Global warming: effects and impacts

Environment, Global Warming

[pic] IntroductionGlobal warmingis the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades and its projected continuation. In principle, global warming is neutral as to the period or causes, but in both common and scientific usage the term generally refers to recent warming and implies a human influence.

Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations, which leads to warming of the surface and lower atmosphere by increasing the greenhouse effect caused by gases which are released by activities such as the burning of fossil fuels, land clearing, and agriculture. The predicted effects of global warming for theenvironmentand for human life are numerous and varied.

The main effect is an increasing global average temperature. From this flow a variety of resulting effects, namely, rising sea levels, altered patterns of agriculture, increased extreme weather events, and the expansion of the range of tropical diseases. In some cases, the effects may already be occurring, although it is generally difficult to attribute specific natural phenomena to long-term global warming.

Examples of projected climate changes include, significant slowing of the ocean circulation that transports warm water to the North Atlantic, large reductions in the Greenland and West Antarctic Ice Sheets, accelerated global warming due to carbon cycle feedbacks in the terrestrial biosphere, and releases of terrestrial carbon from permafrost regions and methane from hydrates in coastal sediments. Global warming controversy The global

warming controversy is a debate about the causes of observed global warming since the mid-20th century, as well as the expected magnitude and consequences of future warming.

A major part of the debate centers around what actions, if any, society should take in response to the prospect of future warming. Some of the main areas of controversy include: 1. Whether the climate is changing beyond natural variations in the historical temperature record 2. Whether human/industrial activity is responsible for the change and if so, to what extent 3. The effect of predicted depletion of fossil fuels, both individually as e. g. oil runs out and users turn to the higher polluting coal and overall as to whether there are sufficient available reserves to cause the more extremeclimate changescenarios 4.

The effectiveness of policies to reduce CO2 emissions 5. The size of future changes in climate 6. The regional effects of climate change 7. The consequences of climate change Among climate scientists there is little disagreement that global warming is primarily anthropogenic, but the debate continues in the popular media and on a policy level. Questions include whether there is a scientific consensus on the extent and rate of anthropogenic global warming, and in particular whether there is sufficient evidence to justify immediate and far-reaching actions to ameliorate its effects.

Those who believe such a consensus exists express a wide range of opinions: some merely recognize the validity of the observed increases in temperature, while others support measures such as the Kyoto Protocol

which are intended to reduce the magnitude of future global warming. Still others believe that environmental damage will be so severe that immediate steps must be taken to reduce carbon dioxide and methane emissions, even if the precise results are unknown, and even if there are substantial economic costs to doing so.

One example of an attempt to force action is the Sierra Club suing the U. S. government overfailureto raise automobile fuel efficiency standards, and thereby decrease carbon dioxide emissions. Most of the consequences of global warming would result from one of three physical changes: sea level rise, higher local temperatures, and changes in rainfall patterns. Sea level is generally expected to rise 50-200 cm in the next century. Erode recreational beaches 100-200 meters, exacerbate coastal flooding and increase the salinity of aquifers and estuaries. o enhance beneficial impacts, but will incur costs and will not prevent all damages. Extremes, variability, and rates of change are all key features in addressing vulnerability and adaptation to climate change, not simply changes in average climate conditions. Human and natural systems will to some degree adapt autonomously to climate change. Planned adaptation can supplement autonomous adaptation, though there are more options and greater possibility for offering incentives in the case of adaptation of human systems than in the case of adaptation to protect natural systems.

Poorer nations The ability of human systems to adapt to and cope with climate change depends on such factors as wealth, technology, education, information, skills, infrastructure, access to resources, and management

capabilities. There is potential for developed and developing countries to enhance and/or acquire adaptive capabilities. Populations and communities are highly variable in their endowments with these attributes, and the developing countries, particularly the least developed countries, are generally poorest in this regard.

As a result, they have lesser capacity to adapt and are more vulnerable to climate change damages, just as they are more vulnerable to other stresses. This condition is most extreme among the poorest people. Historic adaptation Some of those who argue for adaptation to global warming do so with the perspective that human civilization has proven to be highly adaptable to climate change in the past and therefore will likely be able to adapt to climate change in the future.

The counterargument to this perspective is that the costs of adaptation are much higher than in the past due to the greater investment in urban and industrial infrastructure. In the past, cities could be relocated largely by having the populace pack up their possessions on their backs, on pack animals or wagons and relocate. Modern cities the size of Bristol or Liverpool cannot be relocated easily even with the use of truck, air and rail transport. The damage suffered by New Orleans by hurricane Katrina provides some perspective as to the potential damage that can be caused by a rise in sea level.

Far more technology and resources are available today. Our organizational andcommunicationAdaptation mechanisms The following 9 fundamental principles can be considered when designing adaptation policy. 1. The

effects of climate change vary by region. 2. The effects of climate change may vary across demographic groups. 3. Climate change poses both risks and opportunities. 4. The effects of climate change must be considered in the context of multiple stressors and factors, which may be as important to the design of adaptive responses as the sensitivity of the change. 5.

Adaptation comes at a cost. 6. Adaptive responses vary in effectiveness, as demonstrated by current efforts to cope with climate variability. 7. The systemic nature of climate impacts complicates the development of adaptation policy. 8. Mal-adaptation can result in negative effects that are as serious as the climate-induced effects that are being avoided. 9. Many opportunities for adaptation make sense whether or not the effects of climate change are realized. Methods of adaptation Agricultural production Agriculture of any kind is strongly influenced by the availability of water.

Climate change will modify rainfall, evaporation, runoff, and soil moisture storage. Changes in total seasonal precipitation or in its pattern of variability are both important. The occurrence of moisturestressduring flowering, pollination, and grain-filling is harmful to most crops and particularly so to corn, soybeans, and wheat. Increased evaporation from the soil and accelerated transpiration in the plants themselves will cause moisture stress; as a result there will be a need to develop crop varieties with greater drought tolerance.

The demand for water for irrigation is projected to rise in a warmer climate, bringing increased competition between agriculture--already the largest consumer of water resources in semiarid regions--and urban as well as

industrial users. Falling water tables and the resulting increase in the energy needed to pump water will make the practice of irrigation more expensive, particularly when with drier conditions more water will be required per acre. Crop development models In order to further study effects of global warming on agriculture, other ypes of models, such as crop development models, yield prediction, quantities of water or fertilizer consumed, can be used. Such models condense the knowledge accumulated of the climate, soil, and effects observed of the results of various agricultural practices. They thus could make it possible to test strategies of adaptation to modifications of the environment. Because these models are necessarily simplifying natural conditions (often based on the assumption that weeds, disease and insect pests are controlled), it is not clear whether the results they give will have an in-field reality.

However, some results are partly validated with an increasing number of experimental results. Other models, such as insect and disease development models based on climate projections are also used (for example simulation of aphid reproduction or septoria (cereal fungal disease) development). Urban areas One strategy involves adapting urban areas to increasingly severe storms by increasing domestic, unpaved gardens etc and increasing the capacity of storm water systems (and also separating storm water from black water so that overflows in peak periods do not contaminate rivers).

Weather Control Also there are methods like seeding of the sulphur in the clouds to have rain when it is required. The control can be better enhanced by adopting genetical methods of agriculture, green roofs in urban areas etc

where the fewer fertilizers and less water is used and at the same time thefoodproduction is increased thereby increasing the greenery and thus bettering the CO2 sink capacity. Conclusion As discussed in the paper we will like to again focus on the importance of adaptation to global warming as a very strong factor.

It is essential that the mitigation efforts continue towards solving the problem but for practical purposes we all very well know that it alone can never accomplish this feat even if it had very large financial resources at its behest. So the best way to survive in nature is to accept it since Charles Darwin rightly said that it’s only the fittest and most adaptable whom the nature will select to stay along with. Hence it will be good if we understand the fact that its we who need to adapt to the nature, much sooner than later rather than expecting the reverse by putting in huge sums ofmoneyin terms of technological measures.