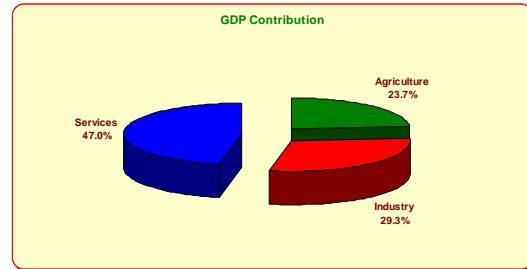


Mauritania: Climate Risk Factsheet



GDP (US\$ billion; 2006) ¹ :	1.9
Population (million; 2006):	3.1
Land Area (1,000 sq. km):	1,030
Agricultural land (percentage of total land area, 2005 ²):	39



Observed Historical and Current Climate Trends	Projected Future Climate Trends
<p>Temperature: In the summer months, temperatures exceed 38 °C; in winters temperatures average around 24°C.³</p>	<p>Temperature: Comparing 1980-1999 and 2030-2050 averages, winter temperature and summer temperature are projected to increase by 1.8 °C and 1.9 °C, respectively [11 GCMs; A1B scenario]</p>
<p>Rainfall: Most rain falls during the short rainy season, from July to September, and average annual precipitation varies greatly. The climate of the Senegal River Valley in the far south contrasts with that of the Saharan and Sahelian zones. Rainfall is higher than in other regions, ranging from 400 millimeters to 600 millimeters annually, usually between May and September. In the northern two-thirds of the country, average rainfall is less than 100 mm where often, isolated storms drop large amounts of water in short periods of time. A year, or even several years, may pass without any rain in some locations⁴.</p>	<p>Rainfall: Future projections of rainfall conditions in Sahelian countries are highly uncertain. Both wetter and drier scenarios are in the realm of possibility. If compared to present-day values, outputs from 11 GCMs suggest that on an aggregate level precipitation is projected to decline by 2030-2050 during the northern hemisphere winter (December, January, February) and summer (June, July August) by -21.1% and -14% respectively (A1B scenario). A sustained drying trend or more erratic rainfall has to be considered a real possibility over the medium to long-term. In conjunction the increasing temperatures the possible implications for the natural resource based livelihoods have to be carefully considered.</p>
<p>Climate Impact Diamond - Mauritania</p>	<p>Time-series Of Normalized GDP Growth And Precipitation</p>

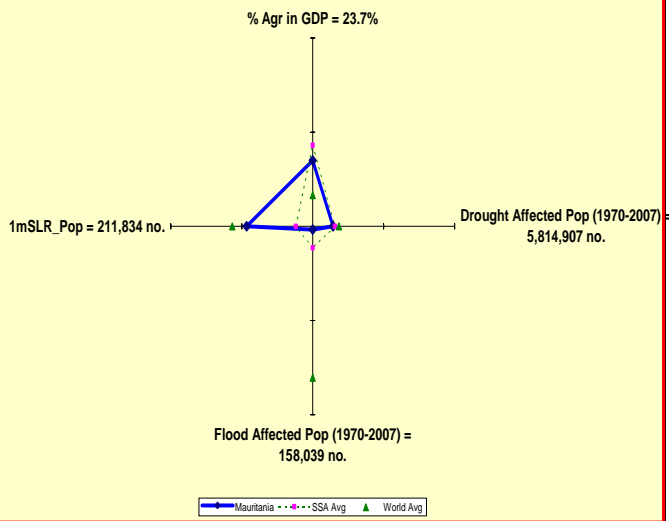
¹ World Bank, 2007, World Development Indicators. Available at: <http://ddp-ext.worldbank.org/ext/DDPQQ/showReport.do?method=showReport>

² World Bank, 2007, The Little Green Data Book

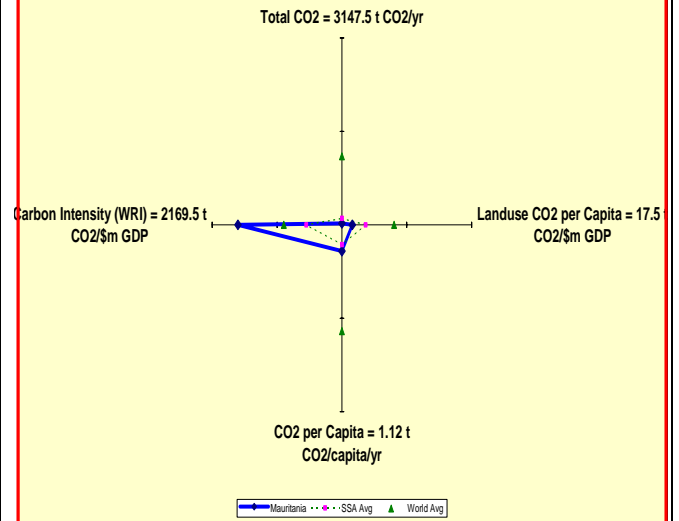
³ Available at: <http://www.britannica.com/EBchecked/topic/370109/Mauritania/55000/Climate>

⁴ Available at: <http://countrystudies.us/mauritania/24.htm>

Climate Vulnerability Diamond - Mauritania



Mitigation Climate Diamond - Mauritania



Key Sectors Affected

Agriculture: Over 80 percent of the country's land surface is desert; only the southern extremity supports rain-fed vegetation. Agriculture is a traditional activity in Mauritania and very localized in the eastern and south-eastern parts of the country, and along the Senegal River. The traditional crops in Mauritania are sorghum, millet, maize, wheat, barley, and "niebe" (beans) and their related wild species. These species may be grown in association with varieties of gourds. Given the role played by the date palm (*Phoenix dactylifera*) in the agricultural system as well as in local traditions, fruit growing is also among the traditional agricultural practices in Mauritania. During the last twenty years, crops such as irrigated rice in the Senegal River valley, market-gardening, and cultivation of fruit trees, have appeared in various regions of the country on an increasing scale. The four agricultural methods in Mauritania are: traditional rain-fed crops or "dieri", subsidence crops, irrigated crops, and oasis crops. Effects of climate change in Mauritania is projected to include increased desertification, significant degradation of arable land, and degradation of pasture and loss of livestock.

Water Resources: Regarding water courses and resources, climate change is projected to reduce production potential, increase livestock costs, cause the level of the water-table to fall, and springs and other natural sources of water to disappear. As far as production systems are concerned, the most vulnerable, and the most affected, activities are those dependent upon rainwater, especially rain-fed agriculture. The production systems with low or even no vulnerability are pastoral systems where owners are dwelling in urban areas, and, semi- and/or intensive systems. Rising sea levels would bring increased flooding, vulnerability of groundwater aquifers to salinization, disappearance of low-lying wetlands and other effects. In some areas, local communities are already adapting to decreasing amounts of surface water by harvesting rainwater. With regards to groundwater, shallow wells (ogglats) have been dug. In some places, deeper traditional wells with walls supported by branches have been dug. Access to potable water is slowly improving, but disparities persist. In 2004, 53.5 percent of households had access to potable water, versus 50.4 percent in 2000. In urban areas, 30 percent of households access drinking water via private connections. This proportion drops to 20-24 percent in Nouakchott. Furthermore, the high price of water in urban areas, particularly in deprived zones, constitutes a major concern. In rural areas, 49 percent of households have access to drinking water. More than half of centers with more than 500 inhabitants are not connected to drinkable water supply networks. Access to sanitation is still low: in 2004, only approximately 36 percent of households nationally had access (World Bank CAS 2007)

Health: During the last decade, the government has strengthened the health delivery system. Access to services and the geographic distribution of health personnel have improved. For instance, in 2005, child immunization rates reached 64 percent; 63 percent of deliveries were assisted by a health provider; and the number of consultations per inhabitant increased to 0.3 per year. However, while access to maternal health care has improved, little progress was made between 2000 and 2004 in reducing child and infant mortality rates (respectively, 132 and 84 per 1,000).⁵ The country may not be able to meet all MDGs by 2015, particularly in the health area. Chronic malnutrition rates remain a serious problem in rural areas among the poorest and the very young (0-3 years). Nearly one-third of children suffer from this condition (World Bank CAS 2007).

Energy: Mauritania gains a some power from dams built on the Senegal River in a joint venture with Senegal and Mali. Mauritania also consumes a significant amount of "non-commercial" (i.e., wood, biomass) energy. Significant oil discoveries were made off Mauritania's southwest coast in 2001 and 2002⁵. Oil production has improved economic prospects to a lesser extent than first predicted (World Bank, 2007 CAS). The collection of firewood for cooking used to be limited to dead wood. Now, however, urban centres are using charcoal, which is particularly devastating to rare forest formations, in order to meet the needs of fuel in many households as a programme to make available butane gas has not been able to satisfy these needs (NAPA).

Forestry: The forestry sector is characterized by the exploitation of resources by local communities to meet their needs. Resources are also being used by local communities in the construction of homes (beams), weaving mats (*Sporobolus robus*), in herbal remedies, in tanning of hides (pods of *Acacia nilotica*), food (wild fruits), and beauty products (henna).

⁵ Available at <http://www.nationsencyclopedia.com/Africa/Mauritania-ENERGY-AND-POWER.html>

Recommendations for Improved Management of Climate Risks

Overall Objective: Improve climate-smart development through appropriate institutional and investment activities.

SECTOR	Enabling Environment/ Capacity Building	Investments
Capacity Building & Cross-cutting	<ul style="list-style-type: none"> - Develop and strengthen the Knowledge Base <ul style="list-style-type: none"> o Data and information – acquisition, analysis, dissemination, utilization o Enhanced hydro-meteorological monitoring systems, and improved and expanded human resources in the hydrological and meteorological services o Analytical tools and products tailored to sector needs o Information on adaptation options based on pilots, field tests and research o Early warning systems o Information exchange networks to enable access to and exchange of data and information between all levels of user and decision makers - Regional and National Networks – Networks of agencies and policy makers, experts, knowledge bases, data and information, research and field experience (pilots, tests) is crucial to stimulating and facilitating investment in adaptation - Support assessments of economic diversification options which reduce the dependency of livelihoods on natural resource based activities over the medium and long-term 	<ul style="list-style-type: none"> - Introduce modern technology for data collection, transmission and assessment; Introduce the use of compatible standards and systems to enhance data and knowledge sharing across sectors; - Strengthen and expand systematic observations of meteorological and hydrological parameters; strengthen the technical capacity of hydro-met services including the development and dissemination of knowledge products to enhance the adaptation of project design and implementation to climate variability and change; - Strengthening and develop early warning systems for drought and flood hazards and natural disasters to improve preparedness, response and recovery in all the sectors (agriculture, health, natural resource, and energy)
Agriculture (including irrigation, watershed management & community development)	<ul style="list-style-type: none"> - Develop climate variability maps including not only rainfall but also flood, drought and drainage risk to enhance sector development planning - Combine risk mapping with river basin and sub-basin water resource assessments including rainfall variability. - Scale up investment in research and extension services to enhance production and farm incomes with an emphasis on sustainable land management and adaptation to climate variability and change 	<ul style="list-style-type: none"> - Pilot and up-scale sustainable land management practices focused on reducing pressures from local environmental degradation and enhancing land productivity - Invest in piloting new, drought resistant crops, cropping patterns (at farm scale), and new technology packages (both for adaptation and carbon sequestration) to enhance adaptation in areas with high climate variability and vulnerability to change - Scale up investment in water conservation for crop production and livestock, and the introduction of irrigation and water management systems wherever possible - Scale up investment in livelihood focused participatory rural develop including sustainable land management, watershed management and community driven development (CDD) approaches - Pilot risk insurance schemes including indexed crop insurance
Water Resources Mgt	<ul style="list-style-type: none"> - Improve technical capacity of water resource management agencies including hydro-met and groundwater management services - Institutionalize multi-sector, integrated water resources planning and management - Strengthen groundwater monitoring and management agencies - Strengthen the analytical and modeling capability of water resource agencies to utilize enhanced hydrologic and metrological data acquisition and monitoring networks and support river basin and sector development and management planning 	<ul style="list-style-type: none"> - Invest in a program to identify, protect groundwater recharge areas, enhance groundwater recharge, and intensify groundwater monitoring and surveillance - Scale up investment in: <ul style="list-style-type: none"> o River basin and sub-basin water resource assessments and the associated institutional capacity to sustain such program on a continuous basis o Development of decision support systems (DSS) including hydrologic models and other analytical tools to enhance sector planning and risk assessment - Implement new mechanisms to disseminate these assessments, DSS and tools to support enhance strategic planning in sectors that are dependent on the basins natural resources

SECTOR	Enabling Environment/ Capacity Building	Investments
Energy	<ul style="list-style-type: none"> - Strengthen electricity utilities to improve their efficiency and financial viability - Strengthen sector strategic planning to include a greater emphasis on climate vulnerability and climate change risk by introducing: <ul style="list-style-type: none"> o Assessment of vulnerability of supply systems, including hydropower and the development of other renewable sources less sensitive to climate o Assessment of climate change impacts on demand o Expand off-grid expansion opportunities (potential for renewable energy) o Grid extension - Carbon finance opportunities 	<ul style="list-style-type: none"> - Support the expansion and development of regional electricity grid interconnections - Scale up investment in electricity access and energy efficiency - Review the effects of climate variability and climate change on the reliability and capacity of existing and potential hydropower facilities and developments; - Accelerate expanded pre-investment studies of hydropower and other renewable sources for grid and off-grid electricity supply - Coordinate grid and off-grid electricity access planning with rural development and forestry sectors and SLM programs to support efforts to reduce fuel-wood harvesting and use
Transport	<ul style="list-style-type: none"> - Enhance the capacity of road and transport sector agencies in the area of strategic planning to identify and incorporate climate vulnerability into sector plans and project designs 	<ul style="list-style-type: none"> - Support sector strategic planning of road and transport networks that incorporate the economic and social shifts that may occur due to the increased intensity and frequency of droughts - Increase the use of flood, drought (greater access to network) and drainage risk mapping in sector planning in rural and urban areas - Introduce risk assessment into the selection of design standards including pavement type
Urban Development, Water Supply and Flood Management	<ul style="list-style-type: none"> - Enhance strategic supply planning capability of urban water supply utilities including climate vulnerability and risk assessment of water supply sources - Strengthen urban development planning based on improved flood and drainage hazard mapping 	<ul style="list-style-type: none"> - Invest in urban water supply conservation and service delivery efficiency to offset the reduced reliability of supply due to increase intensity and frequency of drought - Invest in infrastructure upgrading and improvement to mitigate and adjust to changing flood and drainage hazard patterns - Invest in urban services to reduce flood and drainage risks including housing relocation, reduced encroachment into flood hazard areas, secure solid water management
Health	<ul style="list-style-type: none"> - Develop/strengthen climate-related surveillance systems (as part of overall monitoring system) - Increase awareness of health related climate vulnerability and increase capacity to incorporate adaptation in to the health care system 	<ul style="list-style-type: none"> - Invest in disease vector control systems - Invest in increased surveillance of existing and emerging threat areas affected by climate variability and climate change
Forestry, Biodiversity and Coastal Zone Management	<ul style="list-style-type: none"> - Strengthen capacity to monitor forest and biodiversity resources, evaluate their status and threats and formulate actions - Develop and test new governance arrangements for forest resources 	<ul style="list-style-type: none"> - Invest in forest resource management to enhance climate resilience, enhance livelihoods of people living near and in forest areas, and promote resource conservation - Invest in reforestation and afforestation, and in their sustainable management - Invest in forest fire prevention, risk surveillance, and response

As can be seen, many of these investments to reduce climate risks involve faster sustainable development, careful assessment of vulnerability, strengthening institutional capacity, and re-orienting investments.