPs (namely for rattan, gum, lac and bamboo) values. However they faced the problems due to

unavailability of value records for many nationalised NTFPs. Also in India, the inhabitants of forest communities have the freedom to gather all NTFPs for their own usage and generating their livelihoods; making the chore of finding the precise worth of NTFPs very challenging (Sanyal et al., 2005)

Godoy et al. (2002) sampled 49 out of the total 53 families residing in two villages of Bolivia (approximately 92.45% of the entire population) for mean NTFP consumption value on 5 random days of the year, which were later, multiplied by 365 days. This was done with an assumption that "the mean daily value of consumption from 5 days spread out throughout the year should produce a reasonable, unbiased estimate of the mean value of consumption per year for the household" (Godoy et al., 2002).

The following 'stated preference approaches' supported by Agrawal et al. (2013) can be helpful for valuing such NTFPs consumption at the domestic level;

(a) Contingent valuation method: Using opinion poll to inquire forest inhabitants about how much will they be ready to pay for a certain good (NTFP) if procured from the markets; or what will be the financial loss to the family by not consuming that particular NTFP; (b) Group valuation: this approach is a combination of stated preferences and features of planned processes from political science and is used for value types that may be get omitted in individual based assessments, e.g. value heterogeneity, incommensurability, non-anthropological values, or social integrity.

In the above mentioned case study by Godoy et al. (2002) the values assigned to the NTFPs consumed were the aftermath of group valuation, whereby for those goods whose market prices were unobtainable due to the non-existence of the markets, sets of families were asked to reach an agreement once a month on how much of a good (which had a market value e.g. sugar) they would exchange for an NTFP that they consume commonly having no market value. Also, Godoy et al.

(2002) mentioned that "for goods without a price in Bolivia, we asked villagers the time it took them to find the good, multiplied the amount of time by the prevailing daily wage in the village, and assigned the resulting value to the good", which was also a group based valuation technique.

4. LIMITATIONS OF NTFPS AS SOURCE OF LIVELIHOODS

Plenty of NTFPs are collected for the making of secondary goods. The fiscal values of value-added goods are usually greater in relation to raw or primary goods (Ghosal, 2011). "In India, there are about 15,000 plant species out of which nearly 3000 species (20%) yield NTFPs. However, only about 126 species (0.8%) have been commercially developed" (Murthy et al., 2005). NTFPs like 'fruits, flowers, berries, tubers, resins, honey, leaves, creepers etc.' are provided by the forests which have high nutritive, medical and usage values, however, many of these goods fetch good price in towns and markets but the forest reliant people trade these with the mediators at terribly lower prices (Nayak et al., 2012).

It was witnessed that the stages in the middle of the making of hand sewed Sal plate and the processing of mechanically produced plate, involved value-addition but the largest profit margin of any such value addition existed at the automatic/mechanical process of making Sal plates with the brokers and money-making businesspersons dominating the whole process of value addition (Development and Planning Department, Government of West Bengal, 2007; as cited by Ghosal, 2011). Suryaprakash (1999), in his study on NTFPs states that NTFP activities are still of sustenance nature and major part of it is used for direct household consumption as the exchange value is offset by the use value in most cases thus providing more non cash income benefits than cash income benefits.

The National Forest Policy, in effect from 1988 imposed by the Central Government of India has set the guidelines for use of NTFPs first and foremost for 'improvement of forest peoples' socio-economic condition' and only the left over as raw inputs for various value added goods (Ghosal, 2010). Such an objective has not yet been achieved at present many State Forest Departments are providing the NTFPs to production houses on a large scale complying with the long-term contracts to get high returns from NTFPs (Ghosal, 2010).

In Botswana of the Southern African Plateau (Taylor and Parratt, 1995; as cited by Tejaswi, 2008) the poor village communities are deprived of technical know-how, thus they end up retailing the NTFP in a rather 'raw' form to middle men who then sell it to a value adding manufacturers, implying least profit margin for the harvester and higher profits as one goes up the value chain. Similarly, "the nationalisation of NTFPs in India has not helped forest people or actual collectors to develop their economic portfolios", as the forest residents who are not in association with the Joint Forest Management (JFM) or Large Scale Multipurpose Cooperative Societies (LAMPS) have no right on collection and marketing of nationalised NTFPs (e.g. Sal seeds, Kendu leaves), however members of JFM or LAMPS are employed as wage labourers by Forest Officers for harvesting of such products to be sold in organised markets through formal channels, earning much lower price for the harvested NTFPs than the on-going market prices (Saxena, 2003, as cited by Ghosal, 2010). "For example, the Forest Development Corporation of Orissa (a state of eastern India) pays the actual collectors only INR18/Kg for honey while if the actual collectors sell that honey to the open market directly they will be paid□INR50/kg"(Ghosal, 2010).

5. CONCLUSION

There is a lot of uncertainty attached to the agricultural incomes in the forest areas and the nearby areas thus; poor locals count on the incomes from harvesting of NTFPs for subsistence. The economic contribution of NTFPs in incomes of forest dependent communities can be categorized firstly as gathering of NTFPs for domestic necessities, for which the gatherers pay no money however money need to be spent if such items were to be bought from the markets and secondly as collection of NTFPs for selling or commercial motive, in order to earn money which can be further used for other variant purposes.

While value of NTFPs that are collected for addressing commercial and market aims can be measured through direct market approaches (based on market price, opportunity cost etc.), the economic value of NTFPs that are used for domestic needs are not calculated very often due to problems like unequal distribution of domestic consumption within families in an area, changing patterns of consumption, unbearable high costs involved and time constraints. Contingent valuation and group valuation techniques can be well thought-out by researchers for surveying their sampled households to get an estimate of domestic NTFP use value. Lastly, the dominance of middle men and the processors on the higher levels of value added chain is hampering the potential of the real gatherers or collectors of NTFPs to improve their financial positions. Further, there is a scope for research on the impacts of manufacturing of value-added products by the actual harvesters (forest residents) on their socio-economic status.

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