"Echoes from the Hills" is an interdisciplinary peer reviewed, annual academic journal. The term "interdisciplinary" connotes improved communication across disciplines that foster mutual understanding. This, in turn, advances our understanding of the deeply complex issues that underpin contemporary society. Acknowledging the need for diversity and integrity in speaking to these issues, Echoes from the Hills publishes manuscripts from a wide range of disciplines and encourages approaches to topics that use multiple and mutually supporting forms of analysis. The journal is committed to showcasing and publishing innovative scholarly writing from established and emerging academicians and professionals around the world with a hope to promote dialogue, reflection, inquiry, discussion, solutions and action. The Annual academic journal which is Interdisciplinary in nature will focus on a theme to allow a holistic representation of works from different aspects.

The Theme of the Third Volume :
"Sustainable Development: Challenges and Opportunities"

TRIBUTE TO PHRANGSNGI PYRTUH

*The sudden demise of **Late Shri Phrangsngi Pyrtuh** on the 27th January 2019 has left a vacuum in our midst. This journal would not have seen the light of day had it not been for his tireless efforts. He was instrumental particularly in helping the journal register for RNI and ISSN status. His contribution and suggestions, through his keen and analytical mind, helped the journal take its present shape and form. He was an exemplary individual whose life is a testimony of sheer hard work and commitment. His warmth, exuberance and optimism is missed by all. A life cut too short and cruelly so. May he find his eternal rest in the arms of his Maker.*

NOTE FROM THE PRINCIPAL

It gives me immense pleasure and satisfaction that the college is releasing third volume of the Interdisciplinary journal: "Echoes from the Hills". The journal includes collection of scholarly papers edited by a competent editorial board, is the result of hard work of learned people who share their knowledge and thoughts for enrichment of human mind. We live in a society where there is a continuous effort for development and growth in every field, be it economic, social, art, science and so on. The concept of "sustainability" dominates in all domains of human environment. Sustainable development aims at meeting the present without compromising the ability to procure, produce and support the future generations to meet their own needs. The United Nations came up with 17 sustainable development goals to be met by the year 2030. But it is often observed that development comes with a price of its own like the cost of environmental damage in the shape of deforestation, land degradation, pollution etc. Therefore, the big question is, can development and congenial environment co-exist so that development can be sustained for generations? Also, are these goals achievable in reality?

Keeping in mind the dynamics of all these challenges the third volume of the journal dedicates itself to the theme "Sustainable Development: Challenges and Opportunities". This volume dwells upon the trends that are reshaping the world and their impact on the overall environment, and also whether there are sustainable ways and means by which the world can develop.

I congratulate the Editorial Board whose enthusiasm and tireless efforts have led to the culmination of this third volume. The articles included in this volume will immensely benefit the readers. This volume should inspire future editions to further seek out themes of societal relevance that are pioneering and insightful.

My best wishes to all the authors and contributors of the journal.

Dr. M. Dey
In-Charge Principal

NOTE FROM THE EDITOR

Greetings from the Editorial Board, Echoes from the Hills, An Interdisciplinary Journal, Shillong College. The Board is pleased to present the scholarly writings from established and emerging academicians and scholars from diverse fields in this 3rd Edition of the journal, on the theme "Sustainable Development: Possibilities and Challenges".

Dr. E. Kharkongor underlines the importance of economic development which has brought with it progress and benefits. Further, she tries to explain the challenges of the process of development, and emphasized on the need to understand sustainable development paths and environmental conservation, which is the very essence of development.

P. Khonglah and A. Thabah provides a significant information on how livelihood are influenced by the natural resources of the area among the tribes of Meghalaya. The state of Meghalaya has a lot of tourism potential with respect to its natural beauty, culture and climate. Therefore, this paper explains how in the context of tourism sector, people can acquired a sustainable livelihood without affecting the environment.

Sustainable Development goals adopted by the United Nation are the blue print to achieve a better and more sustainable future for all. Karisa S Kharkongor noted that one of the major challenges for meeting these goals, is the management of wastes. This is because the more prosperous a country is, more is the waste that is being generated from its prosperity, and greater the cost for managing it. Hence, there is an urgent need for sustainable waste management practices that would ensure maximization of the value of waste, not only for environmental sustainability, but also for maximum returns.

Dr. H. Iangrai outlined the importance of making people aware and be prepare in case of natural disaster especially earthquake as we are living in an earthquake zone. The National Strategy towards disaster management emphasized on building a safer and disaster resilient India by developing a holistic, pro-active, multi-disaster and technology-driven strategy for disaster management through collective efforts of all stakeholders, both government and non- governmental

agencies. Therefore, this paper stressed on the need for capacity building to deal with any kind of disaster.

Dr. Rekha M. Shangpliang examined the challenges of teaching courses on gender, as part of a Social Science curriculum in Indian colleges and Universities. Taking a Sociological stance the paper, stresses on the importance of introducing the feminist pedagogy in social sciences, while teaching gender related courses.

Many writings on matrilineal society focused on power structures and authority of women. D. C. Syiem, attempts to promote an academic platform for discourse to understand the empirical reality of the role of women in the Khasi matrilineal society of Meghalaya, in the present day context.

Dr. P. Lyngdoh attempts to explore and investigate the major concerns of the natural environment by analysing the man-animal/man-nature dynamics in Amitav Ghosh's 2004 novel, The Hungry Tides. She tries to highlight the problematic idea of conservation by exploring the complex negotiations of nature and culture, man and animal, man and nature.

Increase in developmental activities has taken a toll on the environment. Today, environmental conservation has taken the highest priority in the mandate of the Indian Government. Conservation of biodiversity is an important aspect of environment conservation. Dr. L. M. Jyrwa and B. Kharbisnop studied the diversity of butterflies found within the North Eastern Hill University, Shillong campus. An attempt has been made to draw the lines of balance co-existence of both concrete forests as well as green forests. The study reveals that the presence of certain species of butterflies in the campus may perhaps indicate the destruction of forest cover due to construction of buildings around the campus.

M. Diengdoh and B. Kharbyngar conducted a bacteriological study on ponds located in Mawthadraishan village. The findings of the study revealed the presence of many enteric bacteria, both pathogenic and non- pathogenic. Contamination of water bodies such as rivers, lakes, ponds etc. due to various human activities has led to many undesirable changes in water bodies such as its quality, colour, odour and has affected many water living animals and the whole food web chain, including humans.

Dr. J.Thabah and B.Lyngdoh, highlights how Shillong College Library is adopting new technology for effective delivery of quality service and for sustainability in the ICT era. The paper examines how academic libraries are redefining to adapt to the revolutionary changes brought about by the application of technologies in the overall functioning of library operations with regards to the transitional mode that has evolved from traditional library to digital library.

A review by Sumarlang Lyngskor on the article "Community Participation and quality Drinking Water" highlights the need for a co-ordination between the Central and State governments regarding clean drinking water supply in both semi- urban and rural areas respectively.

I do hope and wish that the present collection of important research papers related to the issue will be of immense interest to the academicians, scholars, policy makers as well as the general public.

We are fortunate to have the support of Dr. M.Dey In-Charge Principal, Shri K.D. Roy, Vice Principal, Shri B.Syiem, Vice Principal (Professional Course), Shri L.Pathaw, Principal, Higher Secondary Section, Dr. E. Kharkongor, IQAC, Co-ordinator, Advisory Board Members, and all Editorial Board Members of the journal to make this volume see the light of the day.

Dr(Mrs.) S. Khyriemmujat
Editor,

CONTENTS

SUSTAINABLE DEVELOPMENT: REDEFINING OUR FUTURE

Dr. (Mrs.) E. Kharkongor

Abstract

The concern that the environment is a critical input in the process of development seems to have permeated the decision making process of almost all nations of the world. Nevertheless, there has been an increased depletion of the earth's basic life-support systems and these are still under severe stress both in developed and in developing countries. Hence, it is imperative to find sustainable development paths which recognize that environmental conservation is, in fact, the very essence of development.

Introduction

The notion of sustainable development has become an issue of serious concern in the decision-making process of both developed and developing countries of the world. This is so because the processes of economic development driven by technological innovations and industrialization have affected the earths' natural resource base and the ecological crisis that humanity is facing today can no longer be ignored. Ecological crisis such as air and water pollution, desertification, global warming, land degradation and much more prevails in the modern and affluent society of the present day. No doubt, economic development have brought with it progress and innumerable benefits. There has been rapid increase in world output, income levels, decline in infant mortality rate and life expectancy is rising. However, the same process of economic development based upon market forces of competition and profit have resulted in an unequal distribution of the gains and the presence of a vicious circle of poverty. Many parts of the world are in a vicious downward spiral where poor people are forced to overuse natural resources to survive from day to day and their overexploitation of natural resources further impoverishes them, making their survival even more difficult and uncertain. The consequences of the unsustainable developmental paths followed so far have brought into sharp focus that any development strategy and

technology associated with it ought to treat the environment as an integral part of the development process.

Objectives of the Study

In view of the above, this paper will attempt to discuss the interrelationship between the economy and the environment and review the definitions and developments associated with the concept of sustainable development.

The Economy and the Environment

The concern that the environment is a critical factor in the process of economic activity can be traced back to Kenneth E. Boulding brilliant essay, the *Economics of the Coming Spaceship Earth*. This essay presented at the Sixth Resources for the Future Forum on Environmental Quality in a Growing Economy in Washington, D.C. on March 8, 1966, asserted for a change in man's perceptions regarding economy-environment interaction and for measuring economic success. Boulding brought out the significance of this interaction in his presentation of two types of economies: the "cowboy" and the "spaceman" economies. The cowboy economy is describe as an "open system", in which there is always some new space to move on and that nature have unlimited capacity to supply resources and assimilate wastes. The accounting measures of GNP/GDP reflect the magnitude of the material flows and they measure the economic success in the "cowboy economy". Conventional economics have always viewed the economy as an open system and the cowboy economy have dominated the paths of economic development in industrialized and developed nations of the world.

However, Boulding underlined the necessity for a change in the perception from the "cowboy economy", to a "spaceman economy". In the spaceman economy, the Earth is a single spaceship with limited reserves of natural resources and limited capacity to assimilate wastes and "*man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy*" (Boulding 1966). Within this spaceship, every effort should be made to reduce and recycle wastes, conserve exhaustible resources and tap new sources of renewable resources and energy. The accounting measures of GNP/GDP cannot be

appropriate measures of economic performance and Boulding argued that economic success is measured by the *"nature, extent, quality, and complexity of the total capital stock, including in this, the state of human bodies and minds"* (Boulding 1966). The economy is clearly a part of the environment as much as the environment is the basis of the economy. Therefore, it is necessary to adopt sustainable paths of economic development as, *"the welfare of the individual depends on the extent to which he can identify himself with others, and that the most satisfactory individual identity is that which identifies not only with a community in space but also with a community extending over time from the past into the future."* (Ibid).

Boulding's essay seems to have provided the basis for economists to relook at the central economic idea, i.e. of resource-scarcity in relation to possible uses because securing the environment is critical for the survival of future generations (Pearce, D. W. & Turner, Kerry R., 1990). Consequently, environmental awareness intensified specially in the fast growing industrialised countries of the world. As a result, during the 1970's a number of worldviews crystallized within environmentalism providing the background for the emerging environmental economics sub-disciplines (Pearce, D. W. & Turner, Kerry R., 1990).

However, environmental awareness was initially confined to industrialised countries only. In underdeveloped and developing economies, environmental policies were regarded as unavoidable luxuries over and above a concern for basic necessities. It was so until 1972, when the United Nations Conference on the Human Environment held at Stockholm brought together both the industrialized and developing nations of the world to realise that environmental protection is an essential component of social and economic development.

By the 1980's there was a new reorientation in environmental thinking emphasizing the possibility of interrelationship between economic development and environmental improvement (Patowary, U.K., 1992). The essence of this new thinking was how to grow in an environmentally benign way. This new thinking provided the foundation for the concept of Sustainable Development (Markandya, A and Richardson, J., 1992).

Concepts of Sustainable Development: – Definitions and its Development

The concept of sustainable development is usually associated with the Bruntland Commission Report in 1987. The Bruntland Commission was set up in 1983 by the World Commission on Environment and Development (WCED) to look into the major challenges of environmental protection in the world community. The result of this Commission was the Bruntland Commission Report – Our Common Future – presented to the United Nations General Assembly in 1987. The Report had observed that, *"there has been a growing realisation in national governments and multilateral institutions that it is impossible to separate economic development issues from environmental issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development"* (Our Common Future,1987, p. 3). Hence, it calls for alternative development strategies and technologies based on sustaining and expanding the natural resource base in other words - Sustainable Development.

Sustainable development has been defined as meeting the needs of the present without compromising the ability of future generation to meet their own needs (Our Common Future, 1987). In other words sustainable development describes a process in which the natural resource base is not allowed to deteriorate (Pearce, D.W. and Warford, J.J., 1993). It emphasizes the unappreciated role of environmental quality and inputs in the process of raising real income and quality of life. Hence, sustainable development is an economic, protective and a structural long term process of changes in which any type of changes in nature and methods of investment and technology occurs by considering the present as well as future needs.

The growing awareness that environmental protection should constitute an integral part in the development process culminated in the Earth Summit organized by the United Nations Commission on Environment and Development on 3-14 June, 1992, in Rio-de-Janeiro, Brazil. The Earth Summit aims at forging international agreements, which respects the interests of all and to protect the integrity of the global environment and developmental system. The outcome of the Rio summit was the adoption of Agenda 21, which represents the commitment to Sustainable development by more than 178 Governments of the world. Moreover, for further implementation of Agenda 21 and commitments

to the Rio principles were reaffirmed again at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26th August to 4th September, 2002. From then onwards the concept of Sustainable Development has gained wide acceptance and in 2015, the United Nations adopted Seventeen Sustainable Development Goals for a better world by 2030.

Conclusion

No doubt, there has been a growing awareness of the implications of natural resource degradation at the regional, national and global levels. Yet, simultaneously there has been an increased depletion of the basic life-support systems i.e. the land, water, atmosphere etc. These are still under severe stress both in developed and in developing countries. It is therefore necessary to bring in transformation and changes with a clear understanding about the mutual interdependence of all the components of earth's living and non-living beings. Such a transformation and change for sustainability is necessary, technically and economically feasible and socially desirable. This is so because Sustainable Development is possible. The production of food through organic agriculture can be sustained; energy supplies can be sustained indefinitely from renewable resources such as the sun, wind and tidal power. The production of timber from forests can also be sustained cycle after cycle. It is technically incorrect to state that the earth's raw materials can be extracted on a sustainable basis but a combination of re-use and re-cycling can slow down their rate of depletion and make their supply all but indefinite. Finally, although absolute sustainability may not be completely achievable; development strategies adopted should aim as far as possible for a less unsustainable development path.

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A CRITIQUE OF SUSTAINABLE LIVELIHOOD FROM A TOURISM PERSPECTIVE

Piarlincy Khonglah

Aibansienglang Thabah

Abstract

This paper reviews the different uses of natural resources to promote sustainable means of livelihood in the state of Meghalaya. The ideas or the proposal for intervention is based on the understanding that, in the rural context, livelihood is always influenced by the natural resources of the area. We know that the Khasi, Jaintia and Garo community have a deep connection with their land. Their cultural practices echo their sense of conservation and love for their land. In the context of resource management culture reflects this deep understanding of the significance of the environment. Thus, their forefathers with their intrinsic knowledge and understanding endorsed the creation of Sacred Groves (Lawkyntang), Community Forests, Protected Forests and Catchment areas; there is the profound understanding of coexistence which has enabled the community to thrive hereafter. Furthermore, one cannot ignore the ingenious knowledge of using Ficus tree (Ficus Elastica) to create living root architectures which help resolve difficulties in connectivity and create long term solution to simultaneously build bridges and conserve the environment.

Keywords:, sustainable development, sustainable livelihood, resource management

Introduction

Livelihood approach in the present scenario is neither well understood nor analyzed. In the present context, in order to maximize use of natural resources of the community, people are facing four main issues:

1. Livelihood
2. Resource Management
3. Pollution
4. Environment Protection

Sustainable livelihood approach is very challenging, whether one should focus on livelihood or on managing the natural resources

remains a million dollar question. Therefore, the best approach is identifying livelihood issues which have an impact on local people, exploring the connection between livelihood strategies and adopting strategic Resource Management Initiatives.

Creating solution in the context of Livelihood and Resource management is a very challenging task as communities and resources differ from one location to another. However, one common benchmark is its impact on the community as a whole and the impact of livelihood initiative on the natural resources, as well as, providing a road map for future sustainable growth by utilizing the present resources.

The usage of natural resource in the state of Meghalaya for Sustainable Development is, perhaps, still in its nascent stage. The implementation of MNREGA Scheme is to create livelihood but the question that arise is will it maintain sustainable growth? All these years the state bears witness to the growth of tourism sector but is the direction of its growth sustainable? We are eying the ugly face of mass tourism which reel under pollution and unplanned development which will sideline the carrying capacity of the different destinations and create pressure on resources like water, space and infrastructure. Apart from tourism, it is also noted that most of the population is located in rural areas and their main activities depend on agriculture. The problem is most of the agricultural produce does not reach the market or, even if it does, sells at a lower price. There is huge wastage which, if rectified, could save the farmers crops and increase their income. The solution, may I add, is in plain sight. We need cottage food processing or value addition for the farm produce, and then we will be able to create sustainable development in agricultural sector, which will set right the problem of unemployment and proper management of resources in rural areas.

Objectives of the study

1. To understand the challenges, the opportunities and the direction of the tourism industry in Meghalaya in terms of creating livelihood for the people.
2. To analyze the present scenario of tourism and tourism policy in the state of Meghalaya and come up with a comprehensive solution that will effectuate Green Livelihood initiatives.

3. To understand the tourist traffic with regards to natural resource management and practices.

Sustainable Development by using Community Resource: An example

Mawsmai cave is situated about 7kms from Sohra (Cherrapunjee). It is the first lit cave in Meghalaya and one of the major attractions for the tourist. This natural wonder is the work of nature for millennia, though the cave is long, only 150 meters is open for tourists. This cave is like nature's canvas; the stalactites and stalagmites formation, especially the different life forms on the wall and ceiling of the cave, will engage the imagination. The area is surrounded by sacred groves and protected forests. At the entrance there are shops and eating outlets run by the local community. Thus these create livelihood for the local people. The day to day functioning and business at the cave is given on lease to individuals by the community. The income generated from the ticketing and ongoing services enable the community to cater to the maintenance of the caves and waste management in the vicinity. Moreover, the community members also construct shopping outlets which they lease out to support their livelihood. This enables the community to support other community based projects like water management in the area and livelihood generation in addition to beautification and management of the community forest.

The points to be noted about this approach are:

1. The sustainable development was done by the local community based on Community Resources sustained by traditional practices of conservation, i.e. location of caves in the middle of sacred groves.
2. It was based on demand or growth of tourism in the area, the growth and popularity of the destination creates awareness about the importance of the place and its value for creating livelihood.
3. It reflects on the commitment of the community and capitalization of the resource for the benefit of its people by promoting local based employment.
4. The funds generated from this project are used to enhance or scale up other community development undertakings and create future road map for community development.

At present, it is observed that the steady growth in the area has resulted in the growth of other destinations in the locality and the development of other avenues like Home Stay and Guest House for the tourists which further enables steady livelihood generation and sustainable growth.

Tourism sector in Meghalaya

Meghalaya, 'The Abode of Clouds' with the breathtaking landscape, rolling hills, meandering rivers, cascading waterfalls, lush green forest, diverse flora and fauna, rich cultural heritage and tradition has great potential for tourism development. Tourism being a multi-sector activity has the capacity to stimulate different sectors of the economy. It is evident that tourism opens up immense opportunities for economic development, poverty alleviation and income generation. Thus, tourism also makes a positive impact on conserving the environment, cultural enrichment, development of rural areas, employment generation and woman empowerment. With no proper rail and air transport, Meghalaya surprisingly has tourists thronging to its scenic destinations.

Tourism Department statistics state that 11,97,768 domestic and 18,047 foreign tourists visited Meghalaya last year i.e. 2018, with a major chunk of them visiting East Khasi Hills where the state capital is located. West Garo Hills, the main center of the entire Garo Hills region, received 74,729 domestic tourists during that period. Of the foreign tourists, 14,729 landed in East Khasi Hills alone.

In 2017, 989,628 domestic and 12,051 foreign tourists visited Meghalaya while the corresponding figures for 2016 are 844,646 and 8,449 respectively. Around 750,470 domestic and 8,027 foreign tourists visited Meghalaya in 2015, while in 2014, 717,814 domestic and 8,652 foreign tourists visited the state. So far this year, the tourism department statistics state that 184,429 domestic and 7,506 foreign tourists visited Meghalaya.

The tourism department noted that there are 426 registered lodging facilities across the state. These include 215 hotels, 80 homestays, 72 guest houses, 25 resorts, 24 lodges, six circuit houses and six accommodations with bed and breakfast facilities. Of the 426 facilities, 339 are in East Khasi Hills, 18 in West Garo Hills, 15 in Ri Bhoi, 12 in South West

Khasi Hills, 11 in West Jaintia Hills, while the remaining are spread across the other districts.

From living root bridges to one of the cleanest villages in the country, a village which makes use of an idiosyncratic tune instead of names while calling out to their near and dear ones, to breathtaking waterfalls and caves, Meghalaya is home to several tourist attractions spread across 11 districts. It recently sought additional assistance of Rs 4,340 crore from the 15th Finance Commission to, among other projects, develop the state as a "high-value tourism destination".

Recently in Parliament, Rajya Sabha MP Rakesh Sinha asked the government to ensure that the unique practice by the inhabitants of Kongthong, which is known as a whistling or singing village is preserved. The village has also been attracting many tourists for the past many years. Increased tourist footfall has prompted district administrations to issue advisories over keeping tourist spots clean. Hefty fines await the offenders.

The Meghalaya Registration of Tourist Trade Bill, 2019, has been proposed to streamline and regulate tourism. Among others, the bill provides for registration of new and existing hotels. **(Source: The Telegraph Online Edition Dated Saturday 23 November 2019)**

The Tourism Policy of Meghalaya 2011 envisages the seven key principles to bring about responsible growth in this sector with respect to sustainability some of them are: **(Source: Government Of Meghalaya Tourism Department, Ref No.Tourism.74/2009/85, Dated Shillong, the 1st February, 2011).**

a. Government will create basic infrastructure for tourism development and also act as a facilitator for private investment in this sector.

b. Encouragement and assistance for promotion of entrepreneurship within the local communities in the field of tourism. Importance will also be given to tourism projects which are based on community participation.

c. Tourism development will be undertaken in a manner so as to ensure sustainability and conservation of the state's environment and natural resources. Development of tourism activities

around natural resources will be done in conjunction with the relevant Government Departments and in concurrence with any laws relating to protection and conservation. Sustainable development of tourism will also help generate employment for the local people without impacting on environment and local culture.

d. To encourage hotel operators to 'go green' by strictly adhering to minimum standards with regards to environmental performance and health standards. This will include use of renewable energy sources, overall reduction in energy and water consumption, measures to harvest rainwater, measures to reduce waste and provision of non-smoking areas etc.

e. Meghalaya will build on its existing strengths to develop tourism by promoting a clean, healthy and safe environment along with friendly and efficient services.

f. Meghalaya Tourism will aim to develop a unique brand focusing on selected niches and products in order to attract visitors to the state while differentiating itself, where necessary, from its neighbours.

g. Construction works relating to tourism projects may be designed in such a way that the structure will merge with the surroundings and the natural environment of the area so as to present a good ambience, taking into consideration the need for durability and sustainability of the structure in a particular environment.

Taking into consideration the ground reality, in terms of sustainable development and livelihood, to what extent has the policy been effective?

Impact of tourism on sustainable development and rural livelihoods

In its own capacity the government has always focused on the development of infrastructure but what is needed to be understood is that, in a small state like Meghalaya its natural beauty is an asset, thus any changes in its natural asset will destroy its value; moreover, there is complete negligence to focus on human resource development, which is an integral part of any tourism growth. From the economic perspective, livelihood refers to economic activities with focus on day to day earning or the activities that generate income, but livelihood for rural folks is a way of life, it is an intrinsic part of culture and tradition,

within it associates many others such activities like music, food and other practices. Tourism serves many purposes: for the government, it serves as an economic force for income and employment generation; for private entities, it enables to create market; and for those who seek sustainable growth, it is the perfect ingredient to create conservation incentives. Neither one of these approaches lead to inclusive growth for the people.

Traditionally speaking, the true spirit of the Khasi community resides in its concept of community participation which entails inclusive growth, and focuses not only on cash and employment generation but into other intangible benefits whereby community livelihood can be generated. There are many places in the state where the number of tourist visiting the areas are increasing year by year because of mass media coverage. To take an example, Mawlynnong village, with the increase of tourist traffic to these areas, a lot of other problems have risen such as the problem of waste management, use of non-biodegradable items by the tourists, cleanliness, etc. and the biggest problem is that the unique selling proposition of Mawlynnong as Asia's cleanest village is being threatened.

Similarly, Shnong Pdeng also known for its natural beauty has now witnessed degradation with respect to its natural beauty and cleanliness. Again, with respect to transport, it is observed that the majority of tourist coming to the state pre-arrange their conveyance in Assam with Assam tourist vehicles, this is creating a loss in revenue for the local tourist taxis of the state.

Looking at the scenario of the MGNREGA or Rural Employment Generation program scheme of the government it was found out that most of the activities taken was to construct footpath, water tank, approach road or to build toilet or at best to construct pigsty or poultry shelter. It has been assumed that most of these projects bring benefits to the people of the state. But as per the findings while travelling from village to village it was found that most of the villages do not have any area to construct footpaths, drainage etc. The point is, it is imperative to bring a new dimension or a new perspective for this type of scheme. By understanding the pattern of growth in the tourism sector with focus on the rural areas one can understand whether it

is in conflict with traditional livelihoods and whether tourism can generate sustainable development.

A sustainable kind of initiative needs to be incorporated with a clear roadmap for the future, where the project can be started with MGNREGA, but can also standalone once the project is completed. For example, to begin with, a village constructs fish ponds. Once completed, they can generate income from that fishing pond, as well as provide water security and enhance the environment by planting trees in the same area which will, in the long run, produce manifold benefits.

The tourism policy of Meghalaya should take into account the loss of revenue for local tourist taxis to ensure a sustainable income for them. It is a known fact that private or out of state vehicles are not allowed in North Sikkim, also with the functioning of the Inter State Bus Terminal, the welfare of the local tourist taxis can be looked into. Again, many of the state's ecologically fragile areas are subjected to large inflow of tourists which has serious environmental concerns. Vehicular pollution, disturbance to wildlife, garbage accumulation are some of the current major challenges brought about by tourism industry which needs to be addressed. In this context Lakshadweep Island tourism policy takes into account the condition of the natural resources, having done a proper research, initiated a controlled tourist entry permit to ensure that the corals reefs are not tarnished.

Sustainable Livelihood (SL) concepts

In 1992 Robert Chambers and Gordon Conway proposed the following composite definition of a sustainable rural livelihood, which is applied most commonly at the household level:

"A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term."

More recently the Institute for Development Studies (IDS) and the British Department for International Development (DFID) have been putting into operation the SL concept and approach. Leading proponent Ian Scoones of IDS proposed a modified definition of SL:

"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base."

Importance of sustainable livelihood approach for sustainable tourism development in the state of Meghalaya

1. Understanding how tourism development can help rural sustainable livelihood:

Looking at the scenario in the state of Meghalaya it is essential to understand how tourism can have an impact on rural economy and traditional occupation. The rural sustainable approach must be planned to cope with external influences like policy and business ideas. The livelihood approach must be designed in the context of natural resource and capacity of the human resource and the extent which one can develop in capacity building to the local youth and community or providing assistance to start livelihood in the tourism sector.

2. Enhancement of livelihood in Tourism sector:

As per the given context Tourism is viewed as a source of employment or development at the local level, yet one fails to view it as a multiplier or as a direct and an indirect source of sustainable livelihood. What is required is to identify the concerns of the local community in the context of generating employment or sustainable development. Moreover, the ideas of development must also focus on pattern of land use, resource management, carrying capacity and traditional aspect of environment protection and traditional approach related to usage of resource like sacred grove and living roots architecture.

3. Focus on Grassroots Level and Community Approach:

Tourism at grassroots level is neither understood nor planned in the state of Meghalaya. Lack of planning creates confusion as guidelines or plans to identify the strength of particular areas are

found wanting. This dilemma creates a road block in identification of resources and identification of tourism sector as per its niche. Pointing to the community and villages, there are huge potentials for growth, at the community level, if a plan is initiated or designed then the management of resource can be done keeping in mind their usage and requirement at the community level. Thus, this approach can address the issue of carrying capacity, waste management and strengthening the human resource at the local level.

Suggestions

Sustainable Livelihood approach for sustainable tourism development:

1. Identification of Problems and Resource:

    Identification of issues or problems is the main focus at community level and solving the issues should be the priority. The approach should bring solution with long term benefits. Thus for this, first we need to map the resource of the village, understand the types of issues and, what type of resource can be availed to bring a comprehensive understanding of the strength and weakness of the community.

2. Community-Based Planning and Roadmap:

    Most of the development project or initiative in the villages or rural areas are taken up based on the sanctioned or availability of financial support for the project. It was never conducted or prepared according to the requirement. If any requirement was identified it was based on the guidelines or direction which the project was intended for, there was no scope for changes or adaptation. This type of approach needs to change. What remains crucial is planning at the local level, identifying and creating roadmaps so that such projects can act as catalyzers to obtain better local solutions.

3. Incorporating Sustainable Livelihood ideas:

    The village or community level livelihood of many people are linked with their traditional practices and farm activities, incorporating these assets to enhance their livelihood, income and strengthening their skill should be the priority.

Components

Understanding the components of the approach is vital. In the present context we are talking about creating sustainable livelihood at the grassroots level without creating any negative impact on practices and tradition of the community. Hence, as per our understanding, following are the basic components:

1. Stakeholders: Identification of the stakeholders is very crucial for any initiative as this can assist in comprehending the issues, resources available, human resource and the direct and indirect impact on the community.

2. Livelihood Impacts: creating livelihood for the participants cannot be the only criteria for any initiative but overall indirect impact must also be considered in long run.

3. Resources: getting a clear picture of available resources is of immense importance, be it natural or physical or human resource, it will help to plan and identify the activities that suit the local livelihood activities or to upscale any initiative.

4. Income Generation or Financial Feasibility: Another component that needs to be considered is the financial feasibility of the initiative. A project or sustainable livelihood program cannot be taken up if it does not help in income generation of the people, thus identification of such activities is highly essential.

Conclusion

1. Creating sustainable livelihood is not an easy task, understanding its impact is very crucial, it is mandatory to understand the anticipation of the stakeholders and their objectives for livelihood.

2. Participation level is critical be it in tourism related activities, community resource management or creating employment at the local level, in most cases, people do not participate because they do not want to risk their livelihood or come out of their comfort zone.

3. Sustainable livelihood initiatives need to accommodate people's needs and adapt to their local environment rather than modify their life and regular activities.

4. Participation for initiation needs to be encouraged at every level; local community should be the participant in identification of types of initiatives, risk identification and usage of resource.

5. Many schemes like MNREGA, SWACCH BHARAT ABHIYAN and projects at community level should work together for a common purpose, that is, in creating a sustainable livelihood for the people of the region and the state as a whole.

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MANAGING WASTE AS A RESOURCE WITH SPECIAL REFERENCE TO MEGHALAYA

Karisa Shisha Kharkongor

There is no such thing as 'away'. When we throw anything away it must go somewhere." -Annie Leonard

Abstract

It is a common practice to dispose waste materials, but to simply dispose waste out of our sight does not solve the problem. Health hazards, soil, water and air pollution, unpleasant surroundings are consequences of badly managed waste disposal practices. This necessitates the adoption of efficient and sustainable waste management process that include a wide range of activities from collection, transport, processing, treatment to disposal. The process designed should not only suit the needs but has to be economically and environmentally sustainable to that particular region. For successful waste management practices, the combined efforts of the public, the authorities and the private sector is required. The public plays an important role in following the principles of waste management that is Refuse, Reduce, Reuse And Recycle also known as the 4R's which constitutes an important part for efficient waste management. The authorities are responsible for imposing laws, which will lead to sustainable waste management while the role of private sectors cannot be overlooked. The gaps that exist in common practices can be covered or be seen as opportunities for the private enterprises who seek to acquire an economic gain from defaults of current system.

Keywords: Dispose, Waste, Sustainable, Opportunities, Management

Introduction

The development in scientific research, technology, healthcare and many more have brought immense economic gains and benefits to humankind. Yet, all over, the world there is a growing concern about the sustainability of the current state of the development process. Terms like climate change, environmental degradation, deforestation, exploitation, depletion of natural resources are more prevalent than terms that describe the benefits reaped by society through the process of development. These problems, brought about by the fast phase

of unprecedented development, have brought into sharp focus the interconnectedness of the people's wellbeing with the wellbeing of the environment and the economy. In this connection, over the decades, the United Nations has organized discussions and discourses for the formulations of strategies and action plans for sustainable development. In the present day context, world leaders have agreed upon Seventeen Sustainable Development Goals in 2015 for a better world by 2030. These goals include no poverty, good health and wellbeing, clean water and sanitation, climate change, sustainable cities and communities among others. In all of this process, one of the major challenges for meeting these goals is the management of wastes. This is because the more prosperous a country is, more is the waste that is being generated from its prosperity, and greater the cost for managing it. Hence, there is an urgent need for sustainable waste management practices that would ensure maximization of the value of waste not only for environmental sustainability but also for maximum returns.

Objective of the study

In view of the above, the objective of this study is to examine the scenario of waste management in Shillong the capital of Meghalaya, focusing on the vast opportunities that exist when waste is properly managed as a resource.

Scenario of Waste Generation in Shillong, Meghalaya

The state of Meghalaya is one of the eight states of the North Eastern Region of India with an area of 22,429 sq. km. accounting for about 6 per cent of the total land area of the country. The population of the State according to the Census, 2011 was 29, 64,007 persons, comprising about 0.25 per cent of the total population of the country. Although known for its undulating hilly topography and natural landscapes, the state is facing a persistent crisis of managing its garbage, which has reached serious proportions in the present day. For instance, Meghalaya generates over 500 metric tonnes of garbage daily, out of which, about 157 metric tonnes is generated only in Shillong, its capital city.

Shillong, the capital of Meghalaya is the only Class I city in the state. It has an estimated population of 143 million according to the Census 2011, constituting 24 per cent of the total urban population of

the State. Shillong is an unplanned city and have rapidly grown in size over the years, making it the 330th most populous city in India. The city is facing a serious waste management crisis attributed mainly to the unregulated and haphazard urban growth. For instance, rapid and unplanned urbanization has led to the development of slums in the urban centres of the State, and 23 slums have been identified in the Greater Shillong area. Some of the identified slums are Naspatighari (Mawbah), Polo Bazar, Demseiniong, Keating Road, Jhalupara, Paltan Bazar and Nongmynsong. Clearly, not only the problem of waste management but also the overall management, of the city that has become an issue of serious concern.

The amount of wastes generated in Shillong has rapidly increased over the years and the generation rate is about 726 gms per person per day, including a new born baby. In other words, the total amount of solid waste generated in Shillong City is about 160 metric tonnes daily, out of which, about 120 metric tonnes is disposed at the dumping ground at Marten, which is situated at the outskirts of the city. The remaining 40 metric tonnes are lying in street corners, drains and streams. The major sources of solid waste generation comprise households (56 per cent), markets (23 per cent), hotels & restaurants (7 per cent), construction waste (2 per cent), and street sweeping (7 per cent). The rates of waste generation in the city have exceeded the collection capacity of the agencies responsible for waste management.

Waste Management in Shillong

The Shillong Municipal Board (SMB) is responsible for solid waste management in the city. The Board which was constituted in 1910, is governed by the provision of the Municipal Act 1973 and subsequent amendments. A disquieting feature of the waste scenario in Meghalaya is that, waste management is being carried out only in those areas that constitute the Greater Shillong Planning Area (GSPA), and in about 38 localities that are within the purview of the urban local bodies and the Board for facilitating proper waste management practices. There is the absence of proper institutional facilities for waste management outside the area of the Shillong Municipal Board and only the traditional institutions are operating in streamlining the collection and transportation of solid waste in their respective areas.

This brings out the fact that solid waste management services in Meghalaya have failed to meet the demands and expectations of the growing population.

The inability of government agencies to cope with the increase in the volume of urban wastes has created a huge potential for business opportunities in waste management for aspiring young entrepreneurs. This has become more relevant especially with the practice of dumping of waste in open spaces, which is very common nowadays. Managing wastes in various parts of the city depends largely on the involvement of individuals and business undertakings which are part of the informal private sector in waste management operations. Hence, waste management has become a growing field that offers entrepreneurial opportunities, room for innovations and investment prospects.

Waste as a Resource

The most significant step towards maximisation of the value of waste and for its safe management is resource recovery. Resource recovery has become an important economic sector in Shillong city, but still practised on a very small scale, and remains largely unorganized. Groups of scavengers and rag pickers visit the dumping sites in the city to collect different kinds of waste materials. These are then taken to collection centres where they are sorted, cleaned and bound for manufacturing. Most of these waste materials are taken to the neighbouring state of Assam for reprocessing into a host of other products, indicating that the state gets less or no economic benefits at all. Clearly, the garbage dumps in the city are a source of raw materials for the waste processing units of Assam. Such a situation necessitates action from enterprising individuals in the state to exploit the opportunities with innovative ideas and abilities that would facilitate waste management operations in an organized manner, from the initial stage of collection, up to the final stage of manufacturing. This would result in the development of waste processing units in the state, which has otherwise remained industrially underdeveloped. Moreover, these industries would become key partners of waste management operations, thereby contributing to the overall economic health of the state.

Managing waste as a resource involve minimising the quantity of waste, both at generation and disposal stage, followed by sustainable

environmental action. This would involve coordinated efforts to adopt the three **R's** of **Reduce, Re-use and Recycling** in waste management operations thereby enabling waste management practices that are environmentally sustainable. Reducing, resuing and recycling of solid wastes, are the best ways to maximize the value of waste materials, besides reducing the amount of garbage that goes into the landfills. Scientific advancement in recycling for industrial and agricultural processes by utilising wastes has created huge entrepreneurial opportunities, besides resulting in better use of waste resources. The new and alternative building construction materials developed by using agro-industrial wastes, offers ample scope for developing new building components and will reduce the costs of building materials and construction. These opportunities need to be exploited with concerted efforts for organisation and innovative strategies to develop new products and processes that use wastes as raw materials. Such entrepreneurial activities would result in the setting up of secondary industries and in contributing to sustainable waste management and green entrepreneurship.

Moreover, solid waste generated from organic sources including municipal and urban wastes, farming wastes, horticulture wastes, domestic refuses and other agro-industrial wastes, present a huge business potential for aspiring entrepreneurs of the state. These organic wastes, which formed the basis for agro-based industries, would play a major role in transforming the agricultural scene in Meghalaya, towards making it organic, healthy and environmentally sustainable. Moreover, there is huge potential to generate clean energy from solid wastes, of which, only a small fraction has been utilized. The adoption of innovative strategies in this regard would not only contribute to efficient clean energy solutions which are cost effective and environmentally sustainable, but would also ensure effective measures to the waste management crisis in the state.

Conclusion

The challenges to provide and achieve sustainable waste management practices calls for a change in attitudes and perceptions of people towards waste generated. This necessitates that wastes must be viewed as an economic resource that can provide immense entrepreneurial opportunities, and business options that can create employment and generate income, thereby raising the standards of living of the people.

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EARTHQUAKE PREPAREDNESS WITH SPECIAL REFERENCE TO COLLEGES IN EAST KHASI HILLS DISTRICT OF MEGHALAYA

Dr. H. Iangrai

Abstract

Earthquake is one of the common natural disasters especially in a state like Meghalaya, by itself the consequences may be less fatal, but, coupled with manmade buildings the after-effects can be very detrimental to human lives. This paper is written with the objective to observe and analyze the existing level of awareness and preparedness in educational institutions, whether they are financially and professionally equipped to manage such disaster. And, also suggests certain actions which can be adopted by institutions to minimize the cost in case of an earthquake.

Keywords: Disaster preparedness, Disaster awareness, Disaster management.

Introduction

On the 19th July ,2019 at 3: 23 PM while correcting some scripts in the college, the chair I was sitting on rocks, I look around, and all was somewhat fine. The next day at 4:25 AM, lying awake on my bed, I felt the tremors again. Disturbed, I sat up and I was reminded of the experience at the National Integration Camp of National Service Scheme in New Delhi, while we were on the fourth floor the building moved like a boat from one side to another. These experiences have led to the writing of this paper.

Earthquake is a common phenomenon. Every citizen is quite aware of it. The intensity and experience differ from one to the other. Some experience building and structure collapse, courses of rivers change; some part of the land surface are raised while others are depressed. The consequences of an earthquake are numerous. News report loss, damage and sorrow. As per common experience, an earthquake though not yet a disaster it serves as an alarm that raise the level of fear and panic of a section of individuals. Psychologically, it sharpens the senses, increases the alertness and awakens the instinct.

I was told that the 1897 earthquake in the state had an indescribable impact. People who inhabited the southern slopes of Meghalaya

narrated that there was left neither strength nor wisdom. All round there was helplessness as people looked for a place of safety. The old method of lying flat over the ground did not work as the ground itself gave way. The instinct was smothered and all hope was lost. A gentleman in Upper Shillong narrated, that while he was in a cowshed, the surrounding's rolled down and he simply sought God's help. "God have mercy" was all he could say.

Thus, the aims and objectives of this paper is:

i.   To outline the nature and impact of earthquake.
ii.   To urge for an awareness of the threat of disaster
iii.   To address for a Capacity building
iv.   To voice for Preparedness to deal with any kind of disaster
v.   To ascertain readiness and prompt response by all concerned.
vi.   To have a roadmap on Rehabilitation and re-construction
vii.   To propose if the above aims and educational programme be incorporated in the collegiate educational programme.

Review of Literature on Disaster

According to the Disaster Management Act, 2005, Disaster is defined to be a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or degradation of environment,and of such a nature or magnitude as to be beyond the coping capacity of the community or the affected area. Disaster is a natural or human -caused hazard that causes 'a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources' (UNISDR).

According to Smith 1993, Mulyasari et al. 2011, the concern over natural disasters is increasing globally. It is observed that during the last two decades, loss of life and property due to disasters has increased remarkably. Disasters like floods, earthquakes, fire, etc pose serious threat to people. It is imperative to increase the knowledge and attitude of people regarding the natural and man-made disasters in order to make them able to cope up with their adverse effects. In

view of this, education on disaster risks, mitigation and preparedness strategies, as one approach is the need of the day in order to reduce the negative consequences of disasters.

In A Study on Disaster Awareness and Preparedness among College Students in District Ganderbal of Kashmir Valley, Bilal Ahmad Bhat (2017), found that there was a general lack of information among students regarding disaster awareness and preparedness. This highlights the need for disaster safety education. The level of practice was largely negative with acceptable knowledge and positive attitude regarding disaster preparedness. It was concluded that disaster never happened does not mean, it cannot happen. Students can be proving useful workforce in disaster situation. College students need to know basic strategies carried out in disaster.

According to Kelman, a graduate student advisor at the University College London (UCL), Institute for Risk & Disaster Reduction (IRDR), there are two elements of disaster risk. The first of these is vulnerability, which covers the reasons why people end up in harm's way with few choices to redress their situation. The second is hazard relating environment examples earthquakes and hurricanes. Among the topics, insurance, emergency management and gender equity; skills on statistics, group collaboration for crisis management, oral and written communication, and formulating and conducting scientific research are important. 'Typically in emergency planning, crisis communication, infectious disease management, risk analysis, re-insurance, business continuity, security management, emergency logistics, civil defense or humanitarian management' Training to be flexible, to be creative, in being able to help during the worse time of life is the call of the hour.

According to Rajib Shaw et al (2015), the Basic knowledge to risk and disaster includes (i) to reduce the risk and vulnerability. (ii) Risk management linkage among different disciplines. (iii) Development agenda. (iv) It should include not be simply academic agenda but also practical knowledge (v) to build a culture of protection. (vi) To apply technology in their daily work and on line repository of data (vii) Collaborate with real life environment. (viii) Culture of knowledge sharing. (ix) Audience analysis, identification of knowledge gaps to be address in learning programme, (x) Planning, designing, developing

and delivering the programme. (xi) Roles assigned. (xii) Logistical and pedagogical constraints (xiii) Land use. The Assessment and planning includes (a). Checklist of risk. (b). Identify factors to overcome them. (c). Passage (d) Contacts. (e). Earthquake bag (f). Review and (g) Spread of knowledge

According to Sreeja S Nair, Anil K Gupta and Swati (2013)' A paradigm shift is being identified. There was a shift from response and relief centric to mitigation and preparedness. This is driven by climate change awareness and sustainability. Environmental governance includes policies, legal and regulatory frameworks and institutional structure, and offers important opportunities for mainstreaming disaster risk reduction into environmental management, and for strengthening the environmental components of disaster risk reduction. Knowledge of environment is crucial in all stages of disaster risk management. Environmental services like shelter, water, food security, sanitation, waste management and disease control form crucial components of emergency relief.

Case Study Example

According to Petal (2015) The Kobe earthquakes with a magnitude of 7.2 in the Richter scale, and with a depth of 16km hit the city of Kobe and its surrounding areas in the Hyogo Prefecture on 17 January 1995 at 5:46 AM. The total number of casualty crossed 6,400 with numerous injuries and victims of other collateral damages. Buildings and infrastructure were severely damaged, and more than 2, 00,000 people had to find temporary shelter in different parts of the city. Within Kobe city administration area, 70,000 buildings collapsed completely and 55,000 were seriously damaged. Public facilities like offices, schools, and hospitals were also damaged extensively, which left the city services paralyzed for several days. Utility services were also interrupted; electricity service was out of order in the entire metropolitan area, 25% of the telephone services did not work, water and gas services were disrupted throughout. At several locations, severe fires broke out, and 7000 buildings were completely razed, resulting in more than 800,000 sq m of burnt areas. The damage to social and industrial capital stock was estimated at Japanese Yen 7 trillion within Kobe city. Secondary and tertiary stock losses in the

city and other parts of the province were much higher.

Immediately after the earthquake, friends, families and neighbors engaged in rescue operations. A study in the Nishi Suma area pointed out that 60% were evacuated by themselves, and approximately 10% were rescued by neighbors. The data indicates the importance of the community and neighbors in immediate rescue operations. The main reasons for effectiveness of local people in rescue operations appeared are (1) information and knowledge of the community (2) leadership within the informal and formal community organizations (3) availability of small tools for rescue operation such as saws and crossbars "

Definition of Earthquake

Earthquake is an abrupt movement inside the earth matter, which pushes, stresses and deforms rocks. The push can break, shift and transform rock material. It is also the release of energy in the form of vibrations called seismic waves. The important terms used in earthquake are Focus (where the earthquake begins), epicenter (directly above the focus), magnitude (seismic waves) amplitude (size of the waves).

G Tyler Miller & Scott E Spoolman, 1960 classified earthquake as:

Classification	Richter scale
Insignificant	Below 4.
Minor	4 – 4.9
Damaging	5 – 5.9
Destructive	6 – 6.9
Major	7 – 7.9
Great	8 and above

Source: "Environmental Science 14th edition) by G Tyler Miller & Scott E Spoolman, Cenbgage Learning India Pvt, Ltd, New Delhi, 1960, p 258.

Earthquake in Meghalaya

The common natural disasters in the State are incessant rainfall, flash floods (in low lying areas), hailstorms, earthquakes and landslides. The major disaster caused by earthquakes took place in the year 1897.

Meghalaya experienced the Great Earthquake on the 12th of June, 1897. It occurred on the northern edge of the Shillong Plateau. The calculated area of slip extended 180 km along strike and from 9 to 45 kms below the surface. The earthquake in Shillong plateau thrust violently upward by about 11 meters. The fault was about 110 kms in length while the fault slip was about 18 m. In Shillong, the earthquake damaged every stone house and half the houses built of wood. The shock leveled the ground and resulted in 13 deaths. The fissure was also reported in the area. In Sohra, a landslide which led to 600 deaths (*Source Google: the Assam Earthquake of 1897*)

In Meghalaya, seismicity is high. Current seismicity is related to activity on faults. The country has been divided into four zones as per the seismic zoning map of India now Meghalaya falls in Zone V. the State has suffered numerous earthquake of varying magnitude. Past records as provided by Geological survery of India (GSI has reported high magnitude of intensity 8.7. The Great Assam Earthquake (1897) had a severe impact due to poor building construction, poor socio economic condition, poor literacy and education and poor communication (Source: Meghalaya State Disaster Management Plan, 2012" Department of Revenue and Disaster Management Govt of Meghalaya)

A record of past Earthquakes in and near Meghalaya State is as follows:

Location		Date	Magnitude	Source
Lat	*Long*			
26.00	91.00	12.6.1897	8.7	GFR
24.50	91.00	8.7.1918	7.6	ABE
25.25	91.00	9.9.1923	7.1	ABE
25.00	94.00	22.9.1930	6.3	GR
25.50	92.50	6.3.1932	5.6	ABE
26.50	92.00	9.11.1932	5.6	GR
26.00	90.50	6.3.1933	5.6	GR
26.00	91.00	13.4.1938	5.7	ISS
26.50	92.50	27.1.1941	6.5	GR
27.00	92.00	21.1.1941	6.7	GR
27.50	93.00	22.5.1941	5.6	GR

26.00	93.00	23.10.1943	7.2	ABE
26.80	95.00	26.8.1950	6	ISS
24.50	95.25	21.3.1954	7.4	ISS
25.20	90.80	14.3.1956	5	ISS
25.42	95.03	28.5.1957	5.8	ISS
25.00	90.50	9.2.1958	5	CGS
25.70	94.76	9.4.1959	5.1	ISS
27.00	93.00	26.5.1960	5	CGS
26.47	90.38	29.7.1960	5.5	ISS
25.13	92.00	21.6.1963	5.7	ISS
27.12	92.26	1.9.1964	5.5	ISC
27.52	90.17	13.4.1964	5.2	ISC
27.40	91.18	18.2.1964	5.6	ISC
24.97	94.21	18.2.1965	5.4	ISC
24.94	93.67	9.6.1965	5.2	ISC
27.43	92.51	9.12.1965	5.2	ISC
27.49	92.61	26.9.1966	5.4	ISC
27.42	91.86	15.9.1967	5.8	ISC
26.42	90.62	18.8.1968	5.1	ISC
26.93	92.71	30.6.1969	5	ISC
26.41	93.15	17.7.1971	5.1	ISC
25.17	94.73	29.12.1971	5.6	ISC
27.49	92.60	4.7.1973	5.2	ISC
26.51	93.00	13.11.1977	5.1	ISC
25.88	90.31	6.7.1982	5	ISC
25.38	91.46	31.8.1982	5	ISC
26.90	92.87	2.2.1983	5.2	ISC
25.04	94.67	30.8.1983	5.7	ISC
26.76	93.30	21.3.1984	5	ISC
26.49	92.15	22.9.1984	5.2	ISC
25.44	91.51	30.9.1984	5	ISC
27.11	92.52	12.10.1985	5.3	ISC

25.10	91.13	19.2.1986	5.3	ISC
25.38	92.14	10.9.1986	5.3	ISC
26.47	92.91	31.12.1986	5.1	ISC
27.14	91.96	7.1.1985	5.4	ISC
26.64	93.41	6.9.1987	5.2	ISC
26.93	92.77	8.3.1989	5.1	ISC
25.15	94.66	3.4.1989	5.3	ISC
26.58	92.67	2.9.1990	5.2	ISC
25.51	91.17	2.2.1991	5	ISC
25.80	94.70	11.3.1991	5	ISC
26.59	93.19	23.6.1991	5.4	ISC
25.48	91.39	12.12.1992	5	ISC
26.56	92.48	19.8.2009	5.1	USGS
27.30	91.50	21.9.2009	6.1	USGS

Source: Geological Survey of India (GSI) Earthquake Geology Division, North Eastern Region, Shillong in Meghalaya State Disaster Management Plan, 2012" Department of Revenue and Disaster Management Govt of Meghalaya)

Preliminary locations of Earthquake during 2019

*05-*0722:27:4603:57:46/2019-05-0825.5°N91.2°E103.0Distt-West Khasi Hills, Meghalaya
2019-03-2114:30:5420:00:5425.8°N90.8°E104.7East Garo Hills, Meghalaya
2019-01-721:28:1802:58:18/2019-01-2825.3°N92.5°E53.5Jaintia Hills, Meghalaya

From the above, it is a universal fact that earthquake visit our land from time to time, and varies in the level of magnitude. However, it may be hypothesized that the experience speaks loud and clear. It is also proved that it is not within human prediction with regard to time and magnitude.

Impact of the 1897 earthquake on educational institutions

R*ecords have shown the impact of earthquake on educational institutions as follows:*

(i) According to Hamlet Bareh (1996), the historical background of Middle English schools were established during the final quarter of the last century. The Nongsawlia M.E. now Cherra Presbyterian High

School evidently the first school established. The Mission Minor M.E School which functioned since 1878-1880 was the second, it became known later as Mission M. E. School, Girls' section was added in Nongsawlia M.E School a decade before the earthquake of 1897. Laitumkhrah M.E School started at the close of the last century. To our best knowledge, it was started a few years before the earthquake of 1897. Till date, the site of its location was shifted four times, from Upland Road to Police Point, thence to Lum Mawrie and finally to its present site on of the Laitumkhrah Main Road).

*The number of graduates was rising gradually. The first graduates came out in 1898. In 1905, five persons took their graduation degrees from the Calcutta University, the Vice Chancellor of Calcutta University being impressed by the number of graduates. T*he number however shows that the number of graduates during the Great Earthquake of 1897 were very few.

(ii) According to Dkhar (2010)the Rev J.J.M Nichols Roy, a talented and gifted man, who, by sheer dint of merit and ability, rose from a very humble position to be the able leader in the district along with his brother Prof. R. R. Thomas, and Rai Bahadur Dohori Ropmay, attempted to revive and re-establish the High School ruined by the great earthquake of 1897. The people in their pride and meanness met their request with disgraceful insults and mockery. (p48)

Further Dkhar 2010 the school at Nongwar (old) was cruelly destroyed in the great earthquake of 1897 and in the same year, the whole town was removed to Nongwar (present site) and a beautiful Mission school sprang up there which remains to this day. (p60)

Level of awareness and preparedness in colleges in East Khasi Hills

East Khasi Hills District is one of the eleven districts of the State of Meghalaya**.** Meghalaya, the 21st State of India was born on the 21st of January 1972. It occupies an area of about 22,429 sq kms and between 24*57' and 26*10' Latitudes North and 89*46 and 92.53' Longitude East. It is connected by road through Assam to the mainland of India. The population is 29, 64,007 as per 2011 Census.

Colleges: the number of colleges in the State is 76 and they are distributed as follows

District	Population	Government	Deficit	Ad-hoc	Lump sum	Privately financed
East Khasi Hills	824059	1	10	1	2	4
West Khasi Hills	294115		1	1		
South west khasi Hills	110152			1		4
West Garo Hills	518390	2	1	2	1	
West Jaintia Hills	270352	1		1	1	4
Ri Bhoi Disrict	258840	1 (Central)	2			3
south Garo Hills	142574	1 (State)				1
South west Garo Hills	…			1	1	
North Garo Hills	118325		1			
East Garo Hills	132257	1				2
East Jaintia Hills	122436		1		1	
Total	2964007	6	15	7	7	18

Colleges in East Khasi Hills: Altogether there are seventy six colleges in Meghalaya and 35 of them are in East Khasi Hills District. They are Sohra Government College, St Anthony's College, St Edmund's College, St Mary's College, Lady Keane College, Sankardev College, Shillong College, Shillong Commerce College, Synod College, CTE (PGT) College, Seng Khasi College, Bormanik College, Women College, St Mary's CTE College, Nabon Synod College, Bissau College, Iaikyntiew College, Good will College, Mawsynram Border Area College, Mawlai Presbyterian College, St. Peter College, K.L. Bajoria College, Savio Evening College, Shillong Law College, B.B.S College,

Raid Laban College, Umshyrpi College, Morningstar College, St. Dominic College, Khrawsing Christian College, Greater Mawlai College, Meribon Memorial College, NEIGRIHMS (MBBS), NEIGRIHMS (Nursing), and Ri War College. Alpine College and Christian Academy College have been de-affiliated. All the colleges are affiliated under NEHU and the Government has an important role in administration and funding.

A.　**Structural audit as Criteria of affiliation**: All the colleges in the State are affiliated to the North Eastern Hill University. One of the criterias for granting affiliation is to see that construction work like Hostel, classroom and other constructions should be structural audited. NEHU, in its Ordinance (May 2010) has recommended that an Engineer above the rank of Junior Engineer should be a member of the Inspection team. The University Grants Commission (2009) provides that Central/ State Public Work Department engineers should be engaged in construction works of buildings like Colleges, hostels, universities etc. However, the issue here is whether all college have conducted a structural audit, and if so, whether the report reflects the true picture.

B.　**Disaster Management Fund**: Fund to deal with disaster related subject is very important. According to the High Powered Committee on Disaster Management (2001) it is recommended that at least 10 per cent of plan funds should be earmarked for schemes which specifically addresses preparedness, prevention and mitigation of disaster. It may be hypothesized that the disaster management fund would be allocated in government and government aided institutions. However, no such report is made known if such disaster management funds are maintained and improved. It may be suggested that this practice should be mandatory by all educational institutions.

Similar criteria should be observed in Government and Private Universities. It may be worth mentioning that the Universities in East Khasi Hills are North Eastern Hills University, Rajiv Gandhi Indian Institute of Management, University of English and Foreign languages, National institute of Technology, Indira Gandhi National Open University all are Central Universities;

whereas Martin Luther Christian University, William Carey University, ICFAI, and UTM/MIT are private universities. Techno Global University is yet to function. Other important Institutes are National Institute of Fashion Technology and Institute of Hotel Management.

C. **Disaster Management & Administrative system:** Each and every institution, and colleges in particular, should have basic knowledge of the administrative structure dealing with disaster related issues. Its structure may be presented as:

Sl. No	Levels	Bodies/ Organizations/ Department
1	National	National institute of disaster management (NIDM), re-designated as centre for disaster management (NCDM, New Delhi.
2	State	Revenue and Disaster Management Department & State administrative training institutes.
3	District	District Revenue and Management, with Deputy Commissioner as its Chairman
4	Civil Division	Sub Divisional Revenue and Disaster Development Committee under the Chairmanship of the Sub Divisional Officer
5	Block	Block Disaster Management Committee under the Chairmanship of the Block Development Officer
6	Locality	Village Disaster Management and Development Committee under the Chairmanship of the Headman
7	Institu-tional	Disaster Management Committee under the chairmanship of the Head of Institution

D. **General information in case of earthquake:** As far as an educational institution is concerned, and particularly the Principal of the College, the following basic information should be kept in mind. They are

a **Police Station**: Altogether there are 45 Police outposts or check posts and 10 Beat House and 41 Police Stations. The names of the Police Station in East Khasi Hills are Shillong Sardar, Laban, Mawlai, Lumdiengjri, Rynjah, Madanryting, Sohra, Mawsynram, Pynursla, Mawryngkneng and Shella. The Beat House in East Khasi Hillsa are Pastuer, Cantonment, Kench

trace, and Nonghymmai. The main outpost/checkposts are Nongmynson, Mawdiangdiang, Jhalupara, Sohryngkham, Mawngap, Balat, Bholaganj and Tyllap in the State

b. **Fire station**: The main Fire stations /sub fire stations in East Khasi Hils and their contact numbers are Shillong Fire service (2227000/2223300), Barabazar Sub Fire service (2222000), Mawlai Sub Fire service (2546875), Upper Shillong Fire Service (2560327) and Cherrapunjee (2235261).

c. **Education and Training:** Education and Training in the field of disaster activities which include awareness programmes, demonstrations, mock drills etc for college student. These are being carried out by the Civil Defence and Home Guards. The organizational structure includes – Director General, Joint Director, Senior Staff Office, Commandant of Central Training Institute, which is the Nodal Training Insitute for Search, Rescue and Medical First aids. , Commander of Border Wing Home Guards Battalion, District Home Guards Commandants, Deputy Director and Deputy Controller.

d. **Health centre**: Altogether there are 11 hospitals run by the State Government, 24 Community Health Centres and 92 Primary Health Centres. The Hospitals in East Khasi GHills are Ganesh Das Hospital, Civil Hospital, R P Chest Hospital. The Coomunity Helath Centres are Mawiong CHC, Sohra CHC, Ichamati CHC, Mawsynram CHC, Sohiong CHC, and Pynursla CHC. The Primary health Centres are Diengiei PHC, Mawroh PHC, Pomlum PHC, Laitkynsew PHC, Shella PHC, Mawsahew PHC, Sohbar PHC, Mawlong PHC, Dangar PHC, Ryngku PHC, Nongspung PHC, Mawphlang PHC, Pongtung PHC, Wahsherkhmut PHC, Swer PHC, Laitlyngkot PHC, Smit PHC Diengpasoh PHC, Mawsynram PHC and Jatah PHC.

The Hospital run by the Central Government is the North Eastern Indira Gandhi Regional Institute for Health and Medical sciences (NEIGRIHMS). It is an important hospital serving the medical and

needs of the entire region and the country. There is also a Military Hospital in the heart of the city. The hospitals run by private agencies are Nazareth hospital, Bethany Hospital, Woodland Hospital, Super Care Hospitals and the Gordon Robert Hospital

Observation and recommendation

It is a known fact that the region is on the earthquake belt. **A**s per survey conducted by the Investigator who was also the Nodal Officer, Disaster Management, Directorate of Higher and Technical Education (2012-13), the following are observed:

Higher Educational Institutions:

a. University: Except William Carey University, no response has been received from the Higher Educational Institutions on the setting up of Disaster Management Team and management Disaster Management Plan and programme. Hence, it is highly recommended that Institutions consider their plans and have teams which are trained and equipped on the area of Disaster Management.

b. Colleges: Thirty two colleges were found in East Khasi Hills (2012-13) out of which

   i. 9.38% responded they had the Disaster Management team.

   ii. 6.25% responded had some of their staff trained

   iii. 9.38% responded they had some equipment like TV, Radio, generator, Debris equipment,

   iv. Only 3.12% had their rooms retrofitted

Source: Preparation of Plan and SOP for Disaster Management complied and reported by H. Iangrai. Nodal officer for Disaster Management, Directorate of Higher and technical education, Meghalaya, 2012-2013

Generally, the School Disaster Management Plan suggested constitution of different committees like Awareness Generation team, Warning and Information Dissemination team, Evacuation team, Search and Rescue Team, First Aid team, Water and Sanitation team, Shelter Management team, Trauma Counseling, Site Safety team, Fire Safety team, Bus and Transport safety team etc in each institution. But as per findings of the Investigator, very few institutions had constituted such teams. However, the question of functionalities of the teams is yet to be ascertained.

General observation

Some of the important observationswhich need utmost emphasis are:

1. **Administrative function:** It may be mentioned that the Directorate of Higher and Technical Education, Government of Meghalaya is the administrative set up at the State, which look into all higher and technical institutions. There is a lack of attention on the subject of disaster management. It may be mentioned and call upon the State machinery to supervise and monitor the higher educational institutions from time to time. Institutional reports on disaster management programmes, as well as its preparedness needs to be analyzed by this office and, at the same time appropriate suggestions or remedial measures are to be taken.

    The Directorate should also effectively serve as a coordinating agency so that necessary intervention can be taken by specialized agencies.

2. **Affiliating University:** North Eastern Hills University affiliates colleges in the State. It provides and is responsible academic matters**.** It also takeaccounts on co-curricular aspects. There is no regular programme on disaster nor any credit or recognition on education and training on disaster matters. It is high time that the affiliating University considers life skills by introducing/ incorporating minimum and regular programme on disaster for all its stakeholders.

3. **Institutional level:** In the same way,it is observed that no formal and regular programmes are being conducted in colleges in the District and the State. It is heartening to see that other agencies such as the Meghalaya AIDS Control Society have taken the responsibility to educate on HIV/AIDS. National Service Scheme concentrate on their social activities; National Cadet Corps are responsible for their enrolled cadets and so on.In view of this, colleges should find ways and means to educate their students about disaster related issues. It may therefore be suggested that the Heads of Institutions should see that students are aware and equipped with necessary skills

related to general disasters and particularly earthquakes. It is better if a regular programme is chalked out.

Further, there is a need for some contents on Disaster and its knowhow. It can be seen that there is lack of skill and knowledge about the basic skills of life. As almost every student is skilled in the use of mobile phones and internet, so can they be skilled in saving their own lives and that of others. Certificate or diplomas Courses on Disaster Management and be worked out and offered to students of higher educational institutions.

4. **Record:** It was found that there was a lack of proper maintenance of records in the concerned departments like Hospital, Police, disaster response force, etc, and, also open space, ambulances, trained personnel from within and outside the State, health workers, rescue team, and so on. Hence, institutions should have a list of all agencies, tools and materials required and they should be made available to take up the challenge in case of any emergency.

5. **Accountability:** As it is, there is no proper accountability taken up by any authorities in matters related to disasters including earthquake. A checklist of all concerned departments and agencies responsible in case of disaster and a disaster management plan has to circulate to all institutions, and a regular review on preparedness has to be conducted from time to time.

Other Recommendations

1. That all educational institutions including colleges and universities should have a large area of land for building as well as an open space.

2. That school building should be constructed as per scientific requirement of disaster management viz., earthquake proof, retrofitted room, free exit points, open space, etc. High rise buildings should be properly checked and discouraged.

3. All buildings or structure should be thoroughly examined and duly condemned or approved by technical and appropriate department.

4. That disaster awareness and training should be properly and regularly organized. Specific course may be designed at all levels on the area of disaster management.

5. That training on disaster management should be extended and conducted for teaching and non teaching staff by the trained personnel in their respective institutions and the school authorities assign responsibilities accordingly and that that each and every student should acquire basic knowledge and skill relating disaster issues in their respective institution, and then some of them may be put into leadership in different disaster management team.

6. That each and every institution should keep ready essential items and materials, equipments, first aid, and such services in their respective institutions.

7. That there should be meetings and networking which include contact numbers of related departments like State disaster rescue force, Health, social welfare, Public Health engineering, Public Work Department, Police department, ambulance services of some Non-Governmental organizations, as well as key staff or officers.

8. That a special fund for disaster related issues should be allocated and improved.

9. That disaster programme should be a part of the co curricular activity and authorities should allot specific credit

10. That all individuals and institutions should cooperate to eradicate ignorance and build up knowledge and capacity as an extension programme.

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GENDER STUDIES AND RESEARCH: SOME REFLECTIONS ON ITS RELEVANCE IN HIGHER EDUCATION

Dr. Rekha M. Shangpliang

Abstract

We live in a deeply gendered society where work ,family and other major areas of life are organised by categorizing people into 'men'and 'women', 'boys' and 'girls', 'males' and 'females',assigning them to well defined roles and attributes. However, it is only through human perception that we construct such a gendered social order, leading one to believe that such gendered attributes and differences are but 'natural'. The educational system through a well defined curriculum, can be a useful means of sensitizing our young minds on the problems of gender disparity.In a larger context,it is time the Indian academic curriculum makes space for incorporating courses on gender which will help both teachers and students to engage on gender issues in a more effective manner.

This paper examines the challenges of teaching courses on gender as part of a Social Science curriculum in Indian colleges and Universities.Taking a Sociological stance, it stresses on the importance of introducing the feminist pedagogy in social sciences, while teaching gender related courses in this present environment. "Gender"can be incorporated as one of the variables of study addressing key issues such as violence against women,gender disparity at work,intersections of caste and gender, women's liberation, women'smovements, Human rights,etc. Such specialised courses can encourage both male and female students as active learners and the classroom as an interactive environment to promote gender sensitization.At length, the paper aims to explore the possibilities of eliminating marginalization of women,lack of gender sensitivity at the rudimentary level to young scholars, thereby extending the horizon of human knowledge into parameters of social justice.

Keywords: Gender,Specialised Course,Feminist pedagogy, Gender sensitization

Introduction

The concept of gender ,as we now use it, came into common parlance during the early 1970's.(Pilcher and Whelehan 2004: 56)Earlier, gender used to be seen as an analytical category to draw a distinction between 'maleness' and 'femaleness', in other words, what we would describe as 'masculine characteristics' and 'feminine characteristics', 'man' and 'woman', 'girl' and 'boy', clearly demarcating between biological sex differences and behaviour. In simple terms, something is gendered when its character is either masculine or feminine, or when it exhibits patterns of difference by gender. Pink and blue, for example, are gendered colours, the former regarded as feminine and the latter as masculine.Paid work is a gendered institution ,in that women and men undertake different forms and types of paid work (women in nursing and men in construction).(Pilcher and Whelehan 2004: 59).Even children, as early as pre-school age, begin to behave and organize themselves in gendered ways when they play games and toys.Surely ,the Barbie girl vs. G.I Joe figures have evolved as powerful symbols of 'girlie' and 'macho' banners for little girls and boys.(Lorber and Moore 2007: 65).But in a modern industrial society, such differences on the basis of biological ,psychological and genetic criteria hardly have any significance, considering the fact that today, a woman's role as 'mother' and 'housewife' (reproductive function) no longer binds or confines her to strictly adhere to only feminine roles, be it in the domestic sphere, workplace or social relationships. This was the assumption that effectively paved the way for the growth of feminism during the 18th century. Simone de Beauvoir ,who occupies a unique place among feminist theorists had explored this distinction in her pioneering work, *The Second Sex* which was first published in 1949 in French with her bold statement '***One is not born but becomes a woman'*** (de Beauvior 1972: 295).Since then, the contemporary women's movement began to receive worldwide attention, and terms like 'feminism', and 'women's liberation' were used synonymously with 'new feminism' to describe all activities and discussions devoted to the resolution of women's problems.

The Beginning of Gender Studies

As an area,gender has a wide applicability in the world beyond the academia, its effects on society continuously changing the way people think about themselves. However, it is not an easy task to trace the origin of gender studies in academics ,since one has to first relate to what is commonly referred to as the 'wave analogy'.This analogy is a helpful guide in charting out historical movement through stages and periods in history, thereby locating the development of gender as a variable in many academic disciplines.The academic study of gender has a relatively short history.Its emergence can be dated as recently as the late 1960's ,and its development triggered by second wave feminism.(Pilcher and Whelehan 2004: 9).Prior to this, there was an invisibility of women in many academic disciplines in Social Sciences in general, and Sociology in particular. Therefore, there was an urgent need to encourage the growth of feminist knowledge by drawing attention to pressing women's issues, such as paid work, household chores, multiple roles of motherhood and domestic violence.By the late1960's and early 70's, there was a flood of literature on women's studies in UK and the US. Thus, women's studies as a discrete area of study was born, even though the early days were characterized by a huge rush of energy, where such courses began to be taught ,quite spontaneously and without substantial prior organization ,at many US colleges and Universities beginning in 1969'.(Tobias 1978 :86)

It is said that the second wave feminism gave a new impetus to feminist social thought in that it gave feminism a 'new radical touch', acquiring a new brand of women's liberation movement – a movement against the oppressiveness of a patriarchally defined society (To signify all activities and discussions devoted to the resolution of women's problems).Whatever be the identity of women studies in the first wave or second wave, one thing is certain ,that is, women were slowly recognised as worthy of being studied in their own right.This also brought out the interdisciplinary nature of women's studies that came to acquire a place mainly within the disciplines of English, History and Sociology rather than the Physical Sciences.One cannot date the exact beginning of the first or second wave of gender studies nor debate on the domination of one wave over another,however the takeover by

modern feminist perspective, or the so called third wave has surely awakened popular consciousness with much stronger feminist energy. It is also clear that the third wave activism has moved the debate into a new territory. It is important however, to accept that our 'memories' of those events are structured or given meaning by the whole raft of feminist theory which succeeded it. As Linda Nicholson remarks, 'something happened in the 1960's in ways of thinking about gender that continues to shape public and private life'

Issues Before Us

1. Locating the course within the discipline of Sociology

Knowledge about gender can be understood from various perspectives and therefore it would be wrong to presume that it is only the discipline of Sociology that can offer the most vantage points from which gender can be understood. Sociology does not provide the only access to the social world, although sociologists have had a lot to say and contribute to the literature on gender. In fact, social research has for long been interested in incorporating 'gender' as one of the many sociological variables under study. Understanding the fact that gender is a mutilayered concept that cannot be understood at the individual level,Sociology takes a stance by looking at gender through its impact on social relations and interactions,identities and most importantly to the social processes of inequality.Of late, many recent developments in this area has led sociologists to venture into relations between gender and stratification, age, race or ethnicity,-sexual orientation and intersections between race,class and gender. (Wharton 2005 ; 5)However, it would not be an easy task to suggest what would be the most dominant rule of sociological method in formulating women's studies. Feminist scholars have already started examining women's issues from a sociological standpoint. Citing the example of Dorothy Smith who, as a 'standpoint theorist', attempted to work on struggles of women to provide a less biased ,less defensive ,less perverse and most of all, a more equal understanding of human relations.(Aparna Rayaprol:66),Standpoint feminists argue that the theoretical perspectives offered by them and the methods they use to analyze society are from the perspective of the "subjugated gender" (Smith 1974;Hattsock 1983;Rose 1983)

One can co-relate this approach with Marxist theory of class differentiation, in which, the "subjugated class" of proletariats are marginalized and alienated from society. Women's experiences can thus be seen as useful agents in generating knowledge about their problems and in the long run, work towards understanding human emancipation. The 'subjugated gender' cannot be seen as part of a binary opposition with the other gender, but it should be seen, as Smith insists, within the 'relations of ruling' of particular contexts. The standpoint is not always that women are opposed to men, but there are multiple standpoints in the form of caste, class, race, gender, religion etc. which are peculiar to women in particular.

2. Feminist Pedagogy (Innovative part of the subject)

To start a course on gender, the first important task to tackle would be to define its pedagogical contents which would be able to address issues like: women's emancipation, raising gender consciousness, gender justice and overcoming oppressions and, teaching and learning as a reflexive process.

a. **Women's emancipation**: The historical development of feminism(especially in Britain and USA) which emerged as early as 1920's, passed through a series of stages and led to the growth of feminist thought and mobilization paving the way for radical movement for women's liberation in the 1960's. At that time, the principal concern of women's movement was the attainment of equal rights with men and to bring legislative changes .Women's emancipation got a further impetus in 1792 in London with the publication of 'Vindication of the rights of Women' by Mary Wollstonecraft which reveals an urge, or rather a remedy to improve women's lot through women's right to education. This was followed by 'suffragist feminism' which sought to remove all barriers in the path of perfect freedom for women as human beings.

The years from 1930 to 1960 has been described as the period of the 'counter revolution' during which, women addressed issues that centred on the role of women in the home and their multiple roles as mothers. They however continued to fight for equal guardianship of children, opening of legal profession

to women,equal pay,equal standards of morality and widow's pension plan.(Banks 1981 : 163-64)Therefore, introducing students to gender studies exposes them to different schools and perspectives of women's movements and in the long run, would try and bring a connection between theory, action and research. Women's emancipation has indeed come a long way through different stages and has encountered various type of resistances.

b. **Raising Gender consciousness**: At a more matured stage, gender studies should be able to address issues related to domestic violence, racism, human rights,lesbianism,transgender, feminist politics and intersections of caste and gender which will create a more gender-sensitive pedagogy in the academic scenario. Ultimately, the aim of introducing the course should be a synthesis of teaching,learning,reading and experiential realities.

c. **Method of teaching and learning as a reflexive process**: A discussion on gender issues in a classroom situation should create a conducive environment of self –reflexivity based on real life experiences that go beyond the pages of a book or history.Such a course should be able to evoke healthy discussions and debates on gender issues which would give students a chance to open up and relate the personal with the social. .To cite an example of the experiences narrated by Aparna Rayaprol during her teaching a course on gender at University of Hyderabad ,she mentions how the intersections of caste and gender plays a vital role in the analysis of social issues and as teachers, we must be able to deal with these issues without conflating them. The Dalit woman who has to fetch water from a long distance overcoming obstacles like terrible road and sanitation conditions, as well as the potential rapist lurking behind some bush. She has to fetch water from a distant well only because she is a Dalit woman and her husband will not do that chore. One cannot underplay either the caste or the gender identity in this example.

Challenges of teaching gender

1. **Ghettoization or Integration**: There has been an on-going debate between integration and ghettoization since 1980's which tried to sought the outcome of introducing a particular course as a discrete course or mainstreaming it with other disciplines. Therefore, it would be pertinent to discuss here the pros and cons of introducing gender as a specialized course or incorporate it in other disciplines. This has been a concern not only of academicians, but also of Feminists who have been asking questions about the purpose of teaching gender in our institutions .By ghettoizing gender as a separate course, it might be confined to a smaller audience and miss out on important issues of concern. Whereas mainstreaming it would connect to a larger audience, and reach out to a larger section of students from varied disciplines.This again poses a challenge to those teaching the course,forexample regarding issues of patriarchy which has become a part and parcel of Hindu cultural values, most students would feel perplexed about the existence of deep gender hierarchies and inequalities in a patriarchal /patrilineal society.

2. **Select audience**: The common misconception that 'gender' is a women oriented subject may attract a select audience of only girl students, therefore, there is an urgent need to encourage an equally balanced environment in teaching the course. Male students can be active participants in a classroom on gender courses which would generate useful discussions and debates about issues like gender justice, women empowerment and oppressions.

3. Gender Studies have not been sufficiently mainstreamed in any discipline, although gender as a variable has started to gain prominence. There is an urgent need to include 'women' in the research agendas so as to give due recognition to contributions made by women in historical and social situations and thereby, give way to an understanding of 'Indian women'.

Why Study Gender?

A major premise concerning the introduction of courses on gender is its relevance in social life. Gender is one of the organizing principles of the social world, it organizes our identities and self-concepts, structures and our interactions. (Wharton 2005: 9)To understand why gender studies are important, we can draw the following three gender frameworks:

Firstly, studies on gender are important in shaping the identities and behavioural dispositions of individuals in relation to the social world. While the modern world exposes us to various identities, gender identity may be among the most influencial in shaping the standards people hold for themselves.(Wharton 2005: 9)

Secondly, studies on gender facilitates social interactions in a more effective way. As Ridgeway (1997: 219) observes: "It is striking that people are nearly incapable of interacting with one another when they cannot guess the other's sex." Thus, it becomes important to know the gender identity of the other, while interacting with them.

Finally, gender organizes social institutions. Thus social institutions such as family, marriage, kinship, polity, religion, education etc. can be seen as a system of "rules" which vary according to the degree to which they are gendered. Each social institution reinforces different gender meanings.

Conclusion

In keeping with the needs of changing times, the educational scenario of today faces the challenge of a more experiential education directly connected to the social world in which we live. The incorporation of gender courses as part of the social science curriculum in Indian colleges and Universities is an innovative approach of bringing out to the fore, issues of gender in a more reflexive way by involving students both male and female, in classroom discussions, and projecting the teacher as a role-model and a leader to enable the students to empower themselves. From what may seem to be a recent development ,there has been what we call "A Gender Mainstreaming Approach" adopted by one thing is certain that gender issues can safely be incorporated into the wide ranging courses that our colleges and universities are offering. It might even cross the border line of social sciences and

humanities to reach out to a larger audience in the realm of hard sciences, business management and even computer sciences. Even at the level of state institutions such as police academies, and other training institutes, 'gender sensitization packages' have already been introduced .It is therefore the role of the teacher ,as an educator, facilitator and counsellor to make use of the space and slowly make visible the intersections of gender, with caste, class, race ,ethnicity ,human rights etc. so that it would allow a more advanced democratic creation of knowledge, making the classroom a platform for engaging useful discussions.

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THE STATUS AND ROLE OF WOMEN IN KHASI MATRILINEAL SYSTEM

Donna Clarissa Syiem

Abstract

Different societies follow different principles of descent and consequently have different system of kinship. Studies on system of kinship have shown that one needs to understand the interpersonal social relationship in actual interactional situations. This paper will therefore highlight the Khasi Matrilineal system and the role of women in the Khasi social structure. The paper will also examine and depict the traditional role of men at the level of the Iing(family), clan and society.

Changes have been coming in the Khasi society over a period of time. Social change which is an ever present phenomenon in a society becomes all the more important. In view of the above, this paper will also make an attempt to understand the changing role of women in the present day context. Therefore, this paper aims to promote an academic platform for discourse to understand the empirical reality of the role of women in the present day context.

Keywords: Matrilineal System, Women, Status, Role, Change

Sociologist ,and Anthropologists have been interested in the study of tribal society and the role of women because of the issues that have come to the fore in recent years. Many writings on matrilineal society have focused on the power structure and authority of women which is different from the patrilineal system.There has been many opinions expressed by authors on the changes that have taken place in the Khasi matriliny.

This paper gives an insight and examines the status and role of women in the Khasi matrilineal society of Meghalaya. Further the paper also attempts to address the changes that are taking place in the present day Khasi society in which the position and status of women are affected by modernization and influence of Christian ideology. In this context, the paper also reflect on the role of man in Khasi society and also examine how far the forces of change have an effect on the Khasi social structure.

The major matrilineal zones in India are the Nayans of Kerela and the Khasi and Garo of Meghalaya. The Khasi of Meghalaya are a matrilineal tribe, tracing their lineage from the mother.On the basis of descent, one traces one's descent only from one line i.e., either from the male or female line. A family where the line of descent is traced from the male or father side is called as "Patrilineal" descent and a family where the line of descent is traced from the female or mother's side is known as "matrilineal" descent. In a matrilineal descent, only the children of the female of the family can become members of the family. Property is transmitted through the female only. In patrilineal society, rules of descent is strictly on male line. The children will acquire membership in father's clan group.

Khasi Matrilineal System

A very unique feature of the Khasi society is the matrilineal principle of descent, succession and inheritance. Many of the clans traced their descent from an old ancestress who is known as *Ka Iawbei Tynrai* literally, grandmother of the root. Descent is traced from the mother, since the mother is the perpetrator of the clan name. Every individual belongs to a particular clan, traced from a mother. Therefore the popular saying "*Long jait naka kynthei*" meaning from the woman sprang the clan or, from the woman one traces one's clan. Therefore, 'Matriliny helps the Khasis understand the concept of consanguinity and identify their own blood relatives, precisely because all matrilineal groups consider themselves bound by blood' (Kharkrang, 2012:87).

The '*ku*r'(clan) is the first social entity of the Khasi social structure where each and every institution revolves, such as religion, marriage, family and social life. Religion plays a very important role among the Khasi. Participation in family religion and the disposal of a dead member are the two important events that bind the Khasi family together. Women in Khasi society has respect, protection and enjoy special status. She is the priestess of the house.

As nurturer of the family line, Khasi women have a significant role in the domestic sphere (*iing*). The youngest daughter (*ka khadduh*) in a Khasi family is in charge of the family religion. She is entrusted to take care of her parents during their lifetime and to fulfill funeral obligations at the time of their death, and she has to complete the necessary rites i.e. to enter their bones in the common sephulcre(*mawbah*).

The role of the Khasi women(*khadduh*) as a family priestess, as the Khasi say, the woman holds the religion (*ka kynthei ka bat iakaniam*) which means that she is the keeper and caretaker of the family religion. She makes the necessary preparation for the rituals and initiates them but only under her mother's brother guidance or maternal uncle who takes the role of the family priest(*U Suidnia*).

She inherits the family house (*Ka iingseng*), family property, family jewellery and the greater part of what the house contains. Because the house is a place where the family worships, the youngest daughter becomes its custodian, but she cannot regard it as her property as she cannot sell it or mortgage it without the unanimous consent of her sisters, brothers and uncles. So long as she continues to lead the family in worship, she is in charge of the house and the property.

While women are central to the family in Khasi ideology, they need to be protected and guarded by men. Just as the woman's role in reproduction and nurturance favours the mother, a man's physiological strength, according to the Khasi, gives him authority over women. The saying "men have twelve strength"(*u rang khatarbor*) highlights man's superior power and confers on him the role of the protector and the provider(*u nongbsa u nongbtiah*) vis-à-vis the women who is the nurturer and the holder(*ka nongbet kanonglum*).

The position of women in Khasi society becomes clear when we examine the role of the man as a father to his children, and a maternal uncle(*U Kni*) to his nieces and nephews. The role played by a man in the Khasi matrilineal society is evident right from his infancy, where his importance is visible at his christening or naming ceremony called *Ka Jer Ka Thoh*. In the naming ceremony of the male child a replica of a bow and three arrows,(namely *ka tieh iawbei* and *ki nam iawbei* respectively) form part of the ceremony's items. The arrow signifies honesty, strength, integrity, stability, discipline and straightforwardness. These characterestics are important to any society of the world, so also in the Khasi society. The first arrow refers to straightforwardness (*Ka longrynieng kaba beit*), the second arrow signifies that he is the defender of the clan, his kith and kin, his community and race as a whole, while the third arrow signifies good health and happiness, not only for himself, but for his family, clan and the entire community(Khyriemmujat, 2015:129-130).

In the Khasi family, the eldest male member(*u kni*) has several roles to play – as a brother to his sisters and a maternal uncle to his nephews and nieces. In the sphere of kinship, he is the care taker of the members of the matrilineage; in the sphere of marriage of his nephews and nieces, he is the main negotiator; in the sphere of economy, he is the manager of the family property; in the political sphere, he is the main spokesman in the meeting, of his village councils; and in the sphere of religion, it is his duty to perform the various rites and also to take part in presiding and performing the various rites and rituals of the family. Whereas on the other hand, the husband plays the part of a procreator and he works and provides for the family and sees that the family does not fall into poverty or other mishaps that could bring shame upon it (Ibid)

The man in a Khasi family plays a dual role, he is a father who is responsible for his own children(*U kpa u balah u ba iai*), and a maternal uncle(*u kni uba tip ha ka iapka im*), an uncle who comes in when it is a matter of life and death at his natal home.

Changing Role of Man and Women in Khasi Society

In the present day context, the role of the man has been largely distorted and this transition is due to the changes in the overall setup. His role as a maternal uncle has diminished to a large extend and this has a marked decrease in the effectiveness of the mother's brother in his sister's household.

Juanita War, in "The Khasi concept of family-changes in structure and function"(Chacko 1998:27) highlighted that there is a decline in avuncular authority and the position, status and locus of authority of Khasi men are shifting from the natal to the conjugal home, and they are becoming more *kpa* than *kni*. Increasing importance is being given to elementary families (husband-wife units). This has an effect on the *Iing* as divisions based on economic and social standing have also put members of the *iing* apart.

Lineage and inheritance in the Khasi society is reckoned through the female line. The women is the custodian of the ancestral property, but despite men's restricted access to property ownership, they still hold the rights of control over that property and also have access in

law control making bodies and local decision making councils in the Khasi traditional system. It would be interesting to understand the changes on property ownership in the Khasi social structure although rights in landed property conferred important benefits on women.

Observations from the field has shown that though earlier the youngest daughter (*Ka khadduh*) is strictly the care taker and custodian of the ancestral property (*ka nongtymmen*). With the new development and changes it now allows her to dispose her self-acquired property(*ka nongkhynraw*). Even the father has the right to transmit his self acquired property to his own children.

Philomath Passah in his work "Changes in the Matrilineal System of Khasi-Jaintia Family" noted that the youngest daughter can make a claim to the family properties as a legal heir. This change was facilitated during the British rule when wrong interpretation of the local custom was made by courts and lawyers who did not understand the language, and depended much upon interpreters whose own knowledge of the language was also faulty. This has greatly helped the youngest daughter to successfully manipulate and treat the properties, ancestral or otherwise, as personal or self acquired, and disposes them as she pleases.

Various views on the function and sustanance of the traditional practice has been debated by intellectuals and scholars on different forum on the continuity of the traditional matrilineal system. An association by the name *Ka Seng Iktiar Longbriew Manbriew* (Chacko 1998:77) was formed in Khasi hills to spear head the movement for a change in the system. Attempts were made for sons to equally inherit the properties of the parents who have no daughters. The erstwhile United Khasi Jaintia Hills Autonomous District council came out with a bill which was accordingly drafted and widely circulated. This move was accepted and the bill was passed by the Meghalaya Legislative Assembly as the "Meghalaya Succession to Self Acquired Property (Khasi and Jaintia Special Provision) Act 1984". However, this does not apply to ancestral property.

In the traditional Khasi society, the maternal uncle plays a vital role in the lives of his sisters and his sisters' children. Aldela

Mawlong in her study on "Some Aspects of Change in the Family of the Khasis" opined that the role of the *kni* in the present day context is merely symbolic, and in many cases he does not have decisive role.

The Khasi society which is in the throes of transition also reveal that there has been considerable decline in the position of men, owing to the weakening of kinship ties, weakening or absence of marriage bonds and lack of cultural values embedded in the tenets of "*Ka Tip Briew Tip Blei*" and "*Ka Khein Kur Ka Khein Kha*".

With the coming of the British, education took a formal turn, and this trend further developed by missionaries, have transformed the traditional family and the society at large along with the dynamic role of men and women. At the political level, only a microscopic minority of women are participating in decision making. With educated women on the rise and their participation and involvement in the larger social life, their roles are seen in various activities such as professionals, business women, members in various social organizations, religious activities etc. The woman is not only the keeper and custodian but she has come out to venture into the different spheres for the upliftment of the society. As the saying goes "the hand that rocks the cradle is the hand that rules the world", but with education, she has come to the forefront, thereby contradicting the Khasi saying "*Haba la kynih Ka Iarkynthei, la wai kapyrthei*", meaning when the hen crows, its the end of the world. This contradicts the saying, for her voice in public is forbidden as her role is only within the family-as a mother, wife, sister and priestess and not to be diluted in the public domain.

Urbanisation has also brought about diverse cultural interactions. The inter-mixing of various cultural patterns has led to cultural assimilation. The search for better education, better job opportunities and better way of life has resulted in rural migration of women to the towns and cities.

The Khasi has reached the point of time where a need is felt for a serious introspection and re-evaluation of institution, laws and cherished customs and their use and relevance in the present day context.

The problems faced by women in the Khasi society- rape, kidnapping, molestation, harassment, forced prostitution, domestic violence and many other kinds of exploitation are the problems which

reflect the decline of morality in the present day context. The Khasi ethics teaches man to follow a path of righteousness in this world, i.e. "*Kamai Ia Ka Hok*" and "*Im Tip Briew Tip Blei*" meaning man would acknowledge God only if man first acknowledge his fellow being. Today however with the influence of western culture things have changed considerably. Therefore it is pertinent to further relook on the direction to which the position and role of women in the present the day context are moving with the development of society.

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'NATURAL' CRISIS IN AMITAV GHOSH'S *THE HUNGRY TIDES*

Dr. Persara Lyngdoh

Abstract

With the black cloud of global warming looming large, people, in general, have become increasingly environmentally conscious and there is a strong movement to protect and conserve certain areas and species before they disappear into oblivion. Environmental conservation has always had positive connotations but what happens if the conservation efforts do not sustain the less privileged of the society who depend on the natural environment for their survival. This paper attempts to investigate this provocative question by analysing the man-animal/ man-nature dynamics in Amitav Ghosh's 2004 novel, The Hungry Tides. In the peculiar geography of India's Sunderbans, The Hungry Tides explore the problematic and limited idea of conservation in post-colonial societies that gives rise to a modern and natural crisis where the individual has to compete against a broad spectrum of forces that include social, political, historical and economic ones and often results in the disenfranchisement of the individual. Indigenous delegates to the Fifth World Parks Congress in Durban, South Africa in 2003 voiced the same concern when they stated "first we were dispossessed in the name of kings and emperors, later in the name of state development, and now in the name of conservation".

One of the major concerns in today's world where priority is placed mostly on developmental activities is the effects that these activities have on the environment. In fact, the major crisis that we are facing today is the crisis that concerns the natural environment. In most cases, it is the anthropocentric activities that accelerate the impact on global warming in developed countries and there are subsequent conservation efforts that are carried out. However, in post-colonial societies, where a sizeable population is living in poverty and depend on the natural environment for their very survival, the concept of conservation is turned on its head since it fails to sustain the less privileged of the society but harms and threatens them to the point of death. Amitav Ghosh, in his novel *The Hungry Tides* highlights the problematic idea of conservation by exploring the complex negotiations of nature and culture, man and animal, man and nature.

The novel is set in the Sunderbans, an archipelago of islands that appear and disappear on the whims of the tides which can reach nearly three hundred kilometres inland engulfing acres of forests which reappear hours later. This constant reshaping of the land by the water suggests that nothing is permanent. It is also a testament to the power of nature and the fragility of human endeavour. The Sunderbans is also the world's largest mangrove ecosystem, a hostile terrain, home to endangered estuarine crocodiles, the river dolphins and the state protected Bengal tiger which prowl these forests for food leaving the inhabitants in constant fear.

In the back cover of the 2013 HarperCollins edition of the novel, the Sunderbans are described as a place where "there are no borders to divide fresh water from salt, river from sea, even land from water. Here for hundreds of years, only the truly dispossessed braved the man-eating tigers and the crocodiles who rule there, to eke a precarious existence from the mud. Here, at the beginning of the last century, a visionary Scotsman founded a utopian settlement where people of all races, classes and religion could live together". This interaction of land and water, nature and man, man and animal makes the Sunderbans a microcosm of a society where coexistence is the norm. Moreover, two things are to be noted in this introduction. First, the ever-shifting fickle tidal landscape makes it necessary to move with nature rather than against it. Second, it brings to the foreground the identity status of the the inhabitants of the area. They are the "truly dispossessed".

In tracing the genealogy of the inhabitants of the island, Ghosh overlaps fact and fiction. Most of them are outcasts in mainstream society. In their desperation to secure a livelihood and enthralled by the idealised vision of the Scotsman, Daniel Hamilton who wanted to build "a new society, a new kind of country… (where) people wouldn't exploit each other and everyone would have a share in the land" (*HT* 52), they came from various parts of the country to settled there and build a new life. Daniel Hamilton welcomed everyone on the condition that "they could not bring their petty little divisions and differences" (*HT* 51). They were an eclectic mix of ordinary people in a fight for survival and their main antagonist was nature itself. While some of the inhabitants were descendants of settlers as early as the

1920s, from a historical point of view, the movement of people to the Sunderbans is closely linked with the Partition and the events that followed its aftermath. The Partition of India in 1947 resulted in the bifurcation of Pakistan into its Western and Eastern fragments which resulted in the migration of both Muslim and Hindu refugees into the islands. The Bangladesh War of 1972 also led to the influx of Hindu refugees into India's West Bengal region. They were displaced people attempting to survive in an endangered ecosystem.

The Sundarbans delta in India is a stretch of impenetrable mangrove forest of great size and biodiversity. It is a priority region for WWF-India due to its unique biodiversity and the Sunderbans Tiger Reserve has been part of Project Tiger since 1973. The Sunderbans consists of some 102 islands (54 inhabited islands). Ghosh describes the islands as "the trailing threads of India's fabric, the ragged fringe of her sari" (*HT* 6). In the inhabited islands, people survive on agricultural and fisheries activities, but the saline conditions of the land does not yield much and they have to depend mostly on the water and the forest for their livelihood which puts pressure on the fragile ecosystem with man-animal conflicts occurring regularly. Ghosh reminds readers that "at no moment can human beings have any doubt of the terrain's utter hostility to their presence, of its cunning and resourcefulness, of its determination to destroy or expel them. Every year dozen of people perish in the embrace of that dense foliage, killed by tigers, snakes and crocodiles" (*HT* 8). The only people who would attempt to build a life in such a place are the ones who have no other alternative.

The names of many islands in the novel are fictitious but Morichjhápi, the site of one of the most important conflict in the novel, is a real one. The conflict centres around the man-animal equation, however, because of the position of these islanders as refugees and because of the intricacies of caste, class and communal differences (Jalais, "Dwelling on Morichjhanpi", 1757), political and economic factors are also at play in determining the position of these people in the equation. Many of the islanders are the "nimnobarno", the poor and the marginalised who have always been treated disdainfully by the "bhadralok" or the Hindu upper caste. During the Partition, on arrival in India, most of them were unable to find means of livelihood in urban areas, they were relegated to inhospitable

areas outside West Bengal, to Bettiah in Bihar, Andaman and Nicobar islands and Dandakaranya in Madhya Pradesh. Accustomed to paddy cultivation in Bengal, the majority of the refugees found it increasingly difficult to cultivate the sparse and infertile soil (Anand 30). Besides, the tide country was in their blood. So when the Communist Party of India, which had hitherto supported their cause came to power in West Bengal in 1977, about 30,000 refugees started a journey back to Morichjhápi, only to be arrested and returned to their original camps. The ones who made it to the island were regarded as criminals. They became a *stateless* people. This was their post colonial inheritance. The novel dramatises how the island of Morichjhápi, a site reserved by the government for tiger conservation became almost a prison for the inhabitants. Movement in and out was banned, rumours started circulating that police boats are circling the island. The islanders were given no access to food or drinking water or medical aid. "It was as if was had broken out in the quiet recesses of the tide country" (*HT* 252). There is an incident in the novel where a boat full of people and provisions was intercepted by the police who ordered the islanders to turn back. In response they raised a plaintive cry, "Who are we? We are the dispossessed" (*HT* 254). Refusing to return, they desperately attempted to proceed to Morichjhápi and in a matter of minutes their boat was destroyed by the police and the water was full of struggling men, women and children. Though the novel makes allusion to deaths caused by the conflict, historically, the refugees were forcibly evicted and relocated and the state massacred an untold number of refugees. The government based its action on the dictum that the refugees were illegally occupying state property and had violated the provisions of the Forest Act. Annu Jalais in "Dwelling on Morichjhanpi: When Tigers Became 'Citizens', Refugees 'Tiger-Food", writes "the ease and brutalities with which the government wipes off all signs of the bustling life which had been built … were proof for the villagers that they were considered completely irrelevant to the more influential urban Bengali community, especially when weighed against tigers" (1760). The refugees entered another class of disenfranchisement, they became "conservation refugees" who must be seen as separate from "ecological refugees" or "climate refugees" or "environmental refugees". "Environmental refugees" can be defined as those people

who have been forced to leave their traditional habitat temporarily or permanently, because of a marked environmental disruption (natural or triggered by people) that jeopardises their existence and/ or seriously affected the quality of their life (Westra, np). The "conservation refugees" on the other hand, are evicted from their homes, many times, brutally and with little warning in the name of conservation and are branded as criminals. They lose their home and livelihood and face discrimination from economically stronger and more dominant groups. They are the "truly dispossessed". Kusum in *The Hungry Tides* gives voice to their deplorable status when she says:

> The worst part was not the hunger or the thirst. It was to sit here, helpless, and listen to the policemen making their announcements, hearing them say that our lives, our existence, was worth less than dirt or dust. "This island has to be saved for its trees, it has to be saved for its animals, it is a part of a reserve forest, it belongs to a project to save tigers, which is paid for by people from all around the world"… Who are these people, I wondered, who love animals so much that they are willing to kill us for them? Do they know what is being done in their names?... As I thought of these things it seemed to me that this whole world has become a place of animals, and our fault, our crime, was that we were just human beings, trying to live as human always have, from the water and the soil…" (*HT* 261-62).

Thus, when Kusum asked "Who are these people, I wondered, who love animals so much that they are willing to kill us for them?" (*HT* 261), she points to the gap between the Western concept of conservation and the ground realities of the islanders. She understands that there exists a nexus of politics, economics and conservation and since the refugees cannot bring monetary benefits to the state but the tigers can through eco-tourism, they rose in prominence in the eyes of the government. They became treasured animals of the Western and urban middle class along with other animals like the river dolphins and protecting this cosmopolitan tiger is a badge of one's own cosmopolitanism, because it is seen as moving beyond the parochialism of one's location. Cosmopolitanism opposes the local and the native, it emphasises Western knowledge and expectations

against local know-how and local reality. Thus, when Piya, the embodiment of cosmopolitanism, an American cetologist of Indian decent came to the Sunderbans to carry out a survey on the river dolphins (Orcaella brevirostris), she represents the one-sided conservation that fails to take into account the social costs that is borne mostly by the less privileged and the natives of the area that falls under the conservation project. On one of the field trips that Piya made to study the behaviour of the dolphins along with Fokir, a local fisherman who acted as her guide, they came across a village where a mob of more than a hundred people had congregated outside a mud structure with sharpened bamboo poles plunging them into the hut, angrily screaming "Maar! Maar! Kill! Kill!" (*HT* 292). A tiger had trapped itself itself inside the hut while preying on a buffalo. There is no attempt to free it but everyone want to kill it as "it had killed two people there and had long been preying on [the village's] livestock" (*HT* 292). Piya was aghast at the bloodlust she saw in the people's eyes and tried to intervene saying "You can't take revenge on an animal" (*HT* 294). Fokir stopped her and as they backed away amidst the smell of burning fur and flesh, Fokir, through Kanai who acted as interpreter, reasoned with her that "when a tiger comes into human settlement, it's because it wants to die" (*HT* 295). There is, in the islanders' belief a tacit understanding between man and animal that they should not encroach into each other's territory and if they do so, it is at their own risk. Such man-animal conflicts are common in the Sunderbans but as Anand questions "Whose hunger is to be privileged? The hunger of the poor, who are struggling to eke out a living in the face of both discrimination in the name of the environment and resource depletion, or the tiger, losing its habitat, threatened by poaching and on the verge of extinction?"(35).

While drawing attention to an episode from Indian history such as the Morichjhápi incident of 1979, Ghosh also draws attention to the limitations of Western concept of conservation. There is no doubt that human encroachment into the fragile ecosystem of the mangrove swamps cause disturbance and depletion of aquatic species by fishing and trawling, but humans too constantly fall victim to nature's fury in the form of erosion of dykes, silting of channels, flood and attacks by crocodiles and tigers. But the settlers have adapted to their environment. They protect themselves from the onslaughts of nature. They build

dams and embankments. Ghosh mentions even a cyclone shelter that was built on one of the islands in the novel but the settlers never abuse nature. That the islanders respect nature and live from the land and water can be seen in their myths and local culture. Indeed Ghosh interweaves legends, experience, myths and history to reveal human interaction with the non-human world. In a chapter entitled "The Glory of Bob Bibi", he narrates the myth of Bon Bibi which provided emotional sustenance to the people of the Sunderbans. The story is Islamic in origin and it is revered by both Hindus and Muslims and this is a testimony to the ability of people of different religions and wildlife to co-exist in this rugged and difficult terrain. The myth began in Medina with a man named Ibrahim who was a saint, a fakir. He sent his two children Bon Bibi and Shah Jangoli to the Sundarbans to make them fit for human habitation. Things were good until a man named Dhona assembled a fleet to go into the jungle to make a fortune. He was promised riches by Dokkhin Rai, a demon king if he hand over a boy named Dukhey to him. In his greed, he tried to give the boy to the demon king who stalked the boy as a tiger but the boy had a firm belief that Bon Bibi will come to his rescue and that actually happened. Bon Bibi and Shah Jangoli saved Dukhey from the clutches of the tiger demon. Bon Bibi, the victorious deity of the forest decided that:

> One half of the tide country would remain a wilderness; this part of the forest she left to Dokkhin Rai and his demon hordes. The rest she claimed for herself, and under her rule this once-forested domain was soon made for human settlement. Thus order was brought to the land of eighteen Tides, with its two halves, the wild and the sown, being held in careful balance. All was well until human greed intruded to upset this order" (*HT* 103).

The myth clearly highlights the demarcation of territory between man and animal. The inhabitants understood that humans are neither the rulers not the centre of the universe, but are embedded in a vast living matrix and are subject to the laws of reciprocity. Balance is achieved by virtue of their fear of the natural world represented by the tiger and this fear translates to respect for nature's power. Horen, a

character in the novel told Nirmal, another character that he can sense the presence of a tiger through fear, and fear is important "because it's the fear that protects you, Saar; it's what keeps you alive. Without it the danger doubles" (*HT* 244). There is an innate connection that the inhabitants have with nature. "This is an 'agreement' between non-humans and humans that permit them both to depend on the forest and yet respect the other's' needs" (Jalais, *Forest of Tigers* 73). This is inclusive sustainability that does not abide by the Western rule of ecology which sees humans as being different from animals (Richa 177) rather it sees humans as sharing space and resources with the non-humans as exemplified by the myth of Bon Bibi. This coexistence explains Fokir's ability to navigate the tricky waters of the tide country to locate the river dolphins for Piya as well as his understanding of the inhabitants' need to kill the tiger. The myth also points to greed as the destroyer of the delicate balance between man and the non-human world. It was only when Dhona was seduced by riches that the balance between animal and man was disturbed. And if the idea of conservation in the context of the Sunderbans is to be evaluated, greed and avarice seem to triumph over human lives. Tigers have been appropriated as one of the most prominent trademarks of global conservation (Jalais, *Forest of Tigers,* 8) and with that funds and profits go to the state while the local people lose their homes and livelihood, they are disenfranchised and displaced and are branded as enemies of conservation. What is witnessed in the novel and the Sunderbans is as Mukherjee had argued in an essay "Water/Land: Amitav Ghosh", that 'conservation' and 'development' work have produced a drastically impoverished environment where humans and non-humans must engage in deadly competition in order to survive" (Mukherjee 112).

In *The Hungry Tides*, Ghosh provides a materialist and historically circumstanced inquiry into the nature of conservation. He tries to achieve a sort of holistic conclusion as seen when Piya returns to the Sunderbans towards the end of the novel with a proposal to start a conservation project for the river dolphins. The project is to be funded by various international agencies and Piya intends to work in tandem with the locals rather than against them. After her experience in the Sunderbans she has understood

that conservation has be ethical and involve all stakeholders especially the native/indigenous/local population otherwise resentment may lead to violent conflicts. This is Piya's small attempt to deliver environmental justice which is defined by the United States Environmental Protection Agency as "the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income, with respect to the development, implementation and enforcement of environmental laws, regulations, and policies" (USEPA, 2017) to the people she met in the Sunderbans.

In *The Great Derangement:Climate Change and the Unthinkable,* Ghosh contends that we live in an era of "flash floods, hundred-year storms, persistent droughts, spells of unprecedented heat, sudden landslides, raging torrents pouring down from breached glacial lakes, and, yes, freakish tornadoes"(48) and that we are "we are confronted suddenly with "a new task: that of finding other ways in which to imagine the unthinkable beings and events of this era" (63). In the fictional space of the novel, he imagines these "unthinkable beings and events" into reality and the novel becomes a literary tool for a critical engagement with our relationship to nature and the non-human world with the hope that such engagements may act as catalyst for social action and environmental justice.

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STUDY OF BUTTERFLY DIVERSITY AND ITS IMPLICATION ON THE ENVIRONMENT FOUND IN THE NORTH EASTERN HILL UNIVERSITY, SHILLONG CAMPUS.

Bankerdonbor Kharbisnop

Dr. Lucy Mary Jyrwa

Abstract

The North Eastern Hill University is the only central university in the state of Meghalaya and there are two campuses, the main campus in Shillong and the other in Tura. The university's campus in Shillong is situated in the outskirts of the city at Mawlai Umshing Mawkynroh. The University is densely covered by forest mostly dominated by the pine trees with 1225 acres in area and hence provides microhabitats for various fauna. The present work was undertaken to study the diversity of butterflies found inside the Shillong campus of the university. An attempt has been made through this study that the presence of certain species of butterflies like Junonia orithiya, Danaus genutia, Neptis jumbah Moore and Papilio bianor gladiator in the campus may perhaps indicate destruction of forest cover due to construction of buildings around the campus. Thus, an understanding of how to balance co-existence of both concrete forest as well as green forest is the need of the hour.

Keywords: Butterflies, Diversity, Indicators.

Introduction

The Order Lepidoptera is one of the most studied groups under class Insecta comprising of both butterflies and moths. These types of insects have well developed wings which distinguish them from all other insects, hence the name Lepidopteran which comes from Ancient Greek lepís means scales and pterón means wing. Though both butterfly and moth are grouped together in the same order, they are totally different from each other. Butterflies differ from moth because they are colourful, diurnal, antennae are knobbed and when at rest, the wings are held vertical. They belong to the sub-order Rophalocera and super-families Hesperioidea and Papilionoidea. Linnaeus classified 192 butterflies giving them species names among six major sub-divisions in his 10th Systema Naturae (Linnaeus,

1758). Approximately, there are about 17,200 species of butterflies throughout the world and 1,504 species from the Indian subcontinent are known (Arya et al., 2014). Among the insects, butterflies occupy a vital position in the ecosystem and their occurrence and diversity are considered as good indicators of the health of any given terrestrial biotope. Swinhoe (1893) worked on the lepidoptera from the Khasi and Jaintia Hills which was followed by other workers, viz., Parsons and Cantlie (1948), Varshney and Chanda (1971,) and a few more as cited by Varshney (1977). Rynth (1977) published a list of butterflies from the Garo Hills. Radhakrishnan, et al., 1989 contributed an illustrated account of the fauna. Extensive work was performed by Kunte et al., 2012 in parts of Baghmara Reserve Forest, Balpakram National Park and Gongrot-halwa atong area, Siju Wildlife Sanctuaries and Nokrek National Park, Garo Hills with a conclusion of 298 species of butterfly. Recently Shira and Hajong, 2018 studied in details the diversity, richness and abundance of butterfly from Garo Hills specifically from Balpakram National Park and Nokrek Bioshere Reserve. A total of 13,115 individuals belonging to 107 species under 67 genera was recorded among them, 8 new records were made from three family. In 2015, Bora et al., presented an Annotated Checklist of Butterflies of Meghalaya with a total of 514 species under 6 families of the order Lepidoptera.

This present paper deals with the systematic account as well as diversity and abundance on the butterflies found inside the Shillong campus of North Eastern Hill University to correlate their species richness and diversity with development of the infrastructures around the campus as butterflies are good indicators of environmental changes and they are sensitive to habitat degradation and climate change.

Methodology

A. Collecting Sites

The university Campus in Shillong is situated in the outskirts of the city at Mawlai Umshing Mawkynroh. The University is densely covered by forest mostly dominated by the pine trees with 1225 acres in area. It lies within the coordination of 25°36′36″N and 91°54′5″E. The campus shares its boundaries with Mawlai Mawiong to the West, Mawlai Umshing Mawkynroh to the East, Mawlai

Kyntonmassar to the North and Mawlai Mawtawar to the South. Three sites were chosen for butterfly count in the Campus i.e., Site-1 (Sport Authority of India, SAI, Indira Gandhi National Open University, IGNOU and the English and Foreign Languages University, EFLU, Site-2 (Academics Buildings) and Site-3 (Faculty quarter).

Site-1: situated at the west part of the university, dense forest and dominated with pine trees, grasses and some vegetation.

Site-2: situated in the eastern part of the campus bordering with the north, the area is mostly occupied by the infrastructure. Flowering plants were found in different parts of the area and trees are very less.

Site-3: situated in the southern part in the campus bordering with the west. This area hosts mixed vegetation.

B. Methods: Pollard-Walk Method

Duration of three months was surveyed using Pollard Walk method (Pollard, 1977; Pollard and Yates, 1993). The butterflies were photographed during morning time from 7 am to 12:00 noon.

C. Identification of the collected specimens: Collected specimens were photographed using DSLR Camera (Nikon) and editing using Picasa 3. Identification of specimens was done with the help of available literatures.

Table 1: Families and number of species observed in North Eastern Hill University main Campus, Shillong

Sl. No.	Family	Scientific Name	Common Name	Number of species observed			Total
				Site-1	Site-2	Site-3	
1		Danaus genutia	Striped tiger	0	2	1	3
2		Junonia orithiya	Blue pansy	0	2	2	4
3		Neptis jumbah Moore	Chestnut-streaked sailer	1	1	1	3
4		Ariadne merione	Common castor	0	2	0	2
5		Lethe sinorix	Tailed Red Forester	0	1	0	1
6	**Nymphalidae**	Argyreus hyperbius hyperbius	Chinese Tropical Fritillary	1	2	1	4
7		Parantica aglea melanodies	Himalayan Glassy Tiger	0	1	1	2
8		Ypthima baldus	Newer Three-wing	4	2	3	9
9		Doleschallia bisaltide indica	Himalayan Autumn Leaf	0	1	0	1

10		Heliophorus brahma major	Golden Saphirre	6	4	2	12
11	Lycaenidae	Celastrina argiolus sikkima	Hill Hedge Blue	3	1	1	5
12		Rapala pheretima	Copper Flash	0	0	2	2
13		Prosotas dubiosa indica	Tailless lineblue	6	2	3	11
14		Gandaca harina	Tree Yellow	0	1	0	1
15		Eurema blanda	Three spot Grass Yellow	9	4	3	6
16	Pieridae	Eurema hecabe	Common grass yellow	6	2	2	10
17		Appias olferna	Striped albatross 'olferna'	1	1	2	4
18	Papilionidae	Papilio bianor gladiator	Indo-Chinese Common Peacock	1	2	1	4
Total				**38**	**31**	**25**	**94**

Results

The present study reveals that the study area provides favorable ecological conditions and habitat for butterflies. A total of 94 individuals (Table 1) were recorded from 18 species under 4 families during the survey conducted in the University campus for a period of 3 months. Both the three sites share the similar number of individuals. The values of Shannon-Wiener Index (H') were almost equal in all the study sites but site-1 (1.6) shows less diversity as compared to site-2 (3.9) and site-3 (3.7). The diversity indices when compared among the study

sites, site-2 and site-3 show more abundance and diversity because of the availability of food and the favorable environmental factors that enhance the growth and development of the insects.

Among the four families studied Nymphalidae showed abundance with 9 species observed during the survey whereas only a single species from family Papilionidae was observed during the study.

During the study it was found that butterflies were more seen in those areas where plenty of flowering plants were available, which helps them to gather nectar easily. During our survey we found that butterflies were more during morning time from 7:00 am to 9:00 am, stretching their wings and very less seen at noon.

Nymphalidae
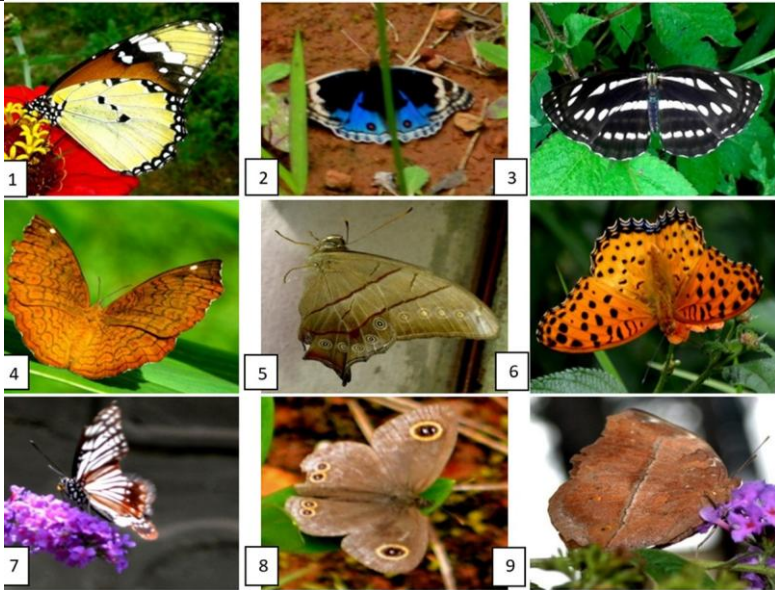
Fig:1.*Danaus genutia*, 2.*Junonia orithiya* , 3.*Neptis jumbah Moore*, 4.*Ariadne merione*, 5.*Lethe sinorix*, 6.*Argyreus hyperbius hyperbius*, 7.*Parantica aglea melanodies* , 8.*Ypthima baldus*, 9. *Doleschallia bisaltide indica*

Lycaenidae

Fig:10.*Heliophorus brahma major,*11.*Celastrina argiolus sikkima,* 12.*Rapala pheretima,* 13.*Prosotas dubiosa indica*

Pieridae

Fig:14.*Gandaca harina,* 15.*Eurema blanda,* 16.*Eurema hecabe,* 17.*Appias olferna*

Papilionidae

Fig: 18.Papilio bianor gladiator

Discussion

The present study indicated that the family Nymphalidae was the dominant family in the study area. A similar pattern of predominance of Nymphalidae was also reported by different researchers from the different ecosystems of Western Ghats (Mathew & Rahamathulla 1993; Kunte 1997; Kunte et al. 1999; Arun 2000; Devi & Davidar 2001; Eswaran & Pramod 2005; Kumar et al. 2007; Dolia et al. 2008; Krishnakumar et al. 2008). The dominance of Nymphalidae was related with their polyphagous nature, availability of food plants found and also due to their strong, active flying habit assist in searching varied food resources. But in the case of abundance, the most abundant butterfly family in the North Eastern Hill University, Shillong campus was Pieridae. A similar pattern of abundance was also reported from various locations in Western Ghats (Ramesh et al. 2010; Rajagopal et al. 2011; Eswaran & Pramod 2005), Vikhroli, Mumbai (Arun 2009) and Siruvani Hills (Arun 2000, 2002). One of the reasons for the higher abundance of Pieridae butterflies in the North Eastern Hill University, Shillong campus might be the higher availability of their larval food plants around the campus. The representation from the family Papilionidae was very low where only one species was encountered when compared to the proportion of other families in the study area. It can be therefore concluded that the North Eastern Hill University, Shillong campus area supports a rich butterfly community, dominated by the nymphalids and pierids. Urban expansion leading to habitat destruction, loss of larval food plant was the main issue of concern. Species which are able to survive in such urban area depend on their special adaptation in the modified habitat. The North Eastern

Hill University was established in the year 1973. It has two academic campuses, one at Mawkynroh-Umshing, Shillong, and another at Chandmari, Tura. The main campus that is in Shillong is around 1225 acres in area. The area was initially densely vegetated with pine trees but with the development of various departments in the University, the area covered by pine trees was reduced. Since 2002, the University has accommodated National Council of Science Museums (NCSM), Indira Gandhi National Open University (IGNOU), Indian Council of Social Science Research (ICSSR), Sports Authority of India (SAI) and the English and Foreign Languages University (EFLU) in its campus further reducing the green vegetation. Pine trees in the campus were micro habitats for the caterpillars of moths. However with change of time and development of the campus, the population of the caterpillars had depleted but butterflies were quite prevalent since growing of flowering plants around the campus. Butterflies are good bio indicators of environment and thus they can be used to identify ecologically important landscapes for conservation purpose (Barlow et al. 2008). For example, studies have shown that the huge presence of *Papilio demodocus* (Esper, 1798), *P. nireus* (Linnaeus, 1758), *Junonia oenone* (Linnaeus 1758) and *J. terea* (Druce, 1890) show widespread destruction and fragmentation of forest cover within the concession (Larsen, 2005). This is because these species were known to be specialists of degraded habitats and open areas. *Danaus chrysippus* (Linnaeus, 1758), *Colotis euippe* (Linnaeus, 1758) and *J. oenone* were species known to be colonisers of disturbed habitats in forest zones. Large numbers of these species were also recorded during studies conducted by various researchers like Fermon, Schulze, Waltert, & Muhlenberg, 2001; Larsen, 2005; Addo-Fordjour, Osei, & Kpontsu, 2015; Khan & Rastogi, 2015; Gandhi et al., 2017. Their presence in relatively high numbers within a particular area is an indication of high levels of degradation of the original forest vegetation. Similar to the above mentioned species, butterflies like *Junonia orithiya, Danaus genutia, Neptis jumbah Moore* and *Papilio bianor gladiator* were found during the present study in the campus which may perhaps indicate destruction of forest cover due to construction of buildings around the campus. From the conservation point of view, butterflies play a very important role in plant propagation through facilitating

cross-pollination and were major ecological indicators. Perhaps part of the area in the campus may be developed into a butterfly garden by appropriate habitat management to improve the habitat quality. Further, long term research and monitoring on the diversity of butterflies, with special reference to their host plants and factors that affect their distribution, diversity and abundance may be taken up in the area in order to sustain the rich and diverse butterfly community of the area more effectively. Thus, an understanding of how to balance co-existence of concrete forest and green forest is the need of the hour. Regulated measures should be seriously considered by the Meghalaya Urban Development Agency, Government of the Meghalaya where development and sustaining the ecosystem is properly balance.

In conclusion, despite the ill effects of campus development, the study area still maintains a good diversity of butterflies which calls upon us to conserve the abundance and diversity of butterflies in the North East Hill University.

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BACTERIOLOGICAL OF POND WATER LOCATED IN MAWTHADRAISHAN VILLAGE WEST KHASI HILLS DISTRICT, MEGHALAYA

Mary Diengdoh

Banridor Kharbyngar

Abstract

Mawthadraishan village is situated in Nongstoin, West Khasi Hills District of the state of Meghalaya. Recently, Mawthadraishan has become one of the tourist destinations due to its mesmerizing view and because of the ponds present in the depression of the hills. There are about 7 to 8 ponds of considerable size that are visible from a distant view. The water from these ponds is frequently used by the locals for many domestic purposes such as cooking, bathing, washing, bathing animals and for drinking as there is no other source in the entire surrounding for water consumption. A bacteriological study was done on such ponds located in Mawthadraishan village and found to be contaminated by many enteric bacteria both pathogenic and non- pathogenic. Contamination of water bodies such as rivers, lakes, ponds etc. due to various human activities has led to many undesirable changes in water bodies such as its quality, colour, odour and has affected many water living animals and the whole food web chain including humans. Study was made to test the quality of water, its sources, and what are the preventive measures that the village and the administration can take to prevent the contamination of the pond water.

Keywords: Mawthadraishan, contamination, ponds, drinking water, pathogenic bacteria.

Introduction

Microbial population of surface water is composed of indigenous and transient populations, since surface water are open to contamination from various sources (Douglas et al., 2015). Mawthadraishan village located in West Khasi Hills District, Meghalaya is one of the source for such activity. There are around 7-8 natural ponds situated at the peak of the area. These pond waters are used for drinking and other domestic purposes for the entire village and also for villages situated nearby the main

village. Bacteriological analysis is one of the important parameters so as to check water quality and isolation of water borne pathogens which may be harmful and may be a cause of different diseases for the whole community. Safe water quality is a major concern with reference to public health importance, as health and wellbeing of the human race is closely tied up with the quality of water used (Rajiv et al., 2004). WHO (2011) has also reported that 80% of sickness and deaths among children worldwide are caused by unsafe drinking water. On an average, every 8 seconds in the world, a child dies of water related diseases (contaminated water). Water used for drinking and other domestic purposes in most communities especially in rural areas are obtained from natural sources such as rivers, streams, lakes, ponds and springs, or artificial sources such as wells and boreholes. Most times these water bodies are likely to be polluted with wastes generated from human activities. Along with these wastes many types of microorganisms such as bacteria, viruses, protozoa etc are also carried to these water bodies. Pond waters are also facing pollution just like other water bodies are getting polluted due to discharge of effluents from various industries, domestic waste, land and agricultural drainage resulting in the degradation of water quality of these water resources. In human health, water plays a very important role and quality of the water supplied is important in determining the health of individuals and the whole communities. Outbreaks of many waters borne diseases like typhoid, cholera, amoebiasis, are linked to unsanitary mixing of some water supplies and sewage which may lead to severe health conditions and even death. Present of coliforms bacteria will not likely cause illnesses to a healthy person. However, can lead to various diseases in children, elderly and immune compromised patient. The human pathogens that present serious risk of disease whenever present in drinking water include Salmonella species, Shigella species, pathogenic Escherichia coli, Vibrio cholerae, Yersinia entercolitica, Campylobacter species, various viruses such as Hepatitis A, Hepatitis E, Rota virus and parasites such as Entamoeba histolytica and Giardia species. The Coliform bacteria includes the members of the family Enterobacteriaceae, e.g. Escherichia coli, Enterobacter aerogenes, Salmonella and Klebsiella.

The study is aimed to evaluate the water quality by analyzing the viable coliforms along with other water borne pathogens present in Mawthadraishan ponds which are used for human activities such as bathing, washing of clothes, bathing animals, and for drinking. The data of this study may provide some important information about public health risks associated with the use of pond water in the area. Farming is the major occupation of the people from the area now depends on water from the pond for their daily domestic and agricultural needs. This, therefore, increases the number of people exposed to water borne pathogens, if the pond water is polluted.

Methodology

A. **Sample Collection site**: Surface Water was collected in a sterile container during the month of December 2015 (winter) and June 2016 (summer) from two ponds (pond 1 and pond 2) which are mainly used for domestic and drinking purpose. Samples were collected aseptically and appropriately labelled. Samples were brought to the microbiology lab and kept in the refrigerator at 4°C prior bacteriological analysis.

B. **Methods**:
  1. Most Probable Number (MPN)
  2. Using selective and indicator media
  3. Gram staining
  4. Biochemical test : IMViC test.

C. **Materials**: The materials used for this study were sterilized by appropriate technique. All glass wares such as Petri dishes, conical flasks, test tubes, beakers, etc., were thoroughly washed and sterilized in the hot air oven at 170°C for about 2 h. The media were sterilized at 121°C for about 15-30 min in autoclave. The inoculation loop was sterilized by flaming in the Bunsen burner until it turns red hot. Similarly, working surface was sterilized by the application of disinfectant solution (95% ethanol).

Bacteriological examination

1. Most probable number (MPN) technique was carried out to detect the presence of water borne pathogen present in the ponds.

2. Single strength and double strength lactose broth with indicator were used for inoculating the samples.

3. 10 ml and 1 ml sample were inoculated in the double strength and single strength lactose broth respectively.

4. After an overnight incubation, tubes were observed for color change and acid production in Durham's tube.

5. Tubes with acid and gas production was further tested for confirmative test by streaking on selective media and indicator media respectively.

6. Eosin methylene blue (E. M. B), nutrient agar (NA) and an indicator media were generally used during the study.

7. After an overnight incubation, plates were observed for microbial growth.

8. Isolates were picked from stock culture and sub-cultured on Nutrient Agar and incubated at 37 C for 24 hours, followed by Gram staining and by the various biochemical tests such as Indole test, Methyl red-Voges-Proskauer test (MRVP) and citrate test (IMViC)
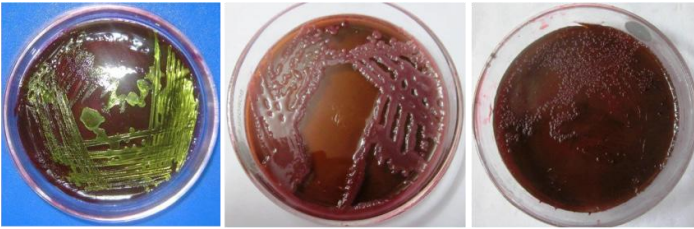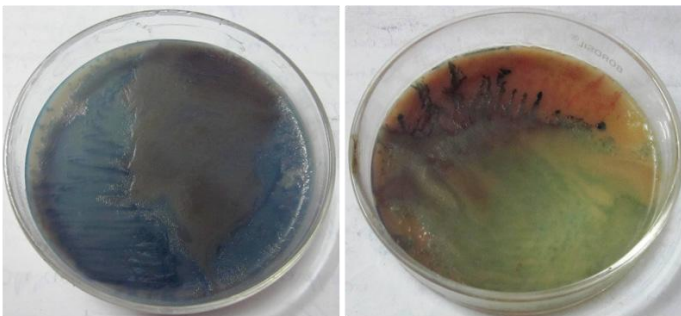
Sample collection site

Pond 1

Pond 2

Results and Discussion

Coliform Bacteria in EMB Agar Medium

Coliform Bacteria in CLED (Indicator) Agar Medium

Table 1:

Sampling Site	Sampling Period	Sample code	MPN index	Microorganism isolated
Pond 1	Winter 2015	S1	280	*E.coli* and *Enterobacter cloacea*
		S2	920	*Pseudomonas* and *Klebsiella* sp
	Summer 2016	S3	350	*Klebsiella* sp
		S4	1600	*Pseudomonas* sp
Pond 2	Winter 2015	S1	1600	*Pseudomonas* sp
		S2	1600	*E.coli* and *Enterobacter cloacea*
	Summer 2016	S3	430	*Klebsiella* sp
		S4	1600	*Pseudomonas* sp

Pathogens and indicator bacteria were detected in both the ponds during the sampling period i.e. winter (2015) and summer (2016). Winter sampling for Pond 1 (S1) showed the presence of E. coli and Enterobacter cloacae, while S2 showed the presence of Klebsiella and Pseudomonas sp. Pseudomonas sp was isolated from S1, while E. coli and Enterobacter cloacae were isolated from S2 of Pond 2 respectively. Summer months sampling showed the presence of Klebsiella and Pseudomonas species in both the two ponds. All the water samples examined from the two ponds, showed an MPN index which is above (i.e. 10 coliforms per 100 ml) level of low risk for total coliforms (Table 1).

According to WHO (2006) *E. coli* or *Faecal coliform* should not be present in drinking water. Djuikom *et al.,* 2006 stated that their presence is of no doubt a reflection of faecal contamination since they are abundantly found in the intestine of humans and warm-blooded animals. Laboratory analysis of water samples from ponds in this study showed that faecal matter heavily contaminated the ponds. Poor sanitary practices could be one of the main causes of indicator bacteria from faeces being introduced into stored water (Ologe, 1989).

Presence of *Enterococcus* species in the present study suggests that contamination is widespread during the entire study period. This according to Laukova and Juris (1997), provide a supplementary data on bacteriological quality of water and augment the faecal contamination of water. High prevalence of *E. coli* was also observed in this study in both the ponds; other coliform such as *Klebsiella*, and *Pseudomonas* species isolated in drinking water increases the possibility of the presence of pathogenic bacteria. In terms of public health significance, *E. coli* has frequently been reported to be the causative agent of traveler's diarrhoea, urinary tract infection, *haemorrhagic colitis* and *haemolytic uraemia* syndrome, while *Klebsiella* is associated with pneumonia and upper respiratory tract infection. Presence of pathogenic bacteria like *Pseudomonas* in water also, may cause acute to severe disease on getting suitable host and condition (Kistemann, *et al.,* 2002 and Mishra *et al.,* 2009).

Observation and conclusion

It is common to hear that water is essential for health, while water is everywhere but not a drop to drink. Potable drinking water be it from tap, springs, rivers, ponds etc. should be clean and healthy. However, drinking contaminated water is and will always be a major threat to human life. Water bodies gets contaminated due to various unwanted human activities such as disposal of solid and liquid wastes from various sources such as industries, hospitals, institution, houses etc. Though various precautionary measures have been taken up by government authorities, yet water bodies stand contaminated due to lack of civic sense. This study on microbial contamination of pond water located in Mawthadraishan village used for domestic purpose and especially for drinking by the local villagers shows the present of few types of pathogenic bacteria such as E.coli, pseudomonas and klebsiella, which if consumed in large amount especially by children, elderly and immunocompromised patients can lead to Urinary tract infection, Pneumonia and many stomach related problems such as diarrhea, dysentery, vomiting and other gastro- intestinal disorders which are fatal in nature. Lack of hospital, PHC, CHC in such villages can definitely lead to death. Causes can be due to severe dehydration and other related symptoms that common people are seldom acquainted

with. Therefore in all forms, it is very important to educate people on the ill effects of pond water by conducting various awareness programme from time to time so that people are made aware of such ill effects due to various contaminants and the consequences that it has on human health.

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REDEFINING ACADEMIC LIBRARIES IN THE EMERGING ICT ERA: AN OVERVIEW

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Betbhalin Lyngdoh

Abstract

This paper discusses an overview of how academic libraries are redefining to adapt to the revolutionary changes brought about by the application of technologies in the overall functioning of library operations. It also highlight the trends in which Academic libraries are constantly in a transitional mode and have evolved from traditional library to digital library, library 2.0 to library 3.0 etc. and efficiently adopting the new means of technology tools for effective delivery of quality services and for sustainability in the emerging ICT era.

Keywords: Academic Libraries, Emerging ICT

Introduction

Academic Libraries which is considered as the "powerhouse of knowledge" in the knowledge society have donned a new outlook in the ICT era. The library activities which were carried out manually in the traditional libraries have been carried out effectively with the help of emerging technologies. The ICT revolution and the advances of Internet have not only increased the ability to access, store, and retrieved information but have also changed the whole concept of organization, process, functions and management of library and information system (Rath, 2015). These changes can be seen in academic libraries more clearly than in any other types of libraries and we have witnessed significant changes in the overall operations of the library right from acquisition, processing, retrieval and dissemination of information to end users. Salve (2008) lamented that in today's era of massive information explosion, advanced technologies, shrinking budget and price hike of documents, shift in the medium of publication, lack of adequate staff and complex users demand have necessitated the dependence on latest technologies in academic libraries. Academic libraries have also been adapting to all these radical changes at a very fast pace where traditional libraries have evolved into hi-tech libraries with the application of web technologies where all work are done by computer.

Traditional libraries are now transformed into digital libraries, virtual libraries, hybrid libraries, libraries without walls or library 2.0, 3.0, 4.0 etc. These technologies have also acquired the "do or die" prominence in which those academic libraries who adopted and adapted to these changes will survive whereas those academic libraries who cannot cope up with all these changes will become obsolete within no time. Baruah & Hangsing (2012) also validate that the rapid pace at which academic libraries is adapting to the revolutionary changes of ICT keeps growing and advancing. Kumar (2009) further justified that academic libraries have been adopting the new means of technology which has drastically replaced the traditional libraries with computerized OPAC system with a variety of web-based graphical user interface (GUI) functions, open access, 24 x 7 accessibility to library resources and remote access, numerous e-databases, e journals and e-book according to the needs and demands to validate the expected changes required in the fast growing and cutting edge of emerging ICT for sustainability and longevity in the digital environment.

Trends of Academic Libraries in the ICT Era

The development of ICT and its application in Library and Information centers has brought unprecedented changes in the concept and services of academic libraries. With the exponential growth of ICT technologies, academic libraries have been acquiring approaches of the same in capturing, processing, storing and dissemination of information and the means of providing services has changed automatically (Adeyemi, 2005 & Marshall, 2000). It has provided an amicable platform to render user friendly services to all students, faculty, scholars and other users of the library at an amazing pace. Today, the influences of these ICT technologies are felt in every aspect of library operations that has enabled academic libraries to devise viable strategies to enhance efficiency, improve reliability and reduce cost. The following are some of the trends that Academic Libraries have been adopting and adapting to fit in, in the dynamic emerging ICT era

Library Automation

Library Automation is the technique; process or system that helps in carrying out library operations effectively. According to Encyclopedia of Library and Information Science, "Automation is the

technology concerned with a design and development of the process and systems that minimizes the necessity of human intervention in their operation". Sharma (2005) pointed out that a library where access points and housekeeping operations are computerized is known as an automated library where the graphic records are still print -on-paper publication. Thus, Library automation is very important in every academic library to provide high speed information accession, it facilitates handling of huge data or information, it increases library use and it minimized staff requirements in the library. The main area of library automation are in acquisition; cataloguing and indexing; circulation; serial control; library administration and management; Online Public Access Catalogue (OPAC); CDROM Database searches; resource sharing through library; Network/ INTERNET; Desktop Publishing (DTP); Office Automation; Information Retrieval (Kumar, 2017).

Shukla & Syuhio (2015) elaborated that the main objectives of library automation are to

1. Increased operational efficiencies;
2. Improve the quality, speed and effectiveness of services;
3. Reduced the manual work of staff;
4. Provides access to remote users;
5. Provides latest and user - friendly services;
6. Improve the management of their physical and financial resources;
7. Facilitate wider access and dissemination to information for their end users;
8. Enhanced the facility of resource – sharing/ library networks;
9. Enhanced rapid communication with other libraries and professional peers.

Networking of Libraries

Networking of libraries also known as "Library Consortia" is the current trend in academic libraries where libraries are interconnected with one another for sharing of resources globally. It provides a wider prospect for sharing of expertise, library resources and other information over the internet and world wide web(www) and it has a major impact on the overall library services (Shukla, 2015 & Igwe, 2010).

Resource sharing is the facility in which academic libraries can create and share bibliographic records and other information resources in digital format among each other. These networked libraries share resources over the web like online catalogue (Web OPAC), indexes, local database creation, co-operative procurement of resources, co-operative technical operation, preparation of union catalogue, exchange of experts, inter library-loan, document delivery services, procurement of consortia, etc. The main objectives of resource sharing and networking are

1. Exchange of library resources and information that are not available in their own library;
2. To facilitates the optimal usage of library resources;
3. To avoids duplication of resources;
4. Facilitates improvement of library services;
5. Provide quality and user-friendly services to users;
6. Developments of policy for inter library-loan and reciprocal agreements for special collections.

Digital Library

A Digital library is an information retrieval system which provides a platform to users to get accessed to a very large, organized repository of information and knowledge. It is popularly viewed as an electronic version of a library popularly known as 'a Library without walls' in which the collections do not exist on paper, microform or other tangible form at a physical location but are electronically accessible in digital format via computer networks (Wiederhold,1995). According to E.A. Fox () a digital library can be defined as the "New way of carrying out the function of libraries encompassing new types of information resources, new approaches to acquisition, new methods of storage and preservations, new approaches to classification and cataloguing, intensive use of electronic system and networks and dramatic shifts in intellectual organizational and electronic practices"

A digital library supports the following features (Chowdhury & Choudhury, 2003; Mahapatra, 2004 & Kumar, 2009)

1. Provide access to very large information collection(s) such as plain texts, images, graphs, audio/video materials and other library items that have been electronically converted via internet.

2. Support multi- media content
3. Provide Network accessible user -friendly interface
4. Unique referencing of digital objects
5. Enable link representation to local external objects (hypertext)
6. Accomplish all essential services of traditional libraries mission of collection development organization, access and preservation.
7. Support advanced search and retrieval
8. *Integrate personal group enterprise public digital library.*

Library2.0

The term library 2.0 was first coined by Michael Casey in 2006 on his blog Library crunch. It refers to the application of concepts and the technologies of web 2.0 to the library services and popularly known as "Library 2.0". It is the concepts that personified to market library services, incorporate user feedback and participation through the use of the social networking site tools, creating a platform to interact, sharing common interests and ideas, discuss and solve various problem between library professionals and users (Kumar, 2009). Jindal & Khan, (2019) also asserted that libraries use this tool to help library professionals and users to interact with each other and share their thoughts, ideas, and opinions for current awareness of user and bring improvement in library. Some of the popular Web 2.0 tools that are commonly use as library forum are

a) **Facebook page** – Facebook page is a social networking site built for social interaction and sharing. Academic libraries generally used facebook page as a means to connect with their user community by posting updates about library's programmes and events for promotion of various library services (Kenchakkanavar, 2015).

b) **Wikis**- A wiki is a website that uses Wiki software, that can be collaboratively authored and edited. Wikipedia is one of the popularly known Wikis that has been broken down the golden rules of library science. Academic libraries can use wikis as a communication tool to enable social interaction among library professionals and users. Users can share information, ask and answer questions (http://en.wikipedia. org/wiki/library_2.0 accessed on 10.06.2019).

c) **Blog** – A blog is a website, usually maintained by an individual, with regular entries of commentary, description of events or rather material such as graphics or videos. Blog are commonly used by academic libraries as a tools for promoting, alerting and marketing new services, providing information about new arrivals, e-databases, news and services (http://en.wikipedia.org/wiki/blog accessed on 10.06.2019).

d) **RSS** – RSS (Really Simple Syndication) is a web 2.0 tool, in which academic libraries use it to broadcast the activities of the library. It is use to provide current awareness service and it is great way to keep up-date in the field and filter any kind of information by subscribing to blog feeds. (http://en.wikipedia.org/wiki/RSS accessed on 10.06.2019).

e) **Instant Messaging Reference Service** – It is one of the real-time electronic consulting and reference offered by academic libraries via specific software running on the internet platform. It is virtually instantaneous communication between two or more people using textual format, providing " real time reference" service, where users can synchronously communicate with library professionals in a face to face reference context the software often allow co-browsing, file sharing, screen capturing and data sharing and mining of previous transcripts (Yalsa,2008)

Library 3.0

Web 3.0 is the third generation of the Web. Library 3.0 refers to library using Web 3.0 technologies such as the semantic web, cloud computing, mobile devices, and re-envisioning the use of established technologies such as federated search, to facilitate user generated content and collaboration to promote and make library collections accessible. Library 3.0 is a virtual "borderless library" complement to physical public library spaces, where collections can be made available to all library users regardless of their physical location. Many Academic Libraries are adopting Web 3.0 into their services through methods such as Resource Description and Access (RDA) tags, metadata and other semantic web developments (Hassanzadeh & Keyvapour 2011)

Institutional Repository

An Institutional Repository is a digital archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution. According to New World Encyclopedia, "An Institutional Repository is an online locus for collecting, preserving, and disseminating, in digital form, the intellectual output of an Institution, particularly a research institution". Sawant defines "An Institutional Repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution, with few if any barriers to access. In today's age of ICT, a major chunk of Academic Libraries, i.e Universities, Colleges and even School libraries have developed institutional repository to archive the rich collection of their institution like thesis, articles, papers published in journals or presented in conferences, e – books, newsletters, research reports, images, news clippings, multimedia, faculty publications, student's projects, teaching materials, committee papers, administrative papers, photograph and video recording, syllabus archive, question paper archive and even all the resources can be collected either in digital format or those in print format can be scan or digitize to convert into digital format. Institutional Repository depends largely on the intellectual strength of any academic institution. The commonly use open source software (OSS) are DSpace, Greenstone and ePrints (Ndidiamaka,2013& Bhardwaj & Kaushik,2013).

Radio Frequency Identification (RFID)

RFID is a wireless technology of radio waves which automatically identify individual items. It is use for detecting theft and security of library collection. Academic Libraries are adopting RFID technology to provide enriched and efficient user -friendly library services. This device facilitates fast tracking of library documents, easy check-in and check-out, fast and accurate stock-taking or stock verification, (Cleveland, 1998 & Kumar, 2017).

RFID consists of two main components the "Tags" which is the integrated circuit for storing and processing information and the "Antenna" for receiving and transmitting the signals. Tags are placed on the library items and when these items come under the range of

antenna it transfers the information to the computer systems; it sends out an alarming siren if any library items are taken without proper check-out or issue them (Jindal & Khan, 2018)

Library and information professionals in ICT era

Library and information professionals are an invaluable asset that plays a pivotal role in contributing to the overall success of the academic libraries. Singh & pinky (2004) emphasized that it is the need of the hour that every Library and Information professionals requires to be goal- oriented, flexible and adaptable and to continuously enhance their professional, technological and personal skills as they are no longer the mere custodian of books but performed the roles of creators, communicators, leaders, mentors and lifelong learners in monitoring and adapting to the continuous changes in the emerging ICT era. These new roles require different skills and knowledge and according to National Knowledge Commission (2007) recommendation the basic skills which are required by library and information professionals to fulfil the changing roles of libraries are "information – handling skills; service orientation; ICT knowledge skills; communication and training skills; marketing and presentation skills; understanding of cultural diversity and knowledge mapping skills". Smith (2006) also suggested nine key elements factors that are required to every library and information professional to be competent enough and sustained in the dynamic ICT environment; they are "ensure readiness for change; plan for change; lead change; manage change; support change; deal with resistance to change; communicate effectively; follow through; evaluate; learn; and attend to the human factor".

Conclusion

In a nutshell, we have witnessed how Academic Libraries are adapting to the changes of today's scenario of digital revolution and technological development and also the transition of academic libraries from traditional to conventional libraries are taking place at a very fast pace, users at large are enjoying and taking advantages of all the facilities offered by these technologies. But technology alone cannot help to bring about the required changes, thus, both the Management and Library professionals have to play a crucial role in adapting to the changes in order to cope up with the emerging technologies in

the digital era. It requires the need of change in practices, policies and support of the management if Academic Libraries are to satisfy the various information needs of users and truly benefit themselves by the application of these new technologies. Similarly, Library and Information professionals at all level should also adapt to all these radical changes, develop and upgrade their technological, professional and personal skills according to the needs of the hour to sustain themselves and the library they serve in the ICT era.

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Dr.K.K.Tripathy: Commnity Participation and Quality Drinking Water Supply: Kurukhshetra-Journal on Rural Development "Drinking Water for Rural India"- Volume 67.No 8.Delhi:Publication Division, Ministry of information & Broadcasting, Government of India,Pages 56, June 2019, ☐ 22.ISSN-0021-5660

Review by: Sumarlang Oracle Lyngskor

The Article Community Participation and quality Drinking Water was written by Dr. Tripathy, an Associate with the Department of Science and Technology, Government of India in one of reputed journal on rural development, Kurukshetra, issue No. 8 of June 2019. It clearly highlights the need of the hour for a co-ordination between the Central and State governments regarding clean drinking water supply in both Semi- Urban and rural areas respectively. This has been a long-cherished dream for every government for the last six decades or so, that safe drinking water is to be provided to every member of the community and society as a whole. However, this article concentrates more in the circle of rural setup which is comprehensible and sideline the Urban Sector where there is also a large chunk of different community fighting for water shortage and community as well as participation from all stake holders is urgently needed.

In one of the paragraph it mentioned that *"Article 47 of the constitution mandates states to provide safe and drinking water to improve public health the provision of clean drinking water reduces the incidences of diseases and fatalities and helps in improving the overall standard of living"* which is logically true and acceptable, but, the facts and ground reality is that, not many states in the country do really adhere with what it has been scripted in the constitution. There are many states in our country that are now facing scarcity of safe drinking water and no proper water policy did come up. In one of the statement we could see the view of the author of this article that empowerment of Self help groups, Cooperatives, voluntary organisations etc can manage and monitor the rural drinking water sources and generate the system at the local levels, thereby, achieve the target of 'har ghar jal' (Water tap for every household), a flagship programme of the Government, but, the approach is 'area – specific development interventions'. How far this flagship programme can be

met is still a question mark as there are states facing shortage of clean and safe drinking water. States like UP, Madhya Pradesh, Jharkhand cannot be compared with states like Kerela, Tamil Nadu or Telangana or in other words the problems of safe water scarcity problems in the states of Mizoram, Nagaland or Arunachal Pradesh is not the same as in states like Gujarat, Maharashtra or Rajasthan. As we know that the rural population in different states have different cultures, customs or even the way they live. Thus, entrusting the whole process in Self Help Groups (SHGs) and Cooperatives may not be that feasible as what we can theoretically analyse. The main reasons for empowerment of SHGs, Cooperatives, etc not being feasible are –

- **All SHGs are not uniform across all states in the country**
- **The stake holders which involved in making clean drinking water to reach all household will first covers areas of their own interest and then the whole community.**
- **The third reasons that such theory may face a road block in making it a possibility is due to financial constraints.**

There are states in India which are self sufficient and self reliant in terms of resources, but, many states do not have enough to make ends meet regarding the fulfilment of clean and safe drinking water. Besides, in rural areas where inhabitants are not literate enough and ignorance dominates regarding safe and clean drinking water also contributes to be one of the factors. It is highly important for the community and people especially in rural areas to learn and educate themselves on how to use clean and safe drinking water.

People stand in line to get water from a tanker in Chennai on June 19
(Source R. Parthibhan/AP)

An attempt by the writer of this Article is highly commendable and it is an eye opener that clean and safe drinking water should not be ignored. With economic growth and development that this country achieved, clean drinking water facilities have not been focus much, even though there were attempts made by different governments, past and present, through different schemes and programmes introduced in the country. Some of the programmes initiated by the Government are Accelerated Rural Water Supply Programme (ARWSP) launched in 1972-73, National Drinking Water Mission (NDWM) -1986 which is also known asTechnology Mission of Drinking Water and Related Water Management, Rajiv Gandhi National Drinking Water Mission (RGNDWM) -1991, and National Rural Drinking Water Programme (NRDWP)- April 2009, Har Ghar Jal (Water tap for every household) – 2017 which is attuned to United Nations sustainable development goals - 2030. However, NRDWP – 2009 has been extended to all rural habitation and was transformed into an outcome oriented schematic intervention to ensure adequate potable drinking water to arrive at the rural household without undermining the convenience, affordability, and, equity while distributing clean drinking water in rural areas. When we discuss about safe drinking water, the hindrance on its way are Industrialisation, environment degradation and unprecedented population growth which makes it quite difficult for all the stakeholders to acquire safe and clean drinking water, and, this has been one of the agenda in the 11th and 12th five-year plans.

__A man fills a container with drinking water as others wait in line__
(source: P. Ravikumar/Reuters)

The author of this Article also supported his view by providing some statistical data from the ministry of Water and Sanitation, Government of India as

Table 1: Drinking Water Coverage Status of Rural Habitations: 2012-13 to 2018-19

Year	Fully Covered	Partially Covered	Quality Affected	Total
in Nos				
1	2	3	4	5
2012-13	11,61,018 (68.6 percent)	4,48,439 (26.5 percent)	82,794 (4.9 percent)	16,92,251 (l00 percent)
2014-15	12,10,199 (74.2 percent)	3,76,343 (21.9 percent)	66,761 (3.9 percent)	17,13,303 (l00 percent)
2016-17	13,25,302 (76.8 percent)	3,26,005 (18.9 percent)	74,724 (4.3 percent)	17,26,031 (l00 percent)
2018-19 (till Feb'2019)	13,85,853 (80.6 percent)	2,72,147 (15.8 percent)	61,309 (3.6 percent)	17,19,309 (l00 per cent)

Notes: (1) Status is based on service norms of delivery of 40 lpcd
(2) Figures in parentheses are percentages to total
Source: Ministry of Drinking Water and Sanitation, GoI

The above data has given the rural drinking water coverage. Which when we glanced through it we can proudly say that maximum water distribution has been achieved in the last six decade or so, but, is this the reality that we are facing? With the growing numbers of households, increased number of Industries, global warming, pollution, etc are some of the facts that need a consideration even though such proposal as mentioned in this article regarding active engagement of Community through PRIs, SHGs and Co-operatives is very encouraging. But, the point which he opined in the article that 40 litres per capita per day (lpcd) to be the minimum amount of water received by households may not be an equitable distribution of quality drinking water. As we know rural households varies in its size from one household to another. The household with a very small size may be adequate enough to have such amount but it may not be possible with certain household for a larger size. This 40 litres has been fragmented in the following manner as per the norms for potable drinking water in rural areas provided by the Government of India as

NORMS FOR PROVIDING POTABLE DRINKING WATER IN RURAL AREAS

While implementing the Rural Water Supply Schemes, the following norms are adopted for providing potable drinking water to the population:

40 litres per capita per day (lpcd) for humans to meet the following requirements

Purpose	Quantity (LPCD)
Drinking	3
Cooking	5
Bathing	15
Washing utensils & house	7
Ablution	10

With normal output of 12 litres per minute, one handpump or standpost is estimated for every 250 persons. In case of an independent habitation/hamlet/Wadi/Tola/Majra/Mohra etc, if their population is less than 250 persons and there is no potable water source within its location, one source may be provided . A rural habitation not having

any safe water source with a permanently settled population of 20 households or 100 persons, whichever is more, is taken as the unit for coverage with funds under the ARWSP. However, the State Government could cover any habitation regardless of its size/population/number of households with funds under State Plan.

Therefore, rural population will still need to find out the ways and means for additional litres of water to meet their requirement.

It also mentioned regarding the quality of water supplied which is really a challenged not only to the rural community but also to the government trying to make such programme a success. But it will be impossible unless and until a genuine and honest practice are being taken up by every household as well as all the stake holders involved in making clean drinking water scheme a success.

The Article widely covered the importance of clean drinking water in the rural areas by highlighting certain challenges that may come on its way as this can be a herculean task not only to the government but to all stake holders. It also provided various suggestions such as preparation of systematic water safety plans, proper execution of water conservation project under PMKSY, MGNREGA etc by the department concerned, coordination at the State/District and Block Levels etc, Training programmes, and provision for availability of water resources and Technical supports.

In conclusion of this review, the article has certainty that if such proposal are being implemented the success rate may be high but it cannot be dependent only from the part of the Government or SHGs, Co-operatives, as the main agency to propagate but it also requires the Panchayats, Local government, Village heads, and all those involved in running the rural administration and most of all by each and every household itself. It has also highlighted regarding the challenges that to make such proposal a reality there are enormous task to complete. In an Article by Sunita Narain (Down to Earth magazine), tradition for water revolution, she stated that, the State cannot harvest rain; people has to be involved in every house, colony and village. Which undoubtedly, water scarcity is not only in rural areas, clean and safe drinking water is not only in countryside or villages but

it is a problem faced by Urbanites and semi-urban habitation. Amid water crisis in the country we observed that the state of Meghalaya has come forward to script a Water Policy as stated in India Today that it is the first state to introduce such policy (India Today/ANI/ July 13, 2019) the Deputy Chief Minister stated that this willintends to achieve sustainable development, management and use of water resources with community participation.

In the words of Benjamin Franklin and Gandhi we have

"When the well's dry, we know the worth of water."
- Benjamin Franklin

"The earth, the air, the land and the water are not an inheritance from our fore fathers but on loan from our children. So we have to handover to them at least as it was handed over to us."   *- Gandhi*

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