



# Tactics adopted by the displaced tribal farmwomen of hill district of Assam to combat with changing aspects of geo and socio-ecological systems

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### ABSTRACT

A study was conducted among the displaced tribal farm women in two hill districts of Assam, namely Dima Hasao and Karbi Anglong district in such areas which were generally regarded as the remote, difficult and disturbed. From each district 100 respondents were selected making a total sample size of 200, farm women were selected and information about the effort to combat geo and socio-ecological was collected with the help of a pre-tested, reliable and valid interview schedule consisting of a specially designed check list. The study revealed that majority 66.00 per cent of the respondents had medium efforts 22.27 out of the total obtainable score 54.00 to combat with geo and socio-ecological change. Different efforts made by the respondents to combat geo socio-ecological change were “The houses have been made in accordance with the social needs and demands”, “Now a days livestock remain under observation even when they graze freely”, “Increased the number of livestock reared so that income is increased”, “The house making is in accordance with the geo-ecological location”, “Made self-help group and ventured to other income generating group activities” and “Increased the number of livestock reared so that income is increased”.

## 1. Introduction

Livestock play a key role in the lives of poor, rural people in developing countries (Delgado *et al.*, 1999; FAO, 2002). Livestock provide a safety net when crops fail but there are disease risks, and capital or credit is required to start up enterprises (Dolberg, 2001). Livestock can play a greater role in adaptation to climate change, geodynamics and variability. In fact livestock husbandry is regarded as a form of adaptation compared to crop agriculture because livestock are mobile and so can be moved to areas with available feed and water. Livestock producers have always used their knowledge of the environment and experiences to adapt to climatic changes but these traditional systems are proving insufficient to meet current challenges.

Further, the expanding human population, urbanization, environmental degradation and increased consumption of

animal source foods have rendered some of those coping mechanisms ineffective (Sidahmed, 2008). In addition, changes brought about by global warming are likely to happen at such a speed that they will exceed the capacity of spontaneous adaptation of both human communities and animal species. Adaptation strategies address not only the tolerance of livestock to heat, but also their ability to survive, grow and reproduce in conditions of poor nutrition, parasites and diseases (Hoffmann, 2008). Such measures could include: (i) identifying and strengthening local breeds that have adapted to local climatic stress and feed sources and (ii) improving local genetics through cross-breeding with heat and disease tolerant breeds. If climate change is faster than natural selection, the risk to the survival and adaptation of the new breed is greater. Changes that could be instituted to help livestock farmers adapt better include:

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Diversification of livestock and livelihoods. Integrating livestock farming with agriculture. Identifying and improving breeds that are better adapted to the environment and disease. Introducing mixed livestock farming systems, such as stall-fed systems and pasture grazing. Adopting farming practices that limit greenhouse gas emissions *e.g.* better management of manure, replacing fertilizers with biological/nitrogen fixing legumes, soil conservation tillage, *etc.* are of tremendous value today. What underlines in between is the fact that the top soil will continue to be under change every now and then directing the farmers especially women in livestock sector to cope up faster with such changes. It is under such concepts that the study was undertaken to know the strategies adopted by tribal farmwomen to combat with dynamics of geo and socio-ecological systems.

## 2. Methodology

The study was carried out in both the two hill districts of Assam namely, the Karbi Anglong and the Dima Hasao where efforts for migration of occupation by the farm families especially the displaced tribal farm women is a common phenomenon because of dominating slash and burn method of agriculture forcing them also to migrate from one place to another. In addition many other factors also contribute for their displacement. The study revolved around the women engaged in livestock farming, especially in the generally categorized remote, difficult and disturbed areas, where even otherwise concentration of displaced tribal women farmers in action is traditionally more. This was again an outcome of a phenomenon where the migrated farmers used to go back to interior places in search of more amount of fertile land. Data were collected by personally interviewing the selected respondents with a pre-tested, reliable and valid interview schedule during the period from January 2016 to July 2016 after obtaining prior permission from them. Data such collected from about 200 animal husbandry farm women from proportionate different ethnic (tribal) groups were authenticated with the help of the peer groups and statutory village administrators, analyzed to find

out the results, conclusions and recommendations. For obtaining response a check list was especially prepared for this purpose and consists of eighteen statements that related to the strategies taken to combat geo and socio-ecological changes by the respondent and against each statement there are three columns corresponding to three degrees namely, “very much”, “much” and “somewhat” with their corresponding values of 3, 2 and 1 respectively. The respondents were asked to respond by placing a check mark (✓) against the statements in the appropriate place. After obtaining the response the frequencies were worked out and they were used for the purpose of the study. Therefore, the minimum and maximum obtainable scores were 18 and 54 respectively.

## 3. Results and Discussion

A perusal of the data presented in Table 1 indicated that the average efforts to combat with geo socio-ecological change were 19.19, 25.36 and 22.27 in Dima Hasao, Karbi Anglong and pooled sample with their standard deviations as 2.31, 3.96 and 4.47 and ranges as 15-25, 21-36 and 15-36 respectively out of the total obtainable score of 54. It could be said that the observed mean was lower to the natural mean which meant that the displaced farm women were lowly picking up the geo socio-ecological change mitigation efforts. Based on mean and standard deviation, the respondents were categorized into low, medium and high groups. Their distribution were 13.00 per cent, 69.00 per cent and 18.00 per cent in Dima Hasao, 19.00 per cent, 63.00 per cent and 18.00 per cent in Karbi Anglong and 13.50 per cent, 66.00 per cent and 20.50 per cent in pooled sample respectively. High score of standard deviation in Dima Hasao district was an indication that there was great variation among the displaced women relating to the measures they adopted to combat the geo socio-ecological changes. Detrimental effects of climate change can be felt in the short-term through natural hazards, such as landslides, floods and hurricanes; and in the long-term, through more gradual degradation of the environment.

**Table 1.** Profile of The Respondents on the Basis of Their Efforts to Combat with Geo Socio-Ecological System

Variables	District	Mean	SD	Range	Low	Medium	High	't' value
Efforts to combat with geo socio-ecological change	DH	19.19	2.31	15-25	13 (13.00)	69(69.00)	18 (18.00)	13.44**
	KA	25.36	3.96	21-36	19 (19.00)	63(63.00)	18 (18.00)	
	Pooled	22.27	4.47	15-36	27 (13.50)	132 (66.00)	41 (20.50)	

\*\* , Significant at 0.01 level of probability

Figures in the parenthesis indicate percentage

DH=Dima Hasao, KA= Karbi Anglong

The adverse effects of these events are already felt in many areas, including in relation to, inter alia, agriculture and food security; biodiversity and ecosystems; water resources; human health; human settlements and migration patterns; and energy, transport and industry. Similar kind of slow but sure realizations was gradually looked like picking up in the areas of the study also as observed by (Chan, 2007). From the findings it was clear that majority of the respondents had medium efforts to combat with geo socio-ecological change. It might have an indication that the displaced women of hill districts had not done much but enough to combat with geo socio-ecological change. In order to know more details about the efforts to combat with geo and socio-ecological change, the results were put in Table 2. The Table showed that as many as eighteen statements forwarded to the respondents for their agreement in either of the degrees ranging from very much, much and somewhat. It could be seen from the Table 2 that the highest number of 98.00 per cent followed by 81.00 per cent, 73.00 per cent, 64.00 per cent, 46.00 per cent, 43.00 per cent, 34.00 per cent, 31.00 per cent, 21.00 per cent, 12.00 per cent, 12.00 per cent, 1.00 per cent, 1.00 per cent, 0.00 per cent, 0.00 per cent, 0.00 per cent, 0.00 per cent and 0.00 per cent of the respondents attached their “much degree” of association with “The houses have been made in accordance with the social needs and demands”, “Now a days livestock remain under observation even when they graze freely”, “Increased the number of livestock reared so that income is increased”, “The house making is in accordance with the geo-ecological location”, “Made self-help group and ventured to other income generating group activities”, “Increased the number of livestock reared so that income is increased”, “Many innovative steps in day to day life has improved lifestyle and comfort like electricity, water supply and use of LPG”, “Houses are located in such a way that the animals now get and expanded grazing land”, “The livestock by-products are brought to better use now”, “To increase income preferred improved quality livestock”, “Keeping relation with those who were our earlier associates in past locations”, “Developed a marketing network so as to reap better price from the livestock produce and products”, “New settlement has provisioned the roadside processing and selling of livestock products”, “Took up business and also keeping livestock”, “Picked up part time job and concentrating on livestock”, “Started spending time in handloom and handicrafts to increase income”, “Producing the livestock products as per the demand of the nearby people” and “New settlements are to meet the livestock product requirements of industrial areas” respectively in Dima Hasao whereas in Karbi Anglong the correspondent figures were 11.00 per cent, 29.00 per cent, 65.00 per cent, 42.00 per cent, 32.00 per cent, 5.00 per cent, 6.00 per cent, 17.00 per cent, 62.00 per cent, 28.00 per cent, 0.00 per cent, 0.00 per cent, 1.00 per

cent, 49.00 per cent, 0.00 per cent, 4.00 per cent, 1.00 per cent and 0.00 per cent. And in pooled sample 54.50 per cent, 55.00 per cent, 69.00 per cent, 53.00 per cent, 39.00 per cent, 24.00 per cent, 20.00 per cent, 24.00 per cent, 41.50 per cent, 20.00 per cent, 6.00 per cent, 0.50 per cent, 5.00 per cent, 24.50 per cent, 0.00 per cent, 2.00 per cent, 0.50 per cent and 0.00 per cent. It gives a clear indication that they had combat with geo socio-ecological change for smooth running of their livelihood and to live comfortably. The findings by and large exposed the fact that the displaced farm women were largely under the natural conditions and tried to get acquainted with the modern amenities of life and living so as to make their living comfortable and free from hazards. Further they also gradually tried to become industrious with their livestock. Some economic orientations looked like came to their horizon of vision of livestock keeping. A recent World Bank report warned that the world’s temperature is likely to increase by more than 3°C when compared with the preindustrial climate. Even with the full implementation of the current mitigation commitments and pledges, there is roughly a 20 per cent likelihood of exceeding 4°C by 2100. If they are not met, a warming of 4°C could occur as early as the 2060s. This they say will have far reaching effects in the Least Developed Countries, which are the most vulnerable to the likely negative impacts of extreme climate conditions. In particular, rural farmers - whose livelihoods depend on rain-fed agriculture - are likely to bear the brunt of adverse impacts. The extent to which these impacts are felt will depend on the extent of adaptation in response to climate change. Adaptation is widely recognized as a vital component of any policy response to climate change. Without adaptation, climate change would be detrimental to many sectors, including agriculture. As climate change impacts men and women differently, women's roles in farming should be recognized when introducing climate-smart practices to communities, the views as projected by (Alam, 2015) are correct to the situations in the area of study also. With an endorsement to the findings, (Assan and Rosenfeld, 2012) stated that as climate change-induced migration becomes more common, it will be necessary for the international community to come to a consensus about the rights of environmental migrants, and determine best practices for providing protection to those fleeing. After comparison of the mean scores of respondents’ efforts to combat with geo ecological change, it was found that the mean scores of the Karbi Anglong were significantly higher than that of the Dima Hasao ( $t=13.44^{**}$ ,  $P<0.01$ ). The simple reason might be that the displaced women of Karbi Anglong district were better off than such women of Dima Hasao district so they could make more effort to combat with geo ecological change. According to (Garbero and Muttarak,

**Table 2.** Frequency Distribution of Respondents on the Basis of Their Efforts to Combat with the Geo and Socio-Ecological Change

Sl. No	Efforts to combat with the geo and socio-ecological change	District	Degrees of information		
			Very much	Much	Somewhat
1.	Took up business and also keeping livestock	DH	1(1.00)	0(0.00)	4(4.00)
		KA	2(2.00)	49(49.00)	27(27.00)
		Pooled	3(1.50)	49(24.50)	31(15.50)
2.	Picked up part time job and concentrating on livestock	DH	0(0.00)	0(0.00)	0(0.00)
		KA	0(0.00)	0(0.00)	1(1.00)
		Pooled	0(0.00)	0(0.00)	1(0.50)
3.	To increase income preferred improved quality livestock	DH	50(50.00)	12(12.00)	4(4.00)
		KA	62(62.00)	28(28.00)	4(4.00)
		Pooled	112(56.00)	40(20.00)	8(4.00)
4.	Increased the number of livestock reared so that income is increased	DH	11(11.00)	73(73.00)	16(16.00)
		KA	9(9.00)	65(65.00)	17(17.00)
		Pooled	19(9.50)	138(69.00)	33(16.50)
5.	Developed a marketing network so as to reap better price from the livestock produce and products	DH	0(0.00)	1(1.00)	0(0.00)
		KA	0(0.00)	0(0.00)	1(1.00)
		Pooled	0(0.00)	1(0.50)	1(0.50)
6.	Started spending time in handloom and handicrafts to increase income	DH	0(0.00)	0(0.00)	97(97.00)
		KA	0(0.00)	4(4.00)	78(78.00)
		Pooled	0(0.00)	4(2.00)	175(87.50)
7.	Made self-help group and ventured to other income generating group activities	DH	18(18.00)	46(46.00)	10(10.00)
		KA	16(16.00)	32(32.00)	20(20.00)
		Pooled	34(17.00)	78(39.00)	30(15.00)
8.	Producing the livestock products as per the demand of the nearby people	DH	0(0.00)	0(0.00)	0(0.00)
		KA	2(2.00)	1(1.00)	1(1.00)
		Pooled	2(1.00)	1(0.50)	1(0.50)
9.	Keeping relation with those who were our earlier associates in past locations	DH	88(88.00)	12(12.00)	0(0.00)
		KA	100(100.00)	0(0.00)	0(0.00)
		Pooled	188(94.00)	12(6.00)	0(0.00)
10.	Many innovative steps in day to day life has improved lifestyle and comfort like electricity, water supply and use of LPG	DH	16(16.00)	34(34.00)	13(13.00)
		KA	72(72.00)	6(6.00)	15(15.00)
		Pooled	88(44.00)	40(20.00)	28(14.00)
11.	The livestock by-products are brought to better use now.	DH	0(0.00)	21(21.00)	18(18.00)
		KA	38(38.00)	62(62.00)	0(0.00)
		Pooled	38(19.00)	83(41.50)	18(9.00)
12.	The house making is in accordance with the geo-ecological location	DH	0(0.00)	64(64.00)	30(30.00)
		KA	3(3.00)	42(42.00)	46(46.00)
		Pooled	3(1.50)	106(53.00)	76(38.00)
13.	The houses have been made in accordance with the social needs and demands	DH	0(0)	98(98.00)	2(2.00)
		KA	75(75.00)	11(11.00)	14(14.00)
		Pooled	75(37.50)	109(54.50)	16(8.00)
14.	Houses are located in such a way that the animals now get and expanded grazing land	DH	0(0.00)	31(31.00)	69(69.00)
		KA	4(4.00)	17(17.00)	26(26.00)
		Pooled	4(2.00)	48(24.00)	95(47.50)
15.	Now a days livestock remain under observation even when they graze freely	DH	3(3.00)	81(81.00)	16(16.00)
		KA	28(28.00)	29(29.00)	28(28.00)
		Pooled	31(15.50)	110(55.00)	44(22.00)
16.	New settlements are to meet the livestock product requirements of industrial areas.	DH	0(0.00)	0(0.00)	2(2.00)
		KA	0(0.00)	0(0.00)	2(2.00)

Sl. No	Efforts to combat with the geo and socio-ecological change	District	Degrees of information		
			Very much	Much	Somewhat
		Pooled	0(0.00)	0(0.00)	4(2.00)
17.	New settlement has opened up the scope of intensive mixed farming.	DH	4(4.00)	43(43.00)	17(17.00)
		KA	95(95.00)	5(5.00)	0(0.00)
		Pooled	99(49.50)	48(24.00)	17(8.50)
18.	New settlement has provisioned the roadside processing and selling of livestock products	DH	0(0.00)	1(1.00)	8(8.00)
		KA	0(0.00)	9(9.00)	18(18.00)
		Pooled	0(0.00)	10(5.00)	26(13.00)

Figures in the parenthesis indicate percentage.

DH=Dima Hasao, KA=Karbi Anglong

2013 and Muttarak and Lutz, 2014), education can directly influence risk perception, skills and knowledge and indirectly reduce poverty, improve health and promote access to information and resources. Hence, when facing natural hazards or climate risks, educated individuals, households and societies were assumed to be more empowered and more adaptive in their response to, preparation for, and recovery from disasters. Indeed the findings from eleven original empirical studies set in diverse geographic, socioeconomic, cultural and hazard contexts provided consistent and robust evidence on the positive impact of formal education on vulnerability reduction. Highly educated individuals and societies were reported to have better preparedness and response to the disasters, suffered lower negative impacts, and are able to recover faster. This suggested that public investment in empowering people and enhancing human capacity through education could have a positive externality in reducing vulnerability and strengthening adaptive capacity amidst the challenges of a changing climate. The same might have happened in the present context also.

#### 4. Conclusions and Recommendations

The amount of land eroded every year in the state of Assam is equal to the total area of Delhi, the deposition of sand over standing crops due to flood rises up to 7-8 feet and the community clashes getting erupted every year especially in the difficult terrains are countless. So, the farm families have to frequently migrate from one place to another quite frequently. Animal husbandry, therefore, is not only an occupation, but the only ray of hope for millions of farmers. Women are considered to be the vulnerable section when they are in a male dominated, underdeveloped and extremist infested society. The welfare schemes, legal protection and statutory provisions cannot help them when they are further in difficult, remote and constrained areas under the situations of unrest and exploitation. Animal husbandry farm women of different ethnic groups in Hilly tracks of Assam are trying their life out and hoping to earn their livelihood against all odds. Animal husbandry for many of them are the only assets, proving silver line to home making, kitchen running and

children up-bringing in addition to provide major support in wedding their daughters out and treating ailing patients. These women also have been bearing the additional burden of geo socio-ecological changes taking place in the name of development and modernization. Based on the present study, it could be concluded that majority of the displaced women farmers in hill district had not taken much efforts to combat with geo and socio-ecological change. Hence attention should be given to create awareness among them about measures to be taken in the said tasks.

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