From dying to eternal economies: When should the paradigm shift from the non-renewable resources based economy take place?

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From dying to eternal economies: When should the paradigm shift from the non-renewable resources based economy take place?

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Abstract

It is known that the current non-renewable resource based economy will sooner or later reach its peak stage and approach a permanent short supply stage. As this takes place, we should expect to see the worsening of competing socio-environmental concerns and economic concerns, locally and globally. If nothing is done, the collapse of the non-renewable based economy may mean a complete system collapse affecting all social and environmental life on earth. Now more than ever it is agreed that a shift towards a renewable resource based economy(clean economy) and away from the non-renewable based economy(dirty economy) as soon as possible is needed.

Therefore, there is a need to come up with ideas about the best timing and management of the transition period needed for the paradigm shift to consolidate to ensure that social and environmental impacts are minimized. And this makes the following question relevant: When should this paradigm shift take place; and how should it be managed so that the transition process is smooth/stable in sustainability terms?. One of the main goals of this paper is to provide one possible answer to this question.

I. Introduction

a) Non-renewable resource based economies

Non-renewable resources are expected to significantly decrease in quantity in the short to medium term and expected to completely disappear in the very long term leading to what the author calls "the dying economy ", an economy where supplies of non-renewable resources sustaining it will sooner or later reach a peak and death stage. Under this type of economy, increasingly limited supplies with increasing demands are bound to cause some social, environmental and economic unrest as those who can afford to buy the non-renewable resources that remain will leave out those who can not.

The negative impacts of dying economies on the poor and marginalized should be expected to be much worse than those on the rich, be it at the individual or country level. Worries that unstable and increasing oil prices will make it more difficult to sustain expected strong global levels of economic growth were expressed by global leaders present in the G8 Gleneagles Summit (G8GS, 2005). William (2005) points out that the more scarcity humanity faces, the higher the prices of non-renewable resources will be; and that these higher prices will make the already detrimental impacts of globalization on the well-being of the poor still worse. The above discussion suggest that non-renewable resource based economies are expected to become one day dying economies.

b) The road to renewable resource based economies

There is agreement that there is a need to address issues such as past and current local and global pollution, which are associated directly or indirectly with the way the non-renewable resource based economy has worked and works. In other words, pollution is the result of the working of the dirty economy; and from this point of view, this pollution is considered to be man-made for the purpose of this article.

There are different views, and very divisive ones, on the role of anthropocentric pollution as driver of today's global warming: a) The official view believes than anthropocentric causes play a leading role (IPCC 2007), with worse impacts apparently on developing countries (IFCCC 2007); b) The anti official view, that anthropocentric factors play a minor or unclear role (Meyer 2007); and that natural forces are driving global warming (THI 2008); and c) The ignored intermediate or sustainability view that a combination of anthropocentric(Human) and non-anthropocentric (Natural) factors may be a play at the same time and need to

be faced together to achieve a systematic approach to the situation; and avoid this way one sided actions(Muñoz 2002).

What ever the causes behind global warming today, there is a need to move from the current dirty energy based economic model or polluting model to a cleaner one, and there are two views on how this can be done: a) The middle of the road view; and b) The end of the road view, which are summarize below:

i) The middle of the road view - The efficient management of the old economy

This view is based on the notion that by using mitigation measures such as the Kyoto Protocol and adaptation measures based on more efficient current technology or the invention of better technologies in the future, the negative impacts of the current dirty economy on pollution levels can be minimized in a way that nobody is left behind. Actions are being taking and promoted right now to decarbonize the atmosphere in a way that is sustainable (Muñoz 2008).

When doing this, then we can allow the old economy to continue to operate, but in a more environmentally friendly manner. As long as there are mitigating options(e.g. protection choices, efficiency gains) all countries have an incentive to continue polluting, an option that is politically viable still today and therefore, a justification, valid or not, to not act in a hurry and to support this view. It has been pointed out that right now the most likely response in all countries to global warming issues is to support weak landscape-strong emission impact based development (Muñoz 2004).

However, this approach to combat pollution by keeping the oil or dirty economy running while trying to minimize impacts to the weakest/less fortunate countries appears to have one main issue that makes it unsustainable in the long-term and it is a political one: a) Developed countries want to avoid binding solutions or strict targets implying they see the problem as of no much urgency. Fisher et al. (2002) stresses that climate change is not an issue for developed countries because they know they can cover the cost of dealing with it; and b) Developing countries feel they need help to deal with global warming as they consider themselves victims and they consider developed countries as the ones most responsible for the problem. Langevin (2009) reported that Brazil was going to Copenhagen ready to press developed countries to accept and implement stricter mitigation programs while asking them to provide help to developing countries all over the world.

And this political issue that divides developed and development countries today will continue to be a source of ongoing unsustainability and uncoordinated action. These issues are at the heart of the recent failure of COP15 in Copenhagen to lead to meaningful and binding coordinated actions in terms of emission targets and funding. Anaba (2009) reported that the expectations of COP15 in Copenhagen in terms of stronger emission target commitments from developed countries; of appropriate funding mechanisms to help vulnerable countries, and in terms of providing a cleaner development path to humanity were not met in Copenhagen.

ii) The end of the road view- The need to move towards a new economy

The other view to deal with pollution is that we should move as soon as possible towards an economy powered or energized by renewable resources together with more efficient and better technologies and more environmentally conscious/educated populations. It is known that increasing populations levels exacerbate the polluting nature of current industry/ economic activity and this justifies the need to move faster towards an industry model that is based on renewable resources and that is more efficient in resource use (Suzuki 2005). And it has been estimated that from 2005 to 2050 population levels will increase from 6.5 billions to 9.1 billions (UN, 2004). And this paradigm shift has to be done in a way that it is socially friendly. It has been stressed that a renewable energy market that is not socially friendly is not sustainable (Muñoz 2008).

In summary, to make the renewable resource based economy or clean economy more attractive than the current dirty energy based system, it should fulfill two main requirements: a) It must be economically better by making green energy cheaper than oil based energy; and b) It should be driven by technology that is easy to transfer or that is socially friendly; and therefore, easily accessible to poor countries so that it can be part of a

global environmental policy that can be used to support poverty eradication polices included in the millennium development goals (MDGs). Flavin and Sawin (2005) pointed out that if we can create a renewable based economy that is better economically than the current one, besides making climate change a successful market opportunity we would be protecting it at the same time. On the other hand, the German Advisory Council on Global Change (GACGC, 2004) stresses the need on part of developed countries to improve environmental policy and poverty reduction linkages as good environmental protection polices, more intensive mitigation and adaptation measures, lead to positive poverty reduction impacts.

Hence, there is not doubt that an economy that is relying on renewable energy is more environmentally friendly; and therefore, we should not be surprised if such an economy would be encouraged by global environmental programs like the Kyoto Protocol. For example, CAN International (CANI, 2005) points out that among the many positive impacts that the Kyoto Protocol has had so far is that it has highlighted the need to be more energy efficient and the need to accelerate the propagation and use of renewable energy.

The above discussion suggest that it is possible now to at least think about the possibility of living in a socially friendly economy that it is fully based on renewable resources or of creating what the author calls "eternal economies", economies where supplies of renewable resources will never reach any peak or death stage and where people have the basic income needed to live within them. It appears that the timing of the new renewable based economy is here.

The need to find the best transition path for the paradigm shift

Hence, the transition from the non-renewable resource economy to the renewable resource based economy needs social, economic, and environmental stability. And this makes the following question relevant: When should this paradigm shift take place; and how should it be managed so that the transition process is smooth/stable in sustainability terms?. One of the main goals of this paper is to provide one possible answer to this question.

II. Objetives

This paper has four main goals: a) To introduce a qualitative comparative framework that allow us to point out all possible economic paradigms based on how significant the interactions of supply and demand are within them; b) To connect those possible economic paradigms to introduce the notion that the life cycle of a general economy has four stages: birth, leap, peak, and death; c) To point out which of the life cycle stages are relevant for the non-renewable resource based economic model; and for the renewable resource based economic model respectively; d) To highlight the worse and the best transition paths to go from the non-renewable resource based to the renewable resource based economy, its timing and how it should be managed to minimize social and environmental consequences; and e) to point out an action plan on how the best transition path could be properly implemented and managed.

III. Metodology

First, the qualitative comparative terminology used to present the ideas in this paper are listed. Second, a simple economy variability model is introduced to highlight the four possible economic scenarios consistent with it. Third, those possible four economic scenarios are linked in a way that allows us to point out the birth, leap, peak, and death stages of a general economy cycle. Fourth, the relevant stages of the non-renewable resource based economy and of the renewable resource based economy are indicated and their main implications discussed. Fifth, the worth and the best possible transition path from the non-renewable resource based economy to the renewable resource based economy are stressed and their main aspects highlighted. Sixth, a plan of action consistent with the discussion above is presented. And finally, some relevant specific and general conclusions are provided.

IV. Terminology

The terminology used to advance the goals of this paper is listed below.

Table 1

E = Modern economy model	**e** = Primitive economy model
S = Supply pressures are significant	**s** = Supply pressures are insignificant
D = Demand pressures are significant	**d** = Demand pressures are insignificant
NRBE = Non-renewable resource based economy	**OBE** = Oil based economy
RRBE = Renewable resource based economy	**NOBE** = Non-oil based economy

Economy variability model

There can be different economy structures (E) depending on how significant the supply (S) and demand (D) pressures interacting within it are, which can be stated as follows:

E = S + D

There are four economy structures or possibilities consistent with the economy variability model(E) above.

a) Primitive economic model (E1 = e)

When both supply(s) and demand (d) pressures are insignificant at the same time, a primitive economic structure exist(e), which can be expressed as below:

E1 = sd = e

There are no active market drivers in this case.

b) Modern demand led economic model(E2)

When only demand pressures (D) are significant within the economy, we have a demand led modern economy, indicated as follows:

E2 = sD

This is a demand ruled market.

c) Modern supply-demand led economic model (E3)

When both, supply (S) and demand (D) pressures are significant at the same time, we have a balanced modern economy model, shown below:

E3 = SD

This is a case where supplies meet demands, both elements are in active form.

d) Modern supply led economic model (E4)

When only supply pressures (S) are significant within the economy, we have a supply led modern economy, indicated as follows:

E4 = Sd

In this situation, there is a supply ruled market.

The life cycle of a general economy

The four economic scenarios described above can be organized in a way that allows us to point out the life cycle of a general economy. Figure 1 below introduces the view that the life of an economy has four stages, which are listed in detail here:

a) The birth stage, when the move is from a primitive economy (sd) to a demand led modern economy (sD);

E1 = sd -----→ E2 = sD

b) The leap stage, when the move is from a demand led modern economy (sD) to a balanced modern economy (SD) ;

E2 = sD ----→ E3 = SD

c) The peak stage, when the move is from a balanced modern economy (SD) to a supply led modern economy (Sd);

E3 = SD ----→ E4 = Sd

d) The death stage, when the move is from a supply led modern economy (Sd) to a primitive economy (sd).

E4 = Sd ---→ E1 = sd

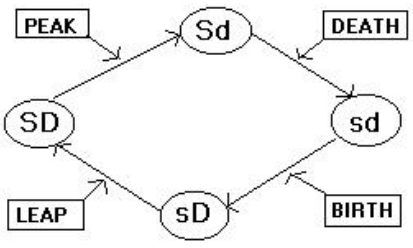

Figure 1 The four stages of economic life: Birth, Leap, Peak, and Death

It can be seen clearly in Figure 1 above that the general economy cycle goes from birth to death as shown by the continuous arrows; and therefore, it starts with a primitive form and ends up in a primitive form at the end of the cycle.

The life cycle of the non-renewable resource based economy (NRBE)

To simplify the presentation in the following section, the non-renewable resource based economy will be called here the oil based economy (OBE). Figure 2 below shows by means of broken arrows that the oil based economy (OBE) has already passed the birth stage(E1 = sd -----→ E2 = sD) and the leap stage(E2 = sD ----→ E3 = SD).

Figure 2 also indicates by means of continuous lines that the oil based economy (OBE) is facing its peak stage (E3 = SD ----→ E4 = Sd) and it is following a path toward its death stage (E4 = Sd ---→ E1 = sd), which is consistent with the nature of so called "dying economies"

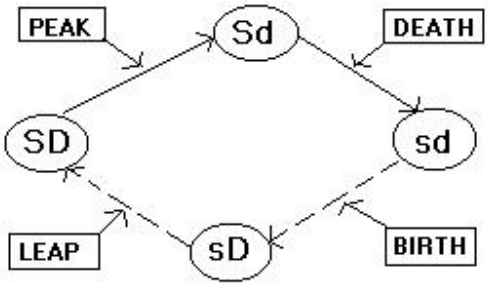

Figure 2 **The nature of the Oil based Economy: It is about to reach the Peak and Death stages as supply[S] starts showing difficulty meeting demand[D].**

It can be seen clearly in Figure 2 above that the oil based economy (OBE) has only two stages left, the peak stage and the death stage as shown by the continuous arrows; and therefore, it is a dying economy in route to the end of its cycle.

The life cycle of the renewable resource based economy (RRBE)

Again, to simplify the presentation in the following section, the renewable resource based economy will be called the non-oil based economy (NOBE). Figure 3 below points out by means of continuous arrows that the non-oil based economy (NOBE) it is currently in its birth stage (E1 = sd -----→ E2 = sD) and moving toward its leap stage(E2 = sD ----→ E3 = SD).

Figure 3 also shows by means of broken arrows that the non-oil based economy (NOBE) will never go through a peak stage (E3 = SD ----→ E4 = Sd) and death stage(E4 = Sd ---→ E1 = sd), which is consistent with the nature of so called "eternal economies".

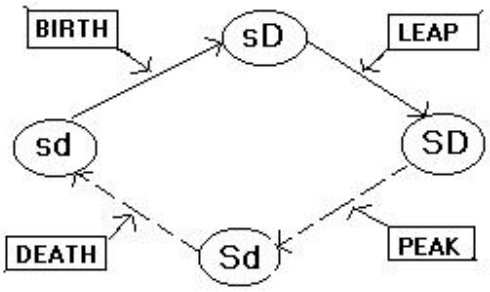

Figure 3 The nature of the non-oil economy: Only the Birth and Leap stages are possible when supply(S) always meets demand(D).

It can be seen clearly in Figure 3 above that the non oil based economy(NOBE) does not have a peak stage and a death stage as shown by the broken arrows; and therefore, it is an eternal economy, a balanced economy where supply meets demand.

Worse and best transition paths

a) The worth transition path from the non-renewable resource based to the renewable resource based economy

Figure 4 below shows clearly that the worse time to make a transition from the oil based economy (OBE) to the non-oil based economy (NOBE) is when we wait for the complete death of the oil based economy (OBE) to start seriously promoting and funding the birth and leap stages of the non-oil based economy (NOBE).

This is the path AB, death-birth, in figure 4.

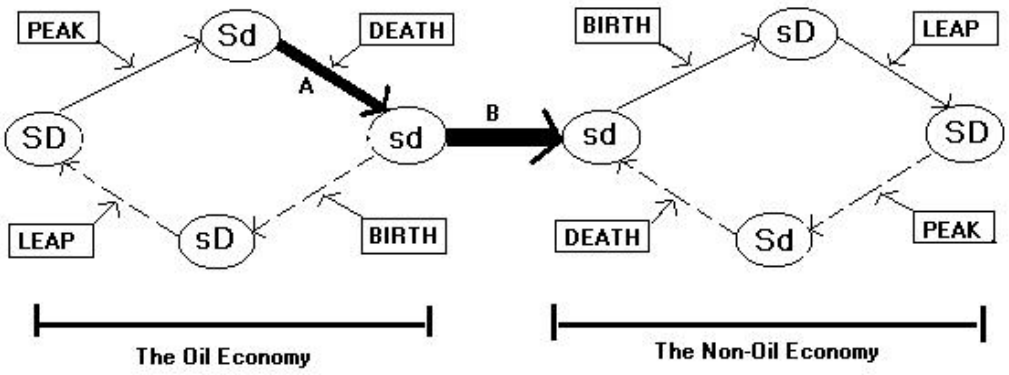

Figure 4 The most destructive path toward the Non-Oil Economy: The oil economy is abandoned (point A) and the non-oild economy is stimulated(poing B) when the oil economy reaches the death stage.

Notice that here extreme increases in energy efficiency per unit of non-renewable resource or oil use may help to slow down the speed at which the oil based economy will peak and/or collapse, but the transition will probably still be very chaotic in the long-term in the absence of alternative sources of energy.

In other words, if the transition to the renewable based economy or non-oil based economy (NOBE) takes place following a sudden total collapse of the non-renewable industrial/economic model or oil based economy (OBE), it will be a very chaotic transition.

b) The best transition path from the non-renewable resource based to the renewable resource based economy

Figure 5 below stresses that the best time to make a transition from the oil based economy (OBE) to the non-oil based economy (NOBE) is to start seriously promoting and funding the birth and leap stages of the non-oil based economy (NOBE) just before the peak stage of the oil based economy (OBE) approaches extreme characteristics.

This is the path AB, from a balanced modern oil economy (SD) just entering the peak stage to the birth stage of the non-oil based economy (sd), in figure 5.

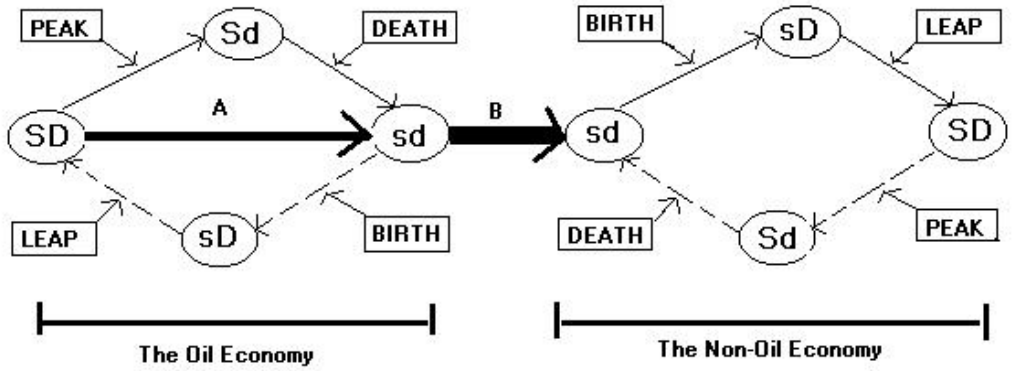

Figure 5 **The least destructive path toward the Non-Oil Economy: The Oil economy must be abandoned (point A) and the Non-Oil economy must be stimulated(point B) before the Peak of the Oil economy becomes extreme and enters the Death stage.**

See that in this situation, increases in energy efficiency per unit of non-renewable resource use may help to improve the smoothness of the transition process from the oil based economy (OBE) to the non-oil based economy (NOBE).

In other words, if this transition is started when the non-renewable based economy or oil based economy (OBE) is still far away from deep scarcity or/and when new technology can dramatically increase energy efficiency per unit of resource use , it will be a stable transition.

The action plan to move towards the sustainable renewable resource based economy

Figure 5 helps to indicate that the best action plan to ensure a smooth transition from the oil based economy (OBE) to the non-oil based economy (NOBE) is the following:

a) Use pollution taxes and disincentives in the short and medium term on dirty producers and dirty consumers in the oil based economy while on the peak and death stage to minimize its social and environmental impacts while raising as much funds as possible. The goal would be to make it more expensive to produce and consume dirty goods and services;

b) Use these funds and other clean energy credits and incentives policies to encourage the production and consumption of renewable energy with the long term goal of making the production price and the consumer price of clean energy cheaper than oil based energy while making sure that the supply of clean energy can be sustained. The goal would be to make it easier to produce and consume clean energy; and therefore to create a competitive clean market, whether the market is supplied by private or public or private-public technologies;

c) Ensure that the technology generated to drive the renewable resource or energy based economy is socially friendly and do not compete with social goals like food security and access to land to create the conditions for sustainable eternal economies;

d) A global institution with the specific task of funding public, private, and public-private partnerships focused on developing the clean energy technologies of the future and of making that technology available/accessible to all needs to be created to give focus and priority, short-term, medium term, and long-term, to this task as we wait for the end of the oil based economy as we know it. In other words, this global institution would be there to ensure a smooth transition from the oil based economy to the renewable resource based economy;

e) If we do not use the oil based economy as the jumping stone to the renewable resource based economy when it is still alive and especially if the renewable energy technology developed or to be developed is not socially friendly, the chances to have a smooth transition, if there is one at all, to the renewable resource or energy based economy will tend to zero.

V. Specific conclusions

It was pointed out that economies go through four stages: birth, leap, peak, and death. The oil-based economy is currently entering into the peak stage, supplies are increasingly limited. The non-oil-based economy is currently in the birth stage as environmental concerns are until now being taken seriously. The worse transition path from the oil to non-oil based economy is to wait until the oil based economy reaches the extreme peak and death stages as doing this in the absence of alternative sources of energy would lead to huge environmental and socio-economic externalities. Hence, the best transition path is to abandon the oil based economy before it reaches the extreme peak stage, as this is the most smooth/stable path towards the renewable resource based economy in sustainability terms.

VII. General conclusions

The best time to seriously promote, locally and internationally, the transition from the non-renewable based economy to the renewable resource one is now that its peak stage is not yet extreme. If we wait too long, unsustainability will become extreme; and the cost of transition, if still possible then, should be expected to be greater in social, environmental, and financial terms than if transition were to start right now. Hence, acting now, rather than later, should be expected to be cheaper. And a possible plan on how to do that and the possible negative consequences of unsystematic action were highlighted.

References

Anaba, Eze., 2009. *The story of a failed summit: From Hopenhagen to Hopelesshagen*. Vanguard, December 28, Denmark.

Climate Action Network International (CANI), 2005. *Why the Kyoto Protocol is a Historic Milestone.* February 16, Brussels, Belgium.

Fisher, Gunter, Mahendra Shah, and Harrij van Velthuizen, 2002. *Climate Change and Agricultural Vulnerability*, IIASA' s Land-Use Change Project, REMA Print, Vienna.

Flavin, Christopher and Janet Sawin., 2005..*Kyoto as an Opportunity.* World Watch Institute News, February 15, Washington D.C., USA.

German Advisory Council on Global Change (GACGC), 2004. *World in Transition: Fighting Poverty Through Environmental Policy-Summary for Policy Makers.* Berlin, Germany.

G8 Gleneagles Summit (G8GS). 2005. *Chair's Summary.* July 8, Perthshire, Scotland.

Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: The Physical Science Basis-Summary for Policy Makers*. WGI Fourth Assessment Report, Geneva, Switzerland.

Langevin, Mark S., 2009. Brazil's Countdown to Copenhagen, *Brazzil Magazin.* December 06, Brazil.

Meyer, Warren, 2007. *A Skeptical Layman's Guide to Anthropogenic Global Warming*, http://www.coyoteblog.com/Skeptics_Guide_to_Anthropogenic_Global_Warming_v1.0.pdf

Muñoz, Lucio, 2002. *Are We Appropriately Assigning Causes to Global Warming?*. In: *Sustainability Outlook*, Issue 16, November 13, Warren Flint (PhD)(Ed), Washington, DC, USA.

Muñoz, Lucio, 2004. *Weak Landscape-Strong Emission Impact Based Development: Is this the Most Likely Response in all Countries to Global Warming Issues?*. THEOMAI, Special Winter Issue, Argentina.

Muñoz, Lucio, 2008. *Renewable Energy Vrs Social Needs: What Do Environmentalists Must Do to Induce the Development of a Sustainable Market fueled only by Renewable Energy?*. Agrocombustibles, REDESMA, Vol. 2(1), Section VII, March, La Paz, Bolivia.

Muñoz, Lucio, 2008. *The Carbonisation and Decarbonisation of the Atmosphere: Systematically Linking Sustainable Development, Decarbonisation, and Adaptation Programs Using Qualitative Comparative Means*. Cambio Climático, Adaptación y Retroceso de Glaciares, REDESMA, Vol. 2(3), October, La Paz, Bolivia.

William, John, 2005. *The End of Oil: The Future is Taller and Goes Swoosh*. In: Common Ground. Vancouver, BC, Canada, Issue 166, May, P. 14.

Suzuki, David, 2005. *Kyoto-Political Football*. In: Common Ground, Vancouver, BC, Canada, Issue 166, May, P. 21.

The Heartland Institute (THI), 2008. *Nature, Not Human Activity, Rules the Climate.* Science and Environmental Policy Project / S. Fred Singer, Chicago, Illinois, U.S.A.

United Nations (UN), 2004. *World Population Prospects: The 2004 Revision.* Economic and Social Affairs, Population Division, New York, USA.

United Nations Framework Convention on Climate Change (UNFCCC), 2007. *Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries.* Bonn, Germany.