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The Inter-linkage between Environment and Women

Dr. Nabanita Debnath

Asst. Professor, Dept. of Economics, Radhamadhab College, Silchar, Assam, India

Abstract

Common lands, especially forests, contributes a lot to the rural economy in terms of providing food, fodder and fuel for the daily uses of the poor people. In most of the forest-bound economies, women play an important role in food gathering and fodder collection. Degradation of such common lands makes these poor rural women to spend longer hours in resource collection which affects their time allocation to other household activities. This paper analyses the inter-relationships between environment and gender in the rural forest villages of Tinsukia district during 2005-2010.

This paper reveals how the environmental degradation in the rural forest villages of Tinsukia district has an adverse impact on the female members of the rural households, not only in terms of reduced time for leisure and other domestic activities but also in terms of increased number of drop-out rates of the school going girl children.

Thus, this paper shows the need for building a natural resource conservation and management structure so that the condition and quality of life of the rural female folks can be improved by addressing the problems of gender biasness in terms of additional work load and education.

Key Words:-Environmental degradation, Gender, Resource collection, Quality of life.

Introduction: The world 'Environment' is a global resource; sustaining life for all of us and hence it needs to be preserved. But, the concern for environmental quality and environmental resources was treated as being the pre-occupation of rich industrial countries in a few years back with the belief that such resources were luxury goods and gained importance only when incomes were high. Developing countries were, on the other hand, regarded as having fewer environmental and resource problems because their traditional technology and institutions were more environmentally benign and eco-friendly and because, they had not yet adopted a materialistic style of life.

The term 'environment' has been used in the context of our climate and issues such as pollution control, effluent treatment, climate change issues etc. Common Property Resources (CPRs) like forest is considered one of the major issues of environment-gender linkage in rural context as poor, especially women are highly dependent on forests for their livelihoods. Forests provide so many things to the rural people but due to the lack of control by any powerful authority, open access resources (e.g. pastoral lands, government forest and wetland) are being over exploitation.

Degradation of environmental resources affects some people more than others. In developing countries, people have traditionally recognized the dependence of human survival on the existence of forests. Communities adjacent to forest are directly dependent on the forests for their sustenance, while for others it provides food and livelihood through water and soil conservation and supplies of fodder and manure. In most forest bound economies, women play a primary role. They are involved in food gathering and fodder collection and in rejuvenating forests through indigenous conservation practices. However, commercial interest has worked havoc and the forests have been reduced to merely a source of timber.

Environmental resources provide important inputs into the livelihoods of poor people and contribute to their well-being through various opportunities. On one hand, the unsustainable destruction of forests causes much misery to the poor, both directly and indirectly and on the other hand, excess use of common forests for fuel wood increases resource collection times of the people, thus decreasing the time individuals can devote to other productive activities which in turn impose welfare costs in terms of lower incomes.

Relevance of the study: Women depend on the forests for food and fodder, and hence their sustenance is hit hard when forests are overexploited. Again women's consciousness of ecological issues makes them better managers of natural resources. This association between women and natural resources exists because of their social and economic roles, which requires them to provide food, fuel, fodder etc. for the surrounding resource base. Therefore, women can feel the impact of environmental degradation more intensely.

It is believed that as the environment is degraded, women who are primarily responsible for resource collection will spend more time in this activity—time that could have been better spent in other activities. Chopra et al (2007) in their study claimed that women are primarily responsible for the collection of resources—the average time spent per female in resource collection (1.71 hours per day) is almost double that of the average time spent per male (0.94 hours per day) in the household. Out of total collection time, women spend the maximum time in water collection—1.25 hours per day per female in the household. It is also evident that women mostly collect fuel wood and fodder. Hence, gender studies in this sphere has significant theoretical, empirical and policy implications.

It is thus apprehended that as the environment and resource availability degrades, the time spent on collection of resources such as fuel wood, fodder biomass etc. also increases, thereby; the welfare of poor women most affected. In this regard, case study of forest dwellers of Tinsukia District is presented to have an insight of these facts.

Profile of the study: Tinsukia is located in the upper part of Assam. The total geographical area of Tinsukia district is 3790 square km out of which about 48% comes under reserve forest. There are three forest divisions (Tinsukia division, Digboi division and Doomdoma division) having altogether 1138 villages in Tinsukia district but only 20 villages are adjacent to the forest divisions (15 villages adjacent to Digboi division, 2 villages adjacent to Tinsukia division and 3 villages adjacent to Doomdoma divisions). This means that only these 20 villages lie at a distance of five km from the forests (according to Digboi Forest Division, Digboi, 2010).

Objectives:

- a) To investigate the effects of environmental degradation on women's time allocation decisions.
- b) To examine the fortune of children -gender wise- due to change in the time required for environmental resource collection by the female members in a family.

Hypotheses:

- a) Resource availability does not affect time allocation decision of the households.
- b) There is no gender bias in the family in sharing the additional time required for resource collection.

Methodology: This study has been based on both primary and secondary data. Secondary data like the name of forest village, name of forest range, number of households, number of population etc has been collected from governmental documents, NGOs etc. The primary data has been collected with the help of an interview schedule through personal interview.

There are about 4725 households in the forest area of Tinsukia District, out of which 4122 households exist in the Digboi Division, only 85 households exist in the Doomdoma Division and the rest 518 households exist in the Tinsukia Division. This study is based on 10% sample of the total population, so 10% of total 4725 population, i.e., approximately 472 samples has been collected proportionately from the three forest divisions. This comes to approximately 412 households from Digboi Division, 8 households from Doomdoma Division and 52 households from Tinsukia Division which covers the period from 2005-2010.

To examine the impact of resource availability on time allocation decision of the households, we have shown how with the change in the time devoted by the male as well as the female members for resource collection has influenced their working hours within the house. For calculating the working hours within the house we have excluded the time spent for resource collection and leisure time from the total time. Again, to show the gender biasness, a comparison has been made separately between the time devoted by the male members and the time devoted by the female members for the family before five years and after five years.

For testing the hypotheses, the present study has applied multiple regression model and Z-test.

Analysis of the Study: In order to know the extent of the dependence of the poor on environment in Tinsukia District of Assam and how due to environmental degradation, those poor especially the women folk who are the main collectors of environmental resources from the forests are affected, we have set the following hypotheses:

Hypothesis 1: Resource availability does not affect time allocation decision of the households.

In order to see the impact on the total working time devoted by the members of the household within the house due to the change in the availability of resources, we have formulated a multiple regression model given as below:-

$$W_i = \beta_0 + \beta_1 MT_1 + \beta_2 FT_2 + u_i$$

where, W_i = Change in total working hours within the house, $\beta_1 MT_1$ = Male's additional time for resource collection, $\beta_2 FT_2$ = Female's additional time for resource collection, u_i = Random error term and $i=1, 2, 3, \dots, 466$ as we covered 466 households

Table 1: Impact on the total working time devoted by the male and female members of the household within the house due to increased time for resource collection

Variables	coefficients	Std. error	T value	Sig.
(Constant)	-.157	.009	-1.72	0.050
Male's additional time for resource collection	-.101	.025	-13.82	0.000
Female's additional time for resource collection	-.905	.007	-86.11	0.000

Number of Observation = 466

R- Square = 0.88

F - value = 72.60

Based on the above results, we fitted the following regression lines:-

$$W_i = -0.157 - 0.101(MT_1) - 0.905(FT_2)$$

From the above equation and table, it has been seen that the male members' additional time for resource collection and the female members' additional time for resource collection has a negative relation with the change in total working hours devoted by the members of the family within the house. But we can see that with the increase in the time spent by both the male and female members for resource collection, there has been a reduction in the working hours of both the male and female members within the house but this burden falls more heavily on the female members than the male members of the house. This means that with the reduction of the availability of environmental resources, female members of the household who have to reduce their time from other useful household activities and leisure and give that time for environmental resource collection and sometime school going girl children also drop-out from school to help their mothers in this work. On the other hand, with the increase in time spent for resource collection due to environmental degradation, only a few male members of the households reduce their time from their income-generating activities and devote more time for resource collection. So, ultimately with the reduction of the environmental resource availability, it is the female members who become the first victim and are being forced to work more both inside and outside the house.

The estimated model fits good as it is revealed from the high value of F (72.60) which is also significant at 5%. However the value of R^2 is 0.88 implying 88% variation in the dependent variable i.e., change in total working hours within the households is explained by the explanatory variables, i.e., male's additional time for resource collection and female's additional time for resource collection. Thus, we can conclude by rejecting our second null hypothesis on the ground that resource availability does affect time allocation decision of the households during the period of 2005-2010.

Hypothesis 2: There is no gender bias in the family in sharing the additional time required for resource collection.

In order to measure whether there is any gender biasness or not in the family in sharing the extra time which is required for resource collection, we have formulated the Z-test.

Table 2: Time devoted by the female and male members separately within the house in 2005 and 2010

Paired Samples Statistics	Mean	Number of observations	Std. Deviation	Std. Error Mean
Time devoted by the female members within the house in 2005	15.05	466	0.3268	0.015
Time required by the female members within the house in 2010	14.28	466	0.4934	0.023
Time required by the male members within the house in 2005	16.00	466	0.3268	0.015
Time required by the male members within the house in 2010	15.90	466	0.1247	0.0578

From the above table of paired sample statistics, if we compare the mean values of the time devoted by the both male and female members within the house in 2010 and in 2005, we can see that the time devoted by the both the members within the house in 2010 has reduced as compared to the time devoted by the members within the house in 2005 but the time devoted by the female members within the house in 2010 has reduced much more than the time devoted by the male members within the house in 2010.

Table 3: Difference between the time devoted by the male and female members separately within the house in 2005 and 2010

Paired Sample	Mean	Standard	Standard	Z-value	Degrees of	Sig.(2-tailed)
Time spent by male members within the house in 2005 - Time spent by	0.033	0.133	0.006	5.396	465	0.000
Time spent by females within the house in 2005	0.774	0.366	0.017	45.600	465	0.000

From the above paired samples Z-test, we can see that the mean value of the difference between the time devoted by the female members within the house between 2005 and 2010 is 0.774. But the mean value of the difference between the time devoted by the male members within the house between 2005 and 2010 is only 0.033. The standard deviation for female members is 0.366 while the standard deviation for male members is 0.133; the number of observation for both the cases is 466 while the degree of freedom is 465. The value of Z-distribution for female members is found to be 45.60 relative to the standard error of 0.017 which is much greater than the critical value, i.e., 1.97 at 5% level of significance while the value of Z-distribution of the male members is found to be 5.396 relative to the standard error of 0.006 which is also greater than the critical value, i.e., 1.97 at 5% level of significance. We thus reject our null hypothesis and conclude that after five years, i.e., in 2010, both the male and female members have devoted significantly less time (hours) within the house than

they use to give before five years, i.e., in 2005 and spent more time (hours) for resource collection. This shows gender biasness within the family of the rural people of Tinsukia district.

Findings of the Study:

- a) There has been heavy environmental degradation in the forest areas of Tinsukia district and such degradation has ultimately resulted in increasing collection time for resources.
- b) With the increase in the total time required for resource collection, the distribution of time devoted for this purpose has affected the female members more than the male members of the sample households, reflecting gender biasness within the family.
- c) The increased time spent for resource collection has made the female members of the sample households to have less time for leisure and other domestic activities while the male members still continue to devote their time for income-generating activities.
- d) With the increase in environmental degradation, the drop-out rate of the school going children, especially the girl children, has increased from 2005 to 2010. This is mainly due to the fact that when time spent for resource collection by female members of the sample households increases, these children mainly the girl children have to stay back at home to help their mothers either in domestic works or in resource collection activities.

Conclusion: This study contributes to a better understanding of the linkage of environment from a gender perspective. For instance, it is believed that as the environment is degraded, women who are primarily responsible for resource collection will spend more time in this activity—time that could have been better spent in other important domestic activities. Again, this study demonstrates that if scarcity leads to households in general, and women in particular, to spend more time collecting natural resources then improved natural resource management is required. Moreover, an increase in the collection time may force girls to drop out of school in order to assist their mothers in household and other chores, which would in turn hinder their education. Hence, it is possible that improvement in the natural resource base may give girls more time for education.

Therefore, this study makes a noteworthy contribution in pointing out the importance of building natural resource conserving structures that would help the rural poor women to lessen their suffering and ultimately to increase their quality of life and as a whole increase their condition by highlighting the problem of gender biasness in terms of additional workload and education.

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