

Statistical Yearbook for Asia and the Pacific 2015

13 CLIMATE
ACTION





Sustainable Development Goal 13

Take urgent action to combat climate change and its impacts

13.1 Climate-related disasters.....	1
13.2 Emissions.....	2
13.3 Data and monitoring issues.....	7

While the deadline for achieving all 17 Sustainable Development Goals is 15 years into the future, Goal 13 calls for “urgent” action to combat climate change and its adverse impacts.¹ Owing to the highly destructive nature of extreme weather events in Asia and the Pacific, recognition of the need for such rapid action is welcomed by the Governments of countries and areas in the region.

13.1 Climate-related disasters

Not only are disaster events in Asia and the Pacific often highly destructive, climate variability and the sudden impact of extreme weather events mean they are also difficult to predict. Based on observations since 1950,² the region is experiencing, among other phenomena, heavier rainfall and higher maximum wind speeds during storms, which cause large-scale local and transboundary floods, as well as greater extremes of temperature that have resulted in severe heat waves and prolonged droughts. Since 1970, records on the occurrence of floods and storms

in the region show the highest increases in such phenomena ever recorded.³ In the current decade, parts of the region were severely affected by Typhoon Haiyan, one of the strongest tropical cyclones ever recorded anywhere in the world, and Cyclone Pam, the most powerful storm to have ever made landfall in the Pacific. (Box 1)

Climate-related disasters have significant impacts on people's livelihoods and on economic assets and infrastructure; indeed, they are among the most potent causes of long-term impoverishment, particularly in rural areas.⁴

Over the last decade, climate-related disasters in Asia and the Pacific affected the largest number of people and accounted for the majority of damage and loss from all types of disasters

Between 2005 and 2014, the overwhelming majority (84 per cent) of the total reported natural disasters in Asia and the Pacific were of hydrological, meteorological and climatological origin. Floods and storms were the most frequent and largest climato-hydro-meteorological disasters in terms of the number of people affected and the amount of economic damage inflicted. In terms of fatalities, storms were the most deadly of the disasters in the region.⁵ (Fig 1, Fig 2, Fig 3 and Fig 4)

During the past 10 years, hydrological, meteorological and climatological disasters resulted in the death of nearly 300,000 people in the region.

Figure 1
Number of natural disasters by type, Asia and the Pacific, 2005-2014

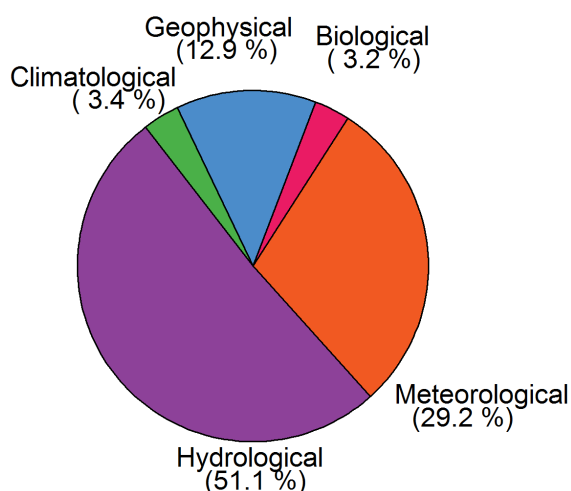
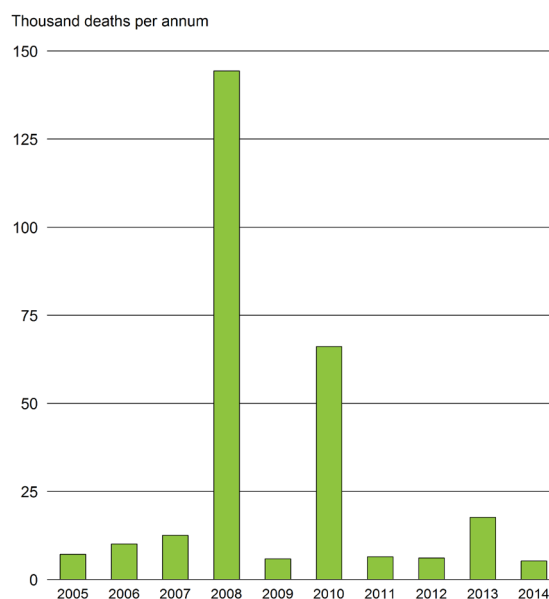
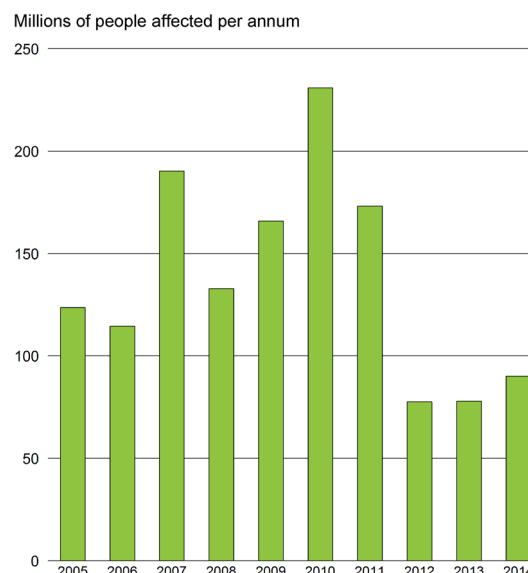


Figure 2

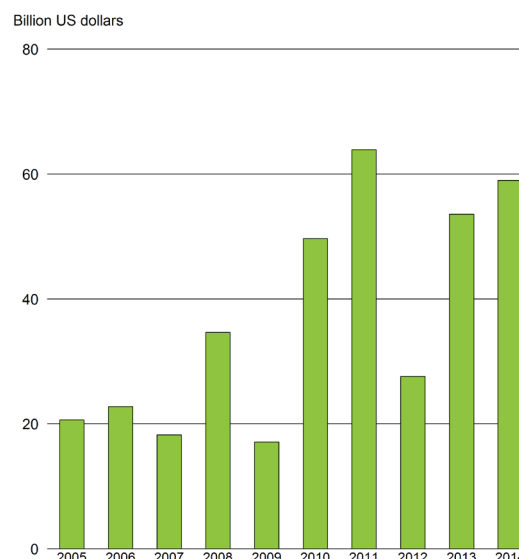
Number of deaths from hydrological, meteorological and climatological disasters, Asia and the Pacific, 2005-2014

**Figure 3**

Number of people affected from hydrological, meteorological and climatological disasters, Asia and the Pacific, 2005-2014

**Figure 4**

Economic damages from hydrological, meteorological and climatological disasters, Asia and the Pacific, 2005-2014



The deadliest event during this period was the category-3 Cyclone Nargis, which devastated parts of Myanmar in 2008; more than 138,000 people were killed or reported missing, 2.4 million people were adversely affected and as many as 800,000 people were displaced.⁶

From 2005 to 2014, a total of 1.37 billion people in the region were affected – injured, required immediate assistance or made homeless – by hydrological, meteorological and climatological disasters; in other words, an average of 33 per 1,000 people in the region were so affected every year. Such disasters accounted for about 95 per cent of the total number of people affected by all types of natural disasters in Asia and the Pacific in the past 10 years.

Over the same period, hydrological, meteorological and climatological disasters were responsible for 50 per cent of the total economic damage from natural disasters in the region, which was equivalent to \$367 billion in value. The highest reported losses (\$40 billion) in the past decade were recorded in Thailand mainly due to its devastating 2011 flood.

13.2 Emissions

Asia and the Pacific has emerged as one of the world's leading GHG emitters as a consequence of industrial and other activities in the region's rapidly growing middle- and high-income economies. The issue of rising GHG emissions can no longer be attributed solely to developed countries. The increasing level of emissions, including rising emissions per capita in the region, reaffirms the universal responsibility of all countries – developed and developing alike – to take urgent action for mitigation of climate change and adaptation to such change. The region's prospects for the inclusive and sustained economic growth necessary for eradicating poverty will depend on its ability to incorporate mitigation and adaptation considerations into national development policies and to transform its development patterns into those that are low-carbon and resource-efficient.

Box 1

Cyclone Pam

On 13 March 2015, Cyclone Pam, a category-5 tropical storm – one of the most powerful storms that ever made landfall in the Pacific – struck in Vanuatu. The intensity of Cyclone Pam can be compared to that of Typhoon Haiyan, which caused tremendous damage in parts of the Philippines in 2013. In terms of fatalities caused by Cyclone Pam, 11 were reported dead, with an estimated 65,000 people being displaced and approximately 17,000 buildings, including houses, schools and medical facilities, damaged or destroyed. The powerful cyclone destroyed crops on a large scale and adversely affected the livelihoods of at least 80 per cent of Vanuatu's rural population. The total damage and loss was estimated at approximately \$449.4 million, which is equivalent to 64.1 per cent of the GDP of Vanuatu.^a The President of Vanuatu, Baldwin Jacobson Lonsdale, stated that Cyclone Pam “set back the country's development by years.”

a Vanuatu, Prime Minister's Office, “Post-disaster needs assessment, Tropical Cyclone Pam, March 2015”. Available from http://reliefweb.int/sites/reliefweb.int/files/resources/vanuatu_pdna_cyclone_pam_2015.pdf.

Emissions continue to increase globally, with countries in Asia and the Pacific being responsible for more than half of global greenhouse gas emissions

Countries in the Asia-Pacific region, which is home to more than two thirds of the world's population, were responsible for emitting more than 26,725 million tons of carbon-dioxide-equivalent emissions in 2012, just over half (50.6 per cent) of the total of such emissions globally (Fig 5). While emissions per capita continue to remain relatively low, the region recorded an increase of roughly 3.1 per cent in such emissions over the period 2011 to 2012. By contrast, decreasing total emissions were recorded for both Europe (–0.5 per cent) and North America (–3.1 per cent). Since 1990,

Europe has cut the volume of its emissions by close to 23.5 per cent (by 2012), while emissions in Asia and the Pacific have increased by close to 70 per cent over the same period.

Of the 58 countries with data on emissions, 53 recorded an increase in their emissions over the same period, ranging from 0.2 per cent to 22.9 per cent. The largest increases in emissions levels were recorded in Nepal (22.9 per cent), Viet Nam (9 per cent), India (6.2 per cent) and Japan (5.9 per cent). However, some countries in the region reduced their GHG emissions: Australia (–3.1 per cent year-on-year); Uzbekistan (–1.9 per cent); Armenia (–0.8 per cent); Kyrgyzstan (–0.4 per cent); and Georgia (–0.3 per cent).

Middle- and high-income countries are responsible for 99 per cent of all greenhouse gas emissions in the Asia-Pacific region

Middle- and high-income countries in the region are responsible for 99 per cent of total regional GHG emissions, or 26,429 million tons of CO₂ equivalent. Upper middle-income countries account for 55.1 per cent of such emissions; China alone accounts for 84.6 per cent of emissions from upper middle-income countries, or 46.6 per cent of the total for the region. (Fig 6, Fig 7)

Figure 5
Greenhouse gas emissions, Asia and the Pacific and other world regions, 1990 to 2012

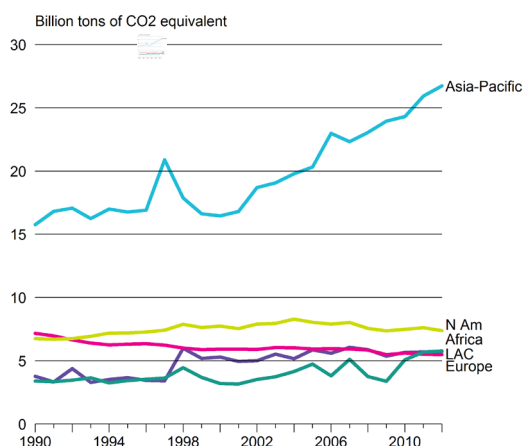


Table 1

Top 10
Greenhouse
gas emitters of
Asian and Pacific
region, 2012

		Greenhouse gas (GHG) emissions		
		Million tons of CO ₂ equivalent	% of regional emissions	% of global emissions
1	China	12 454.7	46.6	23.6
2	India	3 002.9	11.2	5.7
3	Russian Federation	2 803.4	10.5	5.3
4	Japan	1 478.9	5.5	2.8
5	Indonesia	780.6	2.9	1.5
6	Australia	761.7	2.9	1.4
7	Republic of Korea	669.0	2.5	1.3
8	Iran (Islamic Rep. of)	551.1	2.1	1.0
9	Myanmar	528.4	2.0	1.0
10	Turkey	445.6	1.7	0.8

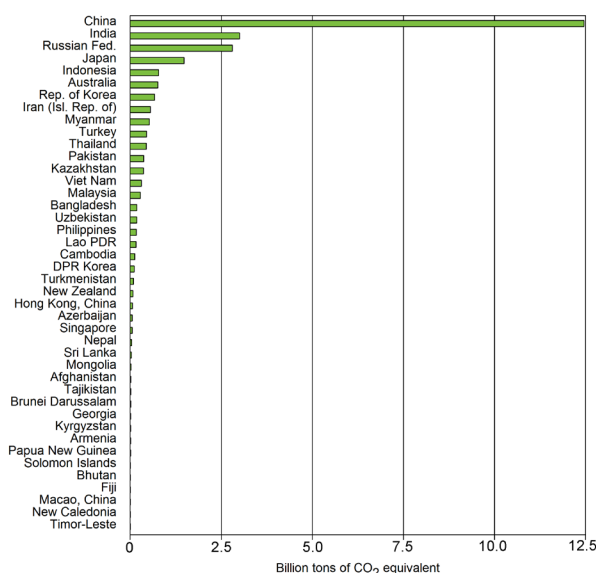
High and lower middle-income economies contribute roughly equal shares of regional emissions, 22.2 per cent and 21.7 per cent respectively; each group of economies in Asia and the Pacific emit more greenhouse gases than the individual regions of Europe, Africa, and Latin America and the Caribbean.

Close to 77 per cent of the total emissions from countries in the region can be attributed to the top five emitters (Table 1): China (12,454.7 million tons, or 46.6 per cent of the total), India (3,002.9 million tons, or 11.2 per cent), the Russian Federation (2,803.4 million tons, or 10.5 per cent), Japan (1,478.9 million tons, or 5.5 per cent) and Indonesia (780.6 million tons, or 2.9 per cent). The top 10 regional emitters, which additionally include Australia, the Islamic Republic of Iran, Myanmar, the Republic of Korea and Turkey, together account for close to 90 per cent of regional emissions (87.8 per cent, or more than 23,476 million tons of GHG).

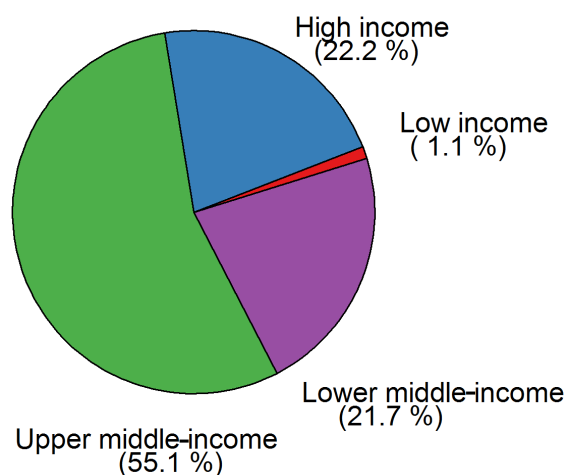
Emissions from low income countries remain negligible (equivalent to 1 per cent of the total for the Asia-Pacific region), with the most vulnerable Pacific small island developing States emitting just a fraction of 1 per cent (0.07 per cent).

Greenhouse gas emissions per capita are lower in Asia and the Pacific than any other region in the world except for Africa

Countries emitting substantial amounts of GHG tend to be those with large populations and sizeable economies. Examining GHG emissions per capita can provide some context to overall emissions data and help in adjusting for the impact of population growth on reported emission levels.⁷ In 2012, the Asia-Pacific region emitted an average of 6.3 tons of GHG (CO₂ equivalent) per capita, lower than any other region globally except for Africa (average emissions of 5.3 tons of GHG (CO₂ equivalent) per capita). In the Asia-Pacific region, there has been a steady rise in the emissions rate per capita since 1990;

**Figure 6**

Greenhouse
gas emissions,
Asia and the
Pacific, 2012

**Figure 7**

Greenhouse
gas emissions,
Asia and the
Pacific, 2012

the rate increased by 30 per cent since that time. In contrast, GHG emissions per capita have decreased since then in Europe (by 26 per cent compared with 1990 levels), and in Africa and North America (by 12 per cent each compared with 1990 levels). However, the Asia-Pacific region still is below the global average, which in 2012 stood at 7.5 tons of GHG (CO₂ equivalent) per capita.

The upper middle and high income economies in the region are responsible for the highest average of GHG emissions per capita, 9.0 and 16.4 tons of GHG (CO₂ equivalent) respectively. The Pacific subregion has the highest emissions rate per capita among the five subregions, at 22.9 tons of GHG, largely due to the inclusion in that subregion of two developed countries, New Zealand (17.6 tons of GHG per capita) and Australia (33.2 tons of GHG per capita).

The largest GHG emitter (on a per capita basis) in the Asia-Pacific region is Brunei Darussalam at 36.6 tons, followed by Australia and the Lao People's Democratic Republic at 33.2 and 25.0 tons respectively. China emits 9.2 tons

per capita, which is the same amount as that emitted by the continent of Europe; by contrast, the continent of North America emits 21.1 tons per capita.

The amount of greenhouse gas produced per unit of GDP is decreasing

GHG emissions intensity is a measure of the GHG emissions per unit of economic output. Decreasing levels of emissions intensity do not necessarily imply an overall decrease in total emissions – just that each unit of economic output is being created more efficiently – that is, with less GHG being emitted. Given the pace of economic growth in the Asia-Pacific region, the ability to deliver one unit of GDP growth while minimizing GHG emissions will be an essential component of a sustainable economic growth strategy and climate change mitigation actions.

The region's GHG emissions intensity has continued to fall since 1990, to 1.0 tons per \$1,000 of GDP in 2012, which is higher than the global average of 0.7 tons per \$1,000 of GDP. The region's reduction in GHG intensity since 1990 (–61 per cent) has been higher than the global average (–56 per cent).

Many countries in the region have made impressive reductions in GHG emissions intensity over the period 1990 to 2012, including Mongolia (93.5 per cent decrease), Indonesia (a 90.4 per cent decrease), Myanmar (a 94.9 per cent decrease), Viet Nam (an 87 per cent decrease), Armenia (an 89.2 per cent decrease), Azerbaijan (a 93.2 per cent decrease) and Turkmenistan (a 90 per cent decrease). By contrast, in 2011/12 Nepal, India and Japan increased their GHG emissions intensity by 25.9 per cent, 8.3 per cent and 5.3 per cent respectively. (Fig 8)

Figure 8
Annual percentage change in greenhouse gas emissions intensity, Asia and the Pacific, 1990–2012

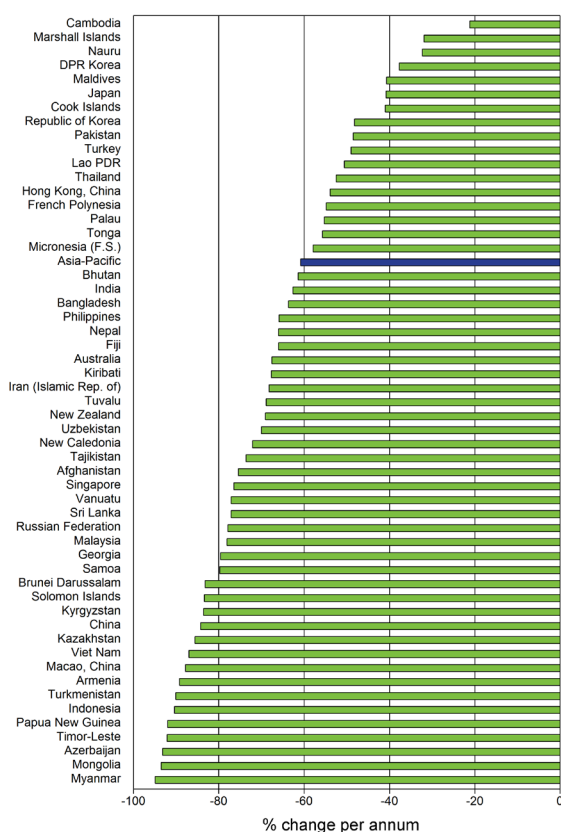


Figure 9

Emissions from agriculture, Asia and the Pacific and other world regions, 2012

Figure 10

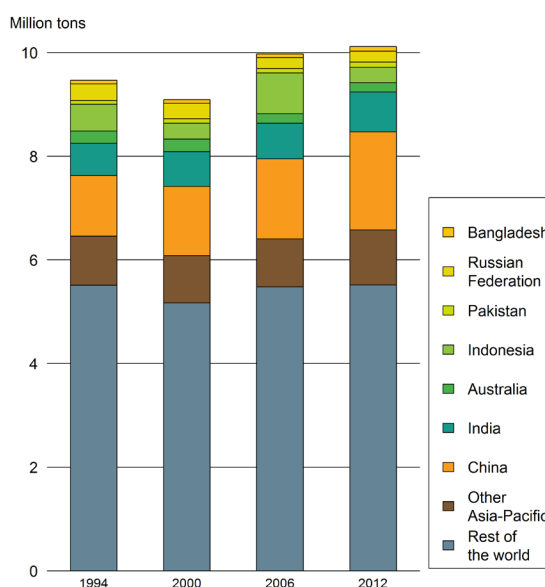
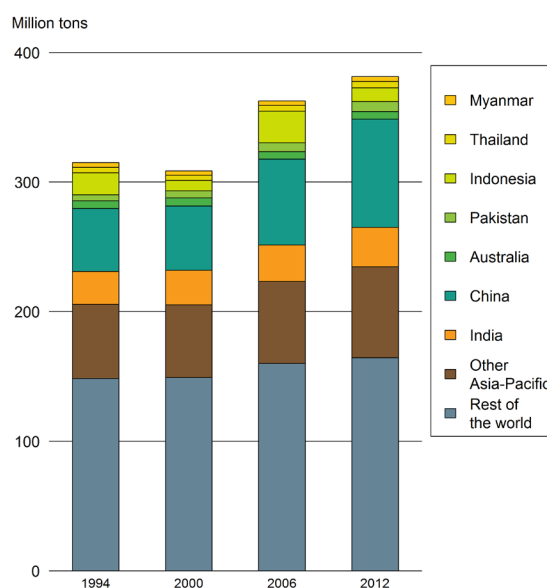
Methane (CH_4) emissions, Asia and the Pacific, 1994-2012

In 2012, Asia and the Pacific emitted 32 per cent more methane and 22 per cent more nitrous oxide than in 1990

Methane (CH_4) and nitrous oxide (N_2O) are greenhouse gases that have potential climate-warming effects that are 21 and 310 times,⁸ respectively, more powerful than that of carbon dioxide. For this reason, emission of these gases is monitored carefully. Countries in Asia and the Pacific have been found to emit 56.9 per cent of global CH_4 emissions and 45.5 per cent of total global N_2O emissions. However, CH_4 emissions per capita in the region (50.9 kg) are on par with the global average (53.9 kg). The Asia-Pacific region is second only to Africa (43.4 kg) in that regard, followed by Europe (51.2 kg), Latin America and the Caribbean (77 kg) and North America (82.6 kg). N_2O emissions per capita for the region (1.1 kg) similarly are on par with the global average (1.4 kg), although regional N_2O emissions are the lowest compared with those of Africa (1.8 kg), Europe (1.7 kg), Latin America and the Caribbean (2.3 kg) and North America (3 kg). (Fig 9, Fig 10)

CH_4 emissions in the region have increased by 32 per cent since 1990 to reach 217.2 million tons in 2012, while in contrast, CH_4 emissions have decreased by 30 per cent in Europe (30.3 million tons) and by 15 per cent in North America (28.9 million tons). The three largest producers of CH_4 emissions in the region are China (38 per cent of the regional total or 83.4 million tons), India (14 per cent or 30.3 million tons) and the Russian Federation (almost 12 per cent or almost 26 million tons). In the Russian Federation, however, methane emissions dropped by 13 per cent compared with 1990 levels, unlike in China and India, where the levels increased by 72 per cent and 24 per cent respectively, during the same period.

As the Asia-Pacific region has continued to develop, N_2O emissions have increased by 22 per cent since 1990, reaching 4.6 million tons in 2012; in the period 2011/12, those



emissions increased by 2 per cent. In contrast, N_2O emissions have decreased by 40 per cent in the developed European economies over the same period (a little more than 1.0 million tons in 2012). In 2012, N_2O emissions in China (almost 1.9 million tons) were 72 per cent higher than in 1990, and accounted for 41 per cent of total regional N_2O emissions, followed by India where N_2O emissions increased by 41 per cent since 1990 (773,404 tons in 2012) accounting for 16.8 per cent of the regional total.

The Asian and Pacific region is responsible for more than half the global GHG emissions from the agricultural sector (Fig 11). Furthermore, agricultural emissions, consisting mainly of CH₄ and N₂O gases, account for 10 per cent of the total regional GHG emissions (all sectors). A growing population and demands for increasing yields from the agricultural sector are fueling increases in agricultural emissions.

Figure 11
Nitrous oxide (N₂O) emissions,
Asia and the
Pacific, 1994-2012

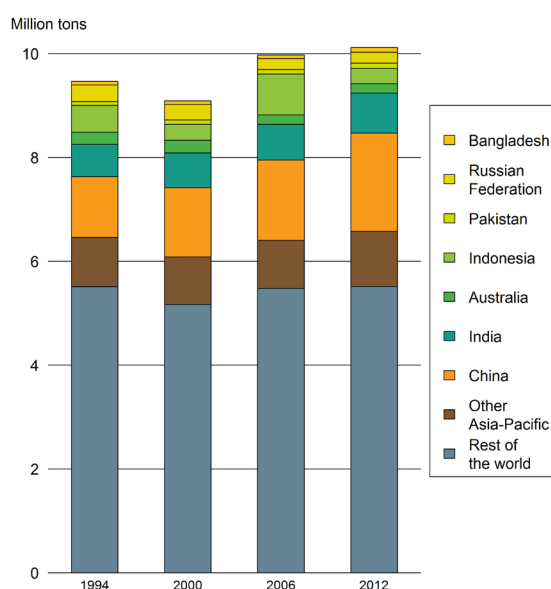
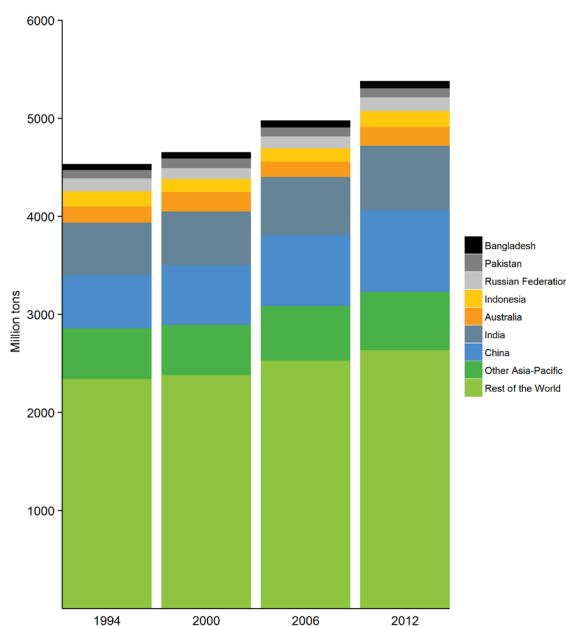


Figure 12
Greenhouse gas
emissions from
agriculture, Asia
and the Pacific
and the rest of
the world,
1994-2012



13.3 Data and monitoring issues

Possible under - or over - reporting of disasters

Emergency Events Database (EM-DAT), an internationally recognized database on natural and technological disasters, is the source of disaster-related data for the Statistical Yearbook. In terms of data coverage, EM-DAT contains data on disaster occurrences and their effects from 1990 to present that meet at least one of the following criteria.⁹ (1) 10 or more people dead; (2) 100 or more people affected; (3) declaration of a state of emergency, and (4) call for international assistance. Therefore, disaster data from EM-DAT could be under- or over- reported when comparing with the information from official sources based on national definitions and criteria. In addition, a blank cell in EM-DAT might be interpreted as missing values or non-reported information in a particular country for a particular year; or it could be due to the fact that no disaster occurred, or the disaster event(s) did not pass at least one of the criteria and thus was not recorded into the database. Furthermore, a '0' (zero) in EM-DAT does not represent a value and could mean that there is no information available.¹⁰

Addressing the challenge of measuring disasters - an emerging statistical framework

Reliability and comparability of disaster statistics has remained an issue particularly when comparing and analyzing data across countries. Even the most basic information on disaster occurrences, direct comparison of the number of disaster events from official sources may be misleading since the definition of a 'disaster' and how different types of disasters are defined and classified vary country by country. Meanwhile, official data on mortalities and affected people as well as direct economic impacts from disasters are not necessarily

compiled for statistical purposes. Due to a lack of standardized methodologies for the production of disaster statistics, global disaster databases including EM-DAT usually gather disaster data from a variety of secondary sources where data are typically inconsistent with the official figures.

In addressing the need for an agreed statistical framework/guidelines for improving disaster-related statistics, the ESCAP Commission at its 70th session in 2014 constituted an expert group comprising experts from national disaster management agencies and national statistical offices to develop a basic range of disaster-related statistics in Asia and the Pacific. It is anticipated that a draft statistical framework for disaster-related statistics will be presented during the 72nd ESCAP Commission in 2016.

Endnotes

- 1 General Assembly resolution 70/1.
- 2 Intergovernmental Panel on Climate Change, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change* (New York, Cambridge University Press, 2012). Available from http://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf.
- 3 United Nations, Economic and Social Commission for Asia and the Pacific, "Overview of natural disasters and their impacts in Asia and the Pacific, 1970-2014", ESCAP Technical Paper (March 2015). A copy of the publication may be downloaded from a link at <http://www.unescap.org/resources/overview-natural-disasters-and-their-impacts-asia-and-pacific-1970-2014>.
- 4 For detailed discussions on this topic, see United Nations, Economic and Social Commission for Asia and the Pacific, *Asia-Pacific Disaster Report 2015: Disasters without Borders – regional resilience for sustainable development* (Sales No. E.15.II.F.13).
- 5 Ibid.
- 6 For additional details on the post-disaster damage and needs assessment (PDNA) in Myanmar, see "PDNA at a glance, Myanmar, Cyclone Nargis, May 2008". Available from http://www.gfdr.org/sites/gfdr.org/.../Myanmar_PDNA_GLANCE.pdf.
- 7 See World Resources Institute, *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy* (Montreal, Canada, 2005), chap. 4. The full publication can be downloaded from a link at <http://www.wri.org/publication/navigating-numbers>.
- 8 United Nations Framework Convention on Climate Change, "Global warming potentials", which is based on data from "Climate change 1995, the science of climate change: summary for policymakers and technical summary of the Working Group I report", p. 22. For more information, especially on the time horizon of 100 years, see http://unfccc.int/ghg_data/items/3825.php.
- 9 For more information, see <http://www.emdat.be/frequently-asked-questions>.
- 10 Ibid.



1 NO POVERTY

2 NO HUNGER

3 GOOD HEALTH

4 QUALITY EDUCATION

5 GENDER EQUALITY

6 CLEAN WATER AND SANITATION

7 RENEWABLE ENERGY

8 GOOD JOBS AND ECONOMIC GROWTH

9 INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

16 PEACE AND JUSTICE

17 PARTNERSHIPS FOR THE GOALS

2 NO HUNGER

3 GOOD HEALTH

4 QUALITY EDUCATION