Climate Change Risk Assessment - Interholco / IFO

Version 1, 12.06.2019

Source:

FAO. 2013. Climate change guidelines for forest managers. FAO Forestry Paper No. 172. Rome, Food and Agriculture Organization of the United Nations.

Introduction

This Climate change risk assessment followed the FAO Climate change Guidelines for forest managers (2013):

"The effects of climate change and climate variability on forest ecosystems are evident around the world and further impacts are unavoidable, at least in the short to medium term. Addressing the challenges posed by climate change will require adjustments to forest policies and changes to forest management plans and practices.

Adaptation and mitigation are the two main responses to climate change.

Mitigation addresses the causes of climate change and adaptation its impacts. In the forest sector, **adaptation** encompasses changes in management practices designed to decrease the vulnerability of forests to climate change and interventions intended to reduce the vulnerability of people to climate change. Mitigation strategies in the forest sector can be grouped into four main categories: reducing emissions from deforestation; reducing emissions from forest degradation; enhancing forest carbon sinks; and product substitution.

Sustainable forest management (SFM) is consistent with climate change adaptation and mitigation and provides a comprehensive framework that can be adapted to changing circumstances. Efforts to advance towards SFM have provided a wealth of knowledge, experience, best-practice guidance, tools, mechanisms and partnerships that can be applied to help meet climate change challenges and which informs this document. Using SFM as an overall framework helps ensure that adaptation and mitigation measures are synergistic and balanced with other forest management objectives and take into consideration the economic, social and environmental values of forests.

This document provides guidance on what forest managers should consider in assessing vulnerability, risk, mitigation options, and actions for adaptation, mitigation and monitoring in response to climate change.

Recommended actions for climate change adaptation address impacts on:

- forest productivity;
- biodiversity;
- water availability and quality;
- fire;
- pests and diseases;
- extreme weather events;
- sea-level rise;

and economic, social and institutional considerations.

A range of mitigation actions is provided, along with guidance on the additional monitoring and evaluation that may be required in forests in the face of climate change."

Scope of the assessment

This climate change risk assessment was prepared to assess and respond to climate change challenges and opportunities at the forest management unit level of Interholco / IFO in the Republic of Congo, a 1,16 million ha forest concession under sustainable forest management.

Methodology

The approach for Environmental and social Impact Assessments was used which consists of:

1. identifying the risks;
2. identifying which risks are material / significant to the company, either by their magnitude or if they are legal requirements;
3. identifying risk mitigation measures or adaptive measures and , in a later stage, identifying indicators to monitor implementation.

Results

The analysis is provided in the below table, based on the scope of climate risks identified in the FAO Guidelines.

Climate change impacts and risks	Likeli-hood	Materiality (Significance)	Recommended (possible) adaptation / mitigation actions	Mitigation and Adaptation Actions applicable for IFO / Interholco
FOREST PRODUCTIVITY				-
Reduced yields of forest roducts due to changes in temperature or precipitation	low	not material: - yield is related to many different species that will have a different response, - natural forest has a high resilience; ⇨ monitor for the future		Monitor research on impact of climate change on yields (e.g. by installed permanent sample plots, by follow up of literature and research projects in the Congo Basin by the "Université de Liège, Gembloux", CIRAD, …
Increased yields of forest products due to higher temperatures or precipitation	low	not material: - yield is related to many different species that will have a different response, - natural forest has a high resilience; ⇨ monitor for the future		Idem
BIODIVERSITY				-
Change in the viability of species and varieties in the managed area	low	not material: - yield is related to many different species that will have a different response, - natural forest has a high resilience; ⇨ monitor for the future.		Monitor research on impact of climate change. Measures below related to SFM in tropical forest are already implemented:
			Adjust management plans to take into consideration changes in species distribution (e.g. reduce logging intensities and hunting pressure on affected species)	*monitor for the future*
			Manage for diverse tree composition, age and structure and understorey vegetation at the stand and landscape levels	*already applied in natural forest management*
			Plant or promote the use of climate-adapted species and varieties	*no planting, natural regeneration*
			establish or expand and manage protected areas to conserve vulnerable species and habitat types	*30% of the forest protected*
			Protect species at the edges of their ranges because they may be better adapted to new climatic conditions	*if applicable*
			Provide corridors of suitable size and habitat to allow species migration and otherwise maintain landscape connectivity	*natural forest is continuous, no fragmentation*
			Assist the movement of species through the restoration and conservation of migration routes and the reintroduction of species	*idem*
			Adjust hunting and fishing to levels that are sustainable under new climatic conditions	*hunting and fishing levels are low*
			Promote extensive grazing management for livestock to prevent overgrazing and encourage regeneration	*not applicable*
Species moving into a management area	low	not material: - no invasive species identified in the forest management unit		
			Where appropriate, promote the establishment and management of beneficial species moving into a forest area	*natural forest is continuous, no fragmentation*
			Put measures in place to detect and control invasive species	*no invasive species*
Aquatic species declining	low	not material: - low possibility that water level will be so low that aquatic species decline in moist tropical forest		
Forest fragmentation	low	not material: - no fragementation by low intensity harvest practices		-
WATER AVAILABILITY AND QUALITY				-
Water scarcity/ stress and increased drought	me-dium	not material: - impact might be very long term, but to be monitored		monitor if changes in forest types, impact if long term droughts occur and their impac on species
			Sustainably manage water resources to ensure water storage, the regulation of water flow and the provision of water to downstream users (e.g. through the protection of forest catchment areas, water harvesting and the protection of streams)	measures not applicable to natural forest management, with natural regeneration and diverse natural forest with low intensity harvesting
Increased precipitation and changes in seasonal rainfall patterns	low	not material: - impact possible, but no direct impact on moist forest		monitor if changes in forest types
			Adjust harvesting schedules to reduce erosion and siltation, taking into consideration the terrain, forest cover, road networks, the	measures not applicable to natural forest management, with natural regeneration and diverse natural forest with low intensity harvesting

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FIRE INCIDENCE				-
Increase in the number, frequency, size or severity of wildfire	high	material: - climate change can increase fire incidence (e.g. fire caused by El Niño in 2016)		IFO/IHC established a working group to investigate the fire that took place and identify actions and measures: *https://www.interholco.com/en/news-interholco/19-company-2018/91-monitoring-of-the-open-marantaceae-forests-in-northern-congo-to-understand-their-origins-and-dynamics*
			Obtain available information on the increased risk of fire due to climate change (e.g. from research organizations, forestry associations and agencies, and local and regional governments)	IFO/IHC is monitoring precipitation at 2 different locations in the forest area. This monitoring will indicate if long, dry periods are occurring and trigger actions in case of prolonged drought (e.g. awareness creation for workers and local communities). https://fires.globalforestwatch.org/home/
			Assess the impacts of climate change on fire occurrence and behaviour at the landscape level	
			support the development of policies and plans for forest fire management	Classical fire management as applied in other parts of the world is not possible in natural tropical forest, with absence of infrastructure and extensive areas without access. Nevertheless, along existing roads and in the annual logging areas, emergency procedures apply: Warning system, fire-fighting with fire extinguishers or the use of bulldozer, intervention of the fire department in Ouesso for fire caused by shifting cultivation along the roads,…
			ensure the inclusion of integrated fire management in local and regional planning	idem
			integrate fire management considerations with forest management planning (e.g. assess the quantities of potential fuel during monitoring to assess fire risk)	In natural tropical forest management, not applicable
			establish or improve early-warning and rapid- response systems for fire using electronic e.g. cell phone, radio, television and email) and social media, as well as traditional communication means	IHC is following up fire incidence, amongst others through above mentioned website. As described above, emergency procedures are in place for forest fires.
			Protect fire-sensitive ecosystems through landscape planning and management, with a prevention focus	N.A. in natural tropical forest as all ecosystems are maintain in their original state and low intensive logging has no significant influence.
			Modify landscape structure to impede fire spread (e.g. establish networks of fire breaks; manage for a mix of stand ages and stocking densities; thin stands; create mosaics of controlled burns; select fire-tolerant species)	N.A.: not possible in large area of natural tropical forest
			Maintain and restore appropriate fire regimes to increase forest resistance to severe fire	idem
			use prescribed burns and "let burn" policies in fire-maintained ecosystems for fuel management and to achieve ecological management objectives	idem
			Minimize the harmful environmental impacts of fire suppression activities	idem
			undertake salvage logging to remove dead or damaged trees that pose a fire risk	idem
			Promote fire-smart landscapes (e.g. by planting fire-resistant tree species as firebreaks)	
			In production forests, employ reduced impact logging to limit logging gap size and minimize logging damage and waste to reduce vulnerability to fire	
			Reduce or avoid the burning of logging residues in fire-prone areas *In areas where slash-and-burn agriculture poses a fire risk, encourage the modification of burning practices (e.g. restrict burning to seasons where the risk of fire is low)*	IHC is actively involving local communities, in particular when long term drought is identified, additional sensibilisation activities are implemented
			Avoid draining peatlands and other wetlands with organic matter-rich soils	No peatlands or other wetlands are drained by IFO/IHC as they are protected
			Recognize, respect and promote the use and dissemination of traditional and ancestral fire management practices	N.A.: fire is used for slash and burn agriculture only
			Monitor methods and techniques for fire management for future planning, and assess the results of these methods	IHC will assess additional possibilities to reduce the fire risk (in particular through slash and burn agriculture and use of fire by hunters and gatherers in dry periods) (*)
PESTS AND DISEASES				-
Increased outbreaks of insects, pathogens and invasive native and exotic plant species	low	not material: - no risk of pests in natural tropical forests		To be monitored if any pests might occur, due to climate change impacts

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EXTREME WEATHER EVENTS				-
Increased flood frequencies and intensities	low	material: - but with low probability (along rivers, impacts on communities and smaller towns)		Measures below can be implemented as indicated:
			Improve early-warning systems and the level of communication among local stakeholders	No sudden floods present such as in dry areas. Warning will be given by communities and others.
			Protect headwaters through watershed protection and management interventions	Already implement through SFM and RIL measures.
			Ensure unimpeded water flows by keeping rivers, creeks and streams free of debris and blockages	idem, RIL measures
			Maintain natural vegetation in riparian zones and avoid the channelization of headwater streams	idem, protection of water buffer zones
			Design and build infrastructure with larger safety factors (e.g. forest roads with proper drainage and dams with higher storage capacity)	idem, RIL measures
			Ensure the adequate maintenance of road networks, particularly in areas with steep slopes	idem, RIL measures
			Avoid the use of heavy equipment on steep slopes and riparian areas	idem, no harvest in riparian areas
			Avoid soil compaction to maintain infiltration rates and the water-storage capacity of the soil	idem, RIL measures
			Adjust rotation lengths and cutting cycles to minimize the risk of storm-induced damage (e.g. landslides or runoff due to reduced vegetation cover)	natural forest, no intensive impact on the forest structure which is very diverse and adapted to natural disasters.
			Modify harvesting regimes to improve species and stand stability	not applicable, natural forest
			Avoid clear-cutting in vulnerable areas	not applicable, low density harvest
			Maintain or increase species and structural diversity in ecosystems to promote resistance to storm damage and resilience following damage	not applicable, natural forest
			In areas experiencing increased snowfall and ice storms, consider favoring hardwood species over conifers to reduce the risk of breakage from snow / ice	not appllicable
			Select wind-resistant species and promote the development of multilayered canopies	not applicable, natural forest
Increased likelihood and size of landslides	low	not material - no land-slides in the region		-
Increased risk of coastal surges	low	not material - no coastal region		-
SEA-LEVEL RISE				-
Sea-level rise and storm surges	low	not material - no coastal region		-
Food security and livelihoods: changes in food production, access, availability, quality and quantity; poverty exacerbated and livelihoods negatively affected	low	not material - currently no indications that in natural tropical forests, food security will be affected by climate change		to be monitored
Health: increase in disease; water shortages; malnutrition; fire and smoke-related hazards	low	not material: - although there might be an increased fire risk, extend is not estimated to be high due to large areas and low population density (contrary for ex. to S-E Asian fire incidences)		to be monitored in case of higher fire incidence
Increased pressure on forest resources due to economic decline or decreased land productivity (e.g. for agriculture)	low	not material: - land availability is not currently an issue in the forest management unit		
Changes in the timing of harvests or duration of harvesting cycles	low	not material: - not applied		
Seasonal or permanent migration for employment	low	not material: - no seasonsal or permanent migration		-

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ECONOMIC CONSIDERATIONS				-
Heightened risks of economic loss	me-dium			-
Changes in policies and markets	**high**	material - Payment for Env. Services is necessary to cope with changes and increased costs		See actions below:
			Be aware of new policies, regulations and financial instruments of relevance to the forest sector that provide financial incentives for climate change mitigation (e.g. REDD+, Clean Development Mechanism, Joint implementation 4 and voluntary carbon markets)	IFO/IHC is well involved in new policies that are developped and PES, through projects by the World Bank (Forest Carbon Partnership Facility) / FSC / etc.
			Explore existing and new climate change- driven requirements and opportunities (e.g. carbon markets, policy changes and new monitoring and reporting) that may affect forest operations and markets	idem
			Before engaging in any financial incentive scheme or selling forest carbon, be fully aware of the rules of engagement and cost implications (e.g. ownership rights to forest carbon)	ongoing for the FCPF project
			Encourage local and state authorities to support (e.g. through the provision of incentives) the increased production and use of bioenergy through bioenergy plantations and more efficient technology (e.g. improved stoves)	not applicable in natural humid forest
			Promote the increased use of sustainably produced wood and other forest products as environmentally friendly construction materials and renewable energy sources	IHC is promoting FSC certified wood
			Advise policy-makers on the benefits of schemes for payments for ecosystem services and encourage them to establish such schemes	IFO/IHC advises policy makers, amongst others via ATIBT (Think-Thank)
			Involve users and beneficiaries of ecosystem services in schemes for payments for those ecosystem services and promote local schemes	idem
			Identify funding for research and development on species that are resilient to climate change	idem
			Create business models that encourage payments for biodiversity services	idem
			Remain well informed on policy changes and their implications for forest management through public information sources, direct contact with forestry officials, and forest producer and trade associations	IFO/IHC are member of forest and trade unions (ATIBT, ETTF, STTC, UNICONGO…) and are actively promoting activites related to climate change and PES.
			Work through forest associations and other means to provide information to policy- makers on the impacts of climate change and climate change policy responses on forest management, with the aim of influencing decision-making	idem
			Support forest associations in their work on climate change and encourage the strengthening of their capacity in this area	idem
			Build strategic alliances with relevant stakeholders for benefits related to information dissemination, technical advances and policy representation	idem
The need to incorporate the results of research on forests and climate change into forest management decisions	**me-dium**	material - Research is done by IFO/IHC and follow up of external research is material		See actions below:
			Access available information and services of forest research and extension agencies and academic institutions; engage with these institutions to encourage relevant and effective research, extension and communication	IFO/IHC is doing research on Carbon impact (e.g. through permanent sample plots, through the evaluation of impact of harvest (GPS mapping of affected areas, size of roads, etc.) and is participating in different research projects with CIRAD, Univ. de Liège, CEA / Sunbirds (Drone project), Nature+, etc.

Framework for other Mitigation Actions	Mitigation and Adaptation Actions implemented for IFO / Interholco
Climate change mitigation actions in the land-use sectors fall into two broad categories: reducing GHG emissions by sources (reducing emissions), and increasing GHG removals by sinks (increasing removals of GHGs from the atmosphere).	
o maintaining the area under forest by reducing deforestation and promoting forest conservation and protection;	All forest area managed by IFO/IHC is maintained under permanent forest area, with minimal impact by selective logging.
o maintaining or increasing carbon density at the stand and landscape scales by avoiding forest degradation and managing timber production forests so that, on average, carbon stocks remain constant or increase over time; and through the restoration of degraded forests;	All forest area is permanent, and carbon stock can increas in natural forest.
o increasing off-site carbon stocks in harvested wood products (e.g. displacing fossil fuels with woodfuels and replacing construction materials such as concrete, steel, aluminium and plastics with wood).	By the production and use of wood, this actions is done.
The designation of forests for conservation (specifically as parks and other protected areas) or protection (specifically for the protection of soil and water resources), where timber extraction is prohibited or limited, cannot be considered a mitigation action unless such forests would otherwise have been cleared or degraded.	IFO/IHC is maintaining about 30% of its fores area under protection and conservation.
Forest area can be increased through planting, seeding and assisted natural regeneration, and through natural succession. Afforestation leads to increases in the carbon pools held in aboveground and belowground biomass and in dead organic matter.	No planting, but natural regeneration is used currently.
Activities to maintain or increase stand-level forest carbon stocks include reduced impact logging and sustained-yield management in timber production forests; maintaining partial forest cover and minimizing the loss of the dead organic matter and soil carbon pools by reducing high-emission activities such as soil erosion and slash burning. Replanting after harvesting or natural disturbances accelerates growth and reduces carbon losses relative to natural regeneration. Retaining additional carbon on the site will delay revenues from harvesting, and forest managers should consider carefully the benefits and costs of this approach.	RIL and sustained yield are applied, in view of FSC Certification and is being used in the FCPF project to show reduced CO2 emissions.
Another mitigation action is the use of harvested wood products. When wood is transformed into long-lived products, such as buildings and furniture, the products can act as a reservoir of carbon for centuries. While forest managers are generally not involved in energy production or product substitution, they do respond to policy changes and market signals. For example, policies in the European Union to increase the use of biofuels for energy generation are affecting how foresters in the region manage their forests.	By the production and use of wood, this actions is done.
Forest managers should consider the various available mitigation options and actions in light of their management objectives, the presence of unforested or degraded land, pressures on the land (e.g. from encroachers or fire), and laws, regulations or other governance factors that affect the range of available land uses and forest management actions	The Forest management unit is protected against activities that c an negatively affect Climate change.