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Climate Change and Conflict: Is the International Community Doing Enough?

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It has long been acknowledged that the negative consequences of climate change will contribute to the loss of many lives, and the wholesale detestation of many areas. Thus many conferences have been organized, frameworks drawn up, and even protocols enacted so as to halt and reverse this trend. Hence by utilizing a qualitative approach, this paper critically assesses the efficacy of the aforementioned measures. The methods as to how climate change may contribute to conflict and the regions that are susceptible to these are also expounded upon. It concludes that the international community's response to the impact of climate change lacks bite, conflicts with World Trade Organization rules, and is myopic in that secondary measures such as the construction of state institutions which are necessary to mitigate the impacts of climate change are discouraged. Thus, in the short to medium term conflicts caused by floods, sea level increases, and droughts will drastically increase, unless state and non-governmental institutions are formed to assist people deal with the challenges that climate change poses.

Keywords: climate change, developing states, cornucopians, relative depravation, WTO, SAPS, institutions, conflict

Introduction

"Climate stress (change) may well represent a challenge to international security just as dangerous - and more intractable - than the arms race between the United States and the Soviet Union during the Cold War or the proliferation of nuclear weapons among rogue states today" (Homer-Dixonn cited in Salehyan, 2008, pp. 315-316). "Global climate change will have profound implications for the quality of life of hundreds of millions of people. The prospect of man-made climate change illustrates for the first time in human history that man is in a position to exercise a significant influence on the global environment" (Nordas & Gleditsch, 2007, p. 2). As can be observed from above, climate change and its consequences present a great threat to humanity, hence this paper aims to assess the efficacy of the international community's response to it.

The first part endeavour's to elaborate on the methodology to be used in the paper. The method of information gathering, and reasons for the paper's decision not to only analyse one or two cases, but to rather cite multiple cases are also elaborated upon in this part. The second part then aims to touch on the definition of climate change and its consequences. It accomplishes this by elaborating on the greenhouse effect, and the negative consequences of an increase in Earth's temperature. The role of man in contributing to climate change is also examined. It needs to be noted that carbon dioxide (CO2), which is largely a result of the burning of fossil fuels, is responsible for over 77% of contemporary global warming (McKibbin & Wilcoxen, 2002). The third part aspires to analyze how changes in climate will be a contributing factor in causing conflicts. It achieves this by firstly elaborating on the hypothesised causal linkage between climate change and conflict. Secondly the types of conflicts that may arise as a result of climate change are discussed. It needs to be noted that the consequences of climate change may cause both inter and intra state conflicts (Homer-Dixon, 1991; Reuveny, 2007; Wolf, 1998). The fourth part endeavours to assess the regions and states that are most likely to experience conflict as a result of climate change. This is realized by firstly touching on how climate change contributed to previous conflicts. Bangladesh is utilized as an example to illustrate how climate change has been a key factor in causing conflicts. This leads it to assess and flag the regions and states that are most likely to experience climate change induced conflicts in the future.

The fifth part then aims to elaborate on the various steps that the international community has taken to deal with climate change and its consequences. This is achieved by firstly touching on the various conferences and workshops organized around the theme of climate change and global warming. It is surprising to note that as early as 1972 the United Nations Environment Program was cautioning against the increased emission of greenhouse gasses (GHGs) by states (Linner & Jacob, 2005). Secondly this part analyzes the 1997

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Kyoto Protocol and how it aims to force states into reducing their GHG emissions.

The next two parts (six and seven) aim to tease out the strengths and weaknesses/criticisms of the international community's response to climate change. Part six endeavours to elaborate on the positives of this response. This is accomplished by touching on the Kyoto protocol's flexibility, and the fact that developed states now acknowledge that they have contributed to the problem.

Part seven aspires to thrash out some of the many inadequacies of the International community's response to climate change and its consequences. This is achieved by firstly elaborating on the many weaknesses of the protocol. Secondly the conflict between measures adopted by states attempting to reduce their GHG emissions and the World Trade Organization's rules are analyzed. Lastly the international community's failure to assist states in building up institutions to mitigate the consequences of climate change is discussed.

The last part aims to briefly discuss and respond to the arguments surrounding climate change made by cornucopians. This is of real importance as these form the base for what can be termed climate change denialism (Hanley, 2011).

Running through this paper is the notion that the consequences of climate change may contribute to conflict in many states; and that the international community needs to do much more to reduce GHG emissions, and more importantly to ensure that adaptability measures are developed to mitigate these. It needs to be noted that in many instances this paper uses the phrase 'climate change contributes to conflict' as opposed to 'climate change causes conflict' as climate change is but one of the many factors that are involved in causing conflicts, and as its importance in inducing conflicts is context dependant.

Methodology

After much consideration, it has been decided that a qualitative approach will be used to assess the implications of the international community's response to climate change. This is as it better enables the paper to elucidate the nuances of the impacts of climate change and how these may contribute to conflicts (George & Bennitt, 2005; Shively, 2005). The various ways postulated by Homer-Dixon as to how the effects of climate change may lead to conflict (to be elaborated upon in section four), best illustrate the benefits of using this method as the nuances can clearly be observed and elaborated upon. In addition this method allows the paper to provide both an internal and external critique of the international community's response, as qualitative methods allow for more detail to be expressed (George & Bennitt, 2005).

Information will be gathered from both primary sources, such as the reports of the Intergovernmental Panel on Climate Change, and secondary sources such as scholarly journals and institutional reports. Journals to be consulted include 'International Security', 'Water Policy', 'Journal of International Economic Law', and 'Journal of Peace Research' amongst others. This enables the paper to incorporate diverse and nuanced perspectives, and thus increase the validity of its conclusions (Shively, 2005).

Lastly it has been decided that instead of attempting a detailed analysis of one or two cases, many examples to back up the paper's assertions will be cited. This is so as to inhibit the author from being accused of case selection bias, an accusation which cornucopians readily make (Homer-Dixon, 1991; Salehyan, 2008). In addition this also has the secondary benefit of illustrating how much of the world (particularly developing countries), are, and have been susceptible to the negative effects of climate change.

Climate Change, Causes and Consequences

Before one assesses and analyzes how climate change is a factor which may instigate conflicts, one first needs to know what climate change refers to, and what causes it. The concept/notion of climate change is usually used to describe the increasing/warming up of the earth's temperature and its resultant effects (McKibbin & Wilcoxen, 2002; Gregory, Ingram & Brklacich, 2005; Homer-Dixon, 1991). These effects include an increase in floods and droughts, sea levels rising, and the melting of the polar ice caps amongst others (McKibbin & Wilcoxen, 2002; Barnett & Adger, 2007; Hanley, 2011). It is hypothesised that climate change is caused by certain gasses (carbon dioxide, methane, and nitrogen oxide etc) which are transparent to UV rays, but absorb the radiation which results from this raise and is reflected to the sun by the earth, what many term the greenhouse effect (Hanley, 2011; McKibbin & Wilcoxen, 2002). This is as the method of temperature increase caused by the presents of these gasses, is similar to how a greenhouse allows the heat from the sun to pass through it, whilst preventing it from escaping back into the atmosphere (McKibbin & Wilcoxen, 2002). It needs to be noted that the increase of most of these gasses (carbon dioxide[CO2], and chlorofluorocarbons amongst others) in the atmosphere are directly a result of human actions, thus leading many to argue that climate change is largely a man-made problem (Hanley, 2011; Linner & Jacob, 2005). The increased presence of CO2 is mainly a result of the burning/use of fossil fuels and is responsible for over 77 percent of global warming, whilst the aforementioned chlorofluorocarbons are

emitted from aerosols and older refrigerator models (McKibbin & Wilcoxen, 2002).

How Climate Change Causes Conflicts and the Types of Conflicts That Are Caused By It

It is argued that the above factors (floods, droughts, and sea level rises) will have a great impact on the outbreak of conflicts as they inhibit peoples' ability to survive, and as they negatively impact on peoples' economic opportunities (Gregory Et Al, 2005; Reuveny, 2007; Barnett & Adger, 2007). The impact of drought on under developed states is insightful in this regard. Drought negatively impacts agricultural production which inhibits the ability of people from agriculturally dependant states to maintain themselves both physically and economically (Barnett & Adger, 2007; Homer-Dixon, 1991; Gregory Et Al, 2005). In other words drought may cause a lack of food supply which will result in people from under developed states not being able to feed themselves (physical effects), and not having surplus crops to sell or to exchange for other services (economic effects) (Gregory Et Al, 2005; Homer-Dixon, 1991). It is hypothesised that this may lead to conflict as the people affected by this may fight over the remaining produce, or may migrate to other areas in search of food thus leading to conflict in those areas were the resources already stretched in the area receiving these migrants (Homer-Dixon, 1991; Reuveny, 2007).

Types of conflicts that climate change might cause

The influential climate change theorist Thomas Homer-Dixon has postulated that climate change may lead to three types of conflict, namely simple scarcity conflicts, ethnic conflicts, and relative deprivation conflicts (Homer-Dixon, 1991). Simple scarcity conflicts are interstate conflicts caused by the desire of a state to possess or control certain scarce resources (Homer-Dixon, 1991). Fresh water rivers and arable land are some of the resources that these conflicts may occur over (Homer-Dixon, 1991). It is argued that realist theories best explain these conflicts, and that these conflicts are largely unlikely as they are usually strategic in nature (Wolf, 1998; Homer-Dixon, 1991). In other words only relatively powerful states will initiate these, and that as the expenses incurred in engaging in a conflict are large when compared to the minimal resources gained, means that states will prefer to co-operate and conflict will be a last resort (Wolf, 1998). The relative lack of interstate conflicts (7) in the twentieth century, as opposed to cooperation treaties signed (145) over water use is cited to illustrate and back up the above point (Wolf, 1998). However before proceeding it needs to be noted that the impact of climate change will be much more severe in the future, thus a greater amount of interstate conflicts may ensue (Wolf, 1998).

Ethnic conflicts may occur as a result of the migration in search of food mentioned above (Homer-Dixon, 1991). Reuveny puts it aptly when he asserts that in the case of environmental changes and their impact on survival, people have three options namely, to put up with the shortage; to innovate and mitigate the shortage; or to migrate, and that migration, though being attractive, may result in conflict (Reuveny, 2007). These conflicts may be both inter and intra state in nature, and it is argued that group systems theories best explain these (Homer-Dixon, 1991). Homer-Dixon argues that a consequence of migration is the strengthening of group identification between both the migrants, and receiving population, and that if the resource being sought is already stretched xenophobia is a likely consequence (Homer-Dixon, 1991). Moreover it is argued that once outside powers begin interfering, the conflict may become increasingly messy and regional war may result (Barnett & Adger, 2007; Barnett, 2001).

Lastly drawing on Gur, Homer-Dixon argues that conflicts brought about as a consequence of relative deprivation may ensue (Homer-Dixon, 1991). This is as the negatives of climate change are unequally distributed, with frustration being a consequence (Homer-Dixon, 1991). The resultant conflicts may be inter class or inter region (rural vs. urban) in nature (Homer-Dixon, 1991). It needs to be noted that group dynamics also have to be prevalent for relative deprivation to result in conflict, but that as opposed to ethnic conflicts, these are inter class and not inter race in nature (Homer-Dixon, 1991).

Historic and Future Conflicts Caused By Climate Change

Conflicts caused by climate change

Contrary to the assertion of cornucopians (theorists who postulate that climate change does not cause, but only exacerbates conflicts), climate change has been a contributing factor in many conflicts (Homer-Dixon, 1991; Wolf, 1998; Reuveny, 2007). It is argued that land degradation, droughts, windstorms, and floods were all factors which contributed to the conflicts which engulfed the Philippines (1970s to 1990s), Ruanda (early 1990s), Mauretania (1980s to 1990s), Somalia (1970s), and Haiti (1990s) amongst others (Reuveny, 2007; Homer-Dixon, 1991). Bangladesh is the most pertinent case which exudes the impact of climate change and its consequences (Homer-Dixon, 1991; Wolf, 1998; McKibbin & Wilcoxen, 2002). It is a poverty stricken state which seceded from Pakistan in 1971 (Homer-Dixon, 1991). This poverty has been compounded by the frequent floods and droughts that have engulfed the state, with 12 to 17 million people being forced to

migrate to the Assam region in India, and another 500 thousand migrating inland (Homer-Dixon, 1991; Reuveny, 2007). This migration led to violence between Indians and Bangladeshis over resources in Assam during the 1980s, and an insurgency within Bangladesh during the 1980s and 1990s (Homer-Dixon, 1991; Reuveny, 2007). Moreover Bangladesh and India are involved in a spat over India's diversion of the Ganges River's flow, a step which contributed to the aforementioned migration (Wolf, 1998). Lastly it is argued that Bangladesh is to receive no respite from the adverse impact of climate change (McKibbin & Wilcoxen, 2002). This is as a 45 centimetre sea level rise will submerge 10 percent of the state affecting over 5 million Bangladeshis, with a 100 centimetre rise submerging 21 percent of the state and affecting over 13 million (McKibbin & Wilcoxen, 2002). It needs to be noted that it is predicted that ocean levels will rise between 90 and 160 centimetres by the year 2100, and that Bangladesh's population is still increasing (Hanley, 2011).

Regions that may experience future conflict as a result of climate change

It is argued that three factors are necessary in explaining and predicting how climate change will contribute to future conflicts (Homer-Dixon, 1991; Barnett & Adger, 2007). These include, the extent natural resources are depended upon by the population of a state/region; the sensitivity of the resource to climate fluctuations; and the ability of institutions to mitigate conflict arising from this (Barnett & Adger, 2007). The above means that developed states are at little risk of experiencing conflict as a result of climate change, as their economies and livelihoods are not dependent on natural resources, and as their state and welfare institutions are well equip (skills and resources) to respond were climate change to affect them (Reuveny, 2007; Barnett & Adger, 2007). Reuveny sums it up brilliantly when he asserts that the only consequences developed states will experience as a result of climate change are a decrease in tourism, higher insurance costs and coastal erosion (Reuveny, 2007).

Developing states and regions on the other hand are extremely vulnerable (Reuveny, 2007; Barnett & Adger,2007). This is as they are dependent on natural resources, and as they do not possess the resources and institutions to adapt were they to experience land degradation and water shortages amongst others (Reuveny, 2007; Barnett & Adger, 2007). The statistics are shocking, it is predicted that by 2020 between 70 and 250 million people will be affected by water shortages in Africa and production of water dependant crops will decrease in some states by up to 50 percent; whilst by 2050, coral bleaching will half the GDPs of many Pacific Islands; and sea level rises will render islands such as Tuvalu uninhabitable (Cilliers, 2009; Reuveny, 2007; Barnett, 2001). States most at risk include Nigeria, Sudan, Yemen, Niger, Bangladesh, Kiribati and Mozambique (Reuveny, 2007; Cilliers, 2009; Barnett & Adger, 2007). Richard Falk best sums up the consequences of climate change for developing states and their inability to adapt to it when he asserts that, "there exists an inverse relationship between the interval of time available for adaptive change and the likelihood and intensity of violent conflict, trauma, and coercion accompanying the process of adaptation" (cited in Barnett, 2001, p. 2)

International Response to Climate Change

The problem posed by climate change, and man's role in creating it, was first touched upon during the 1972 Stockholm Conference on the Human Environment, organized by the United Nations Environment Program (UNEP), where precaution and the need for more research was advised (Linner & Jacob, 2005). This was followed up by many conferences during the 1980s termed 'the decade of climate change meetings' of which the 1985 Villach Workshop which warned about the impact of CO2 () was the most famous (Linner & Jacob, 2005). 1988 saw the formation of the Intergovernmental Panel on Climate Change (IPCC), which was (and still is) tasked with synthesizing the many volumes of research concerning climate change, and providing recommendations on how to deal with its consequences (McKibbin & Wilcoxen, 2002; Linner & Jacob, 2005). The above paved the way for the development of a convention on climate change (the United Nations Framework Convention on Climate Change [UNFCCC]) which was unveiled at the 1992 Reo Earth Summit (Linner & Jacob, 2005; Hornsby, Summerlee & Woodside, 2007). This framework divided states into two categories, annex B states (developed states), and annex A states (developing states), and recommended the stabilization of greenhouse gasses (GHGs) , with negotiations to be undertaken so as to determine the amount it would be stabilized at (Linner & Jacob, 2005). Over 188 states have ratified this framework, and periodical (yearly) meetings (conferences of the parties [COPs]) are held to plot the way forward (Linner & Jacob, 2005; Bohringer, 2003).

The Kyoto protocol

To date 17 COPs have been held, however of importance is the 1997 congress held in Kyoto, wherein the Kyoto protocol was formulated (Hornsby Et Al, 2007; Bohringer, 2003; Linner & Jacob, 2005). This so called protocol built on the UNFCCC, and targets and time tables for emissions reductions were formulated (McKibbin & Wilcoxen, 2002). Annex B states were/are required to lower

their GHG emissions by (on average) 5 percent below 1990 levels during the first commitment period (2008 to 2012) (Hornsby Et Al, 2007). The protocol does not prescribe the steps for this to be achieved, however three flexibility mechanisms (emissions trading, joint implementation, and the clean development mechanism [CDM]) have been developed so as to assist states to fulfill their requirements (Hornsby Et Al, 2007; Bohringer, 2003). Annex B states are legally required to fulfil these obligations, with failure being punished by a reduction of their emissions allowance for the next commitment period, and the barring of them from participating in and utilizing the aforementioned flexibility mechanisms (McKibbin & Wilcoxen, 2002). The protocol came into force in 2005 when over 55 states responsible for more than 55% of GHD emissions in 1990 ratified it (Linner & Jacob, 2005; Bohringer, 2003).

Strengths/Positives of the International Response to Climate Change

There are many criticisms of the international community's (specifically states) response to climate change and its consequences, however the various positives need to be acknowledged (Bohringer, 2003). Firstly the various conferences, workshops, and events that have been organized to highlight climate change have served to increase the research on its causes and consequences, thus assisting the formulation of policies and measures to inhibit these (McKibbin & Wilcoxen, 2002; Cilliers, 2009). Of importance in this regard is the work of the IPCC, which goes as far as predicting which states are most likely to suffer the brunt of the aforementioned consequences associated with climate change, thus enabling these states to adopt proactive measures to inhibit these (Cilliers, 2009). The research on the causes and consequences of climate change have been so successful that even cornucopians have been made to admit that in some instances it may lead to conflict (Salehyan, 2008).

Secondly, with the ratification of the Kyoto protocol, we now have a situation where most developed states have acknowledged that their development has contributed to climate change, and that they need to take steps to curb their emissions (Bohringer, 2003). This may seem like a really small positive, but as Bohringer argues, it would have been very easy for these states not to ratify the protocol as the short term costs far outweigh the benefits (Bohringer, 2003). It needs to be noted that the benefits from curbing GHG emissions are unpredictable, long term, and aren't easily measurable as the GHGs that have already been emitted will take an extended time to dissipate (CO_2 stays in the atmosphere for over 200 years once emitted), thus clearly demonstrating the importance of this acknowledgement (McKibbin & Wilcoxen, 2002).

Lastly the Kyoto protocol is periodic and flexible, thus enabling a more efficient response by states (Bohringer, 2003). Emissions trading (permit trading between Annex B states), joint implementation (an Annex B state undertaking an activity in another Annex B state for some of its permits), and the CDM (an Annex B state undertaking an Activity to reduce emissions in an Annex A state) are just but a few of the mechanisms developed to assist Annex B states in meeting their obligations (Bohringer, 2003). Of importance in this regard is the fact that these permits can be traded, thus incentivising states to curb their emissions (Bohringer, 2003). This tradability leads environmental commentators such as Bernstein to argue that Kyoto is a form of liberal environmentalism, as economic growth and free trade are not sacrificed for environmental protection (cited in Hornsby Et Al, 2007). Moreover domestically states are free to pursue whatever measures they deem necessary to assist them fulfil their requirements (Green, 2005).

The above means that states are able to adopt a wide variety of measures to reduce their emissions, thus providing them with minimal excuses to renege (Green, 2005). Concerning the periodic nature of the protocol, it is divided into commitment periods (the 2008 to 2012 period mentioned above), with states being able to renegotiate their targets and time tables after each commitment period (Bohringer, 2003). This is beneficial as it allows the latest climate research to be periodically incorporated into states' emission reduction targets, and as the advances in technology can be accounted for (Bohringer, 2003). It needs to be noted that to inhibit global warming GHG emissions need to be halved by 2050, and that the 5 percent below 1990 reduction level was formulated mainly to provide time for the invention of cleaner technologies (Bohringer, 2003).

Criticisms/Weaknesses of the International Response to Climate Change

Criticisms of the Kyoto protocol

Free riding

Criticisms of the protocol can be grouped into five main areas, namely the tendency for states to free ride, the inability to monitor and enforce the protocol, the lack of effective sanctions met out toward violators, the fact that combined Annex B GHG emissions by Annex B states may actually increase during the first commitment period, and the protocol's failure to adequately incorporate developing states (Linner & Jacob, 2005; McKibbin & Wilcoxen, 2002; Bohringer, 2003). Concerning free riding, it is argued that because the

costs of reducing emissions are relatively high when compared to the benefits gained, states are tempted to free ride (Bohringer, 2003). In addition because the net gain for global society as a whole is only minimally affected were a state to refuse to reduce its GHG emissions, the option of free riding is very attractive (Bohringer, 2003). Lastly as observed above, because the benefits of states reducing their GHG emissions are long term in nature, whilst governments need to appeal to short term popular interests to protect themselves, free riding becomes a very strategic and rational option (McKibbin & Wilcoxen, 2002).

Monitoring and enforcement

There exists no real independent authority to oversee whether or not Annex B states are complying with their requirements under the protocol (Bohringer, 2003). Moreover under the protocol, states themselves are tasked with enforcing it (Bohringer, 2003). This is problematic as states can easily manipulate the system so as to pay less or no compensation for violations occurring within their territories (McKibbin & Wilcoxen, 2002). It is argued that in order for the protocol to be properly monitored and enforced, a very elaborate mechanism would need to be developed, and that the expense and loss of sovereignty that states would incur were this mechanism to be developed, makes it very unlikely that monitoring and enforcement measures will improve in the near future (McKibbin & Wilcoxen, 2002; Bohringer, 2003).

Credible sanctions

It is argued that the sanctions to be applied to violating states are currently not affective enough (Bohringer, 2003; McKibbin & Wilcoxen, 2002). During the first commitment period, states that violate their commitments will be allowed 1.3 times less emissions during the second commitment period, and their ability to use the flexibility mechanisms will be curtailed (Bohringer, 2003). This though seeming progressive and strong, is actually a very weak punishment which will be easily evaded by states as they can merely choose not to accede to the second commitment period, thus absorbing them of responsibilities (Bohringer, 2003). The foregoing, Bohringer argues is the problem with most agreements wherein states are the main signatories (Bohringer, 2003). It is argued that issue linking may provide the key to solve this, as failure to comply will have other negative effects (Bohringer, 2003).

Increase in GHG emissions by Annex B states during first commitment period (2008 to 2012)

During the negotiations on the protocol, it was concluded that Annex B states could offset their emissions by increasing their Sink capacity (planting trees and laying soil which supposedly absorbs CO2), and that Russia and former Soviet states would receive freely tradable allowances above their 1990 emission levels (called Hot Air). A consequence of this is that because Hot Air is freely tradable, instead of many Annex B states reducing their emissions they merely purchase these Hot Air permits thus in many instances allowing them to increase their emissions (McKibbin & Wilcoxen, 2002). Concerning sinks, it is argued that because the scientific evidence about the storage capacity of forests and soils are in its infancy, states often over exaggerate their capacity, thus leading some to refer to sinks as ‘creative accounting’ (Bohringer, 2003). Lastly because the largest contributor to climate change, the USA (responsible for over 33% of CO2 emissions) has refused to ratify the protocol, its impact has been further diluted (Bohringer, 2003).

Failure to incorporate developing states

Many have argued that the percentage of GHGs emitted by Annex A (developing states) is rapidly increasing, and that by the end of the first commitment period it will have surpassed that of Annex B states (McKibbin & Wilcoxen, 2002). This rise is chiefly driven by the rapidly developing Indian and Chinese economies which have been growing on average by 9 percent over the past 20 years (Shaplen & Laney, 2007). The CDM does seek to involve Annex A states in reducing GHG emissions, however it is argued that this only has a minimal effect is it is a very complex process for projects to be approved and their resultant GHG reductions to be calculated (McKibbin & Wilcoxen, 2002). However attempting to enforce targets and timetables on Annex A states will reinvigorate the debate on fairness and equity in sharing the costs and benefits of GHG reduction, and is likely to go nowhere (McKibbin & Wilcoxen, 2002). It needs to be noted that developing states are of the view that because developed states were responsible for most of the emissions previously, they should be the ones contributing to its reduction (Bohringer, 2003). A consequence of this is that even were Annex B states to comply with their commitments (which are unlikely in many cases) GHG emissions would still increase, and global warming and climate change perpetuated (Bohringer, 2003).

Conflicts between GHG reduction measures and the WTO

In brief, the WTO was established in 1995, and evolved from the General Agreement on Trade and

Tariffs (Oakley, 2006; Hokeman, English, & Matto, 2002). It abides by, and is tasked with upholding two main principles namely trade liberalization, and non-discrimination (Hilf, 2001; Oakley, 2006). For the above to be achieved it applies the principles of Most-Favoured-Nation (] a state cant apply higher or lower tariffs to certain/particular states, it has to apply the same tariffs to all states, accept in the case of regional organizations), and national treatment (that is that a state cant unfairly discriminate against imports by subjecting them to certain regulations that domestic producers are not subjected to) (Hokeman Et Al, 2002; Oakley, 2006). In addition the WTO administers a dispute settlement mechanism which can issue binding recommendations were states adjudged to be violating its principles (Oakley, 2006; Hokeman Et Al, 2002).

Many of the actions that states can adopt to reduce GHG emissions place them in conflict with the WTO's Most-Favoured-Nation (MFN) and National Treatment principles (Green, 2005). It is argued that the emissions trading system conflicts with the WTO principles as only signatories are allowed to trade in them (Green, 2005).

Domestically however is where the real problems are apparent (Green, 2005). As observed above, under Kyoto, states are allowed to implement any measure they deem necessary to reduce their emissions (Bohringer, 2003; Green, 2005). Some of the measures implemented include domestic emissions trading, standards, eco labelling, and voluntary agreements and challenges (Green, 2005). It is argued that these measures fall into the WTO's scope, and that in many cases can be challenged under the national treatment principle, as it can be argued that they are non-tariff barriers (Green, 2005). It needs to be noted that the WTO does allow for discrimination if it can be shown that these measures are taken with the interests of the citizens at heart and not to protect local industries, however because climate change and its effects are characterized by uncertainty, the scientific bases for implementing these can, and has been, disputed (Green, 2005; Hornsby Et Al, 2007).

Hornsby, Summerlee and Woodside, referring to the North American Free Trade Agreement (a free trade agreement based on WTO principles) use three cases to brilliantly detail how states' climate change policies might be challenged (Hornsby Et Al, 2007). In two of the three cases (Ethyl Cooperation V Canada [1999] and S.D Myers V Canada [2000]), NAFTA's chapter 11 (which includes national treatment and MFN) was utilized to force the Canadian government to dissolve the policies it took to protect the environment (the banning of imports and inter provincial transport of the gas additive MMT in the Ethyl case, and the banning of PCB waste in the S.D Myers case) (Hornsby Et Al, 2007). The above means that the ability of states to respond adequately to climate change is seriously curtailed, and that clauses need to be added into free trade agreements and institutions such as the WTO so as to synchronize them with the objectives of the Kyoto protocol (McKibbin & Wilcoxen, 2002; Linner & Jacob, 2005).

Lack of focus on adaptability mechanisms

As mentioned above, one of the key factors in predicting the likelihood of climate change contributing to conflict in a state or region is the ability of it to absorbed shocks (Homer-Dixon, 1991; Barnett, 2001). Key in ensuring this is the institutions prevalent, and their effectiveness (Homer-Dixon, 1991; Barnett & Adger, 2007). It's these (institutions) that have led many to argue that the developed world is much less susceptible to witness conflict as a result of climate change, when compared with developing states (Reuveny, 2007). Hence as well as attempting to mitigate climate change educed conflict by reducing GHG emissions (primary measures), it is argued that the international community needs to assist in developing and implementing measures which would decrease states vulnerability to the changes reeked by global warming (secondary measures).

However this is seriously lacking (Homer-Dixon, 1991; Cilliers, 2009; Reuveny, 2007). Instead of calling for the expansion of state institutions dealing with welfare to be created, the international community is stuck in a neoliberal paradigm which asserts that these should be shrunk as they are inefficient and wasteful (Davis, 2004; Graaff, 2003).

Loans and aid are only provided to states with the conditionality that they privatize, the result being that large state institutions are disappearing (Davis, 2004). A consequence is that states (specifically developing states) are no longer able to provide for their citizens, thus increasing the chances of climate change, and its negative consequences, inducing conflict (Sindzingre, 2006; Reuveny, 2007). Moreover the decreasing amounts of developmental aid provided to developing states is further inhibiting the ability of these (developing states) to adapt to current and future climate change effects (deforestation, water scarcity, floods etc), thus further increasing the likelihood of climate change causing conflict (Reuveny, 2007).

Responses to the Arguments Made By Cornucopians

Lastly before concluding, it needs to be noted that the international community's response to the consequences of climate change has been greatly inhibited by the arguments brought forward by cornucopians, and thus these will briefly be interrogated in the next section. As observed above, cornucopians are of the view that climate change

does not cause conflict, but may in some instances exacerbate it (Salehyan, 2008; Homer-Dixon, 1991). They adopt two main lines of argumentation to assert this (Salehyan, 2008; Nordas & Gleditsch, 2007).

Firstly they argue that historically it has been proven that an abundance rather than a scarcity of natural resources cause conflicts (Salehyan, 2008; Nordas & Gleditsch, 2007). In addition they argue that conflicts over scarce resources are unlikely to occur as this is not rational in that the costs far outweigh the benefits of fighting over these (Salehyan, 2008; Nordas & Gleditsch, 2007).

Secondly they argue that for every conflict that was influenced by climate change calculations and factors, dozens of examples exuding the same climatic circumstances did not result in conflict, thus illustrating that climate change does in actual fact not cause conflict(Salehyan, 2008; Nordas & Gleditsch, 2007).

Concerning the first argument (abundances in natural resources cause conflicts), it can be argued that this fits into the climate change causes conflict (neomalthusianist) argument as most neomalthusianist's assert that scarcity caused by climate change will lead to migration to areas wherein the resource is in abundance which may cause conflicts.

The above discussion on ethnic conflicts is insightful in this regard (Reuveny, 2007; Homer-Dixon, 1991). Moreover because the resources likely to be affected by climate change are essential natural resources (water and arable land)and not just natural resources, rationality is less likely, one can survive without diamonds but not without water (Reuveny, 2007; Homer-Dixon, 1991).

Concerning the second argument, most neomalthusianists are of the view that climate change and its negative consequences is not the only factor that will cause conflicts, and thus many assert that in different contexts other factors such as poverty and corruption will be a better predictor of the likelihood of conflicts erupting (Homer-Dixon, 1991). Moreover the emphasis placed by neomalthusianists on adaptation as a factor which inhibits climate change from causing conflicts, clearly illustrates that their explanations are less deterministic then cornucopians give them credit for (Homer-Dixon, 1991; Reuveny, 2007).

Conclusion

In conclusion this paper has analyzed how the consequences of climate change contribute to conflict, and the negatives and positives of the international community's response to it. The first part discussed and elaborated upon the methodology that was utilized to guide the paper and gather information. The second part then discussed what climate change entails and its causes. The third part analyzed how it contributes to the outbreak of conflicts. Included in this part was a discussion on the types of conflicts it may initiate. The fourth part discussed and analyzed how the consequences of climate change have historically led to conflicts, and the areas that these may affect in the future. Bangladesh was utilized as an example to elucidate this. The fifth part elaborated on the international community's response to the problem posed by climate change. A discussion on the 1997 Kyoto protocol was also undertaken in this part. Parts six and seven critically assessed the negatives and positives of the international community's response to climate change. The last part debunked some of the arguments made by cornucopians surrounding climate change and conflict. The above has led this paper to conclude:

- Climate change is caused by the emission of GHGs such as CO2, which are a direct result of man's quest to develop (McKibbin & Wilcoxen, 2002; Bohringer, 2003; Homer-Dixon, 1991). The consequences are drastic; floods and droughts may increase, the sea level may rise, and normal weather patterns may intensify, all because the GHG component in the atmosphere is rapidly increasing (McKibbin & Wilcoxen, 2002; Bohringer, 2003; Reuveny, 2007).
- These may contribute to conflict as they may inhibit people's ability to survive and reduce their economic opportunities (Reuveny, 2007; Homer-Dixon, 1991; Cilliers, 2009). Inter and intra state conflicts may be the result, with developing states most likely being victim to these (Barnett & Adger, 2007; Cilliers, 2009; Reuveny, 2007). Bangladesh is a pertinent example of how climate change and its consequences contribute to conflict. The frequent floods and droughts that engulf the state led to between 12 and 17 million Bangladeshis migrating to India (causing conflict over resources in India's Assam region during the 1990s), and over 500 thousand migrating inland, resulting in an insurgency during the 1990s (McKibbin & Wilcoxen, 2002; Homer-Dixon, 1991; Reuveny, 2007).
- The impact of climate change has not gone unnoticed by the international community, with many conferences being organized and workshops held so as to establish its impact and chart a way forward (McKibbin & Wilcoxen, 2002; Linner & Jacob, 2005). These led to the formulation of the 1997 Kyoto Protocol which stipulated that Annex B states reduce their GHG emissions by on average 5 percent below 1990 levels, with special mechanisms such as the CDM being developed to enable the achievement of this (Hornsby Et Al, 2007; McKibbin & Wilcoxen, 2002; Linner & Jacob, 2005).
- These (conferences, workshops, and the protocol), have been very positive in that they have spurred on, and in many cases funded, research on climate

change and its consequences, the result being that even cornucopians have been forced to admit that in some instances climate change may induce conflicts (Salehyan, 2008; Nordas & Gleditsch, 2007). Moreover the ratification of the protocol means that for the first time Annex B states have voluntarily admitted that they have contributed to climate change, and that they will take steps to curb their emissions or face the protocols non-compliance penalties (Bohringer, 2003; McKibbin & Wilcoxen, 2002). In addition the flexibility and periodic nature of the protocol ensures that the international community will easily be able to adapt and set new targets were research to conclude that the problem is worse than it was first estimated, or were newer cleaner technologies invented (Bohringer, 2003).

- However there are many weaknesses with the above response. The protocols toleration of carbon sinks and hot air emissions trading, its failure to properly incorporate developing nations into its emission reduction targets, its inability to monitor and enforce targets, and its inability to adequately sanction violators, means that instead of GHG emissions decreasing, the first period (2008 to 2012) might actually witness an increase of global net emissions (Bohringer, 2003; Linner & Jacob, 2005; McKibbin & Wilcoxen, 2002). This is compounded by the fact that states have a tendency to free ride (Linner & Jacob, 2005; McKibbin & Wilcoxen, 2002). Moreover many of the policies that states can adopt to assist them in achieving their emissions reduction targets (eco labelling, standards, voluntary agreements, and the CDM etc) conflict with the MFN and national treatment principles of the WTO, and thus are rendered ineffective (Green, 2005; Hornsby Et Al, 2007). Lastly and most importantly, the international community's fixation on preventative measures (reducing GHG emissions), has blinded it to the fact that secondary/adaptability measures (institution building) are as important if not more important in inhibiting the chances of climate change contributing to conflict (Homer-Dixon, 1991; Reuveny, 2007; Barnett & Adger, 2007).
- Lastly neomalthusianists hypothesis that migration in search of resources may contribute to the eruption of conflict, and their acknowledgement that adaptability mechanisms may mitigate against this, are credible and adequate responses to the two main arguments brought forward by cornucopians (Homer-Dixon, 1991; Reuveny, 2007).

Implications and Recommendations

The implications of the above for the international community are dire. Not only is the international community's response to the negative consequences of climate change woefully inadequate, it also conflicts with the rules of the WTO, a body which as stated above has a dispute mechanism that can issue binding judgements (Oakley, 2006; McKibbin & Wilcoxen, 2002; Green, 2005). Thus even were states tempted not to free ride, or evade sanctions through the use of Hot Air or creative accounting (increasing their sink capacity), they would not be able to easily adopt measures to curb their GHG emissions for fear of being taken to the WTO's dispute settlement body (Green, 2005; Hornsby Et Al, 2007).

Moreover even were the best case scenario to be realized, which is highly improbable, and GHG emissions curbed, the negative consequences of climate change would still contribute to conflicts in the short term as these are not easily reversible (CO2 as mentioned above, stays in the atmosphere for over 200 years) (McKibbin & Wilcoxen, 2002).

250 million people in Africa that are predicted to suffer from water shortages and lack of food as a result of water dependent crops (by 2020) are not going to miraculously survive, and their drastic situation is not going to be mysteriously reversed. thus leading this paper to recommend that in the short term, adaptive measures, such as the building of state institutions and starting up of relief funds to provide assistance to those suffering from the negative impacts of climate change need to be undertaken (Homer-Dixon, 1991; Barnett & Adger, 2007). We need to shift from efficiency to welfare, for as it has long been argued, efficiency in under developed states leads to inequalities and further underdevelopment (Davis, 2004; Evans, 1989).

In addition Annex A states need to be incorporated into the reduction targets set by Kyoto, even if these targets are non-binding, and clauses allowing for the adoption of GHG reduction measures by states need to be added into treaties and organizations such as the WTO, for if not we (the international community) are taking one step forward and two steps backward (Green, 2005; McKibbin & Wilcoxen, 2002; Bohringer, 2003).

Further research needs to be undertaken to assess the impact that incorporating Annex A states (particularly India and China) into the Kyoto protocol in terms of non-binding targets and timetables will have on their development.

References

Barnett, J. (2001). Security and climate change, Tyndall Centre for Climate Change Research, Working Paper 7, October 2001, P1-17.

Barnett, J. And Adger, WN. (2007). Climate change, human security and violent conflict, *Political Geography*, 26, 639-655.

Bohringer , C. (2003). The Kyoto Protocol: A review and perspectives, Centre For European Economic Research (ZEW), Discussion Paper No. 03-61, 1-26.

Cilliers, J. (2009). Climate change, population pressure and conflict in Africa," Institute for Security Studies, ISS paper 178, January 2009.

Davis, M. (2004). Planet of slums: Urban involution and the Informal Proletariat," New Lefl Review, 26, 5-30.

Evans, P. (1989). Predatory, and other apparatuses: A comparative political economy perspective on the Third World state," *Sociological Forum*, 4 (4), 561-587.

George, A I & Bennett. A (2005). Case studies and theory development in the social sciences, Cambridge, MA: MIT Press.

Graaff, J. (2003) Poverty and development," Oxford University Press: Cape Town.

Green, A. (2005). Climate change, regulatory policy and the WTO: How Constraining are Trade Rules, *Journal of International Economic Law*, 8 (1), 143-189.

Gregory, PJ Ingram, JSI & Brklacich, M (2005). Climate change and food security, *Philosophical Transactions of the Royal Society*, 360 (1463), 2139-2148.

Hanley, CJ. (2011). The American 'allergy' to global warming: Why?," The Associated Press, Retrieved September 26, 2011, from http://www.guardian.co.uk/world/feedarticle/9869938 ,

Hilf, M. (2001). Power, rules and principles – Which Orientation for WTO/GATT Law?," *Journal of International Economic Law*, 111-130.

Homer-Dixon, TF.(1991). *On the threshold: Environmental changes as causes of acute conflict*, Harvard College, *31*

Hokeman, B, English, P, & Matto, A (EDS) (2002). "development, trade and WTO: A Handbook," Washington DC: Oxfam.

Hornsby, DJ Summerlee, AJS & Woodside, KB (2007). "NAFTA's Shadow Hangs over Kyoto Implementation, *Canadian Public Policy/Analyse de Politques*, 33,(3), 285-298.

Linner, BO & Jacob, M (2005). From Stockholm to Kyoto and beyond: A review of the globalization of global warming policy and North-South relations, *Globalizations*, 2(.3), 403-415.

McKibbin, WJ & Wilcoxen, PJ. (2002). The role of economics in climate change policy," *The Journal of Economic Perspectives*, 16(2), 107-129.

Nordas, R and Gleditsch, NP (2007). Draft introduction to the special issue of political geography on 'climate change and conflict'," fall 2007, 1-14.

Oakley, T. (2006). *International political economy: interest and institutions in the global economy*, Pearson: London.

Reuveny, R. (2007). Climate change-induced migration and violent conflict, *Political Geography*, 26, 656-673.

Salehyan, I.(2008). From climate change to conflict? No consensus yet, *Journal of Peace Research*, 45,(3), 315-326.

Sindzingre, A. (2006). Financing the developmental state: Tax and revenue issues," Presentation at the Overseas Development Institute (ODI), London, Wednesday 5th April 2006.

Shaplen, JT & Laney, J. (2007). Washington's eastern sunset," *Foreign Affairs*, 86(.6), 82-97.

Shively, PW. (2005). *The craft of political research*, 6th ed," Upper Saddle River, NJ: Pearson Prentice-Hall.

Wolf, ET.(1998). Conflict and cooperation along international water ways, Water Policy, 1(.2), 251-265.