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## A Short Review on Jhum Cultivation

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**ABSTRACT:** Jhum cultivation started from the Neolithic period of about 10,000 years ago. Jhuming is very closely associated with the Socio-Culture and Economic of the jhumias. The loss of forest cover, the degradation of species of flora and fauna, soil erosion and uneconomic way of operation is reviewed. Thus, the intervening fallow period of shifting cultivation has reduced substantially due to inelastic supply of land for permanent cultivation leading to the unsustainable way of land use as it does not get adequate time for natural recovery. The objective of this study is to review the jhum cultivation critically and highlight the viable alternative programmes in terms of short and long run measures.

**KEYWORDS:** Jhum, Terrace, Agriculture, Forest, Permanent, Flora, Fauna, Economic, Socio-Culture.

### I. INTRODUCTION

Shifting cultivation or slash and burn cultivation is popularly known as jhum in North-East India. It is subsistence mode of livelihood in many region of the world right from the Neolithic period. Archeological evidences suggest that by about 7000 B.C a remarkable change took place in the man-environment relationship. Man becomes a food producer from a hunter and food gatherer (Bose, Ghatak and Bora, 1982). It involves clearing of vegetation and then slashing and burning the plant parts including debris. After 2-3 years of cropping, the land loses its fertility and the farmer shift to another piece of forested land for cultivation. The vegetation in the fallow land regenerates during the fallow period, which varies from 3 to 15 years, depending upon the place, population pressure, custom, norms, mythology and religion of a particular region, ethnic group of people, tribe etc. the farmer may return to the same piece of land for farming and the cycle of cropping and fallow continues. The period between slash and returning again to the same plot after completion of intervening fallow period constitute one jhum cycle. CONKLEIN (1957) defined shifting cultivation as, "any continuing agricultural system in which impermanent clearances are cropped for shorter period in years than they are fallowed."

Shifting cultivation is a primitive mode of agricultural practice. Despite of diminishing returns in successive years it is practiced not only as an economic activity but also as a way of life. Arunachal Pradesh being a land of forest and forest dependent people has been region of jhumland since time immemorial. Arunachal Pradesh agricultural census 1990-91 reveals the net area shown in hectare under jhum cultivation as declining from 75.69% in 1970-71 to 44.08% in 1990-91 in the State. According to Singh (1999) an area of about 2705 sq km (3.2% of the state's geographical area) is under jhum cultivation. More than 54000 families are practicing jhum cultivation for their livelihood.

It has been observed that there is a perfect association between the degraded lands and area under jhum cultivation. The areas of degraded river-valley lands of severe erosion are dominated by the practice of jhum cultivation. This method of cultivation is a labour intensive with low productivity as the jhumias used primitive tools and techniques and also constrained by the utilization of indivisibility factors of production in their jhum field. By and large, it is practiced in the hilly terrain with gentle to moderate slope, high rainfall, moderate temperature and fertile soil which favour quick growth of plants. At the same time, low to very low man-land ratio also favors this type of cultivation. Thereby, it is not only a method of cultivation but a way of life in the tribal community of the area in

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question. In fact, the whole socio-economic structure, organization and institution of different ethnic groups of people of the State are woven around jhum. Even their calendar year are focused and regulated by jhum cycle.

In India right from the British administration the government has passed legislation and taken various measures to control jhum cultivation. However, these measures are unable to wean away the heart of the jhumias. Jhum cultivation in the state was regulated by the Balipara. Frontiers Tract Jhum Regulation, 1947 which is closer to Chin Hills Regulation of 1896 that was applied in the case of Mizoram. Since the community ownership of land is common practice in Arunachal Pradesh, the practice of jhum cultivation is also encouraged indirectly by way of a community response of its operation.

## II. REVIEW OF LITERATURE

The topic at hand is much debated subject in the field of different disciplines of the science as well as social science. It has considerably attracted the attention of all the sensitive mind of the modern society. Lots of literatures are available but the literature directly relevant to the problem of Arunachal Pradesh in general and the area under study- 'Siang Basin' in particular is very limited.

If any discussion on agriculture of Arunachal Pradesh is incomplete without a discussion on shifting cultivation, the same is being true in the case of any discussion on literature without the mention of Verrier Elvin's '*A philosophy of NEFA*' (1957). Though the book is far away from the topic at hand but the lucid interpretations on the fundamental problems and social, cultural, religious and psychological aims of NEFA i.e. present day Arunachal Pradesh help a lot to understand the land and the people of the State. P.D Gogoi's '*NEFA Local Polity*' (1969) J.N Chaudhury's '*Arunachal Panoram*' (1973) and many other writers have indirect but basic relevance to the study at hand.

Kanther Terang (1969) in his study on Jhum Cultivation in Karbi Village observed that jhuming is a much discussed and controversial subject. He further state that jhuming is a system of farming is highly insufficient in the sense that output per acre and output per worker-both are extremely low. He agreed that the method has historic significance in the development of agriculture but the practice has become out dated.

In a study on the problems of agricultural development in the Hill areas of Assam, Goswami and Saha (1996) have mentioned 'jhuming' a shifting form of cultivation is predominant against settled farming. The authors are of the view that jhum cultivation is wrongly thought to be the way of life. Practically jhuming is the only feasible way of rising food from rugged slopes.

We regard the prevalence of shifting cultivation in Arunachal Pradesh, Dutta (1989) considered that although alternative measures to jhum cultivation have been in the offing, the prospect of abolition of shifting cultivation is very bleak mainly due to the nature of topography couple with the traditional attachment of the people to the age-old system.

Sachidananda (1988) referring to jhum cultivation among the Wangcho of the Tirap district of Arunachal Pradesh made a concluding remark that shifting cultivation cannot be viewed as an economic activity since all economic relation are set in a social framework. The entire social life of the community may revolve round the practice of swiddening. He further suggested that each case of swiddening has to be studied in its historical, physiographic and socio-political contexts. Among the Wangchos, it is closely integrated with their political and social systems.

Long back in (1942) L.N Bora, a Forest Botanist while addressing the Botanical section of Indian Science Congress said that of all practices initiated by man, the most noxious is practice of shifting cultivation. Another writer in reviewing the Report of Forest Administration in Assam for 1940-41 in Nature 1942 calls shifting cultivation as the most wasteful agricultural method (Gohain, 1994)

Quite in tune in above observation Majumdar (1990) stated that we should not deny the fact that shifting cultivation is becoming more and more destructive of ecological balance and we should not argue for its continuance by saying that it is a way of life and that destroying the way of life will mean destroying the people themselves.

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Majumdar's edited volume '*shifting cultivation in North-East India*' contain 39 scholarly papers on different aspects of jhum in the entire North-East region. The editor has very systematically arranged the papers in three categories. The first part is devoted to the technical aspects of the jhumming and the papers of experts from life scientists, agriculture and forestry experts have been included. All these papers examine the impact of jhum over the environmental situation. Some of the paper in this section suggests ameliorative measures. The second part is exclusively for social scientists who dealt with the problem of shifting cultivation from the human point of view. The third part includes the papers by an assortment of experts including administrators, dealing with the efficacy of shifting control measures.

G.N Das (2001) in his book '*Swidden Cultivation and Development Programme in North-East India*' remarked that it has been imperative on the part of the Government and other concerned agencies to take appropriate measures to regulate and control this practice for a long term welfare of the jhumias, inhabiting the different part of the country.

M.C. Behera & N.C. Roy (1997) edited a volume '*Trends in Agrarians structures in the Hills of North-East India*' is a nice collection of eleven scholarly papers from experts of different fields. Its relevance in context of present work lies in the sense that for papers are directly related to Arunachal Pradesh. The editorial note is of paramount significance in the understanding of area specific problems of jhum cultivation. The another volume edited by Behera (1998) titled, '*Agricultural Modernization in Eastern Himalaya*' is also an important collection, particularly the paper of Asham Borang on '*Jhum Cultivation among the Adis of Arunachal Pradesh and probable strategies of Jhum fallows*' is directly written on the problem of study area at hand. The paper examines various aspects but due to lack of extensive field study the conclusion is sketchy.

Among the other edited volumes of B. Dhar & P.C.Kumar (2004) titled '*Tribes of Arunachal Pradesh*' and B.P Maitham's (2005), '*shifting cultivation in North-East India Policy Issues and Option*' contain a number of relevant papers on the topic at hand.

Other works on the agricultural problems associated with ecological aspects particularly dealing with the study are include S.P. Shukla's (1983), '*Agricultural Potential & Planning in Hill Region in India*' portrays nicely the geographical elements of Siang Basin with some relevant planning measures. The author very picturesquely represented the jhum cycle of the region with important recommendations on alternative measures. Since, the book has been written from geographical point of view, it lacks economic implications in detail.

S.N Jha's (2000&2005) Project Reports on '*Ecological Priorities and Strategies for Agricultural Development: A case study of East Siang District in Arunachal Pradesh*' and '*Customary Laws of Adi Tribal Groups in context of forest and wild life Management: A case study of Siang Basin, Arunachal Pradesh*' respectively deals with the ecological aspects of jhum cultivation and its impact assessment on environment. The problems associated with jhum cultivation have been dealt but it forms only a part of his research work. Naturally, the other aspects did not find proper space in his reports.

From the theoretical point of view the edited volume of S.N Chary & V.Vyasulu (2001) titled, '*Environment Management: An Indian Perspective*' is a precious collection of sixteen scholarly papers. The book comprehends different issues of environment, energy, water and forest and their implications in relation to people, governance, law and international relations. The book provides useful tips on the theoretical aspects of the problems at hand broader perspective.

The North-East ICSSR, Shillong (1976) edited volume, '*Shifting cultivation in North-East India*' contains 23 scholarly papers on the different problems of shifting cultivation. The papers have been divided into three parts. The first part is devoted to the historical and sociological aspects of jhum cultivations. The second part is dealt with the economic implications and its viable alternative occupations of jhumias. The third part is reflected the ecological impacts and technological aspect of the jhum cultivation. In the end suggestions are being made for the implementation of the shifting cultivation control scheme and the strategy to tackle shifting cultivation in North East India. All these papers reveals the multidisciplinary nature of approach to shifting cultivation.

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Shifting cultivation in North East Region (Director, Information and public Relation, N.E/C), observed that the shifting cultivation is mostly practiced by the hill tribes and it is a primitive type of farming system in the region with steady growth of population, the jhum cycle is bound to shrink as low as 5 to 7 years from 30 to 40 years in earlier decades resulting rapid deterioration in the soil productivity. Under the NEC's programmed, eight pilot scheme of soil conservation and jhum control were taken up along with the ICAR recommendation of the 'Model Land Use' as an alternative jhum.

Dealing with shifting cultivation in the eastern Himalayas farmers innovations as for policy (E. Kerhoff and E. Sharma), critically analyzed the shifting cultivation and described it as rational agro forestry, agro forestry with a burn cycle or a form of forest gardening. The flower period are considered as regenerative and integral part of the cycle not as abandoned and unproductive phase. The system of jhum cultivation is thus considered as to be wasteful, inefficient and a leading cause of deforestation rather than an admirable way of maintaining forest while practicing agriculture.

Jhumias view on shifting cultivation in Arunachal Pradesh (State Forest Research Institute, Itanagar) pointed out that Arunachal Pradesh is famous for two biodiversity hotspots of the country and it displayed phenomenal diversity of culture, flora and fauna. Jhuming is very closely associated with the Socio-Culture and economic of the jhumias and its geographical location of the jhum cultivation.

B.Syiem's edited volume '*Agricultural Transition in the Hill Areas of the North Eastern Region*' (2001) contains 21 papers on different aspects of jhum cultivation. The editor has systematically arranged the papers in three categories. The first part is focused on the status of jhum cultivation. Despite of different view the common opinion is that 'jhuming has ceased to be the sole occupation of the jhumias and it is still commonly practiced in the region.' The diseconomies and numerous evil effects of the jhum system on the economy have been taken up. Suggestions are also being made to wean away the jhumias like introduction of alternative occupations such as horticulture, floriculture, forest plantations, livestock and poultry rearing and wage employment. The second part dealt on the 'New Trends in cropping pattern' in which it has been observed by the author that more-cropping pattern is the major cause of low productivity of agriculture in the hill areas of the region. General observation of the authors suggest that for a sustainable development of agriculture by complete abandonment of the jhum system through adoption of multiple cropping pattern along with the introduction of technological improvement in agriculture taking into account the ecological balance in the region. The third part dealt with horticulture and plantation crops which have been suggested as a viable alternative to jhum cultivation in the region in question.

'*Tribal Economy of North Eastern Region*' (T. Mathew, 1980) is an edited volume on various aspects of tribal economic activities. Some of the papers have highlighted in the problem of jhum control and its mode of operations in the region. Suggestions are being outlined to control the jhum cultivation with the introduction and implementation of various schemes by the State government under the North Eastern Council Regional Plan.

The paper 'Land Ownership and its Inheritance among the Adis' (H. Borgohain), examines the land ownership, the division of landed property and its inheritance among the Adis and Galos. It also highlights the jhum cultivation and its traditional inheritance of landed properties among the sons in which lion share goes to the eldest son of the family and prevalence of community ownership of land.

The paper on 'The Traditional Economic life of the Bokars, (K. Kumar), highlighted the Bokar's economic activities by stating that their main occupation is pastoral activity that gradually turn their economy into production-consumption-distribution oriented. The economic organization of Bokars are known as homogeneous community of agriculturists, settle herdsmen, hunters, trappers, fishermen, food gatherers, artisans and traders. The Bokars along with the Ramos, the Pailibs are also pursuing dairying as one of their economic pursuits and comes next to agricultural activity.

An article on 'shifting cultivation: A plea for new strategies' (P.K Bhowmick) seeks to deals with the economic problems of the hill people centering on the shifting cultivation. In the first part of the paper a description of

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the way of life of the jhumias and the ecological system they belong to. The second part deals with the arguments for and against the shifting cultivation and at last suggestion are offered by the author in relation to the problem.

The paper on 'Problem of Pre-agricultural Communities: A case study of the Saoras of Andhra Pradesh' (M.Suryanarayana), observed that in Indian many of pre-agricultural communities are in the process of transformation. The paper aims at describing the traditional pre-agricultural economy of the Saoras, a ST of Andhra Pradesh and the problem of adjustment and reactions of these people towards the process of its transformation. This was carried out based on field work on the Saoras of Bhadravaram and Seethampet areas between 1964 and 1967.

A paper on changes and development in the Socio-economic life of the Adis of West Siang district (Hiren Borgohain), highlighted some of the developmental projects schemes and its development of various sectors of the economy like development of infrastructure, agriculture and industry are responsible for changes in respect of socio-cultural and economic aspects of the Adis i.e. presently called Galong. The paper entitle 'notes on land tenure system of the Nishis, Hill Miris and Tagin of Arunachal Pradesh' (Dwijendra K.Duarah) also highlighted the pattern of landholding, method of agricultural operations and socio-cultural and economic pursuit are more or less similar among the tribes viz. Nishis, Hill Miris and Tagin. An attempt has been made to discuss their land tenure system with a common approach. Both the paper bear hardly any relevance on the subject.

'Shifting Cultivation in North-East India: A way of life' a joint paper by (A.K. Sinha, B.G Benerjee and R.N Vashisnt), critically analyzed the nature, origin and definition of shifting cultivation. The paper also highlights the practice and land affected by shifting cultivation in various North Eastern States. The author observed that jhuming have often found a rationale for the continuance of the practice of jhuming and its relationship with the way of life of the jhumias. Suggestions are being made for the improvement of shifting cultivation with the scope for the conversion it into terrace cultivation. Ramakrishnan (1992) has given a way out of jhum by suggesting other land use options such as valley cultivation, home garden, land use redevelopment, integrated animal husbandry, rural technology, philosophy for rural development.

'An econometric analysis of shifting cultivation in an Indian Tribal Village' (Nirmal Chandra Sahu & Chandra Dhvaj Panda, 2006) analyse the output of shifting cultivation in a tribal village-Gadiabang in Orissa. In this paper an attempt is made to findout the determinants of the podu practice, particularly the income from it. The primary information is processed through a wide array standard statistical tools and econometric methods. They consider forest land and human labour as the two inputs. The cobb-Douglas production function type of analysis shows that the returns to scale parameter are 0.77. The output elasticity of land and labour are 0.42 & 0.55 respectively. Their function exhibits almost constant returns to scale.

'Common property resources and Women: A study in Rural Arunachal Pradesh' (R.J Khataniar & B.D Nayak, 2006) analyse the importance of common property resources on the socio- economic life of the tribal people, giving special focus on women work participation in common property resource-based activities. This paper is based on a field survey on common property resources undertaken in the Kimin Circle of Papum Pare district of Arunachal Pradesh. Attempt has also been made to determine the degree of dependency of rural people in CPR in terms of household energy consumption and explores the women participation in CPR based activities. The paper does not have any direct link with the study area but its relevance lies in understanding the nature of work participation in Arunachal context.

'Jhum cultivation among the Hill Miris of Arunachal Pradesh: A case study on Pega Lomdak Villages' (Rai Lomdak-2006) provides an account of the jhum cultivation of the Hill Miris and its rituals associated with their practices. The author identified the declining trend of labour force in shifting cultivation. This dissertation was submitted for the award for M.A degree in Anthropology.

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'Jhum cultivation and man-nature relationship: A case study of Disi village, West Siang District, Arunachal Pradesh', '(Mobom Riba-2005), observed the process of jhum cultivation and its impact of shifting cultivation on ecology. The author pointed out that shifting cultivation under shifting mode of resource use is eco-friendly as there is a harmonious relationship between the man and nature. This dissertation reflected the study of a Disi Village for the award of M.A degree in Anthropology.

'Jhum cultivation among the Boris of Arunachal Pradesh: A case study of Hiyyo Village' (Jeshek Pari-2004), attempts to throw some light on the system of jhum cultivation. The focus is on the jhum cultivation and its association with the rituals and ceremonies performed by the jhumias. The study has been made on the limited of the West Siang district for the partial fulfillment of M.A degree in Anthropology.

'A study on shifting cultivation of the Ashings of Upper Siang district, Arunachal Pradesh' (Papang Duggong, 2002), highlights the land and the people, culture, flora and fauna. It also dealt with the pattern of land ownership, inheritance of land and cropping pattern of shifting cultivation and its association with festivals and rituals. Further, the author made observation on effect of jhum on the eco system, decreasing of labour force engaged in agriculture and so as the practice in shifting cultivation. Suggestions are offered for alternative occupation of jhumias from jhum to wet cultivation.

The paper 'shifting cultivation and their development' (B.D Sharma), present a historic account of nature and development of jhum cultivation starting from the Neolithic period more than 10,000 years ago. The jhum cultivation has been critically discussed and highlighted the viable alternative programmes in terms of short and long run measures including the terracing cultivation and resettlement of jhumias for improving the system in the economy. The emphasis has been given that the community should be provided psychological security before abandoning or even going slow on their jhum in favour of other occupation like tree culture or cattle rearing programme etc.

'Shifting cultivation and Economic Theory' (Malabika Das Gupta-1997), observes the low level of technical knowledge used by labour and with or without the use of capital in the process of production resulting low level of output per capita in a primitive economy. The body of economic theories can be constructed for understanding how primitive economics works. An economic model called the B-G-I model are developed and identifies as succession of increasingly intensive system of land use in primitive shifting agriculture and correlates them with increasing population density. The model further into account the subsistence requirement of food as the satiating one and the overriding preference for leisure of the primitive cultivator once this food requirement target has been met. The model is partially static in nature and intensification of labour time devoted to shifting agriculture is show in it.

### III. CONCLUSION

The historic account of nature and development of jhum cultivation started from the Neolithic period of more than 10,000 years ago. It also dealt with the pattern of land ownership, inheritance of land and cropping pattern of shifting cultivation and its association with festivals and rituals. Jhuming is very closely associated with the Socio-Culture and economic of the jhumias and its geographical location of the jhum cultivation. The loss of forest cover, the degradation of species of flora and fauna, soil erosion and uneconomic way of operation is well understood. The intervening fallow period of shifting cultivation has reduced from 10 to 2-3 years because of growing demand for food and inelastic supply of land for permanent cultivation of the growing population, and as a result it has become an unsustainable way of land use as the land does not get adequate time for natural recovery. The jhum cultivation has been critically discussed and highlighted the viable alternative programmes in terms of short and long run measures including the terracing cultivation and resettlement of jhumias for improving the system in the economy. Under the NEC's programmed, eight pilot scheme of soil conservation and jhum control were taken up along with the ICAR recommendation of the 'Model Land Use' as an alternative jhum. Suggestions are also being made to wean away the

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jhumias like introduction of alternative occupations such as horticulture, floriculture, forest plantations, livestock and poultry rearing and wage employment.

## REFERENCES

1. Sharma B.D: Shifting Cultivators and their development Sayog Pustak Kutter (Trust), New Delhi, 2003
2. Mathew T.: Tribal Economy of North Eastern Region. Krishan Kumar, Spectrum Publications, Guwahati, Assam, 1980
3. Bhowmick P.K: Action Development Anthropology. Asstt. Secretary ISRRA, 727 Lake Town Calcutta, 1990.
4. Pandit T.N Das : The Pre-Agricultural Communities of India, Das N.k Anthropological Survey of India, Deptt. Of Culture, Calcutta, 1993
5. Fourth conference of the North Eastern Economic Association, Proceedings volume, Agricultural Transition in the Hill Areas of the North Eastern Regions, Secretary Conference Organizing Committee, Shillong 2002.
6. Volume XIX, 2006, Assam Economic Journal, Department of Economics, Dibrugarh University, Assam.
7. Plan and Development of Vol. XXVI No. 1, March 2004, RRID-Center for Research and Industrial Development, Madhya Marg, Chandigarh.
8. Resarun Journal of the Research Department, Vol. VIII No. 2, Autumn and Winter issue, 1982, Directorate of Research, Govt. of Arunachal Pradesh Shillong.
9. Research Journal of the Research Department, Vol. VI No. 2, Autumn and Winter Issue, 1980, Directorate of Research, Govt. of Arunachal Pradesh Shillong.
10. Research Journal of the Research Department, Vol. X No. 1 Spring and Summer Issue, 1984, Directorate of Research, Govt. of Arunachal Pradesh Shillong.
11. Research Journal of the Research Department, Vol. IX, No. 1 Spring and Summer Issue, 1983, Directorate of Research, Govt. of Arunachal Pradesh Shillong.
12. Volume 21 No. 1 Journal of North East India Council for Social Science Research, 1987.
13. Pagang Duggong-2002 : A Study on Shifting Cultivation of the Ashings of Upper Siang District, Arunachal Pradesh. M.Phil. Dissertation, Arunachal Institute of Tribal Studies, Rajiv Gandhi University, Rono Hills, Itanagar.
14. Jesek Pari, 2004: Jhum Cultivation among the Boris of Arunachal Pradesh-A case study of Hiyyo Village. M.A Dissertation Arunachal Institute of Tribal Studies Rajiv Gandhi University, Rono Hills Itanagar.
15. Riba Mobom, 2005: Jhum Cultivation and Man- Nature Relationships (A case study of Desi Village, West Siang District, Arunachal Pradesh) M.A. Dissertation, Arunachal Institute of Tribal Studies, Rajiv Gandhi University Rono Hills, Itanagar.
16. Rai Lomdak, 2006 : Jhum Cultivation among the Hillmiris of Arunachal Pradesh (A Case Study on Pega Lomdak Village under Puchigeko Circle of Upper Subansiri District, Arunachal Pradesh) M.A. Dissertation, Arunachal Institute of Tribal studies, Rajiv Gandhi University Rono Hills, Itanagar.
17. Elvin Verrier: A Philosophy of NEFA, Shillong, 1957.
18. Gogoi P.D : NEFA Local Polity, 1969
19. Chaudhury J.N: Arunachal Panorama, 1973
20. Terang Kanther: Jhum Cultivation in Karbi Village, 1969
21. Goswami & Saha : The Problems of Agricultural Development in Hill Areas of Assam, 1969
22. Dutta: The Prevalence of shifting cultivation in Arunachal Pradesh, 1989
23. Sacchidananda: Jhum among the Wangchos of Tirap district of Arunachal Pradesh.
24. Bora N.L: The Botanical Section of Indian Science Congress, 1942
25. Gohain: The report of Forest Administration in Assam For 1940-41, 1994.
26. Majumdar D.N: Shifting Cultivation in North East India, OMSONS PUBLICATIONS, New Delhi, 1990.
27. Majumdar's: Shifting cultivation in North East India, editing volume 39 scholarly papers.
28. Behera M.C.: Trends in agrarian structure in the hills of & North East India, edited volume common Roy N.C wealth publishers, New Delhi, 1997.
29. Behera M.C: Agricultural modernization in Eastern Himalaya, edited volume, Common Wealth Publishers, New Delhi, 1998.
30. Dhar B: Tribes of Arunachal Pradesh (History & Culture), edited volume, Abijeet Publication Kumar P.C Delhi, 2004.
31. Maithani B.P: Shifting Cultivation In North East India policy Issues & Options.