



Environmental Issues and the Resulting Cultural Changes – A Study in the Hilly Tribal Ecosystem

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Tribal communities have deep connection to environment because they have a greater dependency on natural resources. When the natural environment is altered, it disproportionately affects the tribal life. Overburdened with the environmental issues, they have problem of change in culture and further facing lot of health hazards. Hence, the present study was taken up to document the cultural changes occurring due to the changes in natural environment and to identify the probable causes of factors responsible for each issue. For documentation of the issues, the Nilgiri district of Tamil Nadu was selected considering the highest proportion of tribal population in the district. Ex-post facto research design was used. Totally there were seven major cultural changes have been identified viz., changes in the regular food habits, changes in the health management practices, changes in the dressing pattern, remarkable changes in the celebration of family festivals and ceremonies, changes in the housing pattern, disappearance of traditional utensils and changes in the water use tradition. For the above identified cultural changes, probable responsible factors were also identified and ranked by employing Garrett ranking method.

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1. INTRODUCTION

India is vulnerable to several environmental threats and the priority threats are air pollution, water pollution, denudation of forest, desertification, loss of biodiversity, land degradation, drought, etc. Ever growing population is over straining the natural resources and put the natural environment under severe threat. When the country's natural environment is affected, it is unfortunately very common for tribes to fall prey to environmental issues as their habitat / dwelling and earning places are destroyed. Tribes are the first victims of the environmental degradation. Indigenous peoples around the world are disproportionately affected by the changes in the environment due to three reasons: (a) their location is vulnerable to ecosystems (b) their lifestyles (traditional and cultural) are deeply reliant on natural resources for survival and (c) due to historical events, they are the poorest group among their societies and have the greatest health disparities [1,3]. Tribal communities are in a unique situation because they have a very deep connection to environment, not only because of their history and culture, but also because they have a greater dependency on natural resources for food, shelter and ceremonial life than the other people. Environmental issues disproportionately affect the tribal life because those issues pollute the most essential resources they depend on.

Tribes have experienced impacts of environmental changes for many generations which include drought, deterioration of air and water quality, food scarcity, rise in sea level and inundation, increasingly severe weather and related disruptions and disasters, health impacts including shortened life spans, diminishing wildlife numbers, worsening habitat conditions, soil erosion, and threats to cultural resources.

Many tribal communities have fallen prey to environmental deteriorations, among which hilly tribes are the most affected. These tribes have diverse social habits and cultural differences such as languages, dressing pattern, ornaments and religion but these are the differences which make them who they are [2]. Loaded with the wide range of problems, the hill tribes are at times unaware to the fact that their culture is slowly eroding too [6]. There is growing threat to traditional food use of tribes results from the

impact of climate change on ecological processes, habitat quality, and species populations and the decline in traditional food use is accompanied by decline in health of the tribes [4]. The tribes are taking more stored food available from local stores and less local food and this causes increased separation between local residents and their environment and also the technological developments have resulted in a declining interest to harvest local resources which alter subsistence needs and activities [5].

Even though the contribution of indigenous peoples around the world is very less to changes in the environment, they are disproportionately affected by these changes. Several studies confirm that the environmental issues contribute to the cultural changes of the local residence and also bring many health hazards. The present study has been carried out with the major objective to document the cultural changes arising out of environmental issues and the probable causes of each and every issue.

2. METHODOLOGY

In country, the over exploitation of the natural resources and consequent environmental degradation first affects the life of the people who depend on these natural resources for their life. Several studies confirmed that the hilly tribes are the first victims on such issues. In south India, more such environmental degradation hampers the life of the hilly tribal population, more specifically the tribes of the Nilgiri district of Tamil Nadu. In the Nilgiris district the tribal population constitutes 4.5 % of the total population and there are six types of tribes living in this district namely, Toda, Kota, Kurumba, Kaatunayakar, Irula and Paniya. As it is a hilly resort, the tribes are most affected owing to the fast urbanization and besides fast growing tourism industry.

Hence the present study has been carried out in the Nilgiri district of Tamil Nadu. The study was conducted with the major objective of documenting the environmental issue based cultural changes in the hilly tribal ecosystem and exploring the responsible factors. Ex post- Facto design was used for the present study.

By having elaborate discussion with the local hilly tribes, local environmentalists and social workers, seven most important cultural changes arising out of the local environmental issues were

identified. For each and every cultural changes, the probable causes (responsible factors) were also enumerated by having elaborate discussion and interactive meeting with different stakeholders, environmentalists, social workers and local residence. Finally, the identified factors were ranked by thirty judges / scientists having vast expertise in environmental and social research. The results were analyzed by employing Garrett ranking method in order to rank the probable causes.

$$\text{Per cent position} = 100 \times (R_{ij} - 0.50) / N_j \quad (1)$$

Where

R_{ij} = Rank given for i^{th} item in j^{th} individual
 N_j = Number of items ranked in j^{th} individual

3. RESULTS AND DISCUSSION

3.1 Issues Related to Cultural Changes

There were seven different types of cultural changes / issues identifies in the tribal ecosystem (study area) as a result of over exploitation of natural resources and consequent environmental issues. Following are the issues related to cultural changes

- 3.1.1 Changes in the regular food habits.
- 3.1.2 Changes in the health management practices.
- 3.1.3 Issues related to change in dressing pattern
- 3.1.4 Issues related to changes in the celebration of local festivals
- 3.1.5 Issues related with the changes in housing pattern.
- 3.1.6 Disappearance of traditional utensils
- 3.1.7 Changes in the water use traditions.

The issue wise causes are presented in their rank order in Table 1.

3.1.1 Changes in the regular food habits

The tribes previously had their own local food habits transmitted over generation. Now due to the changes in the land are practices and undesirable climatic factors their choice of local vegetable, fruits, grains have been altered and which consequently led to the changes in their regular food habits.

From the Table 1 it could be understood that the introduction of exotic vegetable stood first in altering the regular food habits of the local residence. Further they there were some local Multinational companies who are constantly

promoting their own processed grains, vegetables and value added products profit motive and this also a main reason ranked second for the change of regular food habit. Habitat destruction was ranked third, contributing to the changes to the regular food habits. In the recent years due to the expansion of tourism industry the land area belong to the tribal ecosystem is being converted into commercial sites and it was ranked as the fourth important causes for the food habit change of the tribes. As their cultivable land is being converted for commercial sites, their local production of fruits, vegetable, tubers and grains decreased and this could have drove them towards some other alternate food products.

3.1.2 Changes in the health management practices

The Garrett ranking analysis showed that the pollution encroaching the overall environment stood first in creating health hazards for the local residence. The erratic changes in the climatic factors, contamination in the local food products, water pollution, changes in the food habits and air pollution were seen in the subsequent order.

It is natural that if the environment is totally contaminated it will cause number of health hazards. Here the local residence also expressed that they suffered out of respiratory problem, eye irritation and skin allergies as their repeated recent health based issues.

The erratic changes in climatic factors also favours the outbreak of certain pest and diseases and multiplication of disease causing pathogens. The local residence also felt that they observed there are certain changes in the multiplication rate of certain pest and diseases. They also observed recognizable changes in the behaviour of certain pests.

3.1.3 Issues related to change in dressing pattern

It could be understood from the table that the erratic changes in the local environment are facilitating changes in the usual dressing pattern and it was ranked first cause in the Garrett ranking.

Because of the introduction of new breeds of sheep and goat, the local sheep and goat are gradually disappearing. These local sheep are the real source of wool which is used for preparing woollen materials and earns remunerative income for the local residence.

This paved the way for changes in the dressing pattern that is dresses with artificially wool and resin based synthetic jackets and this cause has been ranked third.

Thirdly the respondents pointed out the societal pollution as their major cause for the changes in dressing pattern. Everyday people from different part of India and world are entering into the study area as it is a prominent tourism sector of south India. Seeing the dressing pattern habit, the local tribes also changing their usual dresses and this has also created a lot of health hazards.

3.1.4 Issues related to changes in the celebration of local festivals

It is revealed from the Table that certain crops and varieties have disappeared from the local tribal ecosystem and it has been ranked as first being the cause incurring changes in the local festivals. The local tribes usually celebrate the harvesting festivals as an honor to their god / local temple. They have their own small sized country potato which is a prime medium in their regular food. Now because of the introduction of higher yielders, the traditional potato varieties have almost disappeared from their local system. The maturity season of the hybrid yielder are not matching with their regular festival seasons when they earlier did the harvesting of the traditional potatoes. Similarly, they used to celebrate the local temple festival during the time of harvest of their traditional rice varieties. Now the introduction of the high yielders and their maturity season have widely disturbed the celebration of local festivals and hence they could have given rank one for this particular cause.

Previously the tribal rural youth confined themselves with their locality itself and earned their income through local forest products. Now due to the tremendous growth in the tourism industry in this district the tribes and tribal youth are getting gainful employment opportunities in the tourism sector. This could have created a casual attitude towards celebration of the local festivals. Because of this attitude the tribe are not using their regular dresses during their festival time which was considered to be a sacred practice during the ancient time and hence this was assigned second rank.

As regard the disappearance of endemic plants it was considered as an important cause altering their local festivals. In this the local grass called 'Awwull (*Eriochrysis rangacharii*)' as very important auspicious item while celebrating family and local festivals. Now because of local

land use system to promote tourism importance in their locality these holy grasses have almost disappeared and hence they conducted the local auspicious function and festivals without this holy grass.

3.1.5 Issues related with the changes in housing pattern

The erratic changes in the local environment was ranked first by the respondents the present changes in the housing pattern. Previously they constructed their house with the locally available wooden materials and thatches prepared out of leaves of certain local trees. This type of houses gave them comfort and protection from the local weather condition like erratic rainfall, extreme conditions of temperature and high intensity relative humidity and wind velocity. These wooden materials found helpless and they are now going for concrete houses.

Further because of the scarcity of local construction materials they are forced to go for concrete houses and hence they have ranked the scarcity of local construction materials as the second prominent causes.

Overexploitation of the local natural resources are responsible for the frequent land slide in the study area and it was ranked third by the respondents. Because of such frequent landslide they could have suitably design the housing pattern.

3.1.6 Disappearance of traditional utensils

The introduction of modern utensils prepared out of ever silver, ceramics and plastic materials are much preferred by them. Because of their multiple usage and durability. Hence this was ranked first. Previously the local residence widely used the utensils prepared out of mud, wood and bamboo. Now because of the present land use pattern, the above resources become scarce and hence they could not make their own indigenously prepared local utensils and it was ranked second.

Previously the tribes and tribal youth were localites and now owing to the tremendous growth in the tourism industry they go for gainful jobs outside their locality for getting remunerative income. Moreover because of this cosmopolite nature they could have exposed the different modern utensils available in the market and their utility value. This is the main reason for the change in their mindset / attitude for ignoring their traditional indigenous utensils and it was ranked third by the respondents.

3.1.7 Changes in the water use traditions

From the Table it could be understood that the shortage of water for domestic purpose has altered the water use tradition and it was ranked as their first foremost cause on this issue. Because of overexploitation of land resources and present land use practices the local springs, wells and ponds have almost ignored or disappeared. They anciently adopted water recharge system and structure also damaged and disappeared. This was created heavy shortage of water for domestic purpose. Because of this reason those once took open bath in the local springs and wells confined themselves in their houses and depend water supplies through

local panchayats. This also holds good for the drinking water.

They raise their own local crops and for this farming activities because of the shortage of local irrigation water they are forced to divert the drinking water supplied by local panchayats and gained through scarcely available few springs and this cause was ranked as second in altering their water use tradition.

Their ever growing developmental activities related with infrastructure development sponsored by the local panchayat consumes a considerable portion of the local available water which could have also altered their water use tradition. Besides, the introduction of exotic

Table 1. Issues related to cultural changes and the contributing factors

Issues related to cultural changes and their contributing factors	Average garrett score	Rank
Changes in regular food habits		
Habitat destruction	105.13	3
False propaganda by MNCs to introduce their own processed grains, vegetables and value added products with profit motive	107.10	2
Introduction of exotic vegetables	112.17	1
Conversion of agricultural land and forests into commercial sites	100.50	4
More spending towards managing local health hazards		
Air pollution	90.83	6
Erratic changes in climatic factors	150.00	2
Changes in the food habits	125.67	5
Contamination in food products	147.13	3
Water pollution	144.67	4
Pollution of overall environment	158.63	1
Changes in dressing pattern		
Tourism intrusion (societal pollution)	74.73	3
Changes in environment	94.63	1
Changes in weather	83.77	2
Remarkable changes in the celebration of family festivals / ceremonies		
Changes in the attitude	67.33	2
The disappearance of local crops/ varieties	162.00	1
The disappearance of endemic plants	66.20	3
Changes in housing pattern		
Non availability of local construction materials	88.73	2
Frequent land slides	69.00	3
Changes in environment	93.40	1
Disappearance of traditional utensils made up of mud, wood and bamboo		
Introduction of modern utensils	117.63	1
Changes in the food habits	99.27	3
Changes in the attitude	73.00	4
Non availability of local materials	116.60	2
Changing culture of water use tradition		
Developmental activities	98.23	3
Introduction of exotic trees	92.00	4
Drinking water diverted to farming (spring)	108.00	2
Shortage of water for domestic purpose	119.40	1

trees eucalyptus, wattle, acacia etc. are having potential to over extract the underground water potential which could have caused the tremendous scarcity of water.

4. CONCLUSION

From the above discussion the following recommendations could be suggested.

1. Even though it is our duty to provide the better living conditions for the tribes considering the modern developments in the scientific world we should take appropriate steps to protect the traditional crops, varieties and local meaningful indigenous practices.
2. For every health hazards the production in the overall environmental was highlighted. Necessarily legal restrictions to be made to ensure the clean and healthy environment in their local tribal ecosystem.
3. Adequate steps to protect the local sheep providing wool material so as to ensure adequate woollen dressing material for the local residence.
4. Even though the concrete buildings are safe for the local residence, appropriate construction guidance to be ensured while construction such houses considering the frequent landslides. Government should think of coming out with appropriate design and structure of building local smart green and clean houses using locally available wooden materials in order to ensure safety, protect from extreme weather and also to maintain beautiful landscape.
5. As most of the local tribes have started using the utensils made up of ever silver, ceramics and plastic materials, the locally made traditional utensil will disappear very soon.
6. Government and local tourism sector should take necessary steps to develop local gallery with the collection of such utensils, with due course become a shopping complex earning remunerative income for them.

7. Even though the tribes living in the serene green ecological system they suffer out of quality water for farming and domestic purposes. The local panchayat should come with suitable plans to renovate the local natural spring, wells and ponds. Adequate water recharge mechanisms should be introduced.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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