



# Population and Sustainability Network

## Population Dynamics and Climate Change: A PSN Briefing Paper November 2010

### Key Points:

- The interaction between climate change and population dynamics, and the associated implications for the poorest countries of the world, is complex but highly significant for climate change adaptation and mitigation.
- Climate change has to date been driven largely by consumption and greenhouse gas emissions of industrialised countries, yet the impacts are greatest in countries in the global South which have contributed the least to climate change but where population increase is heightening climate change vulnerability.
- Evidence from developing countries affected by climate change shows that population growth compounds human vulnerability to climate change and makes adaptation more difficult.
- Variables such as household size, urbanisation and ageing, as well as population size, affect emissions scenarios in complex ways and are not adequately reflected in current climate change models.
- Increasing access to voluntary family planning services can play a role in climate change adaptation strategies, and to some extent also to mitigation, and would respond to needs identified by developing countries themselves.
- Least developed countries characterised by rapid population growth and high vulnerability to climate change should be encouraged and supported to integrate voluntary family planning into their adaptation programmes.
- 'Contraction and Convergence' presents an equitable framework for global climate change response, recognizing the right of countries in the global South to develop and the need to address over-consumption of resources in the North.

### Introduction

The relationship between population dynamics and climate change has to date been largely absent from the international policy response to climate change. Population growth however is an important variable that can worsen the impact of climate change.

Efforts to link population dynamics, including factors such as urbanization, migration, household composition, as well as population growth, with the climate change policy dialogue are complicated by the uneven global distribution of energy consumption and green house gas emissions. The role of population growth in greenhouse gas (GHG) emissions is controversial and complex because the countries that have the highest per capita emissions often (but not always) have relatively slow





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population growth or population stabilization.<sup>1</sup> The highest rates of population growth, however, occur in some of the world's poorest countries, which contribute a small proportion of the GHG emissions of a rich industrialised economy. This situation is, however, complicated by countries such as China with rapidly developing economies, which are increasingly contributing to growth in global GHG emissions.<sup>2</sup> Note must be taken, though, of the fact that the 'developed' world has 'exported' its GHG emissions to China in recent years, through the expanding industrial base of China, producing goods for countries of the global North. Nevertheless population growth and other demographic variables such as age structure and migration, present subtle and complex challenges that not only magnify current drivers of climate change but exacerbate its impacts.

Addressing population growth, through renewed investment in family planning and female education in tandem with other more traditional climate change policies, can act synergistically to reduce its negative impacts, bolster coping capacity and ameliorate efforts to reduce emissions. Climate scientist Brian O'Neill has posed the question "How much easier will it be to achieve targeted emissions reductions with a lower population path rather than a higher one?"<sup>3</sup> Increasing investment in voluntary family planning programmes is a key component for achieving Millennium Development Goal (MDG) 5 – reducing maternal mortality, and ensuring universal access to reproductive health (Target 5b within the MDG framework).<sup>4</sup>

## Global population

According to 2008 UN population estimates, the world population is projected to reach 7 billion at some point in 2011, up from the current 6.9 billion, and surpass 9 billion people by 2050. Most of the additional 2.2 billion people will enlarge the population of developing countries, which is projected to rise from 5.6 billion in 2009 to 7.9 billion in 2050.<sup>5</sup> Overall 97% of population growth between 2009 and 2050 will be in developing countries.<sup>6</sup> Currently the population of the less developed regions is still young, with children under the age of 15 accounting for 30 per cent of the population and young persons aged 15 to 24 accounting for a further 19 per cent.<sup>7</sup> The numbers of children and young people in the less developed regions are at an all time high (1.7 billion children and 1.1 billion young people),<sup>8</sup> posing a major challenge for their countries, which are faced with the necessity of providing education or employment to large cohorts of children and youth even as the current economic and financial crisis

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<sup>1</sup> PSN (2010) *Population and Climate Change: Is there a link? If so, what are the priorities for action?* Available at: <http://www.populationandsustainability.org/293/articles-and-reports/articles-and-reports.html>

<sup>2</sup> Stephenson, J., Newman, K and Mayhew, S (2010) "Population dynamics and climate change: what are the links?" *Journal of Public Health*, 32, 2, pp. 150-156.

<sup>3</sup> Brian O'Neill (2008). "Population Growth and Climate Change: Relationships, Research and Responses" Presentation Delivered at Woodrow Wilson Center for Scholars. Environmental Change and Security Program, Washington 2008.

<sup>4</sup> Singh, S., J.E. Darroch, L.S. Ashford, and M. Vlassoff (2009). *Adding it Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York, NY: The Guttmacher Institute.

<sup>5</sup> United Nations (2009) *World Population Prospects: The 2008 Revision*. New York, United Nations, Department of Economic and Social Affairs, Population Division.

<sup>6</sup> Population Reference Bureau (2009) *World Population Highlights: Key Findings from PRB's 2008 World Population Data Sheet*. Washington: PRB.

<sup>7</sup> United Nations (2009) *World Population Prospects: The 2008 Revision*. New York, United Nations, Department of Economic and Social Affairs, Population Division.

<sup>8</sup> Ibid.





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unfolds. The situation in the least developed countries<sup>9</sup> is even more pressing because children under 15 constitute 40 per cent of their population and young people account for a further 20 per cent.<sup>10</sup>

The same UN population projections also estimate that fertility in the less developed regions as a whole could drop from 2.73 children per woman in 2005-2010 to 2.05 by 2045-2050. The reduction projected for the group of 49 least developed countries is even steeper: from 4.39 children per woman to 2.41 children per woman. To achieve such reductions however, it is essential that access to family planning expands, particularly in the least developed countries. In 2005, the use of modern contraceptive methods in the least developed countries was a low 24 per cent among women of reproductive age who were married or in a union and a further 23 per cent of those women had an unmet need for family planning.<sup>11</sup>

The urgency of realizing the projected reductions of fertility is brought into focus by considering that, if fertility were to remain constant at the levels estimated for 2005-2010, the population of the less developed regions would increase to 9.8 billion in 2050 instead of the 7.9 billion projected by assuming that fertility declines. That is, without further reductions of fertility, the world population could increase by nearly twice as much as currently expected.<sup>12</sup>

### Box 1: Key facts on Climate Change

According to the Intergovernmental Panel on Climate Change (IPCC):<sup>13</sup>

- Climate change is already happening, and this change can now be firmly attributed to human activity.
- Warming during the past 100 years was 0.74°C, with most of the warming occurring in the past 50 years. The warming for the next 20 years is projected to be 0.2°C per decade.
- The world faces an average temperature rise of around 3°C this century if greenhouse gas emissions continue to rise at their current pace and are allowed to double from their pre-industrial level.

We also know that:

- The increase in Greenhouse Gas Emissions (GHG) over the last 150 years has already significantly changed climate. We have seen a sea level rise of over 40 mm, significant retreat of Arctic sea ice and most continental glaciers.<sup>14</sup>
- The twelve warmest years on record have all occurred in the last thirteen years.<sup>15</sup>

<sup>9</sup> The group of least developed countries, as defined by the United Nations General Assembly in its resolutions (59/209, 59/210 and 60/33) in 2007, comprises 49 countries, of which 33 are in Africa, 10 in Asia, 1 in Latin America and the Caribbean, and 5 in Oceania.

<sup>10</sup> United Nations (2009) *World Population Prospects: The 2008 Revision*. New York, United Nations, Department of Economic and Social Affairs, Population Division.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> United Nations Framework Convention on Climate Change (2009) *Fact sheet: Climate change science*. Retrieved 1 November 2010 from: [http://unfccc.int/press/fact\\_sheets/items/4987.php](http://unfccc.int/press/fact_sheets/items/4987.php)

<sup>14</sup> Intergovernmental Panel on Climate Change (IPCC) (2007) *IPCC Fourth Assessment Report: Climate change 2007 (AR4)*. Geneva: IPCC.





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- Climate change is increasing the frequency and intensity of extreme natural events and disasters including heavy precipitation, drought, heatwaves, tropical cyclone activity and high sea levels.<sup>16</sup>
- The world faces an average temperature rise of between 1.8° to 4°, according to best estimates for various emission scenarios.<sup>17</sup> However, global carbon dioxide emissions are already rising faster than the most dire of the IPCC emission scenarios.<sup>18</sup>
- Sustained temperature rises of 5-6°C could lead to the loss of both Greenland and the Western Antarctic ice sheets by the middle of next century, raising sea levels by up to 13m.<sup>19</sup>
- At the moment, one third of the world's population lives within 60 miles of a shoreline and thirteen of the world's twenty largest cities are located on a coast.<sup>20</sup>
- Hundreds of millions could be displaced in environmental mass migration.<sup>21</sup>
- The IPCC recognizes that less developed regions are most vulnerable to the early and harmful effects of climate change, and have the least resources available to them for adaptation programmes.<sup>22</sup>

### Population Growth and Climate change: Complex, controversial but critical connections

The connection between Population Growth and Climate change is: -

**Complex:** The key driver of climate change is the relatively high level of carbon emissions in the developed world, where population growth is not, for the most part, a major issue. Yet the impacts of climate change are going to be greatest in the least developed countries of the global South, which have contributed the least to climate change. It is in these countries however, that populations are continuing to grow, and this population growth increases vulnerability to climate change, and increases the difficulties for adaptation. Demographic variables such as household size, age and sex composition and population density intensify the complexity of the relationship between population growth and climate change. Research over the past decade increasingly shows that higher investment in ensuring access to voluntary family planning programmes could make a positive impact on climate change mitigation and adaptation strategies.

**Controversial:** While developing countries themselves are increasingly identifying population growth as a factor that confounds national efforts to adapt to climate change, it is not easy to position increased investment in family planning as an important strategy for climate change response. For as long as the industrialized North is not actively reducing its carbon emissions, advocating reduced population

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<sup>15</sup> Costello, et al. (2009) "Managing the health effects of climate change". *The Lancet*, 373, 9676, pp.1693–1733.

<sup>16</sup> Intergovernmental Panel on Climate Change (IPCC) (2007) *IPCC Fourth Assessment Report: Climate change 2007 (AR4)*. Geneva: IPCC.

<sup>17</sup> Ibid.

<sup>18</sup> Pielke, R Jr., Wigley T., Green, C. (2008). "Dangerous assumptions." *Nature*, 452, pp.531–32.

<sup>19</sup> Costello, et al. (2009) "Managing the health effects of climate change". *The Lancet*, 373, 9676, pp.1693–1733.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> Intergovernmental Panel on Climate Change (IPCC) (2007) *IPCC Fourth Assessment Report: Climate change 2007 (AR4)*. Geneva: IPCC.





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growth in the South risks appearing to blame climate change on that growth. It is the countries of the South, which have contributed the least to climate change, which will suffer the most from its impacts. It is also important to advocate family planning programmes that respect and protect human rights: historically those which have been oriented towards reducing fertility have not always reflected these values in the ways that services have been offered; coercive family planning programmes have no place in international development programmes.

**Critical:** While regional differences in per capita carbon emissions must be recognized, alongside the legitimate economic aspirations of developing countries, countries in the developing world are far more vulnerable to the effects of climate change and the resultant impacts on the availability of natural resources. It is also important to bear in mind that, while we speak of the need for 'low carbon (economic) growth', experience to date shows that growth is inexorably linked to higher per capita emissions.<sup>23</sup> Given that rapid population growth is heightening vulnerability to climate change and undermining adaptation in the countries where the impacts are the greatest, it is critical that the links between population and climate change are not ignored, but are fully reflected in climate change response.

### **Box 2: Case Study: China and the USA – Population and climate change complexities**

China is a clear example of the complexities of the ways in which population and climate change factors interact. There are huge differentials in per capita energy consumption levels and resultant greenhouse emissions of the USA and China: 19.3 metric tons of CO<sup>2</sup> emissions per person for the USA in 2006, ranked 7th in the world, compared with China's 4.7 metric tons and ranking of 66<sup>th</sup>.<sup>24</sup> Nonetheless in 2006, China overtook the USA as the world's largest emitter of CO<sup>2</sup>.<sup>25</sup> This is a result of population size; China currently has a population of over 1.4 billion, while the USA population is approximately 318 million.<sup>26</sup> Yet it is important to add that a significant percentage of China's emissions emanate from the manufacture of products that will be consumed in the developed world.

A similar situation is developing in India. While per capita CO<sup>2</sup> emissions are considerably lower in India at 1.2 metric tons per person in 2006, ranking at 121 in the world<sup>27</sup> India's population now exceeds 1.2 billion and is growing at a faster rate than for the USA and China: at an average growth rate of 1.4% between 2005-2010, in comparison with 1.0% in the USA and 0.6% in China.<sup>28</sup>

In addition to these complexities, some of the old certainties are also breaking down, namely population stability in some industrialised nations. For example, the population is now growing in

<sup>23</sup> Ellis, K., Baker, B., Lemma, A. (2009) *Policies for Low Carbon Growth*. ODI Research Report. London: ODI.

<sup>24</sup> World Resources Institute (2010) *Total GHG Emissions in 2006*. Retrieved 1 November 2010 from: <http://cait.wri.org>

<sup>25</sup> Netherlands Environmental Assessment Agency (2007) *China now no. 1 in CO2 emissions; USA in second position*. Retrieved 1 November 2010 from:

<http://www.pbl.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html>

<sup>26</sup> UNFPA (2010) *State of the World Population 2010: From Conflict and Crisis to Renewal – Generations of Change*. New York: UNFPA.

<sup>27</sup> World Resources Institute (2010) *Total GHG Emissions in 2006*. Retrieved 1 November 2010 from:

<http://cait.wri.org>

<sup>28</sup> UNFPA (2010) *State of the World Population 2010: From Conflict and Crisis to Renewal – Generations of Change*. New York: UNFPA.





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countries such as the USA and UK,<sup>29</sup> so the idea that population growth is more or less exclusively taking place in the global South is increasingly misplaced. Migration is clearly an important factor, and may increasingly need to be recognized as one of a range of legitimate responses to climate change.

## Population and vulnerability: evidence from the National Adaptation Programmes of Action

Population growth multiplies vulnerabilities and compromises capacity to adapt to climate change in developing countries. Practical examples are provided by a series of Least Developed Country (LDC) reports: the National Adaptation Programmes of Action (NAPAs). At the time of the first published study of population issues in the NAPA reports in early 2009 a total of 40 LDC governments had submitted to the UN Framework Convention on Climate Change (UNFCCC) for funding of adaptation projects.<sup>30</sup> More than 95% of these reports identify population as a relevant factor to climate change vulnerability. The most common concern was related to food security and the sensitivity of agricultural systems severely degraded through over grazing, soil degradation and shrinking land holdings. Other common concerns were associated with migration to dense areas at high risk of climate impacts, water stress and conflict.<sup>31</sup>

Analysis by PSN and colleagues of the NAPA reports reveals that the governments of Least Developed Countries perceived population to be relevant to climate change in three important ways:<sup>32</sup>

1. Rapid population growth acts in tandem with climate change to deplete key natural resources, such as water and land.
2. Rapid population growth can cause a significant increase in demand and often mismanagement of natural resources that are compromised and in decline due to environmental variability and climate change.
3. Population growth heightens human vulnerability to climate change by forcing people to migrate to areas that are either environmentally marginal or more at risk of the negative impacts of climate change.<sup>33</sup>

### Box 3: Extract from Rwanda's National Adaptation Programme of Action

“High density population zones are currently characterised by overexploitation of lands and a vegetal cover severely altered... This situation explains the present migratory dynamic of people from the most densely populated provinces in the North and the South towards the least populated provinces especially in the East and South East in search of a new land for agriculture and livestock.”

*Government of Rwanda (NAPA p.27)<sup>34</sup>*

<sup>29</sup> Ibid.

<sup>30</sup> Bryant, L., Carver, C., & Anage, A. (2009). “Climate change and family planning: least-developed countries define the agenda.” *Bulletin of the World Health Organisation*, 87, pp.852-857.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

<sup>33</sup> Stephenson, J., Newman, K and Mayhew, S (2010) “Population dynamics and climate change: what are the links?” *Journal of Public Health*, 32, 2, pp. 150-156.

<sup>34</sup> Government of Rwanda (2006) *National adaptation programme of action*. Kigali: Ministry of Lands, Forestry, Water and Mines.





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## Water scarcity

By 2025 up to two thirds of the world's population is expected to be under conditions of water stress – the threshold for meeting the water requirements for agriculture, industry, domestic purposes, energy and the environment. Many of these people will be living in the poorest countries experiencing rapid rates of population growth.<sup>35</sup> Population growth greatly increases pressure upon water resources, especially through placing greater demands upon agriculture, which is responsible for the greatest amount of water withdrawals globally, at 70% (including irrigation).<sup>36</sup> Climate variability, inducing uncertain rain patterns, will further exacerbate water stress in many countries with anticipated risks for increased civil conflict.<sup>37</sup>

## Agriculture and food security

Social and economic factors determine the price of food; notable among recent events has been the rising proportion of agricultural land given over to biofuels.<sup>38</sup> While over the past decade gains have been towards achieving food security across East and South East Asia, significant setbacks have been experienced in South Asia and Africa.<sup>39</sup> Population dynamics can undermine agricultural resilience, through over-cultivation, shrinking land holdings, soil erosion, and increased demand for water and will thus heighten sensitivity to the impacts of climate change. At the household level, high population growth may hinder investment in and impede the productivity of food systems, acting synergistically with climate change to undermine food security.

## Social vulnerability

Increasing evidence is emerging from countries affected by climate change about patterns of social vulnerability at the local level. Women, and particularly single women and female headed households, as well as children, the elderly, and other poor socially marginalised groups can be particularly vulnerable in various ways. These groups are also more likely to inhabit areas at greater risk, including urban slums and fragile environments.<sup>40</sup> Women in developing countries are particularly vulnerable, not only because they tend to be poorer and form the majority of small scale farmers, but also because they are responsible for food preparation, water and fuel collection, and caring for the sick: all burdens which are increased by climate change.<sup>41</sup> At the same time, women are key agents of change in their communities and are central to local mitigation and adaptation efforts.<sup>42</sup> Analysis of population

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<sup>35</sup> United Nations Environment Programme (2007) *Global Environment Outlook 4*. Nairobi, Kenya: UNEP.

<sup>36</sup> Ibid.

<sup>37</sup> For further information about the links between population growth and conflict, see: Population and Sustainability Network (2010) *Population Dynamics and Fragile States: A PSN Briefing Paper*. Available at: <http://www.populationandsustainability.org/293/articles-and-reports/articles-and-reports.html>

<sup>38</sup> World Bank (2010) *Rising global interest in farmland – Can it yield sustainable and Equitable Benefits?* Washington: The World Bank Group.

<sup>39</sup> United Nations (2007) *Millennium Development Goals Report*. New York: UN.

<sup>40</sup> UNFPA (2010) *Key Messages and Related Research on Population Dynamics and Climate Change*. Retrieved 2 November 2010 from: <http://www.unfpa.org/pds/climate/messages.html>

<sup>41</sup> Brody, A, Demetriades, J and Esplen E (2008) *Gender and climate change: mapping the linkages – A scoping study on knowledge and gaps*. Brighton: Institute of Development Studies.

<sup>42</sup> UNFPA (2009) *State of the World Population 2009: Facing a changing world: women, population and climate*. New York: UNFPA.





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dynamics can help to identify vulnerable groups within the population, as well as interventions to support them to effectively respond to climate change.<sup>43</sup>

### **Box 4: Extract from Malawi's National Adaptation Programme of Action**

“Women bear most of the burden in activities that are most impacted by adverse climate, including collection of water, firewood and ensuring daily access to food....More than 90% of the people, mainly comprising resource-poor rural communities, are predominantly engaged in subsistence rain-fed agriculture, 60% of whom are food insecure on a year-round-basis. Female- and children-headed households, the elderly and women are the most vulnerable, a situation that has been exacerbated by increasing poverty and population pressures on a limited land resource base, low economic productivity of the land, labour and capital, and extreme weather events due to climate variability, and low capacity to adapt to the adverse impacts of climate change. These have been compounded by rapid environmental degradation as a result of agricultural expansion to marginal lands and deforestation, inadequate knowledge and skills in the productive use and management of land and natural resources, inadequate access to land and credit, poor health services, and gender inequalities.”

*Government of Malawi (NAPA p.ix & p.1)<sup>44</sup>*

### **Population in the IPCC Climate Change Models**

The Intergovernmental Panel on Climate Change (IPCC) in 2000 produced a series of models which show the possible pathways for CO<sup>2</sup> emissions until the end of the 21<sup>st</sup> century. These models, called The Special Report on Emissions Scenarios (SRES) include important demographic variables which will affect future pathways of CO<sup>2</sup>. The models are built according to varying economic, technological and social dynamics and also different population pathways of high, medium and low growth (projecting a world population of between 7.1 billion and 15.1 billion by 2100).<sup>45</sup>

Technological change and economic organisation are shown by the models to be critical factors determining emissions outcomes in the future, and the models also show that a lower population pathway is associated with a lower emission pathway. This is reflected in recent research estimating that a lower population path could reduce 16-29% of the emissions necessary to avoid global warming of more than 2°C by 2050, and by the end of the century reduce total emissions from fossil fuel use by 37-41%.<sup>46</sup> There is therefore general agreement about the clear relationship that exists between population growth and increased climate change, which will become more pronounced as this century progresses.

<sup>43</sup> UNFPA (2010) *Key Messages and Related Research on Population Dynamics and Climate Change*. Retrieved 2 November 2010 from: <http://www.unfpa.org/pds/climate/messages.html>

<sup>44</sup> Government of Malawi (2006) *National adaptation programme of action*. Lilongwe: Ministry of Mines, Natural Resources and Environment, Environmental Affairs Department.

<sup>45</sup> IPCC (2000) *IPCC Special Report Emission Scenarios*. Geneva: IPCC.

<sup>46</sup> O'Neil, B C, Dalton, M Fuchs, E *et al.* (2010) “Global demographic trends and future carbon emissions.” *Proceedings of the National Academy of Sciences*, 107, 41, pp.17521-17526.







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## Population Dynamics are Important but Controversial

While the significance of population growth is reflected in the IPCC models, an important omission is adequate consideration of population dynamics beyond simply population size. This approach assumes a proportional, linear relationship between population size and carbon emissions. However different groups in any population have different consumption patterns of energy thus making the relationship far more complex.

Urbanisation is one important example, which can affect rates of emissions in complex ways. In 2009 the world passed the point where over half the world's population lives in cities and towns, and from now on the majority of growth in the world's population will be concentrated in urban centres in the less developed regions.<sup>47</sup> While urbanisation can be associated with increased GHG emissions, it is not urbanisation per se that increases emissions, but increases in consumption that can be associated with urbanisation. In low-income countries many urban dwellers have extremely low consumption patterns in comparison with (both urban and rural) dwellers in higher-income countries. So increased urbanisation does not necessarily correspond with increased emission rates, but can be related to whether urbanisation coincides with increases in affluence and consumption patterns.<sup>48</sup> Greater population density means that residents in some cities in fact have lower per capita emissions than those living outside of cities.<sup>49</sup> Economies of scale found in urban settings may therefore offer opportunities for emission mitigation.<sup>50</sup>

Household size and age structure are also relevant to climate change since these dynamics have implications for rates of energy consumption. Due to loss of economies of scale, smaller households tend to have higher per capita energy consumption.<sup>51</sup> Population ageing, on the other hand tends to drive emissions down, as older people who no longer participate in the workforce produce on average fewer greenhouse gas emissions than people of working age.<sup>52</sup> The full extent to which these factors will shape emissions outcomes is, however, not yet known.

While population dynamics are clearly of great significance to climate change and should therefore be a key consideration for the international climate change agenda, this is a matter of controversy and difficulty. This is due to the fact that many countries that have the highest per capita emissions have relatively slow population growth or population stabilization, while the largest growth in population is taking place in the some of the world's poorest countries, which contribute considerably less

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<sup>47</sup> United Nations (2010) *World Urbanization Prospects: The 2009 Revision*. New York, NY: United Nations, Department of Economic and Social Affairs, Population Division.

<sup>48</sup> Satterthwaite, E (2009) *The implications of population growth and urbanization for climate change*. Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED, in collaboration with UN-HABITAT and the Population Division, UN/DESA, 24-25 June 2009.

<sup>49</sup> UNFPA (2010) *Key Messages and Related Research on Population Dynamics and Climate Change*. Retrieved 2 November 2010 from: <http://www.unfpa.org/pds/climate/messages.html>

<sup>50</sup> Dodman, D (2009) "Blaming cities for climate change? An analysis of urban greenhouse gas inventories". *Environment and Urbanization*, 21, 1, pp.185-201.

<sup>51</sup> Population Action International (2009) *How do recent population trends matter to climate change?* Washington: Population Action International.

<sup>52</sup> UNFPA (2010) *Key Messages and Related Research on Population Dynamics and Climate Change*. Retrieved 2 November 2010 from: <http://www.unfpa.org/pds/climate/messages.html>





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greenhouse gas emissions than rich industrialised economies. While there are links to be drawn between population and climate change, in respect to both adaptation and vulnerability and greenhouse gas emissions, dialogue on the issue is obscured by competing frameworks using either total emissions or per capita emissions targets, and mediated through the prism of national sovereignty rather than from the perspective of global cooperation.

## Population and Climate Change: Complementary Solutions

### *The importance of family planning*

Population pathways are subject to considerable variation over the coming decades. Renewed political and financial commitment to voluntary family planning as part of a sexual and reproductive health care approach could encourage a lower population pathway in 2050 rather than a higher one, contributing to both mitigation and adaptation. Furthermore, global demand for family planning has never been higher, with an estimated 215 million women worldwide expressing a desire to either prevent or delay their next pregnancy but with no access to modern contraception.<sup>53</sup> Despite a significantly growing number of young women coming into their reproductive years, funding specifically for family planning dropped by 30% between 1996 and 2006.<sup>54</sup> Although population assistance has steadily increased over the last decade, this has mostly been allocated for HIV programs. Current assistance for family planning programs stands at USD 3.1 billion in 2008), yet it is estimated that an extra USD 3.6 billion a year is required (USD annually) to address the current unmet need.<sup>55</sup> Figure 1 below shows how funding for family planning as a percentage of total population assistance has diminished.

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<sup>53</sup> Singh S, Darroch J E, Ashford, L S *et al.* (2009) *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York: Guttmacher Institute & UNFPA.

<sup>54</sup> UNFPA/NIDI (2008) *Resource Flows Website Financial Resource Flows for Population Activities in 2006*. New York: UNFPA.

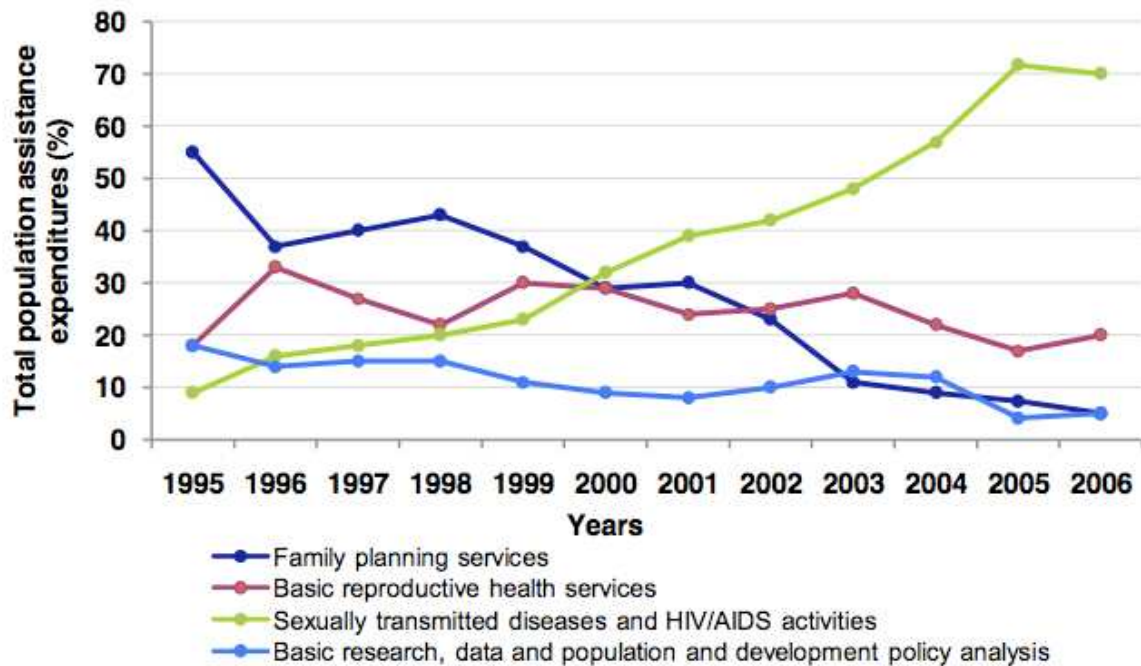
<sup>55</sup> Singh, S., J.E. Darroch, L.S. Ashford, and M. Vlassoff (2009). *Adding it Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York, NY: The Guttmacher Institute.





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**Figure 1: Percentage of Total Population Assistance Expenditure 1995-2006**



All Party Parliamentary Group on Population, Reproductive Health and Development.  
Return of the Population Growth Factor (2009)<sup>56</sup>

Investments in family planning are known to be highly cost-effective. By preventing unplanned pregnancies, family planning reduces the costs of public service delivery and eases pressure upon natural resources. For every dollar spent in family planning, between 2 and 6 dollars can be saved in interventions aimed at achieving other development goals.<sup>57</sup> Given the role that population growth plays in heightening climate change vulnerability and undermining adaptation, and the links with other population dynamics, investment in voluntary family planning programmes would bring considerable investment returns.

## Contraction and Convergence

Climate change is driven, and its impacts are experienced, to different extents by different populations across the globe. Total emission figures mask a huge heterogeneity in *per person* energy consumption which varies widely both within national borders and between them. Equity, including equality of opportunities for development, must therefore be the central pillar around which climate change policy is developed.

<sup>56</sup> All Party Parliamentary Group on Population, Development and Reproductive Health (2009) *Updated Charts from Return of the Population Growth Factor: Its Impact on the Millennium Development Goals* (2007 Report). London: Author.

<sup>57</sup> Moreland, S and Talibard, S (2006) *Achieving the Millennium Development Goals: The contribution of fulfilling the unmet need for family planning*. Washington D. C: USAID,





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In response to these discrepancies, 'Contraction and Convergence'<sup>58</sup> presents a framework in which finite bio-spherical capacity is equitably shared amongst all of the earth's inhabitants, thus placing the importance of *per capita* emissions centre stage. This framework recognizes the right of the developing world to develop economically, and that their per capita emissions will rise as a result. On the other hand the emissions of the developed world will have to contract, with the overall objective of arriving at an equitable global per capita emission level. Population growth is fundamentally relevant to this model, since total population size will largely determine the cap at which total *safe* emissions can be set.<sup>59</sup> Again the complexity of this issue is crucial to grasp: in the short term, it will be in the interests of individual countries to have large populations to capture as large a share of the global emissions as is possible. At the global level the reverse is the case; the larger the global population, the smaller the per capita global emission level will be.

### *A Case Study: Metu Woreda, Ethiopia*

Box 5 provides a case study in Ethiopia describing at the local level the interaction of population pressures, increasingly arid land – a likely result of climate change - and poor environmental management. In the following section, Box 5 explores a local, multi-sectoral policy response to this situation demonstrating the benefits of integrated population, health and environment approaches.

#### **Box 5. Case Study: Metu Woreda, Ethiopia – The Problem Outlined**<sup>60</sup>

The Wichi province of Metu Woreda in eastern Ethiopia has been severely affected by increasingly dry weather conditions. Given the negative effects that drought has on food production, and with a growing number of mouths to feed, the local population was forced to deforest previously untouched areas, in order to convert the land for farming. This led to extreme soil erosion and land degradation, in turn leading the local population to convert more land for agricultural use. In this example, the local population is locked in a cycle where a rapidly growing population is encouraging poor land management, exacerbated by the impacts of climate change.

### *Multi-sector Integrated Population and Climate Change Approaches*

For most countries, family planning sits within the health sector, while other related issues such as climate change, agriculture, and food security sit elsewhere. But, just as climate change is a multi-sectoral issue, likewise the response must reflect that level of complexity. The fact that so many NAPAs identified population as a significant challenge confounding efforts to adapt to the effects of climate change shows that these governments recognize the issues are interlinked and that population should be integrated into existing climate change adaptation strategies.

<sup>58</sup> Global Commons Institute. <http://www.gci.org.uk/index.html> Retrieved October 2010.

<sup>59</sup> Stephenson, J., Newman, N and Mayhew, S (2010) "Population dynamics and climate change: what are the links?" *Journal of Public Health*, 32, 2, pp. 150-156.

<sup>60</sup> Consortium for the Integration of Population Health and Environment Network (2007) *Wichi integrated wetland-watershed management project*. Addis Ababa: Author.





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Box 5 describes how in the case of Ethiopia, family planning was successfully integrated into a conservation and land management program, with positive outcomes.

### **Box 6. Case Study: Metu Woreda, Ethiopia – An Integrated Response**

The Watershed Management Project of the Ethio Wetlands and Natural Resources Association and the Consortium for the Integration of Population, Health and Environment Network in Ethiopia used a multi-sectoral approach to address the problem outlined in Box 3. The project ran from 2005-2007, covered around 3000 rural households and aimed to improve crop production, minimize biodiversity loss and address rapid population growth. Inhabitants were trained in sustainable land management practices, wetlands were rehabilitated through reforestation, and modern family planning methods were promoted.

Not only have soil degradation trends been reversed and nutrition improved reducing the need for further deforestation, but by integrating sexual and reproductive health into the agenda, the project has helped to ensure these benefits are sustainable and protected from rapid population growth. In this scenario, family planning was successfully mainstreamed into the environment and agriculture sector.

*Wichi integrated wetland-watershed management project.*<sup>61</sup>

### **Towards an equitable and integrated population and climate change policy**

The interaction between climate change and population dynamics – and the implications for the poorest countries of the world – is complex. Clearly, rapid population growth poses great challenges to both climate change adaptation and mitigation strategies. A range of policies are needed to address the situation in order to meet the globally agreed MDGs by 2015 and achieve sustainable development beyond. Policies aimed at speeding up the transition of LDCs from a state of high fertility to low should be embraced. Such policies include investing in family planning and reproductive health, female education, combating child mortality (as low child mortality is a driver of lower fertility), creating economic opportunities and empowering women.<sup>62</sup> These kinds of policies would address rapid population growth, thereby increasing the capacity of poor countries to adapt to the negative effects of climate change, and contributing to poverty reduction and economic growth. Investing in family planning is critical and should be central to policy development.

A long-term climate change policy should therefore address the source of future emissions, while acknowledging and supporting the rights and needs of LDCs to develop economically. By addressing population growth and investing in family planning, this would act synergistically to reduce the negative impacts of climate change, whilst bolstering capacity to cope with them.

<sup>61</sup> Ibid.

<sup>62</sup> Jiang, L. & K. Hardee. 2009. "How do recent population trends matter to climate change?" Population Action International Vol 1 Issue 1





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## Key policy recommendations:

- **Increased investment in family planning services:** To meet the needs of the 215 million women worldwide who want to space or limit their children, funding for family planning services must be increased to the estimated USD 6.7 billion necessary a year, requiring an extra USD 3.6 billion a year increased funding and subsequent increases to meet increasing demand.<sup>63</sup> This is a fraction of the costs required for climate change mitigation, and is an extremely cost-effective strategy for meeting wider development goals. Increased funding and support for family planning is necessary at the international level from donor agencies, governments and multilateral organisations, prioritising increased access to contraceptive services that respect and protect rights.
- **An Integrated Policy Approach:** Donor countries must respond to the call of 37 LDCs that identified population growth as a significant challenge in climate change adaptation in their NAPA reports.<sup>64</sup> Integrating a demographic perspective into the global climate change response necessitates funding being made available through climate change funding streams for the incorporation of voluntary family planning into adaptation strategies. Countries which are experiencing both rapid population growth and are highly vulnerable to the effects of climate change should be prioritised for support to implement integrated adaptation strategies.
- **Effective leadership and funding:** Leadership is required at national and international levels to promote and ensure adequate funding for integrated climate change approaches, as well as to increase awareness of the links between population and climate change across disciplines and amongst politicians, decision-makers, donors and NGOs. Governments and donors must embrace rights-based reproductive health approaches as legitimate components of strategies for climate change adaptation and mitigation, and make funding available for family planning as part of climate change adaptation. Funding streams should be flexible and encourage joint approaches, for example PHE (population, health and environment) programmes.
- **Multi-sectoral collaboration:** An integrated approach requires greater cooperation between development, environment and health organisations, including collaborative mechanisms at the international level. At the national level, integrating population dynamics and family planning into adaptation programmes means that climate change must be seen as a priority for both health and environmental departments, with planning taking place in relation to housing and public service provision.<sup>65</sup>
- **Research:** More research is needed to clarify the exact relationships between population dynamics and climate change mitigation and adaptation programmes. This should include comprehensive modelling with a range of demographic variables which is lacking in current IPCC climate change

<sup>63</sup> Singh S, Darroch J E, Ashford, L S *et al.* (2009) *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York: Guttmacher Institute & UNFPA.

<sup>64</sup> Bryant, L., Carver, C., & Anage, A. (2009). "Climate change and family planning: least-developed countries define the agenda." *Bulletin of the World Health Organisation*, 87, pp.852-857.

<sup>65</sup> *Ibid.*





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models. Research to map availability of water, land and climate change induced migration flows must also be prioritised, to inform adaptation strategies and migration policy.<sup>66</sup>

- **Urban planning:** Stronger urban planning and development initiatives are required to encourage urban areas that are more sustainable and less vulnerable to the impacts of climate change, supporting both mitigation and adaptation.
- **Women's empowerment and education:** Initiatives to promote women's empowerment, including a focus on education will support women to exercise reproductive choices and reduce fertility rates. Climate change adaptation strategies must be responsive to gendered vulnerabilities and support women's leadership in climate change responses.

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<sup>66</sup> Stephenson, J., Newman, N and Mayhew, S (2010) "Population dynamics and climate change: what are the links?" *Journal of Public Health*, 32, 2, pp. 150-156.

