



Netherlands Commission for  
Environmental Assessment  
Dutch Sustainability Unit

## Climate Change Profile: UGANDA

This profile is part of a set that was developed in a cooperation between:  
the Netherlands Ministry of Foreign Affairs (MFA), Ms K. Warner and  
Mr P. van de Logt (IGG)  
Aidenvironment, Ms M. van Schaik  
the Dutch Sustainability Unit (DSU), Ms G.L. Buit



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For more information or additional advice: [climatehelpdesk@minbuza.nl](mailto:climatehelpdesk@minbuza.nl)

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## Advisory Report by the Dutch Sustainability Unit

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<b>To</b>	Mr P. van de Logt (Netherlands Ministry of Foreign Affairs/IGG) Embassies of the Kingdom of the Netherlands
<b>From</b>	the Dutch Sustainability Unit of the Netherlands Commission for Environmental Assessment
Technical secretary	Ms G.L. Buit
Quality Control	Mr S.G. Nootboom
<b>Experts consulted</b>	Ms K. Warner (Netherlands Ministry of Foreign Affairs) Ms M. van Schaik (Aidenvironment)
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**Contact:**

W: [www.dsu.eia.nl](http://www.dsu.eia.nl)

T: 030-2347653

E: [dsu@eia.nl](mailto:dsu@eia.nl)

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## Climate Change Profile: Uganda

A landlocked country, Uganda's regions – the mountain regions, lowlands, and the cattle corridor – differ in their vulnerability and adaptive capacity. Agriculture is the main economic sector, accounting for 25% of its Gross Domestic Product (GDP) and employing 70% of the labour force. Uganda faces several developmental constraints, including high population growth (3.3%), post-conflict conditions in the north, soil erosion and degradation, and pernicious impacts of malaria and HIV/AIDS. Increasing variability in rainfall and rising temperature will present an additional stress on development in the country, especially with its high dependency on rain-fed agriculture. Rising temperatures and shifting or increasingly unpredictable rainfall patterns can reduce the extent of agricultural land, shorten growing seasons, hamper crop production, undermine the (ground) water resources and alter the occurrence and distribution of pests.

### Overall ranking

Uganda ranks 160 out of 180 countries in the ND-GAIN index<sup>1</sup> (2014), which is lower than its rank in 2013 of 156. Over the last 10 years, Uganda has steadily fallen in the ranking –from 139 in 2004 to 160 in 2014. Uganda is the 27<sup>th</sup> most vulnerable country and the 25<sup>th</sup> least ready country – meaning that it is very vulnerable to, yet very unready to address climate change effects. *Vulnerability* measures the exposure, sensitivity, and ability to cope with climate related hazards as well as 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*<sup>2</sup>. Uganda lies within a relatively humid equatorial climate zone, but the topography, prevailing winds and water bodies cause large differences in rainfall patterns across the country. Average annual **rainfall** ranges from 800 mm to 1500 mm, generally falling in two **seasons** in the south (March to May and September to November), and in one season in the north (April to October). Average daily temperature is around 28 °C, but varies with altitude (temperatures can reach 0 °C in the highlands)<sup>3</sup>.

Changes in sea surface temperatures in the distant tropical Pacific, Indian and, to a lesser extent, Atlantic Oceans strongly influence annual rainfall amounts and timing in Uganda. Year to year variations in annual rainfall can be considerable, and the onset of seasons can shift by 15 to 30 days (earlier or later). In some locations, the length of the rainy season can also change by 20 to 40 days from year to year, on the order of 0.5 °C.

*Current trends*. In comparison of records from 16 different climatic zones over two 30-year periods, from 1951 to 1980 and from 1981 to 2010 the data overall indicate no clear changes in annual **rainfall** in Uganda (save for a modest decrease in the northern districts of Gulu,

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<sup>1</sup> 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/uganda>

<sup>2</sup> Draws heavily from Uganda Climate Change Findings, USAID, ARCC brief, 2013 and USAID Climate Change Adaptation Plan, June 2012.

<sup>3</sup> Climate Service Center Germany (2015). Climate-fact-sheet. Uganda. Updated version 2015.

Kitgum, and Kotido, as well as Kasese in the west). However, rainfall patterns are expected to change – leading to a potentially less favourable rainfall distribution over the year and an increase of projected precipitation ranging between –2% and +22%. Analyses identified a statistically significant increase in **temperature** at a rate of 0.52°C per decade over the past 30 years<sup>4</sup>. The magnitude of observed warming, especially since the early 1980s is large and unprecedented within the past 110 years, representing a large deviation from the climate norm.

*Climate change.* Global projections downscaled to Uganda for the 2015–2045 period indicate that there may be an increase in **precipitation** during December, January and February, which has historically been the dry season across the country. Some models predict large variations across the country, with significant increases in rainfall in the north of the country and a decrease in the southeast (see [Map 1](#)).

The **warming** trend is projected to continue with some models projecting an increase of more than 2 °C by 2030. A warming ranging between 1.4 °C and 4.2 °C is projected for the end of the century<sup>5</sup>. There is a potential for an increase in the frequency of **extreme events** (e.g. heavy rainstorms, flooding, droughts, etc.). Uganda has experienced an increase in the frequency and intensity of droughts and floods in recent years. The percentage of rainfall coming in the form of heavy precipitation events is anticipated to increase, which would escalate the risk of disasters such as **floods** and **landslides**.

**Water resources** are likely to be increasingly strained in Uganda’s future climate. While it is projected that precipitation will increase in some parts of East Africa, warmer temperatures will accelerate evapotranspiration, reducing the benefits of increased rainfall. With more frequent and severe droughts, countries in the region, such as Uganda, will likely experience negative impacts on water supply, biodiversity, and hydropower generation. A shift in rainfall patterns will decrease the recharge of rainwater into the soil, which will have a negative impact on groundwater resources and water tables in wells. Climate changes may also affect the health of wetland and forest ecosystems, which provide critical ecosystem (and economic) services for communities.

If temperatures rise and the frequency and intensity of extreme droughts and floods increase, this can reduce crop yields and cause a loss in livestock, which will have important implications for **food security**. The increase in rain during dry seasons could have a significant impact on livestock and agriculture – especially on perennial crops and post-harvest activities such as drying and storage. An overall decrease in the predictability of rainfall intensity and onset of the rainy season increases the chance of crop failure.

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<sup>4</sup> Climate Service Center Germany (2015). Climate–fact–sheet. Uganda. Updated version 2015.

<sup>5</sup> Climate Service Center Germany (2015). Climate–fact–sheet. Uganda. Updated version 2015.

## Socio-economic vulnerability<sup>6</sup>

### Key facts:

GDP (PPP) per capita (2014) <sup>7</sup> :	USD 1,771
Population (July 2016) <sup>8</sup> :	40,333,979
Projected population (2050) <sup>9</sup> :	101,872,980
Population density per km <sup>2</sup> (2014) <sup>10</sup> :	188
Human Development Index (2014) <sup>11</sup> :	163 out of 188 countries
Corruption Perception Index (2015) <sup>12</sup> :	139 out of 168 countries
Gender Inequality Index (2014) <sup>13</sup> :	122 out of 188 countries
Adult literacy (2015) <sup>14</sup> :	78.4% (male 85.3%; female 71.5%)

Due to Uganda's poverty, low rural incomes and lack of income diversity the country (and its people) is very vulnerable to climate change. Through its heavy dependence on agriculture, the country's livelihoods and food security are particularly vulnerable to the effects of climate change, given the high proportion of the country's population that depends on rain-fed agriculture (ca. 70% of the labour force). Agriculture is a critical part of Uganda's economy. It accounts for 26.3% of Gross Domestic Product (GDP), employs 82% of the population and accounts for 50% of total export<sup>15</sup>. Half of the agricultural labour force is female farmers, focusing mainly on their families' food security rather than the production of cash crops.

Uganda has greatly diversified its export structure, by including a variety of crops. It moved away from only producing coffee, although it is still the 2<sup>nd</sup> largest coffee exporter in Africa. Climate change is likely to have a strong negative effect on coffee production (see [Map 2](#)). Uganda is also the largest source of locally procured maize in Africa for the World Food Program. Food staples in Uganda remain less expensive than in most neighbouring countries, which allow Ugandan farmers to compete with their food products across borders. However, agricultural productivity is threatened by land degradation and climate change effects (see [Map 3](#) and [Map 4](#) for effects of climate change on maize producing regions). Deforestation (resulting in erosion) is estimated at 2.3% a year mainly due to increasing demand for agricultural land and fuel wood by the rapidly growing population. Settlements and cultivation on steep slopes are further increasing the risk of landslides and rates of soil erosion<sup>16</sup>.

Rapid population growth and the expansion of farming and pastoralism under a drier and warmer climate regime could decrease the resilience of the ecosystem and dramatically increase the number of at-risk people in Uganda in the next 20 years. A recent vulnerability

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<sup>6</sup> Draws heavily from Environment and Climate Change Policy Brief: Uganda, E. Cesar and H. Wolf, Sida's Helpdesk for Environment and Climate Change, 2013.

<sup>7</sup> World Bank Data – GDP per capita, PPP. <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>

<sup>8</sup> World Population Review – Uganda. <http://worldpopulationreview.com/countries/uganda-population/>

<sup>9</sup> UNDESA (2015). *World Population Prospects: The 2015 Revision*. <http://esa.un.org/wpp/>

<sup>10</sup> World Bank Data – Population density. <http://data.worldbank.org/indicator/EN.POP.DNST>

<sup>11</sup> UNDP (2015) <http://hdr.undp.org/en/content/table-1-human-development-index-and-its-components>

<sup>12</sup> <http://www.transparency.org/cpi2015/results>

<sup>13</sup> <http://hdr.undp.org/en/content/table-4-gender-inequality-index>

<sup>14</sup> CIA (2015). The World Factbook – Uganda. Available via <https://www.cia.gov/library/publications/the-world-factbook/geos/ug.html>

<sup>15</sup> CIA (2015). The World Factbook – Uganda. Available via <https://www.cia.gov/library/publications/the-world-factbook/geos/ug.html>

<sup>16</sup> UNDP (2013): *Climate Profiles and Climate Change Vulnerability of the Mbale Region of Uganda: Policy Brief*. [http://www.undp-alm.org/sites/default/files/downloads/tacc\\_mbale\\_climate\\_profiles\\_policy\\_brief\\_final.pdf](http://www.undp-alm.org/sites/default/files/downloads/tacc_mbale_climate_profiles_policy_brief_final.pdf)

assessment suggests that many of Uganda's crops are vulnerable to the projected rising temperatures and rainfall pattern unpredictability (including increasing dry season rainfall). Overall, the report mentioned the following crops ranging from most to least sensitive to climate change effects: Arabica coffee, Robusta coffee, rice, maize, East African Highland banana (matooke), beans, sorghum, sweet potatoes, and cassava<sup>17</sup>.

It has been suggested that climate change greatly contributes to conflicts in Uganda. In many cases, areas with changing climate are coincident with zones of substantial conflict, indicating some degree of association. For example, the frequent scarcity of pastures and water resulting from droughts has been put forward as a major cause of intra- and inter-district as well as inter-regional conflicts. While the contribution of climate change to these conflicts is currently not well understood, it is anticipated that as extreme weather events e.g. floods and droughts become more frequent due to climate change there will be an increasing risk for conflicts, potentially also due to rising food prices.

Among the findings of the recent USAID vulnerability assessment (six research districts: Gulu, Lira, Luweero, Mbale, Isingiro and Kasese) was that households faced important challenges indirectly related to climate, such as declining soil fertility and increasing land pressure. Households reported (on average) being food insecure for almost three months in 2011<sup>18</sup>.

Specific attributes make some households more sensitive to climate variability and change. More vulnerable households are those with many of the following characteristics:

- lower proportion of able-bodied (working) members;
- less well educated;
- more likely to be headed by female;
- less likely to sell a portion of their crops or livestock;
- participate less frequently in community groups such as producer associations, cultural or labour savings groups, and religious organizations;
- earn income less frequently from off-farm sources (and when they do, that income is less than the amount that more secure households earn).

The systemic vulnerability of households studied also stems from the fact that they depend heavily on crops whose value chains are sensitive to climate variability and change; any change in food production critically increases overall vulnerability. For example, maize is an essential part of the diet of most vulnerable households. Households sell a small portion of their harvest; yet this small amount of maize sold represents a significant source of cash for the household. Less vulnerable households sell a greater portion of their harvest, and have other more important sources of incomes.

The level of income diversity affects the ability of households to adapt to climate change. The assessment concludes that households with greater adaptive capacity manage more diverse agricultural portfolios; they plant more crops and invest in livestock. They also have a more varied mix of on-farm and off-farm income sources. Marked differences by districts significantly affect this diversity. Access to land plays a strong role in on-farm diversification; as a result, land pressure in more densely populated districts, such as Mbale, increases

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<sup>17</sup> USAID and ARCC (2013): *Uganda Climate Change Vulnerability Assessment Report*. <http://community.eldis.org/.5b9bfce3/ARCC-Uganda%20VA-Report.pdf>

<sup>18</sup> USAID and ARCC (2013)

vulnerability. Proximity to urban centres also increases off-farm income and thus significantly reduces vulnerability to climate variability and change.

### **National government strategies and policies**

Being a natural resources based economy, Uganda identified sustainable management and use of natural resources – including the necessary measures for climate change mitigation and adaptation – as a priority. Especially for the agricultural sector, climate change is considered influential and calls for measures to enhance soil carbon as well as soil conservation practices<sup>19</sup>. But there are also international drivers of a focus on climate change: Uganda 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.

Such priorities and measures are elaborated in national strategies and policies, and supported via various sources of funding. Although there is an increasing number and variety of policy documents, it has been stated that national policy articulation on climate change is becoming increasingly consistent, clear, and coherent<sup>20</sup>. It has however also been stated that policies are unlikely to produce useful strategies for Uganda's farming communities if they are not complemented by locally relevant and tested strategies for adaptation<sup>21</sup>.

Uganda developed and implements a number of national policies and strategies related to climate change. Its National Adaptation Programme of Action (NAPA), firstly, prioritized the following nine sectors:

- Community Tree Growing Project;
- Land Degradation Management Project;
- Strengthening Meteorological Services;
- Community Water and Sanitation Project;
- Water for Production Project;
- Drought Adaptation Project;
- Vectors, Pests and Disease Control Project;
- Indigenous Knowledge and Natural Resource Management;
- Climate Change and Development Planning Project<sup>22</sup>.

However, only a few of these projects were financed and implemented.

The National Adaptation Plan is currently under preparation.

To date, Uganda has submitted nine proposals seeking support for the preparation of Nationally Appropriate Mitigation Actions (NAMAs). These proposals focus on waste management (solid waste, waste-water treatment), energy (institutional stoves), agriculture (livestock methane emissions; high-yielding upland rice), and transport (a bus transit, vehicle emissions inspection, fuel efficiency).

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<sup>19</sup> Republic of Uganda (2012): National report on progress on the implementation of the Rio commitments on sustainable development in Uganda (draft).

<sup>20</sup> Tumushabe, G.; Muhumuza, T.; Natamba, E.; Bird, N.; Welham, B.; Jones, L. (2013): *Uganda National Climate Change Finance Analysis*. <http://www.cbd.int/financial/climatechange/uganda-climate.pdf>

<sup>21</sup> USAID and ARCC (2013)

<sup>22</sup> Republic of Uganda (2007): *Uganda National Adaptation Programmes of Action*. <http://unfccc.int/re-source/docs/napa/uga01.pdf>



The National Development Plan II (NDPII, 2015–2020) notes that climate change is one of the greatest challenges for Uganda to realise its Vision 2040 of a transformed modern and prosperous country. The response is to mainstream climate adaptation and mitigation into sector planning and implementation. NDP2 promotes a low emissions development (LED) pathway for the country and to climate-proof national development.

The National Vision 2040 prioritizes among others renewable energy, appropriate adaptation and mitigation strategies, knowledge and information sharing on climate change, increased coordination and capacity, and improved monitoring/evaluation regarding climate change interventions<sup>23</sup>. An important operationalization of this vision is the ‘National Strategy and Action Plan to strengthen human resources and skills to advance green, low-emission and climate-resilient development in Uganda 2013–2022’. This learning strategy aims at reviewing and updating the skills and knowledge of key institutions and individuals<sup>24</sup>.

An important development was the approval of a Climate Change Policy in early 2015. Priority concerns in this policy are climate change adaptation, mitigation, and research and observation. The policy identifies common policy priorities as well as adaptation and mitigation responses, aims to strengthen prediction and monitoring of climate change, supports integration of climate change issues in planning, decision-making and investments, and facilitates mobilization of financial resources to address climate change<sup>25</sup>. The policy is accompanied by a costed implementation strategy which contains more detailed provisions. These include a roadmap to early policy implementation, an elaboration of the institutional framework (including on the Focal Climate Change institution and the National Climate Change Commission – see below), and an overview of resources/funding required for implementation of the policy. The document identifies international climate funds as an important potential source to cover these costs, estimated at USD 93 million for adaptation and USD 26 million – for mitigation, for the first year of implementation (and an additional USD 10 million for monitoring, coordination, etc.)<sup>26</sup>.

The implementation of the Climate Change Policy has been delayed due to the lack of progress in the preparation and submission to Parliament of a climate change bill that would provide the legal and regulatory framework for the operationalization of the policy. The climate change bill is still under preparation and it is anticipated that it will be submitted to Parliament in 2017.

Many Ugandan institutions are associated with climate finance and policies/strategies on climate change. A study identified 11 Ministries involved, and a further 9 subsidiary agencies. As a result of the approval of the Climate Change Policy, Climate Change Department (CCD) within the Ministry of Water and Environment has replaced the Climate Change Unit. The CCD, with support from UNDP and working closely with the Ministry of Planning, is preparing a Green

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<sup>23</sup> Government of Uganda (2013): *Uganda Vision 2040*. <http://npa.ug/wp-content/themes/npatheme/documents/vision2040.pdf>

<sup>24</sup> Ministry of Water and Environment – Climate Change Unit (2013): National Strategy and Action Plan to strengthen human resources and skills to advance green, low-emission and climate-resilient development in Uganda 2013–2022.

<sup>25</sup> Maikut, C. (2013): *National Climate Change Policy – Overview*. Ministry of Water and Environment – Climate Change Department.

<sup>26</sup> Republic of Uganda – Ministry of Water and Environment (2013): Uganda National Climate Change Policy – Part II: Draft Costed Implementation Strategy.

Growth Strategy which will provide guidance for the implementation of NDPII and support the implementation of Uganda's NDC.

While some progress has been made on the development of policies and strategies, a well-defined institutional setup with appropriate capacity to implement them is still missing. This is not only the case at the national level, but also – maybe more – at local levels, where the implementation challenge is most acute<sup>27</sup>.

### **Intended Nationally Determined Contribution (INDC)**

In its Intended Nationally Determined Contribution (INDC), Uganda presents itself as being highly vulnerable to the impacts of climate change<sup>28</sup>. Uganda's GHG emissions are relatively low (a national contribution of 0.099% of global emissions) –with one of the world's lowest emissions rates per capita. The total cost of adaptation and mitigation measures mentioned in the INDC are estimated at \$5.3 billion (\$2.9 billion for mitigation and \$2.4 billion for adaptation), of which 70% is conditional upon international support and 30% will be covered by national sources.

Uganda's INDC strongly maintains that its major concern is *adaptation* rather than mitigation, and prioritizes the following sectors:

1. agriculture and livestock: actions include expanding climate information, early warning systems and climate smart agriculture (for which there is a detailed national program), diversification of livestock, expand small-scale water infrastructures, invest in research on climate resilient crops and animal breeds and extend electricity in rural areas;
2. forestry: forest restoration, promoting biodiversity and watershed conservation, encourage agro-forestry and efficient biomass energy production;
3. infrastructure: climate resilient building, update regulation regarding transport, update risk assessment guidelines and improve water catchment protection;
4. water: improving water efficiency, ensuring water supply for agriculture and for domestic use and flood prevention (via establishment of an Integrated Water Resources management system);
5. energy: increase efficiency in use of biomass, promote renewable energy, increase efficiency of electricity sector;
6. health: actions include improving early warning systems for disease outbreaks and develop contingency plans for climate change resilient health systems, building hospitals and making provisions for safe water and sanitation supply;
7. disaster risk management: actions include mainstreaming climate resilience in all sectors, vulnerability risk mapping at sectoral and regional level, improve drainage plans and early warning systems.

*Mitigation.* Uganda's mitigation measures focus on policy implementation in the energy, forestry and wetland sector, which would result in a 22% reduction of GHG-emissions by the year 2030 compared to a Business-as-Usual (BAU) scenario.

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<sup>27</sup> Tumushabe et al. (2013)

<sup>28</sup> Ministry of Water and Environment (2015). Uganda's Intended Nationally Determined Contribution (INDC). Available via:

<http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Uganda/1/INDC%20Uganda%20final%202014%20October%202015,%20minor%20correction,28.10.15.pdf>

1. energy: construction of powerlines, substations and transmission facilities for the electricity sector, aiming to achieve 3,200 MegaWatts renewable electricity generation capacity by 2030;
2. forestry: establish community forest management groups, strengthen forest institutions (including strengthening forest law enforcement and governance), increase forest cover to 21% in 2030 through forest protection, afforestation and sustainable biomass production;
3. wetlands: improving wetland management and increase wetland coverage to 12% by 2030 through demarcation, gazettement and restoration of degraded wetlands.

### Climate finance

National government expenditures on climate change in Uganda are relatively low. Between 2008/09 and 2011/12 they were found to be on average 0.2% of GDP – which is significantly lower than the 1.6% which has been indicated as necessary investment in the Implementation Strategy of the new Climate Change Policy. These climate change expenditures were around 1% of total government expenditures in these years, equal to ca. USD 20 million annually (including all ‘climate relevant’ expenditures). Of this amount, circa two thirds was spent on adaptation measures, and the remaining one third on mitigation. On district level, climate-relevant investments were higher: 2% of total government expenditures, and 98% of this was labelled as adaptation activities, mostly in water, agriculture and natural resources sectors. Effectiveness of public spending on climate change actions is yet unclear. It has been reported that much progress has been made in policy development, but on-the-ground effects are not reported<sup>29</sup>.

In a study in 2013 on Uganda’s climate finance situation, the following funds were found to be active in the country<sup>30</sup>:

- The EU’s Global Climate Change Alliance (GCCA);
- The Global Environment Facility (GEF);
- The UK-funded International Climate Fund (ICF);
- The Forest Carbon Partnership Facility (FCPF) Readiness Fund (see also below), to assist Uganda prepare an Emission Reductions Program Idea Note (ER-PIN) to qualify for FCPF funding.

The Climate Funds Update mentions some additional international funds of which Uganda makes use:

- Germany’s International Climate Initiative;
- Japan’s fast start finance<sup>31</sup>.

Since 2013 Uganda has received additional international climate finance for both adaptation and mitigation. For adaptation, Uganda is a pilot country of the CIF/Pilot Program for Climate Resilience (PPCR) and is preparing its program. For mitigation the UN-REDD national program for Uganda was launched in November 2015 which will include the set-up of a National Forest Monitoring System (NFSM) with appropriate monitoring reporting and verification functions (MRV) with support from the Forest Carbon Partnership Facility of the World Bank and Austrian Cooperation. An investment plan is under preparation for the World Bank Climate Invest Fund (CIF) Forest Investment Program (FIP). Uganda has also been selected as a pilot country for

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<sup>29</sup> Tumushabe et al. (2013)

<sup>30</sup> Tumushabe et al. (2013)

<sup>31</sup> Climate Funds Update website: <http://www.climatefundsupdate.org/country-pages/recipient-country-uganda>

funding under the Scaling Up Renewable Energy in Low Income Countries Program (SREP) of Climate Investment Funds (CIF) with its investment plan of \$50 million (indicative) focusing on solar, geothermal and wind energy endorsed and being finalized.

Excluding the World Bank CIF funds, almost \$46 million of multinational climate finance has been approved for Uganda with the majority of the funds disbursed. Bilateral funding as reported by the Climate Funds Update is around \$50 million (with the likelihood of under-reporting due to the integration of climate change into food security, disaster risk reduction, and water programs).<sup>32</sup>

### Climate change projects

As noted above, various climate change related activities are being implemented in Uganda, both through international climate funds and via other (bilateral or donor) channels. Examples of projects which are currently being implemented, related to food security and/or water, are:

- various projects registered for funding by the CDM (12 registered projects in total) including activities in energy, forestry, and municipal solid waste sectors;
- ‘Sustainable environment and carbon finance’ (USD 84 million committed) by the World Bank;
- projects with a climate change component such as ‘Agricultural technology and agribusiness services’ and ‘Water management and development programme’, funded by the World Bank<sup>33</sup>;
- other World Bank support, including for the development of a knowledge base on climate change, a climate risk profile for hydropower (completed in 2015), and an analysis (to inform their own strategy) of current gaps in support;
- Sector Support to Agriculture (USD 19.2 million) and Rural Recovery and Forestry (USD 38.4 million), funded by the EU<sup>34</sup>;
- a project to improve Uganda’s early warning system (funded by GEF executed by UNDP);
- various projects on low emissions development capacity building (funded by GEF executed by UNDP);
- ‘Feed the Future’, a regional programme with a climate change component, funded by USAID;
- various other climate change support activities by USAID, including capacity building of Makerere University faculty, and a national vulnerability assessment (completed in 2013)<sup>35</sup>;
- ‘Reducing Community Risk and Strengthening Disaster Response’, funded by DFID;
- DFID’s food security programme, which is being reframed in order to be more climate-smart;
- a resilience context analysis in the Karamoja area (funded by DFID);
- CDKN’s Uganda programme (funded by DFID and the Netherlands) undertook an economic assessment of the costs of climate change in Uganda(2014/5) and assisted in the preparation of the Ugandan INDC;
- various water initiatives are being supported by GIZ/KfW;
- GET FIT: this multidonor programme focuses on the East African region. Phase I is being implemented in Uganda. and is concerned with improving electrification and renewable energy production<sup>36</sup>.

<sup>32</sup> Climate Funds Update website: <http://www.climatefundsupdate.org/data>

<sup>33</sup> Tumushabe et al. (2013)

<sup>34</sup> Tumushabe et al. (2013)

<sup>35</sup> Uganda Climate Change Vulnerability Assessment Report, USAID. <http://community.eldis.org/.5bb2fb84>

<sup>36</sup> <http://www.getfit-uganda.org/>

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

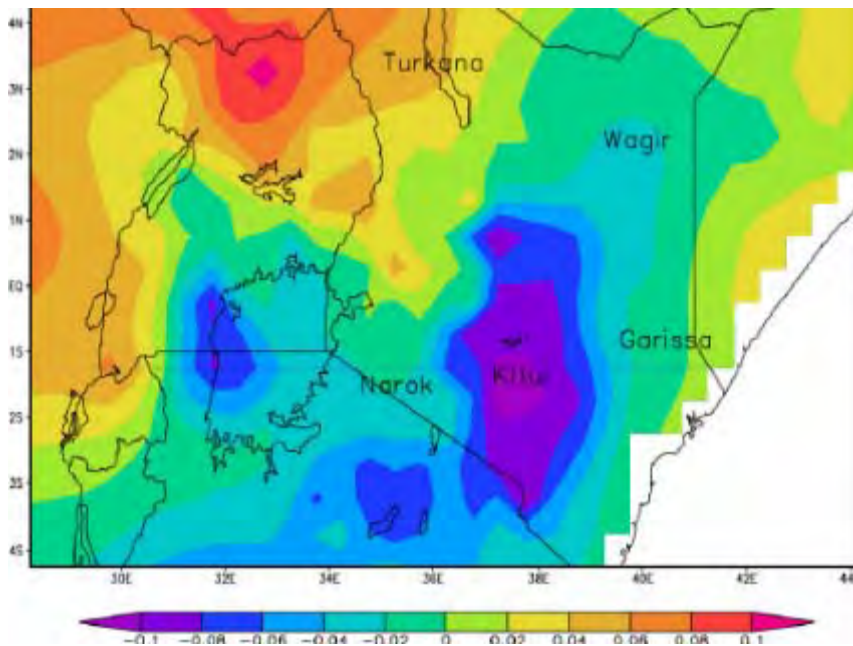
### **Climate contribution of the Netherlands Embassy: Pitch & Bid**

Beginning in 2014, embassies with development programs have been annually preparing a climate Pitch & Bid. The *Pitch* communicates the embassy's climate-smart actions that will address climate change. Based on the actions described in the Pitch, assignment of the Rio Markers and budget information, the embassy prepares a *Bid* which is an estimate of how much is likely to be spent on projects that are relevant for climate in the coming three years. In Uganda, during the 2016–2018 period the climate-smart development programs by EKN Uganda will contribute an estimated amount of €14,695,808 to climate finance [2016: €4,881,165; 2017: €5,248,293; 2018: €4,566,350]. All of the projects contribute to *adaptation*, three projects also contribute to mitigation (solar energy and energy efficiency)

The Embassy's Pitch focuses on food security and contributes to enhancing adaptive capacity and increasing resilience:

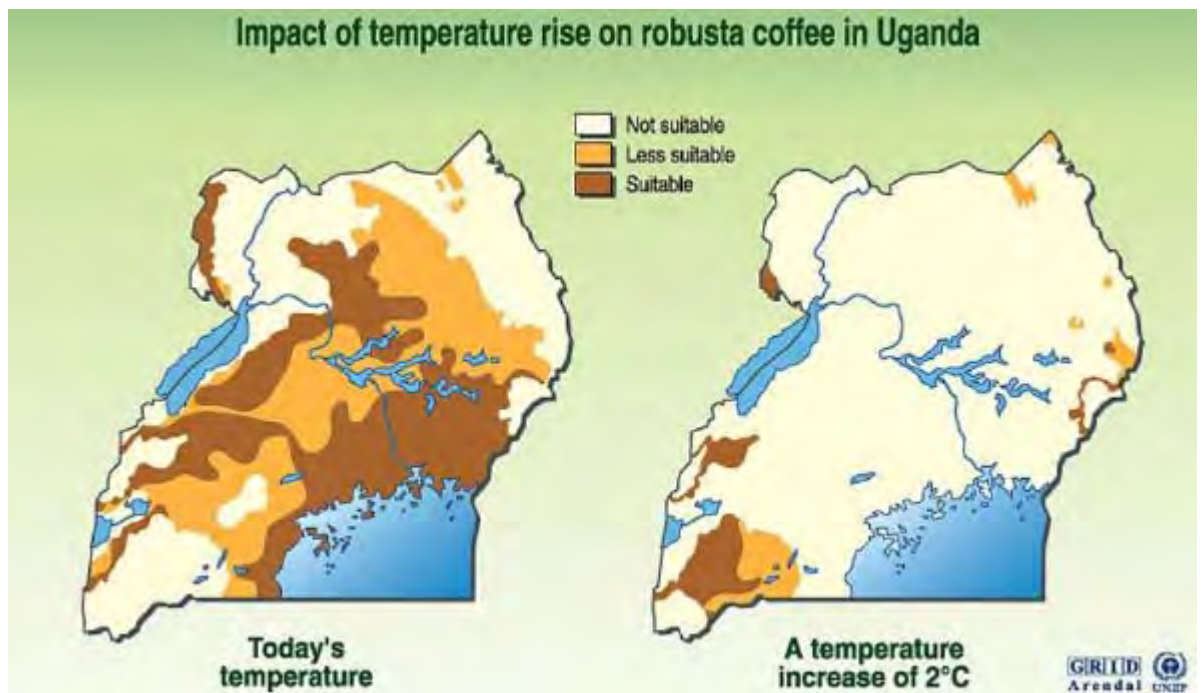
- covering 'hot spots' of climate change in the seed, dairy and agro-skilling projects in (South) West of the country to tackle climate change where it hurts the most;
- targeting the capacities of 200,000 small farmers, of which at least 40% women and many youth, to cope with the effects of climate change, by increasing income, diversifying production and improve knowledge;
- aiming principally at an extra sustainable income thereby increasing the farmers' capacity to invest in climate adaptation measures, and their coping ability to 'save for a rainy day';
- focusing on more resilient integrated farming systems of value chains such as rice, cassava, potatoes, instead of mono-cropping;
- strengthening the dairy sector by increasing yield per cow for 5000 farmers (18% women), thereby increasing income and contributing to more sustainable production systems and mitigation of greenhouse gas emission through reducing the number of cows.
- developing climate adaptive inputs, particularly seeds, and building sustainable linkages with agri-input providers financial institutions and innovative processors, some of which originate from the Netherlands;
- investing in skills and job opportunities for 3800 youth in the agribusiness sector, promoting climate smart agricultural practices such as use of drought tolerant and early maturing crop varieties;
- assisting 50,000 farming households (= 250.000 people) and labourers in Uganda to access quality solar products;
- reducing trade barriers and improving border management with a view to facilitating trade to regional markets which enhances income generation and mitigates price volatility and allows efficient cross-border trade between surplus and climate affected deficit areas;
- improving the policy and regulatory environment for sustainable agricultural intensification in two zones with the greatest population pressure (potato-growing areas in the south-west and irrigated rice-systems in the south east, an area with the largest number of poor people in the country).

Map 1: Differences in rainfall changes due to climate change across Uganda



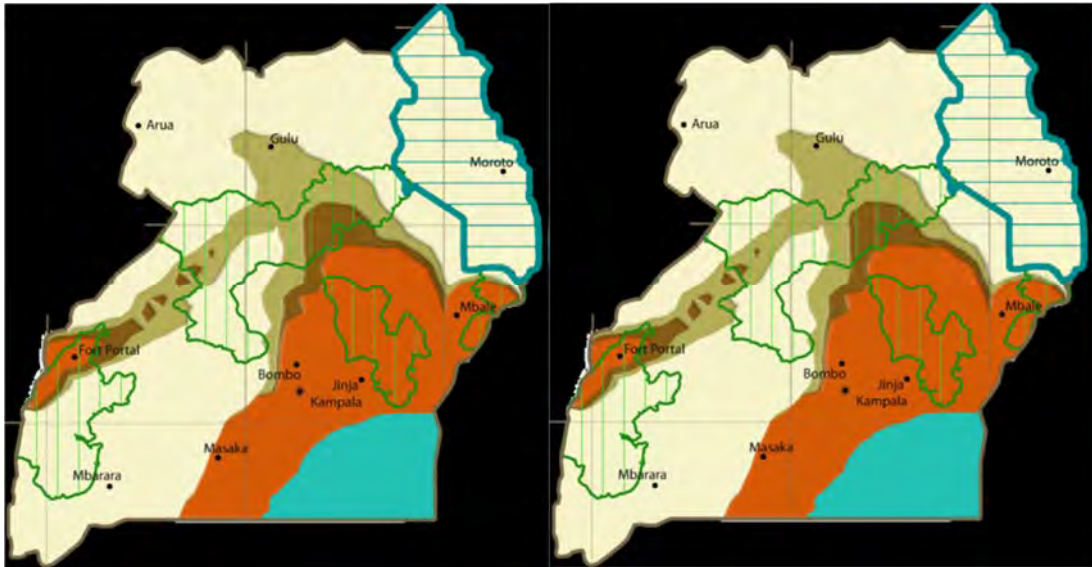
Source: Semazzi, F. (2005): *Opportunities for Collaboration with Uganda Institutions in Climate Change Education & Development of Adaptation Strategies*. North Carolina State University. [http://climlab02.meas.ncsu.edu/confpres/Semazzi\\_Uganda\\_July\\_2010Talk\\_v6.pdf](http://climlab02.meas.ncsu.edu/confpres/Semazzi_Uganda_July_2010Talk_v6.pdf)

Map 2: Effects of temperature increase on coffee production



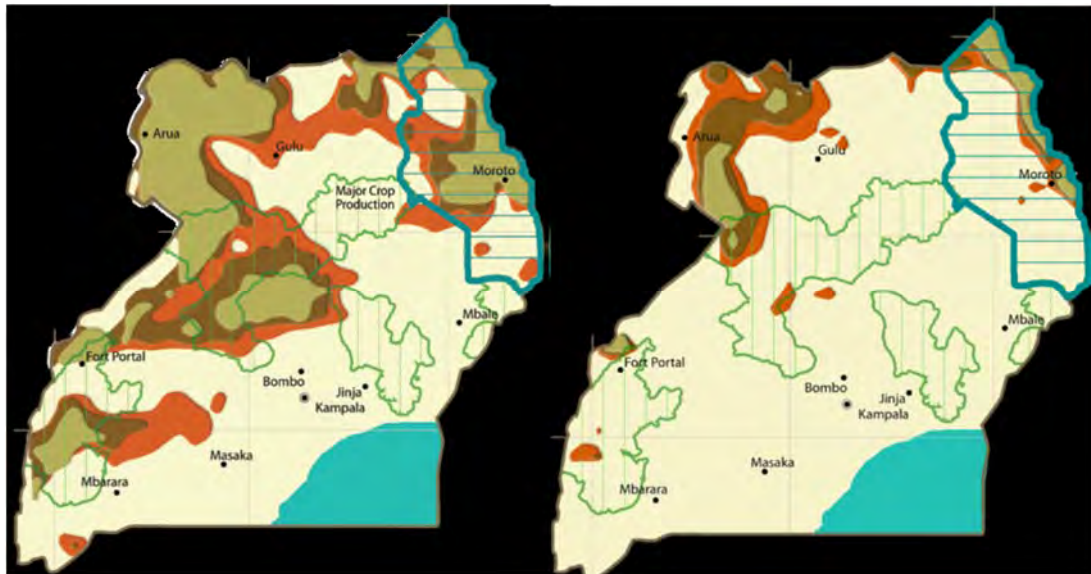
Source: GRID Arendal / UNEP: <http://www.grida.no/publications/vq/climate/page/3090.aspx>

*Map 3: Climate change in Uganda – influence on maize producing regions*



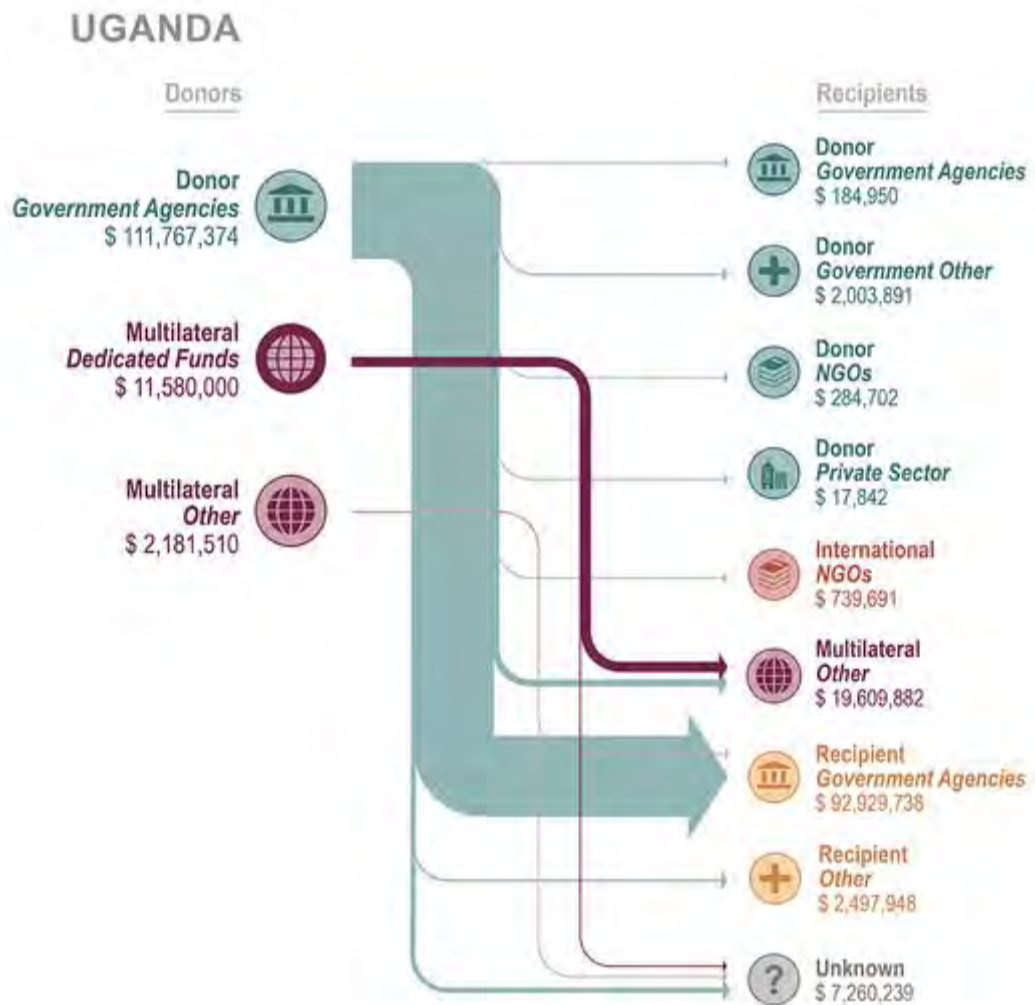
The left map shows the average location of the March-June 500 mm rainfall isohyets for 1960–1989 (light brown), 1990–2009 (dark brown), and 2010–2039 (predicted, orange). The green polygons in the foreground show the main maize surplus regions; these areas produce most of Uganda’s maize. The blue polygon in the upper-right shows the Karamoja region. The right map shows analogous changes for the June-September 500 mm rainfall isohyets.

*Map 4: Warm regions expand in Uganda – influence on maize producing regions*



The left map shows the average location of the March-June 24 degrees Celsius (°C) isotherms for 1960–1989 (light brown), 1990–2009 (dark brown), and 2010–2039 (predicted, orange). The green polygons in the foreground show the main maize surplus regions. The blue polygon in the upper-right shows the Karamoja region. The right map shows analogous changes for the June-September 24°C isotherms.

Figure 1: Donors and recipients of international climate change adaptation finance in Uganda



Source: AFAI website



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

Sources: *Climate Funds Update (2016)*: <http://www.climatefundsupdate.org/data>  
*World Bank Climate Investment Funds*: <http://www-cif.climateinvestmentfunds.org/>

Name of Project	Fund	Funding Approved (USD millions)	Disbursed (USD millions)	Fund Type
Programme for the Restoration of Livelihoods in the Northern Region (PRELNOR)	Adaptation for Smallholder Agriculture Programme (ASAP)	10	0	Multilateral
Reducing Vulnerability of Banana Producing Communities to Climate Change Through Banana Value Added Activities – Enhancing Food Security And Employment Generation	Least Developed Countries Fund (LDCF)	2.92		Multilateral
Uganda – Strengthening Climate Information and Early Warning Systems in Africa to Support Climate Resilient Development and Adaptation to Climate Change	Least Developed Countries Fund (LDCF)	4.1	4.1	Multilateral
Global Climate Change Alliance: Adaptation to climate change in Uganda	Global Climate Change Alliance (GCCA)	12.3	11.7	Multilateral
National Adaptation Programme of Action (NAPA)	Least Developed Countries Fund (LDCF)	0,2	0,2	Multilateral
Building Resilience to Climate Change in the Water and Sanitation Sector	Least Developed Countries Fund (LDCF)	8.6	8.6	Multilateral
NAMA on Integrated Waste Management and Biogas in Uganda	Global Environment Facility (GEF6)	2.2	2.2	Multilateral
Direct support to the design and implementation of UN-REDD National Programmes	UNREDD Program	1.8	0	Multilateral

Name of Project	Fund	Funding Approved (USD millions)	Disbursed (USD millions)	Fund Type
Readiness preparation grant	Forest Carbon Partnership Facility (FCPF)	3.8	1.9	Multilateral
Pilot Program for Climate Resilience (PPCR)	WB/Climate Investment Funds	tbd		Multilateral
Strategic Program for Climate Resilience (preparation of the implementation plan)		1.5		
Scaling Up Renewable Energy	WB/ CIF Funds	50		Multilateral
Forest Investment Program (FIP)	WB/CIF funds	tbc		Multilateral
Enhancing resilience in Karamoja	UK's International Climate Fund	0,2		Bilateral
Feed in Tariff and renewable energy in Uganda	UK's International Climate Fund	1,7		Bilateral
Get FIT	UK's International Climate Fund. Norway, EU-Africa Infrastructure Trust, Germany	45	n/a	Bilateral
Oxfam Climate Action Network	UK's International Climate Fund	0,7		Bilateral
Parliamentary forum on climate change	UK's International Climate Fund	0,3		Bilateral
UNDP Territorial approach to climate change	UK's International Climate Fund	0,2		Bilateral