



KEY ACTIONS AGAINST CLIMATE CHANGE IN THE ENERGY, WATER, FORESTRY, AND AGRICULTURE SECTORS IN THE GAMBIA



<http://www.undpcc.org/en/gambia>

Agriculture in The Gambia is almost fully rainfed and therefore particularly vulnerable to climate change.

Photo: Helleman News www.hellemannews.blogspot.com

→ Climate change threatens to jeopardize socio-economic development in The Gambia, which is a Least Developed Country with a poverty rate of 48 per cent (2010). According to a national assessment of investment and financial flows (I&FF) completed in October 2011, more than US\$ 1.71 billion is needed through to 2030 for The Gambia to implement priority actions to:

- Reduce emissions of greenhouse gases (GHGs) from the energy sector and forest degradation, and
- Adapt to the impacts of climate change in the agriculture and water sector.

Almost 50 per cent of these funds are needed to ensure availability of drinking water and to secure the agriculture sector against the effects of climate change. Additionally, US\$ 423 million (25%) is needed to replace biomass use with more sustainable energy sources and to improve energy efficiency.

Having completed the I&FF assessment, the government of The Gambia is now well placed to discuss the costs of climate change in the international climate change negotiations. This work was conducted as part of the global UNDP project, *Capacity Development for Policy Makers to Address Climate Change*, in which 19 countries participated. The project is funded by the governments of Norway, Switzerland, and Finland, UNDP and the UN Foundation.

Selection of key sectors

Current patterns of **energy** production and use are inefficient and not sustainable. Combined with a growing population and limited biomass resources, energy consumption is leading to depletion of natural forests and therefore contributing to drought and desertification, causing negative social and environmental consequences.

Eight-five per cent of the population derives their daily energy supply from **forest** resources. Together with land-use changes, GHG emissions arise through the logging and burning of forest cover, among others, for farm clearing or game poaching.

Agriculture in The Gambia is about 99 per cent rainfed and therefore very vulnerable to climate change and its impact on water availability and soil conditions. At the same time, the sector contributes 30 per cent of the GDP and comprises 70 per cent of the national workforce.

While the **water** sector is crucial not only for agriculture and drinking water provisions for a growing population, it is under constant pressure from climate change – exemplified by a drop in annual rainfall of around 30 per cent between 1950 and 2000, as well as greater penetration of oceanic saline water in the River Gambia during the dry season months.

Institutional arrangements

At the national level, project coordination was carried out by the National UNFCCC Focal Point, in close collaboration with the existing inter-institutional arrangements that were established during the preparation of the Second National Communication.

Four multidisciplinary expert teams were established to carry out the I&FF assessments in the key sectors. Numerous national institutions provided data and other information for the assessments. The four teams were trained in Banjul from 11-13 November 2009 on the use of a bottom-up UNDP methodology developed under the project for assessing investment and financial flows.

ASSESSMENT OF INVESTMENT AND FINANCIAL FLOWS

Objectives of the Investment and Financial Flows Assessment

The overall objective of the I&FF assessment is to determine the extent and sources of funds needed to address climate change at the national level, and builds directly on national government strategies, plans and programmes. In essence, the assessment seeks to answer the question: *“From a development perspective, what can my country do to address climate change in selected key sectors, and what level of financial contributions will be needed to achieve these objectives?”*

In this context, the I&FF team examined the following questions:

- What are the main adaptation / mitigation measures for the selected sectors in the next 25 years?
- Who is investing in the sector / Who are the main stakeholders and sources?
- What changes / increase in I&FF will be needed in the sectors?
- What additional I&FF are needed to address climate change?

The I&FF assessment covered the time period 2005-2030. Values are given in constant 2005 US\$ (US\$ 1 = 28.13 GMD). The assessment looks at the changes in I&FF needed for three different groups: households (families, individual farmers), corporations (private and NGOs), and the government.

For the energy sector (mitigation of greenhouse gas emissions)

The team of national experts determined that US\$ 423.29 million is needed to reduce GHG emissions of greenhouse gases in the energy sector. The key measures have been proposed to:

- provide fiscal incentives to reduce high energy consumption through energy efficiency;
- better manage natural resources by integrating support from the local population;
- diversify fuel substitutions for cooking, including modern biofuels;
- encourage use of improved cook stoves to reduce fuelwood and charcoal consumption;
- promote biogas production in rural areas from animal and crop residues; and
- promote solar cookers as an alternative to wood and charcoal for cooking.

The mitigation option selected for this sector was the widespread utilisation of LPG for:

- Buildings (US\$ 86.90 million);
- Plants & Equipment (US\$ 257.40 million); and
- Vehicles (US\$ 78.99 million).

For the forestry sector (mitigation of greenhouse gas emissions)

The team of national experts determined that US\$ 502.45 million will be needed for the forestry sector to reduce GHG emissions and to promote:

- sustainable forest management;
- enhanced quality of existing forests; and
- afforestation.

For these three goals, the analysed mitigation options are:

- reducing emissions from deforestation and forest degradation (REDD);
- addressing forest degradation by enhancement of carbon density of degraded and other existing forests through sustainable forest management / forest restoration; and
- afforestation and reforestation as defined in the Clean Development Mechanism framework, which includes agro-forestry.

For the agriculture sector (adaptation to the impacts of climate change)

US\$ 434.96 million is needed to adapt to the effects of climate change in the agriculture sector through the implementation of four main measures:

- Improvement of agricultural land and water management, aimed at increasing food security, creating income generating capacity of farmer beneficiaries and improving nutritional status (US\$ 147.65 million);
- Development of an agricultural chain & market promotion, aimed at transformation of the agricultural sector to a modern market-oriented commercial sector with well integrated food chains (US\$ 46.33 million);
- Sustainable farm development to achieve sustained agricultural production and productivity growth through people-centered learning (US\$ 75.02 million); and
- Development of livestock species resistant to weather conditions (US\$ 165.95 million).

For the water sector (adaptation to the impacts of climate change)

The team of national experts determined that US\$ 16.79 million is needed to adapt to the effects of climate change in the water sector through the implementation of three resource management measures:

- Institutional strengthening, including salaries and incentive packages for personnel (US\$ 0.55 million);
- Water conservation (US\$ 3.14 million); and
- Relocation of wellfields (US\$ 13.10 million).

A fourth management measure, “supply augmentation” promises net savings of US\$ 30.92 million when synchronized and implemented in tandem with water conservation.

Implementing all four measures together will therefore lead to savings of US\$ 14.13 million.

EVALUATION OF THE POLICY IMPLICATIONS FROM THE I&FF ASSESSMENT

For the forestry sector (mitigation of greenhouse gas emissions)

- Issues of land tenure need to be addressed to solve issues with logging, and more secure land tenure needed.
- Find approaches to meaningfully restore wastelands rather than to use forested areas for agriculture, which offers short-term agricultural benefits but results in long-term environmental damage through loss of soil fertility and eventually erosion.
- Promote positive co-benefits such as health aspects when traditional cooking systems are replaced with non-smoke emitting alternatives.

For the energy sector (mitigation of greenhouse gas emissions)

- Elaborate and strengthen policies that promote the use of LPG, with development of a legal and regulatory framework to develop standards, safety, and enabled market environment for private sector participation and consumer confidence.
- Introduce fiscal incentives to reduce the high cost of LPG and increase demand, thereby reducing dependency on forest resources.
- Introduce investment incentives such as tax breaks to companies and businesses to create and additional

favourable investment climate and increase the supply of LPG to make the price affordable.

- Explore innovative financing schemes such as carbon funds that could cushion high investment costs of LPG.
- Expand a public sensitisation campaign to switch to LPG as a cooking fuel.
- Introduce a 'clean fuels levy' on traditional biomass from the supply side so as to make LPG competitive.
- Partner with the private sector in investment schemes for the LPG sector as a form of encouragement and guarantee.

For the agriculture sector (adaptation to the impacts of climate change)

- National policy makers have the responsibility to introduce radical and sweeping new priority investment initiatives such as the Gambia National Agricultural Investment Program.
- Consequently, the political class must be won over to appreciate the gravity of the problem. One promising avenue is the active and dynamic Environment and Sustainable Development Sub-Committee of the National Assembly, whose members are primarily people with backgrounds in agriculture and natural resources.
- Given the potential severe consequences of a 'business as usual' scenario, huge public sensitisation is required on the causes and consequences of climate change, and resulting required adaptation and/or mitigation options. This is necessary because many climate change related problems are attitudinal or cultural in nature and hence demand education, training and mentoring of a broad strata of

SUMMARY TABLES OF INCREMENTAL INVESTMENT COSTS

Table 1: Cumulative discounted IF and FF for all investments in each sector, by investment entity and funding source.
Incremental cumulative (2005-2030) discounted sectoral investments (million 2005 US\$).

Investment category	Sources of I&FF		Mitigation						Adaptation					
			Energy			Forestry			Agriculture			Water		
			ΔIF	ΔFF	ΔO&M	ΔI&FF	ΔO&M	ΔIF	ΔFF	ΔO&M	ΔIF	ΔFF	ΔO&M	
Households	Total		-	-	-			5.73	0.00	0.00	0.00	0.01	0.01	
Corporations	National	Total	-	-	-			54.20	32.18	3.68	-3.23	-1.56	-0.88	
	Foreign	ODA						49.15	52.98	15.03	0.00	0.00	0.00	
	Total		98.06	241.36	43.12			96.57	85.16	18.71	-3.23	-1.55	-0.87	
Government	National	National Budget	-	-	-			59.87	-5.91	0.37	0.02	0.33	0.19	
	Foreign	Loan	-	-	-			-65.54	6.94	0.00	-9.69	0.00	0.00	
		Bilateral ODA	-	-	-			-16.32	-4.60	0.00	-0.02	0.00	0.00	
		Multilateral ODA	-	-	-			18.37	9.24	0.00	0.51	0.07	0.04	
		Total foreign source	-	-	-			62.73	46.00	8.84	0.00	0.00	0.00	
	Total		-	40.76	-	1,19.74	382.72	59.11	51.67	9.21	-9.20	0.07	0.04	
Total		98.06	282.12	43.12	1,19.74	382.72	161.41	136.83	27.92	-12.43	-1.48	-0.83		

IF = Investment Flows, FF = Financial Flows, O&M = Operation and Maintenance costs
 ΔI&FF = incremental changes of Investment and Financial Flows, ΔO&M = incremental changes of Operation and Maintenance costs
 Negative values mean net savings
 Source: National I&FF assessment

society. Civil Society Organizations are particularly suited for these grassroots programmes and will prove critical to their success.

For the water sector (adaptation to the impacts of climate change)

- Integrating operational and strategic policies into a domestic policy framework geared toward slowing deterioration of assets, and encouraging optimal borrowing and fiscal discipline should receive higher attention. Public utilities should develop dynamic asset management plans.
- The water sector is divided into several sub-sectors handled by different ministries. In the absence of a strong

coordinating body, this fragmentation has made it difficult to undertake investment planning in a holistic manner. Implementation of a Science, Policy and Legislation, Investment, and Infrastructure Development-like framework is essential for optimal allocation of resources.

- Implementing the analysed measures in the municipal water subsector holds the promise of significant investment savings.
- The end-user's ability-to-pay should be viewed in the context of service providers' own ability to meet costs, and the impact of service fees on household budgets. Through direct and indirect taxes, households ultimately shoulder public institutions'/enterprises' full costs, albeit in an apparently disconnected manner.

Table 2: Annual IF and FF for all investments in each sector. Annual sectoral investments (million 2005 US\$)

Year	Mitigation					Adaptation					
	Energy		Forestry			Agriculture			Water		
	ΔIF	ΔFF	ΔO&M	ΔI&FF	ΔO&M	ΔIF	ΔFF	ΔO&M	ΔIF	ΔFF	ΔO&M
2005	-	-	-	3.07	11.03	18.67	9.63	2.40	0	0.0	0.0
2006	-	0.07	0.04	1.62	11.28	19.60	10.11	2.52	0.0	0.0	0.0
2007	-	0.17	0.08	3.25	13.59	20.58	10.61	2.64	0.0	0.0	0.0
2008	-	0.30	0.13	4.69	16.43	21.61	11.14	2.77	0.0	0.0	0.0
2009	10.01	0.45	0.21	2.89	17.40	22.69	11.70	2.91	0.0	0.0	0.0
2010	-	0.83	0.28	9.03	20.85	23.82	12.28	3.06	0.0	0.0	0.0
2011	-	1.11	0.35	14.56	36.45	25.73	12.72	3.33	0.0	0.0	0.0
2012	-10.01	1.46	0.43	20.10	54.67	27.19	13.15	3.52	0.0	0.0	0.0
2013	-	1.89	0.53	25.63	72.90	28.63	13.61	3.70	-8.7	0.0	0.0
2014	-	2.39	0.63	31.17	91.12	30.07	14.07	3.89	-8.5	0.1	0.0
2015	10.51	2.99	0.75	36.70	109.35	31.50	14.53	4.08	1.2	0.2	0.0
2016	-	3.70	0.88	42.24	127.57	32.94	15.00	4.27	9.2	0.1	0.0
2017	-	4.55	1.03	47.77	145.80	34.38	15.46	4.46	8.9	0.0	0.0
2018	-	5.56	1.19	53.31	164.02	35.82	15.92	4.65	-13.0	0.0	0.0
2019	11.03	6.75	1.38	58.84	182.25	37.25	16.38	4.92	-12.8	0.0	0.0
2020	-	8.16	1.58	64.38	200.47	38.69	16.84	5.11	0.0	0.0	0.0
2021	-	9.81	1.81	69.92	218.69	40.13	17.31	5.30	12.3	-0.1	0.0
2022	11.58	11.76	2.06	75.45	236.92	41.57	17.77	5.49	0.0	0.0	-0.1
2023	-	14.06	2.35	80.99	255.14	43.01	18.23	5.67	-11.8	-0.1	-0.1
2024	24.33	16.75	2.66	86.52	273.37	44.44	18.69	5.86	0.0	-0.1	-0.1
2025	-	19.91	3.01	92.06	291.59	45.88	19.15	6.05	11.4	-0.1	0.0
2026	51.10	23.62	3.39	97.59	309.82	47.31	19.62	6.24	0.0	-0.1	-0.1
2027	-	27.95	3.82	103.13	328.04	48.76	20.08	6.43	-10.9	-0.1	-0.1
2028	-10.51	33.02	4.30	108.66	346.27	50.19	20.54	6.62	-3.6	-0.1	-0.1
2029	-	38.95	4.83	114.20	364.49	51.63	21.00	6.81	7.0	-0.2	-0.1
2030	-	45.87	5.41	119.74	382.72	53.07	21.46	7.00	6.9	-0.2	-0.2
Total	98.06	282.12	43.12	1,367.51	4,282.22	915.16	407.00	119.70	-12.4	-0.7	-0.9



Knowledge platform
 The project website www.undpcc.org contains information on activities in The Gambia, the I&FF methodology, and many other resources in English, French, Spanish and Russian.

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 Source: National I&FF assessment

More information on activities in The Gambia

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