ADAPTATION FUND

REGIONAL PROJECT PROPOSAL

BOUCLIER-CLIMAT /Mono Project
Towards a climate risks shield in the Mono River Basin
Strengthening adaptation and resilience to climate change through integrated water resources and flood management
Benin, Togo

Title of Project:	**Towards a climate risks shield in the Mono River Basin (Benin, Togo): Strengthening adaptation and resilience to climate change through integrated water resources and flood management (Project: BOUCLIER-CLIMAT[1] /Mono)**	
Countries:	Benin and Togo	
Thematic Focal Area:	Transboundary water management	
Type of Implementing Entity:	Regional Implementing Entity (RIE)	
Implementing Entity:	**Sahara and Sahel Observatory (OSS)**	
Executing Entities:	**Regional level:** Basin Authority (MBA) & Global Water Partnership in West Africa (GWP-WA)	
	National level: National Coordination Institutions	
	Benin	Ministry of Water and Mines (General Directorate of Water)
	Togo	Ministry of Water and Rural Hydraulics[2] (Directorate of Water Resources)
Amount of Financing Requested	14,000,000 in U.S Dollars Equivalent	

[1] *Since the two countries are francophone, the acronym "Bouclier Climat" (French meaning of "Climate Shield") will be adopted.*
[2] *Ministère de l'Eau et de l'Hydraulique Villageoise*

Content

ANNEXES

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ACRONYMS

ADAPT-WAP	Integration of Climate Change Adaptation Measures In the concerted management of the WAP transboundary
AF	Adaptation Fund
AMCOW	African Ministry Council of Water
AP-SPTAT	agricultural policy supported by the strategic plan for the transformation of agriculture in Togo
BADEA	Arab Bank for Economic Development in Africa
BOAD	Banque Ouest Africaine de Developpement
CC	Climate Change
CLIMAFRI	Implementing CLIMate-sensitive Adaptation strategies to reduce Flood RIsk in the transboundary Lower Mono River catchment in Togo and Benin
CN	Concept Note
CWS/DRS	conservation of water and soils/defense and restoration of soil
DCP	Data Collection Plateform
DPSS	Directeur de la Planification Stratégique et du Suivi
ECOWAS	Economic Community of West African States
ED	Executive Directorate/Executive Director
EEs	Executing Entities
ESIA	Environmental and Social Impact Assessment
ESP	Environmental and Social Policy
ESRMP	Environmental and Social Risk Management Plan
EWS	Early Warning System
FAO	Food and Agriculture Organization
FIDA/IFAD	Fonds International de Développement Agricole/International Fund for Agriculture Development
FP	Focal Point
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gaz
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPSD	Growth Program for Sustainable Development
GWP-AO	Global Water Partnership in West Africa
HDI	Human Development Index
HILO	High Intensity Labor Force
HIMO	Haute Intensité de Main d'œuvre
HIPC	Heavily Indebted Poor Country
IE	Implementing Entity
IGAs	Incoming Generating Activities
INBO	International Network of Basin Organizations
INSAE	Institut National de la Statistique et de l'Analyse Economique
IPCC	Intergovernmental Panel on Climate Change
IREE	Initiative Regional pour l'Eau et l'Environment
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
LCCRDS	Low Carbon and Climate Resilient Development Strategy
MBA	Mono River Basin
MRB	Mono River Basin
NAPA	National Adaptation Plan of Action
NBS	Nature Based Solution
NCC	National Coordination Committee
NCCMP	National Climate Change Management Policy
NCPA	National Civil Protection Agency
NDA	National Designated Authority
NDC	National Determined Contribution
NDP	National Development Plan
NDRRS	National Disaster Risk Reduction Strategy
NEE	National Executing Entities
NEE	National Executing Entity
NGO	Non Government Organization
NPACC	National Plan for Adaptation to Climate Change
N-PMU	National Project Management Unit
NTFPs	Non-Timber Forest Products
OiEau	Office International de l'Eau
OSS	Observatoire du Sahara et du Sahel
PANGIRE	Plan d'Action National de Gestion Intégrée des Ressources en Eau
PAPBio C1	Management of mangrove forests from Senegal to Benin Project
PCSO	Platform of Civil Society Organizations
PNDA	National Agricultural Development Policy
PNDES	National Economic and Social Development Plan
PNE	Partenariat National de l'Eau
PROCAD	Agricultural Diversification Support Framework Program
PRSD	Poverty Reduction Strategy Documents
RAMSAR	RASMAR Convention
REE	Regional Executing Entity
RIE	Regional Implementing Entity
RIWE	Regional Initiative for Water and Environment
R-PMU	Regional Project Management Unit
RPSC	Regional Project Steering Committee
RPSC	Regional Project Steering Committee
SAGE	Schema d'Aménagement et de Gestion de l'Eau
SAP	Strategic Action Plan
SDAGE	Schéma Directeur d'Aménagement et de Gestion des Eaux
SIDA	Sweeden International Development Agency
SPDAS	Strategic Plan for the Development of the Agricultural Sector
SSW-NNE	South South West – North North Est
TBR	Transboundary Biosphere Reserve
TDA	Transboundary Diagnostic Analysis
TNC	Third National Communication
UNEP	UN Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WACA	West Africa Coastal Area Management Program
WACDEP-G	Water, Climate, Development, and Gender Investments
WAF	West Africa
WASCAL	West African Science Service Center on Climate Change and Adapted Land Use

PART I PROJECT INFORMATION

1. Project Background and Context:

1.1 The Mono River Basin (MRB): Outlook and Physical setting

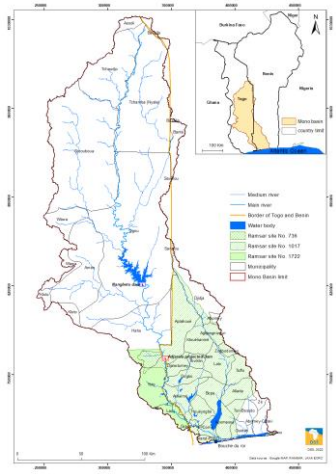

Figure 1:The Mono River Basin (MRB)

1. The Mono River Basin is one of the twenty-five (25) transboundary river basins in West Africa. It covers an area of about 24,300 km² between latitudes 6°16′ and 9°20′ North and longitudes 0°42′ and 2°25′ East and extends over 3,000 km² (12%) in Benin and 23,300 km² (88%) in Togo (Fig.1). It is oriented North-East and South-West on a slightly accentuated landform. The watershed comprises a coastal sedimentary basin in the south, shaped as a coastal plain and plateaus, and higher landform in the north comprising the Atacora Mountains and their southern extensions, the Togo Mountains. These landforms are dissected into several massifs, whose crests oriented SSW-NNE, culminating between 600 and 941 m at Atilakoutsé (Togo), constitute a real water tower. This feeds several sub-meridian to meridian flowing rivers. However, most of the watershed is at low altitude (30 to 250 m).

1.1.1 *Hydrology*

2. The Mono River, 530 km long, has its source in the Koura Mountains at Alédjo in the Commune of Bassila in northern Benin. It crosses the Togolese territory where most of its course takes place. Along the southern part of the river towards its mouth, it forms the international border between Togo and Benin. The river flows into the Atlantic Ocean through its mouth called "Bouche du Roy" in the commune of Grand-Popo in the south of Benin through a vast network of lagoons and brackish water lakes (the lagoon of Grand-Popo, the lake togbadji, the lake doukon, the lake toho, etc).
3. The main tributaries of the Mono River are located in its Togolese portion. These are the Ogou (210 km), Anié (161 km), Amou (114 km), Amoutchou (62 km) and Khra (69 km) rivers. In Benin, the lower Mono valley has also a highly developed hydrographic network, with several ponds and lakes. In addition,, there is another well-defined drainage branch known as the Sazué (63 km). The river is characterized by a "transitional tropical regime with a Dahomean variation" marked by strong inter-annual irregularity and very different flow values yearly. The low water season is rigorous and the high water season quite long. The average monthly flow, observed at the Athieme station, from February to April (minimum low water) is 0 m3/s, while that of September, the main month of flooding, is 261 m^3/s. The average annual flow observed from 1944 to 1992 was 54 m3/s.
4. The analysis of the functioning of the river-lagoon complex downstream of the Mono basin shows that this system is regulated by several factors, including the influence of the marine waters of the Atlantic Ocean, but also by the hydrological regimes of the Mono River and the Couffo River - Lake-Ahemé - Coastal Lagoon complex. Indeed, the Atlantic Ocean influences the hydrology of the lagoon system through the dynamic and saline tide. Although it oscillates only around one meter (microtidal regime), the tidal range dictates the direction of flows in the river-lagoon complex downstream of the Mono basin.
5. Furthermore, each year, the first flood of June-July of the Couffo River is very decisive in the rise of the water level in the lagoon system, which remains brackish. On the other hand, in August-October (Mono River flood), the currents of the Mono River become very strong in the lagoon system and the water becomes purely fresh. Thus, at low tide, almost all the water of the Mono crosses the coastal lagoon and flows directly into the sea through the Bouche du Roy. At high tide, although most of the water from the Mono also flows into the sea through the Bouche du Roy, some of it flows up the Ahô channel to be stored in Lake Ahémé.
6. In short, the lagoon system sees its waters flow in one direction or the other according to the tides and the hydrological seasons of the Mono and Couffo rivers. In a purely hydrological sense, the territory of the Mono Basin Authority should therefore consider both the Mono River watershed (in Togo and Benin) and the Couffo watershed (in Benin) including Lake Ahémé, the Aho channel which crosses the Grand Popo lagoon at the junction of the lake village of Djondji ("triple point" receiving water from the Ouidah lagoon, the Couffo-Lake Ahémé - Aho channel complex and the Grand Popo lagoon).
7. The construction of the Nangbeto dam (11715 hm^3) in 1987 on the river has led to a significant modification of the flow in support of low water levels with more frequent floods that affect the well-being of the populations and the stability of the Mono River ecosystems. The effects of the Nangbeto dam are reflected in a 97% increase in low water flows while flood flows have decreased by 3%. This shows the role played by the Nangbeto dam on the flow rate and the attenuation of floods and consequently a perpetuation of the flow downstream of the basin. The Mono watershed is home to several small water reservoirs.

1.1.2 *Hydrogeology*

8. The Mono River and its hydrographic complex contribute to the recharge of groundwater stored in two major aquifer formations:

- the granitic, gneissic, mica schist basement;
- the sedimentary made up of clays, argillites and sandstones.

9. The main hydrogeological structures of the basement are those of the Dahomeyides chain which contain two types of overlapping aquifers and presenting a hydraulic continuity. They are composed by the fractured aquifers where water circulates in the cracks with a flow of drilling between 0,4 and 10 m^3/h. They are topped by the alteration aquifers which have a better permeability of about 1 to 9.10^{-7}m/s. These aquifers are the most exploited by populations through large wells. The average thickness of the alteration aquifers varies from 3 to 15 m.
10. The coastal sedimentary basin of the Mono Basin is part of the large coastal sedimentary basin or Keta Basin, which extends from Côte d'Ivoire to Nigeria. The sedimentary formations include:
    - **The Quaternary Aquifer**: located along the coastline, over a width of 1 to 2 km, the dune sand reservoir is made up of sand and gravel, generally with little clay. In density equilibrium with the marine salt water, the fresh water table is fragile and is only exploited in its superficial part. It is vulnerable and generally polluted at the bacteriological level.
    - **The Terminal Continental Aquifer**: this is the best known aquifer because of its accessibility and the large number of wells and boreholes that exploit it. It is presented in the form of a series of unconfined aquifers comprising more or less clayey sands, clays and gravel intercalations. The wetted thicknesses are between 10 and 50 m and the depth of the static level varies from 10 to 40m.
    - **The Upper Cretaceous sands**: These are the site of a non-artesian confined aquifer covering an area of about 850 km2 in the northern part of the coastal basin between the Ghana border and the Mono. The best characteristics of this water table are found towards the Togo-Benin border, east of Tabligbo, where the thickness of the sands reaches nearly 25 m and the exploitation rates are 100 m^3/h.
11. It is estimated that about one third of the total area of the basin (1300 km^2/3600 km^2) contributes to aquifer recharge, i.e. an annual input of between 60 and 120 x 106 m^3.

1.1.3 *Bioclimatic zones of the Mono River Basin and their hydro-climatic characteristics*

12. Average annual rainfall in the Mono Basin ranges from 900 mm in the southeast to 1200 mm in the northwestern highlands. There are two climatic domains in the basin: the Sudano-Guinean or Subequatorial domain in the southern part of the basin and the Sub-Sudanian or Tropical domain in the northern part with a rainy season and a dry season.
13. The sub-equatorial climate is subdivided into maritime sub-equatorial (from the coast to latitude 6°35' N) and interior sub-equatorial (from 6°35' to 7°30' N). It is characterized by two rainy seasons and two dry seasons. Rainfall is very abundant during the main rainy season from April to July. It represents 50 to 60% of the annual rainfall, including 30% in June. The short dry season, which lasts on average from the third decade of July to mid-September, represents 15 to 20% of the annual total[3]. The short rainy season, which lasts from mid-September to mid-November, represents 16 to 23% of the average annual rainfall totals. This is followed by the long dry season from December to mid-March with only 8-9% of the annual average rainfall.
14. The Subsudanian or Tropical climate has a rainy season and a dry season. It is characterized by a unimodal regime of the seasonal rainfall cycle with 82 to 84% of annual rainfall received between May and October with a rainfall maximum in July-August, and 16 to 18% between November and April.
15. The average maximum temperature for the entire basin ranges from 28.4˚C to 33.7˚C while the average minimum temperature fluctuates between 24.3˚C and 27.8˚C from 1981 to 2010.

1.1.4 *Ecological heritage and biodiversity*

16. The Mono transboundary basin is marked by a wetland complex composed of freshwater aquatic ecosystems fed by three major tributaries (Ogou, Anié and Amou) and vast marine and coastal ecosystems. The latter extend from the estuary of the Mono commune to the commune of Grand-Popo in Benin. As a result, the region includes gallery forests, grasslands, mangroves and forest plantations, as well as specific ecosystems that constitute protected areas such as the Fazao-Malfakassa National Park in Togo and especially the Mono Transboundary Biosphere Reserve (TBR). Located in the downstream part of the basin between 6° 8' 52.8'' N and 7° 3' 41.8'' N, latitude and between 1° 24' 18.2'' E and 1° 30' 0.0'' E longitude, the TBR covers a total area of 346,286 ha, of which 203,789 ha are in Togo and 142,497 in Benin. It hosts three wetlands of international importance that are recognized as RAMSAR sites: site 1017 (Lake Toho in Benin) and N°736 (Togodo Wildlife Reserve) and site N°1722 (Coastal Wetlands) in Togo. The TBR is of capital importance for the two States since it emphasises the efforts of the two governments in terms of biodiversity conservation.
17. The Mono River Basin abounds with a very varied fauna, which is dependent on the different ecosystems that make it up from upstream to downstream. The inventory of the fish fauna of the "Mono River/Coastal Lagoon" river complex in Benin has identified 61 species of fish, 59 of which have been fully identified. In addition to this multitude of fish species, there are crustaceans such as crabs, shrimps, etc. A preliminary assessment of the potential of mammals at the level of the Mono reserve in Benin and Togo has identified 28 species of mammalian fauna (GIZ, 2015). The Mono basin is home to a significant avifaunal diversity. The most remarkable bird species are mainly water birds.

3 Amoussou, E. (2010). Variabilité pluviométrique et dynamique hydro-sédimentaire du bassin versant du complexe fluvio-lagunaire Mono-Ahémé-Couffo (Afrique de l'ouest) (Doctoral dissertation, Dijon).

Reptiles are represented by Ophidians (snakes), Saurians (lizards), Chelonians (turtles) and Crocodilians (crocodiles). Several species of amphibians are present in the basin.

18. As for the flora, the distribution of plant formations in the Mono watershed depends on heritages, the current climatic environment (rainfall and humidity), pedology and variation in soil salinity (coastal region) as well as anthropic pressure. Thus, from the south to the north of the basin, several main vegetation formations can be schematically identified. There are several forest reserves in the Mono Basin, including the Aboudoulaye forest, the Naglanou forest, the Akissa forest and the Togodo forest (Amoussou et al., 2017). The basin contains also relict forests that are largely sacred. This is the case for the Dogbo Ahomè forest (0.75 hectare), which includes species such as *Parkia biglobosa*, *Xanthoxylum xanthoxyloides*, *Antiaris toxicaria*, *Kaya senegalensis* and *Albizia globerrima*.

1.2 Socio-demographic and economic characteristics of the Mono River Basin

19. The population of Benin occupying the Mono Basin is estimated in 2022 at about 5,266,832 inhabitants, 39% of whom live in Benin and 61% in Togo, with a growth rate of 3.17% and 2.48% respectively. This population, mostly rural (70%), is expected to reach 13,354,360 inhabitants in 2050 (Figure 2).

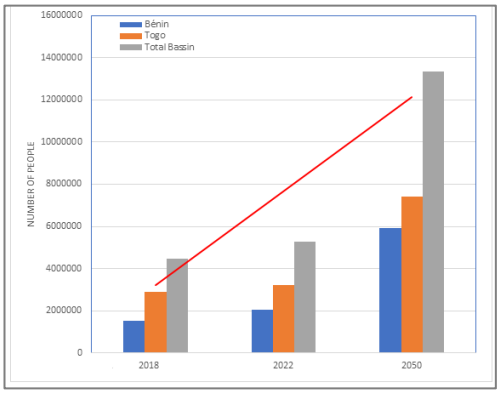

Figure 2: Population trends in the basin from 2013 to 2050

20. The average population density, which was 75 hts/km² in 2002, marks an unequal distribution between the north and south of the basin. Indeed, the population is very dense in the coastal region (230 hts/km²) and quite high on the plateaus (105 to 120 hts/km²), whereas it is lower (5 to 15 hts/km²) in the upper basin (Atacora Mountains in Togo). This is linked to the presence of mountains that do not offer large areas for cultivation.
21. In the basin, ethnic cultural and cultic affiliations based on the cult of the Vôdoun mark the individual and collective way of life, the management of ecosystems and village communities.
22. The natural resources of the Mono River basin have long been a capital for the communities of Togo and Benin from which they have developed several socio-economic activities, notably agriculture, livestock, fishing, exploitation of mining resources and river transport, etc. Despite the contribution of the exploitation of these resources to the economy of both countries, the majority of these populations still live below the poverty line with Gross Domestic Products (GDP) estimated in 2019 at US$ 1,201 for Benin and US$ 845 for Togo.
23. Like Togo and Benin, the primary sector (agriculture, livestock and fishing) occupies more than 70% of the active population of the Mono basin. Rainfed and subsistence agriculture remains the main activity in the watershed and occupies nearly 77% of households on the Benin side compared to 60% in Togo. This percentage varies from 68% among the higher income populations to 93% among the poor populations in Benin (INSAE, 2002) and 44% and 69% respectively in Togo. For both countries in the Basin, achieving food security and improving the livelihoods of the population requires the development and modernization of the agricultural sector.
24. Agriculture is developed from the south to the north of the basin. The cultivation techniques used remain essentially traditional with, increasingly, an extension of the sown areas without an improvement in productivity. In the coastal region of the basin, crops are essentially market garden crops (rincrin, okra, eggplant, carrots, onions, tomatoes, etc.). These crops are often coupled with maize and are perfectly developed during low water periods in the river beds. In the south of the basin, on the plateaus and in the dry valleys, people grow cereals (millet and sorghum) and tubers (maize, cassava, sweet potatoes, rice, cowpeas, etc.) and cash crops, notably groundnuts, palm and sometimes cotton. In the center and north of the basin, cash crops (groundnuts and cotton) are more developed and occupy the plateaus and sometimes the slopes. However, cereal crops (millet and sorghum) and tubers (yams, cassava) are also widely grown and represent a significant area of sowing.
25. Irrigated agriculture is increasingly developing in the basin with agropoles and Planned Agricultural Development Zones, which are areas of at least 100 ha developed by the state. These are the sites of Avévé in the Lakes (100 ha), Hompou in Bas-Mono (100 ha for maize), Kouétchou in Bas-Mono (84 ha for maize and provision for market gardening on 10 ha), Koutoukpa, (100ha in Amou with a rainfed system for rice production) and the irrigated perimeter of Agomè-Glozou (about 400 ha for rice).
26. Like agriculture, fishing is also an important economic sector that occupies the populations of the Mono transboundary basin. It is practiced throughout the year on rivers, lakes and lagoons and, during the high-water period, from June to November in marshes and ponds. The fishing offers a wide range of fish and shellfish. The most caught species are *Parachanna obscura, Clarias lazera, Tilapia heudelotii, Tilapia zilii, Lisa falcipinnis and Acentrogobius schlegelli, Chrysichtys areutus, Synodontis, Lates niloticus, Saratherodon, Callinectes, Macrorachim, Penaeus duorareum*, etc. In the basin in general and, in particular in the lower course, the fished species are sold. The resellers are, for the most part, the fishermen's wives who buy it from their husbands and then deal with other intermediary women traders. In the past, the fishermen's wives who provided the income controlled more than 70% of the household expenses in most cases. They controlled all family income and provided much of the education for their children.

27. The analysis of the fishing sector has shown that the overexploitation of water bodies, reported since 1995 by the FAO, is the main factor in the degradation of freshwater and marine environments. Artisanal fishing alone exceeds the exploitable potential. The decrease in the size of the catches and the accelerated depletion of the populations observed in all the fisheries indicate that the operators have gone beyond the maximum sustainable yield.
28. Livestock production in the Mono Basin is characterized by cattle, which is more important in the northern part and is mainly composed of transhumant animals from neighboring countries, particularly Burkina Faso and Niger. Small-scale livestock production (poultry, sheep, goats, pigs, etc.) and small-scale production is often carried out by women. Modern commercial poultry farming is developing on the outskirts of the major cities in both countries. The search for grazing areas for cattle breeding is causing more and more conflicts in the basin.
29. The Nangbeto dam in Togo represents the most important water mobilization infrastructure around which many economic activities are developed. With a storage capacity of 1715 hm^3, it contributes more than 20% of the electrical energy consumed by Benin and Togo, its annual production reaches more than 1,000 to 1,500 tons of fish and allows 43,000 hectares of land to be irrigated. Despite its very important contribution to the economy of the two countries, the periodic releases of water from the Nangbeto dam have intensified flooding in the communes located downstream. Thus, in 2007, the commune of Grand Popo recorded floods that lasted an exceptional 60 days and caused 2 deaths, 6 injuries and enormous material damage. Approximately 12,839 inhabitants of the commune were left homeless, 3,337 hectares of agricultural crops were destroyed or washed away and 1,918 animals were decimated. The damage to infrastructure was just as extensive: 2009 huts were demolished and 13 classrooms damaged[4]
30. The Mono River Basin is therefore facing major challenges in terms of development and improving the socio-economic conditions of the communities, the most important of which are related to the environmental degradation of the watershed, which has been greatly exacerbated by the impacts of climate change, thus making the communities and ecosystems very vulnerable.

1.3 Project zone identification and description & target population

31. The activities planned within the framework of the BOUCLIER-CLIMAT project will be developed as a priority in localities deemed vulnerable to hydro-climatic risks (Fig. 3) by local actors on the basis of the following criteria: (i) the state of the environment, (ii) the state of water and soil resources, (iii) the degree of food insecurity, (iv) the degree of dependence on natural resources, (v) the degree of dependence on agriculture, and (vi) the threats posed to these areas by climate change (floods and drought). The consultative selection process identified **41 communes**, including 07 in Benin, spread over 03 departments (Mono, Couffo and Donga) and 34 in Togo, spread over 04 departments (Maritime, Plateau Region, Central and Kara Region) as potential project intervention areas, as shown in Table 1.
32. The selected communes are spread out on both sides of the Mono River and mostly downstream of the Nangbeto dam where floods are very frequent and cause a lot of material and human damage. This intervention area is identified with the entire basin considered, for Togo and Benin, as a potentially rich natural capital around which several socio-economic activities are practiced, in particular agriculture, livestock and fishing. Several income-generating activities of a commercial nature are being developed there and mobilize more women and young people.
33. The direct beneficiaries of the project will be selected during the preparation of the full proposal from among vulnerable communities living in critical areas (hotspots) and dependent on available resources and/or activities highly exposed to hydro-climatic risks.

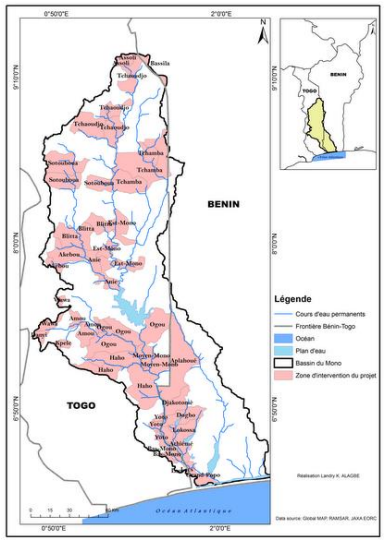

Figure 3: Intervention areas map

Table 1: Project intervention areas

Country	Departments	Number of commune
Benin	Couffo	3
	Mono	3
	Donga	1
Total Benin		7
Togo	Maritime	7
	Région des plateaux	11
	Région centrale	14
	Région de Kara	2
Total Togo		34
Total		**41**

[4] *GWP, 2009. Nangbeto : Quand la source d'énergie devient source de malheurs. INFO Magazine d'information sur l'eau et l'environnement. Atelier régional des Médias sur la gestion des Eaux Partagées en Afrique de l'Ouest.*

1.4 Climate trends in the Mono River Basin

1.4.1 *Past climate*

34. **Temperature:** The temperature in the Mono River basin has increased over the past 50 years (Figure 4a & 5). Several studies conducted in the basin indicate a significant increase in average temperature of more than 1°C with a decrease in the number of cold days and nights and an increase in the number of hot days and nights. This climate change has contributed to the amplification of the effects of drought in the Mono basin.
35. **Rainfall:** Like all of West Africa, the Mono River basin has experienced spatio-temporal instability in rainfall over the last 50 years (Figure 4b & 5). Hydro-climatic studies carried out in the basin have shown a 14% decrease in average annual rainfall with repercussions on the river's water flow during the 1970s and 1980s. In fact, the flow of the Mono River measured at Athieme dropped from 156 m3/s (1961-1970) to 86.6 m3/s (1971-1990) on average, i.e. a 44% reduction. The southern part of the basin has mainly experienced abrupt rainfall decreases. But the rainfall recovery (3%) and a trend towards increased maximum daily rainfall in the 1990s led to a 60% increase in runoff in the basin. The construction of the large Nangbeto dam in 1987 modified the hydrological regime of the Mono River with abundant low flows supported by water releases and lower floods.
36. Nevertheless, the state of affairs carried out by the Mono Basin Authority (MBA) shows an overall decrease in the average Mono precipitation trend (-2.13 mm per decade) from 1961 to 2018 in the basin. Analysis of recent precipitation data over the period 2010 to 2020 (Figure 4b) shows an overall downward trend with several particularly wet years (2010 and 2019) resulting in catastrophic flooding. On the other hand, the number of consecutive dry days shows an increasing average trend in the basin with an increase rate of 3.4 days per decade.

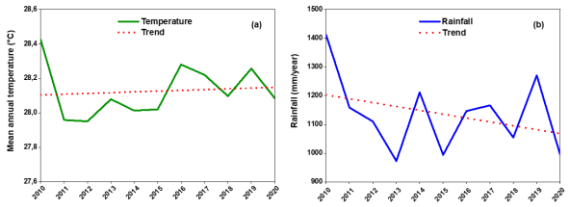

Figure 4. Temperature (a) and Rainfall trends in the Mono basin (Data source: National Meteorological Agencies of Benin and Togo)

1.4.2 *Forecast*

37. The climate scenarios[5] carried out (RCP4.5 and RCP8.5) on the Mono basin all show a continuation of the upward trend in temperatures over the next 50 years. The greatest increases are projected in the north and part of the south (Figure 5). The projected temperature increase is estimated to be between 1 and 2°C by 2071 compared to the reference situation 1966-2015 and may reach 5°C depending on the rate of greenhouse gas emissions.

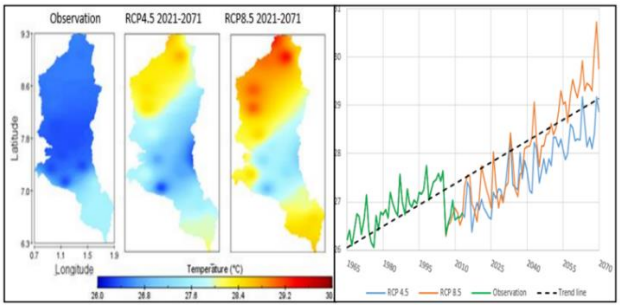

Figure 5: Spatial distribution and temperature trend in the Mono basin (source: CLIMAFRI, 2021)

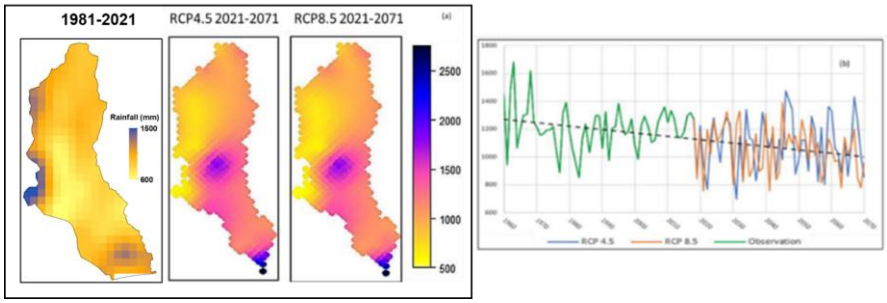

Figure 6: Past and future spatial distribution (a) and trend (b) of mean annual rainfall (mm) in the Mono watershed (Source: CLIMAFRI, 2021; OSS, 2022)

38. A comparison with the period 1966-2015 indicates for the future, a potential decrease in precipitation of 20% over the entire basin (Figure 6b). It is more missed in the northern part, while an increase is projected in the central part and at the outlet in the south near the coast (Figure 6a).
39. Declining trends are observed when comparing past and future periods. Thus, high variability from year to year is to be expected. Also, since these trends are a 50-year average for the entire basin, changes at a specific location and in a given year may be different from the overall trend presented here. A much more in-depth analysis by climate zone or station within the basin will provide a more detailed result on rainfall by station in the future.
40. The similarities between the two scenarios could increase the likelihood that the projections will be realized. It is therefore necessary to take adaptation measures to compensate for this rainfall deficit in the future and/or to take actions to mitigate the anthropogenic effects that lead to this reduction in rainfall in the basin. By 2030, Togo and Benin could experience a sea level rise of 0.1 m and could reach 0.3 by 2050.

[5] *Amoussou, E., Awoye, H., Totin Vodounon, H. S., Obahoundje, S., Camberlin, P., Diedhiou, A., ... & Boko, M. (2020). Climate and extreme rainfall events in the Mono River Basin (West Africa): investigating future changes with regional climate models. Water, 12(3), 833.*

1.5 Impacts of climate change

41. Climate change is increasingly characterized in the Mono Basin by rainfall variability often combined with extreme climatic events that have changed in frequency and/or intensity over the past 50 years, resulting in devastating floods, droughts, storms and sudden temperature changes. Climate projections already predict an occurrence of these events that will have impacts on natural resources, ecosystems and all economic sectors.

1.5.1 *Impacts on water resources*

42. In the Mono River basin, climate change is impacting the quantity and quality of water resources. Droughts combined with other factors, notably the high demand for water, have led to a decrease in the flows of the large lakes[6] and the Mono River, with a drop in flow levels, especially in the north of the basin and downstream of the Nangbeto dam. Thus, the drying up of the Mono River has been noted during less rainy years, especially downstream of the dam, where releases are no longer assured on a recurrent basis to feed the river.
43. In addition, the intensification of rainfall in recent years has caused cyclical and catastrophic floods (between June and October), particularly the floods of 2010 affected large areas, especially in the downstream part of the basin and its lower valley, resulting in the destruction of crops, loss of agricultural and livestock products, pastoral and fish farming, massive displacement of populations and loss of human life and habitat. For example, the exceptional rains of October 2019 caused the following damage, particularly in the localities of the Mono department (in Benin) and the Maritime region (in Togo): the submergence of about 4100 hectares of land in the downstream part of the basin; about 15,000 households and more than 60,000 people in nearly 200 villages were affected; the inaccessibility and degradation of several public buildings and basic infrastructures (health centers, schools, water points, roads, etc.).
44. Flooding, particularly of homes (latrines, waste, etc.), contaminates the water, leading to water-borne diseases such as cholera. The rise in the level of the Atlantic Ocean, into which the Mono River flows, causes saline intrusion into coastal aquifers. Similarly, droughts and intense rainfall limit the recharge of groundwater, leading to a drop in the water level in wells and boreholes, especially in the Togolese part of the basin. However, recurrent flooding favors aquifer recharge in the valley and the downstream part of the basin. These climatic risks also create difficulties for households in terms of drinking water supply, especially during the long dry seasons and in the event of flooding.
45. Climate change will have consequences on the proliferation of floating plants (water lettuce, water hyacinth, etc.) due to the reduction of the flow velocity of the watercourses, the change of their temperature as well as the deterioration of the water quality. These plants provide ideal conditions for the multiplication of vectors of water-related diseases such as malaria and asphyxiate the water bodies of wetlands.
46. In February 2021, the city of Anié suffered from an unprecedented water shortage. The cause was the drying up of the Anié River, which serves as a source of drinking water for the city and its surroundings. A situation which, according to local authorities, is due to climatic changes that led to the severe heat wave recorded this year. In addition to this, there is the increasing demand for water in the city.

1.5.2 *Impacts on agriculture and food security*

47. Agriculture is the main source of subsistence for the populations of the Mono basin. It is highly rain-fed with the introduction of more and more irrigated and flood crops (flood recession market gardening). However, this agriculture remains very vulnerable to the effects of climate change. The frequency and intensification of droughts, resulting in longer dry seasons and a delay in the onset and duration of the rainy season, leads to drying of soils, reduced surface runoff and use of agricultural land, thus increasing food insecurity and affecting the livelihoods of communities. Climate change has reduced yields of maize, the main food crop in the watershed, by about 25%. Similarly, periodic drying of the river has led to a decrease in the availability of water for irrigation, especially in some rice producing areas such as Dézé[7].
48. Rainfall deficits have also led to salinization and acidification of the land, with repercussions on agricultural productivity, mainly cotton, and the level of agricultural income of local populations, leading to a high prevalence of poverty.
49. The simultaneous increase in temperature and rainfall will lead to the proliferation of microorganisms that parasitize plants, insect pests and weeds in flooded areas. This will increase the maintenance costs of farms, reducing the income of producers and exposing the population to food insecurity, with an impact on export earnings and therefore on the Agricultural Domestic Product (ADP)[8]. In Benin, some projections predict a decline in agricultural production of around 23% by 2020[9] in conjunction with a continued decline in rainfall. Projected impacts relative to the baseline (1981-2010) show a decline in maize EVDT yields of 16.7% and 8.9% by 2030 and 2050 respectively. Cowpea yields could decline by 26.7% in 2030 and 26.1% by 2050. For groundnuts, the projections suggest a decline of about 2.5% by 2030, while by 2050 the outlook is more favorable for yield improvement, with a rate of about 6.4%.

[6] *https://www.bees-ong.org/Les-ressources-en-eau-au-Benin-face-aux-changements-climatiques.html*
[7] *Jean GUEDESSOU (2009). Enjeux des changements climatiques dans la mise en œuvre du projet d'aménagement hydroagricole de la basse vallée du fleuve Mono. 14è colloque international de l'IEPF et du SIFEE, Niamey 2009*
[8] *Gouvernement du Togo, 2018 : TCN*
[9] *AKPONIKPE, 2019 Etude de Vulnérabilité aux changements climatiques du Secteur Agriculture au Bénin. Report produced under the project "Projet d'Appui Scientifique aux processus de Plans Nationaux d'Adaptation dans les pays francophones les moins avancés d'Afrique subsaharienne", Climate Analytics gGmbH, Berlin.*

50. In Togo, projections on the impacts of climate change predict losses of between 5 and 10% of maize and rice production by 2025 and 2100. This means losses of between 6.16 and 87.6 billion CFA francs for maize and between 1.4 and 58.5 billion CFA francs for rice for the same period.
51. All of these phenomena, exacerbated by demographic growth and the overexploitation of natural resources, will continue in the future and even increase if appropriate measures are not implemented.

1.5.3 *Impacts on livestock*

52. The water resources of the Mono Basin are also used to raise large livestock, especially during periods of drought, but mainly small livestock (poultry, pigs, goats and Cane rat) used as a source of income by many households, particularly the Peulh. Unfortunately, this sector is also affected by the effects of climate change, resulting in a decrease in livestock production and several other indirect losses. Some of the effects of climate change on livestock include heat stress and cold, increased disease, and decreased food, feed, and water.
53. In Benin, increasingly long dry spells are causing scarcity of grazing and intensification of transhumance, increased soil degradation, and consequent decline in livestock productivity. These climatic events, as well as the frequent floods, directly lead to animal mortality, the proliferation of water-borne diseases and the degradation of watering infrastructures (wells, boreholes). This has obvious economic repercussions on the lives of the affected populations (poverty, food insecurity, low income, migration of the population, etc.). Future impacts include the prevalence of diseases such as foot-and-mouth disease, pest of small ruminants, lumpy skin disease, and the spread of ticks of the genus Rhipicephalus Boophilus microplus, as well as the drastic loss of livestock.
54. In Togo, increased rainfall and temperature will result in increased mortality and abortion rates in herds, proliferation of vectors and diseases, and reduced forage quality. The availability of forage and the development of domestic transhumance could be affected by seasonal variations. This situation will have a strong impact on the availability of meat products in the country and will lead to the impoverishment of those working in the processing of these products. The decrease in the availability and quality of fodder and the development of internal transhumance will exacerbate conflicts between herders and farmers.

1.5.4 *Impacts on fishing*

55. Fishing, the main activity of the Mono floodplain populations, is also subject to the effects of climate change. The change in water temperature has an impact on their growth rate, the seasonality of reproduction as well as on the overall mortality rate of marine animals. Thus, the increase in temperature will lead to a decrease in the volume of fishery products such as fish, shrimp and crabs.
56. The level of rivers plays an important role in the reproduction of aquatic species, so a low rainfall prevents the upwelling of fish, for example, in the arms of rivers for egg laying. This threatens the extinction of certain fish species and consequently the yields and production of fish with impacts on the income of the actors in the field, in particular women, and on the nutritional needs of the populations (malnutrition).
57. In Benin, the future impacts of climate change on the fisheries sector indicate a high rate of fish mortality and the loss of ecological habitats for fish species.
58. In Togo, the rise in sea level associated with the increase in temperature may cause some fish species to migrate to deeper waters and a decrease in the volume of pelagic resources. The rise in sea level will lead to a permanent intrusion of salt water into the rivers with the consequence of migration and a decrease in the productivity of certain fish species such as fish, shrimp, crabs, etc.

1.5.5 *Impacts on ecosystem services*

59. Logging, saltwater intrusion into the Mono River and freshwater lakes, and pollution, linked to the effects of climate change, have contributed to the overall degradation of ecosystems in the Mono River basin. Droughts and floods, which either dry up or fill in ecosystems, affect the provision of ecosystem services. The submergence of ecosystems by flood waters modifies the habitats and ecology of certain animal and plant species by altering the ecological parameters that are conducive to their development.
60. The often recurrent and persistent droughts have pushed the populations to occupy wetlands three of the Ramsar sites for the practice of agricultural and breeding activities. These practices generate conflicts between transhumant herders and agricultural producers on the one hand, and conflicts between producers and hippos on the other hand, who once they leave the water have no other choice but to feed in the fields. These areas are thus subject to degradation resulting in the silting up of rivers and water bodies, the disappearance of certain protected animal species (hypopotamuses, etc.), and the reduction of more than 60% of forest and savannah tree formations (including classified forests).
61. In Benin, the major climatic risks with the highest impact on forest ecosystems (all plant formations combined) and on riparian communities are floods, heavy rains and drought. Among the livelihoods most at risk from flooding, heavy rains and drought, small-scale foresters and managers of traditional agroforestry parks are most at risk. Future impacts include dieback of gallery forests, physiological and ecological dysfunction of some forest ecosystems, decline in populations of characteristic woody species (Dialium guineense, Sclerocarya birrea, Afzelia africana, Diospyros mespiliformis, Daniellia oliveri, etc.), and changes in the stand structure of some plant and animal species.
62. In Togo, flooding resulting from increased rainfall could reduce the productivity of natural wood formations. The intrusion of salt water into rivers as a result of rising sea levels could affect the productivity of mangroves. The

decrease in the national wood potential due to the decrease in the productivity of natural formations (forests, savannahs, mangroves, etc.) will lead to energy deficits, especially at the household level, and an increase in the price of wood products. The increase in the price of wood products will have an impact on the remaining forest formations and on the income of the populations.

1.5.6 *Impacts on energy*

63. Energy production, one of the main objectives of the construction of the Nangbeto dam in the Mono basin, requires a certain level of water in the reservoir. However, this level can drop drastically several times during the year due to climate change, resulting in interruptions in electricity supply. Cyclical flooding affects the infrastructure (sites and power plants, networks, etc.) of energy production.
64. Climate change impacts also affect line losses due to heating of the electricity transmission and distribution network, disruption in the operation of certain infrastructures such as power grids, reduced efficiency of solar photovoltaic panels, and the scarcity of biomass resources. The vulnerability of the biomass and hydroelectricity sub-sectors will de facto lead to a decrease in energy supply in relation to demand and should increase hydrocarbon consumption.
65. The supply of wood energy in the Mono Basin, especially in the Maritime region, would become almost impossible by 2025, 2050, 2075 and 2100. Both artisanal and industrial sectors of activity with significant energy needs to ensure an acceptable level of operation would be affected. The increase in expenditure due to an increase in hydrocarbon consumption should make the transport sector economically vulnerable. The availability of biomass energy, the main source of energy for households, would be seriously compromised in the coming decades. Women would be most at risk as they are directly involved in the collection and use of biomass energy. The trade and catering sectors will also be affected.

1.5.7 *Impacts on navigation*

66. River transport on the Mono River is mainly by dugout canoe in the landlocked areas. However, the decrease in rainfall leading to the cessation of the flow of the river and the drop-in water level in some places, the progressive silting up of the rivers downstream and the drought make navigation difficult.

1.5.8 *Impacts on tourism*

67. The major climatic risks affecting tourism in the basin are flooding, high water, excessive heat, sea level rise and high winds. The submergence/disappearance of habitats or hotel infrastructures in the coastal zone, the drop-in tourist activity linked to extreme climatic conditions, the disruption of the activities of tour operators, the drop in the number of visitors to tourist infrastructures or sites, the drop in the activity of guiding tourists, constitute the climatic impacts observed throughout the basin. In terms of projection, the impacts of climate change on the tourism sector indicate the decrease in tourism revenues, the loss of terrestrial and marine biodiversity, the loss of aesthetic value of landscapes or tourist sites, the disappearance of sandy beaches related to the combined effects of sea level rise and other phenomena such as coastal erosion and the loss or destruction of tourism infrastructure built near the coast. The socio-economic consequences envisaged include loss of jobs and impacts on living standards and reinvestment in the development of new tourism infrastructure at the Coastal level.

1.6 Increasing competition and growing potential conflicts

68. Conflicts arise between various users of the basin's water resources:
    - Conflicts **between farmers and herders**: Conflicts between farmers and herders around water bodies are very frequent in the Mono basin. These are generally transhumant herders. During the off-season, in some villages, groups of young people even organize themselves to watch over their market gardening operations during the night at the edge of the water bodies.
    - Conflicts **between fishermen**: Around Lake Ahémé, for example, conflicts are due to: i) the use of fishing techniques and gear that catch small fish and limit the access of some fishermen to the lake's fishery resources; ii) the use of weirs that prevent marine fish from going upstream to the localities further upstream; iii) the use of fine mesh nets throughout the water body, which only accentuates the decline in fish productivity in the lake; iv) the use of unbaited longlines, which are devastating to the fishery resource and constitute a danger for the fishermen themselves.
    - Conflicts **between the populations** affected by the floods and the Electrical Community of Benin: they are related to the floods recorded in the lower Mono valley following the opening of the sluice gates (water releases) to evacuate the overflow from the reservoir, in order to reduce the pressure on the dam dike during the floods. The authorities of the communes concerned, particularly Athiémé, complain about this situation but have never been able to find a lasting solution with those of the Electrical Community of Benin.

1.7 Vulnerability assessment and adaptation measures in the MRB: Natural risk prevention and adaptation measures

69. Both Benin and Togo, making this request, relate to the same agro-climate/ecological area that is one of the area's most prone to climate change[10]. They have developed the required tools and implemented various actions to adapt

[10] *Sylvia Szabo et al. (2016). Making SDGs Work for Climate Change Hotspots. Environment: Science and Policy for Sustainable Development 58:6, pages 24-33.*

and strengthen the resilience of populations. These include NAPAs and NAPs, which are the reference documents for political and strategic guidance. The different sector agendas (resources in terms of resilience development must be aligned with these documents).

70. The impacts of climate parameters over the last ten years (2010-2020) show that the effects of climate change/variability observed since the severe droughts (1970) are still present. This climate change is marked mainly by an increase in the intensity of daily rainfall, an increasingly frequent return of torrential rains, frequent pockets of drought and a global trend toward a decrease in rainfall and an increase in temperature, which has made the Mono basin particularly vulnerable. This vulnerability is mainly characterized by the degradation of the basin's ecosystems, even in protected areas, the variability of flows resulting in the recurrent drying up of the Mono River in the upstream part of the basin, and frequent floods, the most recent of which was in 2019. These floods represent a major risk for the local population. Indeed, the 2010 and 2019 floods caused significant material and human damage (section 1.5.1) and also led to the loss of livelihoods, increasing dependence on global food aid.

71. The revised Nationally Determined Contributions (NDCs) (October 2021) of Benin and Togo have also assessed the current vulnerability of these two countries where the Mono river basin is located. According to these NDCs, the major climatic risks that impact livelihoods in the agriculture, water resources, coastal and forestry sectors are drought, floods, late and heavy rains, high winds, excessive heat and sea level rise. Over the past three decades, these have had a number of impacts, including reduced agricultural yields, disruption of agricultural calendars, lower water levels in drinking water dams, extended low water periods, sinking of river banks, etc. With regard to future vulnerability, the climate risks to which natural and human systems could be exposed are part of a scenario of persistence or accentuation of the risks currently observed and depend on the sector considered. The potential impacts, according to the climate projections for the 2025, 2050 and 2100 time scales, range from coastal flooding and salt water intrusion into rivers and water tables to a drop in maize yields in certain agro-ecological zones (notably ZAE5). Priority actions are identified and implemented in the two countries in order to contend with these risks in the different sectors, these are:

- Climate change adaptation is taken into consideration in the implementation of irrigation plans and mechanisms for their sustainable management are defined;
- Promotion of sustainable and resilient climate-smart agriculture through: increased planting, staggered and repeated sowing, anti-erosion management, use of short-cycle varieties, modification of sowing order, development of lowlands, installation of artificial ponds
- National plans are developed for the mitigation and adaptation of water resources to climate change;
- Actions are implemented to improve knowledge and monitor the linkages between water, environment and climate change;
- Local policies and local water and climate change related risk prevention plans are designed and implemented;
- The search for sustainable funding for the implementation of priority actions;
- The fight against water-related risks is coordinated at the local level and local capacities are strengthened in the fight against these risks.

72. It is worth noting that these measures implementation is still quite inadequate and the results need significant investments to achieve the expected objectives. In this respect, the BOUCLIER-CLIMAT project will contribute to the implementation of these adaptation measures for the benefit of the most vulnerable communities and to their reinforcement. These adaptation measures will build on the experiences of the past and their teachings, they will also emphasize the integrated, qualitative and quantitative, management of water resources. This integrated approach will take into account other vulnerable sectors, including agriculture, livestock, fisheries and ecosystem services.

2. The project's objectives

73. The overall objective of the project is to strengthen the resilience of vulnerable communities in the Mono River Basin through building adaptive capacity to the risks of recurrent flooding and promoting the sustainable and equitable use and management of water resources and related ecosystems.

74. The specific objectives of the project are to:

- Ensure the long-term monitoring of climate risks through the production of reliable scientific data and information, at local, national and trans boundary levels in the Mono River Basin;
- Develop and implement a regional flood early warning system for vulnerable community’s disaster risk reduction;
- Implement concrete adaptation actions to build the resilience of the most vulnerable communities;
- Strengthen the institutional and technical capacities of the MBA and its stakeholders.

3. Components and financing of the project

75. The table below presents the three (03) components according to which the BOUCLIER-CLIMAT project will be implemented. Their proposal is based on the set objectives and they translate into the set of actions to be carried out in order to contribute to meeting the challenges of strengthening the adaptation and resilience of communities vulnerable to the impacts of climate change in the Mono basin. For each of them, expectations have been formulated in terms of results and a budget has been defined for each of the expected outputs.

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)	%
C1: **Setting up/strengthening tools for climate change resilient management of the Mono River basin**	Outcome 1.1: Regional Early Warning System (EWS) Establishment for effective flood management in the Mono River basin	Output 1.1.1: EWS is designed and validated	Benin and Togo	200,000	1.7%
		Output 1.1.2: EWS is functional and deployed		1,400,000	11.8%
		Output 1.1.3: Disaster emergency management plans are set up and operational		500,000	4.2%
Subtotal C1				**2,100,000**	**17.7%**
C2: **Improving the resilience of the most vulnerable ecosystems and people in the basin to the impacts of Climate Change through concrete adaptation measures**	Outcome 2.1: Resilience of water resources to the impacts of CC and overexploitation is strengthened	Output 2.1.1: The availability of water resources (quantity and quality) is improved and their use is rationalized	Benin and Togo	2,550,000	21.5%
	Outcome 2.2: Mono Basin ecosystems (soil resources, plant biodiversity, animal biodiversity ...) preserved through implementation of adaptation measures against the effects of climate change	Output 2.2.1: Basin ecosystems, especially those in RAMSAR areas, are rehabilitated and preserved		3,200,000	27.0%
	Outcome 2.3: Implemented adaptation measures for the benefit of the population	Output 2.3.1: Resilience and adaptive capacities of populations to Climate Change are improved		3,000,000	25.3%
Subtotal C2				**8,750,000**	**73.8%**
C3: **Strengthening the capacities of different actors, share knowledge and raise awareness among all beneficiaries at different levels**	Outcome 3.1: Mobilized and sensitized stakeholders through communication and capacity building activities	Output 3.1.1: Practitioners, technicians and decision-makers are sensitized and trained on technical and environmental aspects of the project	Benin and Togo	650,000	5.5%
		Output 3.1.2: Communities in target areas are sensitized and trained on climate change resilience issues.		150,000	1.3%
		Output 3.1.3. BOUCLIER CLIMAT project results and lessons learned are disseminated and shared		200,000	1.7%
Subtotal C3				**1,000,000**	**8.4%**
Activities budget (A)				**11,850,000**	**100%**
Project Execution cost (B)				**1,050,000**	**8.9% of (A)**
Total Project Cost (C)=A+B				**12,900,000**	
Project Cycle Management Fee charged by the Implementing Entity				**1,100,000**	**8.5% of (C)**
Amount of Financing Requested					**14,000,000**

4. Project calendar

76. The implementation period for the BOUCLIER-CLIMAT project is 5 years (60 months). Given its current level of formulation, the main steps and the projected schedule for the preparation and implementation of the project are presented in the table below

Milestones	Planned dates
Start of project/programme implementation	September 2023
Mid-term review (if scheduled)	December 2025
Project/programme closure	December 2027
Terminal evaluation	January 2029

PART II PROJECT JUSTIFICATION

A. Description of the Project components

77. As indicated above, the major ambition of this project is to strengthen the resilience to climate change of vulnerable communities in the transboundary Mono River Basin through the implementation of various adaptation actions on the ground and the strengthening of the technical and institutional capacities of key stakeholders in the basin (MBA, technical institutions, NGOs, populations and users, etc.). The main actions to be deployed in the field will eventually lead to a significant reduction of the impacts of major climate hazards in the basin (cyclical floods in particular), to the improvement of the livelihoods and living conditions of the populations as well as to the development of water resources and associated ecosystems. For a better efficiency/effectiveness, the BOUCLIER-CLIMAT project will be implemented following a regional approach which is meant to be participatory and inclusive with the involvement of

all the stakeholders of the basin, especially since it is a common and shared space requiring synergy of actions between the two States.

78. The project is organized around three components; the planned activities as well as the expected outputs and outcomes for each of the components to achieve the project objectives are in line with the Adaptation Fund's strategic outcomes as presented in the table of the Annex 4. The lines below present details on the components, outcomes and activities.

Component 1: Setting up/strengthening tools for climate change resilient management of the Mono River basin (US$ 2,100,000).

79. The objective of this component is to operationalize a modern and efficient regional flood early warning system at the basin level. This regional EWS, which will be a first at the basin level, will be designed in conjunction with regional, national and local systems in this area. In addition to the design of the prototype of the regional EWS and its deployment, the achievement of the objective of the component will also require the strengthening of the networks and systems for monitoring and collecting reliable hydro-climatic data and information in real time to support the effective operation of the EWS. In this regard, particular emphasis will be placed on the acquisition of modern/innovative tools, materials and/or equipment and on the strengthening of the capacities of the actors in their use and maintenance. Similarly, the interventions required in terms of strengthening the technical and institutional capacities of the actors will be deployed to ensure optimal functioning of the EWS as well as its sustainability.

Outcome 1.1 Regional Early Warning System (EWS) Establishment for effective flood management in the Mono River basin

80. The Mono transboundary basin faces many climatic risks. One of the most important risks is the disastrous cyclical flooding, especially in the downstream part of the basin, whose effects are amplified by the release of water from the Nagbeto dam. The BOUCLIER-CLIMAT project aims to develop and deploy a regional early warning system that will help prevent, control and better manage these hydro-climatic disasters. In addition to the direct beneficiaries on the ground, the design and implementation of the regional EWS will involve different categories of actors at the regional and local levels as well as different sectoral technical departments competent in the field (water, environment, meteorology, civil protection, etc.) in the two countries. The different outputs and activities planned for the achievement of Outcome 1.1 are described below.

Output 1.1.1 A regional Early Warning System is designed and validated

81. As mentioned above, the localities in the downstream part of the basin, particularly those located in the southwest of Benin, suffer mainly from the disastrous consequences of recurrent flooding of the Mono River. To date, there is no formal regional early warning system for concerted management of the problem. Each country has its own national early warning system, even though these are still rudimentary and require significant improvement. The development of this regional EWS, which should be based on those existing at the national level, will take into account the aspirations of the two member states and will be accompanied by a global operation and maintenance plan. Measures for its efficient and sustainable management should also be proposed. The activities planned within this framework are the following:

- Activity 1.1.1.1: Carry out an inventory of early warning systems (EWS) and national/regional warning plans for hydro-climatic hazards and establish a detailed technical diagnosis of functioning and operability (data, models, etc.) and institutional (governance, etc.).;
- Activity 1.1.1.2: Develop a prototype of regional SAP at the scale of the basin in connection with the national and local devices and define the investments to be carried out (data production, equipment, etc.) as well as the operation and maintenance plan (measurement network, training, etc.) by integrating a mechanism of sustainability;
- Activity 1.1.1.3: Ensure the institutional anchoring of EWS at the regional and national levels, including community aspects to be integrated at different levels of alert management and the feedback mechanism;
- Activity 1.1.1.4: Validate the studies and the SAP prototype by the project stakeholders though workshops (2 national workshops and 1 regional workshop).

Output 1.1.2: SAP is functional and deployed

82. As a prerequisite for the deployment and effective operation of the EWS designed and validated by the various stakeholders, it will be necessary to put in place appropriate and above all modern tools and equipment. Similarly, the availability of reliable hydro-climatic data and information provided in real time will be necessary for the efficient operation of the EWS and the alerts produced. Finally, a cooperative management mechanism of the system between the two States is a sine qua non condition to guarantee its effectiveness and especially its sustainability. As a result, an institutional and regulatory mechanism will be strengthened. Three levels of intervention will be established and supported by texts, standards and technical procedures to promote the organization and operationalization of the system: In each of the countries concerned, the existing Local Early Warning Units in localities exposed to hydro-climatic risks will be strengthened and revitalized to ensure effective observation, collection and dissemination of information to protect vulnerable people. They will be supported by community relays. The existing national EWS actors will be involved through a coordination unit present in each country: National Coordination Unit which will ensure the organization of information production and management of interventions on the portion of the basin located on the territory of the country concerned. At the basin level, a

Regional Early Warning Coordination Unit will be created, which will be housed within the Executive Directorate of the Mono Basin Authority (MBA) and will be in charge of coordinating the Mono Flood EWS. This body will be linked to each of the two National Units operating in the two countries and will ensure the main interface with the missions (i) to ensure the junction and the relay between the 02 National Units, (ii) to support the implementation of the activities of the National Units, by contributing to the reinforcement of the capacities of deployment of the emergency plans. It will manage the Mono Basin Observatory which is being created. The Figure 6 provides an overview of the planned organization for the operationalization of the EWS Mono- flooding.

83. In this regard, the following activities are proposed for the realization of this output:

- Activity 1.1.2.1: Acquire and set up monitoring/surveillance stations (hydrometric, meteorological, water level gauges, piezometers, real-time remote transmission system, etc.), computer equipment (servers, processing units, software, GPS, etc.) and tools to disseminate warning messages to the population (sirens, telephones) for EWS operationalization;
- Activity 1.1.2.2: Set up an operational EWS with supporting tools (modeling, flood forecasting), services (bulletins, warning messages, etc.), web platform and standard operating procedures, including a chain of information dissemination to potential users;
- Activity 1.1.2.3: Create a regional framework for consultation, sharing and harmonization of information to promote synergy of actions, good forecasting and effective flood control.

Output 1.1.3: Disaster emergency management plans are set up and operational

84. Emergency management plans are essential tools for the operationalization of EWS. As such, to support the deployment of EWS, a contingency plan consisting of an operational manual/tool will be developed that will essentially provide guidance for preventing, protecting against and managing the impacts of flood disasters in the basin. As with the design of the EWS, this plan will take into account existing national/regional contingency plans and involve the participation of all stakeholders. The contingency plan will take into account regional, national and community dimensions and will include a detailed disaster and emergency management procedure. It will target the different environmental and socio-economic components affected by disasters (humans, animals, crops, etc.). The required trainings and different awareness sessions will reinforce the ownership of the emergency plan actions by the beneficiaries.

85. The planned activities are described below:

- Activity 1.2.3.1: Develop and/or update warning and resilience plans for communities facing hydro-climatic risks
- Activity 1.2.3.2: Operational monitoring of EWS, feedback mechanism and prevention/response plans at regional and national levels;
- Activity 1.2.3.3: Establish a sustainability mechanism for EWS (long-term financing, etc.);
- Activity 1.2.3.4: Implement two white operations (Tests) at the regional and national level to validate the different components of the EWS.

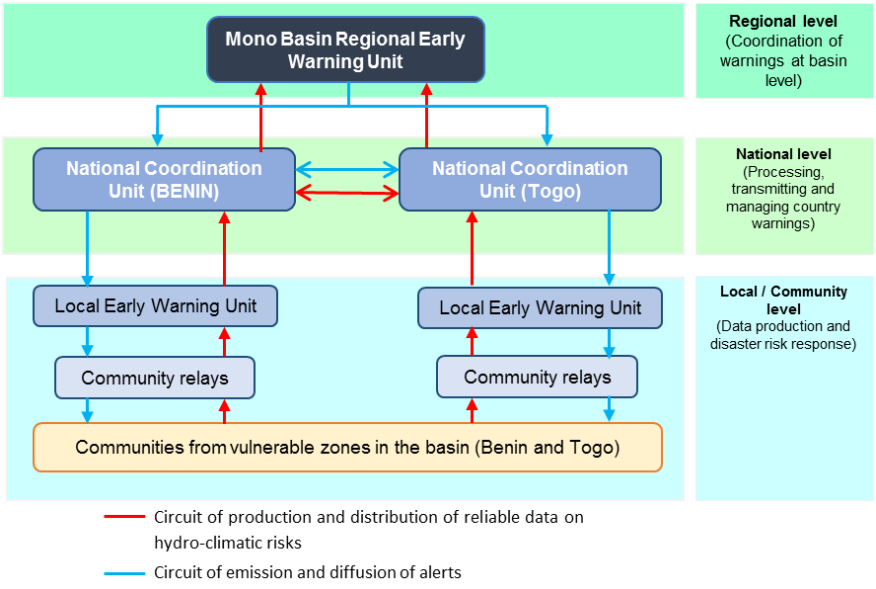

Figure 7: Organizational device for the management of the Mono-flooding EWS

Component 2: Improving the resilience of the most vulnerable ecosystems and people in the basin to the impacts of CC through concrete adaptation measures (US$ 8,750,000).

86. This component intends to deploy concrete actions on the ground to strengthen communities' adaptation and resilience. The priority proposed actions include the rehabilitation and protection of about 500 ha of land (headwaters of rivers and degraded river banks) by biophysical protection means (reforestation, agroforestry, Assisted Natural Regeneration, etc.), the installation of about 2000 linear meters of mechanical bank protection, the implementation

of income generating activities (IGAs) and capacity building actions targeting at least 6500 direct beneficiaries in vulnerable areas.

Outcome 2.1: Resilience of water resources to the impacts of CC and overexploitation is strengthened

87. The resilience of water resources is essential for the development of life and economic systems in the basin and therefore conditions the resilience of all its dependent sectors. It should be noted that in the context of the Mono Basin, the water sector is among the most vulnerable to climate change. It is for this reason that within the framework of the project, particular emphasis will be placed on the implementation of measures and actions aimed at strengthening water availability and resilience in order to support socio-economic activities and the well-being of ecosystems.

Output 2.1.1: The availability of water resources (quantity and quality) is improved and their use is rationalized

88. The recent studies on the update of the state of the Mono basin reveal that the most sensitive areas in terms of degradation and deficiency of water resources are located at the head of the basin. Urgent actions must be implemented to reverse this trend. Furthermore, in the downstream part of the basin, mainly in the coastal aquifer basin, there are many undeveloped artesian wells that have been continuously discharging their water into the environment for decades. In addition to flooding and sanitation problems, this situation exposes the reserves to long-term depletion. The BOUCLIER-CLIMAT project will contribute to proposing solutions for a better management of this crucial problem. Finally, accompanying measures to strengthen water management at the grassroots level will be implemented. Three main activities are planned within the framework of this output and are as follows:

- Activity 2.1.1.1: Build small runoff collection structures (boulders, basins, etc.) at the head of basins to support groundwater recharge and the promotion of agro-sylvo-pastoral activities. In the upstream area of the basin, especially near the headwaters, drought as well as land and soils degradation hinder agricultural and socio-economic activities. This situation makes the communities and ecosystems of the targeted areas more vulnerable. The present activity aims at enhancing water availability through the construction of water retention basins for more resilient agricultural and pastoral purposes and by the same time promote groundwater recharge that can be exploited during the dry season. As result, the income of the beneficiary populations will be improved and the regeneration of ecosystems will be promoted. In addition, the implementation of the activity will minimize damaging runoff and safeguarding freshwater ecosystems;
- Activity 2.1.1.2: Implement actions for the protection, enhancement and sustainable management of groundwater and artesian wells in the downstream part of the basin. It is well known that groundwater systems and aquifer storage are of major importance for climate-change adaptation. Aquifers, along with their substantial natural groundwater storage, provide a potentially sustainable and cost-effective option for improving the resilience of communities and ecosystems[11]. Thus, the aim of the proposed activity is to secure and develop a large part of the confined aquifers in the downstream part of the basin where many undeveloped artesian wells have been discharging groundwater into the environment for several decades. In some areas of the basin, this groundwater presents risks to the population due to flooding and waterborne diseases. In the long term and under the current scenario where there are no tangible actions, these aquifers are subject to progressive depletion and the populations of the concerned areas exposed to water vulnerability. The implementation of the planned activities will allow to limit this risk and will also favor the development of income generating activities;
- Activity 2.1.1.3: Strengthen community/local water management bodies. Water resources management and especially the implementation of adaptation measures requires real adhesion and especially the involvement of communities at the grassroots. Therefore, they must be better organized and structured and above all possess the required means and capacities. The aim of this activity is to provide this group of actors in the basin with the means and capacities required to fully play this role. This will also enable better ownership and ensure the project sustainability.

Outcome 2.2: Mono Basin ecosystems (soil resources, plant biodiversity, animal biodiversity ...) preserved through implementation of adaptation measures against the effects of Climate Change

89. The resilience of production systems (land, soil, biodiversity, ecosystems, etc.) is also useful, like water resources, for the resilient development of communities. Economic production is intimately dependent on it. Actions aimed at the rehabilitation and preservation of degraded areas in the basin will contribute to the objective of strengthening the resilience of ecosystems in the basin. Special emphasis will be given to the two RAMSAR areas in the basin.

Output 2.2.1: Basin ecosystems, especially those in RAMSAR areas, are rehabilitated and preserved

90. The study for updating the basin's inventory highlighted the alarming state of degradation of the basin's ecosystems and the loss of biodiversity. This situation does not spare the areas of ecological importance and heritage such as the RAMSAR sites and other wetland ecosystems located in the downstream part of the basin. Likewise, the river banks show advanced degradation areas in many places. The actions planned under this output will contribute to reversing this trend of land and ecosystem degradation in the basin and to their preservation, all of which is important for the strengthening of community resilience. To this end, the following activities will be implemented under this output:

[11] *International Association of Hydrogeologists (IAH), 2019. Climate change adaptation and groundwater. 6p.*

- Activity 2.2.1.1: Carry out a baseline study to identify localities in vulnerable zones with areas (riverbanks, headwaters and agricultural land) heavily degraded by water erosion and/or other agricultural practices. This baseline study will serve as a reference and will help guide interventions in the truly vulnerable areas of the basin, whether within the framework of the Bouclier project or other interventions in the years ahead;
- Activity 2.2.1.2: Implement development works with the involvement of local populations, in particular through the "Nature-based Solutions (NbS)" approach through reforestation and assisted natural regeneration of degraded areas with particular emphasis on the headwaters of basins. In this activity, the NbS approach is chosen because it has provided convincing results around the world to tackle challenges regarding water security, climate change, disaster risks, etc. Moreover, as NbS approach must be inclusive and led by communities, local populations would be tightly involved in the activity's realization. This will also ensure the appropriation and sustainability of the project's realizations.
- Activity 2.2.1.3: Develop/update wetland management plans for the RAMSAR sites incorporating climate change aspects. The RAMSAR sites as well as the transboundary Biosphere reserve in which they are located will benefit from important interventions from the project. Indeed, the RAMSAR sites provide a wide range of ecosystem services that contribute to the community's well-being and they also offer valuable services for adaptation to climate change. The activity will make it possible to have a coherent planning tool for the interventions in favor of the management and the sustainable valorization of these spaces, in line with the national and international legal instruments regarding this matter.
- Activity 2.2.1.4: Undertake actions to restore and protect RAMSAR areas: wetlands and mangroves in the downstream part of the basin. The activity aims at implementing priority actions for the restoration and protection of RAMSAR sites with the short and medium term objective of increasing the environmental and socio-economic benefits.

Outcome 2.3: Implemented adaptation measures for the benefit of the population

91. Most of the population of the basin still lives below the poverty line and is therefore very vulnerable. The priority actions to be implemented within the framework of this outcome are to strengthen the livelihoods of the populations, especially those who are vulnerable and therefore their adaptive capacities and resilience. The priority actions planned are related to the subsidy of income-generating activities and environmental benefits covering agricultural, livestock and fisheries production, etc., processing units and the promotion of non-timber forest products (NTFPs) for the benefit of vulnerable communities, in particular women, young people and people living with disabilities.

Output 2.3.1: Resilience and adaptive capacities of populations to Climate Change are improved

92. It is acknowledged that strengthening adaptation and risk management requires accelerating financial inclusion, particularly by ensuring that the poor have access to financial products that meet their needs and have low transaction costs. Moreover, ensuring smallholder farmers have resilient livelihoods is one of the most efficient way of reducing the long-term impact of climate change and natural disasters[12]. As stated in the above section 1.2, large part of the basin population, mainly the rural one is facing poverty and their main economic activities are agriculture, livestock and fishing (more than 70% of the active population in the basin). The promotion of income-generating activities (IAGs) focusing on those main community-based activities with positive environmental impacts is certainly one way to increase the financial inclusion and therefore resilience of these communities. Indeed, Bouclier Project will implement IGAs through the establishment of a micro-financing mechanism to help and accelerate the diversification of income-generating activities for the communities. The action will target primarily vulnerable groups, particularly women and young people or groups of such beneficiaries. It is planned to support the implementation of the actions through two financial mechanisms:
93. One-off grants for community activities and/or micro-projects generating environmental benefits such as water and soil conservation, agroforestry, reforestation, fishing, development and management of grazing areas, etc.
94. Revolving funds (Low-interest micro-credits) for income-generating activities (IGAs) targeting activities such as small-scale irrigation/ market gardening, fishing, livestock, non-timber forest product processing, ecotourism, beekeeping products for the benefit of women and young people, etc.). The implementation of revolving funds will enable to reach a large number of beneficiaries and will contribute to not only the activities scaling-up but also to the action's sustainability. The implementation of the different activities will generate significant socio-economic and especially environmental benefits for the basin. The following actions will achieve the goal:
    - Activity 2.3.1.1: Identify the needs for infrastructure and processing units for non-timber forest products for vulnerable and disadvantaged populations in the basin;
    - Activity 2.3.1.2: Implement the actions of realization of the transformation units and their transfer to the beneficiary populations;
    - Activity 2.3.1.3: Establish fodder crops and livestock corridors in order to limit the generalized degradation of the cover and soil;
    - Activity 2.3.1.4: Set up funds to support, in the form of grants and/or microcredits, Income Generating Activities (IGA) for women and youth and other vulnerable groups based on a feasibility study.

[12] Hallegatte Stephane, Jun Rentschler, Julie Rozenberg. 2020. Adaptation Principles—A Guide for Designing Strategies for Climate Change Adaptation and Resilience. Washington, DC: World Bank. 200p

Component 3: Strengthening the capacities of different actors, share knowledge and raise awareness among all beneficiaries at different levels (US$ 1,000, 000)

95. This component aims at consolidating the MBA institutional and technical capacities as well as the project implementation framework. Moreover, it will provide means to ensure dissemination of lessons learned through capacity building, communication and training. It will also support the development of innovative knowledge management mechanisms for information sharing, training and exchange of experiences, data collection and analysis, dissemination and capitalization of best practices. This will be supported by the development of a web platform and innovative communication tools. Some expected outputs of this component are: technical reports; manuals on lessons learned, videos, radio and television programmes, experience sharing visits, awareness campaigns, etc. The component also includes the development of a communication plan for target groups, in particular vulnerable communities (women, youth, the elderly and the disabled) and water users.

Outcome 3.1: Mobilized and sensitized stakeholders through communication and capacity building activities

96. The development of flexible policies and technical and institutional responses requires capacity building of various stakeholders. This is important to facilitate a common understanding among basin stakeholders of the concepts of vulnerability, opportunity, impacts and uncertainties of climate change. The skills to develop an appropriate adaptation plan and its implementation are essential, in particular for managing uncertainties in the development of scenarios and the implementation of measures, for using appropriate tools and for integrating adaptation into the basin management plan[13] . In addition to the MBA Executive Directorate, other key stakeholders targeted for capacity building include local communities, NGOs, youth and women's organizations, and extension staff from various national and local sectors such as water, agriculture, environment and forestry.

97. As an important action of this outcome, it will be necessary to ensure that communities in the targeted areas are sensitized to climate change adaptation and disaster risk reduction. Lessons learned and good practices from the project will also need to be appropriately disseminated.

Output 3.1.1: Practitioners, technicians and decision-makers are sensitized and trained on technical and environmental aspects of the project

98. As the Mono Basin Authority (MBA) is a young organization, special emphasis will have to be placed on capacity building issues to enable it to become operational quickly. The capacity building actions planned within the framework of the project will include both training and material aspects (acquisition of appropriate equipment, suitable premises, etc.) for the MBA and other stakeholders concerned at national and local levels. The activities planned within this framework are the following.

- Activity 3.1.1.1: Take stock of Executive Directorate of Mono Basin Authority's (ED/MBA) capacity to manage climate risks in the basin and define the institution's capacity building priorities;
- Activity 3.1.1.2: Support the implementation of identified priorities;
- Activity 3.1.1.3: Implement specific training/appropriation actions for the benefit of the ED/MBA and the national and regional technical structures on various topics: innovative data production/management tools (GIS and other information systems, remote sensing, cartography, etc.), benefits, use and management of the EWS, use of EWS prevention/intervention plans.

Output 3.1.2: Communities in target areas are sensitized and trained on climate change resilience issues

99. The main objective of this output is to raise awareness and build the capacities of the communities in the basin on various targeted themes. As such, the actions to be deployed may include, among others, awareness campaigns on the impacts of climate change such as land degradation, water quality, concrete adaptation solutions and development of innovative mechanisms to valorize endogenous knowledge. The main activities planned for this output are described below.

- Activity 3.1.2.1: Develop a special awareness plan for grassroots communities on the issue of Climate Change and means of adaptation, with particular emphasis on taking into account endogenous know-how;
- Activity 3.1.2.2: Implement the awareness plan.

Output 3.1.3. BOUCLIER CLIMAT project results and lessons learned are disseminated and shared

100. Dissemination of the results, lessons and good practices learned from the project is essential for the sustainability of the project and especially their replicability and scaling up. To achieve this, various means and actions will be implemented in this regard: toolkits of good practices, technical reports; manuals on lessons learned, videos, radio and television programs, experience sharing visits, awareness campaigns, methodological guidance notes, sharing of information and experiences through trips and visits, training for dissemination and capitalization of best practices. It will also rely on the development of a web platform and innovative communication tools. A communication plan will help refine the approaches and means required to achieve this objective. In this regard, the following activities are planned.

- Activity 3.1.3.1: Develop the project's communication plan and strategy, in conjunction with those of the MBA;
- Activity 3.1.3.2: Ensure effective dissemination of project achievements and lessons learned.

[13] *UNECE (2015). L'eau et l'adaptation au changement climatique dans les bassins transfrontaliers : Leçons à retenir et bonnes pratiques.*

B. Promotion of new and innovative solutions to climate change adaptation

101. The BOUCLIER-CLIMAT project will implement new techniques for the management, adaptation and resilience of populations to the impacts of climate risks in the Mono River basin. Indeed, the first component of the project will develop a regional early warning system for effective flood management in the Mono River basin.

102. This Regional Early Warning System will be based on:

- a community-based approach focusing on empowering communities in vulnerable localities to monitor flood risks and prepare for adaptation and resilience
- a regional approach facilitating hydro-climatic risk modelling at the river basin scale, (ii) more realistic forecasting and adoption of synergistic and effective solutions/interventions, (iii) partnership approach for data/information exchange, experience sharing between national stakeholders and the MBA. This promotes transparent decision making to prevent conflicts over the use of shared resources (water, soil and associated ecosystems) in the Mono basin.

103. The regional EWS will be fed by a Data Collection Platform (DCP) composed of agro-climatic stations equipped with sensors, recorders and remote transmitters that will automatically and continuously collect and send hydro-climatic information from the Mono basin. As described in Output 1.1.2, the EWS to be developed will use satellite imagery to better understand and access large areas at any given time, especially those that are physically inaccessible. In addition, a wide range of communication and sharing tools will be developed to ensure access and free flow of information to all relevant stakeholders.

104. The use of "Nature-based Solutions" through Component 2 for the protection, sustainable management and restoration of ecosystems while ensuring human well-being and producing benefits for biodiversity. These solutions have highly relevant benefits for the preservation of the natural environment and are compatible with the project area, which is full of RAMSAR sites and sensitive and degraded ecosystems.

105. The project will introduce new income-generating activities for vulnerable people, especially women and youth, to diversify food production and improve community livelihoods. The proposed innovations concern the financing of income-generating activities. Thus, two financial mechanisms will be implemented to facilitate beneficiaries' access to grant funding to develop their own initiatives, which will be identified and submitted to a feasibility study. The advantage of these mechanisms lies in the promotion of concrete actions focused on the real needs of vulnerable communities, the implementation of which could ensure their livelihoods, generate income/benefits, foster their empowerment and, in addition, strengthen their resilience.

C. Economic, social and environmental benefits

106. The project aims to implement activities to enhance the resilience of vulnerable populations in the Mono River Basin through civil protection against climate-related disasters (especially floods), development of water resources/wetlands (RAMSAR zones) and other associated ecosystems, improvement of people's livelihoods, and strengthening the technical and institutional capacities of stakeholders. Through its expected outcomes, the project will generate significant economic, social and environmental benefits.

Table 2: Significant economic, social and environmental benefits

Outcomes	Economic	Social	Environmental
1.1: Regional Early Warning System (EWS) Establishment for effective flood management in the Mono River basin	Sustainable protection of economic assets (agricultural production, community infrastructure, businesses, etc.) Sustainable agro-pastoral practices with the creation of fodder fields and livestock corridors	Direct impacts on almost 15,000 persons living in the basin downstream and close to the river banks and indirectly the 5,000,000 people (which of 52% women) living in the basin; Reduction of frequent flood-related deaths	Acquisition of hydro-climatic data in real time and at lower cost than in-situ processes Restore wetlands, mainly those in the RAMSAR zones in the basin Carbon sequestration and low GHG emissions
2.1: Resilience of water resources to the impacts of CC and overexploitation is strengthened	Increase water availability for all economic uses mainly agricultural yields and consequently the economic livelihoods and well-being of the basin's communities	Reduction of women's efforts to access water supply (Targeting directly almost 10,000 women in rural area)	Regeneration of degraded soils and ecosystems, protection of land against flooding, groundwater recharge
2.2: Mono Basin ecosystems (soil resources, plant biodiversity, animal biodiversity ...) preserved through implementation of adaptation measures against the effects of climate change Outcome	Increase agricultural yields and consequently the economic livelihoods and well-being of the basin's communities	5,000 direct beneficiaries and indirectly the 5,000,000 people in the basin	Sustainable exploitation of the basin's natural resources Soil protection and preservation against erosion and desertification

			Protect and reduce degradation of lands used for agriculture
2.3: Implemented adaptation measures for the benefit of the population	Increase climate resilient livestock breeds and numbers which will allow to avoid substantial losses of livestock due to climate change impact	Sustainable increases in productivity and improvements in food security; Women's empowerment; improving social and health well-being.	Reforestation/afforestation Biodiversity improvement
3.1: Mobilized and sensitized stakeholders through communication and capacity building activities	Implementation of measures to protect assets and services increase knowledge on water resources and related ecosystems for informed decision making	7,000 direct beneficiaries	Sustainability of environmental protection actions and scaling up by informed and sensitized populations

107. The main benefits from the project are described as follow:

Environmental benefits

108. The « Bouclier Mono project » will support the strengthening of monitoring networks and the collection of useful and reliable hydro-climatic data to assist in the implementation of the EWS. In addition, data and information produced will allow a better understanding of the interactions between the environment and human factors, as well as the impacts of climate on these components, in order to define the most appropriate approaches and means for a sustainable exploitation of the basin's natural resources. They will also contribute to the development of tools for planning and sustainable management of water resources and associated ecosystems in the basin.

109. The deployment of the EWS is essential and will contribute significantly to the ecosystem, economic and social benefits. Other impacts of these actions include protection and reduction of land degradation for agriculture and restoration of wetlands in the basin. Special emphasis will also be paid to the protection and restoration of RAMSAR zones in the basin.

110. Actions to preserve ecosystems by protecting and restoring springs and riverbanks, protecting and preserving soils against erosion and desertification, reforestation/afforestation, developing livestock corridors, promoting beekeeping, etc. have undeniable and invaluable environmental impacts. Moreover, most of the planned activities will be implemented through the Nature Based Solution (NBS). The immediate and long-term positive effects and impacts of the implementation of these actions are the regeneration of ecosystems and biodiversity in the basin. This will increase the provision of ecosystem services in the basin and by extension, the economic and social development of the communities.

111. The lessons and best practices learned from the project are likely to be useful for planning in other national basins in the two countries as well as in transboundary basins. The planned awareness and communication activities will be useful for the replicability and scaling up actions regarding the preservation of the basin's natural resources, ecosystems and biodiversity. This will ensure the project's environmental sustainability

Economic benefits

112. The deployment of the EWS will undoubtedly provide the means for rapid and effective decision-making and implementation of measures to protect assets and services exposed to flood disasters in the basin, particularly in its downstream part. The economic benefits include the drastic reduction of economic losses and social impacts due to these disasters.

113. The actions targeting the development of water resources (Outcome 2) will increase the availability of water for economic activities (small-scale agriculture and irrigation, livestock farming, etc.) but also the preservation of ecosystems. These activities will not only contribute to increasing ecosystem services but will also substantially strengthen the livelihoods and economy of the populations, especially the vulnerable communities. Another important effect of this action is the reduction of women's efforts to collect water, especially in rural areas.

114. The project's support in implementing income-generating activities (with priority given to women and vulnerable groups) and promoting other actions such as agroforestry and pastoralism will foster improved livelihoods, as well as financial autonomy and social well-being of communities, especially the most vulnerable communities.

Social benefits

115. Effective and sustainable flood management will contribute to civil protection in the basin. The cyclical floods have significant negative impacts on the socio-economic and environmental systems of the basin. Each year, hundreds of villages are affected, thousands of hectares of crops are destroyed, tens of thousands of people are displaced, and the economies of poor and vulnerable people collapse. The implementation of an effective community-based EWS in the watershed will contribute to a significant reduction of these disasters and thus improve the livelihoods but more importantly the protection of the people and thus their resilience.

116. The implementation of this project will have direct impacts on all 5,000,000 people (nearly 52% of whom are women).

117. The support to vulnerable groups, particularly women, through the establishment of income-generating activities aims to increase the economic income of beneficiaries and their financial autonomy. In addition, the empowerment of gender (women-led initiatives) and youth aspects will be at the heart of the project's actions at all stages, from planning to project implementation. They will be actively involved in decision-making. The project is designed to provide benefits to the local populations and in particular, to women and other vulnerable groups who depend highly on these resources for their livelihood and well-being. Thus, gender issues will be integrated into capacity building programs and community level interventions.

118. To enhance mitigation of adverse effects resulting from project implementation, relevant risks related to planned activities in compliance with the Adaptation Fund's Environmental and Social Policy (ESP) and SOA will be employed. This will be applied at all levels, as well as with national environmental legislation in each of the two beneficiary countries. In addition, an Environmental and Social Impact Assessment (ESIA), an Environmental and Social Risk Management Plan (ESRMP) and a gender assessment will be undertaken for the proposed project with inputs from the respective national authorities and implementing entities, hand in hand with the Sahara and Sahel Observatory as the project implementing entity. OSS will also apply the FPIC process to complete the PSE compliance at all project stages.

D. Cost-effectiveness of the proposed project

119. The project will contribute to strengthening the resilience of the population to climate change through the implementation of concrete adaptation actions on the field, using an efficient and cost-effective approach.

120. In recent years, the Mono River Basin experienced floods that caused significant material and human damage, loss of livelihoods, and waterborne diseases. In order to determine the cost-effectiveness of the adaptation investments proposed by the Bouclier Mono project in relation to the expected avoided costs of dealing with the impact of floods and droughts, a cost-effectiveness analysis was conducted. It compared the estimated costs of the status quo under certain assumptions with the costs of the proposed adaptation measures.

121. In the business-as-usual scenario, governments respond to damage caused by extreme weather events in the same way as in the past by undertaking recovery actions (distribution of motor-pumps to pump water into homes, financial assistance to disaster victims, rehousing of people who have lost their homes, food aid, etc.) and rebuilding basic infrastructure (schools, health centers, roads, etc.) in case of floods. This keeps the population in poverty, food insecurity, precariousness, and dependence on food and financial aid. To cope with droughts, which also cause loss of income, especially agricultural income, governments still provide financial and food aid.

122. In the scenario of implementing resilient approaches proposed to address climate risks (floods and droughts), the project aims to reduce the negative impacts of climate change on ecosystems and populations and to strengthen their resilience through the implementation of concrete adaptation actions. These actions include the establishment of an early warning system to reduce the extent of damage caused by floods, the restoration of specific degraded ecosystems, the sustainable and adapted restoration of fisheries (flood resistant), pasture, and agricultural infrastructure. This will be combined with income-generating activities to motivate the sustainable management of land and water resources. The project will use a collaborative or participatory (grassroots empowerment) approach involving local people in the planning and implementation of activities. The underlying principle of this project is that when income-generating activities are made compatible with environmental management and ecosystem and land restoration interventions, they can serve as an incentive to actively involve communities in project planning and management activities. Planned activities will be undertaken at selected sites based on immediate, tangible results that will provide an anchor for local organizations while promoting common pool resource protection and benefit-sharing.

123. The flood recovery and construction costs after a flood are already higher than the costs of the present project. Moreover, these events will become more frequent according to climate projections and will result in multiplying costs that will be far greater than the cost of adaptation measures. Thus, the comparison clearly shows that in the long term, it is more cost-effective to build resilience in populations and ecosystems than to maintain the current situation. With the support of the Adaptation Fund grant, the proposed project will provide several adaptation benefits that will help move each country toward a sustainable climate-resilient development pathway.

124. The regional approach to be employed under this project is the most cost-effective way to create a sustainable and significant impact for vulnerable communities whose level of resilience to climate change will be strengthened as well as food security. Its effectiveness lies in the establishment of an operational framework that promotes the pooling of expertise from across the region to improve knowledge of hydro-climatic hazards and to develop complementary solutions and implementation of integrated and effective adaptation strategies. This approach will undoubtedly contribute to the reduction of investment losses linked to the development of local strategies that are not adapted to shared resources, due to the inadequate knowledge of the situation at the basin level. In addition, the choice of the "Nature-based Solutions" approach represents an economically viable and sustainable alternative. Nature-based solutions (NBS) are, in the long term, often less costly than technological investments or the construction and maintenance of infrastructure to respond to societal challenges such as the fight against climate change or the management of natural risks. They are flexible and adaptive because they do not require heavy, high-impact infrastructure and can be managed according to the evolution of global changes. Applied to the Mono basin,

they will allow for the development of ecosystem preservation actions (replanting, reforestation, soil protection and conservation on 350 ha at the headwaters of rivers), improvement of ecosystem management (hydro-agricultural development using HIMO, agroforestry practices, etc.) and ecosystem restoration (rehabilitation and stabilization of riverbanks on 150 ha, practice of assisted regeneration), as described in Component 2 of the BOUCLIER-CLIMAT project. It is therefore a relevant, accessible and profitable ecosystem approach for the beneficiary communities.

125. The establishment of an Early Warning System will strengthen the capacity of the MBA and contribute to cost-effective solutions to reduce disaster risk. Through monitoring, knowledge will be improved and efficiency will be gained.

126. At the end of the project, it is expected that new innovative solutions will be identified and implemented to effectively and sustainably address climate change challenges at the basin level. If no action is taken, the threats and negative impacts associated with the above-mentioned climate risks will continue and intensify in the basin and consequently increase the vulnerability of the basin's people and ecosystems. Failure to implement the project will inevitably and significantly increase the adaptation costs of vulnerable communities exposed to climate risks.

127. The table below gives an overview of the concrete benefits resulting from the implementation of the project's actions.

Table 3: Concrete benefits resulting from the implementation of the project's actions

Project Components	Concrete adaptation benefits	Avoided losses	Trade-offs (compromise)	Number of Beneficiaries
Component 1: Setting up/strengthening tools for climate change resilient management of the Mono River basin **2,100,000 USD**	- The deployment of a Multi-Hazard Early Warning System (MH-EWS), mainly for floods and droughts management will allow the beneficiaries to gain knowledge and tools to increase preparedness for climate extreme events; - The designing and implementation of tools for climate-resilient agriculture: Supporting climate-smart agriculture in the basin will enable producers to increase their yields; - The production capacity of satellite based and in situ data will help to increase knowledge on water resources and their dependence as well as better planning by decision-makers.	- Reduction of environmental impacts (erosion, pollution, etc.); - Socio-economic losses due to recurrent floods and droughts; - Destruction of socio-community development infrastructure (roads, schools, hospital, water points, etc.) of settlements; - Crops losses due to seasonal climate variability; - Food insecurity	- Significant spending (financial investments) by governments and funding partners to address crisis response to recurrent climate-related disasters; - Increased vulnerability to climate change in the basin	About 15,000 direct beneficiaries along the river (5 million people living in the basin (indirectly).
Component 2: Improving the resilience of the most vulnerable ecosystems and people in the basin to the impacts of Climate Change through concrete adaptation measures **8,750,000 USD**	- Improved river protection and aquatic ecosystem function as well as water quality and quantity; - Enhanced resilience to climate change impact through improvement of water uses (hydro-agricultural development, fishing and livestock) and Sustainable agro-pastoral practices activities, - Increased soils protection and fertility; - Improved household income and the benefit of rural communities through gender responsive income-generating activities. - Ecosystems in RAMSAR areas, are rehabilitated and preserved	- Degradation of the Mono River water resources and ecosystems; - Loss of aquatic resources; - Soil erosion and desertification; - Decrease in crops productivity, mainly maize and rice in the basin; - Loss of the population' purchasing power, especially the most vulnerable ones; - Food insecurity	- Decline in agricultural productivity in the basin due to land degradation and loss of soil fertility; - High adaptation costs, if no action is undertaken – necessity for provisional investment for vulnerable communities in the basin; - Loss of terrestrial and aquatic biodiversity; - High adaptation costs - countries should be investing more in the provision of basic necessities and other basic social services for vulnerable communities in the basin - food and financial aid dependency	About 15,000 beneficiaries along the river (The 5 million people living in the basin will be indirectly target)
Component 3: Strengthening the capacities of different actors, share knowledge and raise awareness among all beneficiaries at different levels **1,000,000 USD**	- Increased institutional and technical capacities of various stakeholders at national (country) and regional (MBA) levels regarding the designing and implementation of climate change adaptation and satellite-based tools; - Increased regional cooperation for better regional coordination of climate action at the Mono basin level; Enhanced regional capacities to communicate projects achievement and best lessons learnt	- Uncoordinated actions; - Lack of consultation; - Non-shared information.	- Governance system specific to each of the two riparian countries in order to manage climate events and disasters without assuming additional roles and responsibilities at transboundary level; - Specific management options to face climate extreme events	About 7,000 directly and several millions indirectly

E. Consistency with development strategies

128. For each of the two beneficiary countries of the project, water management is one of the major challenges for sustainable development in the context of climate change. Thus, through the implementation of its activities, the project will contribute to the achievement of national orientations/priorities in terms of poverty reduction, environmental protection and adaptation to climate change. The objectives of this project are therefore fully in line with the international texts on transboundary water management, climate change and biodiversity conservation.

129. **At the international level:** Several international treaties aim to reduce natural and technological risks. These include the Sendai Framework for Action on Disaster Risk Reduction, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification among others. The objectives of this project are aligned with these treaties and the related objectives are summarized in the table below.

130. **At the regional level:** The project will contribute to the implementation of the various regional guiding documents such as, Regional Flood Risk Management Strategy, ECOWAS policy and mechanisms on Disaster Risk Reduction, Strategic Program for Vulnerability Reduction and Adaptation to Climate Change in West Africa and the Action Plan of the Mono Basin Authority's overall planning and management framework focusing on the updated Mono Basin Authority strategic plan (2016). Indeed, the project actions are based on the documents that highlight all the Mono Basin challenges, including recurrent flooding, biodiversity loss, ecosystem degradation, climate change, human pressure on natural resources and lack of knowledge of surface and groundwater resources.

131. **At the national level:** Benin and Togo both have (i) a national water policy with a National Action Plan for Integrated Water Resources and Ecosystem Management, (ii) a climate change adaptation policy and a National Adaptation Plan (NAP), (iii) a Nationally Determined Contribution (NDC) and (iv) a strategic framework for flood management.

132. The table below presents the main strategic documents to which the project actions are linked

Table 4: Development strategy and project consistency for the BOUCLIER CLIMAT countries

Level	Plan/Strategy/ Policy	Objectives
INTERNATIONAL	Sendai Framework for Action on Disaster Risk Reduction (2015-2030)	This Framework for Action was adopted to reduce all forms of disaster risks. One of the seven goals of the Framework for Action is to "significantly reduce, by 2030, the number of people affected by disasters worldwide, so that the global average rate per 100,000 people during the 2020 - 2030 decade is lower than the rate recorded during the 2005 – 2015 decade".
	United Nations Framework Convention on Climate Change, 1992	One of the principles of this convention is to take beforehand risk management measures with regard to potential immediate and future damage to the environment and health. All actions to be developed within the framework of this project, aim to observe the principles of this framework and more specifically the aforementioned principle.
	United Nations Convention to Combat Desertification	This convention aims to combat desertification and mitigate the effects of drought in the countries that are severely affected by drought and/or desertification. The reforestation of the banks scheduled under this project will contribute to achieve this objective.
REGIONAL	Regional Flood Risk Management Strategy and Action Plan (2020 -2025)	The strategic objectives of this document are to: - Improve the collaboration and develop synergy of action between the relevant institutions working in the flood risk management; - Align the approaches to flood risk management within the ECOWAS Member States; - Establish and/or strengthen the flood warning system and the dissemination of climate risk information within the Member States and in the region; - Consider flood risks in development planning in the Member States.
	Mono Basin Authority Strategic Plan (SP) (2016 – 2020), further implementation authorized by CTA from Benin and Togo	The Strategic Plan aims to: - Value the basin's water resources for sustainable socio-economic development of the States Parties; - Develop and implement the main tools for the Basin water resources management in accordance with national policies and strategies for the integrated management of water resources and the MBA convention.
	ECOWAS Disaster Risk Reduction Gender Strategy and Action Plan (2020-2030)	The ECOWAS Disaster Risk Reduction Gender Strategy and Action Plan (ECOWAS DRR GSAP) aims to help member States to build resilience to natural hazards that is inclusive of all segments of society. While the Action Plan builds on the Disaster Risk Management activities agreed upon by member states and making sure the language is gender responsive.
	ECOWAS Regional Climate Strategy (2022-2030)	The main objective of the ECOWAS Regional Climate Strategy is to support Member States in meeting the challenge of combating climate change, in particular for the fulfilment of their commitments to meet their commitments under the Paris Agreement.
	Strategic Program for Vulnerability Reduction and Adaptation to Climate Change in West Africa (2030)	ECOWAS is seeking a region with no borders, an area in which every inhabitant has access and uses all resources available, through the creation of opportunities and within the framework of sustainable production and environment. The overall objective of this program is to develop and strengthen resilience and adaptation capacities in the sub-region to contend with climate change and extreme climate phenomena.
	ECOWAS Integrated Water Resources Management Policy (2025)	This policy aims to promote an integrated approach to water resources management for economic development and to achieve poverty reduction objectives in the region.
BENIN	National Disaster Risk Reduction Strategy (2019-2030)	The NDRRS aims to make Benin a resilient country, able to prevent, reduce, manage risks and disasters by 2030, and ensure sustainable recovery to provide a healthy living environment. It also aims to increase sustainably the resilience of communities in Benin, its national institutions and its local authorities to disasters.
	Communication on Benin's adaptation under the United Nations Framework Convention on Climate Change (UNFCCC) 2022	Communication on adaptation has the following objectives: • Increase the visibility and profile of adaptation and its balance with mitigation. • Strengthen adaptation action and support for developing countries. • Contribute to the Global Assessment. • Improve learning and understanding of adaptation needs and actions.

	Nationally Determined Contribution (2021 - 2030)	One of the purposes of the NDC in terms of adaptation is to build the capacity to adapt to climate change in all socio-economic sectors (creation of jobs, income, etc.).
	Strategic Plan for the Development of the Agricultural Sector 2025	The SPDAS aims to improve the performance of Beninese Agriculture, allow it to sustainably ensure food sovereignty, food and nutritional security, and contribute to the economic and social development of Beninese men and women. This objective complies with component 2 of the BOUCLIER-CLIMAT project, which aims to promote innovative and climate-resilient agricultural practices.
	Third National Communication, 2019	For the coastal, water resources and agriculture sectors, the TNC has planned adaptation measures such as: • The implementation of an emergency measures plan, • Flood management. • Integrated management of water resources in agricultural systems, • The development of plant and animal production systems that are climate change resilient.
	National Climate Change Management Policy (NCCMP) 2021-2030	In its program of climate change adaptation, the NCCMP plans on: (i) Establishing an effective multi-risk early warning and management system for disasters and natural hazards, including floods and sea level rise, ii) Popularizing water resources integrated management in all hydrographic basins with the construction of rainwater reservoirs in rural areas.
	Low Carbon and Climate Resilient Development Strategy (LCCRDS) 2016- 2025	Implementing the actions of the project component 1 meets sub-project 7 of pillar 3 of the LCCRDS which is to reinforce the climate information and natural disaster risk management EWS.
	PANGIRE, 2010-2025	The objectives of PANGIRE are as follows: - Ensure the ecosystems sustainability; - Provide protection against the negative effects of water, both physical (floods) and health (water-related diseases); - Implement a policy to adapt to climate variability and change impacts on water resources.
	National Adaptation Plan (NAP) (2021-2030)	The NAP aims to increase Benin's resilience and adaptation capacity to climate change while reducing vulnerability to climate change impacts by strengthening the adaptation and resilience capacity of local communities and their livelihoods for an economic and social transformation at the national level by 2030.
TOGO	Nationally Determined Contribution (NDC), 2021-2030	The NDC aims to promote integrated and sustainable management of water resources, meet present and future needs in terms of adaptation and pave the way of low-carbon development for the country.
	National water policy adopted in 2010	The general objective of the national water policy is to contribute to the fight against poverty and to sustainable development by providing appropriate solutions to water-related problems, so that it does not hinder socioeconomic development.
	PANGIRE 2010-2025	PANGIRE plans to establish a positive framework for good governance by creating prosperous environment for a fair water governance and by reforming the institutional and organizational framework for water resources management.
	National Development Plan (NDP) 2018-2022	The NDP overall objective is to structurally transform the economy, for strong, sustainable, resilient, inclusive growth, creating decent jobs for all and leading to the improvement of social well-being.
	The agricultural policy supported by the strategic plan for the transformation of agriculture in Togo by 2030 (AP-SPTAT 2030)	The overall objective of agriculture in its interactions with other sectors is that it fully contributes in the emergence of Togo and accelerates the economic growth, poverty reduction and improved the living conditions while ensuring social inclusion and protection and respect for the environment.
	Third National Communication, 2015	As for the coastal, water resources and agriculture sectors, the TNC has provided for adaptation measures, such as: • The implementation of an emergency measures plan, • Flood management. • Integrated management of water resources in agricultural systems, The development of plant and animal production systems that are climate change resilient.
	Strategic Investment Framework for Environment and Natural Resources Management in Togo (CSIGERN 2018-2022)	The Strategic Investment Framework for Environmental and Natural Resource Management (CSIGERN) aims to further encourage public, private and civil society actors and intergovernmental organizations to coordinate their efforts to better exploit the country's environmental, economic and social potential.
	National Implementation Strategy for the United Nations Framework Convention on Climate Change	This strategy aims to mobilize the various categories of actors around development strategies that consider climate change issues. It identified measures to be taken to reduce as much as possible the uncertainties linked to both activity data and greenhouse gas emission factors. For the agricultural sector, it recommended, among other strategies, improving the efficiency of production and promoting the use of less polluting techniques and limiting the risks related to the dangers of global warming and climate change due to greenhouse gases.
	National Action Plan for the implementation of the National Framework for Climate Services (NFCS) in Togo adopted in 2009	The plan aims at strengthening the capacities of the main structure providing climate services in Togo, the Direction Générale de la Météorologie Nationale (DGMN). The key sectors agreed in this process are five (5): (i) disaster risk management, (ii) energy, (iii) health, (iv) water resources and hydrology, (v) agriculture and food security.
	National Strategy for Reducing Emissions from Deforestation and Forest Degradation (REDD+) 2020-2029	REDD+ aims to reverse the trend of forest degradation and deforestation by opting for sustainable management of existing forests and increasing forest cover to 30% by 2050, leading to carbon sinks and effective carbon sequestration.

F. Alignment with national technical standards

133. The project is consistent with the environmental, social and gender policy of the Adaptation Fund, and with national environmental and social regulations in both countries.

134. Minor negative impacts of the project could arise from some of the activities under component 2, related to the implementation of priority actions in the areas of the basin most vulnerable to climate change. Indeed, within the framework of the project, activities of restoration and mechanical protection of degraded banks will be implemented.

The realization of the small collection infrastructures of runoff water, the implementation of actions of conservation of water and soils/defense and restoration of soils (CWS/DRS) will contribute to attenuate the intensity of the floods and thus the pollution of water, to recharge the groundwater and to restore the ecosystems.

135. The implementation of the Income Generating Activities will consider the alignment and compliance with the environmental and social safeguards, to avoid any harm on the different environment components. However, the project will comply with all relevant agricultural, water and soil resources, environmental and social standards.

136. The activities planned under the project have been proposed in consultation with the implementing entities, ensuring that they comply with the relevant technical standards in each country. An environmental impact assessment will be carried out prior to the implementation of these activities.

137. Also, the site selection criteria applied by the countries have taken into account, among other things: the fragility of the ecosystem and the vulnerability of the environment and the populations. The protection of the environment (particularly land and water) is a major issue for the project, and the training modules will help to raise awareness on this subject. The table below presents the national laws and regulations of the countries concerned regarding agriculture, land, water and soil resources, as well as the environmental and social standards that will be respected during the implementation of the project.

Table 5: Alignment with technical standards

Country	Relevant national technical standards
Benin	▪ Law n° 2018-18 OF 06 AUGUST 2018 on climate change in the Republic of Benin ▪ Law n° 2010-044 of 21 October 2010 on water management in Benin, ▪ Decree n° 2012-227 of 13 August 2012 establishing the water development and management plan. ▪ Law n°93-009 of 02 July 1993 on the forest regime in the Republic of Benin ▪ Law n°2002-016 of 18 October 2004 on the fauna regime in Benin ▪ Law n° 91-004 of 11 February 1991 on phytosanitary regulations in the Republic of Benin ▪ Law n° 98-030 of 12 February 1999 on the framework law on the environment ▪ Decree n°2017-332 of 06 July 2017 on the organization of environmental assessment procedures in the Republic of Benin ▪ Law n°2017-15 modifying and completing Law n° 2013-01 of 14 August 2013 on the land and property code in the Republic of Benin and its application decrees ▪ Law n°2022 -04 of 6 February 2022 on public hygiene in the Republic of Benin.
Togo	▪ Law 2010 - 004 of 14 June 2010 on the Water Code in Togo ▪ Law No. 2008-005 of 30 May 2008 on the framework law on the environment ▪ Law on the Mining Code: Law n° 2003-012 modifying and completing Law n° 96-004 of 26 February 1996 on the Mining Code ▪ Law n° 64-I4 of 11 July 1964 on the regulation of fishing ▪ Ordinance n° 12 of 6 February 1974 to lay down land and property legislation ▪ Order No. 012/MERF of 17 April 2007 to set up the national consultation platform for the prevention of risks and natural disasters. ▪ Decree No. 97-227/PR of 22 October 1997, approving the Disaster Relief Organization Plan or ORSEC-TOGO plan

G. Project duplication

138. Several projects on sustainable natural resource management and strengthening adaptation with objectives including improving water management and livelihoods, reducing the impacts of flooding and erosion, and strengthening the resilience of local communities to extreme climate events are being implemented in the Mono River Basin. Some are still under implementation and others are in preparation. Development initiatives in the Mono River Basin are funded by the two countries sharing the river, donors, NGOs and Partners. The Bouclier Climat Project will build on the achievements of previous initiatives and for the ongoing ones, the project actions will be planned to ensure good complementarity and coherence in the basin. In addition, the stakeholder's consultation process which is initiated during this step of the project preparation will be deepened during the full proposal stage to reinforce the participatory approach. This process is essential to emphasize synergies and complementarities and to ensure no overlap or duplication among projects or between the various financing sources.

139. The table below outlines the initiatives for which the project could develop a complementarity.

Table 6: Related projects/programmes in the Mono River Basin and synergies

Project	Objectives	State of implementaion	Funding source	Intervention zone/extend	Link with BOUCLIER-CLIMAT project (Duplication/Complementarity)
Regional Partnership on Water and Environment in Central and West Africa (PREE-ACO)	Setting up the management structures (Local Water Committee); Strengthen the capacities of the Mono basin observatory through training and the installation of measuring equipment.	Under implementation	SIDA/UICN	Regional (Benin-Togo)	**No Duplication:** Contributes to strengthening the actions of component 1 and 3 of the Bouclier project, in particular the achievement of outputs 1.1.1 and 3.1.1. Indeed, the monitoring equipment installed will enable the extension of the basin monitoring network which will be further consolidated by the Bouclier project. In addition, PREE-ACO will support the provision of reliable data for the operation of the regional EWS. Similarly, the technical and institutional capacity building actions of PREE-ACO will be an important lever for the development and implementation of the Bouclier project.
WASCAL Programme : Hydrometeorological observation of transboundary basins	Training, acquisition and installation of hydrometeorological measurement equipment in the Mono basin.	Under implementation	German Federal Ministry of Education and Research	Regional (Benin-Togo)	**No Duplication:** Contributes to the implementation of component 1 of the project, in particular the achievement of the hydro-agro-climatic (surface and groundwater, meteorological) monitoring network improvement and data and information production. The measurement networks established in this framework will be strengthened and used for the implementation of the Regional EWS
RIWE-Mono: Regional Initiative for Water and Environment in the Mono River Basin	Generate global environmental benefits through enhanced cooperation between Togo and Benin on the Mono River Basin	Under preparation (PPG stage)	GEF/IUCN	Regional (Benin-Togo)	**No Duplication:** The RIWE project which will be implemented by MBA, GWP-AO and OSS aims at developing the Transboundary Diagnostic Analysis (TDA) with and a Strategic Action Plan (SAP) 2023-2027 for the Mono River Basin. The project will establish the technical and scientific basis (e.g. regional database and hydrological model) as well as tools for long-term planning and governance of water resources in the basin (e.g., TDA/SAP, governance bodies, etc.). Indeed, the RIWE will develop complementarities with the Bouclier Project mainly its component 2 on concrete adaptation actions on the ground.
Initiative for Sustainability, Stability and Security in Africa (Initiative 3S)	Contribute to the setting up of the Mono basin observatory, necessary for the knowledge and monitoring of water resources and ecosystems of the Mono basin.	Under implementation	IFAD	Regional (Benin-Togo)	**No Duplication:** Complementarity between the two projects regarding the training actions and monitoring network and data production for knowledge improvement as well as the regional EWS.
CLIMAFRI project	Co-develop and co-implement adaptation strategies for sustainable flood risk and natural resource management in the transboundary Mono River basin Establish a river basin information system by integrating scientific data with information and knowledge of local stakeholders and communities Train professional staff in multiple scientific and technical aspects during the process of establishing the information system and to integrate the information system within the responsible authorities in the (transboundary) region	2019 - 2022	German Federal Ministry of Education and Research	Regional Lower basin (Benin-Togo)	**No Duplication:** CLIMAFRI's actions are mainly related to the production of scientific data and information. The results of the project will therefore be relevant for the implementation of the Bouclier project 's activities, in particular for the development and deployment of the flood EWS
WACA Project - West African Coastal Resilience Investment Project	Contribute to improved management of shared resources and risks integrating climate change affecting communities in the south and coastal area of the basin.	2018 - 2023	World Bank	Regional Lower valley of the Mono Basin (Benin-Togo)	**No Duplication:** The complementarities will be in the development of the physical and social investments of component 2 of the project BOUCLIER-CLIMAT. Thus, the Shield project will reinforce and consolidate the achievements of the WACA project through the scaling up of some of the latter's actions, where possible.
BRIDGE	Contributes to shared water resource management, organization and training of local stakeholders and development of hydro-diplomacy in the basin.	Under implementation	IUCN	Regional (Benin-Togo)	**No Duplication:** Complementarity and reinforcement of the actions of the component 3 of the present initiative with regard to the MBA capacity building. The

"Building dialogue and governance around rivers »					Bouclier project will definitely consider the results and achievements of this project and build on them when planning the various stakeholder capacity building activities.
Water, Sanitation and Hygiene Sector Support Programme (ProSEHA)	Develop actions for the integrated management of water resources in the Mono basin (protection of ecosystems, food security and capacity building of local stakeholders). Also contribute to the development of management tools (SDAGE, SAGE).	Under implementation	GIZ	National Benin	**No Duplication:** GIZ has long experience in the basin, particularly on issues of drinking water supply and recently on the implementation of IWRM and adaptation to CC. Important achievements are available and will serve as a basis for the project planning, which in turn will contribute to strengthen these achievements. indeed, the actions under the component 1 of the project will built on the ProSEHA project achievements and contribute to they complementarity and strengthening
Lower Mono River Valley Development Project	Contribute to the improvement of food security and poverty alleviation of rural populations	Under implementation	BOAD, BADEA	Regional Benin-Togo	**No Duplication:** All the activities of the BOUCLIER project, especially activities under components 1 and 2, present complementarities with this project. Specifically, the Bouclier project will to take into account the planning and the achievements of the project for the planning of its activities under component 2, outcomes 2.2 and 2.3 aiming at the sustainable development of ecosystems and water resources as well as the implementation of other concrete adaptation measures on the ground.
Mono Transboundary Biosphere Reserve Management Project	Improving the conservation of marine and coastal ecosystems and the use of ecosystem services	Start in 2022	European Union	Regional Lower part of the basin	**No Duplication:** The project actions will be concentrated in the downstream and coastal part of the project. Complementarity will be sought with the activities of the Bouclier project to be developed in this part of the basin, in particular those related to Component 2, Outcome 2.2and Output 2.2.1
AGIR-Eau - Benin	Improve policy framework for IWRM integrating gender and climate change resilience	Start January 2022	GIZ	National Benin	**No Duplication:** The actions of components 1 et 3 of the project will contribute to the complementarity and strengthening of the results of this project: This GIZ support has recently started and focuses on the implementation of IWRM (institutional and field actions) in the national portion of the basin in Benin. It will also support the strengthening of monitoring networks and the production of hydroclimatic data and information. To this end, the Climate Shield project will benefit for the Beninese part from the project's assets, especially for its component 1 (Regional EWS) and component 3 (Capacity Building).
Project for the hydro-agricultural development of the Lower Mono Valley	Strengthen food self-sufficiency and improve the standard of living of rural populations by developing an agricultural perimeter with total water control for the cultivation of rice and market garden produce	Closed	BADEA	National Benin	**No Duplication:** The complementarity of the project is linked to the project's component 2, in particular the implementation of income generating activities. Bouclier project will built on the achievement and best practices of this project
Project for the development of multifunctional hydraulic infrastructures and sustainable management of water resources (PDIHM/GDRE)	Project focusing on water resources data collection, valuation studies and identification of sites for dam construction and improvement of legal frameworks	Under implementation	National budget	National Benin	**No Duplication:** Synergy and complementarity with the component 1 activities with regard to the integrated basin-wide climate risk assessment and monitoring model: The PDHIM project focuses on the management and development of water resources in the Beninese part of the basin: reinforcement of measurement networks as well as the development of water mobilization and development infrastructures (surface and groundwater). PDHIM also plans to develop water from artesian wells, similarly to the Bouclier project (Component 2). There are several points of complementarity and synergy between the two projects. To this end, the Bouclier project will absolutely take into account the achievements and planning of PDHIM in order to avoid any duplication
Community-based Marine and Coastal Biodiversity Management Project (PGCBMC)	Contribute to the sustainable management of the biological and ecological diversity (national and international benefit) of coastal wetlands and other associated ecosystems in the coastal zone	Closed	GEF	National Benin	**No Duplication:** The achievements of this initiative, particularly those related to soil protection and conservation, will help to scale up and strengthen some of the achievements of the PGCBMC project

Development of hydro-agriculture downstream of the Nangbeto dam	Contribute to feasibility studies for hydro-agricultural developments and the development of climate change adaptation measures in the Mono basin.	Under implementation	UEMOA - ECOWAS	National Togo	**No Duplication:** Complementarity and reinforcement of the actions of the component 2 of the present initiative with regard to small-scale irrigation development activities. Activities under component 2 of BOUCLIER project present complementarities with this project. Indeed, Bouclier project consider planning and achievements of the to avoid duplication but also de strengthen the project achievement.
Anié dam and irrigation scheme in Togo	To contribute to the irrigation of the exploitation of the Sino-Togolese society	Under implementation	Sino-Togolese Society	National Togo	**No Duplication:** The complementarity of the project is linked to the project's component 2, in particular the implementation of income generating activities

H. Learning and knowledge management

140. Major activities are planned under Component 3 of the project (Outputs 3.1.1 to 3.1.3) for the documentation and dissemination of the knowledge generated by this project to all beneficiaries, different stakeholders, and other basin organizations. In order to foster the change in the current paradigm of case-based development, the education sector will also be largely integrated into the capitalization and dissemination of the project's knowledge. Dissemination of knowledge and good practices will enhance learning outcomes and potentially facilitate replication of successes by government authorities and communities facing similar problems in the basin as well as in other basins or countries. A variety of mechanisms will be used to ensure effective coordination and to broaden the dissemination of the project's achievements to a larger number of institutions and communities in the two MBA member countries.

141. Consequently, at the start of the project, a knowledge management strategy to capitalize on existing climate information, facilitate information sharing among stakeholders, and disseminate project results will be developed. The knowledge shared will be relevant, linked to strategic objectives, practical, replicable, and accessible.

142. To this end, the project will identify, analyze, and share lessons learned that could help design similar projects in the future, as part of actions to build institutional capacity and resilience of vulnerable communities on climate change adaptation practices in the Mono Basin. Lessons learned and best practices on community and ecosystem-based adaptation interventions will be collected regularly through trained local communities.

143. Knowledge materials will be developed, disseminated, and made available, responding to the demand and needs of different stakeholder groups. A knowledge capitalization manual will be developed by ABM based on its experience in preparing and disseminating thematic manuals, to capitalize on best practices in managing climate impacts on water, the environment and populations for use by the country's youth. A web platform will be functional. Advocacy notes will be developed and made available to the public. Data and information generated by the project will be systematically shared on this web platform as well as on the websites of the main implementing partners of the project, in particular OSS, GWP-WA, and MBA. Interaction and exchange of good practices between countries will be facilitated.

144. Existing tools such as the African Water Information System (AWIS) will be used and dissemination of lessons learned will include web-based information dissemination and presentations in national and regional forums. Other broader dissemination channels may include social media (Facebook, LinkedIn, Twitter), mass media (radio and television services using local languages as well as non-technical languages), and videos for dissemination of good practices.

145. Regional and global events (conference symposia, various workshops, and meetings) can be used to help disseminate project results and lessons learned.

146. The envisioned activities of capacity building and climate change adaptation will promote a proactive approach to climate-resilient planning and development by local authorities in both Togo and Benin. The uptake and sustainability of climate-resilient adaptation solutions beyond the project in other national sub-basins in both countries will be promoted through awareness campaigns that highlight the benefits associated with investing in climate-resilient practices.

147. In the third quarter of the second year of implementation, a mid-term evaluation of the project will be conducted to review the results achieved, lessons learned, the overall status of the project against plans, partnerships established under the project, and linkages with other initiatives, in order to make forward-looking recommendations regarding the overall relevance, strategy, and approach of the project, and future activities in particular.

148. At the end of the project, a post-project evaluation will be conducted with the different categories of beneficiaries and stakeholders (government agencies, civil society, and local communities) to assess the lessons learned, the effects and impacts of the project, and its sustainability. The evaluation will also examine the overall management of the project, reports and outputs in terms of relevance, quality and applicability. This report will be prepared in close collaboration with the key stakeholders listed above.

149. An appropriate budget (US$1,000,000) will be allocated to ensure the successful implementation of knowledge management and lesson dissemination activities.

I. Consultative process

150. The BOUCLIER-CLIMAT project is prepared following the three-step approach of the Adaptation Fund: (i) development of the PRE-CONCEPT NOTE, (ii) development of the CONCEPT NOTE and (iii) production of the project document (FULL PROPOSAL). Stakeholder consultation is progressive according to the level of project formulation. This consultative process addresses the description of the approaches developed in the first two stages.

151. At the PRE-CONCEPT NOTE stage, the process started with the first consultation with relevant agencies and ministries at national level in the two-member countries (Benin and Togo). The project idea was then analyzed and validated by the MBA Technical Committee of Experts (gathering representatives of the different sectoral ministries of the two countries) in coherence with the national water resources management policies. Following a regional assessment, the MBA has established mechanisms for the involvement of stakeholders concerned with water and related resources management at the basin level. This facilitates stakeholder consultation during the project development process.

152. At this stage, i.e. CONCEPT NOTE development stage, this consultative process has been developed through two complementary approaches. The first involved direct meetings with institutional stakeholders such as MBA, the Directorate General for Water, the National Water Partnership (PNE-Benin), the National SAP Focal Point, the Ministry of the Environment, JVE NGOs (Benin and Togo), etc. The second was virtual and consisted of meetings with the local authorities and the local communities. For the virtual approach, online questionnaire forms were designed and sent to the targeted

actors. The questionnaire was validated by OSS, the Regional Implementation Entity. Table 7 provides an overview of the different categories of stakeholders consulted and a description of their main roles during the project preparation.

153. In addition to the above approaches, a regional consultation workshop took place from April 14th to 15th, 2022 in Benin (Cotonou) to collect the expectations and needs of the participants as well as to agree on the priority aspects for integration in the concept note (CN). The workshop is also an opportunity to exchange with the participants on the scope of the project and its objectives. The consultative meeting brought together, actors from the Ministry of Water, Environment, Agriculture, local authorities and civil society from Benin and Togo, including representatives from MBA, OSS, and GWP-AO. The detailed report of the consultative meeting is provided in annex 2.

154. The design and implementation of the project is carried out in accordance with OSS guidelines, the Environmental and Social Policy (ESP) of the Adaptation Fund, as well as the national environmental regulations of each member country and the required technical standards. It will be elaborated further during the FULL PROPOSAL phase where all stakeholders will be consulted including beneficiaries, vulnerable groups, women and youth associations, NGOs, etc. Environmental assessment tools such as the Environmental and Social Management Framework (ESMF) and/or Environmental and Social Impact Assessments (ESIA) will be triggered to analyze the environmental risks and impacts that could be generated by the implementation of the project activities in order to plan their management and/or control by means of the specific environmental and social safeguard instruments required for all stages and scales of implementation.

Table 7: Main actors and their main roles during the project preparation

Key categories of actors	Description of key roles
Mono Basin Authority (MBA), Executive Directorate	- Lead regional organization that will coordinate the project activities execution. - During the project preparation, MBA will facilitate and provide all required data and information. - During the project execution, MBA will facilitate community mobilization as well as the monitoring the project progress.
MBA National Focal Points (in Benin and Togo)	- Support the MBA in data collection as well as identification of Flood Early Warning System (FWS) equipment - Identification of ongoing and planned initiatives and projects at national level - Stakeholder identification and community mobilization
Mono Basin Committee	- Support the MBA in data collection, community mobilization - Identification of ongoing and planned initiatives and projects at the basin scale - Stakeholders identification
Research institutions: WASCAL and Water Departments	- Provide technical and scientific expertise/advice - Provide scientific data and information - Support in project execution. - Member of the Regional Steering Committee.
National Civil Protection Agency in Benin	- Vulnerability assessment - Identification of needs/activities - Identification of Flood Early Warning System (FWS) equipment
Various projects management under implementation Units	- Identification of completed, ongoing and planned initiatives and projects in the mono river basin
National governmental bodies: *Technical departments of the sectors in charge of water, and others in charge of related sectors (agriculture, environment, etc.) in the 2 countries*	- Provide inputs during project preparation and execution. - Participate in both Project management at national level - Member of the Steering Committee to provide technical guidance
Local actors: *Decentralized bodies, Local Coordination Committees*	- Provide guidance and technical assistance for the project preparation on key activities - Support in project execution.
National GEF Focal Points	- Provide support to the preparation and execution of the project in the use of satellite data for natural resources and ecosystems monitoring. - Identification of completed, ongoing and planned initiatives and projects in the mono river basin
Civil Organization actors (NGOs) at national and regional levels	- Support to the project management team. - Support in training, community awareness on climate change issues, water resources management and development and advocacy.
Users Socio-professional organizations (farmers, fishermen, etc.); Women and/or youth organizations	- They are among the key project beneficiaries on the ground that will be mobilized through their local institutions to participate in trainings and awareness raising sessions as well as pilot actions implementation at local level. - Provide feedback and lesson learned from project activities since their interventions are directly on the ground.

J. Justification of funding request

155. The objectives of the project are fully in line with the focus of the Adaptation Fund. The measures, mechanisms, capacity building and partnership actions that will be developed and promoted under this project will contribute to improving the resilience of communities to flooding in the Mono river basin. Indeed, one of the major climatic risks in the Mono River Basin is recurrent catastrophic flooding. The main drivers are the frequency of exceptional rain events as presented in section 1.4 above. In addition, there is the poor management of flash floods and spillages from the Nagbeto dam due to the lack of a reliable warning system for the management of the dam. Other drivers include the ecosystem degradation and surface states in the basin that are prone to runoff. As outlined in sections 1.2; 1.5 and 1.6 above and in table 8 below, the socio-economic and environmental impacts of flooding are enormous and inhibit the real development of the basin's already very poor people. The two countries (Benin and Togo) are developing and implementing various action to better manage this climate risk, with the support of technical and financial partners.

156. The population of the two beneficiary countries are still living below the poverty index. Togo's Human Development Index (HDI) value is 0.513 in 2019 and places it in the low Human Development Index category. Its incidence of monetary poverty is 68.7% in rural areas while it is 37.9% in other urban areas and 34.8% in Lomé. Benin's Human Development Index (HDI) in 2019 is estimated at 0.545 (HIPC).

157. The water and agriculture sectors are crucial for their economic development of the population in the Mono river basin. The Mono River basin has long been for the communities of Togo and Benin a natural capital around which several socio-economic activities are practiced, including agriculture, livestock, fishing, river transport, etc.

158. In Togo and Benin, the agriculture, livestock and fisheries sector accounts for more than 70% of the active population in both countries. The portions of the Mono Basin do not remain outside this proportion. The agricultural sector occupies about 80% of the population in the entire basin. The water and agriculture sectors are very vulnerable and exposed to various climate risks.

159. The Bouclier project is intended to provide means for concrete long-term adaptation measures through climate risks mainly floods management and other concrete adaptation actions on the ground as well as capacities building. The following table provides an analysis of the scenarios without the interventions in this project and a justification of the full cost of adaptation.

Table 8: Analysis of the scenarios without the interventions in this project and justification for the need of this request

Project Components	Baseline: Without any support from the Adaptation Fund	Impacts of the proposed project: with the Adaptation Fund support
Component 1: Setting up/ strengthening tools for climate change resilient management of the Mono River basin **(US$ 2,100,000)**	In the current situation, recurrent floods have significant socio-economic and environmental impacts. For instance, the flood statistics for 2019 are as follows[14]: flooding of approximately 4,100 hectares of land in the downstream part of the basin; About 15,000 households and more than 60,000 people in nearly 200 villages are affected; The inaccessibility and degradation of several public buildings and basic infrastructures (health centres, schools, water points, roads, etc.). The losses costs were estimated at almost 10 billion FCFA (USD 20 million). According to climate projections, this situation will intensify and the related socio-economic damage will increase. The Mono Basin Authority (MBA) is recently established (in 2019), facing lack of reliable data and information for long-term monitoring and planning for proper water resources management and adaptation to climate change in the Mono River Basin. This is insufficient hydrological and environmental monitoring tools. The Mono Basin Authority is not sufficiently equipped with technical capacity for providing effective or operational response measures for climate risks in the basin (mainly floods and drought). Under current conditions and without the support of the Adaptation Fund, it is not clear that the situation will improve significantly and may even deteriorate, exposing vulnerable communities in the basin to climate disasters.	The Bouclier project funded by the AF will provide updated and comprehensive information on the vulnerability situation of the environmental and socio-economic systems in the Mono Basin and mostly the exposure to flood risks in the basin; It will provide support to the MBA regarding its technical capacity to face flood and other climate risk, mainly flood disasters prevention and management through the establishment of response plans as well as the designing and implementation of a regional Early Warning System (EWS) using geospatial technologies to the catchment; The project will promote collaboration, data/information exchange and development of a regional emergency response plan. These actions will increase the stakeholders' capacity to make decisions and prepare to reduce impacts and to implement alternative practices if need be.
Component 2: Improving the resilience of the most vulnerable ecosystems and people in the basin to the impacts of Climate Change through concrete adaptation measures **(US$ 8,750,000)**	The population in the Mono River Basin is particularly vulnerable to climate change due to its high exposure and low adaptive capacity. Climate change strongly impact their socio-economic conditions already affected by significant anthropogenic pressures with serious consequences on the environment (deforestation, degradation of water quality, etc.) and impacting ecosystem services provided by the river: inadequate water retention; degradation of water quality, reduced fish stocks and degraded flooded areas; loss of biodiversity, etc. The vulnerability of local communities, especially rural ones, is very high due to livelihoods directly dependent on natural resources (rain-fed agriculture, pastoralism, etc.) combined with limited adaptive capacity and recurrent food crisis and water shortages. The catchment's populations are also highly exposed to drought and flooding hazards, which are set to increase with the climate changes experienced in the area. The Ecosystems are threatened, especially those classified as RAMSAR sites, where the project will undertake specific actions.	The Adaptation Fund support will highly contribute to achieve: - Reducing the vulnerability of human and natural systems through improved adapting practices taking into account climatic and anthropogenic factors (related to development and essential services); - Strengthening the climate vulnerable communities and hydro-systems resilience through the implementation of various concrete adaptation actions (water, soil and land resources protection, livelihoods strengthening and diversification); - Livelihoods improvement of the most vulnerable among smallholder farmers and pastoralists such as women, and youth; - Ecosystems protection, especially those classified as RAMSAR sites

[14] UNITAR &UNOSTAT (2019). Inondations : Analyse des images du 26 Octobre 2019 - Préfecture de Lacs, Région Maritime, Togo. FL20191029TGO. http://floodlist.com/africa/togo-benin-mono-river-floods-october-november-2019; https://www.unitar.org/maps/map/2963

Component 3: Strengthening the capacities of different actors, share knowledge and raise awareness among all beneficiaries at different levels **(US$ 1,000,000)**	The lack of information and awareness for flood-prone communities does not allow them to integrate effectively climate risk into their activities. The various stakeholders in the basin (MBAs, local actors, etc.) and flood-prone communities lack knowledge and tools for mainstreaming gender and developing nature-based solutions for flood management, although they have useful traditional solutions and adhoc experiences.	The project activities achievement will bring to: - The development of innovative knowledge management mechanisms for information exchange; training and learning; data creation and analysis; dissemination of lessons learned and best practices. - Elaboration of communication materials for the target groups including vulnerable communities, women, youth, smallholder farmers, pastoralists, artisans, - Strengthening the Institutional capacities of MBA and countries, including regarding the capitalization of knowledge in the basin, the use of management and decision support tools, and skills for processing and valorization of satellite data. - Awareness of local communities to the impacts of climate change (land degradation, desertification, etc.). They will promote adaptation solutions and be able to facilitate the implementation of adaptation actions with a possibility to scale up the interventions in other sites found in the basin.

K. Project sustainability

160. The BOUCLIER-CLIMAT project plans to improve the resilience of communities in the Mono River Basin through investments and capacity building of actors, particularly institutions, NGOs working in the basin and vulnerable communities, in order to capitalize on and sustain the benefits and achievements.

161. By the end of this project, the actions could inspire the implementation of similar activities in other parts of the basin that have not benefited from the present interventions. These activities could also serve as a basis for the implementation of future projects.

162. For more efficiency, the following aspects of the sustainability will be targeted during the project preparation and its implementation: financial, institutional, environmental, technical and social sustainability. Another crucial aspect to strengthen the project sustainability is to ensure the sustainability of the realized investments and infrastructure as well as their long-term operation and maintenance with the involvement and commitments of the stakeholders at all levels (local, national and regional/transboundary).

163. **Environmental sustainability:** The BOUCLIER-CLIMAT project, through the strengthening of Early Warning Systems, could contribute to the improvement of the knowledge of the natural risks to which the ecological and human systems of the basin are exposed, and then anticipate the protection measures required to safeguard ecosystem functions. In addition, water and soil conservation practices, reforestation and restoration of degraded riverbanks and ecosystems in the basin to be promoted with the "Nature-based Solutions" approach will contribute to the enhancement of the capacity of biodiversity to produce or provide ecosystem services that will benefit the communities to address the many socio-economic challenges both during the implementation of this project and after its closing. In addition, the development of income-generating activities will contribute to the reduction of community pressure on resources.

164. **Social and economic sustainability:** As part of its implementation, Component 2 of the project will implement priority actions for the benefit of vulnerable populations in areas of high flood risk in the Mono basin. It is a component that facilitates the involvement of Youth and Women in the planning and implementation process of the actions to take into account their concerns and interests. In addition, through its component 3, the project also provides for training/awareness-raising actions for the actors for a better social sustainability of the envisaged measures. Finally, the mobilization, through community relays, of NGOs active at the grassroots level represents a considerable asset for the implementation of measures aimed at sustainably improving the living conditions of vulnerable populations. Overall, the implementation of the project activities through component 2 aims to strengthen and diversify the livelihoods and incomes of vulnerable communities, directly benefiting at least 5,500 people in the Mono basin. Indirectly, the whole basin population will be impacted by the project's actions. The project will also enable them to develop economic opportunities through activities such as Non-Timber Forest Products processing and traditional and resilient fishing practices. These actions will help to strengthen the organizational capacity of the communities, enabling them to access micro-credit, enter into direct partnerships with the private sector and empower them well beyond the lifetime of the project.

165. **Institutional, legal sustainability:** The BOUCLIER-CLIMAT project initiated by MBA fits into the institutional and legal framework of IWRM of the two countries sharing the Mono river basin. It is in line with the law 2010-004 of 14 June 2010 on the water code in Togo and the law 2010-004 of 21 October 2010 on water management in Benin supporting the national water policies. Several decrees implementing these laws have been adopted and the project will contribute to the implementation of those relating to sustainable water management. At the institutional level, most of the project implementation and management structures are operational and their capacity will be strengthened through the implementation of component 3. Some structures and NGOs, operating in the basin, will be trained through partnerships with existing monitoring networks. These structures will contribute to strengthening the overall governance framework in the water, agriculture and environment sectors. They will surely help to provide

the Mono basin with integrated management mechanisms that can be replicated in other national and sub-regional basins. The improvement of knowledge and the development of skills constitute elements of structuring of the actors of the sectors concerned and a lever for performance.

166. **Long-term operation/implementation of the EWS, maintenance of the investments and infrastructure and stakeholders' commitments at the post-project phase:**

167. **For Component 1 (Outcome 1.1),** the sustainability of the Regional EWS and the equipment and infrastructure acquired for this purpose requires a commitment from both countries to ensure adequate funding for their operation and maintenance after the end of the project. The economic benefits of the EWS can be used to convince governments to commit to funding these operations. Indeed, about 0.5-1.0% of the annual flood damage costs that will be avoided after EWS deployment could be enough to keep the equipment operating[15]. Similarly, the MBA, which will be the regional management structure of the EWS, will have to include in its annual budget and in the budget lines of its various projects related to the EWS, financial resources to cover the operating and maintenance costs of the EWS equipment and infrastructure. Other potential sources of funding could be sought from national and regional institutions such as the National Climate Funds (e.g., FNEC in Benin). A strategic partnership/agreement could be established with the Communauté Electrique du Bénin (CEB), which operates the Nangbéto hydroelectric dam, to obtain a financial contribution for the maintenance and management of the EWS, as the CEB is one of the main beneficiaries of the warning tool. In addition to ensuring sustainable financing, the technical capacities of all actors involved must be strengthened and serviced. To this end, the relevant technical services in charge of meteorology, hydrology, civil security/disaster management in both countries, the MBA, the technical services of the basin municipalities, the national offices of GWP-AO in both countries, etc., will have to be involved in all the stages of setting up the process and trained technically to this end. The experiences and achievements of similar projects/actions in other basins involving the two countries (as the WMO's Hycos project in the Niger and Volta basins; the CREWS projects in the Volta basin funded by the Adaptation Fund, ECOWAS Hydromet Initaive, etc.) will be highly valuable for the MBA and the stakeholders involved in the management of the project and the capitalization of its achievements. Another technically important issue is that the long-term sustainability of the project achievements will be ensured by the MBA who will receive the meteorological, hydrological and climatological data and related products from the National Meteorological and Hydrological Services (NMHSs) in the two countries. To this end, formal commitments will have to be obtained from the competent national bodies of both countries in order to guarantee the provision of the required data and information in real time (Example of commitment letters).

168. **For the component 2 activities,** the emphasis will be on strengthening the technical capacities of the actors of the local services of the public bodies in charge of infrastructures and equipment maintenance (Departments in charge of water, agriculture, rural engineering, environment, etc.). The beneficiaries will also be technically trained in order to ensure the primary maintenance of the equipment. Since the implementation of most of the activities will generate economic benefits, a maintenance fund could be created and fed by a part of the annual benefits (2 to 3%) generated. Part of this resource will be used to ensure the maintenance and replacement of equipment. The MBA should also be able to monitor and support beneficiaries in the management of infrastructure. MBA would also initiate new projects for additional funding for the scaling up of the different actions in other parts of the basin. **For Component 3,** The role of the MBA will be of paramount importance for the dissemination of the project's achievements and the sensitization of the actors after the project's closure. The monitoring and operation of the equipment and sites for communicating the results of the project and their renewal will be handled by the MBA, which will have to provide for its annual operating budget, the required financial resources, and the qualified personnel needed to do so.

169. The costs of the various operations needed to adequately ensure the sustainability of the project will be refined at the full proposal phase.

L. Environmental and social impacts and risks

170. The BOUCLIER-CLIMAT project will align with the environmental and social (E&S) principles of the Adaptation Fund Policy during its preparation as well as implementation. Indeed, the preliminary environmental and social assessment carried out for the project concept note concludes that the implementation of BOUCLIER-CLIMAT project activities is likely to have specific impacts in some intervention areas but these impacts can be easily mitigated. A detailed E&S impact assessment, including mitigation measures and E&S management framework, will be carried out during the FULL PROPOSAL phase of the project document. The results of the preliminary assessment are presented in the table below.

[15] According to a recent report of the ECOWAS, the benefit-cost ratio of EWS implementation services ranges from 7 to 10 for each dollar invested (Strengthening Weather, Climate, and Water Services In West Africa – ECOWAS HYDROMET INITIATIVE - https://ecowas.int/wp-content/uploads/2022/03/ECOWAS-Hydromet-Initiative.pdf)

Table 9: Preliminary results of the E&S assessment for the BOUCLIER-CLIMAT project

Checklist of E&S principles	No further assessment required for compliance	Potential impacts and risks further assessment and management required for compliance
Compliance with the Law		- Risk: The risk of non-compliance with all domestic and international laws and regulations could occurs during the implementation of the project - Potential Impact: Low The proposed project has been developed in line with international standards on climate change, biodiversity, land conservation, water resources, ecosystem management and poverty reduction. It takes into account selected national and regional priorities, policies, plans and technical standards for climate change adaptation and sustainable development. With regard to the Environmental and Social Assessment, a detailed study will be carried out during the preparation of the full proposal. OSS as the project's regional implementing entity with the support of the MBA and GWP will ensure the strict application of this principle. Particular attention will be paid for the specific intervention related to the Transboundary Biosphere Reserve of the Mono and the RAMSAR sites.
Access and Equity		- Risk: Since the basin surface area is very unevenly distributed between the two countries (12% in Benin and 88% in Togo), the use of surface area as a key to repartition could be a significant mismatch and a potential source of conflict between the two countries - Potential Impact: Low to medium The project will seek to ensure fair and equitable access to the benefits of the project. During the feasibility studies for the full proposal elaboration, mechanisms and approaches will be identified to ensure equitable access to project benefits. All the relevant stakeholders from both countries will participate in this process to avoid any potential conflict related to this issue.
Marginalized and Vulnerable Groups		- Risk: Possibility that vulnerable and marginalized groups will have insufficient access to the project services such as warning, IAGs, knowledge or technological devices, etc. - Potential Impact: Low To reach and ensure the protection of marginalized and vulnerable groups, including women, youth, orphans, the elderly, and people with disabilities, the E&S assessment of the project will be based on a participatory approach, incorporating consultations with communities to identify the best approaches for their inclusion. Further assessment is needed to agree on selection criteria and avoid discrimination
Human Rights	No discrimination will be promoted in the implementation of the project whether it is related to ethnicity, age, gender or even educational level. The project design is based on a consultative approach involving various stakeholders. All activities will be carried out in accordance with established international human rights.	However, further assessment will be conducted during the full proposal stage to identify any impacts and risks regarding this principle
Gender Equality and Women's Empowerment		- Risk: In some parts of the project area, women do not have the same rights as men (participation in decision-making and access to information etc.) but this is not ruled by statutory law but rather by local and common practice. - Potential Impact: Medium Given this risk, the project places particular emphasis on women's and youth groups, especially for capacity building on innovative and resilient agricultural practices. Moreover, advocacy, information and awareness-raising activities conducted by women and men leaders and religious leaders are planned in order to reverse the tendencies of exclusion and separation. A plan for training and energizing women in connection with

Checklist of E&S principles	No further assessment required for compliance	Potential impacts and risks further assessment and management required for compliance
		the FA's gender policies will be integrated into the project's activities in these areas and then implemented.
Core Labor Rights		- Risk: In the region, gender pay inequality and child labor are risks that could arise and therefore affect the successful implementation of the project even there is no legal rule which govern these practices - Potential Impact: Medium During the E&S assessment, particular attention will be paid to the labor codes in force and the labor laws and regulations of both countries will be respected. In addition, the project will ensure that labor laws are taken into account during the implementation of the project. In fact, no major infrastructure such as hydroelectric dams are planned. Child labor and unequal pay for men and women will be prohibited.
Indigenous Peoples	There are no indigenous people or tribes noted in the Mono River Basin that will be affected by the project activities	
Involuntary Resettlement	The implementation of the project activities will not require the displacement of communities from their locations. The project will work with communities in their locations and on a voluntary basis. Therefore, no resettlement or even relocation to new locations is foreseen.	This will be further assessed during the full proposal stage to identify any impacts and risks regarding this principle
Protection of Natural Habitats		- Risk: possible influence on the environmental and ecological equilibrium, especially in areas of particular sensitivity such as the RAMSAR sites and the Mono Transboundary Biosphere Reserve (TBR) - Potential Impact: Low The BOUCLIER-CLIMAT project promotes soil and water conservation (SWC) measures. The adoption of SWC practices could lead to some producers/people converting other land. For the specific cases of the RAMSAR sites and the Mono Transboundary Biosphere Reserve (TBR), as indicated in Section A, (Component 2 and Output 2.1.1), the planned activities (2.2.1.3 and 2.2.1.4) in these areas will focus mainly on the protection and restoration of ecosystems with the aim in the short, medium and long term of maximizing environmental benefits. In any case, for each project site that is likely to be affected by the implementation of project activities, an environmental and social screening will first be carried out to categorize the site in terms of environmental and social impact, and then, depending on the case, an environmental and social impact assessment (ESIA) will be carried out, either simple or complete, and, if necessary, mitigation measures will be defined. If required, for the Fazao-Malfakassa National Park and TBR sites, an Environmental and Social Management Plan (ESMP) will be developed and implemented. Thus, a more in-depth assessment to identify the project's risks to the natural habitat is required, through an E&S assessment to be conducted at the full proposal stage.
Conservation of Biological Diversity		- Risk: Biological diversity slightly affected due to land conversion - Potential Impact: Low Although the project envisages ecosystem-based approaches, the possible conversion of land for agricultural production (i.e for small scale irrigation activities) may affect biological diversity. Awareness raising sessions will be organized to guide people in selecting new land for agricultural production to avoid negative environmental impacts. Further consultations and assessments will be required in the development of the Environmental and Social Management Framework (ESMF) for the proposed project.

Checklist of E&S principles	No further assessment required for compliance	Potential impacts and risks further assessment and management required for compliance
		This will be further assessed during the full proposal stage to identify any impacts and risks regarding this principle
Climate Change	No further assessment required. The activities of the proposed project aim to strengthen the resilience of ecosystems and populations to climate change by improving access to climate data through the establishment of efficient EWS and capacity building of risk and disaster management institutions and organizations. Innovative practices will also be developed and adopted by the community at the grassroots level.	This will be further assessed during the full proposal stage to identify any impacts and risks regarding this principle
Pollution Prevention and Resource Efficiency	The adaptation strategies based on ecosystems such as mangrove restoration and the valorization of non-timber forest products (NTFPs) will contribute to the sustainable management of forest resources and may reduce the pressure on land.	However, A further assessment is required and an ESMF will be developed with the necessary mitigation measures and monitoring mechanism.
Public Health	The project will not have negative impacts on public health. On the contrary, the increased income generated by the introduction of new income-generating activities can be used for other household needs such as schooling for children, access to health care and/or investment in other economic activities.	This will be further assessed during the full proposal stage to identify any impacts and risks regarding this principle
Physical and Cultural Heritage		- Risk: According to the CLIMAFRI Project advisory studies, the bed stream and floodplain contain sites of cultural and spiritual importance which could be impacted if some activities have to be undertaken in such zones - Potential Impact: Low The communities in the basin should be consulted on which parts of the basin to exploit in the installation of facilities and in the implementation of the BOUCLIER-CLIMAT project activities.
Lands and Soil Conservation	The promotion of agroforestry, restoration of mangroves and reforestation of resilient forest species on the banks of the Mono River will limit the risks of erosion linked either to the overflow of the river or to maximum rainfall (above 20mm). Moreover, thanks to soils enriched with organic matter, the soil's capacity to retain nutrients and water is improved. Through reforestation, more carbon will be sequestered.	This will be further assessed during the full proposal stage to identify any impacts and risks regarding this principle

PART III IMPLEMENTATION ARRANGEMENTS

A. Project implementation and management arrangements

171. The institutional arrangement for the project management will be as follows:

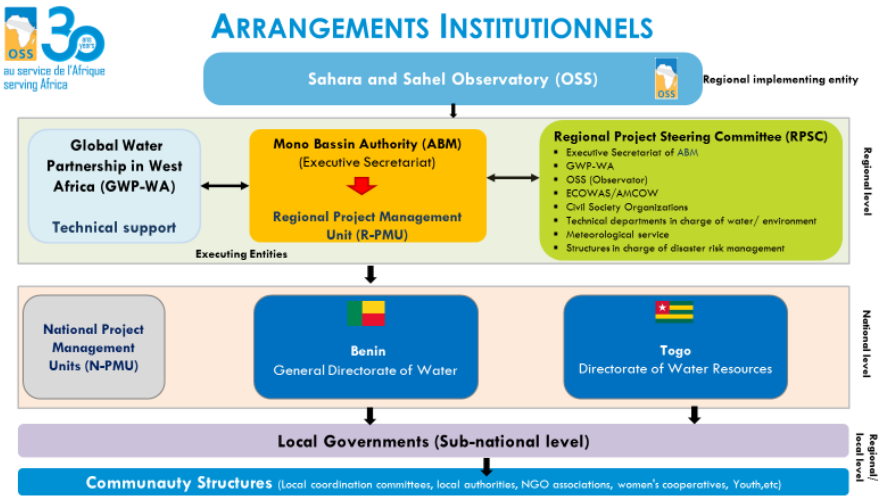

Figure 8: Project institutional arrangements

172. **Regional Implementing Entity (RIE):** The project will be implemented by the Sahara and Sahel Observatory (OSS), which will serve as the Regional Implementing Entity (RIE) and will be responsible for all financial, monitoring and reporting aspects of the Adaptation Fund. OSS has several years of experience working with both countries in the preparation and implementation of several development projects. This experience will facilitate exchanges with key national partners and the successful implementation of the project.

173. **Executing Entities:** The project execution will involve all stakeholders at regional, national and local levels, as follows:

- **Regional level: Regional Executing Entity (REE):** MBA will act as the REE. The main role of the MBA will be to ensure transboundary coordination, to strengthen relations with national structures, and to ensure the sharing and dissemination of data, the supervision of all activities in the field and the capitalization of achievements. To this end, a Regional Project Management Unit (R-PMU) will be set up and hosted by MBA to ensure the execution of the project activities with all other actors involved at the national and local levels. The GWP-AO will be in charge and offer technical support for all activities related to mobilization of stakeholders, as well as capacity building, trainings and lessons learned and project results dissemination.
- **National level: The National Executing Entities (NEE):** The Regional Project Management Unit will be supported by the "National Project Management Units (N-PMU)" hosted by the National Directorate in charge of Water Resources Management in each country. The N-PMUs will involve the Directorates of the sectoral ministries in charge of the environment and climate. As the project includes important activities of national and local scope, the N-PMU will supervise the execution of activities at the local level through relevant NGOs, local enterprises and beneficiary groups (representatives of socio-professional/community organizations, women's cooperatives, youth cooperatives, etc.) for the mechanical and biological protection of river banks, wetlands, among others.

174. **Regional Project Steering Committee (RPSC):** The Regional Project Steering Committee (RPSC) will be the highest decision-making organ for the entire project. It will periodically evaluate the results of the project and provide guidance for its effective management. The RPSC will be composed of permanent representatives of MBA, OSS, GWP-AO, Civil Society Organizations (PNE-Benin, PNE-Togo, Representative of the Basin Committees), Technical Directorates in charge of water/environment in both countries and ECOWAS/AMCOW. Other Structures, organizations and agencies may also participate to the RPSC depending on the thematic and topics discussed to bring their expertise and guidance to the project. The members of the RPSC must be represented at a level that allows them to take decisions independently.

Table 10: Members of the RPSC

Institution	Number of representatives
Executive Secretariat of MBA	2
GWP-WA	2
Technical departments in charge of water	2
Technical departments in charge of environment	2
Civil Society Organizations	5
ECOWAS/AMCOW	1
OSS (observer)	2
Institutions to be invited depending on topics to be discussed	
Departments of Agriculture	1
Meteorological Services	1
Structures in charge of disaster risk management	1
Others	1

PART IVEndorsement by governments and certification by the IE

A. Record of endorsement on behalf of the government

BENIN	Prof. Martin Pépin AINA Directeur Général de l'Environnement et du Climat Ministère du Cadre de vie et du Développement Durable	Date *: August, 03, 2021*
TOGO	Mr. Essobiyou Thiyu Kohoga Directeur de l'Environnement Ministère de l'Environnement et des Ressources Forestières	Date *: August, 03, 2021*

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (ECOWAS, CAADP, NAP, NAPA, NDC,..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this regional project.	
Mr. Nabil BEN KHATRA – *Executive Secretary of the Sahara and Sahel Observatory (OSS) as the Implementing Entity Coordinator*	
Date: **May 2, 2022**	Tel.: **(+216) 71 206 633** Email: nabil.benkhatra@oss.org.tn; boc@oss.org.tn
Project Contact Person: **Mrs. Khaoula JAOUI**	
Tel. and Email: **(+216) 71 206 633 – khaoula.jaoui@oss.org.tn**	

Annexes

Annex 1: Endorsement Letters

MINISTERE DU CADRE DE VIE
ET DU DEVELOPPEMENT DURABLE
REPUBLIQUE DU BENIN

01 BP 3502 - 01 BP 3621
Cotonou
Tél. : + 229 21 31 47 12
dgec_mcvdd@cadredevie.bj

ADAPTATION FUND

Letter of Endorsement by Government

Cotonou, August 03, 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the **« Towards a climate risks shield in the Mono River Basin (Benin, Togo):** *Strengthening adaptation and resilience to climate change through integrated water resources and flood management* **»**

In my capacity as designated authority for the Adaptation Fund in **Benin**, I confirm that the above national grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the **Mono River basin**.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by the **Sahara and Sahel Observatory (OSS)** and executed by the **Mono Basin Authority (MBA)** and **the Global Water Partnership- West Africa (GWP-AO)**.

Sincerely,

Prof. Martin Pépin AÏNA
General Director of the Environment and Climate
Ministry of the Living Framework and Sustainable Development

MINISTERE DE L'ENVIRONNEMENT
ET DES RESSOURCES FORESTIERE

SECRETARIAT GENERAL

DIRECTION DE L'ENVIRONNEMENT

ADAPTATION FUND

REPUBLIQUE TOGOLAISE
Travail – Liberté – Patrie

N° 003/2021 /DE/AdF

Lome, August 03, 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the « **Towards a climate risks shield in the Mono River Basin (Benin, Togo):** *Strengthening adaptation and resilience to climate change through integrated water resources and flood management* »

In my capacity as designated authority for the Adaptation Fund in **Togo**, I confirm that the above national grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the **Mono River basin**.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by the **Sahara and Sahel Observatory (OSS)** and executed by the **Mono Basin Authority (MBA)** and **the Global Water Partnership-West Africa (GWP-AO)**.

Sincerely,

Mr. Essobiyou Thiyu Kohoga
Director of the Environment / Ministry of the Environment and Forest Resources

Project Formulation Grant (PFG)

Submission Date: May 2, 2022

Adaptation Fund Project ID:	
Countries:	Benin and Togo
Title of Project:	Towards a climate risks shield in the Mono River Basin Strengthening adaptation and resilience to climate change through integrated water resources and flood management _ BOUCLIER-CLIMAT
Type of IE:	RIE
Implementing Entity:	Sahara and Sahel Observatory (OSS)
Executing Entities:	Basin Authority (MBA) & Global Water Partnership in West Africa GWP-WA

A. Project Preparation Timeframe

Start date of PFG	Upon Concept Note approval date
Completion date of PFG	10 months after Concept Note approval date

B. Proposed Project Preparation Activities ($)

Description of the PFG activities and justifications:

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
Cost-effectiveness	• Assess the economic and financial contribution for the project zones' beneficiaries • Analyze the profitability of project activities taking into account the cost-effectiveness of the proposed, water management infrastructure, climate-resilient farming practices, IGAs as well as the project added-value at the environmental, social and economic levels	5 000

Gender analysis	• Assess extent of gender mainstreaming into regional and national disaster risk management related policies with regards to governance, management, and emergency action plans • Analyze the existing gender strategies on addressing gender in water, agriculture and fishing related policies. • Monitoring and Evaluation interventions to measure progress and/ or impact of gender mainstreaming • Propose a gender specific action plan for BOUCLIER-CLIMAT project	5 000
Environment Impact Studies/Reviews	• Assessment of the project areas intervention and preliminary baseline establishment with additional stakeholder mapping • Environmental Impact assessment according to the AF 15 safeguards and OSS E&S policy • Review of project interventions identified to cause disharmony to the environment and socio-economic setup of the communities. • Development of an ESMP detailing the mitigation actions and its M&E system.	6 000
Workshops	National and regional concertation workshops with stakeholders and local communities' representatives	40 000
Design of the full project proposal	A complete funding proposal document including all the technical outcome from the preparatory studies and consultation workshops will be developed and validated before submission to the AF	10 000
Travel/participation	Travel costs and technical support	10 000
Other costs	Management fees	4 000
Total Project Formulation Grant		80 000

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)
Mr. Nabil Ben Khatra, OSS' Executive Secretary (RIE)		 05/02/2022

Project Contact Person	Telephone	Email Address
Mrs. Khaoula Jaoui, Climate Department Coordinator	(+216) 71 206 633	boc@oss.org.tn

Annex 2: Regional Consultation Workshop Report

CONCEPT NOTE DEVELOPMENT

BOUCLIER-CLIMAT Project - Strengthening adaptation and resilience to Climate Change through Integrated Water Resources and Flood Management in the Mono River Basin shared by Benin and Togo

Date and venue: Hôtel du Lac, Cotonou, Benin, April 14 - 15, 2022

Context and purpose of the workshop

The Sahara and Sahel Observatory (OSS), AF-accredited Regional Implementation Entity, to support the elaboration of projects benefiting from its funding, took the initiative to hold the regional consultation workshop for the completion of the BOUCLIER-CLIMAT project concept note, on April 14 - 15, 2022 in Cotonou (Hôtel du Lac).

Indeed, the BOUCLIER-CLIMAT project was initiated to meet the challenges of the Mono basin populations, in particular those related to hydro-climate risks. The project is subject to a 3-step approval process recommended by the Adaptation Fund. The project pre-concept note was approved by the Adaptation Fund (AF) in December 2021 and a concept note to be submitted for intersessional reviews before May 2, 2022 is being developed. The concept-note inclusive elaboration process started in March 2022 to ensure its integration and sustainability. This project shall be implemented by the Sahara and Sahel Observatory (OSS) in its capacity as an AF-accredited Regional Implementation Entity and executed at the regional level by the Mono Basin Authority (MBA) and the Global Water Partnership in West Africa (GWP-WA), as Executing Partners. The overall objective of the project is to reinforce the resilience of vulnerable communities in the Mono watershed by developing adaptation capacities to recurrent flood risks and promoting sustainable and equitable water resources. It is based on three main components:

- **Component 1**: Establishing a basin-wide flood early warning system to strengthen climate change (CC) adaptation planning;
- **Component 2**: Improving the resilience of the basin most vulnerable communities;
- **Component 3**: Capacity building, awareness raising and knowledge sharing.

The general objective of the regional consultation workshop is to collect the expectations and needs of all participants on the one hand, and to agree on the priority aspects to be integrated into the project concept note (CN), on the other hand to be submitted to the Adaptation Fund. The workshop is also an opportunity to exchange with the participants on the project scope and objectives. The workshop specific objectives are as follows:

- Collect the needs and expectations of the participants and have them integrated in the concept note:
- Have the participants amend and validate the project logical framework based on the components, results and products;
- Identify with the participants, the project potential areas of intervention and beneficiaries;
- Discuss the project budget allocation and have it validated by the participants;
- Discuss the institutional arrangements, roles and responsibilities of the different stakeholders, who will be involved in the project implementation and have them validated by the participants.

All stakeholders shall agree on the BOUCLIER project objectives, expected results, components and activities and validate the Concept Note content. More specifically, once closed, the regional consultation workshop will have achieved the following expected results:

- A common understanding of the project expectations and the measures to implement to reduce the vulnerability of communities to floods and adapt to climate change impacts in the Mono basin;
- The participants identify the project potential areas of intervention and beneficiaries;
- Validation of the project institutional set-up for an adequate execution;
- Validation of the budget allocation between the project components, products and results;
- A summary of the recommendations and remarks to be taken into account in the different sections of the CN

Participants

The meeting was held in hybrid mode. 33 people from national and regional institutions/structures (28 face-to-face and 05 online), took part in the works of the meeting, namely:

- The Sahara and Sahel Observatory (OSS);
- The Global Water Partnership in West Africa (GWP-WA);
- The General Directorate of Water of Benin (Focal Point / Benin MBA);
- The Directorate of Water Resources of Togo (Focal Point / Togo MBA);
- The General Directorate of the Environment and Climate of Benin (Focal Point/Adaptation Fund);
- The Directorate of the Environment of Togo (Adaptation Fund Focal Point);
- The National Civil Protection Agency (NCPA) of Benin and Togo;

- The Meteorological Agency of Benin and the General Directorate of National Meteorology of Togo;
- The Mono Basin Committee of Benin (Prefect of Couffo) and of Togo (Prefect of HAHO);
- The local authorities of Benin (Mayor of Bassila) and Togo (Mayor of Ogou 2);
- The Platform of Civil Society Organizations (PCSO) of the Mono Benin Basin (AVPN) -Togo (AGBO ZEGUE);
- The Consultant's team.

Participants present at the Cotonou workshop

Online participant (See screen)

In accordance with the agenda in Annex 1, seven (7) major sessions made the Cotonou regional workshop, namely:

- The opening of the workshop;
- Presentation of the project development process;
- Presentation of the project concept note;
- Presentation of the project institutional arrangement and partnership;
- Plenary debates and discussions;
- Group work for the improvement of the concept note;
- The closing of the workshop.

This report provides a summary of the various activities carried out in each session.

Session 1: Opening of the workshop

The workshop opening started with the opening ceremony and the establishment of the presidium to guide the works. Four main speeches marked the opening ceremony of the workshop:

- The welcome speech of Mr. Jean-Pierre Melon FIOGBE, representative of the Director General of Water, Focal Point of the Mono Basin Authority (MBA) - Benin;
- The opening speech of Mr. Dadja GNAKPAOU, Executive Director of the Mono Basin Authority;
- The speech of Dr. AbdelKader DODO, Coordinator of the OSS Water Department;
- The speech of Pr. Emmanuel Agnidé LAWIN, Chief of Staff, representative of the Minister of Water and Mines of Benin who begun the works, welcomed the participants and recalled the project context and all previous stages of the project development process as well as the expectations of the meeting.

Then, the floor was handed to the participants to introduce themselves, give their identity, position and the organization they belong to. The workshop was moderated by Mr. Arnauld ADJAGODO (Head of the MBA Studies and Planning Unit). The attendance list is given to prove the participants' effective presence. In order to start and guide the workshop sessions, a presidium of three (03) members was set up. It was made of:

- 01 President: Mr. Jean-Pierre Melon FIOGBE (Representative of the MBA Focal Point);
- 02 Rapporteurs: Mrs. Abla AGBOTO, (Head of the Weather Monitoring and Forecasting Division/DGMN Togo) and Mr. Gérard AGOSSEVI (AVPN NGO/ PCSO Benin).

Session 2: Presentation of the project development process

Here is the summary of the 3 presentations made during this session:

1) Mr. Razack SANOUSSI, (MBA Deputy Executive Director), made a presentation on the Mono Basin Authority that focused on (i) the MBA establishment process, (ii) its term, mission and mode of operation, (iii) the presentation of the Mono basin and its environmental and social problems and (iv) the MBA actions to date.

2) Mr. Aziz BELHAMRA, made an OSS presentation and recalled the project overall development process and the AF requirements. His presentation focused on: (i) the OSS mission and services, its member countries, its intervention strategy and its areas of expertise, (ii) the OSS experiences and achievements under other projects, (iii) Adaptation Fund requirements, and (iv) The BOUCLIER-CLIMAT project submission process.
3) The presentation of Mr. ALAGBE K. Landry (Consultant), who (i) recalled the context of the workshop and the concept note development mission, (ii) shared the concept note development process in relation with the OSS action plan, and (iii) presented the stakeholder consultation process initiated as part of the Concept Note development.

Session 3: Presentation of the project concept note

This presentation was made by the Consultant who helped develop the BOUCLIER-CLIMAT project concept note and who made a 3-part presentation as described below:

Part 1: General information on the project	Part 2: Project rationale	Part 3 : Project budget
-The BOUCLIER-CLIMAT project context; -Presentation of the mono basin and the project area; -The Project objectives; -Components and expected results of the project; -Other information on the project area of intervention and implementation schedule.	-Description of the components through the project results, products and activities; -Promotion of new and innovative solutions to climate change; -Socio-economic and environmental benefits of the project; -Project cost/effectiveness ratio (profitability); -Consistency with regional and national strategies; -Consistency with relevant national technical standards; -Project duplication or complementarity with other projects; -Environmental and social risks and impacts of the project; -Project sustainability.	-Presentation of the component-based costs

Session 4: Presentation of the project institutional arrangement

This session was moderated by Mr. Aziz BELHAMRA who explained the governing logic of the proposed institutional framework as well as the partnerships that need to be developed for the project implementation. It is worth reminding that:

- The BOUCLIER-CLIMAT Mono project will be executed by the MBA, with the technical support of the Global Water Partnership in West Africa (GWP-WA) and the OSS as the regional implementation entity;
- Project management units will be created at the national level. They will be housed by the ministries responsible for water in each of the two project beneficiary countries.

Session 5: Plenary debates and discussions with all stakeholders

Communicators provided the necessary answers and explanations to the participants' concerns expressed during the discussions. Discussions and debates focused on:

1) The main regional stakeholders and their role in the EWS management planned for the "BOUCLIER-CLIMAT" project;
2) Provisions for the EWS equipment and tool maintenance and monitoring after the end of the project;
3) Considering conflicts over transhumance and between hippos and local communities;
4) Mangroves blocking out the passageway to the SAZUE affluent flowing into the Mono River in the Bouche du Roy and communicating with the Gbaga channel in the Agbannakin village;
5) Compliance with the project document submission process provisional timetable to the Adaptation Fund Board with regard to the remaining works;
6) No field missions and meetings could be carried out with the project direct beneficiaries during this concept note preparation stage;
7) The poor consideration of Togo's strategy documents in the concept note development;
8) The complementarity between the GEF-funded IREE project and the "BOUCLIER-CLIMAT" project to be financed by the Adaptation Fund;
9) Criteria for identifying the 350 ha to be reforested as part of degraded ecosystems restoration.

Session 6: Group work for the improvement of the Concept Note

In order for the participation of the stakeholders to be optimized and to ensure the efficiency of the committee work, the participants formed two (2) groups (Benin and Togo) with clearly defined tasks. Thus, in accordance with the workshop ToRs, each group:

- Identified the potential areas of intervention as well as the beneficiaries of the project through previously defined criteria (see Annex),
- Made amendments to improve the logical framework,
- Proposed an institutional organization chart for implementation and,
- Identified ongoing projects and initiatives.

Several basic tools were previously designed by the OSS and made available to the groups to guide the discussions and promote the outcomes. Indeed, there was a targeting matrix for the project area of intervention, map support, the list of selection criteria and the logical framework presented in the concept note.

Togo Group

Benin Group

PRESENTATION OF THE TOOLS THAT WERE USED	
Targeting matrix for the project areas of intervention	This matrix is made up of the different towns of the basin, sorted by department and the groups of vulnerability elements (socio-economic, climate, etc.). Indices weighted from 1 to 3 per group of vulnerability elements would be assigned to each town as appropriate. A linear sum of the affected indices was calculated for each town to have the weight of vulnerability. This exercise made it possible to tell how vulnerable the towns were and to establish a priority table.
Beneficiary Selection Criteria	The potential beneficiaries of the project were identified based on the strengths, weaknesses, threats and opportunities. The assessment was made on the various development sectors of the basin and institutions for the management of the resources and disaster risks.
Map support	The Mono basin map shows the geographical location of the towns, the mono river and its affluents, Ramsar sites and dams. This support made it possible to give indices to the towns according to their geographical location and knowledge of their hydro-climate phenomena.
Logframe	It is an extract from the concept note presentation on the activities to be carried out for each of the expected results of a component. The amendments to be made relate to the relevance and exhaustiveness of the proposed activities in relation to the components, expected results and products.

Following the group works, the rapporteur of each group reported back on the discussions and exchanges outcomes, which can be summarized as follows:

- The identification of vulnerable areas, potential project intervention sites was made based on an analysis of the Mono basin community vulnerability to cc;
- It was made by national stakeholders having perfect knowledge on the situation of each Mono basin town and considering the towns hit by the floods;
- Ecological, climate and socio-economic vulnerability elements were used in this exercise. They are weighted with criteria ranging from 1 to 3 reflecting the level of degradation of environmental elements (water, soil, etc.), food insecurity, community dependence on agriculture and natural resources, rainfall variability and the appearance of flood and drought phenomena.
- Scores by vulnerability element of the 2 groups are presented below.

Vulnerability assessment

Vulnerability elements	Benin	Togo	Total
State of the environment	19	90	109
State of water resources	20	90	110
State of soil resources	10	94	104
Level of food insecurity	20	56	76
Level of dependence on NRs	**21**	**143**	**164**
Level of dependence on agriculture	**20**	**144**	**164**
Rainfall variability	20	96	116
Flood frequency	18	74	92
Drought frequency	21	59	80

This priority exercise made it easy to list vulnerable towns that could benefit from the project intervention.

Information on the towns targeted by national stakeholders said that it was possible to identify socio-professional groups threatened by these risk elements and which could be beneficiaries of the project activities.

The results presented by each group are summarized below

Session 7: Closing of the regional workshop

This session took into account the exchanges summary supported by the recommendations. It then, marked the closing of the workshop.

Recommendations of the workshop

The plenary discussions brought several recommendations to improve the stakeholder participation process and the quality of the concept note to be submitted to the AF. The most relevant recommendations are presented as follows:

Recommendations	Speaker
- Improve the presentation of the link between the project and the international and national strategy documents/Togo - Improve the presentation of sustainability (complementarity of the IREE project with the BOUCLIER-CLIMAT project) - Propose activities that are more adapted to field realities - Provide details on the intervention sites and direct beneficiaries - Contact the AVPN NGO to value the existing project sheets related to human-hippo conflict management issues on the one hand, and the downstream water bodies siltation, on the other hand. - Establish an accurate system between the existing EWSs and the one to be carried out in the Mono basin for the equipment sustainability after the project - Take into account the actions upstream of the basin and their impacts on the downstream community	Consultants
- Improve the consultation process by involving structures, to take into account beneficiary communities concerns in the future project document development stages - Promote the country proposals in the future full proposal development stages	OSS
- Foster exchanges between the participants by creating a WhatsApp group and collect additional data for the rest of the process - Hold a working session between the MBA, the OSS and GWP-WA for the Logframe proposal validation - Provide a mechanism for sharing AF-comments and collecting country representative inputs for answer formulation	MBA

That being said, the consultant made the commitment to take into account all observations and recommendations. For this to happen, the participants approved the establishment of a support team to collect the additional information necessary for the concept note improvement. This committee will include:

- Adaptation Fund Focal Point - Togo,
- Representative of NCPA - Benin,
- 2 Representatives of PCSO Mono (Togo and Benin).

The concept note was approved and validated by all participants, the recommendations need to be taken into account by the consultant, though.

Before the closing ceremony, a workshop outcome summary note was presented by the reporting team.

Closing ceremony

Three speeches ended the concept note completion regional consultation workshop closing ceremony:

- **OSS speech**: The Water Expert and Project Manager / OSS Water Department paid tribute to the organizers and stakeholders of the basin, expressed his satisfaction with the results and made the commitment to work for the effective submission of the Concept Note on April 29, 2022.
- **MBA speech**: The MBA/ED gave thanks to the workshop organization team, the technical partners, the stakeholders for their fruitful contributions in the development of this note concept and the two countries for holding the workshop. He called upon all stakeholders' mobilization for the BOUCLIER-CLIMAT project drafting process completion.
- **Closing remarks**: The Representative of the MBA /Benin Focal Point thanked all participants and congratulated the organizers, the Benin and Togo delegations for their dedication and quality participation in the group works, and asked the Consultant and the OSS to work together for a good completion of the concept note to meet the identified objectives.

REGIONAL WORKSHOP PROGRAM

Day 1 – Thursday April 14, 2022 / 8:30 a.m. – 5:30 p.m.		
Time	**Activity**	**Speaker(s)**
Session 1: Opening of the workshop		
08:30 a. m. - 09:00 a.m.	Participants reception and registration	All
09:00 a.m. -09:25 a.m.	Opening ceremony	All
9:25 a.m. – 9:35 a.m.	Presentation of the participants and adoption of the agenda	Moderator
9:35 a.m. – 10:00 a.m.	Group Photo, Coffee Break, Press Interviews	All
Session 2 : Presentation of the project development process		
10:00 a.m. – 10:10 a.m.	MBA Presentation	MBA
10:10 a.m. – 10:25 a.m.	Reminder of the general project development process and AF requirements	OSS
10:25 a.m. – 10:35 a.m.	Reminder of the consultation process initiated as part of the CN development	Consultant
Session 3: Presentation of the project concept note		
10:35 a.m. – 11:15 a.m.	Introduction to the project Presentation of the draft CN main sections Presentation of the budget components / results / products	Consultant
11:15 a.m. – 11:30 a.m.	Discussions	All
Session 4: Institutional arrangement and partnership		
11:30 a.m. – 11:45 a.m.	Presentation of the Institutional Arrangement and Partnership	OSS
11:45 a.m. – 1:00 p.m.	Discussions on the implementation institutional set-up	All
1:00 p.m. – 1:45 p.m.	**Lunch break**	
Session 5: Group work for the improvement of the concept note		
1:45 p.m. – 3:45 p.m.	Plenary presentation of the instructions: - Guidelines for amending and improving the project logframe (in particular the activities) and the proposal for the implementation institutional set-up - Criteria for prioritizing the project potential areas of intervention and beneficiaries - Group work (start-up)	All
3:45 p.m. – 4:15 p.m.	**Coffee break**	
4:15 p.m. – 5:30 p.m.	Group work (continuation of the works)	Group works
Day 2 – Friday, April 15, 2022/ 8:15 a.m. – 12:30 p.m.		
Session 5: Group works for the improvement of the concept note (continuation of the works)		
8:15 a.m. – 10:15 a.m.	Restitution of the group works	All
10:15 a.m.– 10:45 a.m.	**Coffee break**	
10:45 a.m. – 11:30 a.m.	Additional interventions and experience sharing: Ongoing initiatives, Synergies and sustainability of the expected results	All
Session 6 : Discussions		
11:30 a.m. - 12:15 p.m.	Summary and presentation of the main results of the workshop: reactions of the participants, closing remarks.	All
	Session 7: Closing of the workshop	
12:15 p.m. - 12:30 p.m.	Acknowledgments and next steps	All
12:30 p.m. – 1:30 p.m.	**Lunch break**	

PARTICIPANT ATTENDANCE LIST AT THE REGIONAL WORKSHOP

au service de l'Afrique
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AUTORITE DU BASSIN DU MONO

Global Water Partnership West Africa

ADAPTATION FUND

Date : 14 et 15 avril 2022
Lieu : Hôtel du Lac à Cotonou au Bénin
Objet : Atelier régional de concertation pour la finalisation de la note conceptuelle du Projet BOUCLIER-CLIMAT/MONO

LISTE DES PARTICIPANTS

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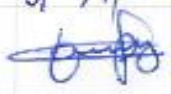
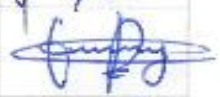
17	HOUANYE Armand	M	Secrétaire Exécutif GWP-AO	Burkina-Faso	+ 226 70 20 03 23 armand.houanye@gwpao.org		
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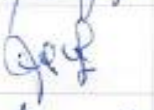
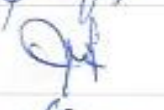
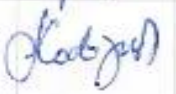
22	GBAGUIDI A. Lucrèce	F	Assistante/DE ABM	BENIN	+ 299 96 74 70 91 secretariatde.abm@gmail.com		
23	CODO Jyslain Innocent	M	Chef du Service de la Formation et l'Information sur les Risques majeurs	BENIN	+229 94 62 46 74/51 10 49 76 jyslainc@gmail.com		

OSS 30 au service de l'Afrique serving Africa

AUTORITE DU BASSIN DU MONO

Global Water Partnership West Africa

ADAPTATION FUND

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28	LAWIN Emmanuel Agnidé	M	Directeur de Cabinet MEM	BENIN	+ 229 97 58 18 09 ewaari@yahoo.fr		
29	PISSANG Tchaa	M	CVA/ABM	BENIN	+ 229 94 00 37 99		

RESULTS OF THE GROUP WORKS – TOGO

List of ongoing projects

Ongoing project	Observation	Contact
Support for the implementation of the Godjé-God'in Sacred Forest Development and Management Plan	WACA	John GAGLO
Support for the sustainable management of the Afito hippopotamus pond complex	WACA	LOLO Amavi
Support for the implementation of the Gbaga channel development and management plan	WACA	AHD/CosolPG
Strengthening flood control and community development initiatives in Edoh-Wokui Copé in the Canton of Afagnagan, Bas-Mono Prefecture.	WACA	CVD Bas Mono
Reinforcing the management capacities by empowering associations, user groups, local NGOs for sustainable management of mangrove ecosystems in the Gbaga Channel and in the Lagoon System (Togokomé).	PAP BIO C1-Mangroves	AHD
Support to capacity building for surveillance, control and rule enforcement in the Mono-Volta landscape		AHI
Support for the improvement of SCOOPS NOVI VA's climate-resilient economic model	FAO	John GAGLO
IWRM Mono project		PADDIE
Support for strengthening technical capacities and meteorological infrastructure	BOAD	Météo-Togo

Targeted project intervention areas

PRIORITIZATION CRITERIA FOR THE PROJECT POTENTIAL AREAS OF INTERVENTION AND BENEFICIARIES

									Registered Climate stimuli			
Department	Town	Country Priority	State of the environment	State of water resources	State of soil resources	Level of food insecurity	Level of dependence on NRs	Level of dependence on agriculture	Rainfall variability	Flood frequency	Drought frequency	Total
Maritime	Lac1	3	3	2	3	2	3	3	2	3	1	25
	lac2	3	3	2	3	2	3	3	2	3	1	25
	bas mono 2	3	2	2	3	2	2	3	2	3	1	23
	vo3	3	3	3	3	3	3	3	2	1	3	27
	yoto1	3	3	2	3	2	3	3	2	1	2	24
	yoto2	3	3	2	3	2	3	3	2	2	2	25
	yoto 3	3	3	3	3	2	3	3	2	3	2	27
Plateau region	Haho1	3	2	1	2	1	3	3	2	1	2	20
	haho 3	3	2	1	2	1	3	3	2	1	2	20
	haho 4	3	2	1	2	1	3	3	2	1	2	20
	ogou 2	3	3	2	2	1	3	3	2	3	2	24
	ogou 3	3	2	1	2	1	3	3	2	1	2	20
	ogou 4	3	3	2	2	1	3	3	2	3	2	24
	Anié 1	3	2	2	2	1	3	3	2	3	1	22
	Anié 2	3	2	2	2	1	3	3	2	3	1	22
	Est mono 1	3	1	2	3	1	3	3	2	1	1	20
	Est mono 2	3	1	2	3	1	3	3	2	1	1	20
	Est mono 3	3	1	2	3	1	3	3	2	1	1	20
Central	Blitta 1	3	1	2	2	1	3	3	2	2	1	20
	Blitta 2	3	1	2	2	1	3	3	2	2	1	20
	Blitta 3	3	2	2	2	1	3	3	2	2	1	21
	Soutouboua 1	3	2	2	2	1	3	3	2	2	1	21
	Sotouboua 2	3	2	2	2	1	3	3	2	2	1	21

PRIORITIZATION CRITERIA FOR THE PROJECT POTENTIAL AREAS OF INTERVENTION AND BENEFICIARIES

									Registered Climate stimuli			
Department	Town	Country Priority	State of the environment	State of water resources	State of soil resources	Level of food insecurity	Level of dependence on NRs	Level of dependence on agriculture	Rainfall variability	Flood frequency	Drought frequency	Total
	Sotouboua 3	3	2	2	2	1	3	3	2	2	1	21
	Tchamba 1	3	2	2	1	1	3	3	2	2	1	20
	Tchamba 2	3	2	2	1	1	3	3	2	2	1	20
	Tchamba 3	3	2	2	1	1	3	3	2	2	1	20
	Tchaoudjo 1	3	2	2	2	1	3	3	2	1	1	20
	Tchaoudjo 2	3	2	2	2	1	3	3	2	1	1	20
	Tchaoudjo 3	3	2	2	2	1	3	3	2	1	1	20
	Tchaoudjo 4	3	3	2	2	1	3	3	2	1	1	21
	Mô 1	3	3	2	2	1	3	3	2	1	1	21
Kara region	Assoli 2	3	2	2	2	1	3	3	2	1	1	20
	Assoli 3	3	2	2	2	1	3	3	2	1	1	20

RESULTS OF THE GROUP WORKS – BENIN

List of ongoing projects

Ongoing project	Observations	contacts
PUGEMU	Project to be completed/Significant achievements in terms of DRR-ACC/Renewal	GD/NCPA
PROCAD (Agricultural Diversification Support Framework Program)	Ongoing	Ministry of Agriculture
Forets galerie project	UNDP	Mrs. TOSSOU
CLIMAFRI TOGO BENIN	Ongoing Adequate for GIS data	GD/NCPA
Support Project for Strengthening Monitoring and Enforcement Capacities in the Mono Volta Landscape	Ongoing	AHI NGO Consortium
Ecosystem-Based Adaptation Project	Project Coordinator	LAHAMI Pascal/97 95 91 90
Awareness project for the conservation of manatees and hippos in the Mono Valley		AVPN-ONG/97 21 84 83
WACDEP-G (Water and gender)	Country Program Officer	Juvénal PNE WACDEP 97 87 31 23
ADAPT-WAP project (Adaptation to Climate Change)	Project Coordinator	67 64 87 88
Vulnerable family farms resilience strengthening project to the adverse effects of climate change in the fourth agricultural development pole - Benin		
Strengthening the Adjohoun, Bonou and Dangbo vulnerable communities' resilience to climate change to face malaria, cardiovascular diseases and acute respiratory infections (ARIs)		

Targeted project intervention areas

PRIORITIZATION CRITERIA FOR THE PROJECT POTENTIAL AREAS OF INTERVENTION AND BENEFICIARIES

									Registered Climate stimuli			
Department	Town	Country Priority	State of the environment	State of water resources	State of soil resources	Level of food insecurity	Level of dependence on NRs	Level of dependence on agriculture	Rainfall variability	Flood frequency	Drought frequency	Total
COUFFO	Aplahoué	2	3	3	1	3	3	3	3	2	3	26
	Djakotomey	2	3	3	1	3	3	3	3	3	3	27
	Dogbo	2	2	3	1	3	3	3	3	3	3	26
MONO	Athiémé	3	3	3	1	3	3	3	3	3	3	28
	Grand-Popo	3	3	3	3	3	3	2	3	3	3	29
	Lokossa	3	2	2	-	3	3	3	3	3	3	25
DONGA	Bassila	3	3	3	3	2	3	3	2	1	3	26

Article on the workshop in the Beninese newspaper l'économiste

Numéro 2144 du Mardi 19 Avril 2022 • Prix : 300 F CFA •

Le Journal des décideurs

L'économiste du Bénin

Premier Quotidien Economique du Bénin N° 0997 MISP/DC/SG/DAI/SCC du 25/10/07 E-mail: leconomistebenin1@gmail.com Tél:00229 97096417

www.leconomistebenin.com

Bourse Uemoa

La BRVM ouvre en hausse

La BRVM ouvre sa séance de cotation du jour en hausse par rapport à la séance précédente... • (Page 07)

Festivités pascales au Bénin

Les chrétiens célèbrent la victoire du Christ sur la mort

La fête de Pâques qui célèbre la résurrection du Christ est la plus importante célébration dans l'univers ... • (Page 11)

Bassin du Niger

Subventions et technologie pour faire face au changement climatique

Les producteurs agricoles des pays du Bassin du Niger ont davantage besoin des technologies agricoles • (Page 10)

Autorité du Bassin du Mono

• (Page 03)

La note conceptuelle du projet bouclier-climat/Mono validée

Collecte de données et financement des filières agricoles

• (Page 11)

Les SFD partenaires du FNDA reçoivent du matériel d'appui

Cherté de la vie

Le Pdt du CES échange avec les centrales syndicales

Le vendredi 15 avril 2022, le Président du Conseil économique et social (CES), Tabé Gbian, a tenu ... • (Page 02)

Projet ARCH

L'Assurance maladie, une réalité à Kandi, Banikoara, Tchaourou et Ouessè

La phase de généralisation du volet assurance maladie du Projet Assurance pour ... • (Page 10)

Jus "made in Benin"

Aminatou Bagoudou, fierté de l'industrie locale

Après 14 ans de travail acharné et le soutien de plusieurs structures et projets, Al Fani Sarl voit enfin une unité de transformation de fruits ... • (Page 04)

Assemblée nationale

Ouverture de la première session ordinaire

Le président de l'Assemblée nationale a procédé, jeudi 14 avril 2022, à Porto-Novo à l'ouverture de la ... • (Page 10)

Taux de change du Fcfa XOF offert par L'économiste

Devises étrangères	Dollar (Usd)	Euro	Livre Sterling	Naïra	Cedi	Rand	Yen	Yuan	Dirham (Aed)	Roupie (Inr)
FCfa (XOF)	602.82	655.95	699.34	1.64	0.0107	34.99	5.57	85.54	164.12	8.06

LE JOURNAL DES DECIDEURS

• Eco-Une

L'économiste | 3

Autorité du Bassin du Mono

La note conceptuelle du projet bouclier-climat/Mono validée

Les 14 et 15 avril 2022, l'Autorité du Bassin du Mono (ABM) en collaboration avec le Partenariat Mondial de l'Eau en Afrique de l'Ouest (GWP-AO) et l'Observatoire du Sahara et du Sahel (OSS) a organisé à Cotonou, un atelier régional de concertation pour la finalisation de la note conceptuelle du projet « bouclier-climat/Mono. Divers délégués du Bénin, du Togo et les partenaires techniques financiers ont participé aux travaux pour la validation du document final.

• *Abdul Wahab ADO*

La note conceptuelle du projet « bouclier-climat /Mono de l'ABM est validée par les parties prenantes. En effet, à l'occasion de l'atelier régional organisé à Cotonou, les bénéficiaires du projet, les partenaires techniques et responsables de l'ABM se sont imprégnés de la note conceptuelle du projet. A l'occasion des travaux de présentation de la note conceptuelle du projet aux bénéficiaires, Nicolas Dadja Gnapkaou, Directeur exécutif de l'Autorité du Bassin du Mono explique que « l'objectif du projet bouclier Climat est de : renforcer la résilience des communautés vulnérables dans le bassin du Mono par le développement des capacités d'adaptation aux risques d'inondations récurrentes et la promotion des ressources en eau durables et équitables ». Le Directeur exécutif de l'ABM Nicolas Dadja Gnapkaou fait savoir aussi que « ce projet est conçu pour répondre à une problématique constatée à travers le bassin du Mono, la dégradation des écosystèmes, le changement climatique comme nous le savons tous aujourd'hui.

Cette problématique avait été soulevée lors du processus de mise en place de l'ABM. Il s'agit de la dégradation de l'environnement, les berges du cours d'eau principal du Mono et ses principaux affluents sont dégradés, les terres de sources principales sont dénudées, la forêt qui était là est dégradée. Les fronts des montagnes sont dénudés et tout cela pose des problèmes environnementaux à travers le Bassin du Mono notamment l'envasement des plans et des cours d'eau. Ce qui a pour conséquences pour le bassin, l'enregistrement des inondations récurrentes aussi bien au Togo dans la zone de AFAGNAN et des lacs au Bénin dans les départements du Mono et du Couffo ».

Le directeur exécutif de l'ABM a aussi indiqué que le montant du projet est de 14 millions de dollars US, soit environ 7 milliards FCFA pour une durée de quatre ans et comprend trois composantes. La composante 1 est la mise en place d'un système d'alerte précoce aux inondations à l'échelle du bassin pour renforcer la planification de l'adaptation au changement climatique ; la seconde composante est l'amélioration de la résilience des communautés les plus vulnérables dans le bassin et la composante 3 est le renforcement des capacités, sensibilisation et partage des connaissances. Quelques autres allocutions ont été prononcées à l'ouverture. Il s'agit de l'intervention de Jean Pierre FIOGBE, point focal de l'ABM-Bénin et Abdelkader DODO, Coordinateur du Département Eau de l'OSS. Avant de lancer les travaux, Emmanuel LAWIN, Directeur du Cabinet du Ministre de l'Eau et des Mines du Bénin représentant du ministre a remercié les différents participants. Il a fait savoir que le projet bouclier Climat vient à point nommé pour réduire les impacts du changement climatique dans le bassin du Mono. Il faut préciser que pendant les deux jours, les différentes parties prenantes tant du Bénin que du Togo ont échangé sur le projet. Il y avait sept délégués venant du Togo et sept du Bénin pour faciliter le déroulement du projet avec l'ABM et ses partenaires techniques que sont l'OSS et le partenariat mondial de l'eau (GWP AO). C'est la deuxième phase du projet.

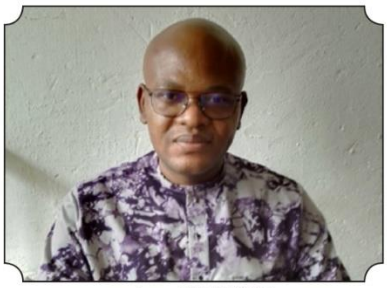
• *Le Présidium*

Les appréciations des partenaires au projet boulier climat/Mono

Pour Mohamed Aziz BELHAMRA, Agronome, expert en Télédétection et responsable de gestion de projet à l'Observatoire du Sahara et du Sahel (OSS), « L'OSS est une organisation qui regroupe 26 pays membres dont le Bénin. C'est le troisième projet dont le Bénin est bénéficiaire. Au cours des deux jours d'échanges, nous avons présenté l'état d'avancement de la note conceptuelle qui sera remise aux bailleurs. Nous avons intégré tous les besoins des bénéficiaires ainsi que les écosystèmes du bassin du Mono afin de trouver de meilleures solutions d'adaptation face aux défis du changement climatique. Ce projet vient en appel à la dernière publication du GEC et aussi notre zone est confrontée à l'augmentation des températures, des précipitations qui provoquent des inondations, des catastrophes. Ce projet vient mettre en place comme un système d'alerte précoce des risques.

Armand HOUANYE, Secrétaire exécutif du Partenariat mondial de l'Eau en Afrique de l'Ouest (GMP AO) explique que : « GWP AO accompagne l'ABM avec l'OSS pour concevoir et mettre en œuvre le projet intitulé bouclier Climat Mono parce que c'est un projet qui met un accent sur la gestion intégrée des ressources en eau mais également des inondations dans un contexte d'exacerbation des impacts du changement climatique qui affecte sérieusement le bien être des communautés du bassin mais également les écosystèmes dudit bassin. Fort de cela, nous pensons que c'est une initiative qui cadre parfaitement avec les domaines d'intervention du partenariat mondial de l'eau notamment en ce qui concerne la promotion de la mise en œuvre de la gestion intégrée des ressources en eau du niveau local jusqu'au niveau régional en passant par les niveau transfrontalier pays entre le Bénin et le Togo. Durant les deux jours, nous avons réuni les parties prenantes pour leur présenter le projet de note conceptuelle qui est un condensé des propositions qui ont été retenues suite aux diverses concertations pour intervenir dans le bassin par rapport aux problématiques d'inondation mais également en ce qui concerne l'amélioration du bien-être des communautés qui sont affectées par les problèmes d'inondations dans le bassin ».

• *Mohamed Aziz BELHAMRA*



• *Armand HOUANYE*

• *Le Directeur exécutif de l'ABM Nicolas Dadja Gnapkaou*

• *Echange lors des travaux*

Annex 3 :Photos and attendance list of local beneficiaries' consultation

N°	NOM ET PRENOM (s)	STUCTURE DE PROVENANCE	LIEU DE PROVENANCE	CONTACTS		SIGNATURE
				TELEPHONE	MAIL	
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03	BIAO AÏNIN-S-Eliasson	Préfecture de Djougou	Djougou	97872893	eliasson.biao@yahoo.fr	
04	SANOUSSI Razaki	ABM	COTONOU	97763910	sanoussi.raz@gmail.com	
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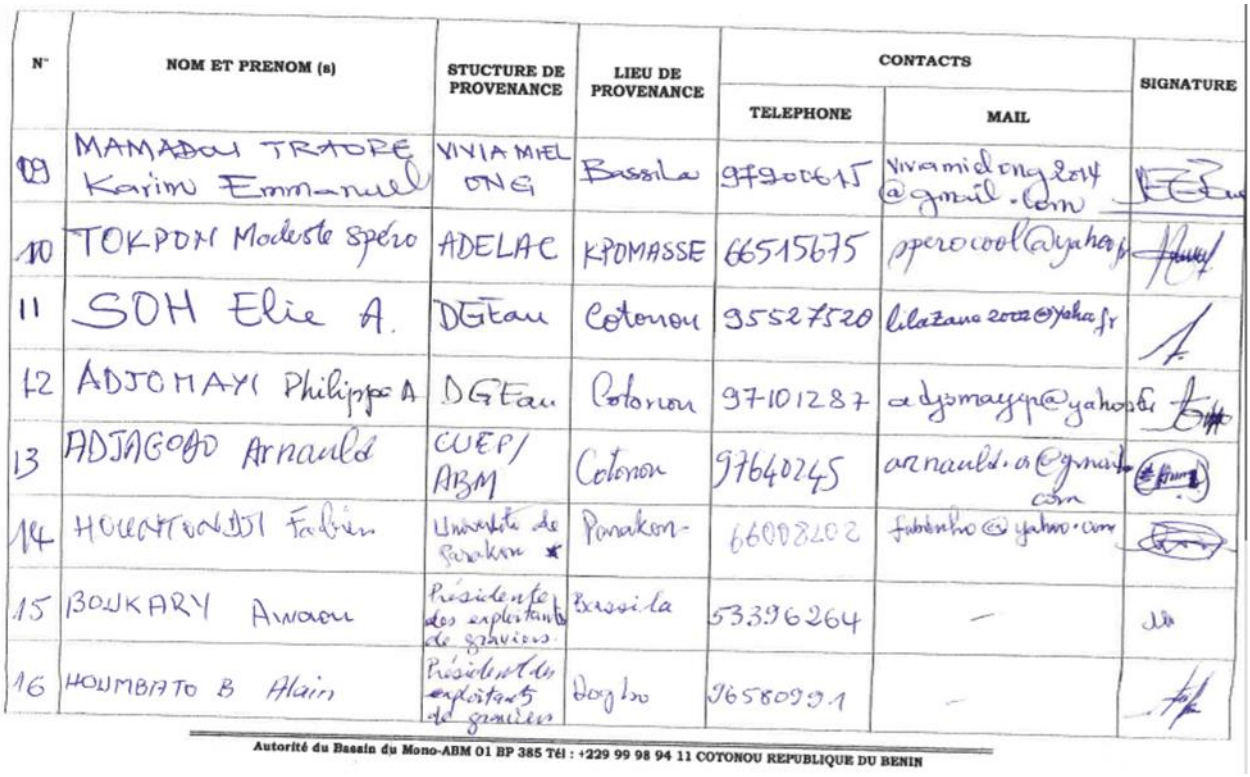
06	AZANMAN K. RICHARD	Président CLE TOHO	LOKOSSA	97455272		
07	AGOSSEVI Jacob	DE/AVPN-ONG	DOGBO	97218483	agossevi.jacob@gmail.com vingarpn@yahoo.fr	
08	AHOSSI Nc. Armel.	PNE-B	Cotonou	96121899	ahossiarmel@gmail.com	



N°	NOM ET PRENOM (s)	STUCTURE DE PROVENANCE	LIEU DE PROVENANCE	CONTACTS		SIGNATURE
				TELEPHONE	MAIL	
09	MAMADOU TRAORE Karim Emmanuel	VIVIA MIEL ONG	Bassila	97900615	vivamieldong2014@gmail.com	
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13	ADJAGOBO Arnauld	CUEP/ ABM	Cotonou	97640245	arnauld.a@gmail.com	
14	HOUNTONDJI Fabien	Université de Parakou	Parakou	66008202	fabinho@yahoo.com	
15	BOUKARY Awaou	Présidente des exploitants de graviers	Bassila	53396264	-	
16	HOUMBATO B Alain	Président des exploitants de granites	Dogbo	96580991	-	

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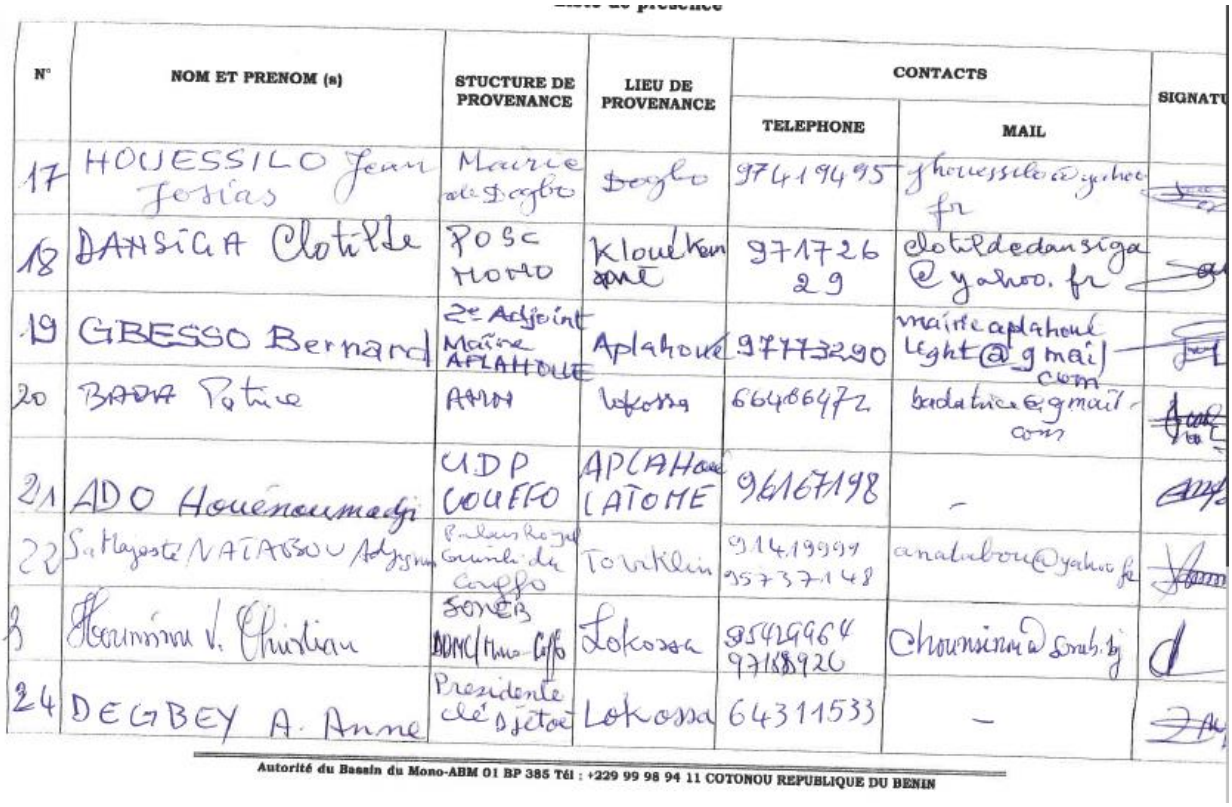

N°	NOM ET PRENOM (s)	STUCTURE DE PROVENANCE	LIEU DE PROVENANCE	CONTACTS		SIGNATU
				TELEPHONE	MAIL	
17	HOUESSILO Jean Josias	Mairie de Dogbo	Dogbo	97419495	jhouessilo@yahoo.fr	
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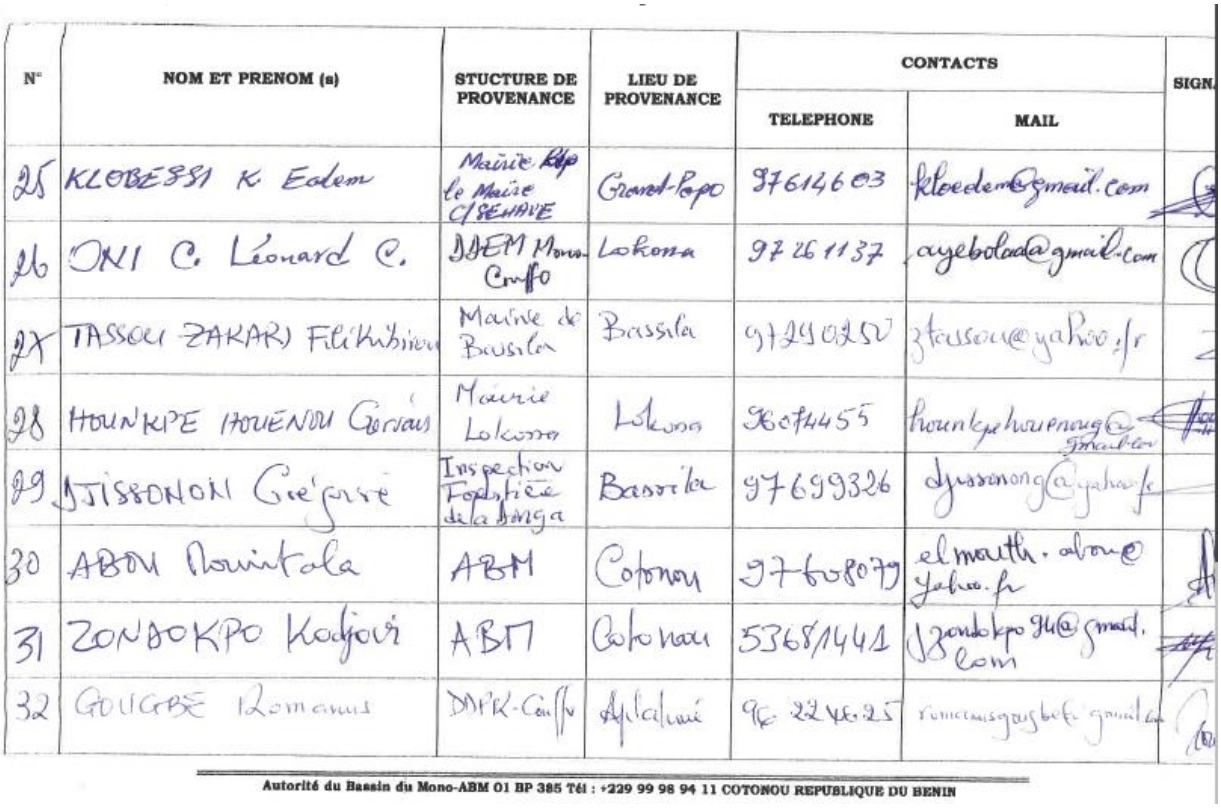
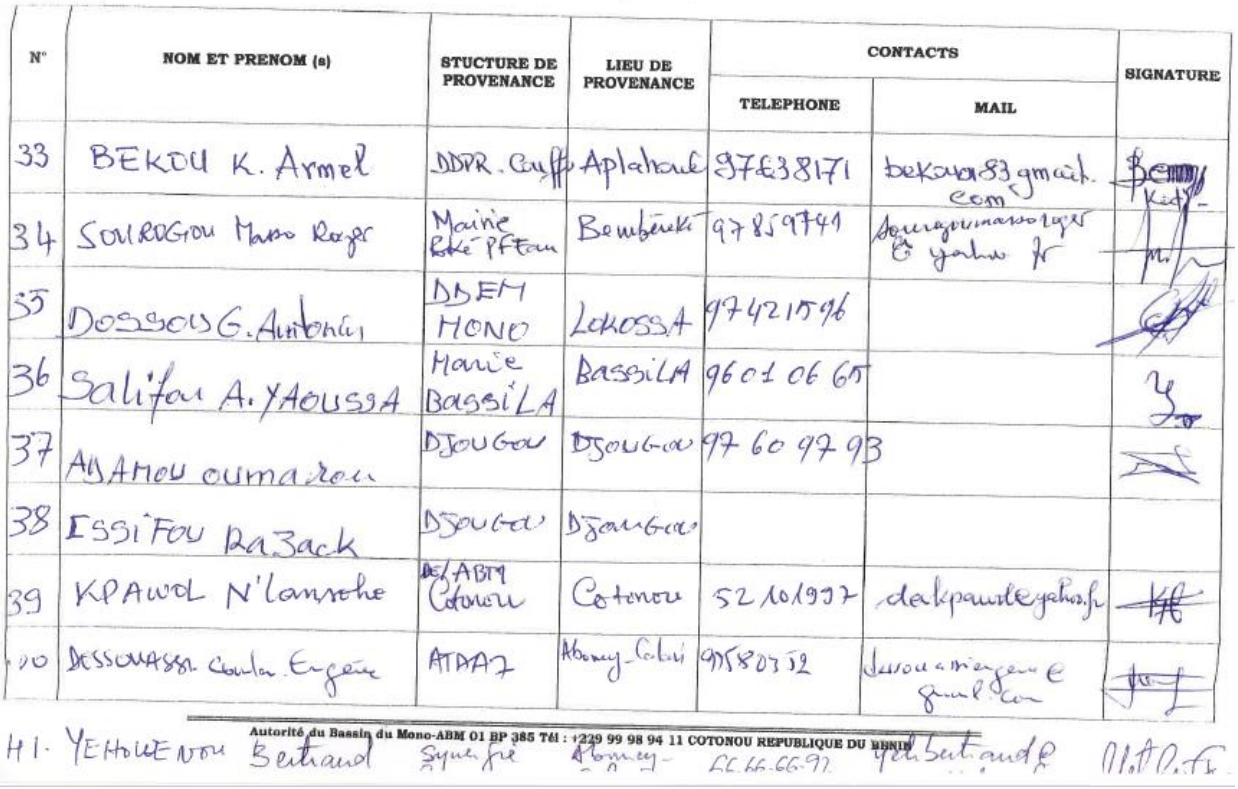
19	GBESSO Bernard	2e Adjoint Maire AFLAHOUE	Aplahoué	97773290	mairieaplahoue1ght@gmail.com	
20	BADA Patrice	ABM	Lokossa	66406472	badatrice@gmail.com	
21	ADO Houénoumadji	UDP COUFFO	APLAHOUE LATOME	96167198	-	
22	Sa Majesté NATABOU Adjossa	Palais Royal Grand de Comé	Toviklin	97419999 95737148	anatabou@yahoo.fr	
23	Hounsinou V. Christian	SONEB ABM/Mono-Couffo	Lokossa	95429964 97158926	Chounsinou@Soneb.bj	
24	DEGBEY A. Anne	Présidente clé d'actes	Lokossa	64311533	-	

Autorité du Bassin du Mono-ABM 01 BP 385 Tél : +229 99 98 94 11 COTONOU REPUBLIQUE DU BENIN



N°	NOM ET PRENOM (s)	STUCTURE DE PROVENANCE	LIEU DE PROVENANCE	CONTACTS		SIGN.
				TELEPHONE	MAIL	
25	KLOBESSI K. Edem	Mairie Rép le Maire C/SEHAVE	Grand-Popo	97614603	kloedem@gmail.com	
26	ONI C. Léonard C.	DDEM Mono-Couffo	Lokossa	97261137	ayebolada@gmail.com	
27	TASSOU ZAKARI Fiikubiou	Mairie de Bassila	Bassila	97290252	ztassou@yahoo.fr	
28	HOUNKPE HOUENOU Gervais	Mairie Lokossa	Lokossa	96074455	hounkpehouenoug@gmail.com	
29	DJISSONON Grégoire	Inspection Forestière de la Donga	Bassila	97699326	djissonong@yahoo.fr	
30	ABDOU Rouintala	ABM	Cotonou	97608079	elmouth.abou@yahoo.fr	
31	ZONDOKPO Kodjovi	ABT	Cotonou	53681441	Jzondokpo94@gmail.com	
32	GOUGBE Romanus	DDPR-Couffo	Aplahoué	96 22 46 25	romanusgougbe@gmail.com	

Autorité du Bassin du Mono-ABM 01 BP 385 Tél : +229 99 98 94 11 COTONOU REPUBLIQUE DU BENIN



N°	NOM ET PRENOM (s)	STUCTURE DE PROVENANCE	LIEU DE PROVENANCE	CONTACTS		SIGNATURE
				TELEPHONE	MAIL	
33	BEKOU K. Armel	DDPR. Couffo	Aplahoué	97638171	bekouarmel83@gmail.com	
34	SOUROGOU Mama Roger	Mairie Bohicon	Bohicon	97859741	sourogoumamaroger@yahoo.fr	
35	DOSSOU G. Antonin	DDEM MONO	LOKOSSA	97421596		
36	Salifou A. YAOUSSA	Mairie BASSILA	BASSILA	96010665		
37	AGAMOU oumarou	DJOUGOU	DJOUGOU	97 60 97 93		
38	ESSIFOU RAZACK	DJOUGOU	DJOUGOU			
39	KPAWOL N'lanrohe	DE/ABM Cotonou	Cotonou	52101997	dekpawolle@yahoo.fr	
40	DESSOUASSI Coulon Eugène	ATAAZ	Abomey-Calavi	97580352	dessouassiengene@gmail.com	
41	YEHOUENOU Bertrand	Synergie	Abomey-Calavi	66-66-97	yehbertrand@	

Autorité du Bassin du Mono-ABM 01 BP 385 Tél : +229 99 98 94 11 COTONOU REPUBLIQUE DU BENIN

42	PISSANG Tchaa	ABM	cotonou	94003793	—	
43	TAMOU B.K. ALIOU	ABM	Cotonou	95-62-63-30	—	
	ADJANNAM					
44	Bernadette AHOUANGBE Epouse FANOU	DDCSD - Mairie - Conseil	Lokossa	96453791	ahouangbebernadette@gmail.com	

Annex 4: Project Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

Project Objective(s)[16]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Strengthen the resilience of vulnerable communities in the Mono River Basin through building adaptive capacity to the risks of recurrent flooding and promoting the sustainable and equitable use and management of water resources and related ecosystems	Number of communities covered by improved warning system and weather information	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic & environmental losses	2.2 No. of people with reduced risk to extreme weather events	
	Number of communties sensitized and aware of predicted adverse impacts of climate change	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1 Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
	Improved Infrastructure to strengthen the adaptative capacity of the community	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	
	Improved ecosystem services for the benefit of the communites	Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Component 1: Setting up/strengthening tools for climate change resilient management of the Mono River basin				
Outcome 1.1: Regional Early Warning System (EWS) Establishment for effective flood management in the Mono River basin	Number of communities covered by the early warning system developed and functioning	***Output 1.1:*** Risk and vulnerability assessments conducted and updated	1.2 No. of early warning systems (by scale) and no. of beneficiaries covered	**2,100,000**
		Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	
		Output 2.1: Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	
			2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	
Component 2: Improving the resilience of the most vulnerable ecosystems and people in the basin to the impacts of Climate Change through concrete adaptation measures				
Outcome 2.1: Resilience of water resources to the impacts of CC and overexploitation is strengthened	Improved water availability and water access for the community	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	**2,550,000**

[16] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

Project Objective(s)[16]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Outcome 2.2: Mono Basin ecosystems (soil resources, plant biodiversity, animal biodiversity ...) preserved through implementation of adaptation measures against the effects of climate change	Number of Mono Basin ecosystems preserved through the implemented adaptation measures against the effects of climate change	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	**3,200,000**
Outcome 2.3: Implemented adaptation measures for the benefit of the population	Number of households/population benefiting of the implemented adaptation measure	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	**3,000,000**
Component 3: Strengthening the capacities of different actors, share knowledge and raise awareness among all beneficiaries at different levels				
Outcome 3.1: Mobilized and sensitized stakeholders through communication and capacity building activities	Number of stakeholders mobilized and sensitized through communication and capacity building activities	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1 No. of news outlets in the local press and media that have covered the topic	**1,000,000**
		Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge	
			3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	

Annex 5: Initial Gender Assessment in line with the Fund's Gender Policy

Background and purpose of the assessment

This gender assessment is prepared as a contribution to give an overview on gender-responsive considerations in the framework of the preparation of the project CN entitled «***BOUCLIER-CLIMAT /Mono Project: Towards a climate risks shield in the Mono River Basin Strengthening adaptation and resilience to climate change through integrated water resources and flood management***». Specific data for the Mono River basin concerning the indicators required for the gender assessment are not currently available. Therefore, data for the two countries sharing the basin, namely Benin and Togo, will be presented instead. These values may mostly reflect the situation in the basin.

The initial gender assessment contains focuses on the following main points: ***(i)*** Basic overview gender-related information in the countries (health, education; level of women's involvement in socio-economic and development activities and gender-based violence in both countries), ***(ii)*** Gender-responsive considerations for the Project outcomes and ***(iii)*** a summary of the legal-institutional instruments and initiatives aimed at strengthening women's empowerment is also provided. All the data and information gathered allows to provide a global overview of the vulnerability degree as well as the resilience to external influencing factors, in particular climatic risks. The outcome of this initial gender assessment is to make more gender-sensitive contributions throughout the project. A specific Gender Action Plan (GAP) (with clear timelines, responsible parties, indicators and budget allocations) will be developed during the preparation of the full project proposal. The GAP will ensure that project results are achieved with gender-sensitive targets, and that environmental benefits are distributed inclusively across the project activities.

Basic overview gender related information in the countries

In Benin, efforts are still needed to achieve gender equality and women empowerment. According to the most recent available information (2019-2020), Gender inequality is high as the Gender Inequality Index (GII) places Benin 148th in the rank of 0.612 (World: 0.436)[17]. Women in Benin comprise 52.1% of the general population and they form 24.9% of the female-headed households. As of February 2021, only 8.4% of seats in parliament were held by women. In 2018, 28% of women had their need for family planning satisfied with modern methods[18]; This situation has been significantly improved over the last two decades as the indicator value was only 8% in 1996.

Togo Republic is also ranked low in regard to Gender Inequality Index (GII). The country is 145th with an index of 0.573 (World: 0.436). The country has a population distribution of 49.3% men and 50.7% women. They form 27.4% of the female-headed households. In terms of women's involvement in decision-making, the level is still low. For instance, only 19% of seats are held by women in the national parliament (in 2020). For the Demand for family planning satisfied by modern methods indicator, there were 32% of married women with demand for family planning (in 2014-most recent data) whereas it was only 4% in 1988.

Health

Benin: In 2018 Benin had a fertility rate of 4.9 which has seen a steady increase over the decades from around 4.6 in the 1990s. Women have a life expectancy of 63.3 years as of 2020 while men have 60.2 years. Benin spends only 3.7% of its GDP on health, with private spending as the largest source of health spending. Out-of-pocket payments represented 47.04% of total health expenditure in 2019. Benin is implementing a Health Insurance project known as " ARCH" which started in 2018, through a pilot phase in some communes of the country. Its generalization was launched in January 2021 and extended to several other communes in Benin. The target beneficiaries of the ARCH include mostly poor and vulnerable populations with particular emphasis on women and pregnant ones.

Togo: Fertility rate of Togolese is currently 4.2% (2020 date) whereas the highest value (7.2%) was recorded during the 1970s and the value has been steadily decreasing since that period. The life expectancy of women is 62 years as of 2020 while it is 60 years for men. The Out-of-pocket payments represented almost 66.21% of total health expenditure in 2019. The Republic of Togo has created the National Institute of Health Insurance (INAM), whose mission is to ensure coverage of risks related to illness, non-occupational accidents and illnesses, and maternity for public employees and their dependents.

Education

Benin records almost 130,000 children out of school primary with almost 90,000 females (70% of the total). This figure has dropped significantly (over half) during the last two decades due to the significant efforts of successive governments to support the schooling of children and in particular free education for girls. The government has been also implementing since several years a free charge for women's schooling.

175. The total net enrolment rate, primary, by sex is as follows (as of 2020)[19]:

- Both sex: 93.52%

[17] UNDP 2020 Human Development Report. https://hdr.undp.org/sites/default/files/2020_statistical_annex_table_5.xlsx
[18] https://data.unwomen.org/country/benin
[19] https://gender-data-hub-2-undesa.hub.arcgis.com/maps/8ab9c34ff7fc4db8865f629ab80d7a09/explore?location=8.552545%2C2.960372%2C7.00

- Female: 90.41%
- Male: 96.55%

Togo: The number of records of children out of primary school is almost 26,000 with almost 16,000 females (61,5%). These figures have dropped significantly (over half) during the last two decades due to the significant efforts of successive governments to support the schooling of children.

For Togo, the total net enrolment rate, primary, by sex is as follows (as of 2020)[20]:

- Both sex: 98.78%
- Female: 97.55%
- Male: 100%

▪ *Women in economic activities*

In Benin, women, especially in rural areas, still face constraints related to their position in comparison to men. They are often assigned an inferior position and this situation considerably limits their ability to engage in economic and profit-making activities. Their role is sometimes limited to providing labor for their husbands or fathers. Their access to land and credit is sometimes limited even if this situation is not supported by official laws or rules. Women in polygamous unions are often heads of households since it is each woman alone who is responsible for herself and her children with sporadic assistance from the husband[21]. Women form around 68.8% of the labor force participation rate[22] of which 30% are employed in the agriculture sector, 43% in the service sector 19% in industry and 8% in other activities; Agriculture is mainly rainfed and traditional requiring important physical efforts[23].

Given the above described situation, the government of Benin has made significant efforts in recent years to reverse the trend. A tangible proof is the establishment of the **National Women's Institute[24]** which aims at promoting women at the political, economic, social, legal and cultural levels, both in the public and private spheres, and to fight against all forms of discrimination and violence against women. Indeed, gender equality is considered as a driver of economic inclusion and a development goal. This recognition is in line with the Revised ECOWAS[25] Treaty, in its Articles 61 and 63 that calls on "Member States to formulate, harmonise, coordinate and implement the appropriate policies and mechanisms to improve the economic, social and cultural conditions of women.

Togo: According to the UN Women, even though some progress on women's rights has been achieved in the country, work still needs to be done to achieve gender equality. According to recent data and information (world Bank, 2021), Women form around 48.8% of the labor force participation rate. Le travail des enfants est aussi important: 22.6% of Child labour (% ages 5-17). This value is still low and tricky. It is also noted that Gender disparities in access to land and credit affect the ability of female farmers and entrepreneurs to invest, operate to scale and benefit from new economic opportunities. As reported by the World Bank, domestic responsibilities such as the care of children, elderly and sick family members prevent many women from seeking a job or starting a business. Women lack economic opportunities and are underrepresented in high-level positions. Only very few public and private enterprises are run by women[26].

The labor code of Togo establishes equal pay for equal work regardless of gender. However, this law is only observed in the formal work sector. Many women are underpaid compared with their male counterparts, particularly in the informal sector[27].In this regard, the government should develop and implement laws and policies" that really promote women so that they can take part in economic life.

▪ *Gender-Based Violence*

Benin

In Benin, Violence against Women and Girls (VAWG) is still occurring. A survey from USAID reported that nearly 70 percent of women will be victims of gender-based violence in their lifetimes in Benin. The UN Women most recent data (2018) on different forms of violence against women[28] are as follow:

- Lifetime Physical and/or Sexual Intimate Partner Violence :23.8%;
- Physical and/or Sexual Intimate Partner Violence: 13.9%;
- Child Marriage: 25.9 %;
- Female Genital Mutilation/Cutting: 9.2%.

The above figures are regarded as a prevalent and critical hindering factor for human development and peace-building.

In recent years, Benin has set up important legal and institutional arrangements (see Table below) to enhance the fight against gender-based violence, particularly violence against women. One of the most important tools is the establishment

[20] https://gender-data-hub-2-undesa.hub.arcgis.com/maps/8ab9c34ff7fc4db8865f629ab80d7a09/explore?location=8.552545%2C2.960372%2C7.00
[21] World Bank (2002). STRATEGIC COUNTRY GENDER ASSESSMENT. 35p. https://documents1.worldbank.org/curated/en/135131468003936000/pdf/393300BN0Strategic0Gender01PUBLIC1.pdf
[22] World Bank / ILO (2020) Ratio of female to male labour force participation rate (%)https://data.worldbank.org/indicator/SL.TLF.CACT.FM.ZS?locations=SD
[23] Karshenas, Massoud (2001). "Agriculture and Economic Development in sub-Saharan Africa and Asia". Cambridge Journal of Economics. 25 (3): 315–342. doi:10.1093/cje/25.3.315.
[24] https://sgg.gouv.bj/doc/decret-2021-391/download
[25] ECOWAS is a regional Economic Commission which has 15 West African member countries including Benin and Togo
[26] World Bank / ILO (2020) Ratio of female to male labour force participation rate (%)
[27] World Bank / ILO (2020) Ratio of female to male labour force participation rate (%)
28 https://evaw-global-database.unwomen.org/en/countries/africa/benin#1

of a legal support service for victims of gender-based violence since 2010 to provide social and legal support and advice to women and young girls in particular, and to boys and men who have suffered violence or violations of their rights. Three years after its establishment, the service received 31,826 people and monitored 1,765 victims of gender-based violence, distributed as follows: 9086 women, i.e. 66% of the victims, 2,341 girls, i.e. 17% of the victims, 662 boys, i.e. 5% of the victims, and 1676 men, i.e. 12% of the victims. Counselling centres for women victims of violence have been also established in 49 municipalities (out of 77 municipalities).

Several national and international civil society organizations are active in Benin in the field of the fight against gender-based violence. Examples include Care International, USAID, Médecins Sans Frontières, etc.

Togo

According to a recent statement by the CrossRoad International[29], gender-based violence is widely observed in Togo. It is reported by the Togolese Ministry of Gender and Women's Affairs that 63 percent of girls aged 9 to 19 have experienced violence. Figures from the UN Woman regading key Gender-based Violence indicators in Togo are as follow:

- Lifetime Physical and/or Sexual Intimate Partner Violence : 25.1 %
- Physical and/or Sexual Intimate Partner Violence in the last 12 months : 12.7 %
- Child Marriage : 21.8 %
- Female Genital Mutilation/Cutting : 4.7 %

Several actions have been undertaken by the government to reverse and eradicate violence against women in all its forms. For example, Togo has launched since 2016, a campaign to fight against sexual violence against young girls with the contribution of target groups consisting of refugees, men's committees and mothers' club, religious and traditional leaders, students, community. A law on sexual harassment was also voted in 2015 (Law No. 2015-10 of November 24, 2015) revising the penal code, which punishes sexual harassment and domestic violence as separate offenses and provides for adequate penalties. Some provisions of this law are also devoted to domestic violence and sexual abuse. Since 2013, Togo has also set up listening and counseling centers for victims of gender-based violence.

Gender-responsive considerations for the Project outcomes

▪ *Gender and adaptation to climate risks*

The impact of extreme meteorological events and disasters has increased significantly over the past two decades in the Mono Basin and this trend is expected to continue in the context of climate change. These actual and potential climate risks remain a serious challenge to inclusive socio-economic development, peace, and security in the basin[30]. They aggravate pre-existing social inequalities. Indeed, these climate risks do not affect everyone in the same way, their effects differ according to levels of vulnerability, which vary according to different aspects of social identity, such as gender. In an unequal world, women and other marginalized groups (the elderly and/or disabled) are often the most affected by the effects of climate change and disasters such as floods because of their limited access to resources and their dependence on agriculture and natural resources for their livelihoods, which are also highly sensitive to climate variability[31]. This vulnerable group faces many gender-specific barriers that limit their ability to cooperate and adapt to climate change. Nevertheless, women and other marginalized groups continue to be nominal stakeholders in decision-making in the implementation of projects and programs like the Mono Climate Project.

Under this project, an early warning system will be put in place to reduce the damage caused by these climate risks. It will ensure long-term monitoring of climate risks by producing reliable scientific data and information at the local, national and transboundary levels in the Mono River basin. The implementation of the planned activities will fully involve vulnerable groups (women and marginalized groups) by adapting the intervention strategy that will respect the habits and customs of the basin populations as well as the policy of the AF, the two countries and the OSS.

The integration activities will mainly concern the involvement of women and marginalized people in the monitoring of climate risks and in the collection of data as well as the dissemination of climate information. Customary authorities and family heads will be particularly sensitized through workshops and community engagement on women's rights and the benefits of their involvement in climate risk management for a positive impact on the status quo.

▪ *Gender consideration in the actions related to the preservation, management and valorization of ecosystems*

Component 2 which is the most important targeting adaptation measures implementation on the ground focuses on strengthening the resilience of ecosystems and people in the basin. The expected outcomes include resilient water and their dependent ecosystems availability and enhanced livelihoods for vulnerable populations through the implementation of Income Generating Activities (IGAs). Interventions within this framework will be mainly based on the Nature-based Approach.

[29] https://cintl.org/stories/695/#:~:text=In%20Togo%20and%20Ghana%2C%20for,to%2019%20have%20experienced%20violence.

[30] ECOWAS, 2020. ECOWAS Disaster Risk Reduction Gender Strategy and Action Plan 2020-2030. The Regional Validation Workshop. Dakar, Senegal, 11-12 February 2020

[31] Ngigi, M. W., Mueller, U., & Birner, R. (2017). Gender differences in climate change adaptation strategies and participation in group-based approaches: An intra-household analysis from rural Kenya. Ecological Economics, 138, 99-108.

As it can be seen from the information reported above, the most vulnerable groups to climate change in the basin are women and are more impacted by the adverse effect of climate change. Indeed, a significant effort will be made to take gender into account in the implementation of these activities. For proof, recent studies[32] have shown, for example, that the effective participation of women is important, because women are more concerned about the environment and their participation could result in environmental gains, with multiplier effects for the project. In Benin and in Togo, women are highly dependent on local natural resources for their livelihood. They charged with securing water, food and firewood for cooking and heating face the greatest challenges. Women also are facing several issues which will hinder their contribution to the achievement of the component's objectives. They are indeed experiencing unequal access to land and decision-making processes, with limited mobility in rural areas. Women often lack decision-making power over what they produce/plant, and commercialization of their traditional products can lead to loss of access and takeover by men, rather than empowerment.

It is thus important to identify gender-sensitive strategies that respond to these crises for women to improve gender mainstreaming in these activities.

▪ *Gender and paradigm shift in climate risks management*

The involvement of gender (women and marginalized groups) is essential for a paradigm shift in climate risk management in the Mono Basin. According to Margareta Wahlström (UN Secretary General for Disaster Risk Reduction), "Countries that do not actively promote women's full participation in education, politics and the workforce will find it harder than ever to reduce risk and adapt to climate change.

In Benin and Togo, beyond social inequalities, women play a very crucial role in the education of children (and therefore of nations) and in socio-economic development. They can also help relay information to households.

Within the framework of the Mono Shield project, capacity-building and awareness-raising activities on climate risk adaptation practices are planned. These activities will benefit both men and women as well as marginalized groups.

For the implementation of the project, the Project Management Unit (PMU) is also envisioning the recruitment of women technicians and people with disabilities. This could help change the beneficiary population's view of the traditional role of women and people with disabilities.

Policies, regulation and other instruments for gender in the two countries

Regional/national	Items
Regional or Global	• The 2005 ECOWAS Gender Policy • The ECOWAS Strategic Programme on Reduction of Vulnerability and Adaptation to Climate Change in West Africa (2017) • The ECOWAS Regional Strategy on Reduction of Vulnerability and Adaptation to Climate Change in West Africa (2012) • The 2018-2027 AU Strategy for Gender Equality and Women's Empowerment (GEWE) • The Sendai Framework for Disaster Risk Reduction (SFDRR) • The Adaptation Fund Gender Policy AND Gender Action Plan (2021) • United Nations Framework Convention on Climate Change and its Gender Action Plan
Benin	• Law 2011-26 of January 9, 2012 on the Prevention and Punishment of Violence Against Women; • The National Policy for the Advancement of Women and Gender Equality (2009 - 2016); • Listening and Legal Support Service for Victims of Gender-Based Violence; • Act No. 2006-19 ff 5 September 2006 on the Suppression of Sexual Harassment and Protection of Victims; • Act No. 2006-04 of 10 April 2006 (Conditions for The Displacement of Minors and The Suppression of Child Trafficking); • Law on the Repression of the Practice of Female Genital Mutilation; • Interministerial Order: Penalties for Perpetrators of Sexual Abuse; • Law No. 2003-03 of 21 january 2021 on the Suppression of Female. Genital Mutilation in the Republic of Benin; • Interministerial Order: Penalties for Perpetrators of Sexual Abuse • Law N° 2021-13 of 20 Dec. 2021 amending and supplementing law n° 2002-07 of August 24, 2004 on the code of persons and the family.
Togo	• Law N° 2015-10 of November 24, 2015 to revise the penal code; • Action Plan for Resolution 1325 on the protection of women in armed conflicts; • The Accelerated Growth and Employment Promotion Strategy (2013-2017); • Law n°002/ PR of January 21, 2013 on the general status of the Togolese civil service, which advocates for equitable access to all public functions; • Situational analysis of the listening and counseling centers for victims of gender-based violence; • The National Strategy for the Fight against all Forms of Gender-Based Violence (2012) • Strategies for the Involvement of Men and Boys (2012-2016) • National Gender Equity and Equality Policy and its National Action Plan (2011)

[32] UNDP Asia-Pacific Human Development Report 2011

Regional/national	Items
	• Law on Reproductive Health (Protection against Various Forms of Violence) • Articles 387-403 of the Children's Code (Protection against Violence) (2007) • National Strategy for Gender Mainstreaming in Togo's Policies and Programmes (2006) • Articles 40-42, 301 of the Labour Code (Sexual Harassment in the Workplace) (2006) • Law Prohibiting Trafficking in Children (2005)

Source:

- ECOWAS (2020). ECOWAS Disaster Risk Reduction Gender Strategy and Action Plan 2020-2030. https://www.gfdrr.org/sites/default/files/publication/ECOWAS%20GSAP_EN_Final.pdf
- https://evaw-global-database.unwomen.org/pt/countries/africa/benin
- https://evaw-global-database.unwomen.org/pt/countries/africa/Togo

Conclusion

The climate variability and change impacts felt particularly through extreme and recurrent flooding events contribute to the exacerbation of gender-related vulnerability in both countries. The solutions being proposed by the Bouclier Mono project will strengthen and operationalize an enabling and transformative gender environment to reduce this differentiated vulnerability, particularly of women, girls and children. The project activities implementation will necessarily include gender mainstreaming. Therefore, a detailed gender assessment analysis will be carried out at the full proposal stage to ensure the effective involvement of women and marginalized groups in the planned activities.