Rapid Population Growth Effects on Environment: Some Challenges of Murshidabad District.

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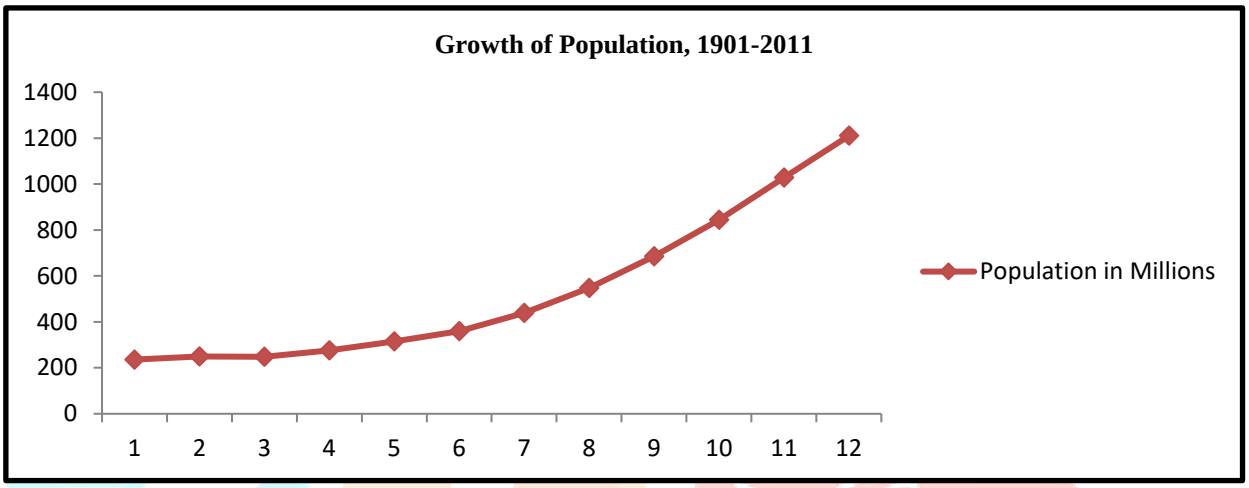
Abstract: Rapid Population growth is now a burning topic across the world. The important source of development is human population as well as at the same time also a major cause of environmental stresses when it beyond the threshold limits of the system. Rapid population growth means more demand for food, clothes and shelter. It means more space to grow food and provide accommodations to millions of people. Besides them there is also the need of better quality of life means communication, transport, industry, education and entertainment. That's for the outcome is always hampered on environment,i.e. deforestation, increased pressure on arable land ,loss of biodiversity, pollution(like air, land/soil, noise water) and results , the climatically change. The study area is Murshidabad district, situated in West Bengal, India, exhibits the curse of environmental degradation resulting from human over population. In terms of total population in west Bengal, Murshidabad occupies 4th position and in terms of area placed 7th in west Bengal. The district had 3rd highest decadal population growth 21.1%(state average 13.8%) and in terms of population density Murshidabad ranked 5th (1384 sq/km).This study is to find out how over population became threat to natural resources and cause of environmental degradation. All the data are collected mainly from secondary sources and methods include calculation, presentation and graphical representation of collected data(population density and decadal growth, land use category, workers and non-workers , urbanization and industrialization, forest cover, increasing rate of crime incidence).It is essential to prevent environmental degradation .Conservation of natural resources is only way to prevent environmental degradation. It is possible by reducing quantity of population and increasing quality of population. Apart from these the balance with the carrying capacity of support system; need to education and public awareness (individual, organizations, and nations) and also the government policy and technologies are needed.

Key-Words: Rapid population growth, Threshold limit, Carrying Capacity, climatic change, environmental degradation, natural resource, conservation.

Introduction: In the study of population, geography there is a relationship between population and natural resources have an important part and greater significance. The realization of the continued explosive population growth was keeping the world in a state of perpetual crisis. At the beginning world had a population only 250 million. It took the world 1650 years to double its population and reach 500 million. However, after 1650 the doubling period has declined significantly. The first billion marked reached in 1820 and the second was in 1930 that is just in 110 years. The post 1930 period, the population growth is more rapid. The world population grew from 2 billion to 4 billion in 45 years. The doubling period of world population is now estimated to be around 30 years.

Fig: 1



Source: Census of India, Provisional Population Totals, 2011, p.41

On the basis of relationship between population and natural resources, this complex relationship has sub-divide into three types- Optimum population - (Optimum population is nothing but ideal man-land ratio, it is dynamic concept), Over Population- (Is an undesirable condition where the number of existing population exceeds the carrying capacity of the earth) and Under Population- (When the population of an area is too small for full utilization of the territory's resources).

By 1972, the club of Rome had released the first computer based population environment modeling effort- Predicting an "Overshoot of global carrying capacity within 100 years. In Neo-Malthusian terms they represented a formula- IPAT

I= Environmental Impacts

P= are the product of population

A= affluence

T= technology

In India there is a big problem with rapid population growth. India became most populous country of world very soon. Now it holds 2nd position after China. Its effect on environment very badly .Overpopulation or rapid population growth adversely affects the natural resources. The rapid growth of population and environmental degradation face the challenge of sustainable development. The basic three demographic factors of population changes are Births, Deaths and Migration. Growth of population is very much related to economic development of the society. They are both contributing too many serious environmental calamities in India. These include heavy pressure on land, land/ soil degradation, forests, habitat destruction and loss of bio-diversity. The changing pattern has raising demand for energy and finally outcomes are air pollution, global warming, climate change, water scarcity and water pollution.

Murshidabad district total population is 7103807 according to 2011 census report of India. Here represent growth of population on different census years in the district of Murshidabad.

Table: 1

Growth of Population on Different Census Years in the District of Murshidabad

Year	Total Population	Index with 1901 as base
1901	1322486	100
1911	1345073	102
1921	1224181	93
1931	1370677	104
1941	1640530	124
1951	1715759	130
1961	2290010	173
1971	2940204	222
1981	3697552	280
1991	4740149	358
2001	5866569	444
2011	7103807	537

Source: Census of India

The increase of population has been due to the improvement of health conditions and control of diseases. The growing trends of population and consequent demand for food, energy and housing have considerably altered land use practices. The district people are engaged in agricultural work. They fulfill their demand for food used HYV seeds, Fertilizers, Pesticides, Herbicides. All these practices caused degradation and depletion of environment. Poverty is one of the important outcomes of population growth and its lifestyle play a major role in depleting the environment.

Aims and Objectives: The aims and objectives of the paper are to examine mainly two components- Population and Environment. The three objectives are

- To describe present population status of the study area
- To understand how rapid population growth effects on environment
- Discuss about some measures or prospects to face that kind of challenges

Study Area: Murshidabad district is Northern most district of presidency division of West Bengal. It lies centrally in the lower Ganga valley. The geographical extension of the district is 24°50`20``-23°43`30``N and 88°46`00``-87°49`17``E with the area of 5324 sq km. This district is separated from Malda by the river Ganga on its North. It is an overpopulated district. Population density of the district is 1334 according to Census of India 2011.

Database and Methodology: Throughout the paper secondary data is used. The secondary data and other information are collected from various literature, journals, books, magazines, published articles, reports etc. For the source of the data some agencies are play a major role. These are Census of India, Ministry of Environment and Forest (West Bengal), Survey of India, Irrigation Department, District Statistical Hand Book and Annual Report. Use some simple statistical representation to interpret the subject related data.

Discussion: The effect of population growth on environment is causing several environmental problems in the study area. Environmental problems are two types- Physical and socio-economic. These include water pollution, soil/land degradation, food security and pressure on land.

I. Land Degradation: India is an agricultural country. In the study area agriculture is the main occupation of most people. It is clear that most of the land is used for cultivation. Day by day population increased and at the same time increased demand for food. Cultivation is also increased with growing population but not balanced with

growing population. That's why people are busy to three or four times ploughing in a field in the form of crop rotation. It is one kind of pressure on land. People are also busy to use insecticide and pesticide for increasing cultivated production. Most of farmer of India are uneducated or not so much knowledge about cultivation in comparison with other countries. So, they are not maintaining crop rotation method properly. That's the other cause for land degradation. To justify the above concept land use of Murshidabad district data is represented below-

Table: 2

Year-wise Land-use Statistics of Murshidabad

(Thousand hectares)

year	Reporting area	forest area	area under nonagricultural use	barren and un-culturable land	permanent pastures and other grazing land	Culturable waste land	Fallow land other than current fallow	Current fallow	Net area shown
2009-10	532.5	0.77	129.41	0.1	1.19	1.02	0.16	0.51	397.47
2010-11	532.5	0.77	130.76	0.1	1.08	1.37	0.24	0.33	395.96
2011-12	532.5	0.77	130.94	0.1	1.16	1.53	0.20	0.94	395.27
2012-13	532.5	0.77	131.02	-	1.08	1.32	0.11	0.50	396.12
2013-14	532.5	0.77	131.34	-	1.13	0.81	0.11	0.84	395.98

Source: Directorate of Agriculture (Evaluation), Govt of W.B

The above table shows changing land use of Murshidabad overtime (year-wise). The quantity of forest area is 0.77 thousand hectares from 2009 to 2014, quantity of non-agricultural use was high with time (2009-10: 129.41thousand hectare, 2011-12: 13o.94 thousand hectares and in 2013-14: 131.34 thousand hectares) and quantity of culturable waste land was fluctuate time to time (2009-10; 1.02 thousand hectares, 2011-12; 1.53 thousand hectares and in 2013-14; 0.81 thousand hectares). The area of current fallow was 0.51 thousand hectares in 2009-10 and 0.84 thousands hectares. Due to rapid growth of population, agricultural land was shrinkage over time for settlement, industry and other needs. Density of forest is decreased. In that area flood is the main cause of land degradation. Growing Urbanization is an important cause of land degradation. Wastelands category of the study area is distributed following table-

Table: 3

Wastelands by Category (area in sq.km, 2008-09)

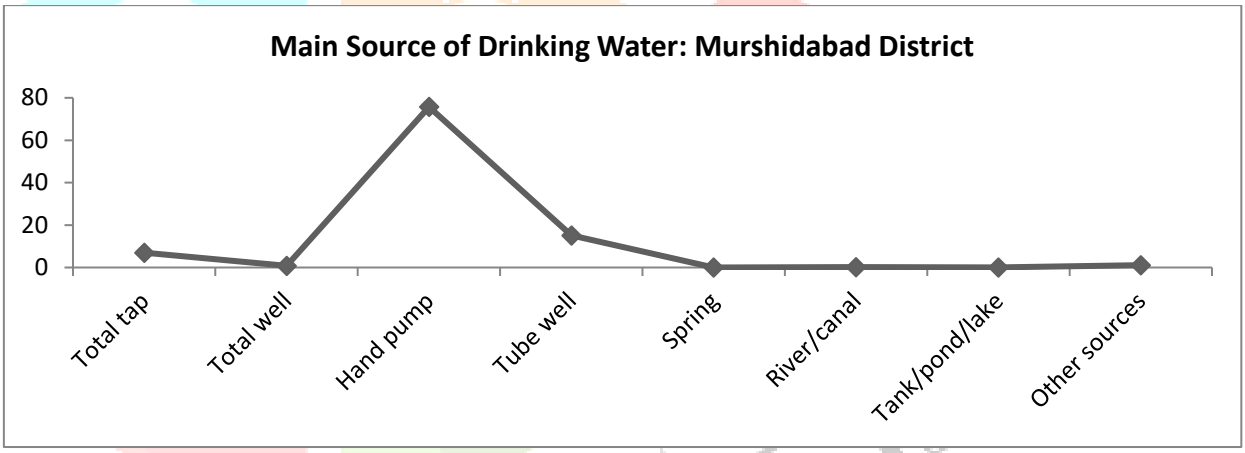
Sl no.	Category	Statistics
1	Land with dense scrub	0.11
2	Land with open scrub	0.40
3	Degraded Forest	1.14
4	Sands-riverine	0.39
Total		2.04

Source: West Bengal, District Fact book; January, 2017

Soil Degradation: It is the problem that related with land degradation. It is the direct impacts of agricultural development on the environment arise from farming activities, which contribute to soil erosion, land salination and loss of nutrients. Use high amount of pesticides, insecticides and fertilizers for fulfillment of demanding food or food security are an important factor for soil erosion. Flood causes major soil degradation. Soil lost its nutrients material. Gullies and ravines are the factors of soil degradation. Floods occur every year in the river Ganga of the study area. Brick field industry is also effects on soil erosion in the study area. Devegetation is another important factor of soil erosion of the area. Constructional purpose like rail, roads also effects on environment through soil erosion.

Water Scarcity and Water Pollution: Safe drinking water and proper sanitation is the basic need of community people. But in the study area availability of safe drinking water in many house-holds is non-existent. Arsenic, iron and Fluoride are the main water pollutant of the study area. Eutrophication is common problem due to land-locked pond with settlements. Medical wastes and urban wastes both are playing important role in water pollution. Most of the blocks of that area are Arsenic affected due to continuous and unplanned use of groundwater. Some blocks are highly affected. Most of the people are used non-treated water. It causes many diseases like diarrhea, Blackfoot, trachoma, hepatitis and fluorosis. Poor sanitation management system is also responsible for these diseases. Main source of drinking water of that area represented through the line graph below-

Fig: 2



Source: West Bengal, District Fact Book, 2011.

But most of the people drink water untreated. That's why most of the people of the study area suffered from water borne disease.

Vegetation Cover/ Deforestation: In that area vegetation cover is very poor and gradually it's getting lost its density because for agricultural demand, housing, food for animal and constructional purposes and little bit industry also. As a result increase CO2 on the Earth (reason of temperature growth), soil erosion and some wild habitats are critically endangered and caused flood.

Flood Hazard: Flood is the common problem of the study area. Its happens for various causes like-

* Meandering courses of River (Mainly Ganga)
* Faulty agricultural practices
* Soil erosion
* Blocking natural flow of water
* Sometimes heavy rainfall causes flood during monsoon of that area.

The flood hazard destructed life and asset every year of the study area. Unplanned soil digging on the river bank area is also major cause of soil erosion and caused flood.

Habitat Destruction: Bio-diversity is an important thing in earth's biological component. Biodiversity has direct consumptive value in food, agriculture, medicine etc. The greatest threat to biodiversity is not destruction of plants and animals but rather the destruction of their habitat. Rapid population growth is the factor for biodiversity destruction. Population growth leads to expanding human settlements and increasing demand for food, clothes, and fuel and building materials. Agricultural modernization also threatens biodiversity habitat. The habitats are threatened due to various developmental programmes like- reservoirs, forest cleaning, mining and transport network.

Air Pollution: Air pollution also affects environmental degradation. Rapid population growth is responsible for air pollution. Major sources of air pollution of the study area are-

- Methane- emission from cattle and other animals, wetlands and rice fields
- Gases like CO2 – from kitchen and domestic heating
- Most of the people burn wood, twigs, leaf litters, cow dung cakes, coal and kerosene oil in the kitchens for cook food (emission CO, CO2, SO2)
- Heat from industries, thermal power plants and domestic kitchens
- Automobiles, diesel, petrol of railways and other transport sector emission gases.

Air pollution impacts on plants and animals. Human being and plants are suffering due to air pollution. Human being faces some major chronic due to air pollution.

Solid Waste Pollution: Solid wastes are those materials which become useless and treat as garbage. These are news papers, waste water treatment plant, water supply treatment plant, and air pollution control facility, Pathological wastes, Eutrophication, different types of cans, bottles, broken glass, plastic containers, polythene bags, ashes and domestic garbage. Solid waste pollution caused to overpopulation. As the number of population producing a pollutant increases, pollution will naturally increase. It is applicable same thing in solid waste pollution. Lack of proper proposal of that kind of wastes caused environmental degradation.

Climatic Change Due to Global Warming: Recent the most significant problem of the world is global warming which is related to global environmental change (GEC). Due to global warming climate is changed. Anthropogenic factors are mainly responsible for global warming. Causes of global warming are-

- Changing air chemistry through air pollution
- Ozone depletion
- Emission of Greenhouse gases
- Urbanization
- Growing use of fossil fuels
- Changing land use pattern

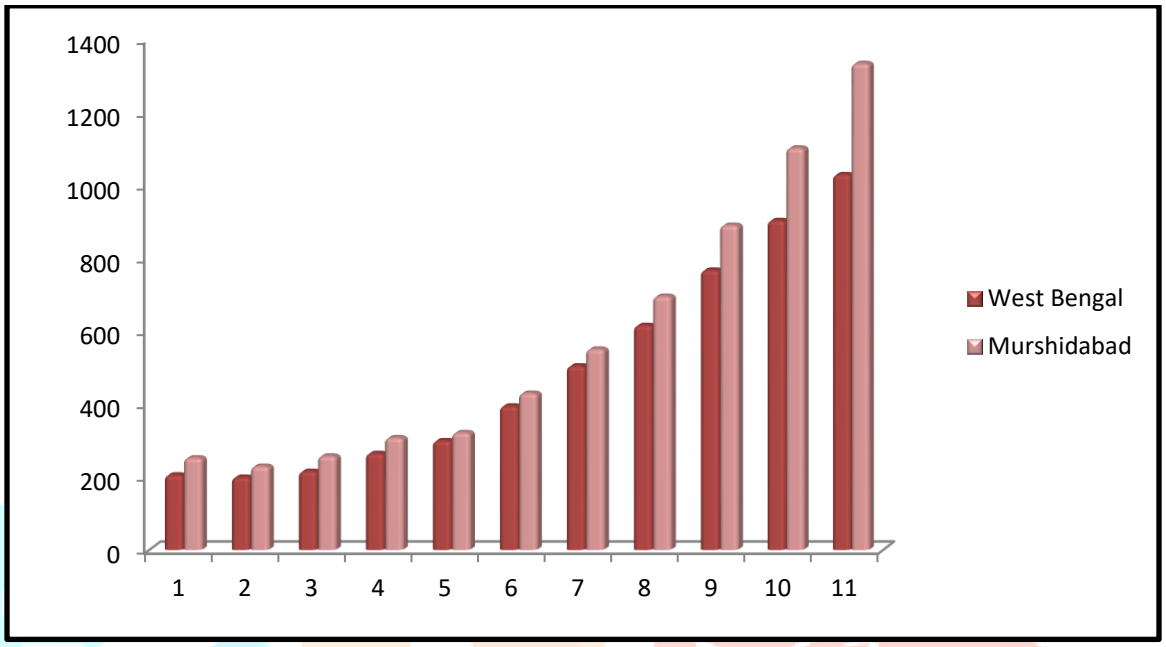
Above all the phenomena increased temperature of the earth and changed climatic condition through regional to global levels which would affects the hydrological cycle, biospheric ecosystem and food chains. Rapid growth of population effects on it massively. Climate change would cause changes in precipitation pattern, water availability, soil moisture and sea level rise. These would make an impact on agriculture, forestry, wetlands and fisheries.

Pressure on Land/ Population Density: For human's population density is the number of people living per unit of an area (sq. mile/ sq.km); then number of people relative to the space occupied by them. Population density indicates how much pressure on land. In terms of population density per sq.km the district rank is fifth after Howrah, Kolkata, North 24th Parganas and Hooghly. Population density of the study area and the state West Bengal are represented below-

Fig: 3

Population Density of the District Murshidabad and West Bengal

(1901-2011, per sq.km)



Source: Census of India (various years)

Large amount of population or high density of population faces shortage of water, bad air quality, insecurity of food, shelter and clothes. It's also effects on health condition and hygiene level also. Employment crisis is another problem creating with that. Its affect on economic condition and literacy rate also. High density of population generally includes high dependency ratio, indirectly.

Poverty: Poverty is a significant topic of the study area. Poverty is the scarcity or the lack of certain amount of material possessions or money. Poverty is multifaceted concept, which may include social, economic and political elements. In the study area causes of poverty are-

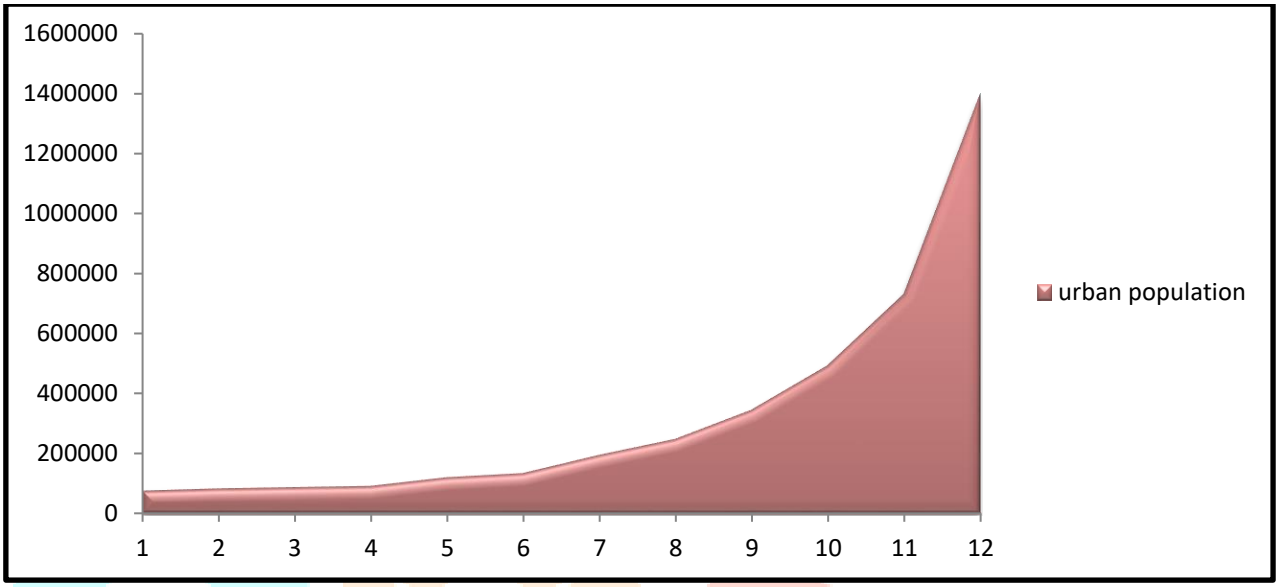
- Lack of control in local food
- Lower level of education or illiteracy
- Economic backwardness

Most of the people of the study area are dependent on Beedi work and they are lived in below poverty line (BPL). Rapid population growth is the main cause of poverty. It effects on environment also.

Urbanization: Urbanization means the gradual increase in the proportion of people living in urban areas. Urbanization also effects on environment and caused degradation. It related with rapid population growth, pressure on land, increasing demand of water and water pollution, soil and land degradation, biodiversity destruction and air pollution. The rate of urbanization of the study area is represent below over the various census years-

Fig: 4

Distribution of Urban Population of Murshidabad (1901-2011, population in number)



Source: Census of India (various years)

Above graph proved about the growing rate of urban population in Murshidabad district. At the same time the district is industrially developed in recent years. These are polluted environment and caused degradation.

Literacy and Unemployment: Unemployment is another issue which effect on environment and it related to rapid population growth and literacy rate. It also interrelated with level of education. Literacy is the reflection of a place of its society, economy and culture. Total literacy rate of the study area is 68%, according to 2011 census (male literacy-71%, female literacy- 64%). Literacy determinants of the study area are-

- Below standard living
- Growing urbanization
- Technological advancement is slow
- Women's status in society is low
- Value system and attitudes

Depends on above points literacy rate of population is not high. Not only literacy but also level of education is effects on people and their living standard. Unemployment is another problem of the area. Most of the people are engaged in agricultural work, household work, labour in industry and brick field and beeri work. Dependency ratio is high of that area. Unemployment effects on health, mental health, tension at home, political issues, crime and violence, social violence and suicidal cases. Lose of skills is the effect of unemployment. All of these are effects on environment.

Crimes and Riots: In the study area riots and crime recorded through Murshidabad crime report among the year 2010, 2011, 2012, 2013 and 2014 respectively. The following table represented the data about crimes and riots.

Table: 4

Persons Convicted and acquitted for different classes of offence in the district of Murshidabad

Class of offence	2010	2011	2012	2013	2014
Murder	160	119	136	117	105
Dacoity	48	36	67	6	2
Robbery	52	71	57	22	19
Burglary	41	77	601	6	3
Rioting	534	378	262	309	84
Theft	1118	1298	1542	936	947
Offences Against women	4320	4237	5167	4964	5286
Minor offence	1295	1419	2322	9857	10188
Others	6324	6774	3340		
Total	13892	14409	13494	16217	16634

Source: District Statistical Handbook, 2014.

Among all the crimes, offences against women and minor offence are higher than another class of offence. It caused environmental stress and degradation.

Prospects: It is interesting to note that previously human was not affected environment as much as now, mainly natural causes affect the environment. But last few centuries human affect the environment negatively due to exploitation and pollution. An effect of rapid population growth on environment is discussed in this paper and it is clear that human being want to exist on the earth anyhow. So, there is need first to protect and manage our natural resource and environment. It is the problem human being and only human being can eradicate that problem through some initiatives take in personally ,locally, regional level and worldwide. Initiatives are-

- Need to control pollution for healthy life (using technology)
- Educated people and local leaders campaigning programme about adverse effects on environment
- Spread Education & communication activities
- Promote sustainable development to reduce natural resource utilization for future generation
- Preserve existing forest, afforestation, social and agro forestry
- Water treatment plant to control water pollution and supply safe drinking water (WBPHED-playing an important role)
- 3R factors is important: Recycle, Reduce and Reuse

- Reduce wastage and purchased recycle product
- Development of local food sources
- Compulsory Environmental education in School level
- Join an awareness camp and talk with others about the impacts of environmental degradation
- Government role and Policy

Conclusion: The outcomes of high population growth rate are increasing number of people below poverty line, increasing population density and pressure on natural resources which contributes to environmental degradation through over exploitation of natural resources. The study proved that the rapid growth of population is the real concerning matter now because in land and soil degradation, declining per capita land and water resources, it has effect most. Now, it is the matter of human existence and gives top priority to protect natural resources. But it should be not only responsibility of government alone but also local people and leaders should be encouraged to make an effort to root out the problems. Also reduced population and need some changes in population policy. But population growth does not have the only cause of environmental degradation. It has need to human resource and technological development and sustainable planning to reduced that kind of problem.

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