



Netherlands Commission for
Environmental Assessment
Dutch Sustainability Unit

Climate Change Profile: DEMOCRATIC REPUBLIC OF THE CONGO (EAST)

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Advisory Report by the Dutch Sustainability Unit

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Climate Change Profile: Democratic Republic of the Congo (East)

This profile serves as input for discussions on climate change in Africa's Great Lakes Region. Therefore, it focuses on the eastern part of the country, mainly the provinces of Nord-Kivu and Sud-Kivu (bordering Uganda, Rwanda and Burundi) and to a lesser extent the provinces of Haut-Congo, Maniema and Katanga (see [Map 1](#)). Where no specific information was available for this region, country-wide information was used.

The Democratic Republic of the Congo (DRC) is very vulnerable to climate change. Physical vulnerability is relatively low: temperature will increase and rainfall patterns will change, but total rainfall will not change significantly and no large-scale water stress is foreseen. Socioeconomic vulnerability is however high, due to widespread poverty, high population density, and the country's conflict situation (the latter two especially in the east). Food security will be affected due to erosion, an increase in livestock/crop diseases, crop failure due to floods and heavy rains, and negative impacts on fisheries.

Overall ranking

DRC ranks 176 out of 180 countries in the ND-GAIN index¹ (2014), which is unchanged compared to its 2013 ranking (176). DRC is the 14th most vulnerable country and the 5th least ready country— meaning that it is very vulnerable to, yet extremely unready to address climate change effects. *Vulnerability* measures the exposure, sensitivity, and ability to cope with climate related hazards by accounting for the overall status of food, water, environment, health, and infrastructure within a country. *Readiness* targets those portions of the economy, governance and society that affect the speed and efficiency of adaptation.

Biophysical vulnerability

Current climate. DRC lies on the equator and its climate is dominated by the Intertropical Convergence Zone (ITCZ). In the regions near the equator, temperatures are high, humidity is high and it rains throughout the year with an average between 1600 and 2000 mm. Regions north and south of the equator, still have warm temperatures, but show more seasonal variation and have distinct dry and rainy seasons². South of the equator, the rainy season lasts from October to May and north of the equator, from April to November. In both cases, the rainfall regime is bimodal, meaning that there is a small dry season during this rainy season (see [Map 2](#) for an illustration of climatic variation in DRC).

¹ GAIN index summarizes a country's vulnerability to climate change and other global challenges in combination with readiness to improve resilience. <http://index.gain.org/country/dem-rep-of-the-congo>

² Climate Service Center Germany (2016). Climate-fact-sheet Democratic Republic of the Congo. Update version, 2015. Available via http://www.climate-service-center.de/036238/index_0036238.html

Annual **rainfall** for the whole of DRC is on average 1,070 mm. For the east of the country, it is higher; averages up to 1,570 mm per year have been reported³. Along the equator, rainfall is fairly regular throughout the year⁴. Average **temperature** of the country is 25 °C, but around the eastern lakes it is significantly lower – in some areas below 15 °C⁵.

Current trends. Between 1901 and 2013 a small increase in temperature (0.05 °C per decade) was found, which was stronger over the last 30 years (0.17 °C per decade). There was no substantial change in rainfall during this period⁶.

Climate change. Projected changes for total **rainfall** under climate change vary. For the eastern part of the country, changes between –200 mm and +200 mm are estimated, with most projections however estimating a slight increase in rainfall of ca. 10% between 2010 and 2100⁷ (see [Map 3](#)). **Temperature** change predictions are more consistent and estimate an average increase of 1–3°C between 2010 and 2050⁸ (see [Map 3](#)). For both temperature and precipitation, more frequent **extremes** are expected. For the northeast of the country, these changes are listed in [Table 1](#).

The main projections for the period 1990–2100 are:

- the number of cold days and nights will decrease (6–10%) while the number of hot days and nights will increase (13–58% for days, 33–86% for nights);
- more dry spells are expected during the rainy season (up to 108% more);
- duration of the rainy season is likely to decrease (changes estimated between –6% and +2%);
- during heavy rain events, rainfall intensity is likely to increase by 3–27%⁹.

These projections suggest that seasons of heat, drought and rainfall will become more intense. Moreover, changes in the east differ per season. Between 1990 and 2100, expected changes are:

- December–February: temperature +1–5°C, precipitation –4% to +26%;
- March–May: temperature +2–5°C, precipitation –3% to +13%;
- June–August: temperature +2–6°C, precipitation –10% to +13%;
- September–November: temperature +1–5°C, precipitation –3% to +17%¹⁰.

These changes are likely to result in an increased frequency of **extreme events**, primarily floods (resulting in erosion, landslides, and crop failure) but in some cases also droughts. Whereas

³ Beyene T., Ludwig F., Franssen W. (2013): The potential consequences of climate change in the hydrology regime of the Congo River Basin. In: Climate Change Scenarios for the Congo Basin. [Haensler A., Jacob D., Kabat P., Ludwig F. (eds.)]. Climate Service Centre Report No. 11, Hamburg, Germany, ISSN: 2192-4058. http://www.climate-service-center.de/imperia/md/content/csc/csc-report11_optimized.pdf

⁴ Haensler, A., Saeed, F. and Jacob, D. (2013): Assessment of projected climate change signals over central Africa based on a multitude of global and regional climate projections. In: Climate Change Scenarios for the Congo Basin. [Haensler A., Jacob D., Kabat P., Ludwig F. (eds.)]. Climate Service Centre Report No. 11, Hamburg, Germany, ISSN: 2192-4058. http://www.climate-service-center.de/imperia/md/content/csc/csc-report11_optimized.pdf

⁵ Beyene et al. (2013)

⁶ Climate Service Center Germany (2016). Climate-fact-sheet Democratic Republic of the Congo. Update version, 2015. Available via http://www.climate-service-center.de/036238/index_0036238.html.en

⁷ Haensler et al. (2013)

⁸ Nsombo, B.M., Thomas, T.S., Kyotalimye, M., Waitthaka, M. (2013): Chapter 3: Burundi. In: IFPRI (2013): East African Agriculture and Climate Change. <http://www.ifpri.org/sites/default/files/publications/rr181ch04.pdf>

⁹ GIZ, WUR, CSC (2013a): *Fact-Sheet – Climate – Democratic Republic of the Congo (DRC)– Zone 3*. http://www.climate-service-center.de/imperia/md/content/csc/kongo/fact_sheet_climate_drc.pdf

¹⁰ GIZ, WUR, CSC (2013a)

problems due to excess of rainfall are mainly expected in central DRC, droughts are forecasted primarily for the south¹¹.

Food security will be affected by land and infrastructure degradation due to erosion/land-slides¹², an increase in livestock and crop diseases due to temperature increase¹³, direct crop failure due to floods and heavy rains, and possible nutrient leaching and fungal growth due to high humidity¹⁴. **Water availability** will be affected by possible periods of drought, but no serious water stress or water shortages for agriculture are expected for the east of the country¹⁵. Both green water consumption in agriculture and evapotranspiration are expected to remain similar over the century¹⁶ (see [Map 4](#)). For urban areas, however, increasing population density combined with erratic rainfall may in some cases lead to water stress¹⁷.

Socio-economic vulnerability

Key facts:

| | |
|--|---------------------------------|
| GDP (PPP) per capita (2015) ¹⁸ : | USD 782.8 |
| Population (September, 2015) ¹⁹ : | 79,659,030 |
| Projected population (2050) ²⁰ : | 195,277,040 |
| Population density per km ² (2011–2015) ²¹ : | 33 |
| Human Development Index (2014) ²² : | 176 out of 188 countries |
| Corruption Perception Index (2015) ²³ : | 147 out of 168 countries |
| Gender Inequality Index (2014) ²⁴ : | 149 out of 188 countries |
| Adult literacy (2015) ²⁵ : | 63.8% (male: 78.1%; female 50%) |

A map presenting overall vulnerability to climate change for various countries in the Great Lakes region is included in [Map 5](#). The associated study concluded that DRC's vulnerability to climate change is low in terms of physical factors (climate hazards and environment) but high due to household and community vulnerability. Poor governance and high population density further increase climate vulnerability in the eastern region, mainly in the Great Lakes region

¹¹ BBC World Service Trust (2010): *Democratic Republic of Congo Talks Climate: The public understanding of climate change*. <http://r4d.dfid.gov.uk/PDF/Outputs/MediaBroad/02-Democratic-Republic-of-Congo-Talks-Climate.pdf>

¹² SIDA (2008): *Democratic Republic of Congo: environmental and climate change policy brief*. <http://www.sida.se/Global/Countries%20and%20regions/Africa/DR%20Congo/Environmental%20policy%20brief%20DR%20Congo.pdf>

¹³ SIDA (2008)

¹⁴ Ludwig F., Franssen W., Jans W., Beyenne T., Kruijt B., Supitl. (2013): Climate change impacts on the Congo Basin region. In: Climate Change Scenarios for the Congo Basin. [Haensler A., Jacob D., Kabat P., Ludwig F. (eds.)]. Climate Service Centre Report No. 11, Hamburg, Germany, ISSN: 2192-4058. http://www.climate-service-center.de/imperia/md/content/csc/csc-report11_optimized.pdf

¹⁵ GIZ, WUR, CSC (2013a); Ludwig et al. (2013)

¹⁶ GIZ, WUR, CSC (2013b): Fact-Sheet – Agriculture – Democratic Republic of the Congo (DRC)– Zone 3. http://www.climate-service-center.de/imperia/md/content/csc/kongo/fact_sheet_agriculture_drc.pdf

¹⁷ BBC World Service Trust (2010)

¹⁸ World Bank Data – GDP per capita, PPP. <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>

¹⁹ World Population Review – DRC. <http://worldpopulationreview.com/countries/dr-congo-population/>

²⁰ UNDESA (2015): *World Population Prospects: The 2015 Revision*. <http://esa.un.org/wpp/>

²¹ World Bank Data – Population density. <http://data.worldbank.org/indicator/EN.POP.DNST>

²² UNDP (2015). <http://hdr.undp.org/en/content/table-1-human-development-index-and-its-components>

²³ <http://www.transparency.org/cpi2015/results>

²⁴ <http://hdr.undp.org/en/content/table-4-gender-inequality-index>

²⁵ CIA (2015). The World Fact Book. <https://www.cia.gov/library/publications/the-world-factbook/geos/cg.html>

along the country's eastern border²⁶. The security and governance situation in the region has further worsened over recent years of conflict, leading to increasing poverty, displacement, immobility, and eroding social networks – all factors that contribute to climate change vulnerability. At the same time, climate change may be a contributing factor to conflicts in the future, especially related to scarcity of productive land²⁷.

In climate change issues, women are more severely affected than men: they are more vulnerable to climate change due to stronger dependency on climate-related resources (through their responsibility to provide or produce water and food). At the same time, their adaptive capacity is low because of limited mobility and restricted access to education and land ownership arrangements, combined with low female involvement in formal sector employment (30%) and political positions (20%)²⁸. Moreover, it has been reported that women in DRC have limited participation in discussions on climate change issues²⁹.

DRC's population has more than tripled over the past five decades, from 16 million in 1960 to 64 million in 2010. Population density is highest in the east of the country, particularly in towns at the Ugandan and Rwandan borders (500–2,000 persons per square kilometre)³⁰. Internal migration, partly due to ongoing conflicts, has led to land tenure issues including fragmentation of farm lands and absence of measures to improve long-term soil quality. This decreases adaptive capacity to climate change, and implies vulnerability especially for the agricultural sector and for food security.

The agricultural sector is not as important for the country's economy as in some neighbouring countries (Burundi, Rwanda), but still contributes 20.3% to GDP and it is estimated that 70% of the population is dependent on the sector³¹ ³², especially in eastern parts of the country. Moreover, the agricultural sector has been identified as one of the sectors with the highest vulnerability to climate change, and small-scale farmers are among the most climate change-vulnerable people in the country (next to the urban poor)³³. Even small changes in climate patterns are likely to have a major impact on agricultural GDP and economic growth³⁴.

The main staple crops in DRC, in order of importance, are cassava (throughout the country), maize (mainly in the central region), and groundnuts and rice (in smaller quantities). Both cassava and maize have been found to be sensitive to precipitation changes, which suggests that their yields will be affected by climate change. Projections of climate change effects for these crops are as follows:

²⁶ Doty, B., Grajeda, E., Phillips, P., Shrestha, A. (2011): Vulnerability to climate change: An assessment of East and Central Africa. <https://www.strausscenter.org/ccaps/publications/student-working-papers.html?download=36>

²⁷ SIDA (2008)

²⁸ AfDB (2013): *Democratic Republic of Congo: 2013–2017 Country Strategy Paper*. <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Democratic%20Republic%20of%20Congo%20-%202013-2017%20-%20Country%20Strategy%20Paper.pdf>

²⁹ Peach Brown, H.C. (2011): Gender, Climate Change and Redd+ in the Congo Basin forests of Central Africa. *International Forestry Review* 13(2), pp. 163–176

³⁰ Nsombo et al. (2013)

³¹ CIA World Factbook (2015). Available via <https://www.cia.gov/library/publications/the-world-factbook/geos/cg.html>

³² Nsombo et al. (2013)

³³ SIDA (2008); BBC World Services Trust (2010)

³⁴ Nsombo et al. (2013)

- cassava yields are expected to increase in all of the country³⁵ – although rising temperatures may also increase the risk of the cassava mosaic virus and other diseases³⁶;
- maize yields will decrease in all of the country (except western regions) – specifically in the southern part of Kivu province, losses of 0–25% are expected;
- rice yields will increase in the east of Kivu, along the lakes (and in some western regions);
- groundnut yields will have a modest yield increase.

For the total of DRC, yield losses in some areas are projected but they are expected to be offset by yield increases in other parts of the country. These developments will however not be sufficient to feed the rapidly growing population: the number of malnourished children will increase under all climate change scenarios³⁷.

Food security may also be affected through the effects of climate change on fisheries. Increasing water temperatures are reported for various lakes in the Great Lakes region, including Kivu and Tanganyika at DRC's eastern borders. Small variations in climate can cause wide fluctuations in freshwater thermal dynamics. For that reason, combined with the large dependency of poor parts of the population on fisheries, DRC has been identified as one of four most vulnerable countries in the world in terms of the effects of climate change on fisheries³⁸.

National government strategies and policies

DRC has ratified the UN Convention on Biological Diversity (CBD), the Convention to Combat Desertification (CCD), the Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. It prepared an Initial National Communication on climate change in 2001, prioritizing agricultural production, rural development, natural resource protection, conservation and development. Although a large number of activities were planned, political and economic difficulties initially prevented the implementation of all but two of the proposed activities (Agricultural/Rural Sector Recovery Programme and Protected Areas/National Parks Rehabilitation Project, both with GIZ assistance). After preparing a National Environment Action Plan and a National Biodiversity Strategy (2002), the government drafted a NAPA in 2006 – and consequently a Second National Communication on climate change in 2009.

The NAPA identifies five key priority areas: water resources, coastal area, health, agriculture, and land and ecosystem degradation³⁹. Activities under the NAPA were being implemented with support from UNDP, funded by the Least Developed Countries Fund, between 2010 and 2015⁴⁰. Specific activities that were implemented include improved meteorological monitoring and forecasting and local level resilience-building to climate change. The focus is however on provinces in western, central and southern DRC; the east of the country is not prioritized.

The Second National Communication on climate change also does not focus on the east of the country, but primarily on the coastal area and some vulnerable regions in the west. It does

³⁵ Nsombo et al. (2013)

³⁶ BBC World Services Trust (2010)

³⁷ Nsombo et al. (2013)

³⁸ IPCC (2014): *Climate change 2014: Impacts, adaptation, and vulnerability. Volume I: Global and Sectoral Aspects*. Chapter 22. Africa. http://ipcc-wg2.gov/AR5/images/uploads/WGIIAR5-Chap22_FGDall.pdf

³⁹ UNDP ALM website: <http://www.adaptationlearning.net/democratic-republic-congo-napa>

⁴⁰ GEF (2009): *The Least Developed Countries Fund (LDCF)*. https://www.thegef.org/gef/sites/thegef.org/files/publication/LDCF-factsheets09_0.pdf

however include some nation-wide strategies concerning agriculture and food security, with a focus on capacity building and improved technologies and infrastructure⁴¹. Climate change is also addressed in the country's Poverty Reduction Strategy Paper (PRSP), in which DRC expresses the aim to be a carbon sink by 2030. Again, east DRC is not specifically targeted⁴².

Some sources have indicated that DRC's challenges in terms of conflict (civil wars, armed groups in remote zones) and health (malaria and the combination of HIV/AIDS and tuberculosis) are stronger policy priorities than the effects of climate change. At the same time, conflict and health issues as well as destroyed infrastructure (partly also due to conflicts) make the country's population more vulnerable to climate change effects and thus make climate change policies and strategies more urgent⁴³.

It has been argued that ongoing civil war in DRC has perversely protected the country's forests from widespread destruction. If political stability however will increase, much-needed economic development of the country is likely to take off – which inevitably comes with increased risks to DRC's forests⁴⁴. Deforestation is already taking place, with over 300,000 hectares of forest being destroyed annually. This is partly due to government policies that have long neglected – or even supported – deforestation. It was estimated that between 2002 and 2005, for example, 15 million hectares of forest were given as concessions to the logging industry, while in 2007 a Chinese company signed a contract to develop over 3 million hectares as palm oil plantations. However, the majority of deforestation in the country continues to be driven by subsistence farming and small-scale agriculture⁴⁵.

The government is now acknowledging the problems of deforestation, not in the least place due to international attention for the topic, and has started to take action. The government aims to reduce over 18 million tons of GHG emissions over 30 years⁴⁶. In 2014, it initiated a pilot programme to safeguard 12.3 million hectares (10% of the country's total forests) in Maï Ndombe and Plateau, using the REDD+ mechanism⁴⁷ ⁴⁸. This programme combines enabling activities (strengthening governance, capacity building, local level land-use planning, securing and modernizing land tenure) and sectorial activities (reduce impact logging, agroforestry, fire management) in order to reduce deforestation and emissions⁴⁹. This climate action is urgent, since the country's tropical forests hold the largest carbon stock in Africa, equal to 17 million

⁴¹ Second National Communication – Executive Summary, p. 20. http://www.undp-alm.org/sites/default/files/downloads/drc-second_national_communication_2009_english.pdf

⁴² IMF (2013): *Democratic Republic of the Congo: Poverty Reduction Strategy Paper*. <http://www.imf.org/external/pubs/ft/scr/2013/cr13226.pdf>

⁴³ Tippmann, R.; Agoumi, A.; Perroy, L.; Doria, M.; Henders, S.; Goldmann, R. (2013): *Assessing Barriers and Solutions to Financing Adaptation Projects in Africa*. IDRC

⁴⁴ Gonzalez, G. (2014): *As DRC Emerges from Civil War, Government Seeks \$50 Million per Year to Protect Forests from Surging Development*. <http://www.forestcarbonportal.com/news/as-drc-emerges-from-civil-war-government-seeks-50-million-per-year-to-protect-forests-from-surging-development>

⁴⁵ Friends of the Congo (2008): *The Democratic Republic of the Congo: Rainforests and Climate Change*. http://friendsofthecongo.org/pdf/congo_rainforest.pdf

⁴⁶ Nakhooda, S.; Norman, M. (2014): *Climate Finance: Is it making a difference? A review of the effectiveness of Multilateral Climate Funds*. ODI. <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9359.pdf>

⁴⁷ Gonzalez (2014)

⁴⁸ <http://www.forestcarbonpartnership.org/sites/fcp/files/2014/MARch/DRC%20Summary%20English.pdf>

⁴⁹ Forest Carbon Partnership website: <https://www.forestcarbonpartnership.org/er-pins-fcpf-pipeline>

tons⁵⁰. It has been estimated that, in a worst-case scenario, complete deforestation in the country could cause up to 140 billion tonnes of greenhouse gases being released⁵¹.

Due to this attention to deforestation, the focus of climate action in DRC is mostly on the Congo Basin. This focus is urgent and logical, and easy to 'sell' to donors and climate funds (see below). However, it may conceal the fact that a vast part of this immense country – mainly in the east – is not receiving much climate attention, while climate action is moreover biased to mitigation instead of adaptation. An exception is a reforestation project from the Global Climate Change Alliance+, that focuses on the Virunga National Park, in the east of the country⁵².

Intended Nationally Determined Contribution (INDC)⁵³

DRC submitted its Intended Nationally Determined Contribution (INDC) on 18 August 2015, which sets an emission reduction target of **17%** by 2030, compared to a Business-as-Usual (BAU) scenario. This target of **17% is conditional** to adequate financial and technical support (financial resources, technology transfer and capacity building). Estimated cost of implementation of INDC measures are USD **21.64 million**, of which USD 12.54 million for mitigation and USD 9.1 million for adaptation⁵⁴.

Mitigation measures focus on agriculture, forestry and energy. The INDC mentions the following concrete measures for mitigation:

- Agriculture (43% reduction, USD 3.53 million):
 - smallholders and subsistence farmers, e.g. professional organization of farmers (co-operatives), promotion of settlement in eroded areas, introduction of Good Agricultural Practices, improving access to finance;
 - development of intensive agriculture and agribusiness, e.g. planning land for intensive agricultural use, promoting integration of livestock for fertilizer production, recovery of waste and by-products.
- Forestry (31% reduction, USD 5.1 million):
 - afforestation, e.g. reforestation and afforestation of degraded forests or deforested land, improved management of protected areas, financial incentives for deforestation reduction;
 - lumber, e.g. diversify use of forest species, implement low-impact forest management, fighting fraud;
 - mine and oil sites rehabilitation, e.g. set up monitoring system of mining and oil, mandatory implementation of Environment Management Plans;
 - bush fires, e.g. education on fighting bushfires, implement monitoring systems and bushfires management plans.

⁵⁰ Friends of the Congo (2008)

⁵¹ Gonzalez (2014)

⁵² <http://www.gcca.eu/national-programmes/africa/gcca-democratic-republic-of-congo>

⁵³ Republique Democratique du Congo (2015). Soumission de la contribution nationale prevue determinee au niveau national au titre de la convention des nations unies sur les changement climatique. Available via <http://www4.un-fccc.int/Submissions/INDC/Published%20Documents/Democratic%20Repub-lic%20of%20the%20Congo/1/CPDN%20-%20R%C3%A9p%20D%C3%A9m%20du%20Congo.pdf>

⁵⁴ Ministere de l'environnement et developpement durable (2015). INDC: Opportunity for Democratic Republic of Congo. Available via: https://unfccc.int/files/focus/indc_portal/application/pdf/indc_drc_v310815.pdf

- Energy (26 % reduction, USD 3.91 million):
 - fuel wood reduction and enhancing access to electric power: rural and urban hydro-electrification; promotion of efficient cook stoves and improvement of carbonization techniques; large-scale afforestation to cover fuelwood needs;
 - improving urban and intercity transport.

The INDC specifies the following **adaptation** measures, per sector:

- agriculture, e.g. resilient economic growth, implementation of the adaptation component of DRCs National Agricultural Investment Plan, integration of climate change resilience into development strategies and climate risk planning, investment in research and innovation, integration of early warning systems;
- forestry;
- energy, e.g. improving access to drinking water, used-water sanitation and sustainable waste management, improved infrastructure, capacity building;
- coastal management, e.g. fighting coast erosion, supporting income generating activities, early warning systems and capacity building.

Climate finance

In its NAPA, DRC estimated its adaptation funding needs for NAPA activities to be only USD 3 million. Indeed, the large amounts of donor funding that the country receives for climate action are mostly related to mitigation activities. It has been argued that adaptation is addressed merely 'as collateral'. Figures on the total amount of climate finance received by DRC vary among different sources. They range from USD 72 million for mitigation and USD 19 million for adaptation approved by 2014⁵⁵ to USD 146 million⁵⁶ or even USD 180 million⁵⁷ in total approved by the same year. DRC ranks second in the 'top 10 African recipient countries of climate finance', after South Africa⁵⁸. Yet it is not in the top 10 of worldwide recipient countries, which is dominated by Asian countries⁵⁹.

The Forest Investment Program (FIP) is the most active fund in the country, funding projects with a total of USD 67.83 million. In late 2015/ early 2016, DRC received a small readiness Green Climate Fund (GCF) grant of USD 300,000 in order to strengthen the capacity of its National Designated Authority⁶⁰, which is anticipated to open up funding opportunities from GCF in the future.

In April 2014, DRC drafted an Emission Reduction Programme Idea Note (ER-PIN) to apply for emissions reduction funds of about USD60 million up to 2020 under the FCPF's Carbon Fund program. These are intended for the Mai-Ndombe Emission Reductions Program (mentioned

⁵⁵ Nakhooda and Norman (2014)

⁵⁶ Climate Funds Update website: <http://www.climatefundsupdate.org/country-pages>

⁵⁷ Barnard, S.; Nakhooda, S.; Caravani, A.; Schalatek, L. (2014): *Climate Finance Regional Briefing: Sub-Saharan Africa*. ODI and HBF. <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9341.pdf>

⁵⁸ Barnard et al. (2014)

⁵⁹ Nakhooda, S.; Fransen, T.; Kuramochi, T.; Caravani, A.; Prizzon, A.; Shimizu, N.; Tilley, H.; Halimanjaya, A.; Welham, B. (2013): *Mobilising International Climate Finance: Lessons from the Fast-Start Finance Period*. ODI, WRI, IGES and Open Climate Network. http://www.wri.org/sites/default/files/mobilising_international_climate_finance.pdf

⁶⁰ http://www.greenclimate.fund/documents/20182/140177/Democratic_Republic_of_Congo_-_Inception_Report.pdf/e37c2963-33b9-4d95-8a66-3d22008e6ea2

above). DRC has received a readiness preparation grant to prepare for acceptance into the fund and is currently on track for received the first payments from the fund^{61 62}.

Climate change projects

A large number of climate change-related projects are implemented in DRC, funded through international funds, donors and/or bilateral relations. The vast majority of them focuses on forest conservation and reducing deforestation, and hence on other areas of the country than the eastern provinces. Examples include programmes under the Congo Basin Forest Fund, Forest Carbon Partnership Facility, Forest Investment Program, and UN-REDD.

Climate change projects targeting agriculture or food security appear to be very few. The most important projects in this respect are:

- a pioneering water initiative to protect the supply of safe water to Kinshasa, using IWRM, funded by the EU and implemented by UNEP (launched in 2012) which is meant to be expanded later to the Kivu and Katanga provinces⁶³;
- 'Addressing climate change in the DRC: support for training and reforestation' (2012–2017), funded by the Global Climate Change Alliance (GCCA), which has specific objectives for not only mitigation but also adaptation, and primarily targets the east of the country⁶⁴;
- Climate Resilient Altitude Gradient (CRAG): Birdlife International initiated this project, aiming to enhance climate change resilience in Great Lakes Region Watersheds (the Lake Kivu Catchment and Rusizi River). The project is estimated to run until 2017⁶⁵.

For a complete list of projects in DRC funded through bilateral/multilateral climate funds, see the list in the [Annex](#).

Climate contribution of the Netherlands Embassy: Pitch & Bid

Netherlands Embassies with development cooperation programs annually prepare a 'Pitch & Bids' to describe how they aim to contribute to climate change adaptation and mitigation in their food security and water activities. Since DRC is not one of these partner countries, it does not prepare a Pitch & Bid. However, the eastern DRC is part of the Great Lakes Region (together with Burundi, Rwanda and Uganda) for which a regional Pitch & Bid is developed. See the Climate Change Profile 'Great Lakes Region and Ruzizi Plain' for more information.

⁶¹ Gonzalez (2014)

⁶² World Bank (2016). Taking climate action from Paris to the rainforests. Available via <http://www.worldbank.org/en/news/feature/2016/06/22/taking-climate-action-from-paris-to-the-rainforests>

⁶³ <http://www.unep.org/disastersandconflicts/CountryOperations/DR Congo/News/DRWaterProject/tar-bid/105709/Default.aspx>

⁶⁴ <http://www.gcca.eu/national-programmes/africa/gcca-democratic-republic-of-congo>

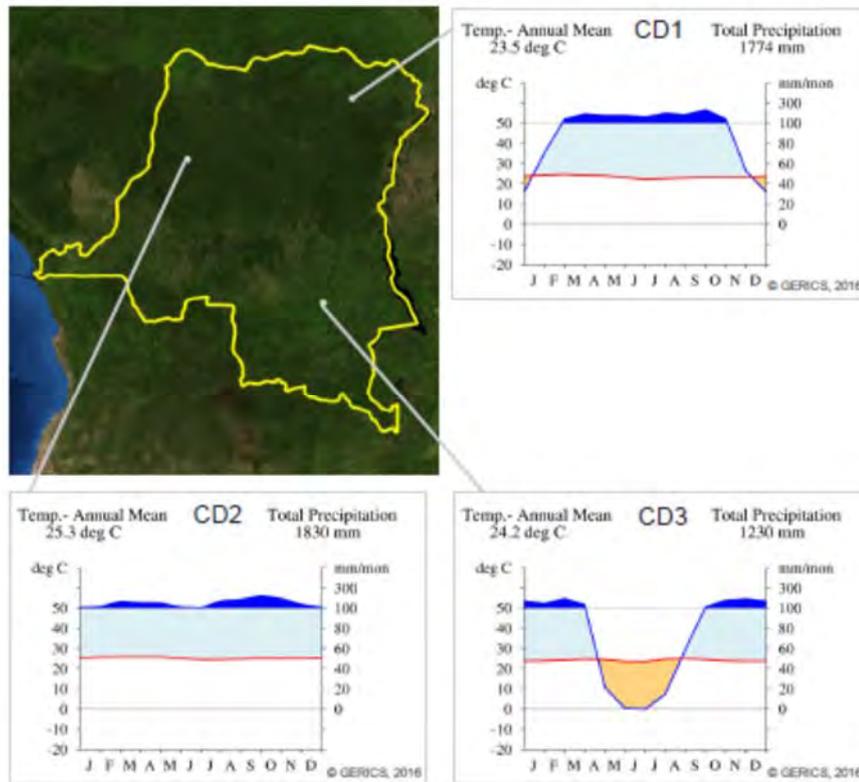
⁶⁵ http://www.birdlife.org/sites/default/files/attachments/CRAG-project_0.pdf

Map 1: Provinces of DRC



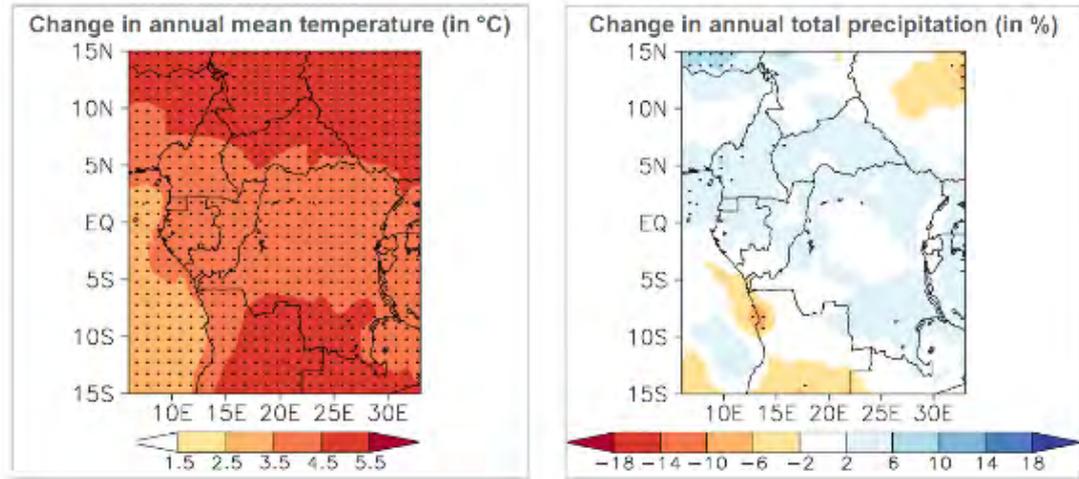
Source: <http://monusco.unmissions.org/Default.aspx?tabid=10702&language=en-US>

Map 2: Climatic variation in and around equator zones in DRC



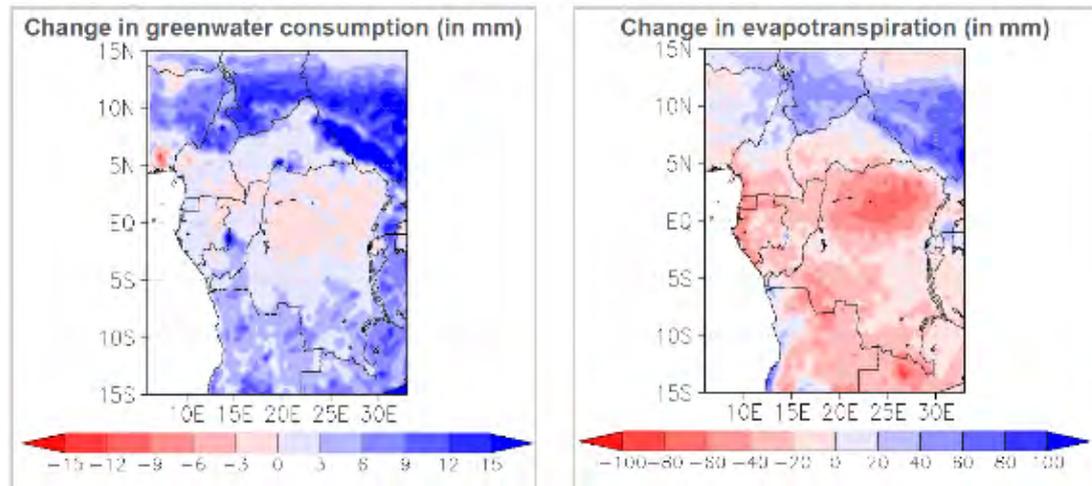
Source: CSC (2016). Climate-fact-sheet Democratic Republic of the Congo. Update version, 2015. Available via http://www.climate-service-center.de/036238/index_0036238.html.en

Map 3: Projected changes in temperature and precipitation, 1975-2050



Source: GIZ, WUR, CSC (2013a)

Map 4: Projected changes in green water consumption and evapotranspiration, 1975-2085



Source: GIZ, WUR, CSC (2013b)

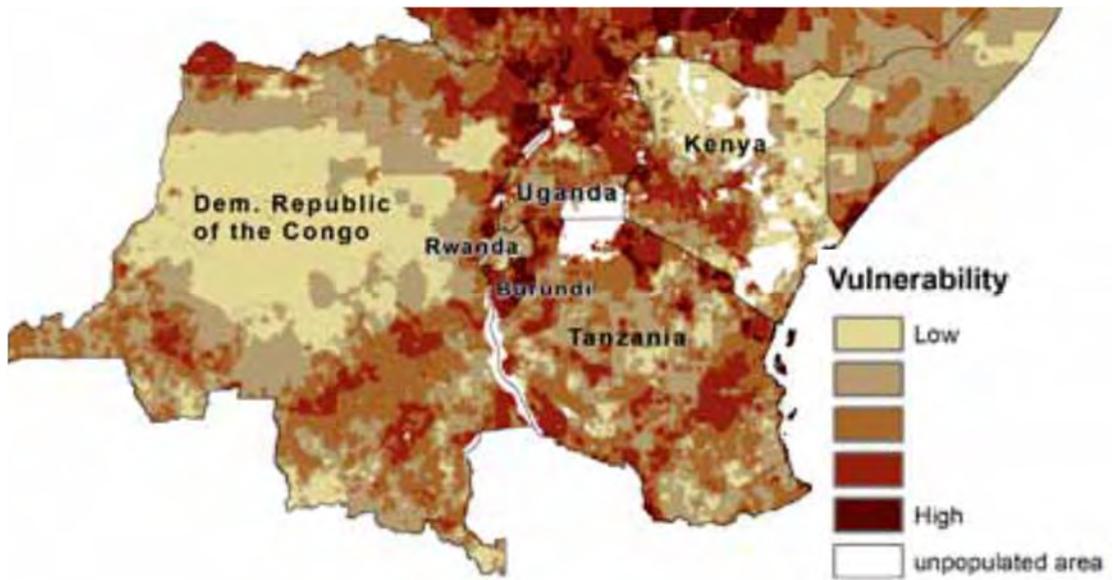
Table 1: Projected changes in temperature and precipitation, short-term and long-term, for DRC northeast (Haut-Congo, Kivu, Maniema)

| Observed mean values and projected changes of temperature based variables (Note: if below two units are mentioned the 1 st refers to the observations and the 2 nd to the changes) | | Observed | Projected changes | | | |
|---|------|----------|-----------------------|--------------|------------------------|--------------|
| | | | Low emission scenario | | High emission scenario | |
| | | Observed | 2036-2065 | 2071-2100 | 2036-2065 | 2071-2100 |
| Surface air temperature (in °C) | YEAR | 24.1 | +1.4 to +2.1 | +1.5 to +2.7 | +1.8 to +2.7 | +3.6 to +5.1 |
| | DJF | 24.1 | +1.4 to +2.0 | +1.5 to +2.6 | +1.9 to +2.5 | +3.6 to +4.8 |
| | MAM | 24.6 | +1.4 to +2.2 | +1.6 to +2.8 | +1.9 to +2.7 | +3.7 to +5.4 |
| | JJA | 23.4 | +1.4 to +2.3 | +1.7 to +3.0 | +2.0 to +2.9 | +3.8 to +5.6 |
| | SON | 24.1 | +1.4 to +2.0 | +1.5 to +2.5 | +1.7 to +2.4 | +3.6 to +4.6 |
| Cold nights (in %) | | - | -9 to -8 | -10 to -8 | -10 to -9 | ~ -10 |
| Cold days (in %) | | - | -8 to -5 | -9 to -6 | -9 to -6 | -10 to -9 |
| Hot nights (in %) | | - | +31 to +52 | +33 to +67 | +47 to +64 | +75 to +86 |
| Hot days (in %) | | - | +12 to +23 | +13 to +31 | +17 to +31 | +33 to +58 |

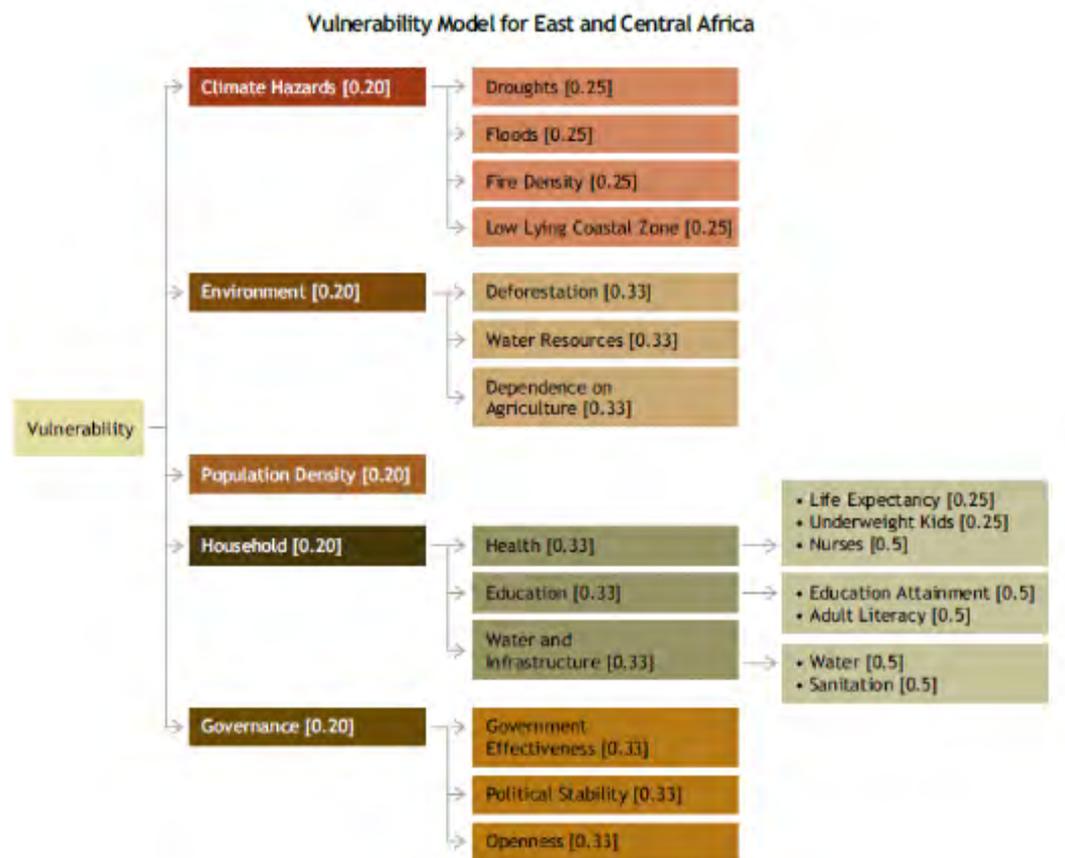
| Observed mean values and projected changes of precipitation based variables (Note: if below two units are mentioned the 1 st refers to the observations and the 2 nd to the changes) | | Observed | Projected changes | | | |
|---|------|----------|-----------------------|------------|------------------------|-------------|
| | | | Low emission scenario | | High emission scenario | |
| | | Observed | 2036-2065 | 2071-2100 | 2036-2065 | 2071-2100 |
| Total precipitation (in mm and %) | YEAR | 1716 | 0 to +6 | -1 to +8 | -1 to +6 | 0 to +11 |
| | DJF | 336 | -5 to +14 | -4 to +16 | -5 to +9 | -7 to +26 |
| | MAM | 489 | -2 to +8 | -3 to +8 | -3 to +6 | -1 to +13 |
| | JJA | 339 | -10 to +11 | -10 to +14 | -9 to +11 | -10 to +13 |
| | SON | 549 | -2 to +6 | -3 to +9 | -1 to +7 | -1 to +17 |
| Rainfall during rainy season (in mm and %) | | 1086 | -1 to +6 | -2 to +8 | -4 to +8 | -4 to +15 |
| Dry spells during rainy season (number and %) | | 2.4 | -2 to +61 | 0 to +66 | +5 to +78 | +10 to +108 |
| Duration of rainy season (in days and %) | | 159 | -3 to +1 | -4 to +2 | -4 to +2 | -6 to +1 |
| Intensity of heavy rain events (in mm/d and %) | | 31 | +3 to +10 | +3 to +14 | +4 to +13 | +6 to +27 |
| Frequency of heavy rain events (in % of all days) | | 1.9 | 0 to +1 | 0 to +2 | 0 to +2 | +1 to +3 |
| Maximum 10day rainfall sum (in mm/10d and %) | | 278 | 0 to +12 | +4 to +18 | +3 to +14 | +12 to +36 |

Source: GIZ, WUR, CSC (2013)

Map 5: Composite vulnerability to climate change

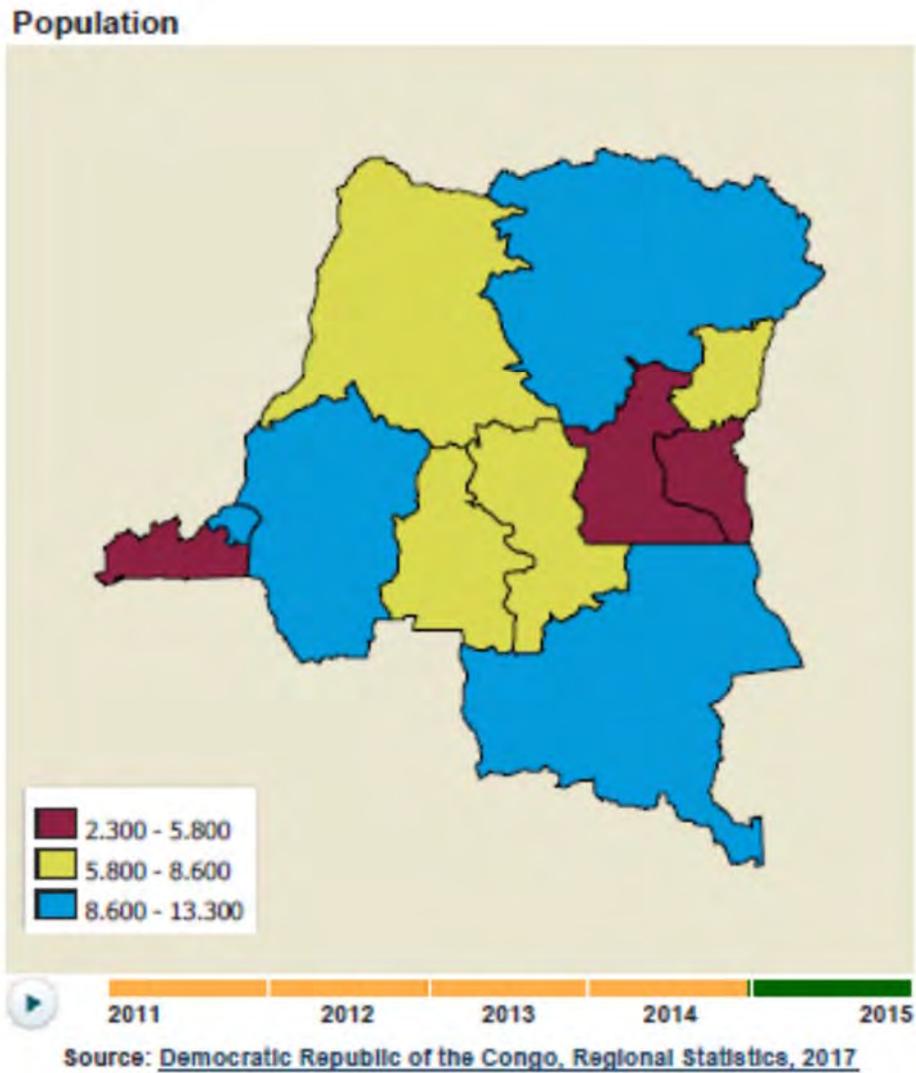


Indicators used:



Source: Doty et al. (2011)

Map 6: Population in DRC, specified per county



Annex: List of projects in DRC under bilateral and multilateral climate funds

Source: *Climate Funds Update (2016)*: <http://www.climatefundsupdate.org/data>

| Name of Project | Fund | Amount of Funding Approved (USD millions) | Dis-bursed (USD millions) | Fund Type |
|---|---------------------------------------|---|---------------------------|--------------|
| Building the Capacity of the Agriculture Sector in DR Congo to Plan for and Respond to the Additional Threats Posed by Climate Change on Food Production and Security | Least Developed Countries Fund (LDCF) | 3.1 | 3.1 | Multilateral |
| National Adaptation Programme of Action (NAPA) | Least Developed Countries Fund (LDCF) | 0.2 | 0.2 | Multilateral |
| Resilience of Muanda's Communities from Coastal Erosion, Democratic Republic of Congo | Least Developed Countries Fund (LDCF) | 5.5 | 5.5 | Multilateral |
| Improving Women and Children's Resilience and Capacity to Adapt to Climate Change in the Democratic Republic of the Congo | Least Developed Countries Fund (LDCF) | 4.8 | 4.8 | Multilateral |
| Strengthening Hydro-Meteorological and Climate Services | Least Developed Countries Fund (LDCF) | 5.5 | | Multilateral |
| Readiness program support | Green Climate Fund (GCF) | 0.3 | | Multilateral |
| Promotion of Mini and Micro-hydro Power Plants in Congo DR | Global Environment Facility (GEF5) | 3.2 | | Multilateral |
| Indigenous Peoples and Local Communities: Forest Dependent Communities Support Project | Forest Investment Program (FIP) | 6 | | Multilateral |

| Name of Project | Fund | Amount of Funding Approved (USD millions) | Dis-bursed (USD millions) | Fund Type |
|--|--|---|---------------------------|--------------|
| Consideration of climate change in the Democratic Republic of Congo (DRC) by the Global Climate Change Alliance (GCCA): support for training and reforestation | Global Climate Change Alliance (GCCA) | 15.7 | 1.6 | Multilateral |
| Direct support to the design and implementation of UN-REDD National Programmes | UNREDD Program | 7.4 | 7.1 | Multilateral |
| Readiness preparation grant | Forest Carbon Partnership Facility (FCPF) | 3.8 | | Multilateral |
| Integrated REDD+ Project in the Mbuji-Mayi/Kananga and Kisangani Basins | Forest Investment Program (FIP) | 21.5 | 0.3 | Multilateral |
| Improved Forest Landscape Management Project | Forest Investment Program (FIP) | 36.9 | 3.2 | Multilateral |
| Assessment and Development of a Modernised, Expanded network of protected areas | Germany's International Climate Initiative | 2.8 | | Bilateral |
| Development of a carbon storage map and carbon payment model for the DR Congo forest belt | Germany's International Climate Initiative | 7.8 | | Bilateral |
| Integrated Protected Area in the Ngiri Rainforest | Germany's International Climate Initiative | 3.8 | | Bilateral |
| Climate Resilient Altitude Gradient (CRAG) | Birdlife international | | | Bilateral |