

Green Growth, Climate Change & the Future of Aid: Challenges and Opportunities in Asia Pacific¹

Working Paper, November 2009

Executive summary

This paper reviews the opportunities and challenges for Asia Pacific in attaining green growth, in particular to mitigate and adapt to climate change. Green growth in this paper is defined as an economy that reduces environmental damage per unit of economic activity and growth that enables the society to mitigate the potential impact caused by climate change. The recommendations for green growth are presented based on the framework of LIIFTT – Low carbon growth; Institutional reform; Investment in ecosystems and agriculture; Facilitation of rural and off-farm migration; Towns and cities that are climate-resilient; and Transitional support to shift to green growth by the international community. Together these add up to a low carbon revolution and what is now called “climate resilient development”.

On the mitigation front, over the last two decades, there have been positive signs of reductions in GHG emissions per unit of economic growth – reduced carbon intensity – in the developing countries of Asia Pacific, particularly in China. This has historically arisen due to the generally high energy inefficiency of Asia Pacific and structural economic changes leading to a larger service sector. More recently many countries, including the key economies such as China and India are seizing opportunities to increase exports and jobs by shifting to low carbon production. Nonetheless, the overall emissions from the region are rapidly increasing reflecting high economic growth. A “low carbon revolution” would be required for the region to make a significant impact in climate change mitigation. The challenge is compounded by the very unequal distribution of emissions within countries. Urban areas in the region are gaining importance in terms of emissions and the number of potentially affected populations.

The progress on a low-carbon revolution in Asia so far is mixed and varies by country. Asia needs to move fast if it wants to be a leader in the low-carbon revolution. Competition for low carbon technologies is picking up in Europe and in the United States as the private sector and governments start to proactively promote clean technologies. Asia has the skills, labor, technology base and entrepreneurship to lead the low-carbon revolution. Asia’s private sector can seize the opportunity to lead the revolution of decarbonization just as it has seized the opportunities of the race for globalization. But Asia’s dynamic private sector needs governments to provide the enabling framework and incentives to make this happen.

¹ This paper was prepared by Paul Steele and Yusuke Taishi.

Please send comments to Paul Steele, UNDP Regional Centre Bangkok paul.steele@undp.org

In terms of adaptation and the crucial role played by ecosystems, almost all indicators of this aspect of green growth are moving in the wrong direction. Asia Pacific, like the rest of the world, is pursuing economic growth by liquidating its natural resource base. This will not only undermine the long-term economic growth potential, but also reduce the adaptability to extreme weather events of the poor, who tend to be already more vulnerable to climate change than any other groups in society. As their poverty and welfare is often strongly affected by and dependent on the surrounding environment and natural resources, these “environment poor” will be especially vulnerable to climate change.

Evidence suggests that, on the one hand, climate change is likely to contribute to ongoing migration from rural to urban areas. On the other hand, however, there will be some people - the poorest of the poor and the most vulnerable - who lack the skills, networks and ability - to move away from rural areas. This dynamic transformation in mobility and immobility across different segments of the populations requires support for those left behind, such as efficient and reliable remittance services and facilitating off-farm incomes, in order to reduce their dependence on an already distressed rural environment.

At the same time, while climate-induced migration may offer some initial escape to poor households from rural climate vulnerability, it is also likely to give rise to a new set of risks in urban areas directly through exposure to sea level rise and extreme weather events, but also indirectly through vulnerability to climate-induced food price rises and climate-induced vector borne diseases.

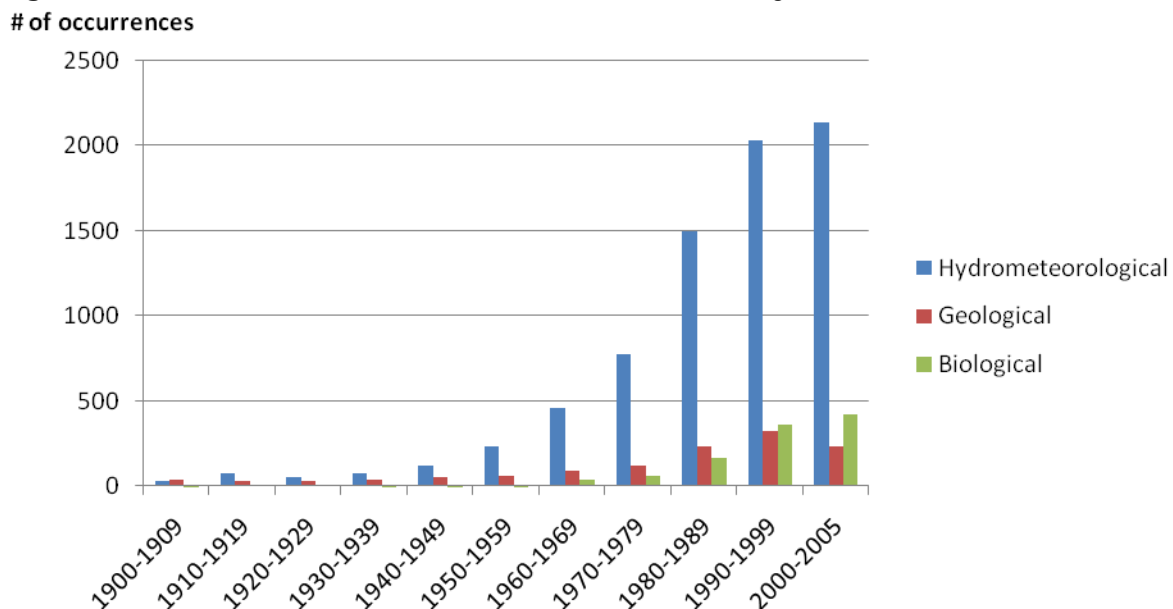
In the face of high uncertainty in the extent of the impact and likely multi-dimensional consequences associated with climate change, the concept of green growth becomes all the more important. Green growth can address climate mitigation and adaptation together by enabling urban settlements that have lower carbon emissions per capita, reduced vulnerability to sea level rise and greater security from climate-induced food price impacts and health impacts. In rural areas, new technologies for food production for the cities will be crucial in the face of climate ravages, and social protection and facilitated remittances will need to be provided to the “chronic” “environment poor” who remain in rural areas.

These actions to operationalise green growth will require funds, and for low income countries some transitional support will be required. The international community will need to agree this December under the Copenhagen Conference of Parties of the United Nations Framework Conference on Climate Change (UNFCCC) to provide significant funds for developing countries to make the transition to green growth to address climate change. This is best achieved by raising funds from internationally coordinated mandatory levies (eg on bunker fuels or currency transactions according to the Tobin tax) and then using agreed criteria to allocate these funds into the public budgets of eligible countries swiftly and with minimum bureaucracy. This will ensure that Asia and the world collectively move towards green growth as quickly as possible. However despite its role as one of the leading centres for trade, Asia Pacific leaders have not fully contributed to the debate. If the Chinese currency will eventually become a reserve currency like the dollar then Chinese leaders need to develop and articulate a position on the Tobin tax and other pressing financing issues. This paper seeks to contribute to this debate in the Asia Pacific context.

1. Green growth and climate change: Some definitions

The term “green growth” is now widely used by policy makers. While green growth has many possible interpretations, in this paper, it is used to refer to making fundamental reforms in society to minimize the impact of economic activities on environment, especially in relation to climate change, and to maximize the resilience to adapt to climate change. The concept of green growth has long been discussed in relation to general economic growth and decoupling environmental damage from economic activity (see, for example, Herman Daly, 2005; Lawn and Clarke, 2008). This partly contributed to the trend that until recently the focus of climate change responses has largely been on mitigation. However, the already visible threat of climate change gives significant impetus to the formulation of the green growth concept which holistically addresses both climate change mitigation and adaptation. Available evidence suggests that disasters are increasing in their numbers and intensity and causing significant damage to the current generation particularly in Asia Pacific (Figure 1).

Figure 1 - Distribution of Natural Disasters (1900-2005: by decades)



Source: UN International Strategy for Disaster Reduction

As evidence accumulates, there has been growing understanding that ecosystem goods and services act as nature’s “infrastructure” that underlies not only economic growth but also the ability of countries to adapt to changing climate. The concept of green growth therefore embraces the promise of delivering continued prosperity while reducing the strains on natural environment and of maintaining ecosystem that helps build resilience to climate change.

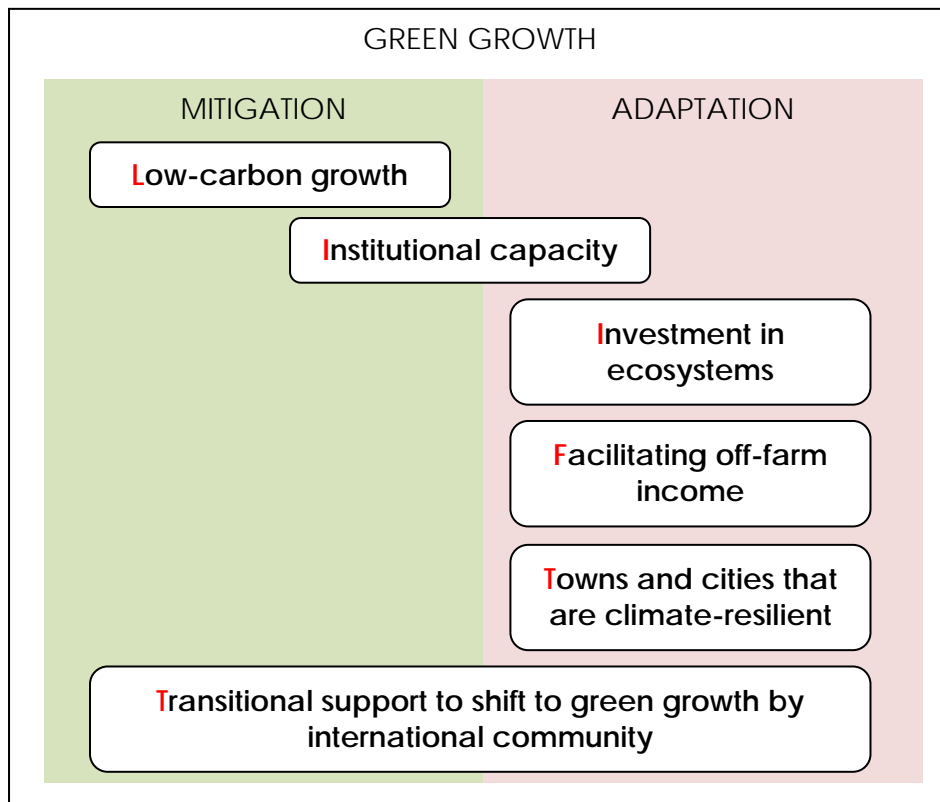
The ongoing economic crisis poses new challenges; yet, it can be an opportunity for ‘green recovery.’ Economic downturn in general has both positive and negative environmental impacts. While slumped economies reduce the overall burden on natural resources with fewer emissions, policy response of promoting economic activity may mean that environment safeguards may be overlooked in favour of

increased investment and production. In the current crisis, the return of migrants back to rural areas may increase some pressure on natural resources.

Whether the governments in Asia Pacific take the path to return to business as usual after the crisis or to perceive this as an opportunity for reform has profound implications for the achievement of green growth. For attaining green growth, it is imperative that the recovery from the current crisis takes the diversion from the existing economic growth framework, in which economic growth comes only at the expense of natural resources, and takes a radical shift to a low carbon growth model or what could be termed a low-carbon revolution. China, for example, has made initial progress towards this direction: It has been estimated that between 20-30 per cent of China's huge fiscal stimulus package of over \$500 billion will focus on low carbon production. The challenge is how to ensure that the remaining 70-80% of the stimulus package in China and elsewhere does not simply promote the old fashioned ecosystem liquidation model of economic growth.

2. Operationalising green growth for climate mitigation and adaptation

Operationalising green growth is presented according to the LIFFTT framework, which presents some of the most important elements for achieving climate resilient development: Low carbon growth; Institutional reform; Investment in ecosystems and agriculture; Facilitation of rural and off-farm migration; Towns and cities that are climate-resilient; and Transitional support to shift to green growth by the international community.

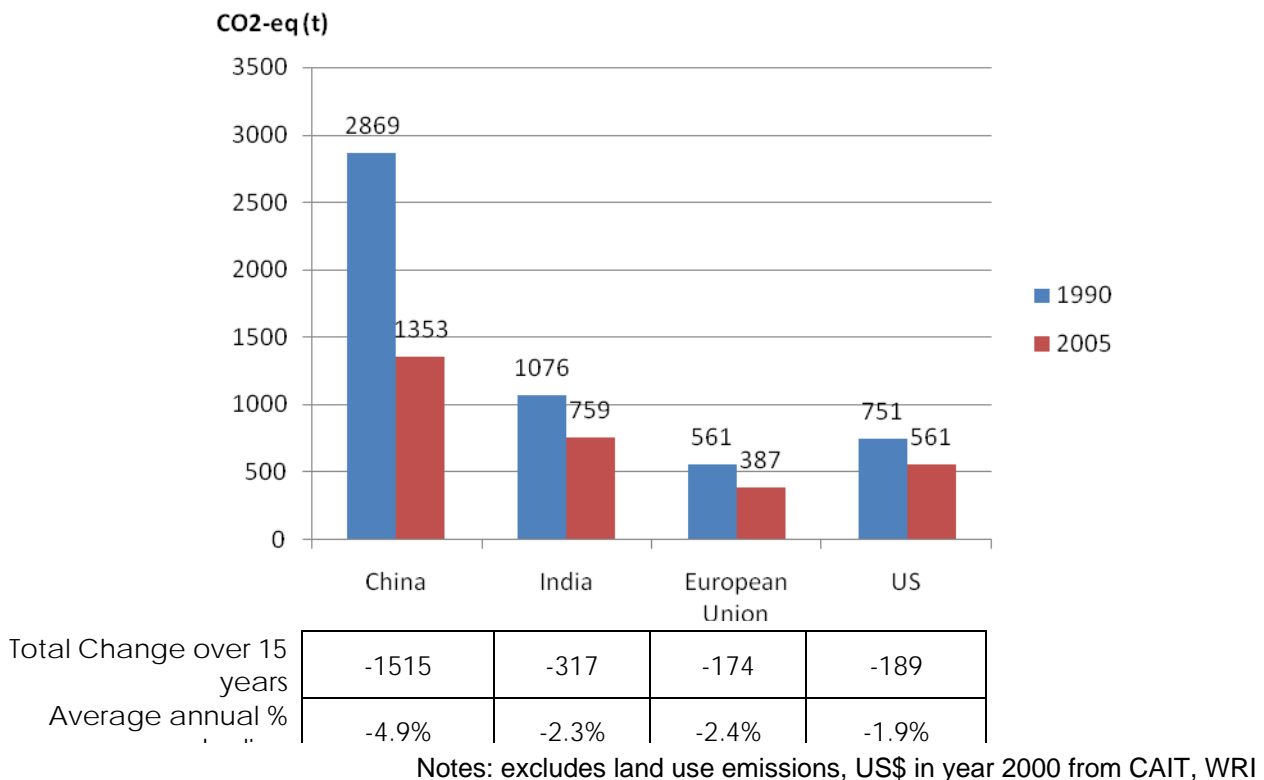


2.1 Low-Carbon Growth: Incentives and Targets

Climate change, typically viewed as a threat, presents an opportunity to Asia Pacific to lead the next industrial revolution as the world shifts to a low-carbon economy. Just as Britain dominated the world in the 18th century after it established its lead in the Industrial revolution based on fossil fuels, Asia Pacific could dominate the world's politics and economics in the future by leading the next shift away from fossil fuels toward low-carbon emitting fuels and technologies. This shift to a low-carbon economy will not only help to avoid long-term climate impacts, it will also create demand for new technologies and open new markets.

Switches to low-carbon economy in Asia show some positive signs. Carbon emissions per unit of economic output are falling globally with China showing the fastest falls. This is partly due to the fact that China is still very energy intensive per unit of output due to large dependence on manufacturing and heavy industry and older technologies. Carbon intensity will also decline as the service sector grows and heavy industry declines. In other export-oriented economies such as South Korea and Japan, similar trends are observed, to a lesser extent, as the private sector is responding to opportunities and incentives to gain a comparative advantage in a competitive market.

Figure 2 Greenhouse gas emissions per unit of GNP



China already leads the world in many low-carbon technologies and the opportunities are increasing through strong policy signals. In China investments in clean energy technologies grew from \$170 million in 2005 to \$420 million in 2007 (UNEP, 2009). China is now the largest producer of solar water

heaters and produces 80% of the world's energy saving lights. In China the renewable energy sector produces output worth \$17 billion and employs a million people (UNEP, 2009). These achievements have been encouraged by strong policy signals with targets for energy efficiency, renewable energy and a focus on major industries.

In other countries, however, the shift to low-carbon has been slow and will likely be achieved through reforms for a more efficient and market-orientated economy. In countries which are less export-orientated, low-carbon export opportunities provide less incentive to move to low-carbon technology and economy. For example, South Asia, such as India and Pakistan whose industry is typically less efficient and more focused on the domestic market, has been slower to move to invest in low-carbon technology.

However, the total GHG emissions in Asia are predicted to more than double over the next twenty years as its economies continue to grow, undermining progress in reducing per-unit carbon intensity. Under business as usual assumptions, economic growth (and accompanying increases in energy use) will continue to drive up emissions more than offsetting the efficiency gains in carbon intensity. For example energy consumption in China is currently growing at 12% per year (UNEP, 2009), while production in China is estimated to grow by 400% to 2020 (WRI, 2007). This would outweigh significantly China's 4.9% annual average decline in carbon intensity.

In China and elsewhere, there are a number of ways to radically shift to a lower energy and carbon intensity, but they require major changes. Key changes include even big increases in renewable energy generation and energy efficiency in industry which currently is the largest energy user and changes in household and transport whose share of energy demand will grow as the economy develops (Tyndall Centre, 2009)

Intra-country disparities compound the complexity of addressing climate change. National averages present a distorted picture in terms of the contribution to climate change. A recent study (Dodman, 2009) compared per capita GHG emissions in 11 cities with their respective national averages and found that city dwellers in general have lower per capita emissions than the national average. The exception is China where the residents of Beijing and Shanghai had much higher per capita emissions than the national average and the extent of their contributions to climate change was comparable to other mega cities like New York or London². A similar study from Bangkok suggests that its per capita emissions (7.1 tonne of CO₂-eq) are higher than its national average (4.3 tonne) and as high as those from London or New York (BMA et al, 2009). This implies that in many developing Asian cities, where public transportation network is less developed, they are likely to be contributing more than rural areas to climate change. This is in line with an estimate

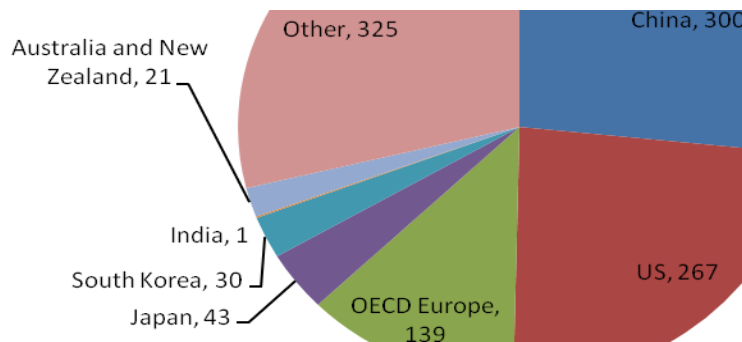
² Note that the methodology used for this study is still under development and disaggregating the level of contributions by city dwellers from the rest of the country is challenging and subject to a number of caveats.

that cities are responsible for as high as 80 per cent of total greenhouse gas emissions (Tibaijuka, 2009).

City	Total emissions (million tonnes of Co2 equivalent)	GHG emissions per capita	National emissions per capita	Per capita City emissions as percentage of per capita national
Shanghai (1998)	n/a	8.1	3.3	241.1%
Beijing (1998)	n/a	6.9	3.3	205.4%
Rio de Janeiro	12.8	2.3	8.2	28.0%
Tokyo	n/a	4.8	10.6	45.3%
New York	58.3	7.1	23.9	29.7%
London	44.3	6.2	11	55.2%

Another study estimates that by 2030 there will be 1.13 billion high GHG emitters with about 40% based in Asia Pacific³ (Chakravarty et al, 2009). This includes 300 million in China compared 267 million in the US. Since this study is based on estimates of emissions, the calculation shows surprisingly small contributions from India and therefore it warrants further work. Nonetheless, it reinforces the view that the Asia region, especially relatively small proportion of individuals, many of whom are likely to reside in urban areas, become increasingly significant contributor to climate change in the next decades.

Figure 3 Distribution of high GHG emitters (World total=1126)



Source: Chakravarty et al

³ This is based on the assumption that the world total emission target is set at 30 GtCO₂ in 2030 and based on this target, individual emission cap was set at 10.8 tCO₂. It estimated 1.13 billion people will be emitting beyond this target.

2.2 Institutional Reform for Climate Change and Green Growth

Climate policy needs to be led by the political leadership and economic decision-makers to determine the country's approaches to both mitigation and adaptation to climate change and therefore set the path to green growth. Climate-sensitive planning and budgeting is needed to promote public investment in low-carbon technologies and climate-resilient infrastructure. As greenhouse gas emissions from households and the transport sector – the so-called “non-point sources” – gains relative importance as urbanisation progresses, setting a proper institutional and policy framework will help make a smooth transition from a carbon-intensive to low-carbon economy. Many governments in Asia Pacific have already established some institutional framework such as National Adaptation Programmes of Action (NAPA) for climate. However, in reality, climate change has been perceived in isolation as “only” an environment issue and so the NAPA framework is often led by the Ministry of Environment alone whose political capital is relatively weak in setting a country's policy, plans and budgets.

It is essential that in future the climate institutional framework is led and coordinated by the President or Prime Ministers' Office, Ministry of Finance, or Ministry of Planning - and China, India and Indonesia are among the countries that have made progress in institutional reform for green growth and climate change. The Ministry of Environment can still play an important role in providing technical inputs. China has included climate under the leadership of the powerful National Development Reform Commission. In India, the Prime Minister's Council on Climate Change coordinates the cross governmental strategy, while a similar role is played by the President's office in Indonesia. In Indonesia the UN has been requested to develop a joint UN programme to deliver on green growth. Such initiatives in these countries enable the respective government to position climate change issues at the centre of the country's decision making and signal the level of commitment by the government to the private sector to stimulate further private investments in low-carbon or adaptation technology.

2.3 Investment in Ecosystems and Agriculture

Most Asia Pacific countries remain on a growth path that depends on converting ecosystems and natural capital not investing in it. Natural capital is particularly important for growth in low income Asian countries. It is estimated that it accounts for 26% of the total wealth in low income countries, 13% of wealth in middle income countries and only 2% of wealth in industrialized or OECD countries (World Bank, 2007). In Cambodia, for instance, although agriculture represents only 31% of the GDP, the sector employs 75% of the labour force. In India, the agriculture sector accounts for 17.6% of the GDP but 60% of the labour force. Moreover, primary production represents a much higher share of production, exports and national income in developing countries compared to that in industrialized countries.

Within a country, particular groups of “environment poor” people have their poverty especially linked to the environment and natural resources – living in dryland areas, upland areas, coastal areas and urban areas. These areas include the most marginal environments and Asia Pacific is home to over half of the 1.2 billion poor who live on fragile lands. These “environment poor” includes 330 million in south Asia and 469 million people in East Asia and the Pacific (UNEP, 2009). This compares with global estimates that half a billion people in developing countries live in arid regions without access to irrigation; another 400 million are on land with soils unsuitable for agriculture; 200 million are in slope-dominated regions; and more than 130 million live in fragile forest ecosystems (World Bank, 2002). This concept of environment poor was developed by the ADB (2008) and remains relevant for many low income countries, but even for middle income countries such as Thailand and Philippines as set out in the box.

Examples of “environment poor” in the Philippines

An estimated two thirds of the Philippine population depends directly on natural resources for a living – the agriculture and fisheries sectors contribute 20 per cent to GDP and directly employ about 40 per cent of the labor force. Amongst these the poor rely most heavily on natural environment to sustain basic livelihood needs. While poverty is geographically widespread in the country, its causes vary greatly. Poor people whose livelihoods are closely linked to their natural surroundings can be broadly divided into four types: (i) upland poor; (ii) lowland poor; (iii) coastal poor; and (iv) urban poor.

Upland Poor: Uplands, operationally defined as areas with a slope of 18 degrees or more, constitute 54 per cent of the land in the Philippines. The upland poor, who are often the poorest of the poor in the society, primarily consist of cultural or tribal communities, slash-and-burn shifting cultivators or *kaingineros* and rice and corn farmers who have been forced to resettle due to inequity and lack of security of tenure in agricultural areas. They are typically subsistence farmers, often with no alternative source of income. These farmers usually cultivate informally tenured land, have extremely limited access to infrastructure, market and social resources and face high food insecurity due to the seasonal availability of crops.

Lowland Poor: The lowland poor consist of landless agricultural workers and small farm owners and cultivators who own between one to three hectares. The landless have neither ownership nor farming rights and typically earn a living from the sale of labor either to plantations or smaller farms. While agriculture is the major source of income for the lowland poor, off-farm income opportunities, particularly seasonal migration to urban centers by household heads, play a role in household income.

Coastal Poor: Approximately 62 per cent of the country’s population resides in coastal areas. Of the over one million fishing labor force, over 60% per cent are engaged in small-scale and subsistence municipal fishing. Majority of municipal fishers are poor with over one million Filipinos deriving direct income from small-scale fishing. These fishermen do not use boats, or use boats weighing less than 3 tons, operate in inland waters and marine waters within 3 miles of the coast and receive low yields per unit effort.

Urban Poor: The rapid urbanization of the Philippines, with more than 2 million people being added to the urban population annually, is putting constraints on the ability of the country to provide adequate infrastructure, social services and suitable urban environmental infrastructure. Consequently increasing numbers of urban residents are becoming squatters and slum dwellers living in poorly serviced communities. This in turn increases the vulnerability of the poor to the health impacts of air and water pollution. In Manila, Tuberculosis incidents per 1,000 residents are 159 times higher amongst urban poor settlements than in the rest of the city. The World Bank estimates that in 2007 indoor air pollution related morbidity cost society \$33 million, outdoor-air pollution related morbidity cost \$21 million and water pollution, poor sanitation and hygiene cost \$450 million. In each instance, productivity loss was the largest category, indicating that environment-related health problems significantly impact the earning capacity and livelihoods of the poor.

Source: ADB and World Bank Country Environment Analyses of the Philippines (2009)

These “environmental poor” are also particularly vulnerable to climate variability which will be exacerbated by climate change. Many people are already vulnerable to climate variability (known as the “adaptation deficit”) and climate change will only magnify this vulnerability. Typically those whose livelihoods are most natural resource dependent will be most exposed to climate risks, while those who are the poorest will have the least ability to adapt.

Climate change will severely undermine the availability of and access to food. It is estimated that climate change will reduce global production of wheat, rice and maize by 25-150 per cent potentially increasing hunger by 10-60 percent (Parry et al, 2009). The relationship between climate change and food security depends on a number of biological, geopolitical and socio-economic factors. Food production is directly affected by the changes in temperature and precipitation and indirectly by water availability. FAO estimates (2008) that Himalayan snow and ice, which are a vital lifeline for 1.3 billion people who live downstream (Chhibber and Schild, 2009) are expected to decline by 20 per cent by 2030. Rain-fed agriculture that covers 61 per cent of cultivated land in Asia will be hit by too little or too much rain. Food prices are expected to rise with increases in temperature. Changes in availability of and accessibility to food have immediate, dire impact on the vulnerable who have least financial and institutional resources to avert such an external shock. Green growth strategies need therefore to address the provision of effective social safety nets through better-targeted food security system or conditional cash transfer and transfer of new technologies for food production and abatement of climate risks.

2.4 Facilitation of Rural and Off-farm Migration

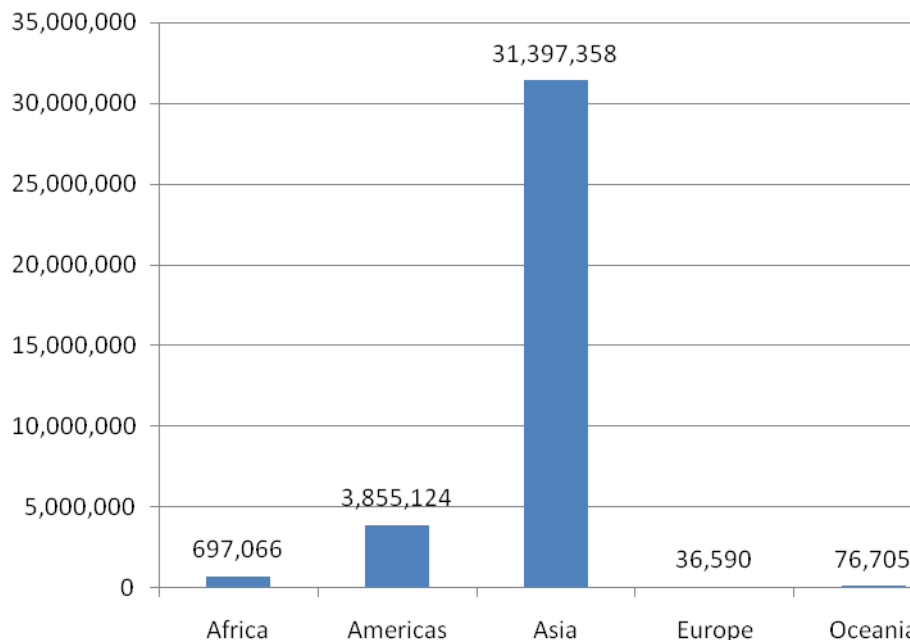
While many poor people live in rural villages, already it is clear that it does not follow that their incomes are always from agriculture and natural resource-based sources. It has been estimated that off-farm incomes provide up to 30 per cent of incomes for rural dwellers in many countries. In many cases, people will be living off money sent as remittances from relatives in urban areas or abroad. In some of the most environmentally vulnerable, impoverished locations – from the rural townships of South Africa, to the drylands of Pakistan – it is the women and elderly who are left behind with the children, when the men depart for better incomes. In other cases, the state may be providing significant income transfers to rural areas.

This trend to off farm incomes exists already and is likely to increase in the future. While natural resources may in some places and for some people currently be both the largest capital asset and the major source of income – will they always remain so? The present dependence of the poor on natural resources is often not the most reliable indicator of what the future would and should look like. Out-migration may still offer the best route out of poverty, especially in environmentally vulnerable areas.

Estimates of climate migration are hard to predict, but climate variability has historically driven population movements. While climate and migration is an emotive topic, evidence suggests that migration away from rural areas will only

increase with climate change (UNDP, 2007). In a recently published report, the Norwegian Refugee Council estimated that 20 million people were displaced in 2008 due to climate-related disasters and Asia was by far the most affected region in the world (2009).

Figure 4 Total displaced and evacuated in 2008 by sudden onset disasters



Note: Figures include non-climate change related disasters. Climate-related disasters account for 13 per cent of the total

Source: Norwegian Refugee Council, 2009

Past evidence suggests that behind all those refugees and migrants are always people, usually the very poor and vulnerable, who do not have enough resources, networks or capacity to move (Tocoli, 2009). As noted earlier, the rural poor are already dependent on fragile, less productive environment from which they maintain subsistence. This underscores the importance of not only investments in ecosystem as insurance for climate change adaptation, but also establishing a framework that facilitates off-farm incomes to support those left behind. Some measures include investment in human and physical capital to increase their opportunities and establishment of more reliable and efficient remittance system, government social safety nets, or migrant workers unions.

2.5 Towns and Cities That Are Climate Resilient

Half of the world's population now lives in cities (UN-HABITAT, 2008). By 2050, in developing countries, urban dwellers will likely account for 67 per cent of the population and Asia is at the forefront of urbanization. More than half of the world's large cities (with population more than 1 million) are in Asia (United Nations, 2008). This, coupled with an added inflow of migrants to cities due to climate

change, will pose yet another set of challenges in, and therefore a compelling reason for, attaining green growth.

First, urban areas and Asian cities will need to have their high vulnerability to climate change reduced. Six of Asia's ten megacities – Jakarta, Shanghai, Tokyo, Manila, Bangkok and Mumbai are located near the coast. China has 40% of its population, 60% of its wealth and 70% of its largest cities in coastal areas (UNDP, 2007). In the Philippines, sea level rise poses a significant threat as 70 per cent of the country's municipalities are along the coast (World Bank, 2009). About 81 per cent of the population is vulnerable to natural disasters and some 85 per cent of Philippines \$86 billion annual GDP is endangered, as it is located in risk areas. Nicholls et al (2008) estimates that by 2070, globally, the asset worth \$35,000 billion, or 9 per cent of projected global GDP, will be at risk from the combined effect of climate change, subsidence, population growth and urbanization.

Second, cities and urban populations may become exposed to climate increased disease vectors such as malaria and dengue. Due to climate change, urban populations who have not been exposed before will now face these health risks and this need to be planned for and prepared.

Third, cities have often benefited from support programmes for food security and nutrition and this will need to continue if climate change pushes up food prices. The last few years saw the impacts of rapid rises in food prices and the accompanying political pressures. Traditionally "urban bias" by policy makers has led to food subsidies for urban populations (Lipton, 1980). Many of these support programmes have been dismantled over the last decade, but were revisited in the recent food price shocks. There is a need to review the effectiveness of such programmes and how they can be made financially sustainable if climate change leads to increased food prices.

2.6 Transitional Support to shift to Green Growth by International Community

A key dilemma in the current financing debate is the need to avoid perverse incentives. There is currently a dichotomy between those who want adaptation costs to be separate as a liability or compensation by the rich world to the poor world versus the need to truly internalize the costs of adaptation into every decision and process. Clearly that latter approach will be cheaper, but fairness and the north versus south negotiating fora are pushing for the former stance. This tension needs to be urgently resolved. The danger is that a stand-alone approach to adaptation financing will create the kind of tensions that arose with stand alone health funds for HIV AIDS etc, which undermined incentives to invest cost effectively in overall health systems.

A second danger is that a focus on stand alone will lead to an attempt to separate development from climate adaptation spending. There is clear evidence that poor people and poor countries are more vulnerable to climate change because of their poverty. So any investment which reduces poverty will reduce climate impacts. Thus ADB has recently demonstrated that expenditure on female education is not only good for poverty reduction but is also vital for climate

adaptation. So any attempt to separate out climate adaption from general development spending is futile and counter-productive.

While there is a need to see adaption investments on a continuum from general development to specific climate related investment, the costs of climate resilient development will in the short run be higher than general development costs. There is little doubt that development will be more costly under climate change. While there are many difficulties and limitations in estimating the exact cost of adapting to climate change under various emissions and temperature increase scenarios, all the available indicative estimates suggest that adaptation costs in developing countries will be in the order of tens of billions.

Evidence is still being developed on the financing needs for adaptation. Recent research suggests that the costs of adaptation may be comparable to the costs of mitigation and possibly much higher. This is an added argument for mitigation, but it is also a wake up call to think through what these adaptation costs will be and who will bear them. This research suggests that global adaptation costs could be 2-3 times higher than previous UNFCCC estimates of \$40-170 billion per year ie about range from \$100-\$425 billion per year (IIED et al, 2009). This compares with similar costs of mitigation of \$200-210 billion per year by 2030 (by IPCC) and \$400-\$1100 billion per year by 2050 (by IEA). The UNFCCC and more recent estimates of the costs of adaptation focus only on the additional cost of climate change so they do not include the cost of adapting to current climate variability or what is known as the “adaptation deficit” which is itself likely to be over a hundred million dollars (IIED et al, 2009).

While there is growing evidence of the high costs of adaptation – there are also few incentives for the private sector to bear these costs – unlike mitigation where the private sector is now making massive investments in the context of new regulatory and public action. These additional costs of financing are not only a moral demand of developing countries; they can also demand them as a legitimate payment to encourage developing countries to reduce their own emissions. Unlike traditional overseas development assistance (ODA), which is essentially a voluntary decision by developed countries, for climate financing developing countries can and are demanding this as a pay-off to ensure that they also reduce their emissions. So climate financing is no longer a voluntary donation to developing countries but a payment in receipt of reduced emissions. This is why developing countries are demanding that climate financing unlike traditional ODA is a guaranteed stream of payments.

A number of different schemes are being discussed to provide such guaranteed financing. These include voluntary contributions from governments, as well as different international levies on bunker fuel from shipping and airlines and on currency trade as in the Tobin tax. The UK and other governments are starting to make commitments on voluntary contributions for climate finance. While this is needed to get the debate started, the danger is that as all government funds are fungible, it is impossible to ensure that such funds are truly “additional” and do not implicitly reduce the existing aid budget. For this reason, levies paid by consumers and producers rather than provided by national governments would seem preferable

– as they avoid the aid fungibility problem and they are not subject to the political, commercial and other conditionalities that have bedeviled the aid industry.

One emerging source of levies is on bunker oil which is used in shipping and airlines particularly as both remain unregulated under the Kyoto Protocol. Shipping produces around 3% of total man-made carbon emissions and is equivalent to the total emission of Africa. Only six countries produce more greenhouse gases than international shipping. A carbon tax on emissions of 20US\$/tCO₂e would generate an annual revenue of about US\$17billion per year based on 2007 data. A similar tax on airlines could raise US\$25 billion per year.

Another option gaining ground is a levy on the sale of currencies which was first proposed in 1971 by the Nobel Prize winning American economist, James Tobin. This proposal was intended to reduce currency market fluctuations and various uses have been proposed for the revenues raised – with climate as the latest suggestion. Such an approach could help resolve the need for climate funding while improving financial management in the context of the economic crisis. The Tobin tax is consistent with the economic logic of taxing global public bads such as currency speculation to finance global public goods such as a low carbon economy and climate resilient development. A charge of 0.005% on global currency transactions could raise an estimated \$30-50 billion, while a charge of 0.01% on transactions could raise an estimated \$100 billion per year. In the short run given the need for swift implementation the IMF could help to facilitate the tax, while longer term management arrangements are worked out.

So far the Tobin tax approach is supported by a wide and growing list of politicians from across the political spectrum: Angela Merkel, Nicolas Sarkozy, Lula de Silva (President of Brazil), Barosa (EC President), Kirchner (of Argentina). It has also received support from George Soros and Adrian Turner, the Chairman of the Financial Services Authority of the UK. The Tobin tax approach was proposed by Angela Merkel in the run up to the G20 Pittsburgh meeting but was not agreed by the EU. Nicholas Sarkozy proposed the approach in his speech to the UN General Assembly at the end of September. The UK Prime Minister has recently voiced his support at the meeting of G20 finance ministers on November 6th. However despite its role as one of the leading centres for trade, Asia Pacific leaders have not fully contributed to this debate. If the Chinese currency will eventually become a reserve currency like the dollar then Chinese leaders need to develop and articulate a position on the Tobin tax.

The advent of new sources of guaranteed financing for climate resilient development – which will likely dwarf traditional flows of ODA – also provides a once in a generation opportunity to learn from the short-comings of the aid business and put in place new models of aid delivery. In the new context where developing countries can demand guaranteed funding, these developing countries then can demand to have these funds delivered as they want without many of the supply driven modalities of traditional aid such as intermediaries institutions with unreasonably high transaction costs and unfair conditionalities such as tied aid.

These kinds of reforms are already emerging in the context of the Adaptation fund and to a lesser extent, the management of funds pledged by the G8 which are showing a much more equitable representation of developing countries in the governance of such funds. This is just a sign of the changes which will arise leading eventually to a much more radical set of governance arrangements where developing countries ultimately control how funds are used – the reverse of the current aid business.

The most effective way to provide the finances is to allocate fair shares to each country as an annual lump sum payment and then allow the countries to decide how they want to programme the funds. In some cases, they may require traditional aid bureaucracies such as development agencies to provide technical support, in others cases they may choose to programme the funds through existing government, civil society or private sector channels. Such “direct access” to climate financing will ensure that development agencies must become more demand driven and competitive otherwise they will no longer be viable. This will essentially be the end of the traditional aid business as we have known it over the last 50 years since the advent of the UN and Bretton Woods institutions.

Even with direct access to a pot of guaranteed global funds, there will still remain the challenge of determining a fair allocation of funds for each country. This will no doubt require considerable debate and deliberation. While it is not possible to predict the final formulae, it is possible to suppose that some set of formulae will be developed using criteria to determine the extent of expected adaptation costs which would include indicators such as population, income and other measures of climate risk.

Once allocated to countries, the best option to incentivise effective use of the funds is to provide the external adaptation funds to be part of each countries formal budget process. Essentially external funds can be thought of as external "tax revenue" - only this time the tax is raised internationally (eg bunker levy and Tobin levy etc) rather than domestically. So as with any fiscal revenue, the funds should then be captured in the national budget process. The formal budget process is where accountability for government spending decisions takes place - and indeed one of the major problems with past environment financing such as GEF, CDM etc is that they have been off-budget. So while budget processes are far from perfect, they are the best attempt each country has to be accountable to their citizens for public finances.

By contrast, any attempt to impose external conditionalities on adaptation financing has at least four draw-backs:

- It will replicate the shortcomings of ODA which has created accountability to the donor rather than the citizens and ignored the fungability of external financing - which is why development agencies are now promoting budget financial support (into the national budget) and public financial management.
- It would replicate the shortcomings of the GEF approach with high transaction costs in time and money in terms of monitoring and approvals etc

- It will replicate the shortcomings of NAPAs in encouraging adaptation "projects" while the objective is instead to include the additional cost of adaptation across the public and private investment portfolio.
- It would replicate the shortcomings of vertical funds for HIV and other global health issue (which are now clearly shown to have distorted health funding priorities) by not promoting system wide improvements to cope with adaptation.

So based on emerging good practice in development financing, the least bad option seems to be to provide the adaptation funds to the public budget with no strings attached. It seems that the real challenge will be to overcome all the vested interests who want a role in managing these adaptation financial flows ie other national governments, development agencies etc. So it would seem that this where the efforts should be - on demonstrating the clear economic, environmental and governance rationale for providing funds directly to government budgets with no external conditionalities other than support for effective public financial management as provided by existing international support.

3. Conclusion

Countries in Asia Pacific face different threats from climate change. In the Himalayan nations of Bhutan and Nepal, one of the immediate and urgent threats from climate change is glacial lake outburst floods. In many Pacific nations, it is sea level rise that determines the very existence of the nation. In some of emerging economies, it may be the combination of shifting patterns in production and urbanization and their associated impacts on socio-economic development. Thus, each country will necessarily take different paths to building resilience to climate change and green growth. Using the LIIFTT framework, which embraces some of the common elements that are essential to achieving green growth, this paper presented some opportunities and challenges that confront countries in Asia Pacific – and how they can play a leading role in the discussions on green economy, climate change and the future of aid.

References

ADB (2009), Philippines Country Environment Analysis

Tyndall Centre (2009) China Energy Transition: Pathways for a low carbon development

Dodman D (2009). *Blaming cities for climate change? An analysis of urban greenhouse gas emissions inventories*. Environment and Urbanisation, Vol. 21, No. 1, 185-201.

UNDP (2007) Climate change and forced migration: Observations, projections and implications, HDR Occasional Paper, Oli Brown

Bangkok Metropolitan Administration, Green Leaf Foundation and United Nations Environment Programme. (2009). Bangkok assessment report on climate change 2009. Bangkok: BMA, GLF and UNEP.

Chakravarty, S., Chikkatur, A., de Coninck, H., Pacala, S., & Socolow, R. (2009). Sharing global CO₂ emission reductions among one billion high emitters. *Proceedings of the National Academy of Sciences of the United States of America*, 106 (29), 11884-11888.

Chhibber, A. & Schild, A. (2009, October 30). Melting mountains. *New York Times*. Retrieved from http://www.nytimes.com/2009/10/31/opinion/31iht-edchhibber.html?_r=2&ref=global.

Daly Herman (2005), Economics in a Full World, Scientific American

FAO. (2008). Climate change, water and food security. *FAO CC Publications – Factsheets*. Retrieved from <http://www.fao.org/climatechange/49537/en/>.

World Bank (2009), Philippines: Country Environmental Analysis

IEA/OECD. (2008). *Energy technology perspectives 2008*. Paris: IEA.

Myers, N. (2005). *Environmental refugee: An emerging security issue*. Paper presented at the 13th Economic Forum.

Nicholls, R., Hanson, S., Herweijer, C., Patmore, N., Hallegatte, S., Corfee-Morlot, J., Château, J., & Muir-Wood, R. (2008). Ranking of port cities with high exposure and vulnerability to climate extremes: Exposure estimates. *OECD Environment Working Papers*, 1.

Norwegian Refugee Council. (2009). *Monitoring disaster displacement in the context of climate change*. Geneva: NRC Internal Displacement Monitoring Centre.

Parry, M., Arnell, N., Berry, P., Dodman, D., Fankhauser, S., Hope, C., Kovats, S., Nicholls, R., Satterthwaite, D., Tiffin, R., & Wheeler, T. (2009). *Assessing the cost of adaptation to climate change: A review of the UNFCCC and other recent estimates*. International Institute for Environment and Development and Grantham Institute for Climate Change, London.

Parry, M., Evans, A., Rosegrant, M., & Wheeler, T. (2009). Climate change and risk of hunger: The scale of the challenge and required response. *World Food Programme Fact Sheet*.

Tacoli, C. (2009). Crisis or adaptation? Migration and climate change in a context of high mobility. *Environment and Urbanization*, 21, 513-525.

Tibaijuka, A. (2009). Opening statement at Cities and Climate Change Initiative Launch and Conference Report 2009 in Oslo, 17 March 2009.

UNFCCC. (2007). *Investment and financial flows to address climate change*. Bonn: Climate Change Secretariat.

UN-HABITAT. (2008). *State of the world's cities 2008/2009*. Nairobi: UN-HABITAT

United Nations. (2008). *World urbanization prospects – The 2007 revision*. New York: United Nations.