



CREWS PROJECT STATUS REPORT

1. Project title	Burkina Faso: Strengthening National Capacities for Early Warning System Service Delivery	2. Project reference	CREWS/CProj/03/Burkina
3. Lead Implementing Partner	WMO	4. Other Implementing Partners	-
5. Reporting period	June - November 2019		
6. Reporting focal point	Jean-Baptiste Migraine < jbmigraine@wmo.int >		
7. Project overview	<p>Burkina Faso is a country in West Africa with a large portion of the workforce depending on rain-fed agriculture (about 30-35% of employment), and an urbanisation rate currently at 29% and rapidly growing. This country is characterized by an extreme climate variability that can produce both persistent dry spells and extreme rainfall events, combined with a rainy season that lasts for 3-4 months with specific convective precipitation patterns leading to flooding. Studies have shown an increase in both, drought and flood events, in Burkina Faso, with increasingly serious consequences for the population, infrastructure, environment and the economic sector.</p> <p>The CREWS project in Burkina Faso, with a budget of US\$2,192,200, is being implemented by WMO in partnership with Météo-France, AGRHYMET, AEMET/BSC and the national meteorological service (ANAM), providing technical assistance in synergy with investments by WMO (USAID, GFCS), the World Bank (IDA, GCF, P164078 and P164345) and UNDP (GEF, SAPIC), as well as with the regional CREWS West Africa project (see comprehensive list of Projects in Burkina Faso). The project's objective is to improve hydrometeorological services for early warning on flood-related risks and risk information for agriculture, food security and anticipation of severe weather impacts.</p> <p>The main focus of the project is to build the capacity of the National Meteorological and Hydrological Services and strengthen cooperation with agriculture, food security, civil protection, humanitarian stakeholders and the media, to test seamless warning systems that deliver relevant information to end-users. This is being achieved through developing capabilities on data management, observation network monitoring and control, implementation of analysis, monitoring and forecast tools for weather and climate early warning, as well as strengthening the interface with information users in specific pilot sites. The project draws on advanced technical expertise from cooperating institutions to ensure access to relevant data, products, tools, training and equipment.</p>		

8. Progress summary




Before the reporting period (since July 2017):




- Partnership agreements were signed between WMO and
 - Burkina Faso Meteorological Service (ANAM) on 3 Oct 2017, for an amount of US\$482,000 (payments were transferred in Oct 2017 and Nov 2018);
 - Météo-France on 24 May 2018, for an amount of US\$310,000 to support (i) use of seasonal and sub-seasonal forecasts in agrometeorological services; (ii) use of remote sensing (including Land Data Assimilation Systems - LDAS) in agrometeorological services and (iii) strategic planning within ANAM (1st payment was transferred in June 2018);
 - AEMET / Barcelona Supercomputing Center (BSC) in July 2018, for provision of Warning advisories on Sand and Dust Storm in Burkina Faso (1st payment was transferred in July 2018);
 - AGRHYMET in Oct 2018, for provision of training on operational use of CIRAD SARRA models in support of agricultural meteorology;
- Numerical weather prediction and severe weather forecasting:
 - A license was purchased for providing access to products from the European Centre for Medium-Range Weather Forecasts (ECMWF) in Oct 2017;
 - A training on sand and dust storm was provided to one ANAM forecaster (Cairo, 10-12 February 2018);
 - A training on numerical weather prediction and climate simulations was provided to two ANAM forecasters (Langen, 12-16 March 2018 and 8-12 April 2019, see [report](#));
 - The Burkina Faso "[Warning Advisory System for Sand and Dust Storm](#)" was launched in Oct 2018 and was presented at the UN Sand and Dust Storms Scoping Meeting in Geneva, 15-16 April 2019;
 - A training on global NWP products interpretation and use in forecasting of severe and high impact weather was provided in Ouagadougou (2-4 May 2019, see [report](#));
 - A 1-year training on high performance computing (HPC) operation and maintenance was delivered to 1 ANAM technician at International Centre for Theoretical Physics (ICTP) in Italy.
- Observing network and climate data management
 - In April 2019, 10 synoptic stations were equipped with CLIMSOF climate data management system (CDMS), with hardware and software purchased earlier by the project, to allow for enhanced quality and timeliness of data concentration in ANAM headquarters. As of Sept 2019, 9 stations out of 10 are using CLIMSOF operationally.
- Seasonal and sub-seasonal forecasting:
 - Two technicians were supported to reinforce the seasonal prediction team (from usually 2 to 4) and to take part in Seasonal Forecast Forum for agro-hydro-climatic characteristics in the Sudano-Sahelian zone (PRESASS), in Abidjan from 30 April to 5 May 2018 and in Nouakchott on 22-26 April 2019. This team is working with Météo France on the sub-seasonal component.
 - A training workshop was organised in Toulouse from 13 to 17 May 2019 (see [report](#)); One technician from ANAM stayed in Toulouse during 1-month for co-production of products using the IRI Climate Data Tool such as (i) high quality checks on the dataset: outliers; threshold, internal consistency, spatial coherence; (ii) interpolation of weekly rainfall data; (iii) correcting estimated rainfall data from CHIRPS with historical in-situ observation data; (iv) zoning of rainfall: automatic classification method using K-means; (iv) analysis of rainfall patterns;
 - As a follow-up to PRESASS, a national climate forum was organized in May to disseminate the seasonal forecast information;
- Agrometeorology:
 - Assessments of user requirements with regards to agrometeorological services was developed for the pilot municipalities of Niangoloko, Tenado and Titao in Dec 2017, and series of Roving Seminars were held with the agro-meteorologists, radio operators, extension agents (from the agriculture Ministry), local authorities and farmers in May, June, August, October and November 2018, and as well as June, July, September 2019, to support farmers' adaptation to the dynamics of the rainy season, anticipate crop yields, and improve the service over time;
 - a training on SARRA-H and SARRA-O took place in Ouagadougou from 12 to 23 Nov 2018;
 - a training on and data assimilation system (LDAS) took place in AGRHYMET (Niamey, 28-29 May 2019), with staff from ANAM and from the Ministry of Agriculture. Priority indices of interest include: soil moisture, long dry sequences (+ 10 days to + 20 days), monitoring and forecasting of biomass and Leaf Area Index (LAI);
- Hydrology:
 - an integrated assessment of the hydrological service's capacity in relation to flood forecasting was launched in March 2019;
- previous WMO supervision missions were held on
 - 19-21 July 2018, with World Bank, focusing on agrometeorology, hydrology, data collection and management;
 - 12-23 Nov 2018, together with SARRA-O and SARRA-H trainings;
 - 23-28 March 2019, with World Bank, for the preparation of the ANAM strategic plan, the assessment of hydrological service's capacities and update the agrometeorological work plan;
- In addition, Burkina-Faso participated in a number of crosscutting initiatives to strengthen sub-regional cooperation:
 - ECOWAS Hydromet Forum (Abidjan, 19-21 Sept 2018), in sessions related to the development of a [CREWS Community of practice in West Africa](#) and to the [CREWS West Africa project](#);
 - mapping of climate services initiatives, as a preparation to the First Steering Committee meeting in Dec 2018
 - first meeting of the project Steering Committee on 19 Dec 2018
 - [2nd International Multi-Hazard Early Warning Conference](#), Geneva, 13-14 May 2019 and in the [Global Platform 2019](#), 14-17 May 2019.

During the reporting period:

- an independent mid-term evaluation of the project was launched in Sept 2019 (see [draft report](#));
- weekly briefings ([MISVA](#)) took place with Meteo France, Senegal, Mali and Niger, between June and October, to test and validate some new products developed by Météo France, share weekly observed rainfall data among participating countries, and elaborate briefing documents;
- an independent evaluation on the value-added of the improved agromet services at pilot sites was launched in Oct 2019;
- in relation with hydrology, (i) the first FFGS planning meeting was organized in Dakar on 25-27 June 2019, and (ii) an integrated assessment of the hydrological service's capacity in relation to flood forecasting was delivered on 7-8 Oct 2019 (see [report](#));
- a WMO supervision mission was held on 7-10 Oct 2019, with World Bank, together with the delivery of the assessment of the hydrological service's capacity and the launch of the mid-term evaluation.

9. Project Performance

Interpretation of color coding		
	High	Good progress, on track in most or all aspects of delivery
	Medium	Moderate progress or on track in some aspects of delivery
	Low	Less than moderate or poor progress. Not on track in critical areas of its delivery. Requires remedial attention

	Rate of expenditure	Rate of delivery	Alignment of Objectives
Coding			
Narrative	The progress with expenditure is satisfactory, with USD 1,162,242 (53%) spent and an additional USD 641,460 (29%) committed. All draft contracts are ready for the remaining balance.	The progress is satisfactory, and the draft independent mid-term review identifies a mix of activities delivered very efficiently (agrometeorological services at pilot sites, capacity development in numerical weather prediction, subseasonal forecasting and agrometeorology) as well as some unexpected delays (procurement of soil moisture sensors, sharing of observations in the WMO Information System, provision of flood forecasting guidance). There are strong reasons to assume that all expected outputs will be achieved by the end of the project (Dec 2020).	The objectives of the program are consistent with (i) national policies and strategies, donor policies, and initiatives of other major donors; (ii) overall purpose and objectives defined during project formulation. The adopted approach, particularly for the capacity building of ANAM, has demonstrated to be well adapted to the context.

10. Risk Management Status

Risk Status	The risk remains moderate, as identified at the proposal stage. While ANAM demonstrated appropriate capacity for implementation, and a stable institutional context conducive to strategic planning and capacity development, there is a risk remaining of suboptimal use of resources within DEIE, and lack of staff, despite the 2 large investment projects supporting the institution (Hydromet 33 million USD and water resources and sanitation 250 million USD). In addition, the security risks in the country have deteriorated over the past 18 months, and French civil servants are no longer able to travel in Ouagadougou.
Measures to address	To cope with the limited capacity of DEIE to manage activities, (i) an amendment to the Letter of Agreement with ANAM was drafted, allowing ANAM to implement activities in support of DEIE and (ii) a coordination meeting was held with the Hydromet project, to ensure rapid uptake of recommendations from the assessment of DEIE. In relation with the deteriorating security situation, a number of trainings have been relocated from Ouagadougou to Toulouse and Niamey.

11. Contributions to CREWS Outputs

11.1. National Outputs

CREWS Output 1: National Meteorological and Hydrological Services' delivery improved, including the development of long-term service delivery strategies and development plans				
Project Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
<i>1.1. Assessment of the observing network as an update of the SAP-IC midterm review report (2017) and recommendations towards integration of the national hydro-meteorological observing systems in OSCAR/surface. Mission 17-19 October 2017, including discussions and visit to central facilities and to some meteorological stations.</i>	100%	90%	90%	90%
<i>1.2. Assessment of the hydrological service's national capabilities as an update to Serge Pieyns' reports (2014; 2016; 2017; 2018) with specific focus on end-to-end flood forecasting and early warning and recommendations towards modernization using CREWS and GCF/IDA</i>	100%	100%	90%	100%

<i>resources</i> . The report has been delivered in October 2019 (see report).				
<p>1.3. <i>Assessment of agro-meteorological users' requirements with regards to climate warnings in 3 pilot areas (Niangoloko, Tenado, Titao) and detailed work plan for the CREWS agro-meteorological component.</i> Since the first mission to evaluate requirements held from 17-22 December 2017, a detailed list of requirements is being updated on an ongoing basis, based upon lessons learned as climate services have been provided to users over the 2018 and 2019 cropping seasons. In addition, representatives from users attended the training in Niamey and provided feedback on requirements in terms of new indices.</p>	100%	100%	90%	100%
<p>1.4. <i>Licence to access products and forecasts from the European Centre for Medium-Range Weather Forecasts (ECMWF).</i> Licence procured on 31 October 2017 covering 100Go of daily downloads from November 2017 until October 2019.</p>	100%	100%	100%	100%
<p>1.5. <i>Data concentration at ANAM and integration of the hydro-meteorological observing systems in OSCAR/surface.</i> Equipment for data concentration from synoptic stations was procured by WMO and has been configured by ANAM. In addition, meteorological and hydrological stations' metadata has been systematically organized (completed by meteorology, still in progress for hydrology). A training on climate data management systems (CDMS) was provided to ANAM staff from 5-9 November 2018 and to the observers at the synoptic stations in April 2019. As of November 2019, 9 synoptic stations out of 10 provide data through CLIMSOFT with a systematic approach.</p>	100%	90%	40%	90%
<p>1.6. <i>Development of an interface responding to the specific requirements of Burkina Faso as part of the West Africa Severe Weather Demonstration Project (SWFDP-West Africa).</i> The RSMC Dakar password-protected website is available in both French and English languages. NWP products including EPSgrams from several contributing global NWP centres (e.g. Environment Canada, ECMWF, NOAA/NCEP, UKMO etc.) are available to NMHSs of West Africa including ANAM. RSMC Dakar also issues daily Regional Severe Weather Forecast</p>	100%	100%	100%	100%

Guidance product to the NMHSs through its web portal.				
<i>1.7. Calibration of a crop model (SARRA-H) for the agro-meteorological pilot zones and (SARRA-O) for national monitoring, and training of staff</i> - A training workshop on CIRAD models SARRA-H and SARRA-O was organized by AGRHYMET from 12 to 23 November 2018 with participants from Burkina Faso, Niger, Mali and Senegal (see report / folder). An analysis on the use of SARRA-H and SARRA-O by ANAM will be reported by the end of 2019.	100%	80%	60%	80%
<i>1.8. Development of priority agromet indices based on Land Data Assimilation Systems (LDAS).</i> Météo-France is developing pilot indices and testing them in Burkina Faso in close coordination with ANAM. A workshop took place from 28-29 May 2019 on LDAS organized by Météo France in Ouagadougou (see report / folder). Additional indices of interest are expected to be included in the tool: soil moisture, long dry sequences (+ 10 days to + 20 days), monitoring and forecasting of biomass and Leaf Area Index (LAI)	100%	80%	70%	80%
<i>1.9. Development of a Flash Flood Forecasting System (FFGS).</i> The initial planning meeting took place from 25-28 June 2019 in Dakar (see Concept Note , Agenda) and the government of Burkina Faso communicated its formal endorsement in October .	100%	20%	10%	20%
<i>1.10. Development of a data sharing tool for meteorological, agro-meteorological and hydrological outputs.</i> ANAM and DEIE agreed to start exchanging rainfall information in the format of rain maps. The terms of reference for the product design and implementation need to be developed.	100%	0%	0%	0%
<i>1.11. Sand and dust storm forecasting.</i> An LoA with the Barcelona Supercomputing Center was signed in July 2018 to support the development of a Warning Advisory System for Sand and Dust Storm in Burkina Faso. The BF-SDS-WAS was launched in Oct 2018 and provides daily information to ANAM forecasters.	100%	100%	100%	100%



<p>1.12. Strategic plan for ANAM, as an update to the KPMG Modernization Plan (2014) and National Framework for Climate Services (2016). Météo-France hired WeatherForce to undertake this task, and the first consultation workshop was held in May 2019. A draft strategic plan was shared in Sept 2019, and should be finalized before the end of 2019.</p>	100%	90%	90%	90%
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CREWS Output 2: Risk Information to guide early warning systems and climate and weather service developed and accessible

Project-specific Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
<p>2.1. Identification of flood prone areas in a GIS portal. The next step is to enter into an agreement with HRC (San Diego) to map the watersheds and flood-prone areas.</p>	100%	0%	0%	0%

CREWS Output 3: Information and communication technology, including common alerting protocol, strengthened

Project-specific Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
<p>3.1. Setup of a data concentration and data management system. 12 PCs, 2 laptops, 1 server, 13 external disks and ten mobile broadband devices have been procured and received at ANAM. A training took place from 5-9 November 2018 before delivery of the equipment to the stations and Internet subscription for 30 months was done. The Climsoft software was installed on 10 PCs for the 10 synoptic stations in April 2019.</p>	100%	100%	80%	100%

3.2. Procurement and installation of soil moisture sensors in pilot sites. Specifications have been identified, for measurements at 5,10, 20, 50 and 100 cm. Procurement process is delayed and still underway in WMO.	100%	50%	15%	15%
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CREWS Output 4: Preparedness and response plans with operational procedures that outline early warning dissemination processes strengthened and accessible

Project-specific Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
4.1. Proposal for standard operating procedures (SOP) for warning production, dissemination, response and return on experience in line with the national disaster risk reduction law (2014) . Terms of reference are being drafted.	100%	0%	0%	0%
4.2. Proposal for data exchange agreement between entities. The automatic process for exchange of data in near real time between ANAM and DEIE is yet to be designed and implemented.	100%	0%	0%	0%

CREWS Output 5: Knowledge products and awareness programmes on early warnings developed

Project-specific Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
5.1. Roving seminars - Seminars involving local radio communicators and agricultural extension agents with regards to agrometeorological services were held at the pilot municipalities of Niangoloko, Tenado and Titao in April-May 2018; 1,101 farmers (501 women and 600 men) and 56 agricultural extension agent and communicators were trained.	100%	100%	100%	100%

5.2. Project mid-term review with knowledge on Burkina Faso early warning system relevance, effectiveness, efficiency, impact and sustainability - The draft report is available.	100%	90%	10%	90%
5.3. Gender-informed analysis of socio-economic benefits related to the delivery of enhanced products and services in pilot zones - The analysis is undergoing as per terms of reference .	100%	30%	10%	30%

CREWS Output 6: Gender-sensitive training, capacity building programmes provided

Project-specific Outputs	Overall Project Target	Target for reporting period	Progress by June 2019	Progress by Nov 2019
6.1. Training on sand and dust storm forecasting - provided to one ANAM forecaster in Cairo, 10-12 February 2018, see report .	100%	100%	100%	100%
6.2. Training on limited area modeling (LAM) numerical weather prediction (NWP) - Provided to two ANAM forecasters in Langen, 12-16 March 2018, see report .	100%	100%	100%	100%
6.3. Development of numerical weather prediction capacities. Forecasters from ANAM have access to products from ECMWF (ecCharts) under a specific licence with ECMWF, and from UKMO and NOAA/NCEP through SWFDP-West Africa. A licence agreement was signed between ANAM and DWD (Deutscher Wetterdienst) for the right to use the COSMO model software, and one ANAM staff member started the Master in High Performance Computing in Sept 2018 in Trieste (Italy). Two staff members from ANAM (a forecaster and a public weather service expert) participated in a regional training workshop in Lomé, Togo from 20-30 Nov 2018. Two forecasters participated in a training at DWD on 8-12 April 2019 (see report). An in-country training on global NWP products interpretation and use in forecasting of severe and high impact weather took place in Ouagadougou from 2-4 May 2019	100%	80%	60%	80%

for operational forecasters. Lecturers came from Morocco, France, Senegal (RSMC Dakar) and WMO contributed. Forecasters were also trained on the interpretation and use of Severe Weather Forecast Guidance product issued by RSMC Dakar on daily basis (see report / folder).				
6.4. <i>Training of ANAM staff on the use of sub-seasonal and seasonal outlooks in agro-meteorological advisories.</i> The training workshop was organised by Météo-France in Toulouse, with participation of Burkina Faso, Mali and Niger. See report / folder .	100%	100%	100%	100%
6.5. <i>Training on dissemination and use of agromet products</i> - Additional workshops were held in 2019 at the pilot sites (Titao, Tenado and Niangoloko) to disseminate the seasonal forecast, and train representatives, radio operators and extension agents from the agriculture decentralized services. In the 3 pilot sites, about 180 representatives and 1,100 farmers were trained on retrieving information and communicating it back to their community.	100%	100%	100%	100%

11.2. Contributions to CREWS Value Propositions

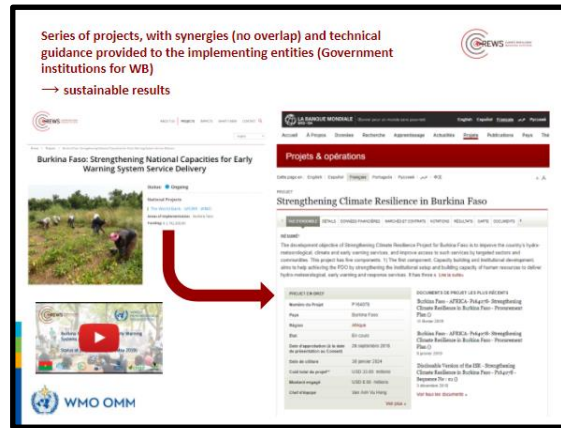
Gender Sensitive	User requirements in pilot sites have been collected in a gender-disaggregated manner, and the analysis of socio-economic benefits of agro-meteorological and other warning services in these pilot sites will be conducted in 2019 with a particular focus on specific vulnerability patterns, including those of women.
Multiplier	CREWS develops specific solutions in pilot areas related to agrometeorology and flood modelling. These will be scaled-up by the WB P164078 Climate Resilience (32 million USD) and P164345 Water Res. (300 million USD) projects, together with 21 projects contributing to GFCS, CREWS or Sendai priorities.
People-centred	1,100 farmers in 3 pilot sites have been trained on the use of weather and climate forecasts, with local radio operators, to optimize field cropping calendars. The trainings have been specifically designed based on a diagnosis of how people access, process, and respond to information and warnings.
Promote Coherence	The latest 2014 DRM law does not specifically address the institutional framework related to warning issuance and response. NMHSs are conceptualising a data exchange mechanism for collaborative flood modelling and warning.
Innovation & Solution-	CREWS supports the development of innovative sand and dust storm warning (with AEMET/BSC) and agrometeorological

oriented	services based on weather, sub-seasonal and seasonal prediction (with Météo-France).
Unique	CREWS provides twinning arrangements between national institutions of Burkina Faso with their counterparts in France, Spain, Germany and the Netherlands, with huge potential to continue knowledge exchange and collaboration beyond the project lifetime. In addition, CREWS innovations tested at pilot sites have the potential to be scaled-up at the national level with WB P164078 Climate Resilience (32 million USD) and P164345 Water Res. (300 million USD) projects.

12. Visibility products



[VIDEO : CREWS Burkina Faso - mid-term review](#)



PRESENTATION : Optimal collaboration among the World Bank and World Meteorological Organization in LDCs and SIDS, delivered at MHEWC-II and featuring Burkina Faso as an example of efficient collaboration

Activite	Date	Initiateur	Délai	Durée (jours)	2017												2018											
					Jan	Fév	Mars	Avr	Mai	Jun	Juil	Août	Sept	Oct	Nov	Déc	Jan	Fév	Mars	Avr	Mai	Jun	Juil	Août	Sept	Oct	Nov	Déc
Développement du plan de mise en oeuvre de coopération régional OIS/EP		OMM	8 Aug 2017	5																								
Signature de la convention OMM - AFM		AFM	11 Oct 2017	5																								
Signature de la convention OMM - CROU		CROU	11 Oct 2017	5																								
Signature de la convention OMM - ANAES		ANAES	11 Oct 2017	5																								
Signature de la convention OMM - SEH		SEH	11 Oct 2017	5																								
Signature de la convention OMM - Météo France		CROU	11 Oct 2017	5																								
Signature de la convention OMM - DRC		OMM	11 Oct 2018	5																								
Signature de la convention OMM - Mali		Mali	11 Oct 2018	5																								
Signature de la convention OMM - Niger		Niger	11 Oct 2018	5																								
Signature de la convention OMM - Tchad		Tchad	11 Oct 2018	5																								
Signature de la convention OMM - Bénin		Bénin	11 Oct 2018	5																								
Signature de la convention OMM - Cameroun		Cameroun	11 Oct 2018	5																								
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Signature de la convention OMM - République de République de Nicaragua		Nicaragua	11 Oct 2018	5																								
Signature de la convention OMM - République de République de République centrafricaine		RCA	11 Oct 2018	5																								

PROJECT MANAGEMENT SPREADSHEET with timeline, contacts, budget, list of synergistic projects and links to deliverables

13. Key supporting documents (also available in the output matrices)



List and annex to the report any documents providing details on project activities such as reports of training sessions, summaries of high-level discussions etc.

- [Project proposal](#) approved by CREWS Steering Committee (Feb 2017)
- [Report of the training on Numerical Weather Prediction](#), Ouagadougou, May 2019
- [Report of the training on subseasonal forecasting](#), Toulouse, May 2019
- [Report of the training on LDAS](#), Niamey, May 2019
- [Mid-term video](#), May 2019
- [Presentation at MHEWC-II](#), May 2019
- FFGS inception workshop – [Concept Note](#), [Agenda](#), Dakar, June 2019
- [ToR](#) for project mid-term evaluation (Sept-Oct 2019)
- [ToR](#) for evaluation of socio-economic benefits of enhanced services in pilot zones (Oct-Dec 2019)