



# **The International Forum of Meteorological Societies**

[www.ifms.org](http://www.ifms.org)

## **Impediments in Creating Collaboration between Global Weather Enterprise (GWE) & Potential Path Forward**

**V01**

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**Dr. Harinder Ahluwalia**

**President - IFMS**

[ha@info-electronics.com](mailto:ha@info-electronics.com)

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## ACRONYMS

AMS	American Meteorological Society
GFDRR	Global Facility for Disaster Recovery and Reconstruction
GWE	Global Weather Enterprise
HMEI	Hydro-Meteorological Equipment Industry (Society)
IFMS:	International Forum of Meteorological Societies
IMA	InterMET Asia
LDC	Least Developed Countries
NGO	Non-Governmental Organizations.
NHMS	National Hydro-meteorological Services (of various WMO member countries)
NHMSoc	National Hydro-Meteorological Societies (some of them also include Ocean)
PPA	Public, Private and Academic
PS	Private Sector
S&T	Science and Technology
SIDS	Small Island Developing States
UCAR	University Corporation of Atmospheric Research
UNISDR	United Nations International Strategy for Disaster Reduction
WBG	World Bank Group (
WELC	Weather Enterprise Liaison Commission
WMO	World Meteorological Organization
WWOSC-2014	World Weather Open Science Conference held in 2014 in Montreal. Canada

## 1 Introduction

The societal need for more accurate and reliable weather information is growing fast as population density increases and climate change is taking place; nowhere is this need more acutely felt than in low- and middle-income countries.

The Global Weather Enterprise (**GWE**) consists of Public, Private and Academic (PPA) sectors and all three of them share a common vision to support safety of life and property and to promote economic development everywhere. It is the belief of the World Meteorological Organization (**WMO**), the World Bank (**WB**) and various GWE players that strong constructive collaboration between the three sectors can result in a much stronger progress in dealing with the disasters caused by natural phenomena due to Global Warming.

The Report of November 28, 2017 Workshop organized by the Global Facility for Disaster Recovery and Reconstruction outlines the outcomes of that Workshop. A complementary summary was prepared by IFMS which is also available. This latter document outlines some impediments in the way of progress which need to be addressed and resolved.

This document is meant to assist the discussion by identifying some of the issues which need to be resolved to strengthen GWE collaboration. In addition, it also outlines steps required to resolve them and create an atmosphere of cooperation and understanding.

We then provide our opinion on the activities required to implement the collaboration and how they can be executed.

We believe that a genuine collaboration can benefit all sectors and above all, the Society in general, we are supposed to serve.

## 2 Background

In **August 2014**, WMO organized a World Weather Open Science Conference (WWOSC-2014) in Montreal. This was the first time when, at the request of WMO, a concerted effort was made by world hydro-met community as a whole to involve all three sectors in a dialogue on the Global Weather Enterprise (GWE). Various top-quality moderators and panelists were invited to engage in a discussion about what needs to be done to strengthen GWE to create a Weather Ready Globe. Various panelists made presentations on the role, the three sectors - Public, Private and Academic (PPA) - can play to the benefit of the GWE and eventually the society at large. Among many other conclusions, the following four of them stood out:

- a) No Sector by itself can create a Weather Ready Globe; strong collaboration is required between the three sectors (PPA).
- b) No country by itself can solve all problems resulting from Global Warming - strong collaboration is required between all nations to achieve optimum results

- c) Since data is important from all corners of the world, we need to create an infrastructure in LDCs (Least Developed Countries) and also assist some developing countries.
- d) We need to create capacity and knowledge in LDCs and developing countries.

This two part Report which was created for that event is available on the IFMS Website ([www.ifms.org](http://www.ifms.org)) under Resources. It is an eye-opening document because it contains manuscripts of speeches and summary of the ideas of world leaders in the weather business.

**On November 28, 2017**, the Global Facility for Disaster Recovery and Reconstruction (**GFDRR**) of the World Bank Group (**WBG**) with the assistance of the World Meteorological Organization (**WMO**) organized a workshop on issues faced by Global Weather Enterprise (**GWE**) and what needs to be done to resolve those issues so that a strong collaboration can be created between PPA Sectors.

A summary Report of that workshop was created by IFMS and is available on the IFMS Website ([www.ifms.org](http://www.ifms.org)) under Resources tab. The official Report created by WBG for that Workshop is also available under Resources tab.

### 3 Global Weather Enterprise

The Weather Enterprise has been traditionally defined as consisting of the Public, the Private and the Academic sectors (**PPA**). During the Panel discussions at WWOSC-2014, two additional entities were recommended: NGO's, such as UCAR, and National Meteorological Societies, such as American Meteorological Society, Royal Met Society, Japanese Met Society, Canadian Meteorological and Oceanographic Society, etc. The National Societies can act as a glue between the other sectors because of their neutrality. AMS plays a very important role as a glue between three sectors in the US and provides facilities for mediation of disputed areas. Other National Meteorological Societies can learn from their experience.

Partnership is not only important between the five sectors but also with the end users – the customer. It was also stated that it is important to open ourselves up to be user driven and needs driven, not so much by the capability that we have as a science but rather in addressing what society needs and what the end user needs. Sound international cooperation continues to strengthen across the Weather Enterprise - a success story for which the World Meteorological Organization (**WMO**) has been playing a very critical role in developing the building blocks of the global weather enterprise – be it the Global Observing System, the Global Telecommunication System, Regional Forecasting Centres, World Meteorological Centres, the World Weather Research Program, and, recently the Global Framework for Climate Services and several others. In addition, the World Bank has been playing a crucial role in capacity building.

In this document we are using the more prevalent definition of GWE which is that GWE consists of PPA, however, interaction with Users is considered to be an important component to ensure that what GWE produces meets the user requirements.

## 4 Collaboration Issues and Impediments

There are a number of issues which cause impediments in the growth of GWE. The list of these issues is outlined below. Details of each issue along with potential solutions are also provided in the following sections.

1. Lack of proper infrastructure
2. Non-Availability of data collected by NHMS to private sector
3. Fragmented Data Collection
4. Existence of Commercial wings of NHMSs.
5. Governments feeling threat from Private Sector
6. Difficulty of coordination of work of three (**PPA**) sectors
7. Private Sector involvement in Least Developed and Developing Countries
8. Legislative Issues and Attitude of Governments
9. Budget Allocations by National Governments
10. Public Education

### 4.1 Lack of proper infrastructure

#### 4.1.1 Problem Statement

In many least developed countries (**LDCs**) there is very little infrastructure and in many developing countries there is deficient infrastructure. For quality weather forecasting, data is required from all parts of the world.

#### 4.1.2 Potential Solution

Possible solutions include:

- a) The World Bank (**WB**) provides financial loans to developing countries. Although some oversight is provided by the WB, the main responsibility is left to the recipient of the loan. With stronger oversight for procurement which also includes specifications of the required systems, the success of these projects can be greatly improved. It has been observed by private sector as well as HMEI that the specifications of instrumentation do not match the requirements. Many times, systems are over-specified resulting in unnecessarily high costs and inadequate systems. For example, high accuracy systems to provide high resolution data are required only for climatology and not for regular weather modelling operations.

Climatology is not in the cities – it is in remote areas. By specifying high end systems to achieve basic purpose is waste of money and in many cases cause of failure.

- b) Both WMO and WB assist in Capacity Building and IFMS plans to collaborate with these organizations to assist in capacity building through local Met Societies and Private Sector companies. For this objective, local NHMSocs need to be strengthened and a part of that is being able to attend selected training courses, conferences and meetings for which they need financial assistance. WMO and WB should assist in that aspect.

## **4.2 Non-Availability of data collected by NHMS to private sector**

### **4.2.1 Problem Statement:**

The NHMS's of most countries do not want to share their collected data because they feel that this data is collected with Tax Payers' money and it cannot be provided free to Private Sector users to make profit. However, the way we see the reality is that this "un-depletable" goldmine of data if "mined/used" by a large number of users, will produce maximum value for the Society at large which the GWE is supposed to serve.

Reasons for not sharing the data vary from country to country and sometimes have no relationship to the state of development of that country. Some developed NHMSs want to run their own commercial weather service and some developing countries feel that the Private Sector in their countries is not matured enough to be able to use data properly.

In addition to the argument about tax-payer paid data cannot be provided for profit, we have also heard the following arguments:

- a) Local Private Sector companies are not sufficiently trained and ethical to ensure the data is used responsibly. They will try to mislead users about the weather situation to attract bigger audience. We believe that this only means that there have to be checks and balances but not a complete black-out.
- b) Since local companies do not have the capacity to use the available data properly, foreign companies which have paid no taxes in that country will use that data to make profit.



## 4.2.2 Potential Solution

This can be achieved only by convincing the Governments of these countries, which do not share Hydro-Met data, about the value of making data available to others who will be able to exploit that data for the benefit of the society which is the final objective of all this investment.

Making data available or not in many cases is a national policy. Even NHMS of the country cannot take such decisions – especially in some developing and in most least developed countries. The Government must realize that if foreign companies do make money in the target country, they will pay taxes. In any case, the competition will give impetus to local companies to build capacity. In addition, foreign companies will use local manpower for marketing and technical support thus build some capacity.

Probably, any National Government involvement needs to be worked out through organizations like UNISDR (United Nations International Strategy for Disaster Reduction - United Nations Office for Disaster Risk Reduction) which is the focal point in the United Nations system for the coordination of disaster reduction and ensures synergy among the disaster reduction activities of the United Nations system and regional organizations (UN General Assembly resolution 56/195). at headquarters and field levels. UNISDR works with the wider UN system.

More information is available on the following website.

<http://www.unisdr.org/partners/united-nations>

## 4.3 Fragmented Data Collection

### 4.3.1 Problem Statement:

In a given country systems are installed by various types of users even within the Government e.g. systems are installed by National Hydro-Meteorological Service, Forestry Departments, Provincial Governments, Power Generation companies, etc. But data is not shared.

### 4.3.2 Potential Solution

We need to work towards “network of networks” model which will allow us to share collected and quality controlled data for the betterment of the society.

All data could be sent to the NHMS where it could be quality controlled and made available to users. There are following types of data collection networks:

- a) Data collected by NHMS
- b) Data collected by other government departments such as Forestry, Parks, etc. and state or provincial level departments

- c) Data collected by companies such as Power Generation companies many of which are government organizations, whereas others are private sector companies
- d) Data collected by Private Sector companies.

Whereas, the first three categories need convincing, the fourth one requires deal making skills because they have made an investment in their network.

## **4.4 Existence of Commercial wings of NHMSs.**

### **4.4.1 Problem Statement:**

Some countries have NHMSs which also have commercial counterpart. Therefore, they compete with the Private Sector in those countries creating uneven playing field for the Private Sector (as compared to the countries where NHMSs share data), and hence creating tension between the Public and Private sectors.

### **4.4.2 Potential Solution**

It is an important impediment for the Private Sector companies to have to compete with Government provided commercial services. This not only hampers the development of the local companies, it also gives advantage to the foreign companies to provide services in such markets.

It is a very difficult issue to resolve because some of these NMHSs have been providing such services and products for a long time. It will require a lot of convincing to achieve any progress.

## **4.5 Feeling of Threat from Private Sector**

### **4.5.1 Problem Statement:**

Some NMHSs feel adversarial relationship with the Private Sector and feel that a strong Private Sector will be a threat to their existence. Recently, some NHMSs have complained to WMO about some Private companies especially from US providing services to the users in their countries.

### **4.5.2 Potential Solution**

National Hydro-Meteorological Services (NHMS) feel threatened that they will lose authority and even jobs. This is a legitimate concern for NHMSs and it needs to be resolved through discussions and rational thinking keeping the betterment and progress of the GWE in the forefront. The stability provided by NHMS for a given country cannot be jeopardized. However, the users need service and if it is not being provided by the NMHS, then they should allow these companies to serve clients.

## **4.6 Difficulty of coordination of work of three (PPA) sectors**

### **4.6.1 Problem Statement:**

First of all, there is a difficulty in getting the three sectors to agree on the rules of this engagement and then how to implement the resulting agreements is, to say the least, is not an easy task.

### **4.6.2 Potential Solution**

We have outlined some potential steps to promote collaboration between PPA in Section 5 of this document where the problems and opportunities have been discussed.

## **4.7 Private Sector involvement in LDC & Developing Countries**

### **4.7.1 Problem Statement:**

Some US Private Sector companies have tried to fulfill the needs of certain countries to a small extent but have met resistance from local NHMSs. One attendee in the GFDRR meeting on November 28, 2017 (referred to in the Background section 3) even complained that they were warned that the company could be charged for breaking local law.

### **4.7.2 Potential Solution**

We have covered this topic in section 4.5 to some extent. However, we thought, as far as involvement of the private sector is concerned, this point raises some difficult issues which need to be discussed and resolved separately. These issues relate to local NMHSs feeling threatened and also outdated national regulations.

The solution will require intervention at the higher Government level and not just NHMS of the country. A Value Proposition showing the benefits to the country needs to be prepared to show that this kind of assistance from the Private Sector (**PS**) companies can have a strong impact on their local economy and safety of life. After discussions with the local Government and getting positive response, PSs should be encouraged to install such networks and WB and WMO should guarantee fair return to the PS company/companies, if they are really interested in building capacity in LDCs.

## **4.8 Legislative Issues and Attitude of Governments**

### **4.8.1 Problem Statement:**

Some of the impediments are caused by Government regulations which are outdated and hence hinder PPA collaboration. They need to be modernized.

## 4.8.2 Potential Solution

Certain legislations in most countries were developed to protect their NHMSs rather than for the betterment of the nation and its citizens. By virtue of the new realization that the effects of the Global Warming and its related events and disasters cannot be solved by any single nation or entity out of the PPA ensemble, there is more awareness to promote collaboration between these three sectors. Now that the venerable organizations like WMO, WBG as well as IFMS have taken up the job to develop and implement this collaboration, there is a need to educate not only NHMSs and NHMSocs but also the National Governments about the virtues of this collaboration. In addition, the legislations of these nations need to be modified with respect to opening up their data and participation of private sector local and if necessary international companies in the area of disaster infrastructure, forecasting and management.

Achieving this will not be easy, but with a proper “Value Proposition” to illustrate the benefits and concerted and honest effort to convince the local governments through United Nations could be necessary.

## 4.9 Budget Allocations by National Governments

### 4.9.1 Problem Statement:

The value of accurate local weather information to mitigate avoidable loss of life and damage to property is not understood by most governments. If they did, they would pay more attention to building national capacity to withstand the effects of disasters and minimize their effect in terms of loss of life and property.

### 4.9.2 Potential Solution

We need to prove to various governments the value of this investment in infrastructure and training by comparing it with the loss of life and cost of property caused by these disasters. This can be achieved by evaluating the cost of adequate Infrastructure and Disaster Management capabilities which is the sum of the cost of the following:

- a) An adequate (and affordable quality) infrastructure – physical and forecasting
- b) Trained Manpower to do accurate forecasting of disaster
- c) Infrastructure to manage the disaster.

Invariably, cost of loss of life and property over a few events would far exceed the cost of the above three items and, of course, the cost of the loss of life cannot be compensated.

WMO/WB/IFMS need to prepare strong value proposition showing the comparative cost of the above in some typical cases.

Then the national governments as well as the population has to be educated for the latter to demand proper investment and former to allocate sufficient money.

Governments need to be educated that they have to be very careful while cutting the budgets of various departments because by doing that they might cut their nose despite their face.

## **4.10 Public Education**

### **4.10.1 Problem Statement:**

Since politicians are accountable to the public needs, public needs to be educated (made aware) to strongly support the need for improved weather information to politicians so that they make adequate investment in disaster management infrastructure and development of related sciences.

### **4.10.2 Potential Solution**

Public Education is very important. This can only be achieved through interesting and informative programs which need to be sponsored by WMO and WB as promotional activity to educate the public. This can take the form of quality TV Programs and videos proving the value of having the right infrastructure and right education and capacity to manage disasters. NHMSs and NHMSocs should cooperate to produce public education lectures and seminars and organize their presentation in the most effective way.

## **5 Activities Required for promoting Collaboration**

Following are the activities required to achieve the proposed mission.

1. Create a WELC (Weather Enterprise Liaison Commission) and find it a home. IFMS would welcome to have this Commission as a part of its activities as long as its operations are financed by WMO/WBG and any other interested parties.
2. WELC to define its activities in consultation with WMO, WBG, HMEI and IFMS.
3. Execute the activities defined above.

### **5.1.1 Create WELC**

The mandate of the Commission should be to act as an Advisor to WMO and the WBG.

It should consist of nine members, 3 from each of the three sectors (PPA). These members must be industry leaders whose opinions can be taken seriously. In addition, WMO, WBG and HMEI should nominate a member for coordination purposes.

This Commission should work under the jurisdiction of a neutral body such as IFMS which has members from all three sectors. AMS is prepared to help IFMS in implementing WELC and its mandate.

## **5.1.2 WELC Defines Activities**

Once WELC is formed, it needs to define activities to strengthen GWE. A preliminary list of suggested activities are:

1. Preparing documents showing benefits of collaboration.
2. Organizing Meetings of three sectors in various regions
3. Finding ways to convince governments to ease regulations, invest more money in infrastructure physical and trained manpower
4. Creating Collaboration Opportunities and supporting them.

### **5.1.2.1 Preparing documents showing benefits of Collaboration.**

It is important to have Value Proposition for various ideas which WELC is planning to implement. Some such items are:

1. Why all Governments should invest more in Infrastructure and Capacity Building – especially Governments of LDCs, Developing Countries and Island Countries
  2. What benefits can be drawn from the Collaboration between PPA Sectors and why it is so important.
  3. Why should Governments or NHMSs provide free access to data? Benefits need to be enumerated.
  4. What is the best way of maximizing the benefit of the investments made by WBG and WMO as well as other Aid Agencies? How the projects funded by these agencies can produce better results?
  5. How we can coordinate the projects executed by different agencies so that duplications can be avoided and coordination can bring maximum returns. Section 6.1 provides additional information on this.
  6. Develop Business models (and their risks for different actors) for sustainability of public and private data services as well as consequences of the ownership of data need to be explored and reported.
- etc.

### 5.1.2.2 Organizing Meetings of PPA Sectors in various Regions

In order to promote the idea of PPA Collaboration, meetings are required in various parts of the world. Some of the meetings which have been held or are planned are:

- 1) WWOSC-2014 Panel Discussion on GWE in August 2014 in Montreal.
- 2) November 28, 2017 Meeting in Washington DC by WBG and WMO with the assistance of AMS which gave opportunity to approximately 70 GWE invited members from around the world but principally from WMO Regions IV and VI.
- 3) January 11, 2018 Meeting in Austin, Texas at AMS Conference will give opportunity to those people invited by WMO for this meeting which will include basically Region IV and VI as well as any invited from other regions.
- 4) April 12, 2018 Meeting in Singapore at InterMET Asia (**IMA**) Conference which will give opportunity to invitees from various regions principally for participants from WMO Regions II and V.
- 5) September 6, 2018 Meeting in Budapest, Hungary as a part of EMS Conference and IFMS Meeting there. This will give an opportunity to Region VI and Region I as well as attendees from other countries who are members of IFMS.

### 5.1.2.3 Dealing with National Governments

Using the information collected for the Value Proposition documents of the previous subsection 5.1.2.1, make a plan to interact with NHMSs and National Governments. It is of paramount importance to convince both these entities to buy into the ideas we are promoting which include:

- 1) Sharing of Data Collected by NHMSs
- 2) Providing sufficient budgets to create infrastructure
- 3) Develop Network of Networks
- 4) Improve Procurement strategies to maximize return on their investments
- 5) Cooperate with Private Sector in creating optimal solutions e.g. Government owned infrastructure or private infrastructure which Government can use to get data at an optimal cost. Of course proper checks and balances to ensure uninterrupted availability of data as well as its cost must be worked out.
- 6) If international private sector companies are interested in providing infrastructure and data, it must be seen as a positive step and not a challenge to the NHMS. Of course cost benefit analysis as well as uninterrupted availability of data must be give prime consideration.

### 5.1.2.4 Creating Collaboration Opportunities and supporting them

***In order to achieve collaboration between PPA, we need to produce a generic list of the type of collaboration opportunities we are looking for.***

After defining the generic list of Collaboration Opportunities, we need to identify specific opportunities and related area of action and players.

One of the important activities of IFMS is to provide infrastructure for collaboration. On its website, IFMS has a Collaboration Tab which users can use for showing their interest in collaboration. This could be expanded and improved greatly to meet the requirements of the WELC for creating Collaboration.

### 5.1.3 WELC Executes Activities

Once all the required documentation mentioned above and the required activities have been defined, then we can work on the way to execute these activities.

## 6 Some Miscellaneous Issues

### 6.1 Coordination of Aid provided by different Entities

It is observed that in addition to WBG and WMO providing assistance in terms of advice and financing, many National Aid Agencies of advanced nations also invest money in building capacity in developing nations. Even UCAR provides aid to some countries for training, etc.

Many of these activities are not coordinated hence resulting in non-optimal use of investments in some cases. We believe that this issue needs some study and coordination.

IFMS can help in this area. As a minimum, IFMS Website can carry a list of such Programs and ongoing Projects. At least we can provide a summary of such Programs and Projects and link to their website.

### 6.2 Review of best way of building Capacity and Infrastructure

It is observed that the investments made in many of the above cases do not achieve optimal results. It is suggested that the way the money is invested and the projects are executed needs to be reviewed. This should be one of the activities of WELC.



## 7 Conclusions

- 8 The societal need for more accurate and reliable weather information is growing fast as population density increases and climate change is taking place; nowhere is this need more acutely felt than in low- and middle-income countries.
- 9 The GWE consists of Public, Private and Academic (**PPA**) sectors and all three of them share a common vision to support safety of life and property and to promote economic development everywhere.
- 10 This vision is greatly supported by advancing science and technology (**S&T**). However, the benefits of significant investment in the advanced economies are not reaching the least developed countries (**LDCs**) and Small Island Developing States (**SIDS**) effectively and efficiently.
- 11 While the GWE has been successful in delivering increasing quality weather information that helps save lives and property, its progress faces some impediments which are listed in this document and they need to be studied and resolved.
- 12 It is important to improve collaboration and build trust within GWE. Any lack of clarity in the respective roles and responsibilities of the different actors would contribute to mistrust which could result in destructive competition rather than collaboration, thus adversely affecting GWE.
- 13 The collaboration should be in development of science and infrastructure, their implementation and commercialization.
- 14 Up to now, the action to strengthen GWE has been too slow and it needs to be accelerated. The WWOSC-2014 Conference of WMO, was the first consolidated opportunity to discuss GWE and a Report of the three Panels as well as the transcripts of the speeches were produced. Some of the ideas generated in those panels were included in the WMO Congress in 2015. IFMS was reenergized to strengthen collaboration between meteorological societies and their constituents PPA Sectors.
- 15 The GWE needs to act much more quickly and the November 28, 2017 Workshop organized by GFDRR of WBG gave a strong boost to the action required on this front. The follow up meetings at AMS Conference in Austin (January 11, 2018) and proposed meetings at InterMET Asia (April 11-12, 2018) in Singapore and IFMS Meeting #5 (September 5-6, 2018) in Budapest Hungary will give further boost to the idea.
- 16 However, it is important to form a WELC as soon as possible to conduct these activities in a more organized manner with well thought out topics of discussion.
- 17 The activities to be carried out by WELC need to be laid out and some of the topics of discussion are outlined in this document.

- 18 In order to remove the impediments on the way of GWEs development, action is required from WMO, WBG, NHMSs and National Governments and even United Nations.
- 19 The WMO committed itself to accelerate its process to develop a resolution for the WMO Congress in 2019 on the better integration and collaboration of the public, private and academic sectors that contribute to the GWE. WELC could assist WMO in a major way on this endeavor.
- 20 This activity requires financing which needs to be committed by WMO, WBG and other organizations which are involved in Capacity Building against natural disasters caused by Global Warming.
- 21 In order to make data access and its exchange possible for both public and private sources, review of WMO Resolution 40 is required.
- 22 As stated in the Summary Report of November 28, 2017 meeting of GFDRR/WBG, Business models (and their risks for different actors) for sustainability of public and private data services as well as consequences of the ownership of data need to be explored.