E/ESCAP/CDR(2)/INF/7

Distr.: For participants only
19 May 2011

English only

Economic and Social Commission for Asia and the Pacific
Committee on Disaster Risk Reduction

Second session
Bangkok, 29 June-1 July 2011
Item 4 of the provisional agenda
Recent trends in disasters and their socio-economic and environmental aspects

Climate change and disaster risk reduction: the role of trade and investment*

Note by the secretariat

Summary

While it has been widely recognized that climate change will lead to an increased incidence of natural disasters in the course of this century, an international consensus on the reduction of emissions of greenhouse gases responsible for climate change has proved elusive so far. This is a key concern as such disasters severely disrupt trade and investment, which are wide acknowledged to be the engines of growth and development. This paper, while recognizing the costs associated with climate change mitigation and adaptation efforts, argues that trade and investment in climate-smart goods, technologies and services are also part of the solution and can contribute to a triple win solution where trade and development, climate and disaster risk reduction all benefit. The paper identifies opportunities to promote trade and investment in those goods and services in the region and briefly presents a policy framework to capture those opportunities. The paper makes a strong case for regional cooperation and suggests a regional partnership or agreement on the mitigation of and adaptation to climate change including a regional trade and investment agreement in this area. The paper proposes that ESCAP could take the lead in such initiative.

* The present document has been issued without formal editing.

Contents

I. Introduction

1. There is universal consensus that the world's climate is changing beyond the normal fluctuations in weather patterns. The changes in climate foreseen towards the end of the century involve a gradual warming of the planet, with a temperature increase ranging from 1.1 to 6.4°C over pre-industrial levels during the twenty-first century. If these temperature increases are not slowed or stopped, sea levels will rise, and coastal communities and other low lying areas may be flooded while others will experience severe drought. In other words, global warming will lead to natural disasters which will affect the livelihood of millions of people, most of whom are living in poor countries. There is compelling evidence that global greenhouse gas (GHG) emissions cause climate change and that most GHG emissions are due to anthropogenic factors.[1] Consensus is therefore growing among scientists and policy makers that in order to reduce the risk of natural disasters, actions need to be taken to curb global GHG emissions and drastically reduce the unsustainable use of so-called carbon sinks, such as the world's forests and oceans, to prevent global temperatures from rising by more than 2°C, which is the rate at which climate change can still be managed. This requires reductions in GHG emissions to a concentration level of 450 ppm CO2e. This information note reviews the role of trade and investment in mitigating climate change and makes the case for regional cooperation in promoting trade and investment in climate-smart goods, services and technologies. The note is based on a larger ESCAP study on Trade, Investment and Climate Change: Working Together towards a Triple Win Outcome, forthcoming (2011).

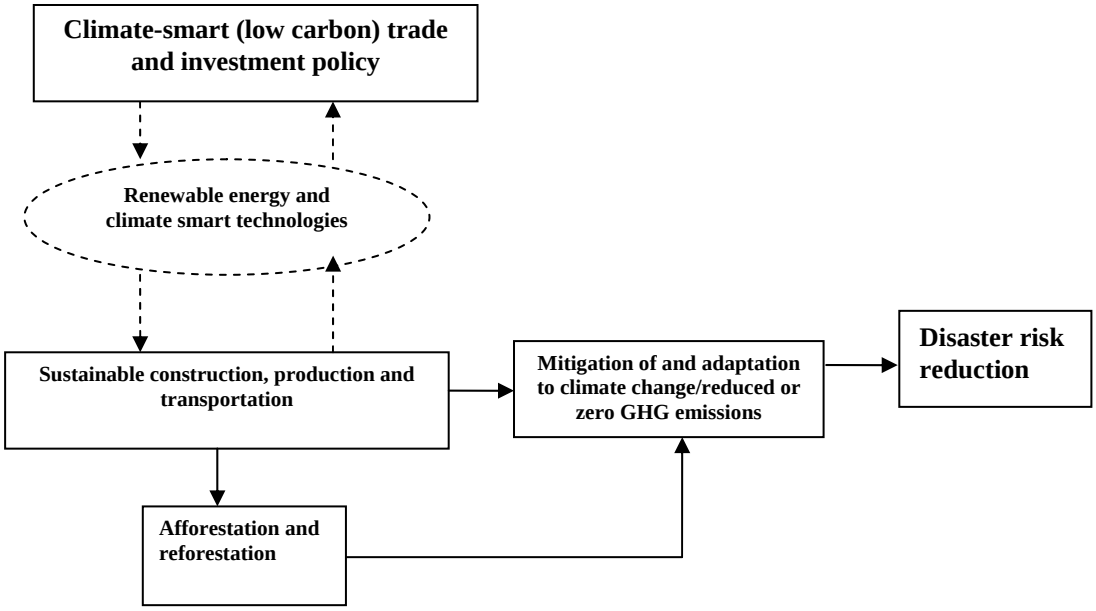
II. Trade, investment and climate change: Linkages, impacts and concerns of developing countries

2. The linkages between trade, investment and environmental issues with a particular focus on the impact of trade and trade liberalization on

[1] According to the International Panel on Climate Change (IPPC), there is less than 5 per cent chance that climate change is the result of only natural climatic processes. IPCC (2007). Climate change (2007). Synthesis Report. Contribution of Working Groups I, II, III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva.

climate change have been comprehensive explored in the literature.[2] It is generally acknowledged that trade and investment contribute to GHG emissions as the associated production and transportation processes depend excessively on fossil-fuels, which are the principal contributors to GHG emissions. However, the carbon intensity of trade is not always higher than that of local production (see below). In addition, trade and investment are essential for economic development and growth and achieving the Millennium Development Goals, in particular poverty reduction. A reduction or elimination of trade and investment is therefore not a practical solution. When production and transportation can take place on the basis of renewable energy sources and technologies, trade and investment become major solutions to climate change. In particular, investment is needed to develop and commercialize viable and cost-efficient low-carbon or climate-smart goods and technologies, while trade and aid for trade are needed to make these products and technologies widely available to all countries, including least developed countries. Under such a scenario, trade, environment and development all benefit while the risks of natural disasters from climate change are reduced (figure 1).

Figure 1
An integrated climate-smart trade and investment policy model



3. Some of the world's fastest growing economies are from the Asia-Pacific region. Their growth has been triggered and sustained by high levels of trade and investment.[3] They are also among the largest carbon emitters in the world. According to the most recent available date from the World Resources Institute Climate Analysis Indicators Tool (CAIT), GHG emissions from the region have grown faster than the world average.[4]

[2] For a comprehensive overview, see for instance: World Trade Organization (WTO)-United Nations Environmental Programme (UNEP) (2009). Trade and climate change. Geneva. WTO Publications.

[3] Economic Commission for Asia and the Pacific (2009), Asia-Pacific Trade and Investment Report 2009: Trade-led recovery and beyond. New York. Sales No. E.09.II.F.19; ST/ESCAP/2549. United Nations.

[4] http://cait.wri.org.

China surpassed the United States to become the world's largest emitter of GHGs in 2005, the latest year for which data are available for all greenhouse gases for 185 countries and economies.[5] India was ranked fifth and Indonesia twelfth. However, measured in terms of CO2e per capita, China ranked at no. 71 and India at no. 123. In 2007, these ranks were 66 and 122 respectively.[6] Also worth noting is that the CO2 emission intensities (the level of CO2 emissions per economic output or CO2/GDP) dropped for most Asian economies in the period 1992-2006 as their economies grew faster than their CO2 emissions. Energy, agriculture, and land use change and forestry were the largest sectors contributing to GHG emissions accounting for 64 per cent, 14 per cent and 11 per cent of all GHG emissions from the ESCAP region in 2005.

4. The Asia-Pacific region is prone to a relatively high incidence of natural disasters. While not all these disasters can be linked to climate change, it is recognized that in the course of this century and most certainly beyond, climate change will lead to increasingly fluctuating weather patterns and rising sea levels, which, in turn, will increasingly affect production and transportation and hence, indirectly, trade and investment (see table 1).

Table 1
Some likely impacts of climate change on trade and investment

Direct effect of climate change	Derived impact on trade and investment
Severe weather patterns: floods, droughts, desertification	Loss of productivity, in particular agriculture in (sub)tropical areas; potential increase in agricultural productivity in temperate areas; decrease/increase in food production depending on locations; increase in forest fires affects wood-based industries
Rising sea levels: inundation of coastal communities	Loss of coastal production and loss or damage of infrastructure necessary for trade (i.e. ports); loss of recreational beach tourism; possible disappearance of whole island developing countries
Other damages to eco-systems: loss of biodiversity and glaciers; coral bleaching	Loss of products and local livelihoods (i.e. medicines based on traditional knowledge); coral bleaching leading to loss of fisheries products; disappearance of glaciers leads to shortages of fresh water for both agriculture and industry
Increase in diseases and injuries due to storms and increased air pollution	Lower labour productivity

[5] GHG emissions include land use change and international bunkers and covers the 6 most common GHGs: carbondioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbon gases (HFC), perfluorocarbons (PFC) and sulphurhexafluoride (SF6). The 185 countries and economies in the CAIT 8.0 database include the European Union as one and Taiwan Province of China.

[6] While GHG emission data are available only for 2005, CAIT 8.0 provides data on CO2 emissions for 2007.

5. For this reason collective action to mitigate climate change through drastic reductions in GHG emissions is called for. However, to date no consensus has been possible to conclude an international climate change treaty which would strengthening the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change and commit all countries to emission reduction targets when the first commitment period of Annex I (developed) countries' GHG emission reductions will end at the end of 2012. In particular, various developing countries have expressed concerns on such a treaty though there is no unifying position among them. Clearly, those that have no or negligible emissions but are severely affected by them (i.e. island developing countries like the Maldives, Tuvalu, Vanuatu) are strongly in favour of binding emissions cuts while emerging but large carbon emitting economies like China and India or major oil and gas exporting countries (e.g. Islamic Republic of Iran, Kazakhstan) obviously are concerned that binding commitments may undermine their economic growth. However, developing countries in general are reluctant to compromise their fragile development gains through emission cuts to address a problem which was not primarily caused by them. They are also concerned that the measures put in place in the name of environment by developed countries may be protectionist measures in disguise affecting their exports.[7]

6. Generally, while developed countries' main concern in climate change negotiations is cost-effectiveness of mitigation measures, for developing countries the main concerns are equity, the costs of climate change adaptation and technology transfer. For that reason, any international treaty on climate change should have clear provisions on equitable cost sharing, technology transfer and aid. In the meantime, negotiations continue but the outlook for a successful outcome any time soon seems bleak. However, nothing prevents countries to take measures at least voluntarily at the national and regional level. While such measures may not be sufficient in the long run they would constitute a meaningful beginning to seriously address the problem of climate change. There is at least consensus that the "business-as-usual" scenario is not acceptable.

III. Opportunities for trade and investment in climate goods and services

A. Opportunities for trade

7. There is a misperception that a good imported would always have a larger carbon footprint than when that good would be produced at home in because of the transportation factor. However, the carbon intensity of a good produced at home may be higher than that of an imported good. Thus, an ESCAP study[8] revealed that using so-called emission intensity indices of

[7] See, for instance: Evenett, Simon .J.; Whalley, John. (2009). Resist green protectionism –or pay the price at Copenhagen. In: Baldwin, Richard and Evenett Simon J. (eds.). The collapse of global trade, murky protectionism, and the crisis: Recommendations for the G20. VoxEU.org Publication.

[8] Truong, P. Truong; Mikic, Mia (2010). Trade and Climate Change: Development of Emission Intensity indices. ARTNeT Alerts on Emerging Policy Challenges No.6. August.

exports and imports,[9] it appears that China, Indonesia, and Viet Nam import commodities which are produced (overseas) with lower emissions than if they were produced locally, while the reverse holds true for Bangladesh, India and Thailand. Similarly, countries like Bangladesh, China, India, Indonesia, Thailand and Viet Nam export commodities which are locally produced with more emissions than the emissions which would have resulted from production locally in the destination countries. It is therefore important to make a detailed carbon intensity analysis of the trade structure of each country and make adaptations based on the results of such analysis. In other words, the concept of traditional comparative advantage needs to be refined to include a measurement of carbon footprint to ensure that such comparative advantage is also sustainable.

Table 2
Top 10 traders of CSGT in 2008 (ranked by the percentage share in total exports and imports of CSGT of ESCAP)

Rank	Economy	Exports (%)	Economy	Imports (%)
1	China	36.1	China	30
2	Japan	30.9	Republic of Korea	13.2
3	Republic of Korea	7.4	Japan	10.2
4	Hong Kong, China	7.2	Hong Kong, China	7.5
5	Singapore	4.2	Russian Federation	5.7
6	Malaysia	3.1	Singapore	5.1
7	India	2.6	Thailand	4.3
8	Thailand	2.5	India	4.1
9	Turkey	1.4	Australia	3.8
10	Indonesia	1.2	Turkey	3.5

Source: From Comtrade data downloaded from WITS

8. It follows therefore that not all trade is damaging to climate change. However, among the most important voluntary measures countries could implement are policies to promote trade and investment in low-carbon or climate-smart goods and technologies (CSGT), in particular renewable energy technologies, and climate-smart services. Such goods and technologies are climate-smart in that they not only contribute to GHG emission reductions but have otherwise no harmful environmental effect. Based on an analysis of a list of 64 of such goods and technologies, ESCAP research has revealed that global and regional trade in climate smart goods is rising but is still only around three per cent of total global and regional trade respectively.[10] The Asia-Pacific region is emerging as the most dynamic region with regard to trade in climate smart goods with China and Japan the top two exporting countries (table 2). In 2008, the ESCAP region

[9] The values of these indices range from 0 to infinite, but the important benchmark is a value of equal to 1. For example, if the emission intensity index of import is larger than one, emissions embodied in goods produced overseas and transported to a destination are larger than the emissions that would have been caused by local production in that destination of the same amount of goods. The index value of 1 indicates that emissions associated with imports of goods are the same as those associated with local production replacing trade.

[10] ESCAP (forthcoming). Trade, investment and climate change in Asia and the Pacific: Working together towards a triple win outcome.

accounted for about 31.9% of world trade in CSGT. The value of CSGT exports and imports tripled during the period 2002-2008. ESCAP's intraregional trade in climate smart goods is about 50 per cent of their total trade in these goods. The ESCAP region's intraregional trade in climate smart goods is about 50 per cent of their total trade in these goods.

9. ESCAP analysis using trade indices such as the Competitiveness Index (CI), Revealed Comparative Advantage (RCA) index, and Regional Orientation index (ROI)[11] and analysis of prevailing applied tariffs in selected countries of the region on climate-smart technologies based on the ESCAP list[12] revealed that there are considerable opportunities to expand international and regional trade and investment in CSGT. Based on RCA analysis alone, it appears that China; Hong Kong, China; and Japan have emerged as the region's most competitive countries in CSGT. Thanks to their strong positions, the RCA index of the ESCAP region as a whole remains just above one, indicating that the region has a comparative advantage in CSGT. An analysis of the ROI indicates also potential for intraregional trade in CSGT. Tariffs on the import of renewable energy technologies have come down in many cases though some countries with high emissions and comparative advantages in these goods still maintain relatively high tariffs. For instance, average effectively applied tariffs on solar PV in the Islamic Republic of Iran (33.19%), Pakistan (19.39%), Viet Nam (14.91%), and Cambodia (18.59%) were especially high in both absolute terms and relative to their corresponding industrial goods average (table 3).[13]

10. However, a simple gravity model analysis has revealed that tariffs play a minor role in explaining trade in CSGT. A higher level of income in any given country seems to be more associated with a higher level of import of CSGT than the tariff level. In addition, non-tariff barriers such as standards appear to be a major impediment to trade in CSGT. Gravity analysis has further found that based on 2008 data, the estimated export potential of climate smart goods in Asia-Pacific was around $30 to $35 billion in that year. If Asian and Pacific economies were able to utilize this potential, their exports of CSGT would have been higher by nearly $7.34 billion. With increasing awareness of climate change and rising trade in CSGT, an increase in trade in climate-smart services would also follow though data on such trade are not readily available and, hence, an analysis of such trade is more difficult.

B. Opportunities for investment

11. It is difficult to measure the extent of investment in CSGT. Figures for FDI in CSGT are particularly hard to assess. However, with focus on renewable energy technologies, it appears that the Asia-Pacific region is emerging as a global leader in overall investment. In sharp contrast to the decline in investment in the Americas and Europe, and in spite of the economic downturn, sustainable energy investment in Asia and the Pacific

[11] For a definition of these indices, see http://www.unescap.org/tid/artnet/artnet_app/iti_aptiad.aspx.

[12] The following categories of CSTs were used: solar photovoltaic (PV) systems, wind power, clean coal, efficient lighting, and other CSTs.

[13] These rates were calculated by the ESCAP secretariat based on on Comtrade data extracted from the World Integrated Trade Solutions (WITS) Database.

increased by 37 per cent in 2009. This compares to drops of 33 per cent in the Americas 16 per cent in Europe.

Table 3
Average effectively applied tariffs on climate smart energy technologies in the top 20 GHG emitting countries of ESCAP

GHG emissions regional rank (2005)	Country	Year (most recent year available)	All industrial goods average (%)	Solar PV (%)	Wind power (%)	Clean coal (%)	Energy efficient lighting (%)
1	China	2008	8.57	4.16	7.65	8.03	8.03
2	Indonesia	2007	5.84	5.93	4.81	0.00	7.63
3	Russian Federation	2008	8.19	4.33	4.14	8.85	0.00
4	India	2008	9.74	5.41	7.28	7.25	9.39
5	Japan	2008	2.61	0.00	0.00	0.00	0.00
6	Republic of Korea	2007	8.29	4.64	5.50	5.35	6.98
7	Australia	2008	3.93	1.91	6.88	0.69	3.97
8	Islamic Republic of Iran	2008	24.78	33.19	5.78	6.38	29.80
9	Turkey	2008	2.41	0.47	0.47	0.46	0.52
10	Thailand	2006	10.97	6.82	6.59	0.89	17.00
11	Malaysia	2007	5.91	7.51	4.39	0.00	25.11
12	Myanmar	2007	4.12	2.69	1.00	1.00	1.00
13	Pakistan	2008	14.04	19.39	31.80	4.63	19.97
14	Philippines	2007	5.00	4.97	0.84	2.07	9.88
15	Kazakhstan	2008	3.91	1.27	4.60	0.00	0.00
16	Viet Nam	2007	11.68	14.91	11.80	0.00	32.22
17	Bangladesh	2007	14.52	11.13	5.00	5.00	18.24
18	Singapore	2008	0.00	0.00	0.00	0.00	0.00
19	Cambodia*	2007	12.45	18.59	12.65	7.00	6.27
20	Turkmenistan*	2002	5.43	3.62	0.00	0.00	0.00
	AVERAGE		8.12	7.55	6.06	2.88	9.80

Source: calculated based on Comtrade data extracted from the WITS Database

Note: Ranking of countries by GHG emissions is based on 2005 data from Climate Analysis