

Climate change and its impact on urban India

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Abstract: *Though climate change is continuing phenomenon since origin of earth but its impact increased adversely on earth system in recent times. The global warming and its associated issues due to climate change causing tremendous loss to resources both natural and anthropogenic. The urban India negatively impacting due to climate change in recent times causing many losses to the country. Ex. The problems like frequent floods and severe droughts in urban areas. The pollution problems are also increasing urban areas. Due to climate change the urban sustainability is falling and it causing tension on surrounding areas. The anthropogenic mistakes like urban planning mistakes are combining with climate change increasing issues associated with urban areas by many folding. The assessment of the available resources in surrounding areas of urban region should be necessary before planning for urban development. By using the GIS systems we can prepare model for urban development for green field cities as well as for existing cities.*

Key Words: *Climate change, Global warming, sustainability, urban planning, Anthropogenic mistakes, floods, Droughts, geographical models, pollution.*

1. INTRODUCTION:

Climate change is continuing phenomenon. Changes occurring in climate since earth origin. Climate change means changes occurring in distributional patterns such as temperature, rainfall, humidity etc. Those changes may occur due in a region depending on various factors such as latitudinal location, altitude, distance from sea. The climate change said to be occurred, when the changes in climatic factors lasts for an extendable time and those changes may varied with intensification of changes in climatic factors such as temperature, pressure, rainfall etc. The climate change factors are variations in sun's energy reaching earth, changes in albedo of earth, Green house effect of surface. Once the climate change induced mostly by the natural factors such as tectonic activities, volcanic eruptions, Earthquakes etc. But later times of industrial revolution the human induced impact increased enormously of climate change. With most focused on growth progress in industries, the natural resources are depleted. The ecological balance between nature and human is losing it's affection. As in earlier times climate change mostly induced by natural factors, the changes are slow in occurrence and people environment adopted to changes successfully, as human induced impact increased in climate change, the changes occurring very randomly and with great variations. There is not enough time for people to adjust for the changes occurring in climate. This creating more damage. Like many other countries India also facing major issues due to climate change like Elnino, late onset of monsoons, early withdraw of monsoons, temperature differences with respect to traditional cold waves, Heat waves intensification etc.

The effect is causing very negatively to our economy as production levels falling, some areas losing their geographical individuality. Climate change have very great impact on the growing season of crops getting variations and untimely rainfall. The damage is increasing due to climate change on Indian economy year by year. Global warming is main cause for change directly. The flash floods, frequent and intense storms mainly attributed to climate change. The climate change impact on urban India is very huge. Urban India comprises about 31.1% of total population as per 2011 census. The actual figure may be greater than that as mentioned above. The urban areas offers the people great opportunities so migration towards the cities is very high. The climate change will have both direct and indirect impact on urban areas. The direct effects are the temperature changes in summer & winter as greater temperatures are recording in urban regions rather than normal. The intensity of temperature changes are increasing year by year in urban region. these temperature changes causing major problems among both humans and animals. The working hours are getting reduced, the frequent power cuttings are increased, this causing lowering in productivity and employment generation capacity of the country. Rainfall variations are other getting changed in urban regions. Some urban regions are not witnessing any rainfall during the slack season, but some cities are drowning into floods with untimely and flash rains. Rains in urban areas are continuously down pouring for several days. For example recent floods in Chennai, Mumbai and Hyderabad cities etc. These rains creating devastating impacts on urban areas such as infrastructure damage. Sea level rise due to climate change is an alarming situation. Indian major urban regions are located on coastline such as Mumbai, Chennai, Kolkata. If the sea level rise trend continues for years most of these urban regions get into sever problems. Salinization of soil and ground water occurs ultimately the ground water may become unfit for both drinking and irrigation purpose. The near shore transportation

system gets distorted and fishing also effects. The agriculture near areas gets damaged. The trading through these cities gets effected as the sea level rises the docking of shifts get varied. As most of India's trade carried forward through sea navigation, this sea level rising due to climate change will have negative impact on Indian economy.

The other issue arising with climate change are health problems. Several tropical diseases started impacting the urban regions with temperate and polar climates. This out breaking of unfamiliar disease in urban area will impacts the people health as people in urban area are mostly living in compact areas with high densities. Intensity of heat waves and cold waves are increasing in urban areas. The heat waves are arriving at faster than normal & with abnormal temperature i.e temperature rising in witnessed areas are greater than expected.. This causing directly and indirectly negative impact on urban lives. The urban heat islands , higher temperature zones in urban areas causing people left with need to adopt their activities accordingly. In winter months cold waves have impact on urban people, they are getting intensified with climate change, death toll due to cold waves in urban regions such as Delhi are increasing year by year. The working conditions of people affected due to cold waves. The agriculture and its allied activities are getting impacted due to climate change but they left with no adaptability. The migration to urban areas from rural areas is another problem arising due to climate change. As agricultural productivity is falling in rural areas due to climate change, the employment opportunities came down. This peculiar situation pushing people to migrate to urban areas. This causing stress on urban areas and people who are migrating from rural areas to urban were mostly caught in trouble. The problems arising due to climate change are affecting them with diseases etc. as they are the most vulnerable. The agricultural productivity is getting changed, production levels are falling down, people are shifting their choices from food crops to commercial crops in order to withstand against crop diseases due to climate change. It will leads to food shortage in urban area as production falls and supply to urban areas lowering down from rural areas. This forcing urban people to import food from other countries. It causing food security and other health issues in urban areas.

Climate change impacts on urban are intensifying with human mistakes, due to heavy air pollution, the temperature is greatly rising compared to surrounding rural areas. The urban heat islands are intensifying every year due to global warming in urban areas due to huge level of air pollution. This is intensifying climate change adverse effects on urban areas. The urban construction is also another issue. Mostly urban constructions are taking place with emphasis according to customer choices rather than not accounting the ecological impacts. The usage of cement bricks, glass and other harmful substances increasing in constructions. These are causing the adverse impact on surrounding environment. Thus the climate change in urban regions are intensifying. Urban planning mistakes are another issue combining with climate change adversely impacting the urban regions. Lack of scientific modern technologies, tend to be traditional in urban planning, not adapting with the climate change are major issues. Not following a strict model for urban development going with the plan suitable for current needs and our focus on urbanization trends in future must be focus on forecasting the growth, available resources, prepare a model suitable for cities which is sustainable in future in terms of ecological, technological, resourceful and progressive. Planning an urban model for the city the environmental conditions in surrounding areas also should be take care. The internal structural defects in urban areas are to be made to adoptive for climate change. drainage system, transportation and infrastructure are need to be adaptive to climate change. Losing of urban sustainability is a major issue if the trend in climate change continues. Urban sustainability means developing the urban region with the resources of the urban region endue forever and not much depending on surrounding rural regions. Due to impact of climate change the economic activities the using pattern of resources gets changed to cope with the climate change. With this the available natural resources depleted rapidly rather than expecting and these resources may become useless with abrupt climate change. Ex sea level rise may results the ground water useless due to salinization. As the activities of the urban changes they depends on surrounding rural regions for the resources as this causes the sustainability of urban region lost. This may finally leads to the abandoning of urban region. IPCC defines climate change adaptability as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (2007). The adoption strategies also to be environment friendly and sustainable. The changes in constructions technology, transportation systems, land using patterns should be accordance with climate change. The urban poor are most affected people by climate change, with compacted living conditions if any harmful events occur nearer to them causes the in vain. They will suffer from resources, infrastructure, food shortage etc. These to be addressed. Their employability in urban area are mostly effected due to climate change.

2. CONCLUSION:

Urban regions are engines of growth of a country. Thus need to be sustainable for consistently in development of a surrounding regions. Thus need to be sustain as the threats posed by climate change, they must be adaptive to the changes. The ecologist's, government, NGO's to be stepped forward in direction for urban sustainability . The policies should be formulated in accordance with adaption besides mitigation of climate change issues.

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