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Enterprise Development, Influence on the Natural Environment in Northeast India with Reference to Manipur: A Review of Literature

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Abstract:

Enterprise and natural resources are indispensable needs for the people. The development pace carried out had impacted the essentiality of water resources to its brinks. The pace of development has impacted both the fauna and flora of today and marks a big question for future generations. The study pictures the dwindling nature of the water resources caused by the faster pace of enterprise activities such as industrialization, logging, Jhuming, mining, etc through indiscriminate action against the serene Ecosystem, by reviewing various studies carried out by the scholars, and various government agencies. The findings relates to the imbalance ecosystem of the areas impacting the livelihood of the people and its surroundings. The need for more awareness to be carried out by the people to understand more about the sustainable approach stays below par for today and future generations. The present pace of awareness couldn't suffice. Therefore, it needs a better collaborative action plan for all the stakeholders for a better future.

Keywords: - Enterprise, water resources, imbalances, and sustainable.

1. Introduction

Enterprise is a project or undertaking that is especially difficult, complicated, or risky such as a business organization, agriculture economic enterprise, etc. On the other hand, water resources are natural resources of water potentially useful for humans, for example as a source of drinking water supply or irrigation and so on. Enterprises endowed with many opportunities yet occupy different stories such as IT, Agriculture, wood business (ranging from small to large business), quarrying of stones for developmental works, etc. And its (enterprise) influence on the varied domain of both flora and fauna is perceptible. The safe drinking water, loss of perennial nature of water resources, and loss of natural resources (flora &and fauna) have been influenced by it (enterprises) directly or indirectly. The demand for water, along with increasing pressures on water from pollution, urbanization, and overexploitation of aquatic resources, is also creating a biodiversity crisis in freshwaters *(World Bank 2003).*

Today, most countries are placing unprecedented pressure on water resources. The global population is growing fast, and estimates show that with current practices, the world will face a 40% shortfall between forecast demand and available supply of water by 2030 *(World Bank 2023)*. Furthermore, chronic water scarcity, hydrological uncertainty, and extreme weather events (floods and droughts) are perceived as some of the biggest threats to global prosperity and stability. Acknowledgment of the role that water scarcity and drought are playing in aggravating fragility and conflict is increasing.

Feeding 10 billion people by 2050 will require a 50% increase in agricultural production, (which consumes 70% of the resource today), and a 15% increase in water withdrawals. Besides this increasing demand, the resource is already scarce in many parts of the world. *World Bank* Estimates indicate that over 40% of the world's population lives in water-scarce areas, and approximately ¼ of the world's GDP is exposed to this challenge. By 2040, an estimated one in four children will live in areas with extreme water shortages. Water security is a major – and often growing –challenge for many countries today.

Water resources are the national wealth of any country and one of the basic foundations of its economic development. The growth of cities, rapid industrial development, intensification of agriculture, a significant expansion of irrigated land, and many other factors make the problems of rational water resource management more difficult. The process of urbanization encompasses these gains, but it also often entails a shift toward industrialization and rising incomes, which could have detrimental effects on the environment (*Jayachandran 2021*).

Water resources are under threat from water scarcity, water pollution, water conflict, climate change, and various enterprise activities as well. Fresh water is a renewable resource yet the supply of groundwater is steadily decreasing, with depletion occurring most prominently in Asia, South America, and North America, though unclear in their perspective of usage and renewable balances, and the threat to the ecosystems. Yet water management is still alarming even though a trend of action plans has been taken up by the Government and various other agencies.

Regions like the northeastern part of India continue to face the daunting task of creating baseline data for the chronically data-poor water sector. The need for such data is apparent: despite the region's huge water resource potential, it still accounts for some of the most water-starved pockets of the country. The poorest members of society, unable to afford sterilized or bottled water, suffer the greatest impacts. Similar problems affect the rural poor as well of course, and sometimes these can be even more severe. However, in a rapidly urbanizing world, the scale of the problem facing cities is particularly acute (*Work Bank Report, 2003*). Aggravating the situation is widespread poverty, with its associated risk of depletion of the natural resource base and accompanying environmental problems. The region also faces an increasing incidence of unrest and insurgency-related to growing unemployment, a stagnant economy with slow development, and a lack of the means to utilize available resources to support productive livelihoods. A long-term water resource management program designed to develop a critical mass of indigenous productivity with the requisite technical, economic, and socio-cultural means for sustainable development is an urgent need. Also required is an increase in the capacity and demand for local expertise to provide comprehensive evaluations of available water resources and ways of utilizing them. The future of the Northeast rests

significantly on how effectively concerted endeavors are made in the complex field of food security and water productivity. With Arsenic and fluoride contamination of groundwater posing serious health threats, the water quality issue too deserves increased attention. It would be fortunate if the choices that maximize economic prosperity also maximize environmental quality. However, the inconvenient truth is that such a perfect alignment rarely occurs (*Jayachandran2021*).

Economic development is very essential for human well-being and the development of nations but is often a source of harmful environmental pollution. Above this, the Manipur River basin in central Manipur, with far less discharge capacity of 0.5192 million hac. meter in a catchment area of 6332 sq.km. On the other hand, most of the important rivers pass through the thickly populated areas of Manipur valleys. It also covers most of the habitations of the hill Districts of Manipur Senapati District, the western portions of Ukhrul and Chandel Districts, and the eastern portion of the Churachanpur district of Manipur. The swift population rise, unplanned urbanization in urban areas, lack of awareness about environmental issues, poverty, and indiscriminate Jhuming cultivation, wood industries in the hills and allied areas have led to environmental impairment, with its associated effects on human development, for it is ultimately the people who have to face the effects of environmental damage today and the days to come.

Manipur (Hill areas) is the reference area for the study to better understand the dwindling nature of the water resources in terms of perennial nature, the quantity of water, loss of species, etc with a faster pace of enterprise activities, the behaviour of the people towards the vital need of water resources and for the future sustainable approach at hand had been the relevant study carried out.

The following tables are the changes that took place since 20215 (Regard to environment, Northeast India)

Table:1 (Area in square kilometers)

State	Geographical Area	Very Dense	Moderately Dense	Open Forest	Total Forst Area	% of the forested areas	% change since 2015
Arunachal Pradesh	83,743	21,058	30,176	15,197	66,431	79.33%	-0.39%
Assam	78,438	3,017	9,991	15,304	28,312	36.09%	-0.05%
Manipur	22,327	905	6,228	9,465	16,598	74.34%	-1.48%
Meghalaya	22,429	560	9,160	7,326	17,046	76%	-0.43%
Mizoram	21,081	157	5,715	11,948	17,820	84.53%	-1.03%
Nagaland	16,579	1,272	4,449	6,530	12,251	73.9%	-1.88%
Sikkim	7,096	1,102	1,551	688	3,341	47.08%	-0.03%
Tripura	10,486	647	5,212	1,863	7,722	73.64%	-0.05%

The forest cover in 2021 in India by state and union territory as published by the Forest Survey of India (FSI) is shown in the table above.

***Very Dense**: All lands with tree canopy density of 70 percent (0.7 tree density) and above. **Moderately Dense**: All lands with tree canopy density of 40 percent and more but less than 70 percent (0.4 to 0.7 tree density).*

***Open Forest**: All lands with tree canopy density of 10 percent and more but less than 40 percent (0.1 to 0.4 tree density).*

Table: 2 (Area in square kilometres)

State	Geographical Area	Very Dense	Moderately Dense	Open Forest	Total Forst Area	% of the forested areas	% change since 2015
Arunachal Pradesh	83,743	20,721	30,955	15,288	66,964	79.96%	-0.23%
Assam	78,438	2,797	10,192	15,116	28,105	35.83%	+0.72%
Manipur	22,327	908	6,510	9,928	17,346	77.69%	+1.18%
Meghalaya	22,429	453	9,386	7,307	17,146	76.76%	-0.52%
Mizoram	21,081	131	5,861	12,194	18,186	86.27%	-2.52%
Nagaland	16,579	1,279	4,587	6,623	12,489	75.33%	-2.71%
Sikkim	7,096	1,081	1,575	688	3,344	47.13%	-0.13%
Tripura	10,486	656	5,246	1,824	7,726	73.68%	-1.56%

The forest cover in 2017 in India by state and union territory as published by the Forest Survey of India (FSI) is shown in the table above.
***Very Dense**: All lands with tree canopy density of 70 percent (0.7 tree density) and above.*
***Moderately Dense**: All lands with tree canopy density of 40 percent and more but less than 70 percent (0.4 to 0.7 tree density).*
***Open Forest**:All lands with tree canopy density of 10 percent and more but less than 40 percent (0.1 to 0.4 tree density).*
***Scrub**:All forest lands with poor tree growth mainly of small or stunted trees canopy density less than 10 percent (Less than 0.1 tree density).*

2. Manipur

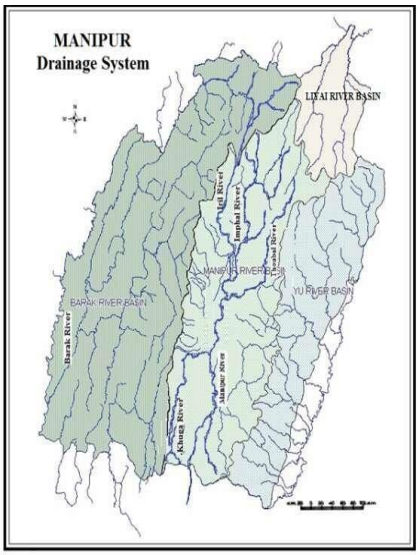
Manipur is a state of India, located in the north eastern part of the country. It is bordered by the Indian states of Nagaland to the north, Assam to the west, and Mizoram to the southwest, and by Myanmar (Burma) to the south and east. Like other north eastern states, it is largely isolated from the rest of India. The name Manipur means “land of gems.” Its economy centres on agriculture and forestry, trade and cottage industries also are important. The state capital is Imphal, located in the centre of the state. Area 8,621 square miles (22,327 square km). Pop. (2001) 2,293,896; (2011) 2,855,794. On 9 December 2016, the government created 7 new districts, bringing the total number of districts to 16,(Bishnupur, Thoubal, ImphalEast, ImphalWest, Senapati, Ukhrul, Chandel, Churachandpur, Tamenglong, Jiribam, Kangpokpi, Kakching, Tengnoupal, Kamjong, Noney, Pherzawl.)

Table 3: Protected areas of Manipur

	Number	Total Area (km2)	Coverage % of the state
National Parks (NPs)	**2**	140.00	0.627
Wildlife Sanctuaries (WLSs)	**7**	708.543	3.173
Conservation Reserves (CRs)	**-**	**-**	**-**
Community Reserves	**11**	104.736	0.469
Protected Areas (PAs)	**20**	953.279	4.27

***River and Drainage System of Manipur: 2015*.Table 4.**

Drainage System of Manipur and (Catchment and average yield)	River Basin	Catchment areas	Percentage of average yield	Yield in MLD
	Barak River Basin			
	Barak	6,865	43 %	230 MLD
	Tuvai River	1,860	17 %	95 MLD
	Jiri River	316	7.3 %	39 MLD
	Total	**9,041**		**364 MLD**
	Manipur River Basin			



Manipur River (up to Ithai Barrage)	5,109	21 %	116 MLD
Manipur River (beyond Ithai Barrage)	1,223	10 %	55 MLD
Total	**6,332**		**171 MLD**

Source: Extracted data from http://www.manipur.nic.in/planning/ DraftMSDR/ Draft_SDR_pdf/ Chapter%207_irrigation.pdf

Hill District of Manipur was once aplenty & abundance of rainfall, vast vegetation with big trees of varied fauna & flora. The jungle was thick with numbers of animals, vegetation and a varieties of forest products were intertwined along the rivers and various streams as well and a decade's back Rivers holds healthy quantity of water at every junction point or confluence of rivers. Many have experienced the beauty and value of the river water along with memories in it. But as the time passes by the value of the perennial river for the common benefits have been degrading to the level that rational thoughts could tell that down the line there lies a fear of water resources for vital need to the people of Manipur.

The population were engaged to the activities i.e., agriculture activities such as paddy planting, fruit farming, livestock, logging activities for consuming as well as commercial activities that too in a minimum value/rate. In fact, all the activities were carried out in a manual manner with minimum wages. But as the development goes on the enterprise's activities carried out are in such a manner that it has impacted the livelihood sustaining resources. And now as the years goes by the volume or level of the water has become lesser and lesser and even to support many species in and out of the river catchment areas becomes a constant question.

During the progress of livelihood process the health of the rivers seem to be forgotten in spite of the utmost need for our livelihood. The negative effects of deforestation on the ecosystem, such as soil erosion, water scarcity, and biodiversity loss, Manipur has had severe economic effects from deforestation. Timber and other forest products support local economies and are a significant source of income for the state. Yet Unsustainable logging methods, on the other hand, have diminished the amount of forest resources available for economic gain (Sarangthem, Kumar. 2023). The human has played & impinge the value and beauty of the rivers in an exploitative manner in a way of polluting in the form of indiscriminate cutting of trees, poisoning, Jhuming, poppy plantation, mining, quarrying, deluge of effluent(plastics) etc have made a significant damage to the most beautiful rivers that the people were very dear to it.

And the need for rural enterprises has impacted the water resources in a very unpleasant manner to which the society seem to lack the vital need for the people for today and for the future in particular. The development of enterprises in the hill Districts could be felt mostly to the forest-based industries (wood products, honey, bamboo products), agro-based industries (fruit juice, spices oils etc), handicrafts (toys antiques etc) etc.

The creation and generation of employment (Marginal) stands a positive note but on the contrary indiscriminate approach to the deforestation have cause enormous side effects to the vital health of the water resources. Example healthy forest within the range of 100 metre of the rivers couldn't be seen, the varied endemic species could be seen missing, and most importantly the volume of the river is being witnessed decreasing as the developmental approach is taken up or in the process.

Above which the enterprise works such as logging for furniture works, sand mining, quarrying, etc have a closed connections for the deterioration effect to the rivers of the districts of the state and other north eastern states as well. An alternative strategy such as collaborative approach of government and all the stake holders, NGOs etc, and growing of more trees, application of scientific approach in regard with enterprises for sustainable approach to address the present situation is the utmost need, in order to have a healthy and sustainable ecosystem in particular.

3. Results

As per the review of the papers, journals, statistical data, etc with respect to the reference area. It has come to the preview that the trend of the enterprise such as logging activities for furniture and other acts have impacted the water resources in such a manner that imbalance of the ecosystem is the first thing it has picture out. The species both the fauna and flora which is considered endemic to the area could be picture out as vanishing day by day, shortages of drinking water, rapid erosion of the soil with lesser fertility of the land, flash floods during rainy season, siltation of the river water resources with lesser quantity could be other important areas related to the action of the enterprise's development in the process. And most importantly the behaviour of the people could be as per the studies relates to lesser attune to the dwindling nature of water resources in spite of the present trend happening. Yes, the People of the areas concern felt the deteriorating nature with appealing to the concerned authority for action, yet pace of the action plan remains to be taking longer time. Awareness campaign, reforestation plan, impact of mining activities with alternative action plan for livelihood activities have been the awareness campaign yet the action plan stays below par with the intended aims. A strong will of a leadership is the need of the hour

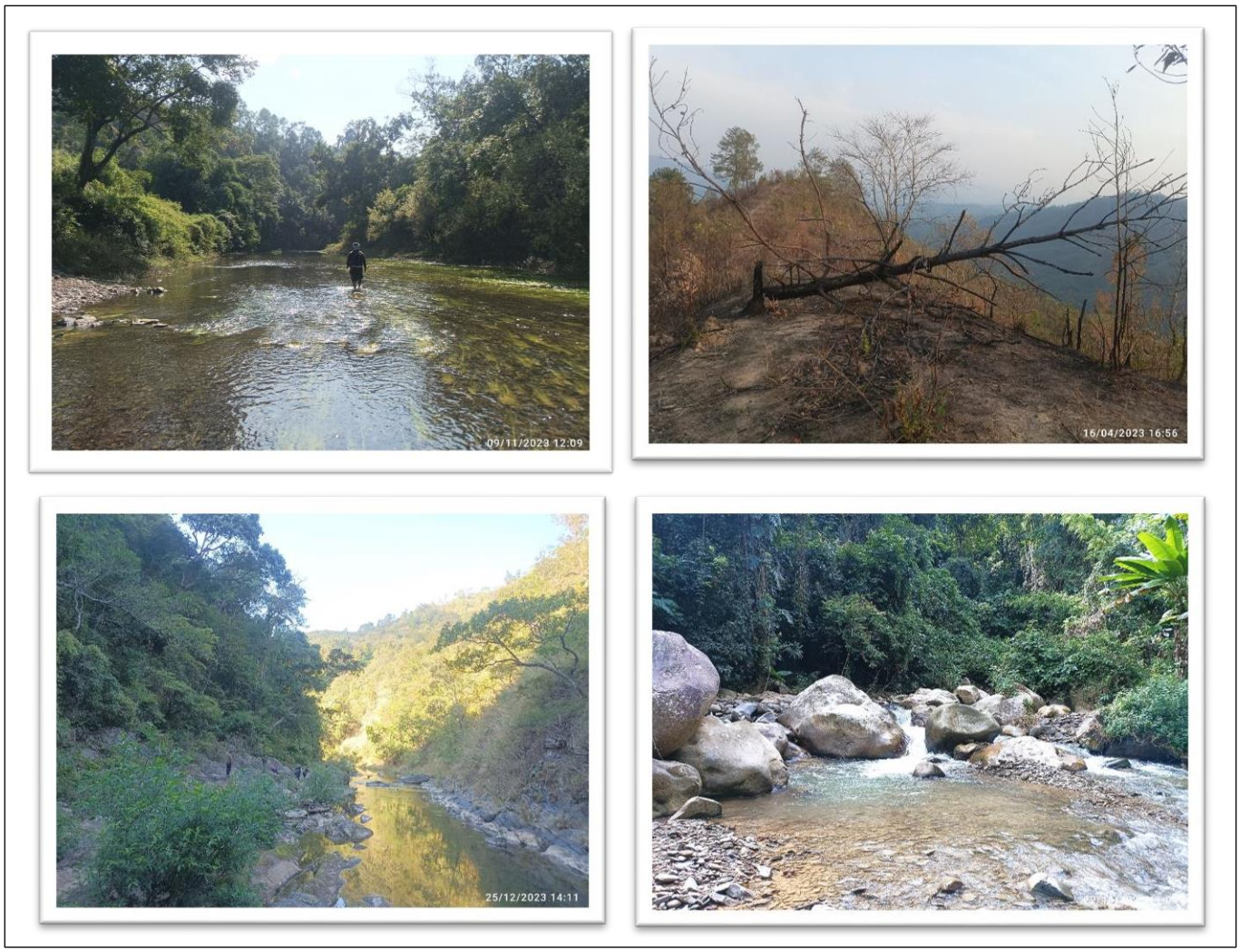


Figure: forest & river Basins during the winter season (Chandel district, Manipur)

4. Discussion and findings

The north-eastern states of India — Arunachal Pradesh, Assam, Manipur, Nagaland, Tripura, Mizoram, Meghalaya and Sikkim — have lost 1,020 square kilometres of forest during 2019-2021, *according to the biennial India's State of Forest Report 2021 published by the Forest Survey of India.*

The eight states account for 23.75 per cent of the country's total forest cover. The Forest Survey of India defines "forest cover" as all land of one hectare or more of tree patches with canopy density of more than 10 per cent.

Among the eight states, Manipur recorded the largest loss in forest cover (249 sq kms), followed by Nagaland (235 sq kms) and Mizoram (186 sq. kms). The report attributes this loss in forest cover to shifting cultivation, which is practiced in many northeastern states.

The people of the hills once used to be reluctant going alone in the jungle for fear of wild animals has now become a different story. Now a days the sounds of the wild animals are missing unless one does not go to the deeper jungles. One or two decades back streams, ponds etc could hold a good amount of water even in the winter season (February to march). But today the trend could be seen missing as well. And the people could be seen fetching water and buying fresh water from the water carrier pick-up van with water sintex on it. This trend of water resources problem could be seen and witnessed not only within the hill districts but to various hill districts & valleys of Manipur as well. And in Temenglong district in manipur, the second rainiest place in northeast states next to mausnyram (Shillong) too witnessed the acute shortage of water resources as well.

The ever-increasing human population and their unlimited needs and its impact on natural environment is one of the most drastic issues. Human impact on forest is greater than any of the other components of the environment. Indiscriminate logging activities for furniture for home as well for commercial and deforestation for Jhum/poppy cultivation, and many other development works carried out by government machineries, privates and all the stake holders' legal & illegal activities Tangibly/intangibly impacted the beauty and value of the live sustaining rivers of Manipur. All efforts carried by the people in the form of social media campaign, mass literacy awareness campaign, planting of more tress campaign and application of eco- friendly approach such LPG gas subsidy (under pradhan mantra ujjwala yojana) etc. Although the efforts to enhance to revive the health and the quantity of the volume of rivers are at play. Yet there are many loopholes attach within the social strata of the state which couldn't suffice the health and balance the activities of enterprise and water resources till date.

5. Ways and means

"The world has enough for everyone's need, but not enough for everyone's greed." Mahatma Gandhi

Enterprise and water resource is an indispensable to the progress of the mankind from the domestic to the masses. And reviving and rejuvenating the health of the water resources through well channel enterprise is in the hands of all the stake holders of the people and even to the other districts, states as well. As it holds the live in it and indiscriminate approach of enterprises or development and rivers resources could derail the mankind generations down the line. Hence civil society organizations, government machineries, and all the stake holders are accountable for the revival and sustainable approach to the most value gift of the serene ecosystem. In the process of development, the concerned states' genuine association with the Ministry of Environment, Forest and Climate Change (MoEFCC) and its broad objective Conservation and survey of flora, fauna, forests and wildlife such as Prevention and control of pollution, Afforestation and regeneration of degraded areas, Protection of the environment, Ensuring the welfare of animals, etc could be a positive vital approach.

Above all measures towards Sustainable approach such as: -

- Family planning.
- Taking environmental issues into consideration in the process of management of an enterprise.
- Establishing environmental managing system and regulations.
- Introducing environmentally friendly production line
- Sustainable agriculture e.g., organic products, plantations, etc.

- Wise environmental practices, such as recycle, reuse and reduce our waste wherever and whenever we can could be certain ways to address the study in particular.

On the other hand, North Eastern Region Community Resource Management Project (NERCORMP), The project's primary objective is to improve the livelihood options of economically vulnerable groups in a sustainable manner through the promotion of livelihood opportunities and strengthening of local institutions that relate to livelihood development. The objectives could be an immense asset to address the issues such as to

- enhance the capacities of local people to select appropriate livelihood opportunities, access required financial resources, manage new technologies and institutions at the village level;
- Increase incomes through more sustainable income generating rural livelihood activities and the establishment of more and more non-farm enterprises at the micro and small-scale level; and
- Establish effective and appropriate delivery systems for inputs and for the maintenance of assets and resources, with emphasis on microfinance, savings and thrift, and micro insurance products, along with access to business development services that would link households-based livelihood activities with the larger economy.
- Wise environmental practices, such as recycle, reuse and reduce our waste wherever and whenever we can etc could be certain ways to address the study in particular.
  These are some of the alternative ways and means, and well execution of the valued government policies and funds could address the impacted areas cause by the anthropogenic acts.

6. Conclusion

What is the role of all the stakeholders who depend on her of every need for survival is a big question to be rationalised at the moment. Because life never ends here and we have a generation down the line. This generation's gift from the Mother Nature shall soon be found nowhere if the present activities still prevail with no remedy. And the present intellectual with an immediate action is the demand in order to revive the rivers resources health to her pristine original self again.

And if the present trend has to go or follow there is a probability that upon the ascending trend of shrinking of the volume rivers, streams, rivulet etc. there lies a fearsome fate of the people down the line that one day our naturally available water resources may vanish and it will be imported like the crude oil India's imported from the other country at a high cost. Therefore, a development has to be initiated from within that we belong to this mother earth and judiciously usage and application of machinery in a healthy manner is the need of the hour and minimizing the creed character of mankind are the basic tools that today's generation could abide to address the dwindling value of our natural resources (Water resources).

7. Limitations and Future Recommendation

The demand for the sustainable approach is an inevitable for the happy existence of man and environment, hence there lies a numerous area for further study/research, the studies rely more on literature reviews and genuine implementations of the various policies on the impact of environment cause by the human

development process is needed. The need for more empirical approach and more penetration to the public domain is needed for the study.

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