The Millennium Development Goals: a Gendered Critique within the context of Climate Change

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THESIS DECLARATION

STUDENT

I hereby declare that this thesis comprises my own original work and does not exceed 12,000 words (Master of Criminology, Master of International Relations, Master of Public Policy & Management, Master of Social Policy) or 15,000 words (Honours & Postgraduate Diploma in Criminology, Politics & International Studies, Sociology, Anthropology & Social Theory, Development Studies, Master of Development Studies) exclusive of footnotes, bibliography and appendices.

(Student's signature)

SUPERVISOR

I hereby declare that I have approved this thesis for submission.

(Supervisor's signature)
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Abstract

This minor thesis applies a gendered lens to the Millennium Development Goals (MDGs) within the context of climate change. This was done in order to examine the degree that the MDGs will be affected by climate change as well as whether the current Development paradigm has in fact contributed to the process of climate change. A wide expanse of literature has been examined, focusing on several case studies. The finding of this thesis was that because the MDGs are designed to operate within the current capitalist system, the structural inequity and polluting methods of production and consumption which contribute to climate change and compound poverty are not questioned. Critiquing this is particularly significant at this moment as the Development sector moves from the era of the MDGs to the era of Sustainable Development.
Summary and Overview of Climate Change:

Increasingly, the human population is beginning to experience the negative impacts of climate change. The global South will continue to be particularly affected and this has severe implications for the success of Development progress. Climate change has the potential to possibly reverse much of the work that has been done towards achieving the Millennium Development Goals (MDGs) and this will be felt widely not only by vulnerable communities today but also by future generations. Although the link between climate change and poverty has been made by many scholars, few state governments or multi-lateral institutions are officially acknowledging the threat that climate change currently poses to the future of Development (Macdonald 2010, p.2). This represents a huge, worldwide lack of engagement in current environmental issues.

This minor thesis will adopt a gendered lens to investigate the ways climate change may undermine the MDGs, ultimately questioning whether this process will compound underdevelopment. The MDGs were established in the year 2000 and recognize that the world faces multiple, serious problems such as poverty, food and water insecurity, gender inequity, environmental degradation, HIV/AIDS and other health related issues. These widespread social issues are felt most keenly by vulnerable communities in the developing world and particularly by the women and children that live within these communities due to their position on the lowest rungs of the social hierarchy (Chant 2007).

The majority of climate scientists now agree that climate change is an anthropogenic process fuelled by the emissions of greenhouse gases (GHGs). Some projections of likely impacts indicate that we have already reached the point at which we can no longer avoid the melting of the Antarctic and Greenland ice-sheets (Bellamy-Foster & Clark 2012, p.1). The warming of the Cryosphere has been documented by the leading authoritative body, the Intergovernmental Panel on Climate Change (IPCC). The IPCC (2013) states that the loss of ice from the Greenland ice sheet has very likely been ‘substantial’ and there is ‘medium confidence’ that the summer retreat of ice in the Antarctic has been ‘unprecedented’ (p.9). The melting of the ice sheets will have a sequential effect
on rising sea levels, with the IPCC (2013) reporting ‘high confidence’ that sea levels have been rising since the early 20th century (p.11). It is important to remember that any IPCC observation is presented in conservative language. Before each IPCC report is published it must be vetted by leading climate scientists and then it must also receive the consensus of over 120 participating governments. Reading between the lines, we might interpret terms such as ‘high confidence’ or even ‘medium confidence’ to be concerning. The IPCC now accepts that unless dramatic mitigation is implemented, the world will not avoid a 2 degree rise in temperature (IPCC 2013, 20). The panel states that it is ‘more likely than not’ that global warming will exceed 2°C and that this pattern will continue beyond the year 2100 (IPCC 2013, p.20). How the planet will cope with a 2°C rise is hard to predict.

The economist Nicholas Stern who is the author of the widely read ‘Stern Report’ on climate change is optimistic about our capacity to avert major catastrophe: “These huge risks can be reduced drastically at reasonable cost, but only if we act together and follow clear and well-structured policies starting now. The cost of action is much lower than the cost of inaction – in other words, delay would become the anti-growth strategy” (Stern 2009, p.10). Stern’s perspective as an economist is particularly pertinent to Development practitioners, whose job it is to promote economic growth and alleviate poverty while simultaneously trying to limit environmental damage and keep abreast of any threats to this agenda. This is becoming increasingly difficult because of the complexity and uncertainties that surround environmental change which are further compounded by processes such as globalization and gender inequity (Shackleton & Shackleton 2012, p.275). It is beginning to seem that whether or not we have reached the ‘point of no return’, the earth’s limits are growing closer.

The politics that surround climate change are also accompanied by a strong sense of injustice. It is now widely thought that the negative impacts of climatic change will trickle down from the top of the ladder where they were created by the wealthy, polluting nations to pool at the very bottom were they will most severely affect the world’s poorest and most vulnerable people who have contributed the least to GHG emissions. Vulnerability or ‘livelihood insecurity’ occurs when poor people
have to face threats or shocks without the capacity to effectively respond (Shackleton & Shackleton 2012, p.275). For this reason, it is those at the bottom of the ladder who will specifically require extra support with adaptation. MacDonald (2010) summarizes this process, “These calamities and others like them offer a glimpse of the ways in which global warming constrains the efforts to achieve the MDGs, as well as broader objectives for advancing human rights and ensuring sustainable development” (p.5). Because climate change affects the magnitude and frequency of the existing stresses such as drought, flooding and disease burden, it may also introduce new stressors (Shackleton & Shackleton 2012, p.276). These stressors may also lead to increased reliance on fragile ecosystem services (Shackleton & Shackleton 2012, p.277).

Despite the existence of MDG 7: ‘Ensure Environmental Sustainability’, it is arguable the MDGs have not only neglected environmental goals but also accepted Development pathways that have actively contributed to the ecological destruction of many, fragile environments. Absolute priority must be given to understanding how climate change will interact with existing issues both now and in the future. For this reason, this thesis will conclude with discussion surrounding the proposed Sustainable Development Goals (SDGs) which are to be implemented in the post-MDG era.

Although this minor thesis largely concerns the impact climate change will have on the women of the developing world, a gendered lens has been chosen to approach this topic rather than a feminist lens or eco-feminist lens. Certainly this minor thesis does not shy away from discussing the structural inequalities that will ultimately position women as the more vulnerable gender but the overall goal is a more holistic investigation of the gendered impact of climate change on the MDGs. Science, technology and even the Development paradigm that the MDGs fall within are not gender neutral. It must be acknowledged however that the theoretical framework employed for this minor thesis borrows heavily both from liberal feminist theory, social feminist theory and ecofeminist theory. All of which share similar beliefs regarding existing patriarchal power structures and the subjugation of both nature and women. This concept is woven throughout the body of this thesis. Certain aspects of socialist feminism and ecofeminism are challenged or rejected within this thesis, such as the cultural-feminist notion often
embraced by ecofeminists that women are inherently gentler and therefore more suitable for leadership than men. Democratic eco-socialist theory is also drawn upon at times, mostly when discussing the way in which the current Development paradigm has been constructed by the West from within the mainstream capitalist system.

The goal is to find a way to both ensure that the harm climate change does to existing Development success is curbed while simultaneously contributions to mitigation and adaptation for the developing world are made a priority. Underscoring this is the understanding that the world’s most vulnerable populations, significantly the women and the children of the developing world will disproportionately feel any negative effects of climate change and therefore must be central in planning for climate change both now and in the future.
Chapter 1: A Critique of the Millennium Development Goals and MDG 8

Some consider the Millennium Declaration established in 2000 to be one of the greatest promises made in the history of humanity. The eight MDGs outlined in the declaration were designed and implemented by the UN to tackle some of the world’s biggest issues including poverty, communicable diseases, gender equity, education, environmental degradation and maternal and childhood mortality. The target year for most of the goals is 2015. The MDGs are each accompanied by quantitative indicators to measure their success. These indicators ensure that targets are not only time bound but also easily monitored. This was perhaps a large reason they were so readily embraced by the Development community (Fukado-Parr, Greenstein & Steward 2013, p.19).

The significance of the goals goes beyond providing benchmarks for the Development sector to work towards as they also provide normative objectives on which to base Development activity. The MDGs rely on base-line data from or predating the year 2000. It is against this data that the indicators are used to measure Development success. Taking the 2015 time limit on the goals into consideration, there is also the implication of pressure to achieve the MDGs at a fast pace in order to claim success (Fukado-Parr, Greenstein & Steward 2013, p.20). According to the most recent data published by the UN, it seems that several goals are on target to be met next year while a few remain out of reach (see Appendix 2).

Injustice and Quantitative Indicators
The utility of established, quantitative goals that can be monitored is a logical option. However, there is growing concern within the Development sector that a preoccupation with measurable goals might be detrimental to achieving more holistic development. There is also criticism surrounding the accuracy of much of the data that the UNDP has used and continues to collect in order to monitor action. This calls into question the very effectiveness of established quantitative measures and perhaps even elicits the question: “Could it be, despite an
appearance of firm targets, deadlines, and focused urgency, that the MDGs are actually imprecise and possibly ineffective agents for Development progress?" (Attarin 2005, p.0001). A significant portion of MDG data is plagued by wide accuracy margins due to a lack of accurate reporting in a lot of the poorest nations on earth (Attarin 2005, p.0001). The inaccuracy is largely because data is usually collected via census-like surveys filled out by individuals within the home. This makes the data more subjective than it would be if it were collected by national health services or individual medical practitioners (Attarin 2005, p.0001).

MDG 6 is: ‘Combat HIV/AIDS, Malaria and other Diseases’. One of the targets of MDG 6 is to halt malaria incidences by 2015. There is question as to whether an accurate base-line statistic even exists from which to measure action on this target (Attarin 2005, p.0002). Malaria incidences in particular are quite prolific and existing medical records are so rudimentary in many parts of the world that gauging how many cases of Malaria there are is in essence, immeasurable (Attarin 2005, p.0002). As Attarin (2005) states: “The health goals for 2015 sound quantitative, but for most of them, their quantification is irretrievably flawed. The trends that the health goals allude to are either immeasurable or were not measured properly from the 1990 baseline year onward” (Attarin 2005, p.0004).

Fukado-Parr, Greenstein & Steward (2013) point out in ‘How Should MDG Success and Failure Be Judged: Faster Progress or Achieving the Targets?’, if the goal is actually to incentivize, why do none of the UN reports monitoring MDG action focus on the progress made rather than the overall benchmark goal (p.21). The starting point was not the same for all regions involved. Because of this, the MDGs are arguably biased against the continent of Africa and other regions that had low starting points. It is even more confusing that measurements often seem to be broken down by region rather than country. This might mask the lack of progress made by one country if another country in the region is over-performing. If the results are analysed on a global level, it could easily be argued that the MDGs have already proven to be greatly successful. If we analyse on a regional level most regions have performed quite well with the exception of Sub-Saharan Africa, the South Pacific and possibly South-East Asia. On an individual country level, it is an entirely different story. To halve poverty in the continent of Africa, the average African country would be required to reach a per capita GDP growth of
7% over a time-frame of 15 years. As Fukado-Parr, Greenstein & Steward (2013) point out; this kind of growth was barely heard of before the conception of the MDGs. Therefore, data indicating the implausibility of success for Africa must already have been present (Fukado-Parr, Greenstein & Steward 2013, p.21).

The UN has engaged the developing world in a crucial race, the finish line is the MDG targets but rather than lining each country up from an equal position at the beginning of the race, they were able to begin from where they were already standing on the track. The results will be recorded with no acknowledgement of who was standing closer to the finish line when the race began. In his article ‘How the Millennium Development Goals are Unfair to Africa’, the American economist William Easterly (2009) notes that the MDGs have created a dichotomy of ‘winners’ and ‘losers’ according to a rigid definition of the qualities which define ‘success’. He argues that as a result, Africa’s progress will instead be masked as failure (p.26).

The Costs

Former director of the Millennium Project and economist Jeffrey Sachs (2012) has been very vocal in pointing out that MDGs are not more on track because a number of donor countries have neglected to fulfil their aid commitments (p.2206). Other scholars such as Clemens, Kenny & Moss (2007) are critical of this attitude, claiming that blaming aid for ‘failures’ undermines engagement with developing countries and the process of sustained development (p.735). Blaming a lack of aid could be a mechanism that helps to disguise some of the flaws with the goals that have already been discussed in this chapter. In fact, a focus on aid as the necessary ingredient for progress might detract from facilitating positive policy-change. By focusing so much attention on ODA and quantitative indicators we also seem to be setting ourselves up for failure, as many costing studies suggest that many of the MDGs are simply too ambitious to be met within their timeframes (Clemens, Kenny & Moss 2007, p.738). In effect we are asking the poorest nations in the world to perform on almost the same level as the richest (Clemens, Kenny & Moss 2007, p.746). A risk of setting the world up for failure in this context has the
potential for what is known as ‘donor fatigue’. If many of the goals are not met next year, this may have a negative impact on donor and interest groups.

The issues the MDG targets are designed to address are usually interwoven in numerous, complex ways. For example, certain health initiatives may have a positive impact on primary school attendance. Goal number 7: ‘To Ensure Environmental Sustainability’ is particularly interwoven with the other goals. According to Webster et al. (2011) more than 250 million people are affected by natural disasters each year and this has apparently increased by an estimated 50 to 60 thousand people per decade since the 1970s (p.149). The number of natural disasters reported has also increased from a total of 90 per year in the 1970s to 450 in recent years (Webster et al. 2011, p.149). These numbers are only likely to rise as extreme weather events increase with the climate change process. The costs incurred by natural disasters are so large that it is difficult to calculate total costs on average per year. This is because environment related disasters tend also to have a much deeper social impact than the direct damage of property and loss of lives.

Climate scientists are predicting more heat waves, wildfires, tsunamis, intense storms and sea level rise (Webster et al. 2011, p.159). All of these extreme weather occurrences will have a cost in terms of human life, social impact and damage repairs. Webster et al. (2011) have produced a study that looks at the total number of disasters recorded and the people affected between 1975 and 2008. The study estimates that a minimum increase on disaster related spending will be $57 million or as much as $2.7 billion (Webster et al. 2011, p.161). This is only immediate post-disaster costs and is a tiny proportion of the costs incurred by longer term impacts of climatic change. The IPCC (2007) estimated that macro-economic costs for the mitigation of climate change and stabilization of global warming will be the equivalent of 5.5% of global GDP (cited in O’Brien et al. 2008, p.199), while Nicholas Stern (2007) estimates that the cost of inaction of climate change could rise to between 5% and 20% of global GDP (cited in O’Brien et al. 2008, p.199). One doesn’t need to be an economist to see the figures adding up and realize that the cost of inaction will be far-reaching and will far exceed the cost of implementing immediate mitigation measures.
Chapter 2: Extreme Poverty and Hunger

The first MDG is to ‘Eradicate Extreme Poverty and Hunger’ and this can probably be viewed as the over-arching goal of the Development sector. Shackleton & Shackleton (2012) define poverty as such: “…poverty is articulated as the pronounced deprivation of well-being related to a lack of material income or consumption, low levels of education and health, poor nutrition and low food security, high levels of vulnerability and exposure to risk, and a profound lack of opportunity to be heard” (Shackleton & Shackleton 2012, p.278). MDG 1 is particularly pertinent to discussion on climate change because poverty along with gender are primary factors which determine vulnerability to climatic change. Both of these factors can be extreme inhibitors of capacity to deal with shocks (Shackleton & Shackleton 2012, p.282). The direct effects of climate change will contribute to the exacerbation of poverty and gender inequity.

This chapter will discuss the impacts of global warming including heatwaves, drought, flood and other severe climate related events. The impact of these climatic events are varied and complex. The Food and Agriculture Organization (2014) defines chronic hunger or undernourishment as: “A state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements.” The FAO (2014) estimates that there are currently 827 million hungry people in the world. If the global temperature increases by 2 to 3 degrees, crop yields will be significantly impacted in Africa, desertification and salinity of soil will impact agricultural output in Africa and rice production in Asia could be significantly impacted (MacDonald 2010, p.7). This could result in widespread hunger and poverty unless action is taken.

Heat
Increasingly, the world is beginning to experience more instances of severe weather. One of the most harmful forms of this for human health is extreme heat. Several regions across the world including the US, Europe and Australia have in recent years seen record-breaking stretches of severely hot weather. This increase in frequency and intensity of heat is not only generally uncomfortable for
the humans and animals that have to deal with it; it also has serious health implications for all living things (including our natural environment). Some direct effects on human beings include thermal stress which can lead to cardio-vascular and respiratory distress, heat exhaustion, cramps and dehydration, as well as heat effects on urban pollution and humidity which can exacerbate pre-existing medical conditions (Markandya & Chiabai 2009, p.761). Though it is often weather-related disasters that get attention for being costly, it is actually less visible losses due to temperature extremes and drought that account for 60% of climatic related costs (O’Brien et al. 2008, p.195). Extreme heat usually has the greatest impact on the very young and the very old because they are much more vulnerable to the stress that heat places on the body. A counter-argument to this is that while summers may get hotter due to global warming, the winters too will warm. Some studies estimate that the result of this will be a decrease in winter mortality which may in fact outweigh the increase in heat-related mortality that will accompany summer (Markandya & Chiabai 2009, p.761).

**Drought**

Prolonged periods of heat plus the absence of precipitation leads to drought which has been the root cause of some of the worst famines known to history. Some projections about food security in relation to climate change have indicated that as weather patterns become less stable, food may become scarce. The FAO defines food security as: “...a situation that exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life” (cited in Lang & Barling 2012, p.313). Traditionally, food insecurity has been associated with systemic problems regarding supply and demand. Instances in history, such as the prolonged drought and subsequent famines that have ravaged the Horn of Africa during the past three decades stand as proof that climate has a direct impact on the amount of food available in affected areas. This indicates that food insecurity as a result of a sudden shift in climate patterns is not a new phenomenon. In Africa however it is only likely to get worse with climate change.
Some extreme predictions claim that in the future up to 6.8 billion people (or 80% of the population) may suffer from periods of food insecurity (Ryland, Odland & Sandanger 2013, p.4). Furthermore, up to $26 billion could potentially be lost due to yield decrease in drought prone regions (Macdonald 2010, p.7). In their study ‘Climate Change Threatens the Achievement of the Millennium Development Goal for Maternal Health’ Homer et al. (2009) point out that:

> The combined effect of temperature rise and lower rainfall in the worlds’ major food producing regions is likely to be a reduction in yields, which will create food shortages and increase prices beyond the reach of many of the world’s poor. The global food crisis of 2008 may indeed be a forecast of future climate change impacts on food security, and importantly, the nutritional status of childbearing women in developing countries (p.607).

It isn’t just crop yields that will be affected by climate change. Fishing stocks are also likely to deteriorate further threatening both food security and biodiversity (Bryant et al. 2009, p.853).

Food security re-entered world-focus during the 2008 Global Financial Crisis (GFC) which resulted in the sudden and dramatic hunger of millions in urban settings (Lang & Barling 2012, p.314). These ‘hungry cities’ had never been witnessed on such a scale before and the extreme nature of the problem quickly elevated the price of food, creating a ‘banking bubble’ which succeeded in exacerbating the problem (Lang & Barling 2012, p.314). There is increasing evidence that in food insecure regions, households are forced to rely more heavily on wild natural capital (Shackleton and Shackleton 2012, p.278). When families are forced to forage for new food sources, this can placed added stress on delicate ecosystems (Shackleton and Shackleton 2012, p.278). Of the 1.2 billion people that are hungry today, 7 out of 10 of them are thought to be women and girls (MacDonald 2010, p.7).

**Flood and Bangladesh**

Nicholas Stern (2009) states that the real danger posed by climate change is not primarily heat, but will be water or lack of it due to drought, floods, storms and rising sea levels (p.9). While countries like Bolivia can expect longer periods of
drought, on the other end of the spectrum, countries such as Bangladesh can expect more frequent and severe flooding. There has been a lot of literature produced about cyclone vulnerability in Bangladesh that indicates that this phenomenon too is also gendered in terms of how it is experienced. It is now commonly understood that women and children are more vulnerable although of course, other structural aspects such as age, caste or class and social status also play an important role in how individuals experience a disaster. After the 1991 cyclone in Bangladesh, it was found that 90% of those who died were women and children (Nagel 2012, p.468).

There are several proposed reasons for this: women’s unwillingness to leave the home due to their domestic responsibilities, the heavy saree (traditional form of clothing) and long hair commonly worn by the women of Bangladesh which when wet can be very heavy and easily tangle with debris, as well as a lack of involvement in disaster preparedness strategizing and meetings (Alam & Collins 2010; Nagel 2012). In fact, Bangladesh is one of the few countries in the world where men tend to live longer than women (Nagel 2012, p.468). As a result of this, disaster reduction NGOs operating in Bangladesh now often recognize that the impact of disaster is gendered and make a more concerted effort to address this inequity (Alam & Collins 2010, p.937).

Particularly vulnerable are female headed households (FHH). In certain regions in Bangladesh women tend to be confined to the private realm and may wait until they are given instruction by the male head of house before they leave the home (Alam & Collins 2010, p.943). In a FHH, the impetus to evacuate may only be present once water is already entering the home. This was the case during 2011 Cyclone Sidr with the worst affected families only choosing to leave their homes when water was visibly entering the premises (Alam & Collins 2010, p.943).

Another issue is the Purdah system practiced by many Muslim families which can problematize evacuation: “Due to conservative religious beliefs, many of the male head of the households prefer not to move to cyclone shelters, thinking that the female members of household might lose their purdah (a scarf worn by some Muslim women on their heads) while travelling to or staying at cyclone shelters. The household also considers the problems that can arise at cyclone shelters, such as space issues, lack of light and poor sanitation” (Alam & Collins 2010,
p.944). It is clear from these reports that the decision to move to shelter is not taken lightly and may even be delayed.

**Gender Dimension of Extreme Weather**


“National and ethnic cultures, which restrict women’s mobility and resilience, make them more vulnerable to the effects of climate change – not only from storms and flooding but also from drought, in cases where women are subsistence farmers, and from forced migrations out of drought and flooding conditions. While it’s true that both men and women are affected by climate change, the effects are not always the same, nor are they always equal" (p.468-469).

Alarmingly, there is often an increase in reports of sexual assault and violence against women which take place during or after a major weather event. In the aftermath of Hurricane Katrina which assaulted New Orleans in 2006, cases of sexual assault in the city increased in the several months after the cyclone by 45% (Austin 2008, p.1). As Austin (2008) points out, during times of emergency:

“…gender role breakdown and reconstruction follow a disaster because gender role performance depends on institutional supports, and the disaster often destroys those supports” (Austin 2008, p.1). This heightens the vulnerability already being experienced by people in vulnerable communities, particularly women and children. Gender also intersects with race and class to create multiple femininities and masculinities (Austin 2008, 3), which means that climate change will be experienced from numerous unique and subjective perspectives.

Concurrently however, for the purpose of developing policy it can also be useful to engage with dominant, hegemonic discourses surrounding gender, class and race which are understood to have a role in shaping society.

**Food and Water Insecurity in Bolivia: A Gendered Perspective**

Both food and water insecurity will increasingly be exacerbated by climate change. According to Wutich (2009), “The Biophysical impact of water insecurity is 2 million deaths and 4 billion cases of diarrhoea per year” (p.436). Bolivia is an example of
a country that will be affected by food and water security issues in the wake of climate change. The country has almost every type of conceivable climate from glaciers in the Andean peaks, through to salt deserts in the Altiplano and the immense Amazon rainforest in the lowlands.

To the Bolivians themselves, there is a clear distinction in terms of class and wealth drawn down the lines of temperature and climate. The wealthier classes tend to inhabit the warm, low-lying regions while poorer (largely indigenous) Bolivians inhabit the harsh Altiplano. In their study ‘Social Impacts of Climate change in Bolivia: A Municipal Level Analysis of the Effects of Recent Climate Change on Life Expectancy, Consumption, Poverty and Inequality’, Anderson and Verner (2009) point out that consumption can also be correlated to temperature (p.7). In fact, consumption levels (which are often used as indicators of wealth) are almost twice as large in the warmer regions than in the high-lands (p.12). Anderson and Verner (2009) state: “Bolivians do considerably better in hot areas than in cold areas, even when controlling for other factors such as education attainment and urbanization levels” (p.8).

Despite the well-known fact that Andean glaciers are currently melting, data indicates that over the past 60 years the Altiplano has cooled by up to 0.2 degrees per decade with the lowlands staying the same or warming slightly (Anderson & Verner 2009, p.11). This process seems to be an anomaly, with recorded daytime temperatures indicating a warming effect while night time temperatures tend to indicate that the Altiplano is cooling (Anderson & Verner 2009, p.11). Anderson & Verner (2009) largely associate this anomaly with reduced cloud coverage which may responsible for encouraged solar irradiation. This might explain the extreme differences recorded in daytime and night time temperatures and which may ultimately be speeding the melting of Andean glaciers despite freezing temperatures during the night (p.11). This indicates that the already existing inequality between Bolivian regions may be increased by climate change which will possibly inflame poverty in the highlands as the indigenous populations are exposed to colder winters and more frequent frosts which will inhibit the growth of staple crops (Anderson & Verner 2009, p.12). Concurrently, the low-lying regions may even receive a boost to their agricultural endeavours.
In a large part due to climate change, Bolivia is already engaged in a struggle against water insecurity. In some parts of Bolivia, particularly in the Altiplano, it can take up to 4 hours to walk to water, wait in line and then return home (Wutich 2009, p.438). In 2000, there were protests against a government attempt to privatize the water supply in Cochabamba, a city already stricken by drought and water insecurity. The protestors were successful in reversing plans to privatise the municipal water supply service. However, the situation is still not good. In one indigenous Quechan district on the outskirts of the city, a study reports that up to 49% of homes do not have adequate access to water (Wutich 2009, p.439). These families are forced to depend on unreliable water vendors and public tap stands where they pay a fee and have a limited amount of time to collect the water (Wutich 2009, p.439). The result is that there is barely enough drinking water. The stress that this places on families and human health in affected regions should not be underestimated.

Food security in the case of Bolivia involves several factors related to reduced cultivatable land, increasing exportation of staple crops (Quinoa), increased food importation, growing urbanization, environmental shocks such as drought and floods and dietary changes towards cash crops such as potato (Cuesta, Edmeades & Madrgal 2011, p.2). Agriculture is incredibly important to the Bolivian economy and accounts for between 13 to 27% of GDP (Cuesta, Edmeades & Madrigal 2011, p.3). Almost 90% of people living in rural areas are engaged in the agricultural sector, 85% of whom live in poverty and 75% in extreme poverty (Cuesta, Edmeades & Madrgal 2011, 3). Within vulnerable regions, women are more likely to be burdened with water responsibilities (Wutich 2009, p.436). Studies indicate that women experience water related stress differently to men, with women more likely to suffer from anxiety and depression (Wutich 2009, p.437). Women are also more likely to prioritize the use of food and water for the use of others over their own (Wutich 2009, p.438).

Children are also very likely to suffer during times of drought due to food and water insecurity. Data collected in rural communities that are already afflicted by both issues indicated that about a third of children are stunted due to malnutrition (Heaton & Forste 2003, p.410). The childhood mortality rate is two times higher in rural areas than urban areas in Bolivia, with 40% of the population residing in rural
locations. This has resulted in Bolivia repeatedly reporting the highest rates of infant mortality in all of Latin America (Heaton & Forste 2003, p.411). These high rates are largely due to gastro-intestinal and respiratory infections which reflect poor quality food and malnutrition (Heaton & Forste 2003, p.411). Sanitation and education would make a difference to these statistics but unless these are implemented in conjunction with climate change mitigation measures, the crisis is only likely to worsen.
Chapter 3: Universal Primary Education and Gender Equality

The implications of rising sea levels on the MDGs have been broad and go beyond the obvious practical concerns of human displacement. The total human population of the planet has now reached 7 billion and it is predicted that it could be as high as 9.2 billion by 2050 (Bryant et al. 2009, p.852). If humanity does not alter its consumption patterns, the significance of this kind of population on GHG emissions will be large. This chapter examines how rising sea levels are already beginning to affect maternal health and childhood mortality, specifically within the context of Bangladesh. As sea levels rise, a significant loss of land will have serious repercussions for communities in low lying areas such as Bangladesh and the South Pacific. For many communities, the population has swelled to the point where the loss of land may have a critical impact on their ability to sustain themselves. A clear response to this will be forced outward migration.

Salinity Intrusion and Bangladesh
MDG number 5 is: 'Improve Maternal Health'. This goal is split into two targets: a) Reduce the maternal mortality rate by three quarters and b) Achieve universal access to reproductive health. The current rate of maternal mortality is about 210 deaths per 10,000 births which is down from 480 maternal deaths in 1990, meaning that we are still a fair way from the goal of 120 (UN 2013). In their article ‘Climate change and the Potential Effects on Maternal and Pregnancy Outcomes: an Assessment of the Most Vulnerable - the Mother, Foetus, and Newborn Child’, Rylander, Odland & Sandanger (2013) point out that “The populations in developing countries in tropical areas are likely to suffer most from climate change due to poverty, poor sanitation, poor population health status, high population density, poor health care systems, and political instability, that is, limited government ability to cope with external crisis” (p.2). Part of this vulnerability is the lack of capacity in developing countries where human health is beginning to be impacted by climate change. One of the ways that climate change undermines MDG 5 is through the rising sea levels and the impact this has on salinity levels in drinking water in the populous country of Bangladesh.
Every year, 536,000 women die from complications relating to pregnancy and childbirth or during the 6-week post-partum period directly after birth and most of these deaths are due to blood loss or hypertension (Rylander, Odland & Sandanger 2013, p.2). It is believed that 187,000 of these maternal deaths occur in South Asia alone (Homer et al. 2009, p.606). Healthcare workers estimate that 99% of maternal deaths are avoidable and are directly correlated to giving birth in the developing world (Rylander, Odland and Sandanger 2013, p.2). Pregnancy is a particularly vulnerable time for a woman, during which she is more susceptible to health problems such as diabetes or hypertension. Access to safe drinking water is always a concern for vulnerable populations and this issue has been very present in coastal Bangladesh which is affected by both protracted droughts and saltwater intrusion into drinking water sources as sea levels rise (Khan et al. 2011, p.1328). According to a study conducted by Khan et al. (2011), “Drinking water from natural sources in coastal Bangladesh has become contaminated by varying degrees of salinity due to saltwater intrusion from rising sea-levels, cyclone and storm surges, and upstream withdrawal of freshwater” (p.1328). This contamination follows a clear seasonal pattern due to rainfall and the upstream withdrawal of freshwater dictated by the season (Khan et al. 2011, p.1328). It is predicted that salinity levels will only increase as climate change continues to take hold in Bangladesh (Khan et al. 2011, p.1328).

Khan et al. (2011) took urine samples from hundreds of women in Bangladesh and analysed the sodium levels. The results indicated that the mean level of sodium found in the urine was far above the recommended levels in all of the women that were tested (p.1328). The average rate of hypertension in pregnancy is between 2.65% to 6.8% depending on the community but in coastal Bangladesh this figure is closer to 21% (Homer et al. 2009, p.609). These results indicated a clear link between elevated levels of sodium and an increased rate of eclampsia and gestational hypertension amongst pregnant women (Khan et al. 2011, p.1328). Approximately 20 million people are affected by the salinity intrusion in their drinking water source in Bangladesh (Khan et al. 2011, p.1328).

This will be further compounded by a rise in temperature. A rise in temperature in Bangladesh increases the risk of heat exposure for pregnant women, which can have dangerous consequences, particularly for those pregnant women who
engage in physical labour under the sun (Rylander, Odland & Sandanger 2013, p.6). Core body temperature should not exceed 38 degrees for any sustained period of time. Pregnant women are at particular risk of ‘over heating’ and this risk only increases during long periods of drought (Ryland, Odland and Sandanger 2013, p.7).

**Childhood Mortality**

Good maternal health is intrinsically linked to the likelihood of childhood survival (Rylander et al. 2013, p.2). Just as nutrition is important for pregnant women, children are also particularly vulnerable to malnourishment. In sub-Saharan Africa, under-nutrition is the leading cause of death among children between the age of 0 and 5 (Rylander, Odland & Sandanger 2013, p.4). Under-nutrition can also lead to stunting, poor foetal growth, and micronutrient deficiencies (Rylander et al. 2013, p.4). Diarrhoea is another leading cause of death amongst children under the age of 5 and this can often be linked to poor quality food (Rylander, Odland & Sandanger 2013, p.4). Both of these can be a symptom of food insecurity. For this reason, salt intrusion in cropland soil is likely to exacerbate childhood mortality rates in Bangladesh. Childhood Mortality rates are also closely linked to vector-borne disease which will be discussed in greater detail in Chapter 4.

Unfortunately the solution to the problem of rising sea levels is not straightforward. Of course adaptive response can be taken. For example, flood embankments can be built to improve drainage in Bangladesh (Suhrke 1994, p.486). Alternative water sources for vulnerable communities can also be sourced. However, these responses do not address the root of the problem and will be costly for developing countries like Bangladesh. For the South Pacific, where land loss will be perhaps even more severe, there may be few adaptive options in the near future.

For these reasons, it seems that even if the quantitative indicators for the MDG 5 are reached, unless environmental change is addressed immediately and radical measures to begin to reverse climate change are introduced, any positive steps towards a healthier human society may in fact be reversed and possibly even worsened (Homer et al. 2009, p.607). Maternal mortality rates are always crucial
indicators of Development progress because maternal mortality is closely related to gender inequity and poverty. Therefore, MDG 5 is one of the indicators that most explicitly demonstrate the gap between the rich and the poor and for men and women.

**Primary Education & Gender Inequity**

Extreme weather events are also likely to seriously influence school attendance rates and gender equity in vulnerable communities. In terms of MDG 2: ‘To Achieve Universal Primary Education’, MacDonald (2010) points out: “If parents’ livelihoods are negatively affected by erratic weather – harvest fail, drought wipes out livestock, business infrastructure is damaged, employment opportunities are lost- school fees or the costs of uniforms, books, and transportation can become insurmountable hurdles” (p.8). In this way, the achievement of MDG 2 is strongly linked back to the issues discussed in previous chapters. Storms may contribute to the actual physical damage of school buildings, preventing children from attending school (MacDonald 2010, p.9). Even if the buildings are accessible, other stressors such as hunger, water insecurity and financial or emotional stresses on family, which are more likely to accompany climatic events, may prevent children from obtaining an education (MacDonald 2010, p.9). During times of financial hardship, girls are usually the first to be taken out of school (Chant 2007).

MacDonald (2010) states: “Girls who begin primary school may be required by parents to skip a year (or more) or stop attending classes entirely where their labour is deemed essential to help counter household ecological deficits related to climate change, such as declining local availability of water or wood for cooking and heating” (p.9).

Women are the majority of the world’s farmers and produce between 60 to 80% of food in most developing countries, the interrupting forces of drought and flood may compromise harvests and threaten the livelihoods of countless women (MacDonald 2010, p.9). It has also been proven over the past couple of decades that greater gender inequality also feeds the spread of HIV/AIDS, Malaria and other health issues that have a large impact on maternal health and child mortality (MacDonald 2010, p.10).
Migration
When traumatic climate related events occur, sometimes the most logical form of action may be either temporary or permanent migration to a safer location. This compounds the issues discussed above: maternal health, primary education and gender inequity. This is because misplaced people living in unsettled conditions may not have adequate access to resources or the infrastructure essential to providing basic needs such as health care and education (MacDonald 2010, p.9).

In terms of migration, the consequences of environmental change are complex and will most severely affect those communities which are most heavily dependent on natural weather cycles. As sea levels rise, significant portions of land will be lost. In some cases, loss of land may be so severe that out-migration may be the only option.

Some of the most common reasons for outward-migration apart from rising sea-levels include desertification, land degradation and deforestation (Suhrke 1994, p.464). Each of these environmental problems is accompanied by unique social impacts. For example, land degradation can lead to reduced income of individuals, whole families and entire communities (Suhrke 1994, p.467). Likewise, deforestation can accelerate poverty due to its impact on soil erosion and agricultural practices (Suhrke 1994, p.470). At this point, seasonal or permanent migration is often considered as a viable option. Rising sea levels are expected to directly affect many coastal communities, particularly in the regions of China, Bangladesh and the South Pacific. The National Climate Assessment (2014) estimates that sea levels may rise to anywhere between 30 and 120cm by the end of the 21st century. This would affect approximately 360,000 kms of coast-line (Suhrke 1994, p.477). For Bangladesh this could mean the displacement of approximately 15% of the total population which at present is close to 155 million (Suhrke 1994, p.477). For islands such as Kiribati in the South Pacific, loss of land as a result of rising sea levels may result in the only option being migration to neighbouring countries like Fiji, Australia or New Zealand (Suhrke 1994, p.477).

At the heart of this debate is the figure of the 'environmental refugee' which was first introduced by the environmentalist Lester Brown in 1976. The environmental refugee is described as such: “They are people who can no longer gain a secure livelihood in their erstwhile homelands because of drought, soil erosion,
desertification, and other environmental problems. In their desperation, they feel they have no alternative but to seek sanctuary elsewhere, however hazardous the attempt. Not all of them have fled their countries; many of them are internally displaced. But all of them have abandoned their homelands on a semipermanent if not permanent basis…” (Myers 1993, p.752). Some scholars are more careful to make a distinction between refugees and migrants, arguing that “In a broader development perspective, environmental degradation appears as a proximate cause of migration, while the underlying factors are population pressures and the patterns of resource use” (Suhrke 1994, p.470).

This has significance due to the legal framework surrounding refugee status. The term refugee has been used primarily in accordance to the 1951 UN Refugee Convention which defines it in the following terms: “The person has to be outside his or her country of origin, for reasons of “persecution”, based on his or her “race, religion, nationality, membership of a particular social group or political opinion”. The definition does not include internally displaced people or those who have migrated due to natural disaster. Typically a refugee is someone who is a victim of violence that is either perpetrated or uninhibited by the state within which they reside. Therefore people fleeing the effects of climate change would not be accorded refugee status according to international law (Suhrke 1994, p.473). As such, the countries to which people displaced by climate change migrate would not be legally bound to accord them the rights that accompany refugee status.

It could be that for this reason many politicians and scholars are careful to avoid the term ‘environmental refugee’ due to the fact that applying this label to environmental migrants would carry legal ramifications. Indeed, to migrants such as those from the Pacific Islands, the title refugee might actually be considered offensive due to its connotations of victimisation (McAdam 2011). While claiming refugee status due to forced displacement might grant migrants certain legal rights in terms of International law, it also might tarnish prospective relocation agreements in countries like Australia which currently has a difficult relationship with the internationally recognized rights of the refugee. The term migration does not necessarily imply a problem and therefore it perhaps is not fitting to describe the imperative that accompanies some forms of migration. For lack of a better word, ‘displaced people’ may substitute until the matter is resolved.
The bulk of migration has occurred internally so it is hard to measure numbers and the root cause of displacement (Suhrke 1994, p.484). Arguably, some outward-migration which may look elective may in fact be due to displacement (Hugo 2013, p.27). In 1993, Myers estimated there were approximately 10 million displaced people due to environmental reasons; half of these were in Sub Saharan Africa (p.752). Accurate data on the number of displaced people is very hard to find but it would not be unreasonable to assume that this number has gone up in the years since. Worldwide sea level rise could fall somewhere between 8 and 29 cm (Myers 1993, p.753). Prospectively, with a 1 metre rise in sea levels, over 7% of Bangladesh could be consumed by water (Myers 1993, p.753). Bangladesh is also very prone to extreme weather such as coastal flooding, cyclones and storm surges (Myers 1993, p.753). The Agricultural Sector accounts for 50% of Bangladesh’s GDP, meaning that there is also the added threat of food insecurity and economic collapse (Myers 1993, p.753). Although there are steps that can be taken to prevent flood damage such as: sea walls, dikes, anti-flood levees, beach nourishment and damming, these measures are very costly and will probably not be implemented on a large enough scale (Myers 1993, p.753). What this mean for Bangladesh, is that if adequate measures cannot be taken, upwards of 15 million people may be forced from their homes due to rising sea levels and backwater flooding (Myers 1993, p.754). The obvious path of action that these people will be forced to take is both internal and external migration which will have massive consequences not just for Bangladesh but for its neighbouring countries as well.
Chapter 4: Child Mortality, Maternal Health and HIV/AIDS, Malaria and Other Diseases

A serious consideration that is often overlooked when discussing the impact of climate change are the consequences it will have for human health. To societies that have enjoyed the protection of antibiotics for almost a century, epidemics may seem like a distant memory but climate change may threaten this security. As Baer & Singer (2009) point out, “It is noteworthy that, unlike in cooler climes, in tropical areas influenza knows no seasons; it is a year-round event. With increased global warming, wider areas will be subject to continual influenza infections, including sickness caused by new mutant strains” (p.111). WHO warns that diarrheal diseases, malnutrition, dengue fever and malaria are very sensitive to climate and will likely be worsened as climate change progresses (MacDonald 2010, p.11). Changes in weather patterns may also alter geographical and seasonal distribution of vector-borne disease, allowing transmission to spread to both higher altitudes and wider latitudes (Markandya & Chiabai 2009, p.762).

This will be compounded by the issues of food and water security discussed in Chapter 2 which, when they result in malnutrition, also increase chances of disease contraction. This may also be aggravated by a process known as syndemic infection in which a person is more likely to contract a disease or develop a health problem if they are already infected or sick (Baer & Singer 2009, p.110). The implications of climate change for human health must also be framed within simultaneous greater pressures such as political instability, mass urbanization and globalization which place added stress on human health (O'Brien et al. 2008, p.196).

In much of the developing world, nearly 4 in every 10 deaths occur among children under the age of 15 (WHO 2014). Infectious disease is the leading cause of death with respiratory infections, HIV/AIDS, diarrhoeal disease, malaria and tuberculosis collectively accounting form one third of all deaths in low-income countries (WHO 2014). Disease can be transmitted through a variety of forms. Food can be a carrier as can water, domesticated animals, other human beings and even the air we breathe. Possibly one of the most famous examples of a carrier of disease is
the mosquito. It is projected that a rise in temperature of only 2 degrees (the base rise calculated by the IPCC) will double the metabolism rate of vector carrying mosquitos such as those that carry Malaria. In effect this could expand the Malaria domain of active infection from 42% to 62% of the world (Baer & Singer 2009, p.117).

**Malaria and China**
Malaria is an infectious disease caused by parasitic protozoans which are exclusively transmitted by the *Anopheles* mosquitos. The disease is incredibly widespread in warmer climates. WHO reported 207 million cases of Malaria in 2012 (with an uncertainty range of 135 to 287 million) and this led to approximately 627 000 malaria related deaths, mostly among African children (WHO 2013, p.ix). The parasitic protozoans are transported by infected mosquitos which are then transferred to human hosts when the mosquito carrier bites the host and transfers the protozoans through its saliva into the bite-wound. In the blood, the parasitic protozoans travel to the liver where they feed and multiply up to 40,000 times until infected cells are completely destroyed. At this point, significant damage is done to the liver and the parasites may begin to enter the bloodstream, targeting red blood cells (Baer & Singer 2009, p.121). The symptoms of malaria may include headaches, fever, muscle pain and seizure sometimes leading to permanent neurological damage (Baer & Singer 2009, p.121). Generally the parasites take about four weeks to develop and mature but in warmer climate this process can be shortened to as little as 2 weeks (Baer & Singer 2009, p.122).

Malaria infects approximately 125 million pregnant women each year in sub-Saharan Africa which is estimated to result in between 75,000 to 200,000 connected infant deaths (Rylander, Odland & Sandanger 2013, p.5). Because of this, malaria is a disease that has implications for several of the MDGs including most notably MDGs 4, 5 and 6. Malaria is not usually fatal for affected adults but the mortality rate for small children remains high. Currently 7.3% of all deaths of children under the age of 5 are related to malaria (WHO 2013, p.64) and WHO estimates that a child dies every minute from malaria (WHO 2014). Malaria may also cause high rates of miscarriage and could lead to maternal death in non-
immune pregnant women (WHO 2013, p.xi). There is currently no registered vaccine for malaria. Treatment of infection involves the use of powerful drugs that can have harsh symptoms. For the treatment of pregnant women and young children the drug Quinine is most commonly used. Although it too has harsh side effects, Quinine is the only drug approved by the WHO for the treatment of pregnant women because it does not have abortifacient properties. However, resistance to known anti-malarial drugs is growing.

According to Parham and Michael (2010), “Along with schistosomiasis and dengue infection, malaria is considered one of the major vector-borne diseases most sensitive to changing environmental conditions” (p.620). This is due to environmental variables that include temperature, rainfall, humanity and wind speed which affect the incidence rate of malaria through its impact on mosquito and parasite life cycles and behaviour (Parham & Michael 2010, p.620). Because these variables are complex, data can be difficult to quantify. Parham & Michael's (2010) study indicates that it is rainfall that mosquito population rates are most sensitive to rather than temperature (p.620). However, we know that rainfall is connected to seasonal temperature patterns. It has also been confirmed that the geographic domain for malaria is widening and therefore a connection between global warming and the likelihood of an increase in malaria incidences can be made.

Malaria represents just under half of any significant health costs, followed by diarrhoea and malnutrition (Markandya & Chiabi 209, p.771) According to WHO (2014), since 2000 there has been a successful and concerted effort to tackle the problem of malaria which affects 103 countries. The 2014 data indicates that 59 out of the 103 countries are currently meeting the MDG target of reversing incidence rates. It is projected that 52 of these countries will have successful reduced malaria incidences by 75% by 2015. However, the costs of malaria are enormous. WHO estimates that currently, 5 billion dollars a year is required for malaria control (WHO 2010, p.11). If climate change does succeed in exacerbating the transmission of malaria, these costs are likely to continue to increase rather than decrease.
The same can be said for other vector borne diseases such as dengue fever and yellow fever. Rather than decrease in prevalence, according to 2013 WHO data the incidences of dengue have grown dramatically in recent decades due to expansion in geographic coverage. This expansion is in part due to the fact that due to global warming, the mosquito carriers of dengue can now live in higher altitudes and in places that were traditionally cooler (Baer & Singer 2009, p.120). Now approximately 2.5 billion people (or almost half of the world’s population) are at risk of infection giving dengue the potential to be one of the 21st centuries’ most deadly diseases with new outbreaks described as ‘explosive’ by WHO in the developed regions of Europe and North America where sanitation is generally of a higher standard. Likewise, recently in the Americas there have been more reported cases of yellow fever which kills about 30,000 people annually (WHO 2014).

Water Borne Disease
Waterborne disease contributes to roughly 90% of deaths from infectious disease in the developing world (Baer & Singer 2009, p.111). These diseases vary in their mode of infection but all are carried in water and are notably more active in terms of infection during the warmer months. Just a few are outlined below.

Cholera is a water borne disease that is already firmly established as having global significance for human health. The pathogen responsible for cholera is called *Vibrio cholerae* and it functions by rapidly producing large amounts of enterotoxin that causes the body to produce a very watery diarrhoea which may ultimately result in dehydration and even death (Baer & Singer 2009, p.113). According to Baer & Singer (2009), cholera infection rates are very likely to be affected by ocean temperature, pH level and salinity with incidences of cholera being more likely to appear after extreme climatic events such as cyclones. This was the case in Bangladesh during the 1992 cholera outbreaks in Dhaka which directly succeeded heavy monsoonal flooding (Baer & Singer 2009, p.113). Cholera is generally contracted through infected drinking water as well as through the consumption of uncooked produce.
Perhaps the most prevalent water-borne disease is one that gets very little attention in the media. It is called schistosomiasis and it is a chronic disease caused by parasitic worms. In 2012, the World Health Organization (WHO) reported that there were at least 249 million people in the world who required treatment for schistosomiasis, while only 42.1 million actually received any treatment for the infection. The parasite is known to be transported by snails and it is sometimes known as ‘snail fever’. Symptoms can range from abdominal pain and diarrhoea to blood in the stool or urine and for those who have been infected for a longer period infection may result in damage to vital organs such as the liver and kidneys. Long term risks may include infertility or bladder cancer and in children schistosomiasis may result in stunted growth and development (WHO 2014). In women, urogenital schistosomiasis can result in lesions of the cervix and vagina, vaginal bleeding, pain during intercourse and nodules in the vulva. Many women may also have female genital schistosomiasis (FGS) and new studies are indicating that this infection may also make women more susceptible to HIV infection during unprotected sex (WHO 2014). Urogenital schistosomiasis can also affect the fertility and bladder in men.

Schistosomiasis, like the other water borne pathogens, is most commonly contracted by people who collect their water from untreated water sources such as rivers. In many instances it is women and children who are most exposed to the water borne pathogens due to their domestic role as water carriers or in the case of children, when they are taken to water sources by their parents or care-givers. In some situations, infection rates among small children are quite high (WHO 2014).

**Costs**
The costs imposed by infectious diseases in both monetary terms and human health and life are massive. It is estimated that diarrhoeal diseases are responsible for 1.8 million deaths per year (Ryland, Odland & Sandanger 2013, p.5). In 2008, 247 million cases of malaria were reported with 1 million deaths as a result (Ryland, Odland & Sandanger 2013, p.5). 125 million pregnant women are
infected with malaria each year resulting in up to 250,000 infant deaths in Sub-Saharan Africa alone (Ryland, Odland & Sandanger, p.5).

This means that the Development sector will have to invest increasing amounts of money and energy to try to combat the negative impacts of climate change on human health in the developing world. There are initiatives that can be taken to counter this process. This may include: the expansion of mosquito control, further vaccination coverage, enhancement of existing elimination programs, establishment of early warning systems, improved housing and sanitation, strengthening of preparedness of extreme weather events and public health education and inter-departmental cooperation in terms of government response (Bai, Morton & Liu 2013, p.17; Markandya & Chiabai 2009, p.766). In vulnerable regions of the developing world such as China or Sub-Saharan Africa it is crucial that climate change adaptation is centralized as an important priority for local public health sector workers (Bai, Morton and Liu 2013, p.18). Of course, these efforts are often constrained by limited resources.

It is difficult to quantify the exact health costs that will be incurred by climate change because disease and other conditions can have long-term and complex consequences for a person which are often compounded by the presence of syndemic infection. Any kind of estimate will be broad but Markandya & Chiabai (2009) estimated that it will cost upwards of 46 billion dollars to implement recommended measures to counter the impacts of climate change (p.773). Considering that South East Asia and Africa are expected to face the highest costs in terms of infectious disease and climate change, the costs of these interventions may exceed available resources (Markandya & Chiabai 2009, p.772). In terms of malaria control, only 4.6 percent of the estimated resource required can be covered in African countries and this rises to only 9.2 percent in Asia, Oceania and America- meaning there is an alarming funding gap of up to 95% (Markandya & Chiabai 2009, p.774).

It is not just the direct economic costs of treatment and prevention that should be considered. Disease has serious impacts on household poverty and agricultural production, linking it directly to poverty and food security. As Shackleton & Shackleton (2012) point out:
“…loss of a breadwinner or multiple adults in the household frequently results in sale of household assets, thereby diminishing capacity to recover from other shocks; and in areas with high prevalence rate the formal healthcare system is overwhelmed requiring increased home-based care, which diverts household labour from economically or agriculturally productive activities” (p.279).

In fact, the issue of forced migration discussed in the previous chapter may also exacerbate disease transmission. As people are forced out of their homes and into cramped settlements or slum dwellings they may be more vulnerable to disease. This is demonstrated in the high contraction rates of HIV/AIDS found in mobile populations, especially amongst men who have been forced to migrate in search of resources or employment (MacDonald 2010, p.11). These costs can be limited by immediate climate change mitigation. As Markandya & Chiabai (2009) point out, “…we can achieve a 25% to 35% reduction in costs for treating diarrhoeal diseases, and 37% to 49% reduction in costs for malaria by reducing GHGs enough to stabilize emissions at 750 ppm and 550ppm respectively” (p.772).
Chapter 5: Environmental Sustainability

It has only been relatively recently that MDG 7 ‘Ensure Environmental Sustainability’ has gotten any real attention. In the past, it was often tacked on to the bottom of any Development or policy agenda. With awareness about anthropogenic climate change rising, policy makers are starting to invest more energy in protecting Earth’s delicate ecosystems. Rather than viewing nature as something to merely exploit for resources, MacDonald (2010) points out that attitudes are slowly beginning to shift towards viewing nature as an essential service to human society which provides us with clean air, fresh water and the means to grow and pollinate crops (p.11). In the pursuit of wealth and development, it is possible that we have unleashed what MacDonald (2010) calls a ‘vicious circle’.

Environmental Degradation and China

China is being touted as a Development success. Its economic development has been rapid, widespread and almost without precedent. When the UN releases its evaluations of the MDGs in 2015, China’s success will undoubtedly bolster the quantitative indicators measuring the MDGs overall success significantly; however this has not come without great cost to the environment. China has now overtaken the US as the largest GHG emitter in the world (Gu & Han 2010, p.418). This is due to the very large population which has experienced a rapid increase in consumption of energy which has fuelled the reduction of poverty (Heggelund 2007, p.161). While China’s consumption of energy (mostly coal) doubled between 1980 and 2000, its GDP more than quadrupled in that time (Heggelund 2007, p.161). A reliance on coal consumption has resulted in serious air pollution which impacts on residents’ standard of living and health (Heggelund 2007, p.165). Climate change also threatens to pull many of the 738 million lifted from poverty back down (Heggelund 2007, p.157). Gu & Han (2010) believe that the 2 core human activities that contribute to climate change are the processes of industrialization and urbanization (p.418). They state:
The former led to large-scale use of fossil fuels and CO2 emissions, as the economies’ focus transformed from agricultural to industrial. Urbanization is a spatial concomitant of industrialization, reflecting the spatial extend of scale economies and also influencing industrial development. The land use and land cover changes associated with urbanization leads to an increased consumption of natural resources. In the post industrial cities, commuting in metropolitan areas is a major cause of greenhouse gas emission (Gu & Han 2010, p.418).

Arguably, the delicate balance between development, resource consumption and environmental degradation has been purposely skewed towards economic development. Reducing emissions has not even been on the agenda for China until recently.

One of the motivators for reducing emissions is the extreme air pollution China is now experiencing as a direct result of industrialization. Despite this, economic growth still remains an urgent priority as the gap between the rich and poor continues to grow (Heggelund 2007, p.159-160). Sustaining a population of approximately 1.3 billion in the process of rapid development could not be done without a level of reliance on fossil fuels at this point in time and China still has considerable coal reserves. However, China is attempting to shift towards cleaner forms of energy decreasing the percentage of coal power from 75% in 1996 to 67.7% in 2004 (Heggelund 2007, p.162). China aims to reduce this to 53% by 2030 (Heggelund 2007, p.162) and for at least 15% of its energy to come from renewable sources by 2020 (Heggelund 2007, p.164). This is a matter of energy security for the future as much as GHG emission and air pollution reduction. Already China has experienced a GDP loss of between 7 and 20% due to environmental degradation (Gu & Han 2010, p.428). If China is to continue to grow sustainably, consumption and emissions need to be limited.

Urbanization and soil degradation have long created concern surrounding food security in China and the impacts of climate change on the agricultural sector will only exacerbate this (Tao et al. 2009, p.433). In their study ‘Climate Change, Land Use Change, and China’s Food Security in the Twenty-First Century: An Integrated Perspective’ Tao et al. (2009) predict that China will be able to continue to meet its overall food demand despite climate change but that regional disparities will become more apparent as weather patterns change (p.433). Tao et
al. (2009) state: “China’s population policy should soon lead to zero population growth and a population decline within the modelling period… this will increase food security. In contrast, urbanization, desertification and land degradation, combined with conservation, will greatly reduce the land available for agriculture. That will decrease food security, particularly in a scenario with high population growth and low GDP growth” (Tao et al. 2009, p.443). For this reason, it could be argued, that China’s future food security is hinged on the delicate balance between future population, resource consumption and climate (Tao et al. 2009, p.434).

Another predicted problem accompanying climate change for China will be water insecurity. In their study ‘A Regional Climate Model Downscaling Projection of China Future Climate change’, Liu, Gao & Wang (2013) state that “…global warming will lead to severe water problems in China who faces extremely grim ecological and environmental conditions under the impact of continued changing regional environment” (p.1872). China’s ‘mega-urban’ regions are particularly vulnerable to water scarcity. It is predicted that there will be 1 billion Chinese people living in cities by the year 2025 (Gu & Han 2010, p.418). Northern China has traditionally experienced periods of prolonged drought and this is likely to be exacerbated as climate change progresses (Liu, Gao & Wang 2013, p.1872). Conversely, the wet and warm south is more susceptible to flooding (Gu & Han 2010, p.421).

If China is to adapt to climate change, it will need to alter the path of economic development that it is currently on. Crucial to adaptation will be ensuring food and water security and protecting the low lying coastal areas which are vulnerable to rising sea levels (Heggelund 2007, p.167). In the past, China has stated that its low per-capita resources will make it difficult to adapt to climate change (Heggelund 2007, p.167). So far this argument has been used fairly successfully in negotiations to avoid making any serious commitments to emissions reduction. The Chinese have contrasted their ‘survival’ emissions with the ‘luxury emissions’ of developed nations, pointing out that the developed world must first curb their patterns of production and consumption before forcing the developing world to sacrifice its industrialization efforts (Heggelund 2007, p.176). China in particular condemned the US withdrawal from the Kyoto protocol claiming that their lack of
accountability and refusal to curb energy consumption is not politically acceptable (Heggelund 2007, p.177).

Though significant poverty-reduction efforts have been successful, inequality between the wealthy and the poor continues to widen. The emissions produced by this are now threatening to undo all of the progress that has been made unless major adaptive measures are undertaken. Balance must be restored through a more sustainable form of development, if such a thing exists. It is the only secure option for future Chinese growth that will not threaten the ecosystem and human health (Gu & Han 2010, p.428).

Some steps have been taken in this direction. China launched the National Climate Change Program which aimed to reduce energy consumption and promote the creation of technology that could be used to combat or adapt to climate change in China (Gu & Han 2010, p.429). The plan aims to make the use of fossil fuels more energy efficient rather than moving to an alternative form of energy (Gu & Han 2010, p.429). China has also ratified the Kyoto Protocol although they have stressed that any action taken by developing nations should be hinged on the actions and leadership of the developed world and that these countries should fulfil their obligations to transfer technology (Heggelund 2007, p.175).

**Issues Surrounding MDG 7**

MDG 7 concerns environmental sustainability and includes 4 targets: a) Integrate the principles of Sustainable Development into country policies and programmes and reverse the loss of environmental resources, b) Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss, c) Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation, d) Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers (UNDP 2014). Goal number 7 doesn’t tend to get as much attention as the other goals. Perhaps this is because it lacks very firm quantitative indicators to measure its success. In the article ‘The Environmental Millennium Development Goal: Progress and Barriers to Its Achievement’, Donat Castello et al. (2010) state that: “It is necessary to generate scientific knowledge
around MDG7, and identify weakness in the indicators in order to adapt policies to
the new challenges and make decisions based in best evidence” (p.154). The
indicators that we do have suggest that insufficient progress is being made
towards MDG7 in the developing world.

Undeniably, it is developing nations who are faced with the greatest challenges in
achieving the MDGs and cruelly, it is the developing world that will also be most
affected by climate change. As people struggle to lift themselves from poverty,
solid fuel use increases and forest mass continues to decrease by approximately
13 million hectares per year (Donat Castello et al. 2010, p.155). This is combined
with rapid urbanisation and urban migration. Vast slums have appeared in
countries like Bangladesh and Bolivia and these are accompanied by a whole
range of social issues. This is even before we have really begun to feel the effects
of climate change. At the very heart of any discourse about climate change is this
issue of injustice. The developed world by far has contributed the most to GHG
emissions throughout history. They were able to build their own industrialized
economies which enabled the citizens of the developed world to lead lives centred
on the consumption of resources. Therefore, there is question as to how
responsibility in terms of climate change action should be distributed.

China maintains that the developed world must take responsibility for its
contribution to the present situation while allowing the developing world to
continue to increase emissions while their economies are developing (Heggelund
2007, p.179). This view would position China as a victim of Northern consumption
but if indeed we are to engage in the ‘winners and losers’ dichotomy things may
not be so clear cut. There is an emerging concept within discussion surrounding
mitigation and adaptation that richer countries dealing with the effects of climate
change will have the ability to outsource their polluting industries to poorer
countries. In the case of China, this process first began with relocating polluting
industries from richer provinces to poorer ones; next, pollution was outsourced to
their neighbour Mongolia (Kuishuang et al. 2013). Finally, as China continues to
grow wealthier, we have recently seen Chinese companies buying up swathes of
land and interest in mining companies around the world but particularly in Africa.
When climate change really takes hold, those governments with the largest
holdings of land in areas that are less likely to be drastically affected will be in a much better position to continue to thrive and adapt.

**Gender Inequity**

Despite the fact that millions have been raised above the poverty line in China, there are still large gender inequity issues at play as well as disparity between urban and rural citizens. There still exists a traditional preference for boys in China, 15 years ago in some provinces the ratio was as high as 130 for every 100 girls born (Yungou 2007, p.270). The preference is a remnant of years of a patriarchal system which favoured boys for inheritance as well as the need for male farming labour on household land leased from the government (Yunguo 2007, p.270). A 2005 WHO and UNAIDS study on HIV/AIDS in conjunction with the Chinese Ministry of Health found that the accumulated number of HIV infections was around 650,000 with 70,000 new infections in 2005 (cited in Yunguo 2007, p.270). HIV is mostly transmitted through intravenous drug use but transmission through sexual intercourse is on the rise (Yunguo 2007, p.270). With this new trend in transmission, infection risk have spread from high risk groups to the general population with females infection rates increasing by as much as 16.9% between 1998 and 2004 (Yunguo 2007, p.270).

Not only is syndemic transmission a compounding factor, but structural inequality tends to have a gendered impact on health. As Yunguo (2007) states: “In general, women in China suffered higher illness prevalence, felt less healthy and are exposed to more reproductive health risks” (p.270-271). This is particularly a concern for rural women who tend to fall at the very bottom of the ladder. In 2004, only 38.9% of pregnant women in the province of Guizhou delivered their babies in a hospital, this was in contrast with 99.5% of women who had hospital deliveries in Beijing (Yunguo 2007, p.270-271). There are still large maternal mortality disparities that correlate with these statistics.
Chapter 6: Discussion and Recommendations

The previous chapters have outlined why the care of our environment is integral to the provision of basic goods and services such as health care, food and water. This chapter will discuss the concept of sustainable development and how it is currently being implemented within the field of Development and whether or not the notion of Sustainable Development is inherently oxymoronic. Ultimately, climate change may call into question whether it is actually possible to foster economic growth within the capitalist system while simultaneously drastically reducing the ecological footprint of capitalist production and consumption. Based on the research done for this minor thesis, recommendations on how the SDGs might address the gaps in the MDGs will be made.

Capitalism

From the perspective of a Development studies scholar, the correlations between underdevelopment, economic growth and climate change are very concerning. We live in a world in which 85 of the world’s richest people hold the same amount of wealth as 50% of the global population (Oxfam 2014, p.2). After the GFC, the wealthiest top 1% received 95% of any growth, while the poor only became poorer (Oxfam 2014, p.2). Every year, the world’s taxpayers pay as much as $700 billion in subsidies to industries that have direct and negative impacts on the environment (Brown 2006, p.233). As Lowy (2014) points out,

The capitalist system has imposed on us logic of competition, progress and limitless growth. The regime of production and consumption seeks profit without limits, separating human beings from nature and imposing a logic of
domination upon nature, transforming everything into commodities: water, earth, the human genome, ancestral cultures, biodiversity, justice, ethics, the rights of people and life itself (Lowy 2014, p.20).

Paradoxically, we are now more aware than ever that we must take care of the environment. However, we also have a rich history of taking from the environment what we need to grow wealthier without consideration of the impacts or the fact that finite resources will someday run out. There are many firm arguments that climate change can be averted from within our current system through the power of ecological modernisation. Stern (2009) argues:

Without strong growth it will be extremely difficult for the poor people of the developing world to lift themselves out of poverty, and we should not respond to climate change by damaging their prospects. Moreover, politically it would be hard to gain support for action by telling people that they have to choose between growth and climate responsibility. Not only would it be analytically unsound it would also pose severe ethical difficulties and be so politically destructive as to fail (Stern 2009, p.10).

The UNDP seems to be in support of the concept of green capitalism which advocates for a market-based approach to resolving environmental problems. There are even some advocates who claim that a ‘Green’ economy can be more economically productive than a ‘Brown’ economy (Tienhaara 2010, p.199). For example, Brown (2006) argues for the eradication of poverty and stabilization of the climate through an economy based on renewable energy rather than fossil fuels. In his book Plan B 2.0, Brown (2006) states: “The key to building a global economy that can sustain economic progress is the creation of an honest market, one that tells the ecological truth. The market is an incredible institution, allocating resources with an efficiency that no central planning body can match. It easily balances supply and demand, and it sets price that readily reflect both scarcity and abundance” (p.227). He proposes this through a taxation system that would lower income tax and raise taxes on polluting activities (Brown 2006, p.227).

Brown (2006) concedes that the market does have certain weaknesses: it does not include the indirect costs of production and consumption, such as the cost to
our natural systems (p.228). He also admits that the market does not show concern for future generations (p.228). A gendered perspective might add to this that the market does not account for those at the very bottom of the ladder: the women and children of the developing world. It is these people who arguably provide the backbone of the global market through the affordability of their labour which they are forced to provide at very low cost.

Stern (2009) also points out that an obvious failing of the capitalist system is that it is based on the assumption that growth can be exponential. He states, “A picture of indefinite expansion is an implausible story of the future, but two things are key: first, to find a way of increasing living standards (including health, education and freedoms) so that world poverty can be overcome; and second, to discover ways of living that can be sustained over time, particularly in relation to the environment” (Stern 2009, p.10). There is no denying that the Industrial Revolution unleashed ‘enormous creative energies’ at cost to the environment (Brown 2006, p.247). Rather than allowing this to ‘set the world firmly on a course of eventual economic decline’ (Brown 2006, p.247), Brown, Stern and their peers seem to believe that we can transform industry into a more sustainable, greener machine. In this way, green capitalism is a highly optimistic model as it puts enormous faith in technological innovation.

Though Stern (2009) and Brown (2006) may acknowledge the existence of a growth paradigm, they seem to gloss over this fact as though it were not a crucial detail. This is perhaps because to explore the growth paradigm may inevitably lead to discussion surrounding the necessity of ‘de-growth’ in the developed world. Mies and Shiva (1993) point out that: “Virtually all development strategies are based on the explicit or implicit assumption that the model of ‘the good life’ is that prevailing in the affluent societies of the North: the USA, Europe and Japan therefore developing countries should engage in a ‘catching-up development’ path” (p.55). However, the inescapable truth is that if every person were to enjoy the same standard of living as a middle-class citizen of the USA, we would require several planets comparable to Earth to support the enhanced standard of living enjoyed by the human race.
Rather than acknowledging the need for the North to abandon its unsustainable model of production and consumption, the existing Development paradigm has arguably instead fuelled the impossible notion that the developing world should aim for the same standard of living and affluence enjoyed in the developed world (Mies & Shiva 1993, p.59). In fact, arguably the 'lagging behind' of underdeveloped nations is more often a result of the overdevelopment of rich industrial countries who freely exploit countries in the periphery (Mies & Shiva 199, p.59). Therefore, the notion that the developed world is supporting a ‘catching up’ development pathway is oxymoronic, for they are in turn dependent on the exploitation of the developing world to sustain a high standard of living. Furthermore, to distract from the injustice of the growth paradigm, Development scholars have often pointed to other things such as population growth in the global South as the culprit of environmental destruction and poverty. This not only shifts attention away from the incredible injustice being perpetuated by the current system but lays blame on the poor women of the South. Meanwhile, the North is never forced to contend with lowering their standard of living for the sake of the rest of the world.

**The Ecofeminist and Democratic Ecosocialist Models**

Ecofeminists tend to draw parallels between our current environmental problems, comparing the social mentality that has historically oppressed women with the social mentality that struggles to dominate nature (Nagel 2012; Salleh 2012). Furthermore, women often suffer the hardest from the impacts of ecological disasters and environmental deterioration and they have historically usually been the first to respond in protest against this destruction (Mies & Shiva 1993, p.3). As such, a natural affinity appears to exist between feminists and ecologists.

Ariel Salleh is an Australian ecofeminist who engages in commentary on the patriarchal nature of the capitalist system and its repercussions for the environment. Salleh (2012) believes that “…capitalist patriarchal economies rest heavily on a profound human alienation from nature, one that is generated in the exploitation of people’s labour and resources. The rationalization of this condition permeates all capitalist practices and structures…” (p.185). Salleh acknowledges
that the capitalist system fully benefits those in power. To detach from it would mean learning de-growth, which the affluent would likely not be in favour of (Salleh 2012, p.144). In this way, she argues that reproductive and subsistence labour continues to be grossly undervalued despite the fact that it sustains a large proportion of the population. She also argues that these capitalist, patriarchal economies are reproduced within the MDGs and that the new UN Sustainable Development agenda is yet another avenue for promoting ‘ecological modernization’ (Salleh 2012, p.144).

In referring to ‘ecological modernization’ Salleh (2012) is referring to the institutionalization of technology which she claims is the agenda of the transnational capitalist class. Many ecofeminists disavow technological fixes, cautioning that pursuing avenues such as biofuel production may only contribute to the current capitalist system, feeding the metabolic rift. In their book Ecofeminism Mies and Shiva (1993) claim that ecofeminism rejects the homogenizing process of modernisation and the capitalist production process (p.11). They state: “In patriarchal society women are responsible for the production and maintenance of everyday life, of subsistence, for water, fuel, food and fodder as well as for land preservation” (Mies & Shiva 1993, p.279). As the process of modernisation continues to take hold, this kind of sustainable existence is increasingly pushed into the margins.

Ecofeminism shares similarities to a democratic eco-socialist model which calls for the replacement of capitalism with socialism. In his book Global Capitalism and Climate Change, Hans Baer (2012) outlines a democratic eco-socialist model that would serve as an alternative to the capitalist system. Baer describes his model as an economy built on basic social needs rather than individual accumulation of wealth and trade (p.207). He states: “…humans live on an ecologically fragile planet with limited resources that must be sustained and renewed as much as possible for future generations” (Baer 2012, p.208). Consciousness of the environment underscores Baer’s democratic eco-socialist vision, along with the three core socialist values of democracy, egalitarianism and public ownership of resources and means of production (Baer 2012, p.207). Energy would be provided from renewable sources as much as possible and gratuitous consumption would be curbed.
Baer (2012) points out that all social systems are temporal (p. 204) and cautions that capitalism’s reliance on exponential growth is impossible and will inevitably have an expiration date. He advocates for a shift toward democratic eco-socialism through peaceful transition. He predicts that the collapse of capitalism will follow an aligned anti-systemic movement such as the Occupy movement, the Indigenous movement and of course certain left-leaning sections of the Environmental movement (Baer 2012, p.214). In this way, democratic eco-socialism would have the opportunity to flourish organically within communities and then finally, throughout the world. However, Baer stresses that the success of such a system would require global cooperation (Baer 2012, p.214).

**The Sustainable Development Goals**

Arguably the cost of not addressing our environmental targets will be far more extensive than perhaps the failure to meet any other Goal. The UN seems to have grasped this fact if the plans for new Sustainable Development Goals (SDGs) are any indication of the direction Development is now moving in. According to Moldan, Janoušková, & Háč (2012), Sustainable Development can roughly be defined as Development which will continue to meet present needs without compromising the needs of future generations (4). Next year, after the MDGs have been examined, the Development sector will move on to begin the implementation of the SDGs.

Although these goals have not been finalized, a draft version has been published by the UN and can be viewed in Appendix 3. It is clear by looking at the proposed SDGs that the new Development pathway has a much greater focus on protecting and rehabilitating the environment. Environmental health is now recognized as being intrinsically linked to other Development goals such as the eradication of poverty and hunger. According to the former director of the Millennium Project-Jeffrey Sachs (2012), “Almost all the world’s societies acknowledge that they aim for a combination of economic development, environmental sustainability, and social inclusion, but the specific objectives differ globally, between and within societies” (p.2206).
In his article ‘From the Millennium Development Goals to the Sustainable Development Goals’, Sachs (2012) outlines many overlapping areas: climate change as a result of GHG emissions, environmental pollution including the poisoning of estuaries and other ecosystems, the acidification of oceans largely as a result of concentrated CO2 in the atmosphere, loss of biodiversity due to demands on forests, the conversion of land for agricultural use and the depletion of key fossil resources and groundwater (p.2207). Loosely, it appears that the SDGs will place pressure on the world to move towards best-practice technologies, low-carbon energy, sustainable agriculture, stabilisation of the world population and problems surrounding rapid urbanisation in the face of climate change (Sachs 2012, p.2208).

Sachs (2012) has revealed that more responsibility will be placed on the private sector to facilitate and fund the SDGs. Despite this, he concedes that many large companies are also lobbyists for policies antagonistic to Sustainable Development. He reasons that as a result, engagement with business has to be done cautiously. Perhaps it is unfair to critique the SDGs before they have been finalized however; it is precisely Sachs’ failure to outline how the private sector will contribute in a productive way that is alarming. SDG 12: ‘Promote Sustainable Consumption and Production Patterns’ will be particularly difficult to both properly define and implement if the private-sector is having a large input in Development. Target 12.6 is ‘encourage companies, especially large and trans-national companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle’ (UN, 2014). While this objective is valid, the UN has made no specific mention of moving away from a capitalist system of production and consumption. As Amin (2014) points out, it is almost presupposed that capitalist economic strategy is compatible with sustainable development.

Another major problem with the MDGs from the stand point of an ecofeminist or eco-socialist has been that it does not challenge the fact that capitalism drives economic inequality and over-consumption which in turn contribute massively to poverty and environmental degradation. Sachs (2012) identifies that enormous stress on the earth’s ecosystem is a major problem for development but then fails to directly point to the current model of production and consumption as responsible for this stress. SDG number 12 in particular seems as if it will address this large
oversight but this may in fact be countered by Sach’s insistence that the SDGs will be largely funded by the private sector. It seems counter-intuitive to place responsibility for changing the system on the people who are currently making large amounts of money from it. In fact, as Baer (2012) implies: it almost seems that sustainable development in itself is antonymous to capitalism (p.151-152). It is still early days for the SDGs but until it is clear who or what body will be responsible for ensuring that corporate agendas do not compromise the legitimacy of the SDGs a large question mark will remain over the implementation of our new Development pathway.

**Recommendations**

Extreme caution should be observed when encouraging more inclusion of the private sector in Development. Economic inequality as a result of capitalism has seriously disadvantaged the women of the developing world. A shift towards more socialistic modes of production and consumption would be much more easily integrated with environmental protection because it would be free from the competitive drive of the free market and its large requirement for natural resources. However, it can be conceded that there is a time limit on climate change mitigation that could be better served by competition driven by the process of ecological modernisation and the production of renewable energy sources. It seems unlikely that floating kelp farms or spraying metallic particles into the atmosphere will provide the answer to our problems but cleaner technology and new innovations should not be discounted completely. Any action on climate change will require a change in mentality from what ecofeminists describe as the hegemonic and masculine attitude of dominion over nature.

Many eco-socialist or ecofeminist models are critical of the process of ecological modernisation. They point to Jevons paradox as a counter-argument for the effectiveness of ecological modernisation in curbing emissions and providing greener economies. This is often where ecofeminism departs from liberal feminism. Ecofeminist theory tends to engage with the ‘spiritual realm’, often deifying ‘mother earth’ and indulging the cultural feminist notion that women are more caring and nurturing than men while simultaneously being more connected
to the natural world. Biehl (1991) critiques this, arguing that ecofeminist engagement with the spiritual injects their arguments with ‘irrationalism’ and results in the glorification of the early Neolithic (p.2). Biehl (1991) claims that, “Some ecofeminists literally celebrate the identification of women with nature as an ontological reality. They thereby speciously biologize the personality traits that patricentric society assigns to women” (Biehl 1991, p.3).

The ecofeminist concept of a social hierarchy in which men dominate both women and nature has been a useful tool to critique the Development paradigm and modern modes of production and consumption within this thesis. However, a gendered critique aims to be representative both of the concerns of men and women. The claim that women are more connected to nature because of their biology is a dangerous notion because responsibility for the protection of nature must be assumed by both men and women. The notion that we must make a break from science and technology in order to achieve more sustainable living could in fact be interpreted as counter-productive when it comes to the practical reality that the Development sector faces: billions still live in poverty and the natural world is changing in unpredictable ways. It is quite possible that science and technology can help to both lift people from poverty and to predict and perhaps even begin to counter changes to the environment. Rather than rejecting science and technology on the basis of it being part of the ‘patriarchal’ Development paradigm of the past, the benefits that come from increased productivity and medical advancement could instead be utilized in the future. The provision being that this would be undertaken with the understanding that wherever possible, no action should be taken which will damage fragile ecosystems or harm biodiversity by pumping noxious gasses into the atmosphere or participating in any other activities which strip both humans the natural world of health.

It seems unlikely that the world could peacefully and successfully implement a socialist system rapidly enough to facilitate climate change mitigation. Therefore, perhaps it would be more beneficial to global society if ecological modernisation within the existing framework of capitalism and the free market were embraced. At least in the short term as the environmental revolution continues to gain momentum. Arguably, a gentler form of green capitalism is possible that would
simultaneously incentivise investment in greener production techniques without seriously stunting the economic development of poorer nations.

We need to work on providing a more even playing field for nations of the developing world and the people who live in the vulnerable communities within them, particularly for the women and children at the very bottom of the ladder. To do this might inevitably require dismantling the capitalist system in totality but this must happen slowly and organically so as to not interrupt progress towards combatting climate change. It is those that are ‘pushed to societies edges’ who will pay the greatest price because of their reliance on their surrounding environment (MacDonald 2010, p.4). Usually these people belong to marginalized groups due to their gender, ethnicity or ability and their voices are rarely heard by policy makers (Macdonald 2010, p.4). This is why it is crucial that climate change policy into the future actively aims to not exacerbate, maintain or ignore structural inequalities.

**Lessons Learned**
In researching this minor thesis it has become very clear that there is not enough cooperation between physical and social scientists on the study of climate change and Development. The leading authority on climate change, the IPCC has three separate bodies; two of these bodies are predominately made up of physical scientists. This is problematic because while scientific data on climatic changes is crucial, interpreting that data in order to understand how it will affect human society is perhaps equally important. This is especially true for policy makers who may not be well versed in the scientific language used in a lot of the reports being published on climate change.

In terms of gender and climate change, Prettle et al. (2010) conducted a study on the amount of articles published with the key words ‘Climate Change’ and ‘Gender’. Inevitably, the results proved that there was very little conversation happening about the gendered nature of climate change. This made applying a gendered lens to the issues discussed in this thesis difficult at times because there was not a large amount of literature to strengthen the gender analysis required.
Conclusion

The findings of this minor-thesis indicate that we still have a long journey ahead in terms of not only beginning to repair the damage we have done to the environment but also in understanding how intrinsic a healthy planet is to human health and well-being. It was argued that the MDGs have operated within a Development paradigm which has not questioned the current capitalist system of production and consumption. Due to this, the MDGs have arguably sustained a Development pathway that has in fact contributed to environmental degradation. It seems the UNDP is now more aware of the importance of placing environmental goals at the forefront as we move into the era of Sustainable Development. However, the Development sector may now need to challenge the notion that this new pathway can operate within the existing capitalist Development paradigm which could be deemed unsuitable due to its reliance on the impossible notion of exponential growth. If the capitalist paradigm must be continued, it will need to be adapted to the new conditions we now face as climate change progresses. If this does not happen, it could be that the notion of Sustainable Development turns into a nice concept rather than a lived reality. Meanwhile, the women and children of the developing world will continue to pay the largest price as climate change continues to threaten the planet.
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Appendices:

Appendix 1

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<td>GOAL 1: ERADICATE EXTREME POVERTY &amp; HUNGER</td>
<td>Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than $1.25 a day</td>
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<td>Target 1.B: Achieve full and productive employment and decent work for all, including women and young people</td>
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<td>Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger</td>
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<th>GOAL 2: ACHIEVE UNIVERSAL PRIMARY EDUCATION</th>
<th>Goal 2 Targets:</th>
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<tr>
<td>Goal 2 Targets:</td>
<td>Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</td>
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<td>Goal 3 Targets:</td>
<td>Target 3.A: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015</td>
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<th>GOAL 4: REDUCE CHILD MORTALITY</th>
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<td>Goal 4 Targets:</td>
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<th>GOAL 5: IMPROVE MATERNAL</th>
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<td>Target 5.B: Achieve, by 2015, universal access to reproductive health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GOAL 6: COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES</th>
<th>Goal 6 Targets:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 6 Targets:</td>
<td>Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS</td>
</tr>
<tr>
<td></td>
<td>Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it</td>
</tr>
</tbody>
</table>
Target 6.C:
Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

<table>
<thead>
<tr>
<th>GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 7 Targets:</td>
</tr>
<tr>
<td>Target 7.A:</td>
</tr>
<tr>
<td>Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources</td>
</tr>
<tr>
<td>Target 7.B:</td>
</tr>
<tr>
<td>Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss</td>
</tr>
<tr>
<td>Target 7.C:</td>
</tr>
<tr>
<td>Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation</td>
</tr>
<tr>
<td>Target 7.D:</td>
</tr>
<tr>
<td>Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>GOAL 8: DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 8 Targets:</td>
</tr>
<tr>
<td>Target 8.A:</td>
</tr>
<tr>
<td>Develop further an open, rule-based, predictable, non-discriminatory trading and financial system</td>
</tr>
<tr>
<td>Target 8.B:</td>
</tr>
<tr>
<td>Address the special needs of least developed countries</td>
</tr>
<tr>
<td>Target 8.C:</td>
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<tr>
<td>Address the special needs of landlocked developing countries and small island developing States</td>
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<tr>
<td>Target 8.D:</td>
</tr>
<tr>
<td>Deal comprehensively with the debt problems of developing countries</td>
</tr>
<tr>
<td>Target 8.E:</td>
</tr>
<tr>
<td>In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</td>
</tr>
<tr>
<td>Target 8.F:</td>
</tr>
<tr>
<td>In cooperation with the private sector, make available benefits of new technologies, especially information and communications</td>
</tr>
</tbody>
</table>
### Appendix 2:

<table>
<thead>
<tr>
<th>Goals and Targets</th>
<th>Africa</th>
<th>Asia</th>
<th>Latin America and the Caribbean</th>
<th>Caucasus and Central Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOAL 1</strong></td>
<td>Eradicate extreme poverty and hunger</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reduce extreme poverty by half</td>
<td>low poverty</td>
<td>very high poverty</td>
<td>moderate poverty</td>
<td>very high poverty</td>
</tr>
<tr>
<td>Productive and decent employment</td>
<td>large deficit</td>
<td>very large deficit</td>
<td>moderate deficit</td>
<td>very large deficit</td>
</tr>
<tr>
<td>Reduce hunger by half</td>
<td>low hunger</td>
<td>high hunger</td>
<td>moderate hunger</td>
<td>moderate hunger</td>
</tr>
<tr>
<td><strong>GOAL 2</strong></td>
<td>Achieve universal primary education</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Universal primary schooling</td>
<td>high enrolment</td>
<td>moderate enrolment</td>
<td>high enrolment</td>
<td>high enrolment</td>
</tr>
<tr>
<td><strong>GOAL 3</strong></td>
<td>Promote gender equality and empower women</td>
<td></td>
<td></td>
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<tr>
<td>Equal girls’ enrolment in primary school</td>
<td>close to parity</td>
<td>close to parity</td>
<td>parity</td>
<td>parity</td>
</tr>
<tr>
<td>Women's share paid employment</td>
<td>low share</td>
<td>medium share</td>
<td>high share</td>
<td>medium share</td>
</tr>
<tr>
<td>Women's equal representation in national parliaments</td>
<td>moderate representation</td>
<td>moderate representation</td>
<td>moderate representation</td>
<td>low representation</td>
</tr>
<tr>
<td><strong>GOAL 4</strong></td>
<td>Reduce child mortality</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reduce mortality of under-five year-olds by two thirds</td>
<td>low mortality</td>
<td>high mortality</td>
<td>low mortality</td>
<td>low mortality</td>
</tr>
<tr>
<td><strong>GOAL 5</strong></td>
<td>Improve maternal health</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reduce maternal mortality by three quarters</td>
<td>low mortality</td>
<td>very high mortality</td>
<td>low mortality</td>
<td>low mortality</td>
</tr>
<tr>
<td>Access to reproductive health</td>
<td>moderate access</td>
<td>low access</td>
<td>high access</td>
<td>moderate access</td>
</tr>
<tr>
<td><strong>GOAL 6</strong></td>
<td>Combat HIV/AIDS, malaria and other diseases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halt and begin to reverse the spread of HIV/AIDS</td>
<td>low incidence</td>
<td>high incidence</td>
<td>low incidence</td>
<td>low incidence</td>
</tr>
<tr>
<td>Halt and reverse the spread of tuberculosis</td>
<td>low mortality</td>
<td>moderate mortality</td>
<td>low mortality</td>
<td>moderate mortality</td>
</tr>
<tr>
<td><strong>GOAL 7</strong></td>
<td>Ensure environmental sustainability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halve proportion of population without improved drinking water</td>
<td>high coverage</td>
<td>low coverage</td>
<td>high coverage</td>
<td>moderate coverage</td>
</tr>
<tr>
<td>Halve proportion of population without sanitation</td>
<td>high coverage</td>
<td>low coverage</td>
<td>high coverage</td>
<td>moderate coverage</td>
</tr>
<tr>
<td>Improve the lives of slum-dwellers</td>
<td>moderate proportion of slum-dwellers</td>
<td>very low proportion of slum-dwellers</td>
<td>moderate proportion of slum-dwellers</td>
<td>high proportion of slum-dwellers</td>
</tr>
<tr>
<td><strong>GOAL 8</strong></td>
<td>Develop a global partnership for development</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Internet users</td>
<td>high usage</td>
<td>moderate usage</td>
<td>high usage</td>
<td>moderate usage</td>
</tr>
</tbody>
</table>

The progress chart operates on two levels. The words in each box indicate the present degree of compliance with the target. The colours show progress towards the target according to the legend below:
- Target already met or expected to be met by 2015.
- Progress insufficient to reach the target if prevailing trends persist.
- No progress or deterioration.
- Missing or insufficient data.

For the regional groupings and country data, see mititrons.org. Country experiences in each region may differ significantly from the regional average. Due to new data and revised methodologies, this Progress Chart is not comparable with previous versions.

Sources: United Nations, based on data and estimates provided by: Food and Agriculture Organization of the United Nations; Inter-Parliamentary Union; International Labour Organization; International Telecommunication Union; UNAIDS; UNESCO; UN-Habitat; UNICEF; UN Population Division; World Bank; World Health Organization - based on statistics available as of June 2014.

Compiled by Statistics Division, Department of Economic and Social Affairs, United Nations.
Appendix 3:

<table>
<thead>
<tr>
<th>Proposed Sustainable Development Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. End poverty everywhere</strong></td>
</tr>
<tr>
<td>1.1 by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day</td>
</tr>
<tr>
<td>1.2 by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions</td>
</tr>
<tr>
<td>1.3 implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable</td>
</tr>
<tr>
<td>1.4 by 2030 ensure that all men and women, particularly the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership, and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services including microfinance</td>
</tr>
<tr>
<td>1.5 by 2030 build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters</td>
</tr>
<tr>
<td>1.a. ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation to provide adequate and predictable means for developing countries, in particular LDCs, to implement programmes and policies to end poverty in all its dimensions</td>
</tr>
<tr>
<td>1.b create sound policy frameworks, at national, regional and international levels, based on pro-poor and gender-sensitive development strategies to support accelerated investments in poverty eradication actions</td>
</tr>
</tbody>
</table>

| **2. End hunger, improve nutrition and promote sustainable agriculture** |
| 2.1 by 2030 end hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round |
| 2.2 by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons |
2.3 by 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.

2.4 by 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality.

2.5 by 2020 maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed.

2.a increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular in least developed countries.

2.b. correct and prevent trade restrictions and distortions in world agricultural markets including by the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.

2.c. adopt measures to ensure the proper functioning of food commodity markets and their derivatives, and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

3. Attain healthy lives for all

3.1 by 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

3.2 by 2030 end preventable deaths of newborns and under-five children.

3.3 by 2030 end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, waterborne diseases, and other communicable diseases.

3.4 by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment, and promote mental health and wellbeing.

3.5 strengthen prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.
3.6 by 2020 halve global deaths and injuries from road traffic accidents

3.7 by 2030 ensure universal access to sexual and reproductive health care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes

3.8 achieve universal health coverage (UHC), including financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all

3.9 by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination

3.a strengthen implementation of the Framework Convention on Tobacco Control in all countries as appropriate

3.b support research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration which affirms the right of developing countries to use to the full the provisions in the TRIPS agreement regarding flexibilities to protect public health and, in particular, provide access to medicines for all

3.c increase substantially health financing and the recruitment, development and training and retention of the health workforce in developing countries, especially in LDCs and SIDS

3.d strengthen the capacity of all countries, particularly developing countries, for early warning, risk reduction, and management of national and global health risks

4. Provide quality education and life-long learning opportunities for all

4.1 by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

4.2 by 2030 ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

4.3 by 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university

4.4 by 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

4.5 by 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for
the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations

4.6 by 2030 ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy

4.7 by 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture’s contribution to sustainable development

4.a build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

4.b by 2020 expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries

4.c by 2030 increase by x% the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially LDCs and SIDS

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<tr>
<th>5. Attain gender equality, empower women and girls everywhere</th>
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<tbody>
<tr>
<td>5.1 end all forms of discrimination against all women and girls everywhere</td>
</tr>
<tr>
<td>5.2 eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation</td>
</tr>
<tr>
<td>5.3 eliminate all harmful practices, such as child, early and forced marriage and female genital mutilations</td>
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<tr>
<td>5.4 recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies, and the promotion of shared responsibility within the household and the family as nationally appropriate</td>
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<tr>
<td>5.5 ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life</td>
</tr>
<tr>
<td>5.6 ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the ICPD and the Beijing Platform for Action and the outcome documents of their review conferences</td>
</tr>
<tr>
<td>5.a undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land</td>
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<tr>
<td><strong>6. Ensure availability and sustainable use of water and sanitation for all</strong></td>
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<td><strong>7. Ensure sustainable energy for all</strong></td>
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<tr>
<td>7.a</td>
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<td>7.b</td>
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## 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

| 8.1 | sustain per capita economic growth in accordance with national circumstances, and in particular at least 7% per annum GDP growth in the least-developed countries |
| 8.2 | achieve higher levels of productivity of economies through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors |
| 8.3 | promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services |
| 8.4 | improve progressively through 2030 global resource efficiency in consumption and production, and endeavour to decouple economic growth from environmental degradation in accordance with the 10-year framework of programmes on sustainable consumption and production with developed countries taking the lead |
| 8.5 | by 2030 achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value |
| 8.6 | by 2020 substantially reduce the proportion of youth not in employment, education or training |
| 8.7 | take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour, eradicate forced labour, and by 2025 end child labour in all its forms including recruitment and use of child soldiers |
| 8.8 | protect labour rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment |
| 8.9 | by 2030 devise and implement policies to promote sustainable tourism which creates jobs, promotes local culture and products |
| 8.10 | strengthen the capacity of domestic financial institutions to encourage and to expand access to banking, insurance and financial services for all |
8.a increase Aid for Trade support for developing countries, particularly LDCs, including through the Enhanced Integrated Framework for LDCs

8.b by 2020 develop and operationalize a global strategy for youth employment and implement the ILO Global Jobs Pact

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<tr>
<th>9. Promote sustainable infrastructure and industrialization and foster innovation</th>
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<tbody>
<tr>
<td><strong>9.1</strong> develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</td>
</tr>
<tr>
<td><strong>9.2</strong> promote inclusive and sustainable industrialization, and by 2030 raise significantly industry’s share of employment and GDP in line with national circumstances, and double its share in LDCs</td>
</tr>
<tr>
<td><strong>9.3</strong> increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets</td>
</tr>
<tr>
<td><strong>9.4</strong> by 2030 upgrade infrastructure and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, all countries taking action in accordance with their respective capabilities</td>
</tr>
<tr>
<td><strong>9.5</strong> enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, particularly developing countries, including by 2030 encouraging innovation and increasing the number of R&amp;D workers per one million people by x% and public and private R&amp;D spending</td>
</tr>
<tr>
<td><strong>9.a</strong> facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, LDCs, LLDCs and SIDS</td>
</tr>
<tr>
<td><strong>9.b</strong> support domestic technology development, research and innovation in developing countries including by ensuring a conducive policy environment for inter alia industrial diversification and value addition to commodities</td>
</tr>
<tr>
<td><strong>9.c</strong> significantly increase access to ICT and strive to provide universal and affordable access to internet in LDCs by 2020</td>
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<tr>
<th>10. Reduce inequality within and between countries</th>
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<tr>
<td><strong>10.1</strong> by 2030 progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average</td>
</tr>
<tr>
<td><strong>10.2</strong> by 2030 empower and promote the social, economic and political inclusion of all irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status</td>
</tr>
</tbody>
</table>
10.3 ensure equal opportunity and reduce inequalities of outcome, including through eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and actions in this regard

10.4 adopt policies especially fiscal, wage, and social protection policies and progressively achieve greater equality

10.5 improve regulation and monitoring of global financial markets and institutions and strengthen implementation of such regulations

10.6 ensure enhanced representation and voice of developing countries in decision making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions

10.7 facilitate orderly, safe, regular and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies

10.a implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with WTO agreements

10.b encourage ODA and financial flows, including foreign direct investment, to states where the need is greatest, in particular LDCs, African countries, SIDS, and LLDCs, in accordance with their national plans and programmes

10.c by 2030, reduce to less than 3% the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5%

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<tr>
<th>11. Make cities and human settlements inclusive, safe and sustainable</th>
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<tbody>
<tr>
<td>11.1 by 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums</td>
</tr>
<tr>
<td>11.2 by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</td>
</tr>
<tr>
<td>11.3 by 2030 enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries</td>
</tr>
<tr>
<td>11.4 strengthen efforts to protect and safeguard the world’s cultural and natural heritage</td>
</tr>
<tr>
<td>11.5 by 2030 significantly reduce the number of deaths and the number of affected people and decrease by y% the economic losses relative to GDP caused by disasters, including water-related disasters, with the focus on protecting the poor and people in vulnerable situations</td>
</tr>
</tbody>
</table>
11.6 by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management

11.7 by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities

11.a support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

11.b by 2020, increase by x% the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, develop and implement in line with the forthcoming Hyogo Framework holistic disaster risk management at all levels

11.c support least developed countries, including through financial and technical assistance, for sustainable and resilient buildings utilizing local materials

12. **Promote sustainable consumption and production patterns**

12.1 implement the 10-Year Framework of Programmes on sustainable consumption and production (10YFP), all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

12.2 by 2030 achieve sustainable management and efficient use of natural resources

12.3 by 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains including post-harvest losses

12.4 by 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment

12.5 by 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse

12.6 encourage companies, especially large and trans-national companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.7 promote public procurement practices that are sustainable in accordance with national policies and priorities

12.8 by 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
12.a support developing countries to strengthen their scientific and technological capacities to move towards more sustainable patterns of consumption and production.

12.b develop and implement tools to monitor sustainable development impacts for sustainable tourism which creates jobs, promotes local culture and products.

12.c rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.

13. **Tackle climate change and its impacts**

   *Acknowledging that the UNFCCC is the primary international, intergovernmental forum for negotiating the global response to climate change.*

   13.1 strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries.

   13.2 integrate climate change measures into national policies, strategies, and planning.

   13.3 improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

   13.a implement the commitment undertaken by developed country Parties to the UNFCCC to a goal of mobilizing jointly USD100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.

   13.b Promote mechanisms for raising capacities for effective climate change related planning and management, in LDCs, including focusing on women, youth, local and marginalized communities.

14. **Conserve and promote sustainable use of oceans, seas and marine resources**

   14.1 by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.

   14.2 by 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration, to achieve healthy and productive oceans.

   14.3 minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.
14.4 by 2020, effectively regulate harvesting, and end overfishing, illegal, unreported and unregulated (IUU) fishing and destructive fishing practices and implement science-based management plans, to restore fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

14.5 by 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information.

14.6 by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to IUU fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the WTO fisheries subsidies negotiation.

14.7 by 2030 increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

14.a increase scientific knowledge, develop research capacities and transfer marine technology taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs.

14.b provide access of small-scale artisanal fishers to marine resources and markets.

14.c ensure the full implementation of international law, as reflected in UNCLOS for states parties to it, including, where applicable, existing regional and international regimes for the conservation and sustainable use of oceans and their resources by their parties.

15. **Protect and promote sustainable use of terrestrial ecosystems, halt desertification, land degradation and biodiversity loss**

15.1 by 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

15.2 by 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by \(x\)% globally.

15.3 by 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world.
| 15.4 | by 2030 ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits which are essential for sustainable development |
| 15.5 | take urgent and significant action to reduce degradation of natural habitat, halt the loss of biodiversity, and by 2020 protect and prevent the extinction of threatened species |
| 15.6 | ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources, and promote appropriate access to genetic resources |
| 15.7 | take urgent action to end poaching and trafficking of protected species of flora and fauna, and address both demand and supply of illegal wildlife products |
| 15.8 | by 2020 introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems, and control or eradicate the priority species |
| 15.9 | by 2020, integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies, and accounts |
| 15.a | mobilize and significantly increase from all sources financial resources to conserve and sustainably use biodiversity and ecosystems |
| 15.b | mobilize significantly resources from all sources and at all levels to finance sustainable forest management, and provide adequate incentives to developing countries to advance sustainable forest management, including for conservation and reforestation |
| 15.c | enhance global support to efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities |

| 16. Achieve peaceful and inclusive societies, access to justice for all, and effective and capable institutions |
| 16.1 | significantly reduce all forms of violence and related death rates everywhere |
| 16.2 | end abuse, exploitation, trafficking and all forms of violence and torture against children |
| 16.3 | promote the rule of law at the national and international levels, and ensure equal access to justice for all |
| 16.4 | by 2030 significantly reduce illicit financial and arms flows, strengthen recovery and return of stolen assets, and combat all forms of organized crime |
| 16.5 | substantially reduce corruption and bribery in all its forms |
16.6 develop effective, accountable and transparent institutions at all levels

16.7 ensure responsive, inclusive, participatory and representative decision-making at all levels

16.8 broaden and strengthen the participation of developing countries in the institutions of global governance

16.9 by 2030 provide legal identity for all including birth registration

16.10 ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

16.a strengthen relevant national institutions, including through international cooperation, for building capacities at all levels, in particular in developing countries, for preventing violence and combating terrorism and crime

16.b promote and enforce non-discriminatory laws and policies for sustainable development

17. Strengthen the means of implementation and the global partnership for sustainable development

**Finance**

17.1 strengthen domestic resource mobilization, including through international support to developing countries to improve domestic capacity for tax and other revenue collection

17.2 developed countries to implement fully their ODA commitments, including to provide 0.7% of GNI in ODA to developing countries of which 0.15-0.20% to least-developed countries

17.3 mobilize additional financial resources for developing countries from multiple sources

17.4 assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries (HIPC) to reduce debt distress

17.5 adopt and implement investment promotion regimes for LDCs

**Technology**

17.6 enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation, and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, particularly at UN level, and through a global technology facilitation mechanism when agreed
| 17.7 promote development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed |
| 17.8 fully operationalize the Technology Bank and STI (Science, Technology and Innovation) capacity building mechanism for LDCs by 2017, and enhance the use of enabling technologies in particular ICT |

**Capacity building**

17.9 enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all sustainable development goals, including through North-South, South-South, and triangular cooperation

**Trade**

17.10 promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the WTO including through the conclusion of negotiations within its Doha Development Agenda

17.11 increase significantly the exports of developing countries, in particular with a view to doubling the LDC share of global exports by 2020

17.12 realize timely implementation of duty-free, quota-free market access on a lasting basis for all least developed countries consistent with WTO decisions, including through ensuring that preferential rules of origin applicable to imports from LDCs are transparent and simple, and contribute to facilitating market access

**Systemic issues**

**Policy and institutional coherence**

17.13 enhance global macroeconomic stability including through policy coordination and policy coherence

17.14 enhance policy coherence for sustainable development

17.15 respect each country’s policy space and leadership to establish and implement policies for poverty eradication and sustainable development

**Multi-stakeholder partnerships**

17.16 enhance the global partnership for sustainable development complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technologies and financial resources to support the achievement of sustainable
development goals in all countries, particularly developing countries

17.17 encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

**Data, monitoring and accountability**

17.18 by 2020, enhance capacity building support to developing countries, including for LDCs and SIDS, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

17.19 by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement GDP, and support statistical capacity building in developing countries