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Contents

Production Growth and Adoption of Technology in Agriculture: A Case of Central Brahmaputra Valley Zone, Assam

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Abstract

The Central Brahmaputra Valley zone, in the middle of the state Assam is basically rural and agro-based region. Yet agricultural sector of the zone has made very little headway towards modernisation, characterised by small holdings, low crop intensity and meagre irrigation facilities. The paper analyses the growth pattern of agricultural production and yield in the zone and compares with the state average for the period 1971-2010. The zone shows structural rigidity and foodgrains have remained the predominant crop accounting for more than three- fourths of the gross cropped area. Production and yield of major foodgrain and non-foodgrain crops though have witnessed positive growth during the study period, last decade (2001-10), however shows deceleration, culminating in negative growth rate in production and low growth rate of yield for most of the crops. Still, analysis reveals that growth rate of production of most of the foodgrain and non-foodgrain crops in Central Brahmaputra Valley is higher than the state average which could be attributed to adoption of new technology.

Introduction

Agriculture still continues to be a fundamental instrument for sustainable development and poverty reduction in developing countries where three fourth of poor people live in rural areas (Yila and Thapa, 2008). In such economies agricultural sector is the chief contributor to the GNP, and the proportion of work force engaged in agriculture is also asymmetrically high. In India for e.g. agriculture and allied sector is the largest contributor in its economy though it contributes a meagre 13.9 percent to the total GDP (at constant 2004-05 prices) during 2011-12 (Government of India, 2012) and this sector employs 58.2 percent of India's work force (Census of India, 2001). The Braphmaputra valley in the state Assam with the vast tract of fertile land supposed to be immensely helpful for agricultural development, but the agricultural sector of the state could not make the desired progress over the years. Agriculture in Assam is still characterised by small holdings, low crop intensity, low productivity and meagre irrigation facilities. Recurring floods and irregular rainfall often add fuel to the problem. Despite all these impediments, a significant proportion of the population still depends on agriculture in the state. Census report 2011 shows that the rural population in Central Brahmaputra Valley is 88.33 percent of the total population which is higher than Assam (85.92 percent) and national average of 68.84 percent. As per the Agricultural Census 2005-06, the average size of holding in Central Brahmaputra Valley is only 0.99 hectare, which is less than state average holding of 1.1 hectare (Government of Assam 2013). This zone needs a sound agricultural sector to ensure sustained livelihood opportunities particularly for the rural masses. In this context transfer of agriculture technologies in appropriate manner and adoption would induce a desired result. Adoption of technological innovations in agriculture has attracted the attention of development economists and policy makers since it is commonly believed that introduction of new technology increases productivity (Feder *et al*, 1985). Given this background, the note have addressed two broad objectives- (1) analyse of the growth pattern of agricultural production and yield and (2) analysis the status of adoption of agricultural technology in the Central Brahmaputra valley zone of Assam.

Review of literature

In one of the earliest study on technology adoption in agriculture, Rogers (1983) argued that the adoption of an innovation goes through a decision-making process beginning with awareness, then the formation of positive or negative attitudes, and finally deciding whether to adopt the technology. The technology involves both improved cultivation practices (e.g., proper spacing, proper timing of planting and irrigations) and the use of a variable

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input (e.g., fertilisers, pesticides) with which the farmers are not familiar (Feder and Slade, 1984). Some of the improved technologies are the use of tractors (mechanisation), application of fertilisers and insecticides, adoption of improved spacing, treatment of seed before planting, improved storage techniques and a host of others (Oluyole, 2005). Chandra and Singh (1992) made an attempt to identify the level and determinants of the adoption of new technology of tribal farms in Bihar. They found that adoption of technology had not made an appreciable headway and traditional methods of crop cultivation were still predominant on small farms. This indicates that farm size may be an important determinant of technology adoption. Bezbaruah and Roy (2002) stated that in comparison to all India standards, all the agriculture zones of Assam continue to lag behind. Agarwala and Hazarika (2004) found that out of six agro-climatic zones, only two zones namely "Central Brahmaputra valley" and "Lower Brahmaputra valley" can be classified as developed relatively or moderately.

Methodology

The state of Assam has six agro-climatic zones based on rainfall, terrain, soil and crop characteristics[1]. Field study was carried out in the Central Brahmaputra Valley (CBV) zone, which covers an area of 5524 sq. km. The valley occupies 7 percent of geographical area of the state. The two districts in the zone, namely, Nagaon and Morigaon have total population of 3,783,859 (Census of India, 2011) with density of 685 persons per sq.km. This density outstrips the state average of 397 and the national average of 382. This is an indication that the CBV is land constrained and have high percentage of small and marginal farmers. This is an important argument for selection of this study area.

[1] 1. Upper Brahmaputra valley comprised of the districts of Dibrughar, Sibsagar, Jorhat, Golaghat and Tinsukia; 2 Central Brahmaputra valley comprised of the districts of Nagaon and Morigaon in the center of the state; 3. Lower Brahmaputra valley comprised of the districts of Kamrup (Metro and Rural), Nalbari, Barpeta, Dhubri, Kokrajhar, Bongaigaon, Chirang, Baksa and Goalpara; 4.Hill zones comprised of district of Karbi Anglong and North Cachar hills; 5.Barak valley comprised of Cachar, karimganj and Hailakandi districts and 6 North Bank zones comprised of the districts of Lakhimpur, Sonitpur, Dhemaji, Sonitpur and Darrang on the north bank of the river Brahmaputra (Government of Assam, 2013).

Apart from the secondary data made available from publications of Department of Agriculture and Department of Economics and Statistics, Government of Assam, a primary survey was conducted during April-June 2012. The CBV has five Agricultural Sub-Divisions, four in Nagaon district and one in Morigaon district. From each of the five subdivisions, one Agricultural Development Officer's (ADO) circle is selected and then one village is selected from each ADO circle randomly. Finally, farm households are selected from each of the selected village using Yamane (1967) formula to calculate sample sizes[2].

The sample of the study comprises of 378 farm households. Data from households are collected using a pre-tested structured questionnaire. In addition to this discussions were held with extension officers to understand use of improved agricultural technologies for the study area.

The growth rate of agricultural production and yield are calculated using the formula

$$\frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100$$

After reviewing some of the standard studies (Das Gupta and Chowdhury, 2002: Kumar and Popat, 2010) a technology adoption index (TAI) for individual farmers is developed as follows:

$$TAI = \frac{\text{Total adoption score obtained by an individual farmer}}{\text{Maximum score one can obtain}} \quad \ldots\ldots\ldots (1)$$

The agricultural technologies considered for the study have been finalised in consultation with Agricultural Development Officers and officers of Regional Agricultural Research Station located in Nagaon district. These are- improved seed variety, organic manure, urea, Single Superphosphate (SSP) / Diammonium Phosphate (DAP), *Muriate of Potash* (MOP), micro nutrient, pesticides, bio-pesticides, lime, Soil testing practice, use of fungicide (disease management), line sowing, use of weedicide, use of chemical for pests in storage, use of power tiller/tractor, rotavator, roller marker, shallow tube well, electrical water pumpset, weeder, hand

[2] Yamane (1967:886) provides a simplified formula to calculate sample sizes. It assumes 95% confidence level and .5 as assumed level of precision.

sprayer, power sprayer and duster. The respondents' responses are recorded as adopted and not adopted against each item with scores of one and zero. Based on the extent of adoption, farmers are categorized into-

(1) Low adoption (< 0.33)

(2) Medium adoption (0.34-0.66), and

(3) High adoption (>0.66) groups.

Results and discussion

Growth pattern of agricultural production and yield of Central Brahmaputra Valley

In CBV, area allocation among various crops has shown a measure of structural rigidity that reflects the traditional character of agriculture where foodgrains have remained the predominant crop accounting for more than three fourths of the gross cropped area since the early 1970's. In this valley only 18.2 percent area under non-food crops and economy is largely subsistent. Cereal (95.8 percent) is the dominant food crop in this zone and pulses form only a negligible proportion (4.2 percent). The decadal annual average growth rate of production and yield of major crops in CBV and for the state of Assam over the period of 40 years since 1970 are presented in Table 1. The growth rate has been calculated for five periods, 1971-80, 1981-90, 1991-2000, 2001-10 and 1971-2010. Annual average growth rate denotes the percentage change in the value of production and yield of crops per hectare of land over the period of a year.

The estimates of decadal growth rate reveals that the growth of production of total foodgrains in CBV during the entire period 1971-2010 had increased by 3.7 percent whereas the average growth rate of yield had shown an increase by 2.6 percent (Table 3). Growth rate of production of total foodgrains in CBV showed an increasing trend and became more impressive (8.1 percent) during 1991-2000. This was largely on account of high yield growth rate of 2.2 and 6.4 percent respectively. During 1991-2000, the growth rate of production for state as a whole (3.4 percent) was much lower than CBV (8.1 percent), which might be caused by much lower

yield growth rate (2.7 percent) than the CBV (6.3 percent). It was only during 2001-10, the state as a whole attained higher growth rate of production of all foodgrains.

The difference in the growth rate of production and yield of total cereals between CBV Valley and average of Assam was significant during 1991-2000. This could be due to the difference in the adoption of technologies. In subsequent years the CBV showed shrinkage in production of total cereals (-1.7 percent per annum during 2001-10), whereas the average for Assam had increased at the rate of 1.8 percent per annum. It is important to note that the growth rate in production and yield for total rice, total cereals and total foodgrains have shown almost similar trend for the reason that rice is the most important cereal crop occupying more than 90 percent of the cropped area under total foodgrains. Growth rate of production of total pulses and total oilseed in both the CBV and in Assam however had showed declining trend. As reported lack of optimum rainfall during flowering to maturity stage and decrease in area under production are mainly the reasons for low level production of both pulses and oilseeds.

Table 2 presents the annual average growth rate of production of foodgrain crops of CBV and Assam. It is revealed that during 1971-80 performance of CBV was better than the state average in case of almost all the major foodgrain crops and this continued till 1981-90 with the exception of winter rice and pulses. During the period 1991-2000 however, among the foodgrain crops Assam recorded higher production growth rate than CBV only in case of summer rice (marginally), wheat and pulses. The subsequent period, however, witnessed a reverse situation where Assam as a whole recorded higher production growth rate in case of major foodgrain crops except wheat, tur, other cereals and small millets. Analysis of the trend rates of growth separately for the three types of rice suggests that although winter paddy was dominant in terms of area and production, summer paddy had shown marked improvement due to its higher productivity. During 1971-80 wheat showed significant production growth. Succeeding periods however it recorded low growth in the CBV and in the state as a whole till 2000. Surprisingly, during 2001-10, when most of the foodgrain crops showed declining trend, wheat showed a rising trend.

Table 1: Annual Average Growth Rate of Agriculture Production (in %)

Crops	Central Brahmaputra Valley and Assam					
	1971-80	1981-90	1991-2000	2001-10	1971-2010	t value
Total Rice	3.7 (0.2)	4.6 (4.4)	8.7 (3.5)	-1.7 (1.9)	3.8 (2.6)	0.396
Total Cereals	3.9 (0.7)	4.3 (4.1)	8.3 (3.5)	-1.7 (1.8)	3.7 (2.6)	0.387
Total Pulses	5.3 (3.8)	2.2 (2.4)	0.6 (2.8)	-1.3 (0.5)	1.6 (2.3)	0.227
Total Foodgrain	3.9 (0.8)	4.3 (4.1)	8.1 (3.4)	-1.7 (1.8)	3.7 (2.5)	0.376
Total Fibres	-0.7 (1.0)	4.4 (0.96)	4.3 (-0.1)	2.4 (2.5)	2.7 (1.1)	0.3
Total Oilseed	11 (6.6)	11.2 (4.8)	2.5 (0.5)	2.1 (0.5)	6.6 (3.0)	0.585

Source: Directorate of Economics and Statistics, Government of Assam.
Note: 1. Figures in the parentheses represent respective growth rate for the state as a whole.
2. The calculated t values are not significant. Thus there is no significant difference in the growth of production between Central Brahmaputra valley and Assam.

Table 2: Annual Average Growth Rate of Production of Foodgrain (in %)

Crops	Central Brahmaputra Valley and Assam					
	1971-80	1981-90	1991-2000	2001-10	1971-2010	t value
Autumn Rice	4.5(-0.2)	9.4 (5.3)	6.9 (2.3)	-6.4 (-2.6)	3.6 (1.2)	0.466
Winter Rice	3.8 (0.3)	3.3 (4.3)	5.9 (2.2)	-0.4 (2.7)	3.1 (2.4)	0.195
Summer Rice	27.5 (11.3)	20.8 (13.1)	20.9 (21.7)	0.3 (3.1)	17.1 (12.3)	0.627
Wheat	75.2 (53.6)	12.9 (2.4)	0.6 (2.6)	39.7 (8.8)	31.0 (15.9)	0.736
Other Cereals and Small Millets	92.8 (30.5)	3.2 (-2.4)	1.1 (0.96)	2.3 (-4.9)	23.1 (5.4)	0.983
Gram	15.6 (13.4)	6.1 (0.4)	-5.6 (-1.9)	-2.3 (0.67)	3.1 (2.9)	0.036
Tur	21.2 (6.9)	15.6 (2.2)	-1.2 (0.6)	-0.2 (-1.2)	8.5 (2.0)	1.071
Other Rabi Pulses	4.6 (3.6)	1.2 (2.7)	1.7 (3.2)	-0.2 (0.7)	1.8 (2.5)	0.229

Sources: Directorate of Economics and Statistics, Government of Assam.
Note: 1. Figures in the parentheses represent respective growth rate for the state as a whole.
2. The calculated t values are not significant.

Table 3: Annual Average Growth Rate of Yield (in %)

Crops	Central Brahmaputra Valley and Assam					
	1971-80	1981-90	1991-2000	2001-10	1971-2010	*t value*
Autumn Rice	1.9 (-1.3)	4.2 (3.2)	8.8 (3.4)	2.3 (2.7)	4.3 (2.1)	0.514
Winter Rice	1.1 (-1.1)	2.8 (3.1)	4.9 (1.8)	1.4 (2.3)	2.6 (1.6)	0.34
Summer Rice	1.3 (6.2)	7.8 (3.7)	4.5 (4.9)	0.05 (0.14)	3.5 (3.7)	-0.04
Total Rice	1 (-1.1)	2.5 (3.0)	6.3 (2.7)	1.19 (2.1)	2.8 (1.7)	0.43
Total Cereals	1.03 (-0.97)	2.1 (2.8)	6.3 (2.7)	1.03 (2.1)	2.7 (1.7)	0.4
Total Foodgrain	0.9 (-0.95)	2.2 (2.7)	6.3 (2.7)	1.03 (2.01)	2.6 (1.7)	0.42
Total Pulses	1.1 (1.5)	0.9 (1.3)	1.2 (2.3)	1.12 (0.04)	1.06 (1.3)	-0.1
Total Fibres	1.4 (1.99)	7.0 (1.9)	5.5 (1.6)	2.51 (3.3)	4.2 (2.2)	0.41
Total Oilseeds	4.4 (1.8)	9.1 (0.5)	1.7 (0.8)	3.38 (1.7)	4.7 (1.2)	0.72

Sources: Directorate of Economics and Statistics, Government of Assam.
Note: 1. Figures in the parentheses represent respective growth rate for the state as a whole.
2. The calculated t values are not significant.

Table 3 shows the annual average growth rate of yield of major crops in both CBV zone and Assam. The table reveals that the annual average growth rate of yield of most of the major crops for the entire study period (1971-2000) was higher in CBV than Assam as a whole. As the calculated t values are not significant, there is no significant difference in the growth of yield between Central Brahmaputra valley and Assam.

Status of adoption of new technology

New agricultural technologies/practices are usually recommended in a set or package form for the use of the farmers. However, for several reasons, farmers usually adopt only certain components of the package. Moreover, in most cases there is variation in level of use of a given technology or practice by the farmers. Such variation in farmers' level of adoption of technologies could be related to economic, social, personal, institutional and psychological factors.

Table 4 presents crop-wise distribution of respondents according to extent of adoption. The findings reveal that overall most of the respondents (50.5 per cent) are falling under low adoption level and 43.7 percent are in medium adoption level. In case of winter rice the majority (54.9 percent) of respondents belong to low adoption category. In case of summer rice, however, a majority (64.62 percent) of the respondents are in medium adoption category. In case of autumn rice, majority (78.57 percent) of respondents are in low adoption category. Table 5 shows that mean value of technology adoption of all the agricultural subdivisions is higher in case of summer rice compared to other two rice varieties. Summer rice planted during off-monsoon period is mostly of HYV seeds and subsequently needs more operational inputs to ensure yields. In case of rape and mustards 58.1 percent and 51.3 percent of the respondents are in low adoption category respectively. In case of potato, 72.5 percent farmers are in medium adoption category. In case of cauliflower and cabbage, majority of the farmers (78.5 and 84.6 percent respectively) are in the medium category. It has emerged that the average value of technology adoption in case of crops like potato, cauliflower, cabbage is more than the foodgrain crops (Table 5).

Mean difference test was conducted using ANOVA to find subdivision wise difference in technology adoption and it showed that in case of total crop there is significant mean difference in technology adoption among the agricultural sub-divisions. The ANOVA test result for subdivision wise difference in technology adoption is represented in Table-5.

Table 4: Crop-wise Distribution of Respondents to the Extent of Technology Adoption

Crops →	Category of technology Adopter →	Number of Respondents →					
		Nagaon sub division	Kaliabor sub division	Raha sub division	Hojai sub division	Morigaon sub division	Total respondents
Winter rice	Low adopter	41	33	51	35	32	192 (54.9)
	Medium adopter	38	37	26	38	15	154 (44)
	High adopter	3	1	0	0	0	4 (1.1)
Summer rice	Low adopter	25	22	10	0	29	86 (31.05)
	Medium adopter	49	46	49	4	31	179 (64.62)
	High adopter	8	3	0	0	1	12 (4.33)
Autumn rice	Low adopter	NA	4	1	NA	6	11 (78.57)
	Medium adopter	NA	0	1	NA	2	3 (21.43)
	High adopter	NA	0	0	NA	0	0 (0)
Rape and mustard	Low adopter	13	14	8	NA	1	36 (58.06)
	Medium adopter	7	12	4	NA	2	25 (40.32)
	High adopter	1	0	0	NA	0	1 (1.61)
Jute	Low adopter	41	31	NA	NA	26	98 (51.31)
	Medium adopter	41	40	NA	NA	12	93 (48.69)
	High adopter	0	0	NA	NA	0	0 (0)

Table continue to next page

Crops ↓	Category of technology Adopter ↓	← Number of Respondents →					
		Nagaon sub division	Kaliabor sub division	Raha sub division	Hojai sub division	Morigaon sub division	Total respondents
Potato	Low adopter	13	14	NA	0	0	27 (20.61)
	Medium adopter	51	42	NA	1	1	95 (72.52)
	High adopter	6	3	NA	0	0	9 (6.87)
Cauliflower	Low adopter	0	0	NA	18	NA	18 (20.22)
	Medium adopter	5	6	NA	59	NA	70 (78.65)
	High adopter	0	1	NA	0	NA	1 (1.12)
Cabbage	Low adopter	1	0	NA	1	NA	2 (15.38)
	Medium adopter	4	4	NA	3	NA	11 (84.62)
	High adopter	0	0	NA	0	NA	0 (0)
Total	Low adopter	36	29	49	32	45	191 (50.53)
	Medium adopter	44	41	28	46	25	184 (48.68)
	High adopter	2	1	0	0	0	3 (0.79)

Source: *Field Survey*

Note: *NA stands for not available. These crops are not produced by the respondents of belonging subdivisions. Figures in the parentheses represent percentages of total of respective category.*

Table 5: Variation in Technology Adoption across Sub-Divisions

Crops	Average Technology Adoption Index Score (TAI) #					F-Stat	Total respondents
	Nagaon sub division	Kaliabor sub division	Raha sub division	Hojai sub division	Morigaon sub division		
Winter rice	0.34	0.32	0.26	0.35	0.27	6.07*	350 (92.6%)
Summer rice	0.43	0.41	0.42	0.46	0.34	4.18*	277 (73.3%)
Autumn rice	NA	0.23	0.3	NA	o.25	0.4	14 (3.7%)
Rape and mustard	0.33	0.30	0.34	NA	0.35	0.5	62 (16.4%)
Jute	0.33	0.35	NA	NA	0.28	7.31*	191 (50.5%)
Potato	0.45	0.45	NA	0.61	0.39	0.5	131 (34.7%)
Cauliflower	0.53	0.58	NA	0.41	NA	13.43*	89 (23.5%)
Cabbage	0.51	0.59	NA	0.42	NA	1.49	13 (3.4%)
Total	0.38	0.38	0.32	0.38	0.29	9.6*	378

Source: *Field Survey*

*Note: (i)*significance level at 1%,(ii) # value of TAI lies between 0 and 1,see section 3 for details, and (iii) NA stands for not available. These crops are not produced by the respondents of belonging subdivisions.*

The results as depicted in Table 5 show that, there is a significant difference in technology adoption in case of winter rice, summer rice, jute and cauliflower individually. For total crop also the F value is highly significant representing a significant difference in technology adoption among the agricultural subdivisions. The mean value of technology adoption for winter rice, summer rice and potato is the highest for Hojai subdivision, whereas for jute, cauliflower and cabbage it is highest in Kaliabor subdivision. Morigaon subdivision has witnessed the highest mean technology adoption index in case of autumn rice and rape and mustard produced by a few sample farm households.

Conclusion

The note has assessed the growth rate of production of foodgrains during 1971-2010 and finds that the rate was higher for Central Brahmaputra Valley than the average of the Assam till the year 2000; the difference was more prominent during 1991-2000. The decade 2001-10, the state as a whole however attained higher growth rate of production of total foodgrains. Interestingly, summer paddy had shown marked improvement in the growth rate of production and yield compared to other two paddy varieties, where technology adoption and rise in acreages under cultivation play significant role. However, the growth rate of production of total pulses and total oilseed in Central Brahmaputra Valley and the state as a whole showed declining trend consistently rainfall inadequacy (or lack of irrigation during the *Rabi* period) as well as shrinkage in area under production. The status of technology adoption overall in the zone is not satisfactory, the farmers showing low and medium level of adoption of technologies and there is significant difference in the extent of technology adoption among the five subdivisions of central Brahmaputra valley zone of Assam. It has been observed that winter rice still covers larger share of land area under cultivation but yield showing low growth rate. There is the need of adopting policy for promotion and dissemination of agricultural technologies for winter paddy (*Kharif*) as well as for pulses and oilseed crops. It has also emerged that development of irrigation facility and other provisioning such as credit and orientation would facilitate faster spread of agricultural technology.

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Journal

The journal Social Change and Development intends to provide an academic platform to scholars belonging to the northeastern region of India as well as outside to project issues focused particularly on the region, express their views and analyse the issues putting them in proper perspective, both historically and as guidelines for the future. However, issues cutting across the region's border are also welcome.

The unique diversity of the region in terms of ethnicity, culture, language and social institutions makes the region a challenging area of study for the researchers. Although, there has been a prolific growth of literature on the region, it is still lacking discussions with academic rigour. It is therefore, strongly felt that the social scientists would take up issues for academic debate and the journal acts as a platform for the exercise. This is expected to create a better understanding amongst the people of the region and the rest of the country. The geographical seclusion of the region from the rest of the country is sought to be broken through vibrant academic interactions.

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Note for Contributors

1. Manuscript should be submitted in duplicate, typed in doubled space on one side of the A4 paper only with ample margins on all four sizes: Manuscripts should be typed in MS Word, using Times New Roman Font 12 point font size and text properly justified in alignment. The paper should carry an abstract with maximum 200 words.
2. Papers should be submitted both in softcopy preferably through mail as well as in hardcopy at the address given below.
3. Contributors must provide their affiliations and complete mail address. Papers with incomplete address will not be considered for publication.
4. All paper's must carry full and correct references. Reference should be embedded in the anthropological style e.g. (Sen, 2001). Citation should appear alphabetically. Multiple references of the same data by the same authors should be aptly identified e.g. (Nayar, 1991 a; Nayar, 1991 b). Style of reference should be as follows :

Book

Sen, A K (1999), Choice, Welfare and Measurement, Oxford University Press, New Delhi

Journal Article

Minter, B (2008), "The Food Retail Revolution in Poor Countries: Is it Coming or Is It Over", Economic Development and Cultural Change, Vol.56, No. 4, p. 767.

Article from Edited Volume

Sarkar, N (1997), "A Note on Customary Laws of the Tagins" in Aspects of Customary Laws of Arunachal, P C Dutta and D K Duarah (eds.), Directorate of Research, Government of Arunachal Pradesh

5. Use only British spelling in the Text.
6. We follow Footnotes. This should be clearly and properly inserted. The footnotes should be serially numbered.
7. All Tables and Figures need to be numbered serially with appropriate title. The place of insertion in the text should be clearly marked.
8. All Editorial correspondence should be sent to The Editor, Social change and Development, OKD Institute of Social Change and development, VIP Road, Upper Hengrabari, Guwahati 781 036. email: dkdscd@yahoo.co.in