International Journal of Social Research and Development
www.socialsciencejournal.net
Online ISSN: 2664-8709, Print ISSN: 2664-8695
Received: 06-11-2021; Accepted: 22-11-2021; Published: 07-12-2021
Volume 3, Issue 2, 2021, Page No. 36-39

Shifting cultivation and tribal livelihood: A contextual debate in contemporary economic anthropology

Debendra Kumar Biswal
Assistant Professor, Department of Contemporary and Tribal Customary Law, Central University of Jharkhand Cheri-Manatu, Ranchi, Jharkhand, India

Abstract
Shifting cultivation has been a much debated issue among the anthropologists, environmentalist and policy makers. They have raised the questions and issues mainly on two lines; firstly, on dependence of indigenous population for livelihood and it's productivity vs. deforestation. Secondly, on development projects vs. displacement of the practitioners, i.e. tribal/indigenous population groups who practice this form of agriculture. However, there are very few studies worldwide and particularly in India which have evaluated the economic aspect of this simple form of agricultural practice. Economics of shifting/swidden agriculture argues that it is a sub-optimal method of cultivation, output is low and labour intensity is very high. It is one of the most efficient forms of land use where output is based on very little inputs and shifting cultivators usually optimise their production in relation to ecological conditions and long-term sustainable use of land. However, there is no denying of the fact that per capita land requirement is very high to sustain productivity and to fulfil requirements of food/nutrition. Based on this hypothesis, the present paper has sorted out two assumptions; firstly, it has analysed the factors (primarily land and labour) of production, yield and efficiency to understand the economics of shifting cultivation. Secondly, through the empirical literature, it has tried to analyse the economics of shifting cultivation in different tribal population groups in India.

Keywords: shifting cultivation, tribal economy, sustainable development, cultural ecology anthropology

Introduction

Shifting/swidden cultivation is a 9000 years old primitive form of agricultural practice, which is assumed as the first step in transition from food gathering and hunting to food production in human history. Rowley-Conwy (2004) [27] argued that shifting cultivation dates back to the earliest times i.e. primitive and archaic. It is also found that this form of cultivation is still widely practised in different parts of the world. Thus, this practice is said to have 'survived longest' and is accepted as an early stage of the agricultural evolution. Presently, it is still practiced by many indigenous populations/adivasis communities in the deep tropical and sub-tropical regions of Asia, Africa, South America and Australia. As different from settled cultivation, shifting cultivation involves traditionally established conventionality and rituals in the following sequence; selecting a forest patch and clearing the vegetation, burning of the vegetation (without stumps and roots), sowing of seeds (generally of cereals, vegetables and oil seeds), continuing cultivation for a few years and abandoning the cultivated site and shifting to other forest sites and Returning to the former site, again practice shifting cultivation on it.

Many forms of shifting agricultural systems are practised in different environmental and socio-economic situations in Africa, Central and South America and Southeast Asia (Nye and Greenland, 1960; Spencer, 1966; Allan, 1965 and Ruthenberg, 1976) [23, 29, 1, 28]. This is reflected in innumerable nomenclatures given to this widespread practice in different parts of the world (Spencer, 1966) [29]. Today, shifting agriculture is estimated to support the livelihoods of 300-500 million people, and is practised on about thirty per cent of all arable land world-wide, mostly in the tropical countries (Brady, 1996) [4]. Extent of shifting agriculture is substantial not only in terms of number of population dependent upon it, but also characterised by the fact that these people constitute the poorest of the society. Therefore, this population also forms the major part of the poverty-ridden people in the globe. In India, Shifting cultivation has been a traditional cultivation practice in hilly terrains, especially amongst the tribal communities. About 5.0 million tribal families are practising this system on 4.37 million hectare of land covering I l states (Shifting cultivation in India, ICAR).

1. Shifting cultivation and tribal livelihood: Debate on ecology and economy

Shifting cultivation has been a much debated issue for the environmentalists, policy makers, economists, anthropologists and the field of tribal development. The issues relating to swidden are considered in ecological, economics and institutional terms. While ecological aspects deal with the concepts related to deforestation/ forest degradation, biodiversity loss, soil erosion and nutrient loss and carrying capacity; economic issues are related to factor use, production and efficiency in swidden, Institutional issues in swidden are dealt in terms of property rights, customs, norms, forms of market integration, technology and role of state and external agencies.

Economics of swidden is an interesting as well as an analytically complex issue to handle. It needs to be considered from various points of view; Economics of land use, methods of production

and productivity both in energy and actual terms. The arguments advanced against the economics of swidden always state that it is a sub-optimal method of cultivation, output is low, and labour intensity is very high. The arguments for this form of agriculture come from the standpoint that, it is one of the most efficient forms of land use where output is based on very little inputs. Another point put forth for swidden is that, shifting cultivators usually optimise their production in relation to ecological conditions and long-tenn sustainable use of land. However, there is no denying of the fact that per capita land requirement is very high in the case of swidden system to sustain the production and fulfil the food requirements. Therefore, it is essential to take a note of empirical literature to understand the economics of swidden. In this context, analysis of factor use (primarily, land and labour), Yield and efficiency would be useful to understand the economics of swidden.

The single most prevalent argument about swiddening system is that it is an extensive form of agriculture and therefore land requirement is very high. To produce from one acre of swidden land every year, a household requires at least five acres of land to maintain a short shifting cycle of five years. The other side of the argument is, since swidden involves rotation of fields, forest regeneration IS an integral part of the system. This recycling of land use is a form of conservation practice, which prevents land wastage. Xu *et al* (1999) [30], in their study in Yunan, China during 1965-93 found that the extent of the active swidden fields through the period remained stable at 2 per cent of the total area. Fox *et al* (1999) [10] in their study in north-western Vietnam also found a similar result, where the swidden land cover has increased about 10 per cent of the total land cover during the period 1952 to 1995. They also observed that this complex indigenous land use system thus maximises the stability of food production and the percentage of the landscape dominated by secondary vegetation, Their research suggests that perhaps too much emphasis has been placed on changes on land cover, and insufficient attention is paid to the stability of swidden agriculture as the main land use system in that region (Fox et.al. 1999) [10].

It is also argued that swidden has been a more labour intensive method of production. Cutting of primary forest where the tree growth is substantial requires a very high labour force, and the output is not convincingly higher than from that of a well-grown secondary forest. But, this is a method of cultivation where hardly any capital is used other than on some implements like hoe axe. Therefore, the intensity makes little sense. Generally, It app that a plough system minimises the labour Input due to the technology involved as compared With the traditional slash and burn method. But, studies show that labour requirement is very high for specific activities at one point of time In modern system of agriculture, whereas, In the swidden system, labour use is well spread over the Scilson (Rutenberg, 1976).

The Swiddening involves burning of the vegetation and mixed cropping that are very effective methods of weed control. The labour use for weeding is therefore very low in the case of swidden in comparison to other forms of cultivation. As it is understood, production in swidden system depends on two prominent factor uses namely land and labour. However, the effectiveness of the system relies on the organisation of the production system in pooling the labour as well as maintaining the fallow. Therefore, it always becomes a crucial factor to understand the organisational behaviour of the swiddening communities to optimise their production.

Although researchers have arrived at different estimates to determine self-sufficiency among swidden cultivators, the general conclusion is that they are able to feed themselves adequately. Several findings have estimated that swidden households would require between 1203 to 1935 kilograms of food grains depending on its family size (Freeman, 1955 and Chin, 1989) [11, 5]. Freeman (1955) [11] estimated for requirement of 1203 kilograms of food grain to an average family size of 5.7 members and Chin (1989) [5] estimated for 1935 kilograms of food grains for a household having average size of 9 members to meet its yearly consumption. In relation to average yield per household, these vary from place to place. Dove (1989) [7], in one of his case studies found that the average yield per household is about 4270 kilograms. Chin (1989) [5] found that the average yield per household per year is 2300 kilograms, which is far above the estimated food requirements. Ramakrishna (1992) [25] has also studied the average yield of grains and seeds, leaves and fruits, and tuber and rhizomes under different shifting cycle in the north-eastern part of India. The yield is higher than the estimated requirements of an average household size, even produced in a short cycle of 5 years. But the average yield alone does not reveal the economic efficiency of the shifting system, unless the output-input ratio is very high (both in energy as well as monetary terms) as compared with alternative systems of agriculture.

The Swidden systems have been upheld as models of productive efficiencies where 5 to 50 units of food energy are obtained for each unit of energy expended (Rapport, 1971; Steinhart and Steinhart, 1974) [26]. In fact, the alternative agricultural systems may be efficient in terms of human labour and time, but are highly inefficient from an overall energy equation point of systems require higher energy input for the production of a single unit of food. Ramakrishna (1992) [25], in a comparative study in North-Eastern India, concluded that longer the cultivation cycle higher the energy efficiency. Since, the only energy input is in the form of manual labour of the farmer, a major fraction of which goes for the slash-and-burn operation.

The output-input ratio in swidden is also more favourable when, compared with terrace and valley cultivation (Banerjee, 1995) [2]. A similar study by Dove (1984) [8] in Kalimantan, Indonesia, also shows the efficiency of swidden in terms of net return. A comparison of swidden with modern logging, Dove (cited in Banerjee, 1995) [2] concludes that not only are net returns higher than commercial logging, but swidden also supports more than three times as many people. For a developing economy, larger subsistence support would be a more important criterion for choice of land use. The issues relating to efficiency in swidden systems is not that simple as it appears, specifically in economics, where substantial literature is available on methodology and analysis of efficiency. In this context, computation of simple ratio as a method of Inquiry Into the efficiency of swidden may not be satisfactory for a few reasons. First, ratio of averages does not provide any clue about the efficiency of individual observations. Second, such computations do not provide information on which factors and to what extent contribute to efficiency or Inefficiency. Therefore, it is essential to identify appropriate methodology to understand efficiency in swidden.

2. Tribal livelihood vs. ecological sustainability: Contemporary debates in economic anthropology

Shifting cultivation as an ingenious system of agricultural practice needs to be evaluated as a contributor to livelihood of a specific population group and conceptual understanding of shifting cultivation as a part of land use system. It is also required to study the factors of production, economics of production, energy use efficiency and output efficiency in specific ecological set-ups to know the link of tribal livelihood and shifting cultivation.

Firstly, In India, shifting cultivation has been a traditional cultivation practice in hilly terrains, especially amongst the tribal communities. About 5.0 million tribal families are practising this system on 4.37million hectare of land covering 11 states (Shifting cultivation in India, ICAR). In the eastern state of Odisha, around 5298 sq. kms. of area is under shifting cultivation in the districts of Kalahandi, Kandhamal and other southern and western districts. Orissa is estimated to have the highest amount of land under shifting cultivation among the states of India (FSI, 1999; N. Pattnaik, 1993; GOO, 1995; GOO, 1959). The tribal communities, *viz*. Kondha, Kutia Kondha, Dongaria Kondha, Lanjia Sauras, Paraja, Godaba, Koya, Didayi, Bonda, Juanga and Pauri Bhuyan, Peranga and Erenga Kolha are involved in this practice. Many festivals and other such rituals revolve around the *podu* fields, because the tribals view *podu* cultivation not just as a means of their livelihood, but as a way of life. In the upland and hills where *podu* or shifting cultivation is carried on, the tribals adopt the practice of mixed cropping. They sow various seeds like Ragi, Suan, Kosla, Kangu, Ganghi, Jahna, Jhuranga, Kandul, Maize etc. Alasi (or Niger) at a time in the upland hill areas. So also they grow a dwarf variety Dongar Paddy on high lands. In a study by KCDS, Bhubaneswar (OTELP, 2007) in four districts; Kandhamal, Kalahandi, Koraput and Gajapati it was found that each household takes about 0.68 hac. as the podu of forest land under shifting cultivation which provides food security for 4-5 months (September January). Sowing of seeds begins in the month of May. As the maturity period is different for each crop, harvesting is carried out successively starting from September to December. Generally, after the third year, the tribals abandon this land and shift to new land. On the abandoned land, natural regeneration starts from the available root stocks and seed bank. Bamboo comes up naturally; and kendu (*Diospyros melanoryron*), mahua (*Madhuca indica*) and termanalia (Asan, Arjun, Behera, Harida) along with certain other climbers also regenerate. Generally, this land is not cultivated for the next 3-5 years.

Secondly, it is difficult to attempt a systematic approach to define shifting/swidden cultivation because of the heterogeneous factors involved in this form of cultivation including topography, agro-climate and institutional factors. But, as generally observed, it is a form of agricultural practice, especially in the forest and hilly tracts where plough agriculture is difficult. It involves the clearing and cultivation of patches of forests in rotation. The individual plots are burnt and cultivated for a few years and left fallow for an extended period, to allow the vegetation and soil to rejuvenate and recover the lost nutrients. Cultivators then move on to the next plots, abandoning the earlier area, especially when the production starts declining, normally after one or two years (Gadgil and Guha, 1992). Conkline (1961) define swidden as a continuing agricultural system in which an implemented field is cropped for a shorter period in years than fallowed. Such definitions, if are over simplistic if do not necessarily distinguish between the fallow systems and shifting systems which is clarified by Ruthenberg (1976) [28]. A relatively appropriate criterion is the relationship between crop cultivation and fallowing within the total length of one cycle of land utilisation. Swidden can be modelled as follows. Let't' be the year in the cropping-and-fallow cycle. While, 't=l' is the year of initial clearing and first year of cropping, where tis the final year of cropping; and t'' is the final year of fallow of the crop fallow cycle.

Based on the above, several alternative definitions are possible. These Include;

1. Allan's land use factor L = t''*f* t' (Dvorak, 1992) [9]; Allan defines swidden as the practice when L > 10,
2. Ruthenberg's R value i.e. R = (t'/t') x 100 (Ruthenberg, 1976) [8]. Ruthenberg uses R<33 to distinguish swidden from semi-permanent (fallow) farming. For semi-permanent (fallow) farming he takes 33<R<66 and
3. Boserup's land use intensity i.e. t'ft'' (Dvorak, 1992) [9].

However, such definitions are also not free from ambiguity. First, because these definitions do not consider factors like the cropping pattern, crop mixture, type of vegetation and canopy cover, rainfall, soil quality, method of production and migration systems, etc. Second, the difficulty arises in operationalizing such definitions, particularly while deciding from what angle the land use system should be observed. For example, the 'L' or 'R' value will differ if the land use system is observed from a regional, cluster or household point of view. As the swidden system is spread all over the tropics, the practice vanes across region, community, and climate. The variations can be marked in the cropping pattern, crop mixture, selection of area, dependency on such form of cultivation, and also rotational cycle. Hence, drawing conclusions from the rotational cycle alone without a proper understanding of other aspects may lead to a bias against swidden.

Conclusion

Presently, shifting cultivation is estimated to support the livelihoods of 300-500 million people mostly in the tropical countries. It can be argued not only in terms of number of people involved, but also by the fact that these people constitute the major part of the poverty ridden people in the globe. In India, around 5 million tribal/Adivasi families are sustaining their livelihood through this agriculture. The environmental issues are that shifting cultivation is responsible for large scale deforestation, biodiversity loss and soil erosion. Against which, the anthropologists argue that the factors of production, economics of production, energy use efficiency and output efficiency in specific ecological set-ups is linked to tribal livelihood and sustenance of the practitioners. Another approach in economic anthropology takes A relatively appropriate criterion of relationship between crop cultivation and fallowing within the total length of one cycle of land utilisation to clear the issue of environmental impact vs. livelihood. Finally, it suggests for an alternative livelihhod for the practitioners of shifting cultivation worldwide.

References

1. Allan W.The African Husbandman, London: Oliver and id. Edinberg, 1965.
2. Banerjee AK. "Rehabilitation of Degraded Forests in Asia". world Bank Technical , World Bank, Washington. DC, 1995, 270.
3. Boserup, Ester. The Conditions of Agricultural Growth, Aldine Publisher, Chicago, 1965.
4. Brady NC. "Alternatives to Slash and Burn: A Global Imperative", Agricultural Ecosystems & Environment, 1996.58.
5. Chin S. "Managing Malaysia's Forests for Sustained Production", fliallenoeana,, 1989, 55-56.
6. Conkline HC. "*Population-Land Balance under Systems of 'Tropical Forest Agriculture", Proceedings of the Ninth Pacific Science Congress* (Bangkok, 1956), 1959.
7. Dove MR. "The Transition from Stone to Steel in the Prehistoric Swidden Economy Agricultural Technology of the Kantu" of Kalimantan. in D. Harris and G.C. Hillman (eds.) Foraging and Farming, London, Allen and Unwin, 1989, 667-677.
8. Dove MR. "The Chayanov Slope in a Swidden Economy" P.E. Durrenberger (ed) in Chayanovs Peasants and Economic Anthropology, 1984, 97-132.
9. Dvorak KA. "Resource Management by West African Farmers and the Economics of Shifting Cultivation", American Journal of Agricultural Econornics, 1992, 74(3).
10. Fox J. *et al*. "Shifting Cultivation without Deforestation: Case Study in the Mountains of North-western Vietnam", FWC Working Papers: Environmental Series No. 50, East-West Center. Honolulu, Hawaii, 1999.
11. Freeman JD. Iban Agriculture, Colonial Officer Research Studies No.8, London: Her Majesty's Stationary Office, 1955.
12. (iadgil, M, Guha R. Forestry and Social Conflict in British India: A Study in the Ecological Bases of Agrarian Protest. Unpublished draft paper, 1987.
13. Government of India, Census Data, 1991. www.nic.in
14. Government of Orissa, Forest Enquiry Committee Report, 1959
15. Government of Orissa. Statistical Abstract of Orissa, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 1981, 1986, 1991, 1996.
16. Government of Orissa. Economic Survey of Orissa, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 1986.
17. Government of Orissa, Report on Population Involved in Shifting Cultivation by Adibasi and Harijana Research Cum Training Institute, Bhubaneswar, 1988.
18. Government of Orissa, Department of Soil Conservation, Orissa, Bhubaneswar, 1993.
19. Government of Orissa, District Statistical Hand Book, 1995, Gajapati, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 1997.
20. Government of Orissa, District Statistical Hand Book, 1995, Rayagada, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 1997.
21. Government of Orissa, Economic Survey of Orissa, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 1997.
22. Government of Orissa, Economic Survey of Orissa, Directorate of Economics and Statistics, Orissa, Bhubaneswar, 2020.
23. Nye P, Greenland IJ. The 5011 under Shifting Cultivation. Technical communication no.51. Farnham Royal, England: Commonwealth Agricultural-Bureau,1960.
24. Patnaik. N. Shifting Cultivation in Orissa, ADIBASI,1977:16(4):1-21.
25. Ramakrishnan P. Agriculture and Sustainable Development, UNJÆSC'(), Paris and the Parthenon Publishing Group, 1992, 10
26. Rapport RA. I he Flow of Energy in Agricultural Society" Scientific American, 1971, 225(3).
27. Rowley-Conwy P. How the West was Lost, Current Anthropology, Special Issue Agricultural Origins and Dispersal into Europe (August/October 2004),2004:45(4):S83-S113
28. Ruthenberg H, Farming Systems in the Tropics. Oxford University Press. Second Edition, 1976.
29. Spencer JE. Shifting Cultivation in South-eastern Asia. University of California Publications in Geography. Berkeley and Los Angels: University of California Press, 1996, 19
30. Xu JC *et al*. "Effects of Swidden Cultivation. State Policies and Customary Institutions on Land Cover in a Hani Village.
31. Yunan. China" Mountain Research and Development, 1999, 19(2).