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| **Outputs**  | **Output related activities** | **Overall Baseline situation**  | **Key performance Indicator (with Gender disaggregated)**  | **Target to be achieved** | **Methods of Verification** | **Assumptions for each outcome** |
| **Component 1: Develop capacity and established frameworks at the local, national and regional levels to ensure risk****Informed decision-making** |  |
| Outcome 1.1Improved knowledge of risks, climate change impacts and risk management capacities through knowledge sharing and participatorymechanisms  | Desk study, Field study, Finding information from the available reports, documents etc. | The existing reports and documents doesn’t have information on Floods and Drought risks mapping for the Volta Basin and its consequences on human and natural resources. | Development of Flood and Drought risks maps for the Volta Basin region  | Availability of Flood and Drought risks maps for risk-informed decision making | Web-based risks maps, Field visit reports, and Monitoring and Evaluation reportsSocial media posts/reports | Beneficiaries will implement thetechniques andtools which are disseminated and used in other regions Active involvement of stakeholders and availability of information |
| Output 1.1.1Inventory of information on vulnerabilities, capacities, exposure and risks (VCERs) for floods and drought in the Volta Basin is conducted | Conduct a study and meetings to gather available information on vulnerabilities, capacities, exposure and risks (VCERs) in the Volta Basin as well as | There is a lack of updated and integrated information on Floods and Drought related VCERs for the Volta Basin region | Percentage of baseline information on vulnerabilities, capacities, exposure and risks will be made available for the Volta Basin region | The existing data on vulnerabilities, capacities, exposure and risks will be collected and made available for developing risks maps. | Reports with information on vulnerabilities, capacities, exposure and risks of the Volta Basin region.Communication documents |  |
| Output 1.1.2 Database ofVCERs, floods and droughtrelated risk maps are developed | Data management and analysis;Select and develop database which contains data related to VCERs, hydrological and meteorological at the local/ national /regional level.Volta Basin regions classified under Flood and Drought probability Index | No database and risk maps are available for Floods and Drought events at the Volta Basin regionThe Volta Basin lacks updated classifications of the regions according to Flood and Drought risks. | Progress in terms ofdeveloping the database and risk maps (zones) on VCERs of Volta Basin (Percentage of basin surface area)The data from different countries will be made compatible highlighting the missing data and information of respective countries | The VCERs database and flood and drought risk maps (risk zones) for the Volta Basin will be developed with the available data;Metadata of VCERs will be available | Technical report of the activity, Monitoring and Evaluation reports, Meeting reportsSoftware and database |  |
| Output 1.1.3Capacity ofstakeholders to use Floods andDrought risk maps is enhanced | Conduct workshops/training session to disseminate the knowledge on VCERs and Flood and Drought risk maps | The risks related to Floods and Drought are not well identified and are nottaken into account by the different actors of Volta Basin | Number of workshops are organized for the dissemination of knowledge on VCERs and Flood and Drought risk mapsNumber of womentrained | Atleast one workshop per country will be organised to disseminate knowledge on VCERs database and Flood and Drought risk maps1 transboundary level consultation workshop with National Focal Point (NFP) | Reports of consultationworkshopsFeedback report of the workshopsGuidelines for organizing consultation workshops and documentation |  |
| Output 1.1.4Reports andcommunication documents on vulnerabilities, capacities,exposure and risks (VCERs)and Floods and Drought riskmaps of the Volta Basin areavailable | Produce draft report of vulnerabilities, capacities, exposure and risks (VCERs) and Flood and Drought risk maps in Volta Basin region. | Report on the VCER and Flood and Drought risk maps are not available for various actors concern by climate change adaptation and disaster risk reduction | Progress in the development of the VCER and Flood and Drought risk maps report  | First report on VCER and Flood and Drought risk maps is made available for the six countries  | Report on VCERs and Flood and Drought risk maps |  |
| **Outcome 1.2** Bridging the gap inAdaptation measures to integrate future scenarios (economic, urban, climate, environment etc.)into current practices andknowledge | Develop future scenarios (socio-economic, urban, climate, environment etc.)  | There is no prediction about the role of future scenarios on socio-economic, urban, climate and environmental conditions  | Developing future scenario for the climate change variability and Floods and Drought events | Future scenarios are developed for the climate change variability and Floods and Drought events | Technical report of the activitySocial media reports | Past data and informations are provided by the government agenciesThe output’s will be considered along with inputs on the uncertainties and other sources of information |
| Output 1.2.1 Scenarios forsocio-economic andenvironment development alongwith the climate changeprojections are collected | Past and future data and information on climate change are collected for developing future scenarios | There is no availability of future scenarios for socio-economic and environmental development related to the climate change projections  | Progress in acquiring data and information on socio-economic, climate change projections for developing future scenarios  | Data and information on climate change projection and environment development is available  | Database and reports on climate change projections, Monitoring and evaluation report. |  |
| Output 1.2.2 Projected impactson water resources, urbandevelopment and bio-diversity and agriculturalareas are analysed on the basisof future scenarios | The qualitative or modelling data is analysed to assess the future scenarios | Lack of methodology to understand the impact of Flood and Drought events on risks; | Progress in terms of analysis of qualitative or modelled data output | The future scenarios are developed and presented to the stakeholders | Project Technical reports, Periodic field survey, Monitoring and Evaluation reports |  |
| Output 1.2.3 Impact onenvironmental indicators isevaluated for current and futurescenarios | A tool-kit with environmental information for future risk management | Lack of strategy and action plans for managing environmental risks in the Volta Basin  | Progress in terms of impact assessment, designing measures and identification of actors | A tool-kit is designed and developed for assessing environmental risks for current and future scenarios | Project technical reports, Monitoring and evaluation report |  |
| **Outcome 1.3** RiskManagement strategies in short,medium and long termto be integrated into development plans (economic, social, environmental aspects) | Capacity development activities to disseminate risk management strategies  | A knowledge tool to integrated risk management strategies into development plans is unavailable for the policy-makers of the Volta Basin countries | Participation and training of the relevant stakeholders (Number of women involved) on risk management strategies and action plan | Capacity development of relevant stakeholders and assigning roles and responsibilities | Project technical reports, Monitoring and evaluation report | Training/ Consultation workshops willprovide staffs with the capacity to integrateclimate resilience strategies into development plans or actions. |
| Output 1.3.1: Guidancedocuments for stakeholders aredeveloped to raise awarenessabout the future scenarios | Desk study, Finding information from the future scenarios, documents etc. | There are no reports or guidance documents available for future scenarios of climate change projections on socio-economic and environment in the Volta Basin region. | Guidance document on future scenarios for the Volta Basin region will be developed for the transboundary level  | Availability of Guidance document for risk-informed decision making on future scenarios due to the climate change projections. | Guidance documentSocial media posts/reports |  |
| Output 1.3.2: Capacity ofstakeholders to use futurescenarios and to develop actionplans is enhanced | Capacity development activities with the national level policy-makers | National stakeholders lack knowledge and tools to mitigate or manage risks due to Floods and Drought events. | Number of workshops are organized for the dissemination of risk management strategies and action plan for their integration into development plans | Atleast one workshop per country will be organised 1 transboundary level consultation workshop with National Focal Point(NFP)An action plan is available with roles and responsibilities of the relevant actors | Reports of consultationWorkshops including list of participantsFeedback report of the workshops |  |
| **Component :2 Develop concrete adaptation and environmentally friendly actions with an integrated approach** |  |
| **Outcome 2.1** Improved flood anddrought forecastinginstruments andEarly WarningSystems (EWS)and coordination atthe transboundarylevel to reduce disaster risks invulnerable communities | Floods and Drought Forecasting and Early Warning Systems | There is lack of forecasting and early warning systems for both Floods and DroughtAgencies and populations are unaware of the relevance and utility of theForecasting and EWS and how to use it |  Progress in the establishment of Forecasting and EWS for Floods and DroughtNumber of beneficiaries (male and female – data disaggregated by gender)and regions are identified for forecasting and EWS | The Flood and Drought forecasting and EWS is operationalAt least 70 % of the Volta Basin region covered by Forecasting and EWS and there are used.More than 60% of the women have direct access to the EWS information | Project technical reports, Monitoring and Evaluation reports of EWSSocial media reports | Government agencies,ministries arecommitted to actively participate in the design and development of EWS and to use the delivered information to address the impactsof climate change and variability   |
| Output 2.1.1 Needs andexisting resources of nationaland regional agencies staffs forweb-based EWS are defined | Desk studies, meetings with the local/national agencies staffs of National Hydrological Services(NHS) and other stakeholders | There is a lack of skills and knowledge on the forecasting and early warning systems among the local and national staffs | Number of meetings and consultation workshops organised and conducted to understand capacities and needs of the NHS and other stakeholders | Meeting and consultation workshop are organised at the national and transboundary level | Consultation meeting reportsIncluding list of participants |  |
| Output 2.1.2 The operationalcentre for the VoltAlarm EarlyWarning System is establishedin synergies with the NMHSsand the Volta Basin Authority | Identification of the needs (rooms, equipment’s, resources etc.) and establishment of the operational centre | There is no Early Warning System for Floods and Drought covering the entire Volta basin region | Progress in the identification of need and procurement of the resources (equipment’s, staffs etc.) | The operational centre is established in consultation with NMHSs and Volta Basin Authority | Monitoring and Evaluation reportsInauguration and running of the operational centre  |  |
| Output 2.1.3 The historical andreal-time hydrological data fromthe gauging stations arecollected and the procedure tolink with the meteorological datais defined | Hydro-meteo data for Volta Basin region are collected for forecasting and EWS | Hydro-meteo data are not available timely and as well not managed  | Percentage of data collection, storage and management of each country | Compatible data are available from the respective countries for flood and drought forecasting and EWS | Data collection report,Data management unit is set-up at VBAData sharing agreements between Meteo, Climate and Hydro services |  |
| Output 2.1.4 Thresholds forFloods and Drought risk levelsare selected for the variousparts of the Volta Basin andlinked with environmentthresholds | Desk study (Modelling and Analysis) to identify the thresholds for Floods and Drought risk levels linked with the environmentalthresholds | Thresholds levels for the Floods and Drought risks linked with the environmental thresholds is not available for the Volta Basin region | Progress in the development of thresholds levels for Floods and Drought risks linked with the environmental thresholds | Availability of the thresholds for Floods and Drought risks linked with the environmental thresholds in the Volta Basin region | Project technical reportsCommunication documents |  |
| Output 2.1.5 The procedure forproducing impact basedforecasts for the sub-basins andvulnerable areas on a dailybasis is defined | Data Modelling and Forecasts for Floods and Drought events based on risks maps | Adequate Floods and Drought Modelling and Forecasts are not available at the local and national levels in the Volta Basin region | Percentage of operationalization of Floods and Drought forecasting at the local and regional centres.  | Modelling and Impact based forecasting of Floods and Drought are available at the local and national centres of the Volta Basin region. | Project technical reportsMonitoring and Evaluation reports of the modelling and forecasting services |  |
| Output 2.1.6 The web-basedEarly Warning disseminationinterface for VoltAlarm isdesigned | Web-based Early Warning dissemination strategies for floods and drought are designed and developed. | Currently there are no forecasting and early warning techniques available for the communities and agencies of the Volta Basin region, which can be interpreted easily | Progress in the design and development of the early warning dissemination tool Percentage of the population (men, women, elderly, and youths) understanding the added-value of the early warning system | The web-based Early Warning dissemination interface is co-designed and developed so that the early warning information will reach more than 70 % of the communities in the Volta Basin prone to floods and drought events  | Early warning design and development reportMonitoring and Evaluation reports |  |
| Output 2.1.7 Knowledge andawareness about VoltAlarmwithin the user groups areincreased | Capacity development of stakeholders | Lack of knowledge on forecasting and EWS for Floods and Drought | Number of workshops are organised and conducted to develop capacities of the participantsPercentage of the population understanding the added-value of the early warning system | Atleast 1 workshop per each country is conducted and participants (communities and agencies) have increased knowledge and awareness. | Report of technicalworkshopFeedback report of the workshopMonitoring and evaluation report |  |
| **Outcome 2.2** Demonstration ofthe added value of the E2E EWSVoltAlarm through a series of pilottesting during monsoon and dryseasons | Pilot testing at Floods and Drought prone regions of the Volta Basin | Lack of medium and long-term adaptation measures with early warning system. | Pilot-tests are organised to assess the impact of tools and models developed | Atleast one pilot locations of each countries have been tested with developed tool and models | Pilot-tests technical report,Monitoring and evaluation reportSocial media reports | Selection of pilot sites with flood and drought eventsAgencies and communities continue to use the information provided by EWS and knowledge gained in the pilot testsDissemination of the knowledge from pilot-sites to the entire region of the Volta Basin |
| Output 2.2.1 Pilot testing for anumber of areas over the basinduring the monsoon and dryseasons is performed | Forecasts and EWS for Floods and droughts are implemented during the monsoon and dry seasons | Agencies and Communities have limited knowledge about the forecasting and EWS for both Floods and Drought | Progress in the pilot testing (identification and selection of pilot tests, monitoring during the floods and dry season etc.) of forecasting and EWS Participation of various actors and stakeholders working for Floods and Drought management | Pilot testing in atleast one locations of each riparian countries More than 80% of the participants benefits from the pilot-testing to understand their roles and responsibilities beneficiaries | Pilot-tests technical report,Monitoring and EvaluationList of participants to the pilot tests |  |
| Output 2.2.2 Feedback fromthe series of pilot testing iscollected | Assessing coordination and collaboration of actors and stakeholdersCapacity development and communication outreach of stakeholders | Lack of coordination and collaboration between the actors and stakeholders. | Workshops are organised and conducted to develop capacities of the participantsDevelopment of the communication material | Atleast 1 workshop per each country is organised Success stories, best practices, lesson learnt are shared through various social media channels so as to reach broader audience. | Feedback report of the workshopMonitoring and evaluation reportBooklet (Voices from the field) and communication documents |  |
| Output 2.2.3 Development and implementation of community-based flood and drought management | Capacity development Identify, implement and evaluate the appropriate measures  | Need for local flood and drought systems empowering the communities for enhanced hazard management |  Progress in the identification and implementation of the local systemsNumber of people contributing and benefiting from the local systems | Atleast one local community in each country has measures and is using the tools and methodologies. | Community-based management manual Field visits reportsFeedbacks from the stakeholders |  |
| **Outcome 2.3** Strengthenedawareness of vulnerable peopleon hydrometeorologicalrisks, prevention, preparedness, and response strategiesthrough education programs usingparticipative solutions | Capacity development of stakeholders for hydro-meteorological risks management and green infrastructures | Lack of tools and awareness on mainstreaming gender and natural and nature-based solutions for flood management | Workshops are organised and conducted to develop capacities of the participantsNumber of women, youths are trained | Atleast 1 workshop per each country is organised 1 workshop is organised with national focal points of countries | Report of technicalworkshopFeedback report of the workshopMonitoring and evaluation report | In future, the countries are expected to plan, design and build natural and nature-based solutions for DRR and climate change adaptation measures after adequate EIA and SIA studies.Participation of women, elderly and youths in the training/workshops and also in future activities of the End-to-End Early warning System for flood forecasting and flood and drought management, in general. |
| Output 2.3.1 Knowledge andcapacity development using the Flood Green Guide (FGG) | Capacity development for natural and nature- based solutions for flood events | Lack of knowledge on natural and nature-based solutions for Floods  | Number of workshops organised and conducted to develop capacities of the participantsNumber and type of local and national staffs selected for the trainingNumber of womentrained | Atleast 1 workshop per each country is organised  | Report of technicalworkshopFeedback report of the workshopMonitoring and evaluation report |  |
| Output 2.3.2 Capacitydevelopment based on theTraining Manual formainstreaming gender in theE2E-EWS-F and floodmanagement. | Capacity development for mainstreaming gender in the E2E-EWS-F and flood management. | Lack of knowledge on mainstreaming gender in forecasting and early warning system for Floods  | Workshops are organised and conducted to develop capacities of the participantsPercentage of women participating in the workshopswith dialogue and advocacyPercentage of women with physical, social, political and economic empowerment | Atleast 1 workshop per each country is organised  | Report of technicalworkshopFeedback report of the workshopMonitoring and evaluation report |  |
| **Component 3: Strengthening policy and institutional capacity for integrated flood and drought management at the local, national and transboundary levels** |  |
| **Outcome 3.1** Decision supportand policy development forstrengthening resilience at thelocal, national and transboundarylevels of the Volta Basin | Decision support system and governance for the Volta Basin region | Unavailability of decision support system and policies for developing resilience to Floods and Drought  | Workshops and meetings are organised  | A decision support system framework and governance policies are established with the stakeholders | Reports of workshop and meetingMonitoring and evaluation report | The stakeholders of the project continue to show dedication towards revising,developing, adopting policies and action plans for better climate resilience andimplementinterdisciplinaryapproaches at national and regional level to integrate, tools techniques andpractices |
| Output 3.1.1 Thetransboundary governanceplans, policies and guidelinesabout long term flood anddrought management areevaluated | (Desk study/Research) Transboundary governance related to water resources management, data and information sharing, development plans etc.Development of strategic framework for strengthening resilience and coping capacities | Lack of strategic framework and information at the transboundary levelfor the management of water resources , floods and drought event | Desk study and meetings are organised and available baseline data and information is shared as supporting detailsNumber of policies, plans and guidelines to be revised | The transboundary level information for water resources management, floods and drought management is availableStrategic framework at the transboundary level is available in consultation with the stakeholders | Reports of the desk study  |  |
| Output 3.1.2 Awareness ofpolicy-makers from the sixcountries on the key long-termstrategies for floods and droughtmanagement and environmentalimpact is strengthened | Capacity development | Lack of knowledge and tools for the key stakeholders to manage flood and drought events at the transboundary level | Number of workshops organised and conducted to develop capacities of the participants (decision-makers, policy-makers)Number of womenparticipating in the workshops  | One workshop at the transboundary level is conducted.The present information gap and key long-term strategies are identified and disseminated  | Reports of technicalworkshopFeedback report of the workshopMonitoring and evaluation report |  |
| Output 3.1.3 Experiences oflocal communities on key long term strategies for floods anddrought management arecollected | Meetings/Consultation workshops with the direct and in-direct beneficiaries of the project | Lack of involvement of key-stakeholders in the development of key long term strategies for floods and drought management | Progress in the organising meetings or consultation workshops at local level Number of women, elderly, and youths consulted | More than 20 meetings or consultation takes place at various local region of the Volta Basin region.The discussion outcomes are drafted to improve the existing policies, plans etc.  | Consultation or meeting reports |  |
| **Outcome 3.2** Strengthenedcapacities of actors and decision makers at national and transboundary level on long term risk management policies, plans and strategies | Capacity development of the stakeholders at national and transboundary level | Lack of knowledge, policies, plans and guidelines for the key actors to manage risks  | Workshops are organised and conducted to develop capacities of the participants | The available policies, plans and guidelines are used and key long-term strategies are implemented | Reports of technicalworkshopFeedback report of the workshopMonitoring and evaluation report | Training/ Consultation workshops willprovide decision-makers with the capacity to integrateclimate resilience strategies into long term development plans or actions. |
| Output 3.2.1Strengthenedimplementation of the revised, ornew, climate adaptation plans(NAPA, NAP, NDC), policiesand guidelines (on data andinformation exchanges) onissues related to risk reduction and Early Warning System (EWS) | Capacity development of the stakeholders from local/national and regional. | Limited knowledge and implementation of action plans, policies and guidelines for the risk management  | Number of transboundary consultative workshop organised with the policy-makers and advisors  | One transboundary consultative workshop is conducted with participants from each country of Volta BasinClimate adaptation plans(NAPA, NAP, NDC), policiesand guidelines (on data andinformation exchanges) onissues related to risk reduction and Early Warning System are revised or developed and shared with the stakeholders for their approval | Reports of technicalWorkshopMonitoring and evaluation report |  |
| Output 3.2.2Improved integration of national policies on long term risk reduction and climate adaptation into the transboundary Strategic Action Programme | Consultation meeting with the policy-makers of the six countries | There is lack of integration of national policies on long term risk reduction and climate adaptation into the transboundary Strategic Action Programme | Consultative meeting are organised so that new or existing plans, polices and guidelines on climate change adaptation and disaster risks management are integrated into the transboundary SAP. | Improved integration of national policies on risk reduction and climate adaptation into the Transboundary Strategic Action Programme (SAP) resulting in better management of water resources and flood and drought events at the national and transboundary level  | Consultation meeting report |  |
| **Outcome 3.3** A collaborative process is developed to ensure those instruments and strategies are accepted by the local organization and communities and adapted to the local context | Collaboration with the stakeholders and direct and in-direct beneficiaries | Lack of consultation and collaboration with the direct and in-direct beneficiaries on the instrument and strategies for climate change risk management | Collaboration meeting is organised with the stakeholders (including community representatives, associations and civil authorities) Number of men, women, elderly, and youths consulted | One meeting in each of the Volta Basin countries is conducted and measures and plans are adopted to the local context | Consultation Meeting report  | Relevant entities are willingto sustain long-term public consultation initiative, awareness strategies and to share experiences within national and across countries. |
| Output 3.3.1Collaboration withlocal communities andorganizations in defining theprocedures and measures tomanage risks and to adapt toclimate change | Collaborative workshop with the communities and organizations | Communities knowledge and experience are not involved in the development of the policies and action plans for managing risks and climate change adaptation | Number of meetings organised with the communities and organizationsNumber of men, women, elderly, and youths consulted | Meetings are conducted and participants are provided with opportunities to share their views and perceptions on the policies and action plansCommunities and organizations involvement in the designing and implementation of action plans is drafted | Consultation Meeting reportMonitoring and evaluation reportList of the consulted stakeholders |  |
| Output 3.3.2Collaboration with local communities and organizations in finalising the policies, plans and further adopting to manage risks  | Participative consultation with the communities and organizations  | Communities are not consulted and involved in the refining of the policies and action plans for managing risks and climate change adaptation | Number of meetings organised with the communities and organizationsNumber of men, women, elderly, and youths consulted | Meeting is conducted and approval or necessary changes suggested by the participants are considered  | Consultation Meeting reportMonitoring and evaluation report |  |