EUROPEAN ACADEMIC RESEARCH
Vol. II, Issue 2/ May 2014

Impact Factor: 3.1 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Women, Environment, and Sustainable Development: A study of Women among Sumi Community of Nagaland

KITOHOLI ZHIMO
Junior Research Fellow
Department of Anthropology
University of Delhi
India

Abstract:

Women have been participatory stalwart of conservation for centuries without much recognition and appreciation in natural resources and environmental management. They are known to exist in close proximity with nature and possess inherent indigenous knowledge about the earth systems thereby contributing to the sustainable management of the resources, yet they continue to suffer the brunt of environment degradation at the expense of Gender disparity. Had they been given equal opportunity and control over the natural resources the world would have achieve greater if not, complete sustainable development.

In this milieu, the present work seeks to explore the role and contribution of women in sustainable development within the patriarchal framework. Are women the key to Sustainable Development? What are the contributions of women in the environmental management? What are those Gender constraints that hamper the process of Sustainable Development? Or is Gender parity the "missing link" of Sustainable Development? An attempt is therefore made in the present work to unearth these queries based on the qualitative research study conducted among women engaged in Organic farming, Vermiculture/Vermicompost, and Indigenous based Knowledge Systems in Agriculture.

Key words: Sustainable Development, Gender Disparity,

Environment, Organic Farming, Indigenous Knowledge

Introduction

In a traditional set-up of Sumi tribal community, land is an important source of income and means of livelihood for the rural poor. The natural resource base is very crucial to their existence because every activity for their growth and survival is directly related to the forest and forest land in terms of food security, fuel, fodder, water security, medicines, etc. With agriculture and animal husbandry as the main stay of more than half of the tribal population in the rural villages, any imbalances in the environment hamper their overall economy affecting women the most in the process due to sexual division of labor.

Traditionally the local practice a form of subsistence agriculture, slash and burn also called jhum cultivation or shifting cultivation in which the farmer slash, burn, cleared the land and cultivate it for about 2 years until the soil loses its fertility and then they move on to next patch of land and continues the same process. This takes about 15 to 20 years for the soil to retain its moisture and fertility after which they come back to cultivate on the same plot of land and utilized the regained nutrients before leaving it barren for the next cycle. However, this practice became unsustainable in the face of rapid land degradation, deforestation, population pressures, food demand, and development programmes at the expense of modernization and global forces. As a result, the gap of years for soil fertility enhancement was cut down at a high rate from 15-20 down to 5-7 years in an attempt to meet their subsistence needs. Organic farming was by default in the context of traditional agriculture of the local people, life was simple with no menace of health complications, people eat healthy, deriving their vital supplement of nutrients from the forest judiciously in their harmonious co-existence with the nature. But increased

use of artificial fertilizers and chemicals reached the remote corner of the rural location brought about by the global market and forces to combat the invading problems of land degradation and food demand. Local believes increasing cases of still-born or abnormalities in new born children to be the outcome of chemicals in the food crops coupled with the incoming elements of the global market bringing health complications in their trouble-free existence long time ago. They also recount of the past glories when modern medical conditions and health complications were unknown or scarce at the expense of their living standard, which was simple, natural and healthy.

In this milieu, there was a great urgency to adopt innovative and sustainable technique of cultivation to combat the increasing environmental issues, health complications, livelihood management, and quality of life in the face of rapid growth and development. The question arises as, what could be the new innovative techniques in agriculture that would produce not only quality food crops but also contribute to the sustainable management of the natural resources? And who could devote earnestly for nurturing the natural resources and promoting the sustainability of the given environment? Modern organic farming incorporation with the local indigenous knowledge of women emerged as the new ecological paradigm and sustainable strategy to combat against contemporary issues of the environment and natural resources.

The present paper therefore seeks to explore and address the relation of gender in the context of environment and natural resource management from an ecofeminist perspective. Ecofeminism as an activist and academic movement sees critical connection between the domination of nature/ environment and the exploitation of women in different context of the world. Women all over the world engaged in environmental movement in different contexts dedicated to the continuation of life on Earth. A range of ideas on their interconnectedness have been explored within ecofeminist

framework, but for the present paper three central connection to the theory is derived to understand the co-relation of women and environment of the field area;

Conceptual or cultural/symbolic connection: This connection is articulated in several ways and represents ideas of the world in dualistic structure as such women are identified with feminity, body, earth, sexuality and men with masculinity, mind, spirit, power. Therefore dualism such as mind/power, reason/emotion, culture/nature, heaven/earth, men/women converges which implies that men have innate power and control over both nature and women. These ideas are perpetuated by religion, philosophy, culture, networks and constructions. In the present paper, focus is made on cultural elements as such patriarchal tradition that results in domination of women.

Empirical claim: This claims that in most parts of the world environmental problems disproportionately affect women the most. The increased burdens may not result from environmental deterioration per se, but from a sexual division of labor that considers family sustenance to be women's work such as food security, fuel, fodder, water security, hygiene and so on.

Epistemological claim: the fact that women are disproportionately affected by environmental problems establishes an innate connection between women and nature which makes them better qualified as experts on such situations. It also places them in an epistemological privilege to develop inherent knowledge about the earth systems and assist them in bringing about new ecological paradigm.

Universe of study

The study was conducted among the Sumi women of Khukiye-Lukhai village 6 -7 km away from its administrative block, Satakha town under Zunheboto district, Nagaland, North-East

India. The village has its own tribal council of governance and autonomy which at present, is witnessing development with the formation of village development board (VDB) in 1981. It has a population of about 1200 (approx) with the population of females relatively higher than the male population. The topography of the village is hilly landscape with lush green forest, swift flowing streams abounding with diverse range of flora and fauna. With its moderate weather conditions throughout the year it sustains the village with their mainstay as agriculture, animal husbandry, forestry and other subsistence activities. Although the mainstay of the village is agro-pastoralistm yet many modern amenities like highway road, solar cells, internet connection, cars, luxury goods, machinery, and so on covers the remote corner of the village betraying the picture of the rural economy and location.

Methodology

The data for the present study was collected by conducting full-fledged anthropological fieldwork for 2 months using participant and non participant observation, village survey, census, genealogy, case studies, narratives, focus group discussion, semi structured interviews, informal conversation, etc. Grounded theory was followed up in which the data collection was carried out till it reaches the saturation point to validate the information. Interview guide was employed in which board themes and dimensions were constructed to lead the conversation. A total of about 80 (approx) women, both married or unmarried were interviewed using different methods of data collection engaged. Focus was given on women engaged in Organic farming. Cross Gender views was taken to crosscheck information.

Monthly journals, informative journals, newspaper, electronic media like television, online journals, and scholarly literatures were referred to gain insights into the situations

and enrich with the ongoing problems and issues relevant to the present work.

Locating Women's lives within Patriarchal Framework

Tied down in patriarchal system, women have certain limitations and reservations in every sphere of her life be it the social, cultural, economic, political, or the religious domain. Although the outer cover displays uniformity between gender relations yet the internal functioning and organization is still very much patriarchy in prevalence. Following the customary laws and traditions, women are denied of property and landownership of neither her parents nor her husband rendering her immobile and voiceless regarding any decisions for the welfare of the family and the society at large. However, women as a caregiver, nurturer, etc are expected to meet the basic requirements of the house with or without any source of income in their hand and as a result they face daily constraints of household management. They entirely depend on the forest and a forest product to generate some sort of income to meet household requirements which is considered to be their domain. Therefore they develop intrinsic connection with the forest in the process and gathers inherent knowledge as a nurturer and conservationist. Although they contribute immensely for the welfare of environment yet they continue to remain marginalized in decision-making regarding any environmental policies and development programmes of the village. Women's multiple role as mother, nurturer, care giver, etc renders endless responsibilities to tackle and these do not delineate their contribution but rather they are tied down to ensure food security, fodder, water security, fuel, and other miscellaneous needs. As a result, any imbalance in the environment disproportionately affects them which may not be directly due to environmental degradation but due to sexual division of labor perpetuated by male oriented social order. When we look

at the sexual division of labor, women in general are simply tagged as house wife/house keeper because their works is unpaid and limited to domestic boundary and is not associated with official workplace. Men usually work outside the village in some private sector, Government sector, or self employed like carpentry, running rice mill, shops, hunting, daily wage laborers, and private driver, etc therefore escapes the direct brunt of environmental crisis.

In those household where the only income source is agriculture based, men does their part of clearing the forests, preparing the soil for sowing, constructing the rest house, lending a hand in harvesting but the heart and bones of the work ultimately becomes the sole duty of women who does the occasional clearing of weeds, nurturing of the food crops, protecting the crops against rodents, pests and birds, seeds preservation for the next season, checking the water canal etc. Besides, women are naturally and dutifully gripped with the tensions for the outcome of the food crops in regard to excess rainfall, drought, other climatic conditions, rodents and pests, weeds, quality of the crops, and harvest bearing in mind the sole dependence and sustenance on agriculture but men are generally freed once their part is considered done. On off days from fields, men take complete rest at their best but it is not the same case for women, for it is a day meant to ensure other source of livelihood; a day to collect fodder, fuels, water, vegetables, food security, drying and grinding the grain, washing and cleaning, selling the vegetables in the village and nearby towns, and so on.

Table 1, Presents how sexual division of labor influence vulnerability to environmental degradation.

	Women	Men	Link to environment change and crisis
	Role of house keeper/ child bearer, nurturer, remain attached to household boundary or	Usually engaged in odd jobs, move around for economic opportunities	Men may earn reasonable income for the benefit of the family but their absence

Role	village	outside the village	usually increases workload of women overall exposing her to all sorts of pressures both within and outside the household.
	Produce household oriented food crops and livestock products i.e. Green fodder besides fuel, water, medicinal herbs etc	Usually produce market oriented products like carpentry products, bamboos, commercial trees, or in absence engaged in some odd jobs outside the village.	Both activities are equally affected by environmental crisis. However, men can migrate for some jobs but women have to stay back and look after the children, elders, and the house. therefore, environmental change has profound consequences over household food security
	They are responsible for food storage and preparation, seed preservation, preservation of fodder, fuel and water etc	They takes charge of selling market oriented products, animals etc which are taken care by womenfolk	In times of water scarcity, excess rain, rampant of pests and rodents, change in weather conditions it affects the role of women in ensuring their responsibilities. While this may also affect market value of goods produced by men folk, women face extreme brunt in terms of household food security measures.
	They have no control over finances, no access or control over land or other assets	They have full power and authority over financial matter, and own land and property, and other assets in their name	Without decision making power, women often faces financial constraint, household management problems, no scope for self-improvement and recreation. No control over land and property renders them helpless in untoward situations like divorce, death, or separation.

Resour-ces	Have less access to information regarding development programmes, employment opportunities, often compromises in terms of education, food, and healthcare etc.	Men takes in-charge of development programmes, greater participation in village politics, ultimate decision making power, often derive the best without compromising.	Inadequate information results in less resilience power because of absence of prior preparation. However, women have inherent traditional knowledge that aids them in times of environmental crisis. But modern application is also required like men. Compromising on basic requirements also leads to deterioration of oneself in terms of women,
Power	They have no power over finances, family assets or no bargaining power, no or less power in politics	They have full control and power over family finance, land and property ownership, full participation in village politics	Without the power to decide on family finances, their ability to manage risk or combat incoming problems is limited.
	Face greater resistant in mobility, self expression, self-improvement, stigmatization of their sexuality.	No or less socio-cultural restrictions on men.	With no power of movement and self-expression, women often become the ultimate victim of environmental problem, both the social and the physical environment.

Application of women's indigenous knowledge in Agricultural Practices

In their co-existence with the natural environment, women are believed to develop inherent knowledge of the earth systems which further assist them in fulfilling their role as nurturer and conservationist. Modern Organic farming is not entirely a new agricultural technique in itself but it is incorporation of local indigenous knowledge contributed largely by women who acts as the storehouse of intense and varied information of the

natural resources. Their traditional knowledge of the forest not only ensures their subsistence needs but many existing studies/ researches have shown that women's inherent knowledge constitutes a fundamental contribution to sustainable development in the community, (Filomina Chioma Steady; 1998). In the present work, an attempt is made to explore application of indigenous knowledge of women which aimed to enhance sustainable and judicious management of the natural resources.

Women as Custodian of Seeds: Seed preservation is always considered to be women's work. They have good knowledge about seed quality, genetic diversity of seeds, seeds selection, seeds compatibility to soil types, and different technique to preserve seeds organically and therefore they are ultimately known as Custodian of Seeds. Women also have diverse knowledge of variety of seeds of different food crops which is accumulated and exchanged through networks of relationships such kinship networks, friend circle, villages, cross tribal connections etc. Different technique of seeds preservation is employed to set them dry for the next season, to avoid consumption of chemicals after sowing, and also to keep away pest and rodents.

1. Moisture-free: Seeds when exposed to moisture tends to rot and increase invasion of worms or insect and becomes unfit for sowing. Therefore, immense efforts are taken to prepare the seeds for the next season in which the women selects best of all the variety of food crops produced and separates them out for preservation. To prevent the seeds from developing moisture they store the selected seeds in a cane basket/ polythene or jute bags/used paper and hang them in the kitchen or near the kitchen hearth so that it remain dry and resist moisture till the next season.
2. Resist pests/ rodents: when seeds resist moisture when kept near the fireplace, it also leaves no or less room for

the pests or worms/insects to invade it. Moreover, when seeds are preserved near the fireplace they remain exposed to the smoke for a longer time making it bitter in taste. This acts as natural pesticides to keep away the wild pests/rodents from attacking the seed after sowing in the field.

3. Chemicals –free: Smoke acts as a natural pesticide to keep away invading agents or animals. This eliminates the use of artificial chemicals which otherwise was used extensively to keep invasion of pests/rodents under control. This indigenous method of seed preservation not only helps to avoid consumption of affected food crops but also eradicate the problems of polluting soil quality and water sources.

Indigenous Land Management Strategy: The topography of the forest land is hilly, mountainous, and has elevated vertical slope. In this condition, soil erosion is rampant which leads to loss of soil nutrient and texture resulting in poor quality food crops. To combat soil erosion indigenous land management strategy is incorporated in the modern organic farming promoted by the local women. Several earthen embankments are constructed with the support of dried branches of trees which takes the shape of a step/terrace cultivation that runs horizontally down the slope. This slows the rate of soil erosion or even if soil erosion occur the soil nutrients does not run off but settles down in the subsequent embankment. As a result, loss of rich nutrients is minimized and soil moisture and texture is retained in the constructed embankments without running off in vain. Increasing deforestation, use of artificial fertilizers, grazing of cattle, encroachment of wild animals, shifting cultivation, etc contributes to the growing rate of soil erosion in the region which in the context of present agricultural system, indigenous land management system is highly incorporated and applied to

arrest loss of soil texture and nutrients.

Home-based Manure: In the course of tending and nurturing the food crops in the field, the women gather eatable weed, vegetable remnants, food crops invaded by pests/rodents, fallen crops, etc and feed the domesticated animals as fodder. The animals feed on these organic materials and excrete it out as high quality compost which is again utilized by the women in their kitchen garden or field. They also collect chicken droppings from the coop and make efficient use of it in their kitchen garden where they usually grow essential home-based requirements such as green chili, tomato, spring onion, king chili, yum, etc.

Strategy of Crop Management and Cultivation: Women are equipped with immense knowledge on the wide-range of food crops which they locally grow and cultivate in terms of seed quality, genetic diversity, crop selection, soil types, weather conditions, nutrients, water requirements, quality yield, manure requirements, etc. They also employ their experienced knowledge in considering what kind of food crops are suited/not suited to grow on the same patch of land, as according to them some crops yield good result when grown together along with different crops but some do not. This is because some plants need support of other while some grow independently of the other. E.g. small height crops like chilly, tomato, spring onion, bitter gourd etc are collectively grown on a small separate patch of land providing support to each other in terms of sunlight, space, and nutrient intake. But maize are often grown alone or along with one or two standing crops of similar height to avoid suppressing the growth of other crops which happens in case it is cultivated with crops of small height. Likewise, soya bean is cultivated separately on a small semi-arid patch of land away from the water sources because it does not grow well in high water content. Precautionary

measures are taken to avoid intercropping of green chili, round gourd etc with soya bean as they believe that the sharp odor/ flavor of these crops suppress the growth of soya bean plant which is soft and blunt. Leguminous plants such as beans, long beans (*Kuithi* in local term), flat beans (*Apa Khetsuthi* in local term*)* and other plants like bottle gourd, bitter gourd, etc needs support of a standing tree or stalk for their growth and development. This is achieved by growing these food crops on dried standing trees or tree stalks which is kept purposively at the time of clearing the forest. Plant creepers like pumpkin, watermelon etc are grown over the fences to make maximum use of the field area as well as to demarcate the field boundaries.

Women and the New Ecological Paradigm in Agriculture

As discussed earlier in the introductory part of the present work, traditional agriculture also called jhum or shifting also called slash and burn cultivation resulted in rampant exploitation of the forest land leading to land degradation, deforestation, soil erosion, pollution of water, health complications with increased use of artificial fertilizers. In the contemporary times, modern amenities have reached the remote corner of the village betraying its rural location and economy. Population pressures, food demand coupled with adaptation to advanced lifestyles and modern forces, the local poor no longer remain self-sufficient with hand to mouth existence. This has lead to trigger their conscious being of making the best of what they own with more judicious and meticulous efforts giving more of a picture of survival of the fittest in their attempt to upgrade themselves socio-economically with changing times. Agro-pastoralism as their mainstay and high dependence on forest and forest products as the only source of livelihood options for women, they brought about new ecological paradigm in Agriculture in the form of

Modern Organic Farming and Vermiculture/Vermicompost.

Organic Farming: Organic farming is a technique of farming to achieve high quality yields without harming the natural environment or the people who live and work in it. Modern organic farming is not entirely a new technique in itself but it is a new concept of agriculture which does not work without incorporation of local indigenous knowledge. Soil structure and soil fertility is given major emphasis for which several techniques are employed such as seasonal crop rotation, mixed cropping, crop and animal wastes, mulching, animal husbandry, increasing genetic diversity, good cultivation practices, natural pesticides, careful management of water sources, Crop nutrition, weed control, Pit compost etc . Sensing increasing issues of environmental deterioration, organic farming was first introduced in the village by one educated woman belonging to same village but reside in far off town who had acquired degree and training in modern application of organic farming. Bearing in mind the nurturing capacity and inherent knowledge of women she organized them into several groups and trained them in organic farming in collaboration with their indigenous knowledge. Each group has about 15 to 25 members namely *Akumto* group, *Topuvi* group, *Tokulu* group, *Xakulu* group, etc. All the members of each group work on their common field which is taken on rent from the local land owners, or village council. Some groups work in more than one field depending on their group strength, availability of field land and labor. For the present paper although all the groups were interviewed and their agricultural field sites were visited, focus was given on 2 to 3 groups for deriving case studies.

Case Study 1

Akumto Organic Group: The name of the group implying itself as "Strong/ Strength", this group emerged as the most dynamic of the entire existing group with active participation in training programme, exhibition, cultural festival, agricultural events, and fete day both at the local as well as the national level. A group of 15 women all married of different age groups ranging from 30 to 60 (approx); they have their own executive bodies elected with collective decisions. The chairman takes initiatives of the activities such as group meeting, training, welfare programme, supply of food crops and vegetables etc. she acts as the head of the group and any decision concerning the group activities is finalized by her. The banker takes responsibility of hosting group meeting and discussion at her place. All the property of the group such as utensils, agricultural implements, files and document, machines, essential food items etc rest under her care. The finance secretary deals with the finance of the group. She maintains register on group expenditure and income. She also takes responsibility of group bank account of deposition and withdrawal. Fund, prize money, donations etc, is also taken care by the finance secretary. Initiated by the local educated women to combat the environmental crisis, these organic groups do not fall under Government recognition and so they do not receive any loan or compensation from the local Government. However, with their painstaking efforts and labor they receive timely appreciation and financial aid from Government official, Affluent personalities, Political leaders, and local leaders etc who notice their contribution in the environmental fronts. They have also showcase their organic products on many occasions and represented their village, community, district and their state at the national level.

In the earlier times of subsistence agriculture based on jhum cultivation, the food production was excess for household consumption and was not sufficient to sell in the market. What little they could save was sold in the nearby town or village proximity to generate humble income for their immediate use. But with organic farming they now not only supply organic food crops to neighboring towns and cities but also to different state of the country due to its high demand. Due to high quality yield it has more price value than the conventional food crops and therefore they generate a good source of income for themselves. With economic benefits the group has opened a joint account in which they deposit money every month as a security for themselves. They have also purchased grinding machines, drying machines, and other essential items needed for processing and preserving seasonal food items which they export it to different places adding to their sources of income. Organic farming not only helps them in achieving their environmental theme but also gives them economic opportunities to generate their own income. Economic independence enhances their self-worth and increases their bargaining power within the household as well as the village or the social level. It also provides them a source of economic security for situation like death, divorce, or separation since they do not have any control or power over land and property. Working in group also enhances social solidarity among the women and prepares them to confront any social evils or conflicts that target the women in general.

Vermiculture/Vermicompost: Vermiculture implies rearing and cultivation of earthworms and using them in manufacturing of vermicompost replacing chemical fertilizers aimed for the

betterment of human beings. Vermicompost is the excreta of earthworms which involve rigorous process of collecting organic wastes, variety of plants, cow dung, water etc and allowing the worms to feed on it and give its excreta as the end product. It takes about 6 to 8 months to harvest the matured compost. Earthworms not only convert organic materials into valuable manure but it also keeps the environment healthy and chemicals-free. Vermicompost as an ecofriendly natural fertilizer free of chemical inputs does not have any adverse effect on soil, plant and environment but it rather improves soil aeration and soil texture. It also helps in water retention of the soil because of its high organic content and enhances soil nutrients. The worms are cultured in a plastic tank, makeshift box, tub, pit etc away from direct sunlight to allow the natural process of decomposition to take its course. Watering at regular intervals is required to maintain its moisture level.

Case Study 2

Akumto organic group: The concept of vermiculture/Vermicompost was first introduced to the women by agriculture department through whom they purchased a packet of earthworms for 500 rupees. They also received training from agriculture department on types of vegetation to be used, quantity of water, cow dung, and other precautionary measures to be taken. Initiated in 2009 they have harvested about 7 to 8 times till date. It is a rigorous process which takes about 6 to 8 months to attain its full maturity. Cultivation is done in a makeshift plastic tank measuring 12 ft length, 6 ft breadth and 5ft in height provided by the Agriculture Department for they do not own a land to construct a permanent cement tank. A tin roof is constructed over the tank with wooden walls in all the four sides to keep away from direct sunlight. They begin the process by collecting several baskets of green leafy vegetation, soft grasses, tree leaves, and other local plants, slash the collected vegetations into pieces and spread them in the tank as the base. A mixture of cow dung and water is spread over the base followed by scattering the earthworms over the bed. After this they covered the tank with jute bag and supply a large quantity of water into the tank. The jute bags allows the water to penetrate deep inside steadily without disrupting the arranged layers and enables the earthworms to come in contact with the mixtures to start its action of ingestion and decomposition. They feed on the mixture, defecate it as manures. Regular supply of water is carried out, say 4 to 6 bucket twice a week to maintain the moisture level. This process continues till the mixture level shrinks down after which they put another batch of slashed leafs and plants with cow dung. This action is repeated again and again until the tank is filled. The water supply is cut short after 3 or 5 months to allow the mixture to settle down and dry out naturally with balanced moisture. In the due course of these process, the number of worms multiples and continues the cycle of

reproduction. In the 7 or 8 month the mixture is confirmed for harvesting by checking whether it contains few or no scraps of uneaten food or bedding. The process of harvesting is time consuming, increased labor, and involves lots of precautions to separate out the worms which have multiplied over the time for use in the next cycle. The excreta as the end product is harvested and spread over a large plastic/cane mat, and left to dry in the sun. They store the collected earthworms in a bucket filled with moist mud to maintain its moisture level. After drying they handpicked the stalk, twig, and other undigested remnants from the mixture and the separated manure is filtered out using sieve. The final filtered manure obtained is of high quality which is utilized for growing organic crops in their field. The surplus manure is sold in the market for its high demand and quality and fetches them good amount of money.

Table 2. Significance of the New Ecological Paradigm

Ecological activity undertaken	Ecological significance	Economic significance	Social Implication
Organic Farming	Increase long term soil fertility and texture, ensures natural water sources, natural in practice, promotes sustainable practices of agriculture, maintains overall balance in the environment, high quality yield etc.	Less cost and high productivity, high quality yield leads to high income, economic opportunities increases for women, economic security in times of crisis. Scope of self-improvement is increased	Economic independence enhances self-worth and increases decision-making power. They also contribute for the growth of human development in terms of quality education, nutrition, healthcare etc. Working in group enhances social solidarity to stand against any sorts of social issues that target women in general. Economic empowerment also redefines gender relationship not only within the household, but at the village, community or society at large.
Vermiculture/ Vermicompost	Eliminates use of chemicals, ecofriendly, waste reduction naturally, improves soil life and structure, ensures safe water sources, reduce organic wastes that pollutes that environment maintains overall balance in the environment etc.	Low capital investment, sustainable yet high economic benefits , highly nutritious organic products, both the compost and worms generates income, etc.	

Women in Times of Environment Deterioration

In the context of the present study, sexual division of labor perpetuated by the patriarchal setting push women to become the ultimate victim of the environment degradation. Having no control and power over land and property ownership contributes to their plight. The destruction of the environment clearly poses grievous threat to the marginalized population of the world who are heavily dependent on their immediate environment for their survival, but with the maximum impact of the destruction of natural resources on women. (Anil Agarwal, in Guha's 1994). As the environment degrades, their survival needs becomes increasingly difficult to collect and women have to invest extra ordinary amount of time foraging for fodder, fuel, vegetation, water besides her usual activities as house-keeper, caretaker, agricultural works and animal husbandry. Agro-pastoralism as their mainstay, every activity is connected to the forest or the natural resources and therefore women face dire consequences of environment degradation especially with regard to water, fodder, fuel, and food security.

In the field area, the recent years witness the development of highway road initiated by the male folk to connect the village to other neighboring villages, nearby towns and other part of the state had cut off all the water pipes which were connected to almost every house in the village. The source of water connection was derived from a natural water sources from the mountains which was fresh and plentiful. But after the water pipes were cut off in the construction process they had no other source but to wholly depend on rain water for household needs. Big plastic tanks are installed to store the rain water for dry season but the village has not developed in terms of rain water harvesting which pose a big challenge for women in absence of rain. The stored water remains hardly sufficient for a household of 7 to 10 members. Women had to walk a long distance of 3-4 km down the vertical slopes to reach

the stone caves to collect water for household needs. Development programme without inclusion of women's opinion coupled with environmental crisis puts extra burden on women weakening their health conditions in the process.

Pig rearing emerges as one good source of economy and nutrition of the local. Every occasion, festivals or cultural celebration ends with a grand feast with pig meat occupying the central place at the table. It also has ritual or cultural significance of reinforcing social solidarity in times of celebration and festival; an act to rekindle old relationship or an act to initiate new relationship over eating. Considering its importance and significance, pigs are reared in large numbers in every household for their own use as well as for commercial purposes. Generally looked after by women folk although man do give a hand at times in handling feed or cleaning but the greater part of the work falls on women such as collecting fodder from deep jungles, cooking, cleaning pig sty, bathing the pigs, feeding etc. Ensuring fodder is not an easy job for women because they have to careful in identifying edible plants or choosing the kind of vegetations that enhances the growth of pigs while man generally have no knowledge of fodder exception of few common ones. On normal days women spend about 3 to 4 hours a day in foraging for fodder alone which they have become accustomed to. But in times of scarcity of vegetation especially during the autumn season when green vegetation dries out, women foraged deep into the jungles with their mid day meals in search of fodder increasing their foraging time to 6 to 8 hours a day. With the good source of income it generates, pig rearing has become rampant even among affluent household which has resulted in severe competition over fodder, space and boundary. As a result, poor women from farming household without lands are pushed to the wall as they are stopped even from collecting edible weeds in other's field which was previously possible. Deforestation also leads to diminishing of vegetation that was once plentiful and healthy. Irony of this

situation is that although women work to their bones to look after the animals but the finances regarding the transaction of selling of pigs are handled by the men folk. The penetration of modern forces coupled with cash economy is affecting the relationship between men and women as while men have become more involved with the cash economy, women continue to deal with the non-monetized, subsistence based economy of the household. (Anil Agarwal, in Guha's 1994). Days after days, the routine repeat itself, women continue to work extra hours throughout the week except on Sunday, else their fuel and fodder collection time increases. Firewood meant still more work and another tiring journey. When women collect firewood they only go for dried branches which had fallen off and so trees are hardly deforested for their use. Yet they continue to face constraints in the face of private ownership of land where entry even to collect dry twigs are denied. Shifting cultivation, deforestation, concept of private property and other environmental conditions in addition to sexual division of labor which expects women to ensure these essential needs creates greater hardships in their day to day lives. As a result there is no scope of improvement, recreation and self-maintenance in terms of nutrition, healthcare, etc and many women opined that stretching, bending, walking over the long distance, and foraging hills and mountains has resulted in the acute body ache, swelling and pain in the knee joint, back ache etc which never seems to get better because even if they take a day off, they have to resume it the next day and undergo the same process as such one woman add that 'there is hardly any time for hospital or healthcare, and for that we have to go out of village which is time consuming as well as travelling requires finance, and moreover these body pain are often overlooked, we have other major problem in life'.

Discussion

Women all over the world have embraced the environmental problems and are among the most ardent activists for protecting the earth systems and the lives of the inhabitants in it (Filomina Chioma Steady, 1998). From Greenbelt movement of Kenya (women initiate and promote afforestation) to Chipko movement of India (women protested against illegal cutting of trees) to Pacific Region (where women protested against nuclear testing) to Philippine movement (Filipino women halting the building of environmentally threatening dam) to South America (Guyanese women initiating a biogas program to save fuel) etc. all these represents the contribution of women in the environmental fronts dedicated to the continuation of life on earth. Accordingly, in the present work an attempt was made to connect the movement of local women to promote organic farming against land degradation and other environmental conditions with the ecofeminist perspective in the background of patriarchal social order.

The present study is in sync with many other existing literature and scholarly research studies. Many researches, organization, platforms at both national and international level have addressed the dynamic role of women in the management of natural resources. A number of contemporary researches (Nath, 2013; Kshatriya & Mitra, 2013; Dem, 1993; Loots & Witt, 2005) etc have discussed on the active contribution of women in maintaining sustainability of resources with her power to create, nurture and transform. These studies also bring into picture the constraints of gender inequality in policy, ownership of assets and decision-making in environment development and welfare and stressed for inclusion of women in decision making to enhance greater, if not sustainability. In sync with the present study, many existing studies (Filomina Chioma Steady, 1998; Susan Buckingham, 2002; Mary AA, 2005; Janet Brand, 1996; Pottier Johan, 1999) etc opined that in-order to achieved sustainable development, women indigenous knowledge should be incorporated and gender parity

be attained in policy and decision-making as women are more likely to have better knowledge and perhaps, a close affinity with the environment (Earth Summit, 1992). Many ecofeminist discourses (works of Gwen Kirk, 1997; Bina Agarwal, 1992; Gunnel Cedarlof, 2004; Susan H,2004) etc confront gender disparity and articulates women as the active agents or the driving force of environmental movement. Some ecofeminist argues that due to their intrinsic connection they become the ultimate victim of environmental crisis and disfavors the western technologies in favor of women's indigenous knowledge that ensure sustainability. In sync with the present study, some studies also bring us to an understanding of how development programmes directly impacts women and increased their labor and therefore stressed the urgency of gender mainstreaming and inclusion of women's voice in decision making which otherwise from women point of view, it can be argued that all development is ignorant of women's needs, often anti-women, literally designed to increase their work burden (Anil Agarwal (1986), in Guha's 1994). Given a chance, women would procreate whatever be given to them had they given equal opportunity in terms of resources, decision making and social spaces etc. Gender fair policy and programmes emerged as the crucial need of the hour coupled with recognition of their knowledge and contribution aimed to achieve greater if not, complete sustainable development.

Conclusion

The present study was a small attempt to understand the role of women in the context of environment and their contribution to sustainable development. This study further confirms and validates existing studies in terms of gender inequality in policy making, environmental crisis, indigenous knowledge of women, and their intrinsic connection which brings about new ecological paradigm. Jhum cultivation, deforestation, new

developments, population pressures, food demand, etc contributes to increasing issue of land degradation. With proper management in terms of forest land, incorporation of indigenous knowledge and innovative agricultural practices of organic farming, these problems is found to be moderate. However, if human's voracity of utilizing resources continues to grow at the present rate then the outcome shall be grave for humanity to bear.

Recognition of women's work and inclusion of their voice in policy and decision-making on natural resource management emerged as the crucial need of the hour for the betterment of all life on earth. Existing custom in the form of patriarchal society is also needed to overthrow its harsh biasness and promote gender parity in terms of recognition of women's right over land and property ownership. Economic independence of women also emerged as important agency to empower them in speech and action and to assert their rightful position in the affairs of the village or the society. It is found that when women are empowered economically, they utilize the hard earned money for the human development such as quality education, nutrition, healthcare, medicines, and a scope of improvement for themselves. Therefore, in sync with the existing literature and emerging researches, the present work concludes on a positive note by acknowledging women's inherent role as a nurturer and promoter of environment sustainability and demands the urgency of gender fair development in favor of sustainable development.

Reflexivity of self as young feminist scholar

Conducting fieldwork in my community did not affect me much in terms of familiarity because I chose the field site of a village which was alien to me rather than my ancestral village. Moreover, as a true socio-cultural anthropologist I have imbibe a greater lot of cultural relativism that allows me to respect

and regards every other culture, tradition and customs and this leaves me no room to nurture prejudices against other culture nor any favoritism of my own culture. As a feminist, growing up unconsciously in my community headed by male oriented ideology and supremacy I could relate myself to the plight of women which helped me in obtaining their narratives of daily lives, struggles, and anguish at the hands of patriarch. Relating myself to their situation also gained me insights into the sensitive issues like income, gender relations within as well as outside the household, social evils and conflicts of the village, recent growth and development of their work and position, and many others. However, I faced some sort of resistance from some male elders in the village because my topic was somehow in critic of the patriarchal setting. Other than this the fieldwork enriched me with life-long experiences and a will to continue the struggle more rigorously.

REFERENCES

Agarwal, Anil. 1994. "An Indian Environmentalist's Credo." In *Social Ecology,* edited by R. Guha. USA: Oxford University Press.

Agarwal, Bina. 1992. "The Gender and Environmental Debate: Lessons from India." *Feminist Studies*. 18(1): 119-158.

Ajayi, Mary A. and Abiodun Olukayode Olotuah. 2005. "Violation of Women's Property Rights within the Family. Gender- Based Violence Trilogy." *Domestic Violence*. 1(66): 58-63.

Brand, Jannet. 1996. "Sustainable Development. The International, National and Local Context for Women." *Built Environment* 22(1): 58-71.

Buckingham-Hatfield, Susan. 2002. "Gender Equality: A Prerequisite for Sustainable Development." *Geography* 87(3): 227-233.

Buckingham, Susan. 2004. "Eco-Feminism in the Twenty First Century." *The Geographical Journal* 17(2): 146-154.

Cedarlof, Gunnel. 2004. "Environment, Knowledge and Gender. Local Development in India's Jharkhand." *Human Geography*. 86(2): 138-140.

Dem, Mariam. 1993. "Sustainable Development: Women as Partners." *Focus on Gender* 1(1): 14-18.

Kikhi, Chozule. 2011. *The Role of Women in Natural Resource Management. A thematic Report*. Nagaland: Artworks.

Kirk Gwyn. 1997. "Eco-Feminism and Environmental Justice. Bridges across Gender, Race and Class." *A Journal of Women Studies*. 18(1): 2-20.

Loots, Lliane and Harald Witt. 2005. "Women and the Environment; How are we close to Earth Democracy?" *Agenda* 64: 52-62.

Kshatriya, Gautam and Suili Mitra. 2013. "Women: The Harbinger of Sustainable Development." *World Focus* 34(5): 22-25.

Merchant, Carolyn. 1992. *Radical ecology: The Search for a Livable World*. New York: Routledge.

Mies, Maria and Vandana, S. 1993. *Ecofeminism*. Jaipur: Rawat Publications.

Nath, Anna. 2013. "South Asian Women and Sustainable Development: Redefined Roles and Practices." *World Focus*. 34(5): 48-53.

Nakhro, Vengota. 2011. *Traditional Agriculture. Practices and Sustainable Livelihood. A Thematic Report*. Artworks: Nagaland.

Pottier Johan. 1999. *Anthropology of Food: The Social Dynamics of Food Security*. Cambridge: Polity Press.

Steady, Filomina Chioma. 1998. "Gender Equality and Ecosystem Balance: Women and Sustainable Development in Developing Countries." *Race, Gender and Class* 6(1): 13-32.