CREWS CLIMATE RISK & EARLY WARNING SYSTEMS

CREWS Operational Procedures Note 6

Private Sector Engagement

CONTENT

OPERATIONAL PROCEDURES ON PRIVATE SECTOR ENGAGEMENT INCLUDING GOOD PRACTICES

1. INTRODUCTION

1. As requested by CREWS Steering Committee at its 16th meeting on 10 Nov. 2022, the CREWS Secretariat in consultation with the Implementing Partners and other key partners[1] developed a *draft operational procedure to engage the private sector and enhance country operation*. An initial draft was presented at the 17th Meeting of the Steering Committee held on 14 June 2023. The current draft benefited from additional consultations and an online review.
2. The **private sector**[2] (inclusive of academia, scientific & research institutions and civil society organisations) with their experience in research, innovation and technology can contribute to strengthening and sustained people-centred risk-informed early warning systems, while scaling-up national and regional capacities.
3. CREWS seeks to strengthen the engagement of the private sector in its projects at national regional levels, through its Implementing Partners. The private sector engagement guided by these operational procedures is based on collaboration, seeking mutual benefit, different from commercial procurement or provision of services. The World Bank, WMO and UNDRR have long experience, existing mechanisms, and programmes to engage with the private sector, which have been considered in this document, see footnote 1 and 2.

2. DEFINITIONS

4. CREWS applies existing definitions for these operational procedures:

   Private sector: all business enterprises working at local and national levels or transnational firms, regardless of their size, sector, location, ownership, and structure, with experience and/or expertise in developing early warning systems and willingness to cooperate in partnership.

   Private sector engagement: "An activity that aims to engage the private sector for development results, which involve the active participation of the private sector. The definition is deliberately broad in order to capture all modalities for engaging the private sector in development co- operation from informal collaborations to more formalised partnerships..." (OECD 2016, from Crishna Morgado et al., forthcoming; Di Bella et al., 2013).

   Private sector collaboration: "A subset of private sector engagement, collaboration refers to engagement with the private sector that does not include a formal contractual relationship. Collaboration occurs when potential partners explore opportunities to address development challenges. This style of engagement is characterised by low levels of formality, obligation and risk" (OECD 2016, from Commonwealth of Australia, 2015).

1 Document developed in consultation with CREWS Implementing Partners (WMO, WB/GFDRR, UNDRR) and other partners (ITU, IFRC, FAO, GEO, REAP: "State and The Role of State and Non-State Actors in Early Warning Early Action: Least Developed and Fragile Contexts", Global Shield, etc), as well as with consideration of existing guidelines, platforms or publications (examples: WMO Guidelines for Public-private Engagement, WB GFDRR Global Weather Enterprise and "Power of Partnership" publication, and UNDRR ARISE Networks), and submission to CREWS Steering Committee members.

2 CREWS Operational Procedures will be applied for private sector engagement, as well as to engage academia, scientific & research institution, and civil society in the implementation of CREWS projects.
CREWS through its Implementing Partners already engage government entities (public sector) in the design and implementation of CREWS projects. To complement, these operational procedures are geared to engage the private sector and other partners such as: academia, scientific & research institutions, and civil society in CREWS operations.

Private sector partnerships: "A subset of private sector engagement, partnerships are characterised by more formal relationships (contract, memorandum of understanding, etc.) between parties and generally include higher levels of structure and obligation, including funding components" (OECD 2016, from Commonwealth of Australia, 2015).

Public-private partnerships: A subset of private sector partnerships, according to the OECD Glossary of Statistical Terms, public-private partnerships are arrangements whereby the private sector provides infrastructure assets and services that traditionally have been provided by government, such as hospitals, schools, prisons, roads, bridges, tunnels, railways, and water and sanitation plants (OECD 2016).

Academia: all higher education institutions, including public or private universities connected with studies, curricula, and knowledge development in relation to early warning systems.

Scientific & research institutions: all scientific institutions specialised in research and innovation development to enhance early warning systems.

Civil Society: "The wide array of non-governmental and not-for-profit organisations that have a presence in public life, expressing the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations. Civil Society Organizations (CSOs) therefore refer to a wide of array of organizations: community groups, non-governmental organizations (NGOs), labour unions, indigenous groups, charitable organizations, faith-based organizations, professional associations, and foundations" (World Bank, 2010).

5. CREWS Implementing Partners will contemplate collaboration and partnership[3] with the private sector, academia, scientific & research institutions, and civil society willing to cooperate or partner in developing and/or strengthening early warning system in LDCs and SIDS.

3. OBJECTIVES

6. These Operational Procedures have three objectives:

i. To define modalities, based on current practices (see annex 1), for expanded, efficient and effective engagement with the private sector in the implementation of CREWS projects at national and regional levels.

ii. To enhance the technical assistance of the CREWS Implementing Partners to countries in CREWS project operations by leveraging their existing partnerships, platforms, and experience with the private sector in supporting efficiency, quality, sustainable and innovation solutions across the four pillars[4] of EWS.

iii. CREWS Implementing Partners will analyse the option and provide reasons for including or not including the private sector in all CREWS projects, or to create an environment conducive to private sector engagement aimed to meet CREWS objectives.

3 Sendai Framework for Disaster Risk Reduction 2015-2030: Global and Regional levels paragraph 25 (d) "To promote common efforts in partnership with the scientific and technological community, academia and the private sector to establish, disseminate and share good practices internationally". National and local levels: paragraph 27 (a)

4 EWS pillars: i) Disaster risk knowledge, ii) Detection, observations, monitoring, analysis, and forecasting of hazards, iii) Warning dissemination and communication, iv) Preparedness and response capabilities, plus v) Governance.

4. GUIDING PRINCIPLES

7. The CREWS Implementing Partners, other partners involved in CREWS operations, adhere to the following guiding principles to engage the private sector, in addition to the principles stated in CREWS Operational Procedures N.1 on Programming and Project Development.

i. Modality – the private sector will be engaged by CREWS Implementing Partners in accordance with their administrative procedures or procurement process to support CREWS operations and projects, and will not replace the role and responsibility of national authorities in developing and implementing early warning systems.

ii. Trust – establish an open dialogue and "win-win" partnerships whereby all stakeholders can recognise and realise opportunities for development and growth, based on science, technology, and innovation to meet society needs.

iii. Shared values – CREWS Implementing Partners and the private sector apply the following shared values: respect for human rights, anti-corruption standards, a shared vision and responsibility for the targeted impacts and collaborative approach to ensure coherence, mutual benefit, and sustainability.

iv. Open data policy – CREWS Implementing Partners and the private sector apply "WMO Unified Policy for the International Exchange of Earth System Data" adopted by the 193 WMO Member States and Territories at the WMO Extraordinary Congress held in October 2021. The Resolution 1 (Cg-Ext(2021))[5] states: *"Adopts the following policy on the international exchange of Earth system data: As a fundamental principle of WMO and in consonance with the expanding requirements for its scientific and technical expertise, WMO commits itself to broadening and enhancing the free and unrestricted[6] international exchange of Earth system data".*

   Other data and information, regarding the use of social media, traditional media, big data and mobile phone networks to support national measures for successful EWS communication, will be in accordance with national laws and consultation with related government authorities.

v. Sustainability – CREWS Implementing Partners, and any private sector engaged, will favour knowledge sharing with national and regional partners and ensure sustainability of operations by providing training and knowledge transfer, including equipment as per approved project proposal and implementing Partners' modalities. The engaged private sector would be encouraged to re-invest part of their profit for the sustainability of the operations.

5 Resolution 1 (Cg-Ext(2021)) was adopted by recalling previous related Resolutions and Decisions, and considering requests and intensive consultations. See https://library.wmo.int/doc_num.php?explnum_id=11256.

6 "Free and unrestricted" means available for use, re-use and sharing without charge and with no conditions on use", Annex 4 to the Resolution 1 (Cg-Ext(2021)).

5. ROLES AND RESPONSIBILITIES

7. To achieve the objectives of these Operational Procedures, the CREWS Steering Committee, the Implementing Partners, and the CREWS Secretariat, will adhere to the following roles and responsibilities:

a. Steering Committee

- Promotes private sector participation in CREWS projects operations, by ensuring CREWS Implementing Partners and Secretariat carry out their roles and responsibilities.
- Takes decisions that contribute to resourcing the implementation of the operational procedures for private sector engagement.
- Considers the participation, as observers, of entities representing the private sector in relevant CREWS Steering Committee discussions.

b. Implementing Partners

- Identify, encourage, analyse and initiate the participation of the private sector in CREWS country and regional operations through their existing networks, coordination mechanisms and consultation with country authorities, inter-governmental organisations, and partners as appropriate.
- Consider the private sector participation in CREWS projects, based on their operational and administrative procedures and the present operational procedures.
- Provide technical assistance to countries which request support to build capacity to engage private sector to put in place relevant regulations and business models.
- Report on progress made and document successful practices related to the participation of the private sector in CREWS country and regional projects.

c. Secretariat

- Revise, as necessary, project templates to incorporate private sector engagement in proposal development and reporting.
- Update as needed the operational procedures on CREWS Programming and Project Development Note 1 to facilitate the engagement of the private sector.
- Works with Implementing Partners in documenting private sector engagement in CREWS projects, share knowledge on successful practices, including through the CREWS annual reports.
- Regularly report to the CREWS Steering Committee on the roll-out of these Operational Procedures.

6. OPERATIONALISATION

8. The following steps will be applied to operationalised and support the roll-out of the Operational Procedures to engage the private sector:

i. CREWS project programming

In the next round of project programming, the CREWS Implementing Partners will consider one or more activities with the participation of the private sector in project proposals, either in multi-year national or regional projects (pipeline list) or for the accelerated support window, to be submitted to the CREWS Steering Committee through the CREWS Secretariat.

ii. Initial consultations

The three Implementing Partners will comply with the roles and responsibilities stated in these Operational Procedures and identify suitable private sector partners to engage in specific activities of the CREWS operations at national level in consultation with country authorities, and at regional level in consultation with regional inter-governmental organisations.

iii. Financing

During the consultations, CREWS Implementing Partners can contemplate seed financing or incentives within the project proposals, in accordance with the respective Implementing Partner's administrative procedures, collaboration, partnership or procurement process, to engage with the private sector. For this purpose, the related private sector will be asked to provide inputs for CREWS Implementing Partners project proposals with justification and specification of activities, equipment development, tools or innovations, by highlighting those that would require incentives.

iv. Pipeline list and Accelerated Support Window template

The CREWS Implementing Partners will include information regarding potential private sector engagement in specific activities in the CREWS Pipeline project briefs, and in the Accelerated Support window template.

v. Reports

Project report by CREWS Implementing Partner(s) will include the activity(ies), tool(s) or innovation(s) developed by the private sector, based on the report(s) submitted by the private sector to the related Implementing Partner(s).

vi. Knowledge management and Scaling-up

Successful engagement of the private sector will be recognised by CREWS. Knowledge will be shared with partners in particular with governments, inter-governmental organisations and considering the potential to replicate and scale up to other countries and regions. CREWS annual report will include successful practices on private sector engagement. CREWS Secretariat and its Implementing Partner(s) will promote further engagement of the private sector.

vii. Good practices

The application of these operational procedures will be practical for the benefit of countries and regions assisted by CREWS. To this end, good practices from CREWS projects and partners have been compiled and analysed (see Annex 1, table 2) to illustrate and encourage its replication as appropriate.

viii. Modalities

Based on the analysis of existing good practices (Annex1, table 2), the following **modalities** are more suitable to the CREWS operational model: 1. Collaboration with no cost implications (sponsorship arrangement could be applied), and 2. Partnership with contractual or implementing arrangement for small grants, incentives, or cost recovery.

9. These Operational Procedures will be regularly reviewed by the Steering Committee based on the documentation of practices from CREWS operations and reports by Implementing Partners.

ANNEX 1

Table 1 below provides examples of the type of private sector engagement in relation to the four early warning pillars.

In consultation with CREWS Implementing Partners and other partners[7], several good practices have been compiled from CREWS regional and national projects and other initiatives (see **table 2** below).

These practices have been selected as they have demonstrated positive results in engaging the private sector, academia and/or scientific & research institutions in strengthening early warning systems.

The analysis considers three criteria: i) Process of selection, ii) Modality of financing and iii) Added value that the private sector brought. Based on it, the modalities of engagement with the private sector[8] could be summarised as follows:

1. Partnership with no cost implications, such as: Norway. Japan (cost-sharing), CREWS Cambodia (sponsorship arrangement), WMO/OTT East Africa.
2. Contractual or implementing arrangements to provide seed money (grants, incentives) or cost-recovery such as: CREWS Caribbean with CARICHAM, CREWS/WMO West Africa, WMO/SDC HydroHub in Africa, ADC in the Philippines.
3. Usual service provider (contract) with important payment: cases of the UK and Switzerland. These practices can potentially be replicated in future CREWS operations under modalities 1 and 2.

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Table 1: Examples of private sector engagement in relation to the 4 pillars of early warning

Pillar	Examples of private sector engagement
Pillar 1 - Disaster Risk Knowledge and Management	• Private sector expertise can be leveraged for developing a database and information management system, back-up systems, development of data quality control methods, use of cloud computing, etc. • Visualization, decision-support and tools and products that translate data into information
Pillar 2 – Observations, monitoring, and forecasting	• Collaboration with cell phone operators for earth observation data collection (e.g., to derive rainfall estimates from microwave signal attenuation) • Sharing of technology for impact-based forecasts (e.g., flood modelling conducted by artificial intelligence companies).
Pillar 3 – Warning dissemination and communication	• Dissemination of warnings via mobile phone operators, private media, push alerts via social media platforms, etc. • Co-production and dissemination of climate information (e.g., rice exporters can provide agro-meteorological information to rice producers)
Pillar 4 – Preparedness to respond to warnings	• Development of early warning capabilities in small and medium enterprises, business continuity and training of staff. • Agreements to utilise private sector resources where appropriate (e.g., amateur radios, safety shelters). • Accessing pre-arranged finance for forecast-based early action (e.g., risk pooling facilities)

(Source: REAP[9] , adapted from UNDP 2020, Private Sector Engagement in Climate Information Services and Early Warning System in Cambodia)

7 Partners consulted: WMO, UNDRR, WB/GFDRR, ITU, IFRC, ADB, FAO, REAP, GEO, HyroHub, OTT Hydromet,

8 As indicated in p. 1, for these operational procedures private sector includes academia and scientific & research institutions.

9 REAP: Risk-informed Early Action Partnership

Table 2: Examples of good practices and analysis in engaging with the private sector, academia or scientific & research institutions for Early Warning Systems that could be replicated in CREWS projects.

Good practices of engaging the private sector, academia, scientific & research institutions and civil society organisations to develop or strengthen EWS	**Process of selection** how the partner (PS) was selected	**Modality of financing** how was the partnership financed? 1/ collaboration with no cost implication 2/ partnership including agreement for small grants or incentives or cost recovery 3/ service provider (contract) with cost implications	**Added value from the private sector** what did the partner invest / bring or would bring to CREWS project), how does the collaboration, partnership / business continue / has been scaled up, etc.
Practices drawn from CREWS projects			
Caribbean CARICHAM	Through the regional CREWS funded project in the Caribbean, UNDRR and WMO integrate the Chambers of Industry and Commerce in the Caribbean (CARICHAM), Regional and National Disaster Risk Management Offices, and Meteorological Agencies in the Caribbean region.	Small grants to support business resilience and continuity of Caribbean Small and Medium-sized enterprises (SMEs).	Implementation of the Regional EWS Strategy recommendations in the area of private sector engagement. Opportunity to accelerate local socio-economic development through facilitated support to SMEs.
Cambodia	National cooperation built on USAID and ECHO project as well as SDC's early warning initiative in South-East Asia and the Pacific 2018-2022 to further develop and maintain **"EWS 1294"** by People in Need (PiN) through mobile service provider, see **here**. The system is currently owned by the National Committee for Disaster Management (NCDM) of Cambodia.	Smart Axiata Co., Ltd. ("Smart") telecom and mobile company. The Cambodian Government coordinates the cooperation of Smart and PiN.	Smart provide in-kind sponsorship: short message service (SMS) warning messages sent from EWS 1294 to all Smart user, using geo-location technology ("In-Kind Sponsorship") and cellphone network. This initiative has been promoted to scale up across ASEAN member states.
West Africa by WMO Under Implementation Arrangements with WMO, partners support WMO in project implementation. They comply with WMO procedures (code of Ethics, cost-recovery approach, support delivery by public NMHSs, etc.) and can also support twinning arrangements.	On going win-win partnership between Météo France, NMHSs of **Burkina Faso, Chad, Mali, Niger and Togo** and Weather Force Consulting to improve operational capabilities geared to produce and deliver agrometeorology services for early warning with a multi-hazard approach.	**WMO Implementing Arrangement, see: IA / MoU** with Weather Force Consulting under umbrella MoU. Total cost: CHF 150,000 for two years 2022-2023.	Weather Force brings its expertise on agrometeorology services for early waring in multi- hazard context.
	Partnership with SEPIA Conseils to develop a methodological framework to progressively built urban flood forecasting capabilities at national and local levels to foster flood management strategy in **West Africa and the Sahel.**	**WMO Implementing Arrangement (IA) with SEPIA** Conseils, registered in France. Total cost: CHF 55,800 for 2023.	SEPIA", a consulting engineering firm brings its specialisation in project management assistance, advice and support water cycle management, including flood risk, integrated storm drainage management and urban planning.

West Africa by WMO Under Implementation Arrangements with WMO, partners support WMO in project implementation. They comply with WMO procedures (code of Ethics, cost-recovery approach, support delivery by public NMHSs, etc.) and can also support twinning arrangements.	Partnership with **Academia:** Laboratoire Pierre PAGNEY – Climate, Eau, Ecosystèmes et Développement, (**LACEEDE**) Université d'Abomey-Calavi (**Bénin**) supports service delivery in Togo.	WMO Implementing Arrangement with **academia LACEEDE**, Université d'Abomey-Calavi (**Bénin**). Total cost: CHF 30,000 in 2022.	LACEEDE brought its expertise on the subject and collaboration with the Togo Directorate of Water Resources (DRE), to introduce new technologies and improve the resolution and quality of current seasonal hydrological forecast in timely manner to deliver products adapted to the needs of its main national actors.
	Partnership with **French Institute for Research and Development (IRD)**	WMO Implementing Arrangement with French Institute for Research and Development (**IRD**). Total cost: 111,650 CHF	IRD supports national meteorological and hydrological services of Chad and Togo to adopt innovative practices for rainfall estimation (from cellphone network attenuation data) and hydrological monitoring (from satellite) in Chad and Togo. IRD contributes with a full-time staff in N'Djamena, which provides support beyond the CREWS project.
	Partnership with the **University of Florence** (UNIFI), as a continuation of a collaboration initiated with FAO in West Africa.	LoA: WMO with University of Florence **UNIFI** (Italy). Grant: CHF 21'000.	The University of Florence UNIFI (Italy), INERA and ANAM of Burkina Faso brought their expertise and experience to develop a comprehensive decision support system for improved irrigation management in the Sahel region. Climate risks were modulated by anticipating crop water requirements ahead of climate stresses affecting agricultural production.
	Partnership with l'**Institut de l'Environnement et de Recherches Agricoles** du Burkina Faso (INERA), the only national institution with mandate on agrometeorological research.	WMO Implementing Arrangement with **INERA**. Grant: CHF 3'000.	
	Partnership with **Barcelona Supercomputing Center** (BSC), the only academic partner of Dust WMO-designated center.	WMO Implementation Arrangements with BSC for **Burkina Faso** and then **West Africa**: total CHF 109,743	BSC runs the Barcelona Dust Regional Center together with AEMET (Spain), a WMO designated center for sand and dust forecasting. This provides warning advisories to NMHSs, who can in turn convert those into warnings at provincial levels.
	Partnership with **French public "Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement** (INRAE).	**WMO Implementing Arrangement with research center INRAE**, French **public** scientific and technological research institute, under umbrella MoU, within CREWS West Africa project amounting to approx. CHF37,000 in 2021.	INRAE contributed with its public scientific and technological expertise and experience in research to design a detailed methodology for an operational flash flood forecasting system (FFFS) in **Sahel and West Africa**
East Africa by WMO	Co-organised workshop by **WMO and OTT Hydromet in ICPAC.** See: training on calibration, maintenance and management of **AWS**: Automatic Weather Stations and Datasets.	OTT provided a trainer and capacity building **with no cost implications.**	NMHSs benefited from on-the-job training with real equipment. OTT provided a trainer free of charge to ensure more optimal and sustainable use of its equipment, and therefore improve its reputation. A similar training based upon PPE will be organised for CREWS West & Central Africa in Sept 2023. We are planning to involve both HMEI and SOFF.

Examples from members and partners			
Finland **Weather observation and forecasting system project in Ethiopia – implemented by Vaisala Corporation in collaboration with the Finnish Meteorological Institute**	The Ministry for Foreign Affairs organizes annually calls for proposals for Finnish companies to present concept notes for projects to be funded through the **Public Investment Facility** (PIF).	The project is funded through the Finnish Public Sector Investment Facility (PIF), a soft-loan financing instrument administrated by Ministry for Foreign Affairs of Finland. Besides the soft- loan component for investments in Finnish technology, PIF projects include a grant-based capacity-building component.	Through this unique Finnish public-private partnership, a seamless integrated solution is delivered. Vaisala's high-end weather observation system integrated with **Finnish Meteorological Institutes** state of the art forecast production system covers the whole value chain of the National **Meteorology Agency of Ethiopia.** This will enable much needed weather-related services for different sectors of society.
Hydro Hub (WMO, SDC)	WMO HydroHub project is supported by SDC and is aligned and will contribute to CREWS East Africa project. The selection of the vendors who implement WMO HydroHub Innovation Calls is done through WMO Procurement rules. Proposals received are assessed based on specific criteria such as potential to scale up, sustainability, local manufacturing potential, among others. See more **here**	So far, 3 Innovation Calls have been funded by SDC with envelopes between CHF 100,000 and 200,000, for a total of four projects. One Innovation in the pipeline is planned to be funded by the Inter-American Development Bank.	The consortium of partners implementing the project brings together NMHSs, academia, private sector (solution providers) and others, to address specific hydrometric challenges identified by NMHSs through the operationalisation of innovative solutions developed by the private sector (mostly start-ups and small enterprises).
ADB in the Philippines	ADB finances **Komunidad company** to help local government prioritize the safety of their constituents, moving towards digital transformation to achieve an impact-based monitoring and early warning system.	Investment case through **ADB Ventures** (seeds grants up to 200k USD to innovative technological solutions).	Helping at-risk communities thrive through Climate Action Campaigns (Mobile CAC). Digital tools that enable people to take climate action. Tools automate sustainability data gathering, analysis and reporting, including physical risk exposure. Promoting inclusive resilience and sustainability. Capacity-building initiatives and climate-tech interventions at local level.
International Telecommunication Union (ITU) and partners	Collaboration between ITU, the Groupe Speciale Mobile Association (GSMA) and the association of Mobile Network Operators (MNOs) in national workshops to initiate early warning for all initiative (EW4All).	Collaboration with no cost implications	GSMA shared their experience in delivering early warning and coordinated the participation of mobile network operators in national workshop in Tajikistan end August 2023, and Cambodia early October 2023.

Selected examples of public-private engagement in countries of CREWS contributing partners and observers *(source: WMO, Public-Private Engagement Office)*			
Norway **Integrating private sector observations in operational weather forecasting in Norway**	Based on document WMO has • "MET Norway needed to correct for biases in atmospheric models and at the same time increase the granularity of the weather forecasts" but "Conventional observation networks are not dense enough to capture very local, large (coastal temperature) gradients", while "Netatmo's Weathermap on the other hand, is the largest personal crowd sourced weather community". (See para 3 and para 4 of **Integrating private sector observations in operational weather forecasting in Norway**)	Probably free as a partner • "a public-private collaboration" and "this partnership between **Netatmo and MET Norway"** (See para 1 and para 6 of **Integrating private sector observations in operational weather forecasting in Norway**) • Partners, including Netatmo, are credited for their contributions on Yr, an open weather and climate service delivered on web (yr.no and yr.no/nb) and app (Android and iOS), in Norwegian and English language with about 100 million unique users per year. (See para 1 and Factboxes of **Integrating private sector observations in operational weather forecasting in Norway**)	"A balanced give-and-take interaction, trust and mutual respect (or an enabling culture)" • Real-time observations from Netatmo Weather Stations have given MET Norway the opportunity to post-process MET Norway's weather forecasts, reducing the large temperature forecast errors by a factor of three and greatly reducing the frequency of large temperature forecast errors. • A quality-control system developed by MET Norway has been integrated into the Netatmo Weathermap, enhancing the value of the map itself and demonstrating the scientific value of the Netatmo weather stations. • "Such partnerships strengthen the weather community by getting the information value from different partners into the final forecast in an optimal manner, increasing the value of the weather analysis and forecast for everybody." (See para 6) • "By working together, we (MET Norway and Netatmo) harness the synergies." (See para 7)
Switzerland **MeteoSwiss public-private partnership with MeteoGroup**[10]	Based on an analysis started in 2007 after some devastating storms and floodings in 2005, the largest private weather company in Switzerland, MeteoGroup, with over 300 weather stations, was selected, to fill the gap in covering newly defined warning regions to ensure at least one automatic weather station in each warning region (MeteoGroup's 50 stations were selected and used). (See pp 1-3 of **MeteoSwiss public-private partnership with MeteoGroup**)	A regular customers contract clarifying terms and conditions of use (Probably payment for services) • Based on the said analysis, MeteoSwiss decided that using partner stations would be an effective way to save taxpayers' money. • A special contract has been signed between MeteoSwiss and MeteoGroup in order to ensure data quality, availability, timeliness, etc. Swiss law does not allow barter agreements between governmental agencies and private companies. Thus, with MeteoGroup being a private company, a regular customer contract clarifying the terms and conditions of use was signed. (See page 3 of **MeteoSwiss public-private partnership with MeteoGroup**)	• The purpose of this collaboration is to increase the density of the Swiss network of automatic weather stations to ensure at least one automatic weather station in each new finer warning region based on a new warning concept. • Data from 50 MeteoGroup stations have been integrated into the central data platform of MeteoSwiss, and to ensure the quality and comparability of the data, MeteoSwiss has developed a procedure to evaluate a station's quality, called METEO-Cert. • The quality of measurement of both MeteoSwiss and partner stations has been improved thanks to the METEO-Cert inspections carried out in the last years. The inspections and application of the METEO-Cert is carried out by a third-party institution. • Use of a set of 50 stations, added great value to MeteoSwiss official duty tasks such as forecasts, warnings or verification.

10 MeteoGroup was integrated into US weather services company DTN in November 2019.

UK **Met Office's partnership with Microsoft to harness next generation of supercomputing capability and data technologies**	"A comprehensive procurement exercise" (see **Met Office Supercomputing 2020+ Programme: Accounting officer assessment 2022**)	Payment for services • "a multimillion-pound agreement with Microsoft for the provision of a world-leading supercomputing capability to enhance weather and climate forecasting to the next level and help the UK stay safe and thrive, announced today on Earth Day (22 April)." (See **Supercomputing leap in weather and climate forecasting**)	• This collaboration will "help the UK stay safe and thrive. Once up and running, the new supercomputing will help ensure the government, industry, and communities are better prepared for severe weather and the changing climate through more detailed models, better forecasting of local-scale weather, and increased access to greater amounts of weather and climate data." (See **Met Office and Microsoft share information on what their partnership means for the future of the Met Office**)
Japan **Prompt and Clear Dissemination: Impact- based and personalised early warning via Push-type communication**	A public call • Five companies responded to a public call for proposals to cooperate in the push-type communication of the Japanese Meteorological Agency's (JMA's) state-of-the-art real-time risk maps. JMA employed objective and detailed standards in selecting companies, to take account of factors such as information infrastructure, number of users, business continuity plans, and financial health.	Free as partners • Partners were able to utilise JMA's public communication opportunities such as press releases in collaboration with JMA, a joint press conference at the JMA headquarters. In addition, each company was able to increase its visibility and credibility through the notification of cutting-edge Disaster Risk Reduction-related information from the trusted government agency. • Partners were given the opportunity to provide comments on the design of data format in advance (partial co-designing), potentially contributing to lower development costs for them. Partners and JMA established robust communication channels.	• JMA, with the cooperation of the five cooperating companies, was able to provide push-type notifications of the new risk maps widely, effectively, and efficiently, while the companies that cooperated with JMA on the notification of cutting-edge information were able to raise their profile in terms of Disaster Risk Reduction and contribute to the national Disaster Risk Reduction efforts thereby demonstrating their contribution to the public. • As partners had already established their own infrastructure/platform (or had been developing it for their own purposes) to disseminate other information, including traditional early warnings, neither JMA nor partners needed to make significant investments. • JMA was able to obtain direct feedback on the push- type communication of the risk maps from users of partners' platforms. This project successfully established a win-win relationship, as evidenced by the recent initiation of a similar collaboration related to volcanic warnings.

Nigeria (video from 34m 12s) **Nigerian Meteorological Agency (NiMet)'s MobileMet Project with GSM operators**	"Leveraging the use of ICRC[11] models regarding funding, revenue sharing and benefits realisation" • NiMet's "partnership with the four major Global System for Mobile Communications (GSM) service providers in the country, based on which they've developed an App that could easily relay information of real-time including short range and long range forecast to farmers and other users in Nigeria." (See page 43 of **Report of the Second High-Level Session of the Open Consultative Platform (OCP-HL-2)**) • "Using provision of the ICRC Act (Infrastructure Concession Regulatory Commission Act), models for funding, revenue sharing and benefits realisation could be developed" (See slide 11 of **PUBLIC PRIVATE PARTNERSHIP FOR WEATHER AND CLIMATE SERVICES**)	Probably introducing revenue sharing • "Partnership is a two-way venture, requesting us as meteorological services to do a lot in terms of technical, financial and procedural as well as administrative frameworks." (See page 43 of **Report of the Second High-Level Session of the Open Consultative Platform (OCP-HL-2)**) • "Sales of SMS, USSD[12] *** and other Mobile services. **Revenue to be shared** between NiMet, Mobile Services Providers and Strategic Investors of the Agency" (See slide 17 of **PUBLIC PRIVATE PARTNERSHIP FOR WEATHER AND CLIMATE SERVICES**)	• relaying information of real-time to the "TARGET: 170m[13] Mobile Phone Users Nationwide" (See slide 17 of **PUBLIC PRIVATE PARTNERSHIP FOR WEATHER AND CLIMATE SERVICES**) • "Deployment of ICT and Telecommunications facilities. • Development of products for marketing by MobileMet operators (MTN, Airtel, Glo, 9Mobile)" (Ditto) • "COVERED SO FAR: Select 1m phone users under the pilot phase" (Ditto)

11 ICRC = Infrastructure Concession Regulatory Commission
12 USSD = Unstructured Supplementary Service Data
13 m = million

CREWS CLIMATE RISK & EARLY WARNING SYSTEMS

The CREWS Initiative gratefully acknowledges the support of:

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