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49. EFFECTS OF CLIMATE CHANGE ON DISTRIBUTION, FRESHWATER RESOURCES AND THE ECONOMY - A THEORETICAL ASSESSMENT

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ABSTRACT

Climate Change reveals the multi dimensional spheres of economic impact on the developing economy. The inherent nature of economic forecasting involves significant degrees of uncertainty, estimates of the results of global warming have varied widely. However, climate change impacts can be measured as an economic cost. This is particularly well-suited to market impacts, that is impacts that are linked to market transactions and directly affect Gross Domestic Product. Monetary measures of non-market impacts, like impacts on human health and ecosystems, are more difficult to calculate. Therefore protecting the forests, wildlife, climate, natural wealth and the environment are now a matter of life and death for this world. Talented, imaginative and committed young professional are needed more than ever to create a future where people can live in harmony with nature. Show that professionals are concerned and contribute their share to safe guard the climate and environment. Hence, the main objective of this research paper is to study the theoretical aspects of the effects of climate change on humans, industry, economy and society.

KEYWORDS: Climate and Environment, Economic Impact, Economic Forecasting, Stern Review, Developing Economy, Uncertainty and Climate Models, Agricultural Market Sector.

INTRODUCTION

Climate Change reveals the multi dimensional spheres of economic impact on the developing economy. The inherent nature of economic forecasting involves significant degrees of uncertainty, estimates of the results of global warming have varied widely. Several Studies, such as that of the Stern Review presented to the British Government, have predicted reductions by numerous percent of world gross domestic product due to climate related costs such as dealing with increased extreme weather events and stresses to low-lying areas due to sea level rises. Other studies by independent economists looking at the effects of climate change have found more ambiguous results around the range of net-neutral changes when all aspects of the issue are evaluated,

though the issue remains intensely debated.

CLIMATE CHANGE AND ITS IMPACT ON DISTRIBUTION

Climate change impacts can be measured as an economic cost. This is particularly well-suited to market impacts, that is impacts that are linked to market transactions and directly affect Gross Domestic Product. Monetary measures of non-market impacts, like impacts on human health and ecosystems, are more difficult to calculate. Other difficulties with impact estimates are,

- **Knowledge gaps:** Calculating distributional impacts requires detailed geographical knowledge, but these are a major source of uncertainty in climate models.

- **Vulnerability:** Compared with developed countries, there is a limited understanding of the potential market sector impacts of climate change in developing countries.

- **Adaptation:** The future level of adaptive capacity in human and natural systems to climate change will affect how society will be impacted by climate change. Assessments may under- or overestimate adaptive capacity, leading to under- or overestimates of positive or negative impacts.

- **Socioeconomic trends:** Future predictions of development affect estimates of future climate change impacts, and in some instances, different estimates of development trends lead to a reversal from a predicted positive, to a predicted negative impact.

- Climate change would increase income inequalities between and within countries.

- A small increase in global mean temperature would result in net negative market sector impacts in many developing countries and net positive market sector impacts in many developed countries.

With high confidence, it was predicted that with a medium to high level of warming, negative impacts would be exacerbated, and net positive impacts would start to decline and eventually turn negative.

NON-MARKET IMPACTS

The climate change would likely result in pronounced non-market impacts. Most of impacts were predicted to be negative. The literature assessment suggested that climate

change would cause substantial negative health impacts in developing countries. Smith noted that few of the studies they reviewed had adequately accounted for adaptation. Based on the literature assessment, the studies that had included health impacts, those impacts contributed substantially to the total costs of climate change.

CLIMATE CHANGE AND ITS IMPACT ON FRESHWATER RESOURCES

In this sector, costs and benefits of climate change may take several forms, including monetary costs and benefits, and ecosystem and human impacts, like loss of aquatic species and household flooding. These costs had been estimated in monetary terms. In respect to the water supply, they predicted that costs would very likely exceed benefits. Predicted costs included the potential need for infrastructure investments to protect against floods and droughts.

CLIMATE CHANGE AND ITS AGGREGATE IMPACTS

Aggregating impacts adds up the total impact of climate change across sectors and/or regions. In producing aggregate impacts, there are a number of difficulties, such as predicting the ability of societies to adapt climate change, and estimating how future economic and social development will progress. It is also necessary to make subjective value judgements over the importance of impacts occurring in different economic sectors, in different regions, and at different times.

The aggregate impacts of climate change. With medium confidence, a small increase in global average temperature would result in an aggregate market sector impact of plus or minus a few percent of world GDP. A small to medium global average temperature increase, some studies predicted small net positive market impacts. Most studies they assessed predicted net damages beyond a medium temperature increase, with further damages for greater temperature rises.

The non-market impacts of climate change would be negative. decided that studies might have understated the true costs of climate change, like by not correctly estimating the impact of extreme weather events. It was thought possible that some of the positive impacts of climate change had been overlooked, and that adaptive capacity had possibly been underestimated.

REVIEW OF LITERATURE

Goklany (1995) concluded that promoting free trade through the removal of international trade barriers could enhance adaptive capacity and contribute to economic growth.

Fankhauser et al. (1997) and Azar (1999) found

that greater concern over the distribution of impacts lead to more severe predictions of aggregate impacts.

Pearce (2003) argued that where there are monetary costs of avoiding impacts, it is not possible to avoid monetary valuation of those impacts.

Hope (2005), Analysed that uncertainty over climate sensitivity affects economic estimates of climate change impacts. The uncertainty over the climate sensitivity was the most important factor in determining the social cost of carbon an economic measure of climate change impacts.

Channing Arndt, Adam Schlosser, Kenneth Strzepek, James Thurlow (2014), evaluates the potential implications of climate change for overall growth and development prospects in Malawi. We combine climate, biophysical and economic models to develop a structural analysis focused on three primary impact channels: agriculture, road infrastructure and hydropower generation. We account explicitly for the uncertainty in climate forecasts by exploiting the best available information on the likely distribution of climate outcomes.

Samuel Fankhauser and Nicholas Stern (2016), Climate change is not the only environmental problem we face, nor is it the only threat to global prosperity. But climate change is unique in its magnitude and the vast risks it poses. It is a potent threat multiplier for other urgent concerns, such as habitat loss, disease and global security and puts at risk the development achievements of the past decades. If unchecked, climate change could fundamentally redraw the map of the planet, and where and how humans and other species can live.

Channing Arndt, Finn Tarp (2017), Aid and aid institutions constitute an important element of the global response to interlinked global developmental and environmental challenges. As such, these institutions are now being drawn into new arenas beyond the traditional focus on improving the livelihoods of poor people in low-income countries.

METHODOLOGY

The methodology adopted for the study is purely depends on secondary theoretical information obtained from various sources like published and unpublished reports in India and the World. The secondary sources of information were further processed and consolidated suitably for the purpose of analysis. Finally, keeping the objective of the research paper in mind, the paper was written in lucid language and easy understanding.

ECONOMIC EFFECT OF CLIMATE CHANGE

Losses accelerate with greater warming, and estimates diverge. The new estimates have slightly widened the uncertainty about the economic impacts of climate. Welfare impacts have been estimated with different methods, ranging from expert elicitation to econometric studies and simulation models. Different studies include different aspects of the impacts of climate change, but no estimate is complete; most experts speculate that excluded impacts are on balance negative. Estimates across the studies reflect different assumptions about inter-sectoral, inter-regional, and inter-temporal interactions, about adaptation, and about the monetary values of impacts. Aggregate estimates of costs mask significant differences in impacts across sectors, regions, countries, and populations. Relative to their income, economic impacts are higher for poorer people.

MARGINAL IMPACTS

The Social Cost of Carbon (SCC) is an aggregate measure of the impacts of climate change. It is defined as the incremental or marginal social cost of emitting one more tonne of carbon as carbon dioxide into the atmosphere at any point in time. Different GHGs have different social costs. For example, due to their greater physical capacity to trap infrared radiation, have a considerably higher social cost per tonne of emission than carbon dioxide. Another physical property that affects the social cost is the atmospheric lifetime of the GHG.

SENSITIVITY ANALYSIS

Sensitivity analysis allows assumptions to be changed in aggregate analysis, the results of the aggregate analysis are,

- **Shape of the damage function:** This relates impacts to the change in atmospheric Green House Gas (GHG) concentrations. There is little information on what the correct shape like linear or cubic of this function is. Compared with a linear function, a cubic function shows relatively small damages for small increases in temperature, but more sharply increasing damages at greater temperatures.
- **Rate of climate change:** This is believed to be an important determinant of impacts, often because it affects the time available for adaptation.
- **Discount rate and time horizon:** Models used in aggregate studies suggest that the most severe impacts of climate change will occur in the future. Estimated impacts are therefore sensitive to the time horizon and the discount rate the value assigned to consumption in the future versus consumption today.

- **Welfare criteria:** Aggregate analysis is particularly sensitive to the weighting of impacts occurring in different regions and at different times.
- **Uncertainty:** Usually assessed through sensitivity analysis, but can also be viewed as a hedging problem.

ADVANTAGES AND DISADVANTAGES OF CLIMATE CHANGE

Smith et al., (2001) revealed that there are a number of benefits of using aggregated assessments to measure climate change impacts. They allow impacts to be directly compared between different regions and times. Impacts can be compared with other environmental problems and also with the costs of avoiding those impacts. A problem of aggregated analyses is that they often reduce different types of impacts into a small number of indicators. It can be argued that some impacts are not well-suited to this, like the monetization of mortality and loss of species diversity.

RELATIVE IMPACTS

The effects of climate change can be compared to other effects on human society and the environment. Future socio-economic development may strongly affect climate change impacts. For example, projections of the number of people at risk of hunger vary significantly according to assumptions over future socio-economic development.

Some ecosystems are likely to be especially affected by climate change. In the long-term, climate change may become the major driver for biodiversity loss globally.

The socio-economic impacts of climate change are likely to be greatest in communities that face other stresses. For example, poor communities are vulnerable to extreme weather events, and are likely to be especially affected by climate change. In general, however, other changes like demographic and technological are likely to have a greater effect on human society than climate change. On the other hand, major non-marginal impacts could occur with abrupt changes in natural and social systems.

Another consideration is how vulnerability to climate change varies with scale. At local scales, extreme weather events can have a significant impact, especially in vulnerable locations. Another potentially significant impact is the long-term effect of sea-level rise on low-lying coastal areas.

CLIMATE INDUCED CONFLICTS AND CLIMATE INDUCED MIGRATION

The Stern Review's figures tend to be at the upper end of the scale compared to

other estimates currently circulating, even its quantitative estimates fail to include the economic upheavals that would arise as a consequence of climate-induced conflicts or might be triggered by climate-induced migration.

Several analysts have emphasized the importance of catastrophic risks because of climate change. Due to climate change, significant impairment of the global economy is a distinct possibility.

CONCLUSION

Overall, the adaptation costs for climate change, including for developing countries. They have similar-sized estimates and have been influential in discussions on this issue. However, these issues have a number of deficiencies which need to be transparent and addressed more systematically in the future. In some parts of the world low levels of investment have led to a current adaptation deficit, and this deficit will need to be made good by full funding of development, without which the funding for adaptation will be insufficient. Residual damages also need to be evaluated and reported because not all damages can be avoided due to technical and economic constraints. There is an urgent need for more detailed assessments of these costs, including case studies of costs of adaptation in specific places and sectors.

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