UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

Statistical Yearbook for Asia and the Pacific 2015

Sustainable Development Goal 15

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Since the United Nations Conference on Environment and Development,[1] which was held in Rio de Janeiro in 1992, awareness of the importance of biodiversity and protecting the condition of terrestrial ecosystems has greatly improved. Factors for protecting biodiversity and creating more sustainable relationships with terrestrial ecosystems, however, are still not well understood. Moreover, the full extent to which the ongoing permanent loss of biodiversity will affect human welfare in the future cannot be entirely known. What is clear, however, is that diversity of species and biomes, or terrestrial landscapes, has been declining, and this trend has major implications for sustainability.

Biodiversity is produced and protected naturally by ecosystems that are in a healthy state and protected from such drastic changes as deforestation and desertification. Sustainable Development Goal 15 is aimed at addressing the current rate of biodiversity loss, which some experts believe to be unprecedented since the last major global extinction event 65 million years ago. In Asia and the Pacific, the problems of biodiversity loss and ecological degradation have been growing. According, to the Living Planet Report 2014,[2] which contains synthesis data collected from biodiversity monitoring sites around the world, there has been a 52 per cent decline globally in biodiversity between 1970 and 2010, and South Asia, South-East Asia and the Pacific have the second highest rates of decline of species populations in the world, following that in Latin America.

15.1 Critical losses to primary forests in Asia and the Pacific

Countries in Asia and the Pacific face diverse challenges in improving the sustainability of terrestrial ecosystems due to vast differences in the scale and characteristics of current stocks of forests. Protected areas are one of the main tools used by Governments for conservation of the remaining forests, but these efforts have had mixed results, according to statistics on primary forests and numbers of threatened species.

During the past five years, the Asia-Pacific region permanently lost the equivalent of approximately 27,000 square meters of primary forest per day

An average of about 27,000 m^2 of primary forest is lost every day in the Asia-Pacific region. Over the five-year period from 2010-2015 the total area lost is equal to about 49,000 km^2 of primary forest, an area equal to nearly one third of the world's total loss of primary forests during the same period. In other words, this destruction

of Asian and Pacific primary forests during the past five years is equivalent in area to an average of 3,842 football fields per day. Primary forests are particularly important to biodiversity as they are exclusive habitats for many animal and plant species that cannot survive in planted forests or other types of environments. Primary forests comprise forests and other wooded land home to native species where there are no clearly visible indications of human activity, and the ecological processes are not significantly disturbed. After they have been lost, primary forests cannot be recovered except through major efforts to reintroduce native species followed by long-term protection of the candidate terrestrial landscapes.

The rate of annual loss of primary forest in Asia and Pacific exceeds the global average. The highest annual percentage change during the period 2010-2015 was observed in the Pacific subregion where the average rate of permanent loss of primary forest stock was 2 per cent per year. (Fig1)

In terms of cumulative percentage change since 2000, the largest percentage loss of primary forest area at the national level between 2000 and 2015 took place in the countries shown in figure 2. In the extreme case, Viet Nam lost more than 50 per cent of its primary forest area compared with the forest cover that had existed in that country in 2000.

In absolute terms, primary forest depletion in Indonesia exceeded 34,000 km^2 during the past 15 years. Land use and land cover change associated with forest depletion is one of the key growing sources of greenhouse gas emissions from Indonesia.[3]

The region's remaining primary forest areas are spread unevenly across countries and subregions. Large countries, such as the Russian Federation, account for the largest share by far of area. The primary forests in the Russian Federation accounted for more than 65 per cent of the region's total primary forest area in 2015. Other countries with large primary forests are Indonesia (11 per cent of the Asia-Pacific total) and Papua New Guinea (4.2 per cent).

The proportion of primary to total forest area in Asia and the Pacific is below the global average, at just over one quarter

Total forest area includes places with tree canopy cover of at least 10 per cent spanning more than half a hectare; total forest area includes plantation forests and areas covered with non-indigenous species. In terms of proportions of primary forest to total forest area, shares of primary forest in Asia and the Pacific are well below the global average. Developed countries tend to have smaller shares of primary forests compared with the developing and low income economies in the region. (Fig 3)

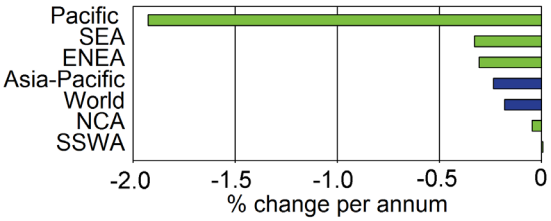


Figure 1
Annual percentage change in primary forest area by sub-region, 2010-2015

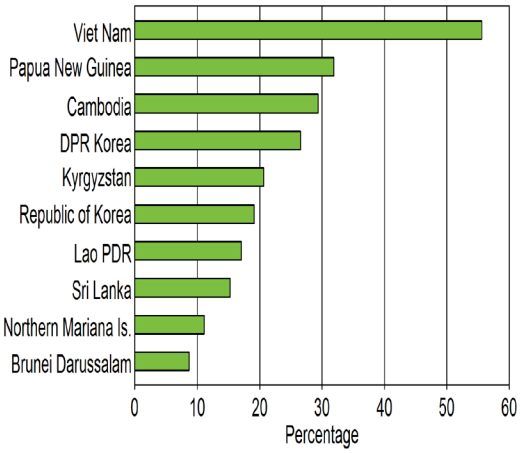


Figure 2
Loss of primary forest area (cumulative percentage change between 2000 and 2015)

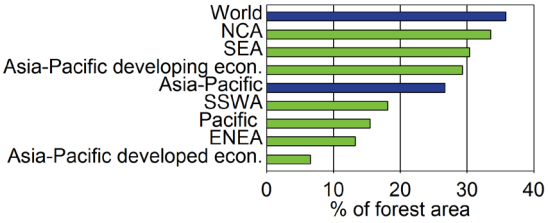


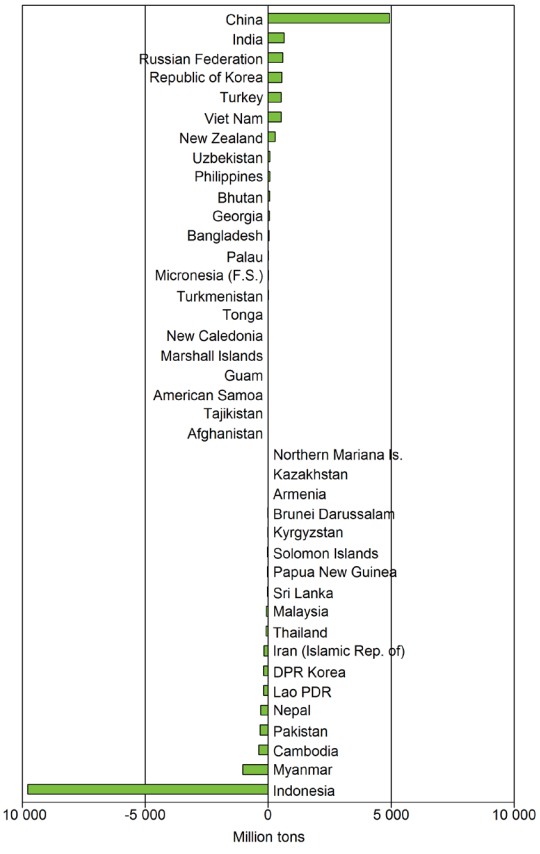
Figure 3
Percentage share of primary forest to total forest area

Qualitative differences are also relevant to protecting primary forests across the region. For example, tropical regions tend to have greater inherent biodiversity in forests, and consequently the largest absolute number of endangered species.

Another source of heterogeneity to consider when analysing statistics on primary forests is the causes or the manner in which deforestation occurs. Much of the illegal removal of trees from primary forests is to obtain wood for use as a household fuel. The cumulative effect of many illegal extractions from protected forests by proximate communities can be quite significant.[4]

Yet another method of deforestation is burning or clear-cutting. Burning and clear-cutting of forest areas, although controversial practices, continue to be one of the major sources of deforestation in the region; these practices have caused dramatic transformations of landscapes and often lead to critical endangerment or extinction of indigenous species, not to mention a source of health risks due to smoke created by burning. Ecologists have observed that relatively small tracts of primary forest, particularly in tropical regions, are sole habitats for species found nowhere else in the world. When such tracks of land are deforested or otherwise converted for other land uses, the possibility for further study of those unique species, their functions in the ecosystem and other potential benefits to humans, is permanently lost.

Figure 4
Changes in living biomass of forests for selected countries in Asia and the Pacific between 1990 and 2015



Since 1990, the stocks of living biomass in forests have increased slightly from 159 billion tons to 167 billion tons in 2015 in the Asia-Pacific region

As forests grow they produce new organic matter or biomass through photosynthesis, whereby carbon is absorbed and oxygen is respired. In addition to sequestering carbon as an offset to carbon emissions, accumulation of biomass is an indicator of productivity of the biological material that forms the basis for the food web and what is sometimes called a forest's metabolism. Given the context of climate and other relevant factors of growth, changes in the stocks of living biomass in forests form one of the basic indicators for monitoring the overall state of forests in a country.

Figure 4 shows the change in stocks of biomass in living carbon stocks, as measured in Global Forest Resources Assessments[5] for selected countries in Asia and the Pacific. Such data are indicative also of forest carbon sequestration and storage**.** Presented are cases for the Asian and Pacific region, where stocks of living forest biomass have dropped by 50 million tons or more between 1990 and 2015.

Since 1990, the stocks of living biomass in forests have increased slightly from 159 billion tons to 167 billion tons in 2015 in the Asia-Pacific region as a whole, but there have been significant declines, particularly in some of the large, naturally forested countries in South-East

Asia. For example, the living biomass of forests in Cambodia and Myanmar have shrunk at more than 1 per cent annually between 1990 and 2015; amounting to a total reduction of living forest biomass of 376 million tons and more than 1 billion tons in Cambodia and Myanmar respectively. In contrast, Viet Nam, mentioned above as the country with the highest relative rate of loss of primary forests, has actually recorded increased total storage of living forest biomass in 2015 as compared with 1990. Generally, primary forests accumulate biomass more slowly than plantation forests or other farms because the trees in primary forests are

Box 1

World Database on Protected Areas

The World Database on Protected Areas, which was jointly initiated by the United Nations Environment Programme and the International Union for Conservation of Nature (IUCN), is the most comprehensive global data set on marine and terrestrial protected areas in the world.

The criteria for inclusion in the database are based on the IUCN definition of a protected area: "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values".

Included in the database are nationally designated protected areas (designated under regional and international conventions and agreements) regardless of their size and the type of governance involved. There is limited scope for qualitative comparisons of protected areas except in cases of internationally designated sites, such as those covered by the Convention on Wetlands, the so-called Ramsar Convention, and World Heritage sites, where validation is handled by the secretariats for those international agreements.

Box 2

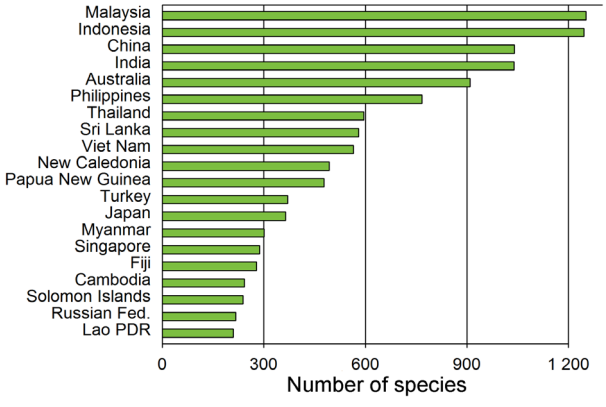
Monitoring threatened species

Tropical climates are characterized by their great biodiversity; countries located in such zones, therefore, have a potentially stronger biodiversity incentive for fostering conservation than countries in other climate zones. Thus, it is logical that the actual rate of increase of protected areas in Asia and the Pacific would be the highest among countries in tropical zones. A tool used by policymakers to preserve biodiversity in their countries is to identify threatened species and adopt specific provisions for their preservation.

Internationally, species are classified and monitored for threat of extinction through the "Red List of Threatened Species" of the International Union for Conservation of Nature (IUCN). Information contained in the Red List database is compiled from global studies, which can provide Governments with useful information for prioritizing conservation efforts and for identifying the likely important causes of species decline in their countries.

Figure

Number of threatened species countries of Asia and the Pacific with over 200 threatened species



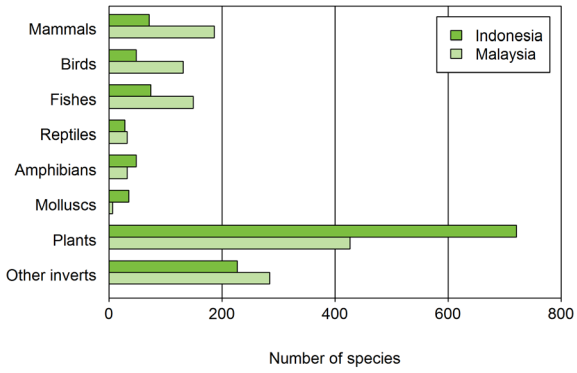


Figure 5
Distribution of threatened species in Malaysia and Indonesia by taxonomic group in 2014 (number of species)

likely to be in a relatively mature state, at which point their growth rates naturally slow and the canopy cover tends to limit the rate of growth of new trees. These factors demonstrate why it is important to consider multiple indicators related to forest cover and conditions in monitoring progress towards attaining Goal 15, particularly when monitoring at the national or regionally aggregated levels.w

15.2 Nationally protected areas as refuges for biodiversity

Many of the benefits from primary forests are public goods, meaning that the benefits are beyond the influence of market forces. Thus, efficient management of the trade-offs between preservation of remaining primary forests and deforestation or conversion of primary forests for other land use purposes depends on public designation and enforcement of protected areas. Many countries in Asia and Pacific have taken action to increase nationally protected areas during recent decades.

In the Asia-Pacific region hundreds of species are threatened with extinction

The number of threatened species in a country is typically higher in larger countries and in those with tropical rather than temperate climates. For the two countries in the Asia-Pacific region with the largest total number of threatened species, Indonesia and Malaysia, the distribution of listed threatened species, according to IUCN, is presented in box 2. Although Indonesia and Malaysia are neighbouring countries with a similar climate and similarly high levels of biodiversity, the number of threatened species by taxonomic group varies between the two of them. In Indonesia, more than twice the number of listed mammal and bird species are threatened than is the case in Malaysia, whereas Malaysia has nearly twice as many endangered plants than Indonesia. (Fig 5)

In practice, monitoring biodiversity requires more than adopting provisions for preserving a selection of species. In addition to species diversity, ecologists also emphasize the importance of monitoring specifically important habitats (such as primary forests), the diversity of landscapes and the diversity of niche roles within an ecosystem, such as the function of decomposers and apex predators. However, species endangerment comprises a useful baseline of information for policymakers that is easily understood by non-specialists.

15.3 Data and monitoring issues

The indicators described in this chapter were selected based on their coverage of comparable figures from existing international compilations. Statistics on protected areas contained in the World Database on Protected Areas provide good cross-country data. Those statistics are compiled by the UNEP World Conservation Monitoring Centre which updates the figures on a monthly basis and gathered in the Millennium Development Goals Indicators database. The availability of data on threatened species depends on the submission of studies meeting IUCN Red List criteria. Statistics on budget allocations for the protection of the conditions of ecosystems, including biodiversity, of both marine ecosystems (Sustainable Development Goal 14) and terrestrial ecosystems (Goal 15) are currently critically limited for making comparable analyses across countries in the region.

FAO Global Forest Resource Assessments, conducted every five years, provide a strong and broad baseline of statistical evidence for monitoring the management of forests at the nationally aggregated level; with good coverage of Asian and Pacific countries.

Box 3

Red List of Threatened Species

The Red List of Threatened Species of the International Union for Conservation of Nature (IUCN) is a compilation of results from global-level assessment studies of individual species. Systems of standard rules are applied to five general criteria for determining appropriate status, by species, according to the Red List classification. The criteria are related to the size of the population and its reduction, geographic range (including fragmentation) and demographic information related to reproduction.

IUCN publishes guidelines for applying the criteria for conducting assessments, for utilizing Red List categories and for transferring status between the classes.[a] The results of assessment studies evaluated for the Red List are classified according to the nine categories below. The indicator "Threatened species" refers to the sum of species classified as critically endangered (CR), endangered (E) and vulnerable (VU).

Extinct (EX)

A taxon (a biological classification, such as genus or species) is "Extinct" when there is no reasonable doubt that the last individual taxon has died. A taxon is presumed extinct when exhaustive surveys in a known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

Extinct in the wild (EW)

A taxon is "Extinct in the wild" when it is known only to survive in cultivation, in captivity or as a naturalized population well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in a known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

Critically endangered (CR)

A taxon is "Critically endangered" when the best available evidence indicates that it meets any of the criteria from A to E for being critically endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered (EN)

A taxon is "Endangered" when the best available evidence indicates that it meets any of the criteria from A to E for endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable (VU)

A taxon is "Vulnerable" when the best available evidence indicates that it meets any of the criteria from A to E for vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

Near threatened (NT)

A taxon is "Near threatened" when it has been evaluated against the criteria but does not qualify for the labels of critically endangered, endangered or vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least concern (LC)

A taxon is "Least concern" when it has been evaluated against the criteria and does not qualify for the labels of critically endangered, endangered, vulnerable or near threatened. Widespread and abundant taxa are included in this category.

Data deficient (DD)

A taxon is "Data deficient" when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking.

Not evaluated (NE)

A taxon is "Not evaluated" when it is has not yet been evaluated against the criteria.

a For details, see http://www.iucnredlist.org/technical-documents/assessment-process.

Analysis of currently available international compilations of indicators related to conservation of biodiversity provide only partial analysis

Biodiversity depends on many factors besides protected areas, including pollution and impacts from climate change. The poor correlations between the nationally aggregate indicators of protected areas and counts of threatened species shown in figure 6 suggests that these may not be good indicators for monitoring action to reverse a trend of biodiversity.

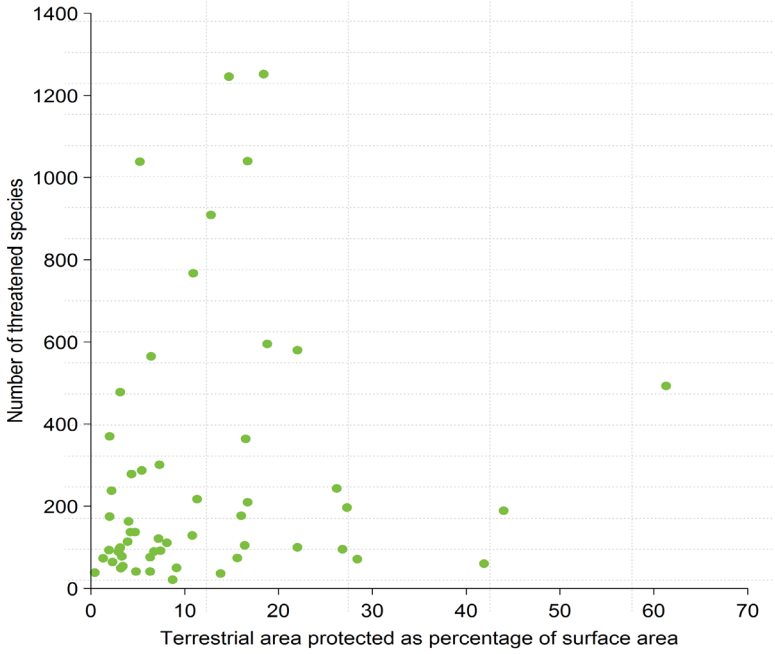
The analysis in this chapter is limited by the partial scope for monitoring of mankind's relationship with terrestrial ecosystems. Terrestrial protected areas provide a useful baseline of information on efforts to halt biodiversity loss, but more information is needed on the characteristics of protected areas and on enforcement of protection.

National shares of protected areas were also used under the Millennium Development Goals as an indicator for the biodiversity target for Goal 7. The experience from monitoring the Millennium Development Goals suggests that there are limitations to the value of this indicator for monitoring and taking action in respect of actual trends in biodiversity. The target concerned (7.B) was to "reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss". (Fig 6)

The Red List of Threatened Species depends not only on population size but also on geographic factors, such as spread and fragmentation of habitats. Terrestrial protected areas include all officially designated sites, but important characteristics relevant to biodiversity are not evident from these indicators, such as the degree of protection and enforcement, connectivity with other protected sites and condition of the fringe areas of protected areas and ecotones, which are regions of transition between two biological communities, such as the periphery areas between different land cover or landscape types.

Ecologists tend to study ecosystems by using detailed information and indicator, or keystone species or a range of data specific to a relatively homogeneous location, rather than by aggregating information across species or across a country's ecosystems. Even if an attempt were made to narrow the scope of a nationally aggregated analysis to the details of threats faced by different groups of taxa, such as threatened bird species which tend to depend on primary forests for habitat, the

Figure 6
The relationship between terrestrial protected areas and threatened species



correlations for national aggregates tend to be weak or non-conclusive.

Correlation is not the same as causality. However, one interpretation of weak or non-conclusive correlations between these aggregate indicators that have been traditionally used for monitoring biodiversity targets since the time of the Millennium Development Goals is that there are other significant factors for the underlying threats that are missed by such indicators.

Geospatial information is essential for monitoring biodiversity

The Red List compilations are not strictly for national-level reporting purposes. In fact, national-level assessment studies are not used for populating the Red List except in special cases of single-country endemic species, in which case the national study is technically a global assessment. ESCAP publishes annually updated figures on numbers of threatened species by country and by major taxa category as a high-level source of information for its member States. A complete assessment for baseline measurement and the assessments of progress, however, would need to take into account trends at other relevant geographic scales as well.

Nationally aggregated counts of threatened species can provide a rough summary of the overall scale of the challenge for individual countries in Asia and the Pacific, but more detailed information is needed for designing an effective course of action. As populations of threatened species may be concentrated in small areas of remaining habitat within a region or spread thinly over large areas and across international boundaries, future analyses for monitoring achievement of Goal 15 will require use of geographic information tools. In this way, policymakers will be able to link the best available evidence on threats to species biodiversity with investments in enforcing conservation commitments that are targeted for maximum benefit.

Investment in statistical development is needed to measure land degradation

Under Sustainable Development Goal 15, there is a call for "urgent and significant action to reduce the degradation of natural habitats," among other measures. Land degradation affects all countries and all regions of the world. Yet, despite the importance and global relevance of this issue, the statistics available for monitoring this target are very limited. Land degradation and desertification are two related issues, but in both cases data are lacking for regional or national monitoring.

Land degradation is a composite term; it describes how ecosystems have changed to a negative effect from the perspective of nature's contributions to well-being. Under the United Nations System of Environmental-Economic Accounting (SEEA), land degradation is estimated through compilation of data for the "Experimental Ecosystem Accounting" system. Experimentation with ecosystem accounting following SEEA proposals has been undertaken in only a few countries in Asia and the Pacific. Yet, the Experimental Ecosystem Accounting framework is potentially a very important basis for integrating statistics on biodiversity and the sustainability of economic activities into the official statistics systems of countries in Asia and the Pacific. However, investment is needed in application of the ecosystem accounting framework in the region that could be used to produce new indicators for countries where land degradation is an urgent threat to their ability to achieve Sustainable Development Goal 15.

Another form of land degradation cited in the Goal 15 targets is desertification. Desertification is a slowly developing risk, linked to changing climates and land use activity, that can result in a disaster for proximate communities, especially in cases where the risk is not carefully monitored by specialists and by policymakers.

The United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification,

Particularly in Africa,[6] was established following the United Nations Conference on Environment and Development in 1992. The Convention is aimed at reversing desertification and mitigating the effects of drought in affected areas in order to support poverty reduction measures and environmental sustainability.[7] Baseline statistics on desertification risks and trends in Asia and the Pacific are needed to initiate monitoring necessary for achieving the global target to combat desertification under Sustainable Development Goal 15.

Endnotes

1 Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex I.

2 WWF (World Wide Fund for Nature), Living Planet Report 2014: Species and Spaces, People and Places (Gland, Switzerland, 2014). Available from http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/

3 Wetlands Intenational, *Carbon emissions from peatlands* (Wageningen, The Netherlands). 2015

4 World Resources Insititute, *New Study Shows Indonesia Losing Primary Forest at Unprecedented Rates*, (http://www.wri.org/, Washing, D.C. USA). 2015.

5 The Food and Agriculture Organization of the United Nations (FAO) has been monitoring the world's forests at 5-10-year intervals since 1946. Assessments are published every five years; the one for 2015 is available from http://www.fao.org/forest-resources-assessment/en/.

6 United Nations, *Treaty Series*, vol. 1954, No. 33480.

7 The 10-year strategic plan and framework to enhance the implementation of the Convention is available from http://www.unccd.int/Lists/SiteDocumentLibrary/10YearStrategy/Decision%203COP8%20adoption%20of%20The%20Strategy.pdf. The 10-year period extends from 2008 to 2018.

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