

Compendium of Good National Practices for Public-Private Engagement

Meteo France International (MFI): Modernizing NMHSs through public-private partnerships

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How to best implement the Meteorological Value Chain at the national level; how to best use the public monies in the most effective and sustainable ways; are challenges of this decade for a lot of National Meteorological and Hydrological Services (NMHSs), and no NMHS can embrace the whole value chain with the same level of energy. Public-Private Engagement would address those challenges, within which the DBO (Design Build Operate) approach could bring a lot of incentives to NMHS in the field of system integration, change management and sustainability. It is also fully compliant with the spirit of the Geneva Declaration - 2019 endorsed during the 18th World Meteorological Congress.

PPE-DBO approach also brings proven Key Success Factors that Meteo France International (MFI) already experienced and introduced in the past 10-15 years in various contexts like in Indonesia, Cambodia, Angola, India:

- Strong strategic partnership with NMHS
- Shared managerial vision
- Design & Build approach
- Flexible Design all along implementation
- Co-steering the project with flexibility
- Integrated approach to implementing value chain
- Setting up the new NMHS workflow
- Support to Change management
- Operational procedures
- Capacity Building & twinning with leading NMHS
- Transfer of knowledge to NMHS and local private sector for long term sustainability

How to scale up this approach, which has demonstrated the successful results and its principles supported by development partners and beneficiaries? It is the challenge of the current decade toward safeguarding public investment while maximizing benefit for NMHSs and societies

We hereby suggest; (i) deep change in the way of designing projects and of procuring integrated projects (along with multi-year support); (ii) higher focus on non-technical aspects (Key Success Factors); and (iii) clearer share of responsibilities on such endeavours between development partners, WMO, advanced NMHSs, Private sector and Academy.

Meteorological Value Chain implementation strategy

In the long history of meteorology, it has been clearly underlined *“the vital importance of the mission of the National Meteorological and Hydrological Services (NMHSs) in monitoring, understanding and predicting weather, climate and water, and in providing related information, warnings and services that meet national,*

*regional and global needs”, and “the responsibility of Members’ governments to maintain and sustain requisite infrastructure and the operation of international systems and facilities for observations, data exchange and information supply”*¹. The evolution of meteorology from only a subject of science to a wider capacity, including warning and service delivery to weather and climate-sensitive sectors, led to the agreed concept of Value Chain, ranging from observation and infrastructure to warning and service delivery, and ultimately value creation for countries and the world.



Based on this approach, the NMHS strategy has continuously shifted to **how best implement the Value Chain at the national level** (i.e. finding the optimum ratio between Value Chain components), taking into account two basic potential opportunities: a holistic approach for better efficiency, and partnerships for risk minimization.

At the time of high awareness of climate change impacts, the socio-economic value of meteorological, hydrological and related environmental information is widely shared, and governments are now supporting the modernization projects more and more, both through local and development partners funding. That is excellent news for the whole community, for WMO Members, business users, and for societies in general.

However, key issues remain on **how to best use the public monies** for such endeavour in the most effective and sustainable way. Public-Private Engagement (PPE), as praised in the Geneva Declaration - 2019, provides a high-level policy as well as suggests concrete ways for addressing those issues and embedding Key Success Factors in modernization projects with tangible and sustainable improvements for the beneficiaries.

Business models for implementing PPE along Value Chain – needs and categorization

As stated above, a strategy is a matter of choice. Due to the resource limitations, no NMHS can embrace the whole Value Chain with the same level of energy, although the societal expectations are growing. Hence the idea of addressing the Value Chain challenge as an invitation to other sectors (private and academic) to explore ways to team up with public sector to maximize value creation locally. *“Promoting sustainability of the global infrastructure by seeking opportunities for multi-sector engagements that improve efficiency and better serve society”* is one of them.

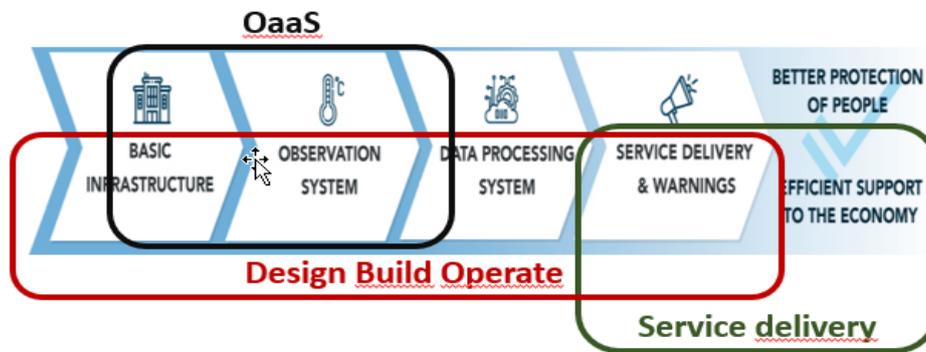
We may categorize the relevant potential arrangements (PPE) across the Value Chain based on the Geneva Declaration call for *“viable business models that provide sustainable solutions for modernizing infrastructure and enhancing services in developing countries, LDCs and SIDS”*. Here are three of the eligible PPEs (*“innovative and*

¹ All quotations in italics are extracts from Geneva Declaration – 2019: Building Community for Weather, Climate and Water Actions, adopted with Resolution 80 of the 18th World Meteorological Congress in June 2019.

mutually beneficial approaches”): Observations as a Service (OaaS), Design-Build-Operate (DBO), and collaborative Service Delivery (CSD).

Eligible PPE arrangements

- **OaaS** (Observation as a Service) Private Co maintains and collects observation data on behalf of NMHS
- **DBO** (Design Build Operate) Private Co implements (part of) NMHS Observation and IT infrastructure and provides long term support and assistance to basic operations
- **Joint Service** delivery Private Co helps NMHS develop service capacity



PPE-DBO approach and Key Success Factors

MFI is convinced that emerging and developing, including least developed countries, may benefit from a flexible systemic **integrated** approach (across the Value Chain) which will help them make the project **investment effective and sustainable**.

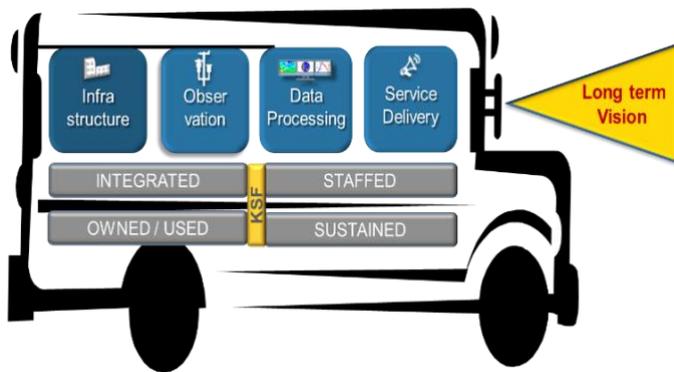
DBO stands for **Design – Build – Operate** and has a very special meaning:

- “**DB**” means that the one in charge of the project design is the one implementing the solution. It also means that Design may also (slightly) change during the Build phase, based on mutual agreement. Last but not least, it means that the “Builder” is one only and acts as a **one-stop-shop** for the beneficiary NMHS. That is simple and effective.
- “**O**” means that NMHS is not left alone with modern technology and new concepts after the project is completed. The partner will help for a given period of time to maintain the observation network, administrate the IT systems, and even, on request, help prepare new products for sectoral users, while the NMHS will first concentrate on its core mission, thus “*respecting the sovereign right of Members in deciding how weather, climate and water services are organized and provided*”.

DB approach is much quicker than other approaches as it allows parallel processing of project design and engineering phases, thus enabling full implementation of an ambitious project within 3 years or so. And **the “O” phase may vanish** after few years as soon as a NMHS can take over on system maintenance & administration aspects, and government funding is secured for the needed running costs and maintenance.

PPE means that DBO can hardly take place unless a **strong partnership** agreement is in place, reflecting “*trust, mutual understanding and cooperation between stakeholders from all sectors*”. As a matter of fact, and just as an example, the design phase is critical and requires sharing views on Value Chain implementation strategy.

DBO key success factors (KSF) have been identified and shared with main donors (e.g. World Bank, Green Climate Fund, Agence Française de Développement, Japan International Cooperation Agency, etc.) during 1st Donors Conference organized by WMO & GFDRR in 2016. They are gathered with the Value Chain components to show they are an integral part of the project.



- **Embrace the whole value chain** as much as possible and guarantee socio economic benefits
- **Share long term vision** with NMHS (be partners) and **flexible project design**
- Take care of **system integration**
- Assist in project ownership and **Change management** (incl. AOS and SOPs 2)
- Help **NMHS upgrade its organization** and plan recruitments
- Finally, **Transfer knowledge locally** to help “Operate” the modernized infrastructure until NMHS can take over.

The realization of the KSF comes with a cost, which may be a significant fraction of the total budget of the project. This is the price of effectiveness and sustainability, but at the end, this cost will be much lower than the losses stemming from the lack of integration, absence of socio-economic benefit, and unsustainability – all these being quite typical in many development modernization projects.

Example of best practices based on DBO since 2012

Shared Managerial Vision as a key input to Project design

Shared managerial vision between NMHS and its partner (e.g. MFI) is key as it will guarantee full consistency between Management vision/strategy and Project scope/design. It is not an obvious matter as the needed

² Assistance to Operational Start and Standard Operating procedures.

modernization process also includes an update of the NMHS strategy. Such vision was discussed and shared in countries like Libya in early 2000's, Qatar (2005), India (2006), and lately Indonesia (2009). As a result, Libya opted for a phased approach based on a unique vision; India got clearance for a major modernization program endorsed at the Cabinet level; and Indonesia adopted an integrated approach with a contractual commitment on sectoral applications. In all cases, the shared vision was secured long before the initial project design.

Flexible joint Design for full ownership; Steering committee

Although the DBO approach sets a very special relationship between Contractor and Beneficiary, the design phase of the project always comes... early! Which means, it takes time to draw a high-level shared vision out of a shared detailed design. It is therefore important to be able to re-adjust the building blocks of the project all along its lifetime, from initial design to final implementation.

MFI has come up with a whole set of “tools” to ensure this flexibility. The Project Design Study (PDS) is a critical phase in this respect. The PDS usually includes two milestones: Initial System Design Review (ISDR) and Final System Design Review (FSDR). These reviews allow both MFI's team and the customer representatives not only to jointly refine the technical specifications elaborated in pre-contract phases, but also to clearly define operational workflows and project outcomes.

However, the design may still evolve after PDS approval, who knows? This happened in 2012-2013 during the ambitious Strengthening 1 project for the Indonesian agency for meteorology, climatology & geophysics (BMKG). At least on the concrete implementation of the PWS-EWS 3 workflow over Indonesia, which needed quite a few adjustments before reaching mutual understanding and ultimately full ownership through appropriate SOPs (see below). Also, when HIMAWARI became operational as a replacement of MTSAT-2, MFI changed the entire plan in the middle of the project implementation to process HIMAWARI data flow instead of the entire MTSAT flow, without any legal hassle or financial implication.

In Angola, where MFI is achieving an ambitious modernization project for INAMET (National Institute of Meteorology and Geophysics): During the first SC meeting of the project, it became evident for the Ministry that the project should give quick and visible results before effective implementation. Outside of any contractual obligation, MFI committed itself on “quick wins” in the form of temporary solutions, in the fields of Aviation (via temporary access to Météo-France's pilot briefing solution), media (via temporary bulletin generation service), and Oil & Gas.

Major projects led by MFI are also punctuated by the organization of Steering Committee (SC) meetings that bring together, twice a year, top executives from MFI and Beneficiary. These SC meetings give opportunities to keep a close eye on all aspects of the project (technical, organizational, financial, etc.) and mostly agree on adjustments through a continuous adaptation process.

³ Public Weather Services – Early Warning System.



Figure 1 - Opening of the 4th SC meeting in Jakarta, Dec.2014.
Co chairs Andi Eka Sakya (DG of BMKG) and Patrick Bénichou (MFI Chairman)

System integration for implementing NMHS Value chain and workflow

System integration means data integration, integration of new and existing equipment, integration from system to system.

It is strongly expected and welcome by Beneficiaries, who generally cannot handle this complex process by themselves.

It is clear that system integration should be carried out with the primary goal of implementing the NMHS workflow, which is tightly connected to the organization, core processes and ambition of the Beneficiary (NMHS) (i.e. the daily sequencing of all operational tasks from observation to warning and service delivery).

System integration is a continuous process which is performed throughout the project implementation and involves not only integration skills but also experts of all technical components. System integration is therefore very much consistent with the DBO approach, much less with a multi-tender approach.

Indonesia: Between 2012 and 2015, the Strengthening 1 project involved the setting up of an integrated distributed information system (10 different systems), as well as the upgrade of the national observation network (AWS, lightning sensors, upper air sounding sites, AWOS and Volunteering Observing Ships) all over Indonesia.

Of course, this new equipment had to be deployed in HQ, 5 regional centers, and 34 provinces over the “maritime continent”. For such a complex project, the attention paid to integration was essential. To take up this challenge, MFI has set up a unique methodology based on an integration matrix that defines interactions needed between all information and observation systems, as well as System Integration Sheets which give data formats and data exchange protocols, and specify the technical actions required for effective

In most cases, the scope of integration will also reach out to outside components to increase benefit for the project and for the country. For instance, in Angola, the project will also integrate external AWS networks from the ministry of agriculture, which will bring additional value to Angola and also match WMO/WIGOS objectives.

Change Management; Standard Operating Procedures

All modernization projects imply deep changes in both practices and organization of the concerned NMHS. Most of them will help NMHS become a national player and implement an effective warning and service delivery capacity.

Changing to a full user-oriented body takes time and needs **change management**, and support for that. Indeed, the Change Management process should logically (i) be clearly identified from the initial design phase; (ii) come along with the Technical project implementation, under the guidance of the Steering Committee. Most of the time, the operational process must be rethought and a complete reorganization of services is necessary.

In Angola, it is planned to replicate this practice. In addition, management workshops are being held on key topics to take options on future organization and workflow before shipment and installation of the systems.



In **Indonesia**, MFI assisted BMKG to deeply reorganize its forecasting & production process, and also convince dozens of forecasters / managers to pay more attention to users. The Strengthening 1 project allowed the effective implementation of the Forecasting / Warning / PWS workflow all over Indonesia. It was necessary to define the role and responsibilities of each office, to sequence them in time and to homogenize them throughout the country, with respect to an agreed “production timeline”. To achieve this goal, MFI elaborated detailed Standard Operating Procedures (SOP) describing all tasks to be undertaken daily on each critical working position. Assistance to Operational Start was provided by MFI and Météo-France experts for BMKG staff to implement the SOPs without fear or risk.

Capacity building: PPA & Twinning

NMHS modernization also means recruitment and training of new profiles (e.g. system administrator, PWS expert, etc.). Capacity building is, therefore, a crucial component of the project consists of on-the-job training and initial training.

For on-the-job training, twinning facilities are arranged with the engagement of advanced NMHS like Météo-France or IPMA (Portugal) in order to organize specific sessions on agreed topics of interest. In India, where MFI achieved a successful modernization project for the Indian Meteorological Department (IMD) in 2010, training sessions on Tropical meteorology, Advanced use of Satellite imagery and NWP output for forecasting, and Statistics for climatology were organized in France and in India in collaboration with experts from Météo-France, MFI’s mother company. These training programs played a crucial role to ensure project ownership and to enhance the capacity and skills of IMD’s staff. By the completion of the 3-year project, nearly 400 IMD staff had been trained.

For initial training, MFI can set up innovative Public-Private-Academic partnerships (PPA).

In some cases, MFI can even propose high-level programs to train future executives of the NMHS. In Indonesia, 4 forecasters were selected by BMKG management to follow the master course for one-year at the French National School for Meteorology, located in Toulouse “Meteopole”.

In Angola, MFI is currently working on setting PPA with INAMET, the University of Agostinho Neto in Luanda, and Portuguese and Brazilian academic institutions. The PPA will help set up a 16-month training program in the field of meteorology leading to an official Meteorologist qualification, adapted to the Angolan needs and, to a larger extent, to those of the entire African continent. In the first phase, the training will be jointly given by Angolan and Portuguese / Brazilian teachers. Later, the Angolan teaching staff is expected to gradually emancipate from foreign assistance and provide high-quality training locally.



Figure 2 – Linux training for IMD officers in line with setting up of an IT Division (ISSD) MIMOSA / VARSAMANA Project in India, Nov.2008

Transfer of knowledge to the local private sector for long term sustainability

Sustainability of major modernization initiatives depends on the ability to maintain all project deliverables (infrastructure, observation network, information system, production capacity) in the long run. The DBO approach explicitly includes the “O” component, i.e. long-term assistance to operations, which also implies SLA

considerations. Training NMHS staff in this respect is a must, but it is not enough because of many reasons including staff turnover. MFI has developed an innovative approach to secure the process, which **involves local private players** from the beginning of the project. The local partner will help deploy the system hand to hand with MFI, and after the implementation phase is over, will later bear long-term responsibility on level-1 support.

In this context, MFI has identified and trained local partners in several countries like Indonesia, India, and Angola.

In Indonesia, MFI participated in the recruitment and the training of the local engineers meant to work at the Indonesian private partner. This local team has enabled the implementation of over 60 weather stations across the country in a record time of 6 months. Presently, the same team ensures the maintenance of the equipment, and supports activities for the information system implemented by MFI.



Having a local partner is proven to be the key to secure operations and maintenance. Yet, securing yearly budgets for balancing running costs (consumables, high quality data, technical support) is still more important. Our experience shows that NMHSs need to demonstrate the visible outcome of their investment (which may take a couple of years after the end of project implementation) in order to convince their umbrella Ministry and the Ministry of Finance (like the case in Cambodia) that grant yearly budget to NMHS. The DB approach helps cross the relevant milestones leading to such decision.

Thanks to this “O” concept, all major projects deployed since the 2000s or 2010s are still running. Since then Beneficiary (e.g. in Cambodia, India, Indonesia, Qatar, Seychelles, etc.) has arranged a dedicated line from the Ministry of Finance, and for major projects the local partner became the prime contractor for annual support.

Recommendations for large scale application of PPE-DBO

The DBO approach brings a lot of benefits for beneficiary agencies.

Until now DBO has been successfully implemented by MFI in several countries, based on strong partnership agreements. It is noticeable that some beneficiaries / partners have decided to renew the partnership and go for a “follow-up” project, like in Indonesia, where BMKG decided to scale-up the Strengthening 1 concept into the SUS (Scaling Up Strengthening) initiative, which is starting in 2020. The SUS Project will implement innovative concepts like Impact Based Forecast, building on the solid technical and organizational foundations achieved through the Strengthening1.

How to scale up this approach, which has demonstrated the successful results and its principles supported by development partners and beneficiaries? It is the challenge of the current decade toward safeguarding public investment while maximizing benefit for NMHSs and societies.



PUBLIC-PRIVATE ENGAGEMENT

MFI hopes that the development partners and WMO will find ways to scale up the DBO approach where applicable. This involves a fundamental change in the project design (from high-level vision to detailed implementing plans), and moreover, in the way of procuring integrated projects (together with suitable multi-year support phase). Non-technical aspects (Key Success Factors), particularly change management, should also be clearly specified from the initial design phase.

Last, the respective scope of responsibilities of development partners (financing), WMO (regulation), advanced NMHSs (twinning), Private sector (integrators, local players), Academy (training) could be reshuffled toward a simpler and more efficient way while keeping the highest objectives to ensure effectiveness and sustainability of the public investments. Concrete future of many NMHSs is at stake!