

Guidelines for Public-private Engagement

2021 edition

WEATHER · CLIMATE · WATER



WORLD
METEOROLOGICAL
ORGANIZATION

WMO-No. 1258

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EDITORIAL NOTE

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Chair, Publications Board
World Meteorological Organization (WMO)
7 bis, avenue de la Paix
P.O. Box 2300
CH-1211 Geneva 2, Switzerland

Tel.: +41 (0) 22 730 84 03
Fax: +41 (0) 22 730 81 17
Email: publications@wmo.int

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FOREWORD

The increasing impacts of extreme weather and climate change and the substantial progress in science and technology over the past decades have resulted in an unprecedented demand for more accurate and reliable weather, climate, water and related environmental information. No single stakeholder is able to meet this demand alone. However, through engagement and partnership arrangements, there are excellent opportunities for stakeholders in all sectors concerned to provide users with access to this information via products and services that are affordable, fit-for-purpose and efficient.

With the adoption of the Geneva Declaration – 2019: Building Community for Weather, Climate and Water Actions, the Eighteenth World Meteorological Congress established a high-level WMO policy on public-private engagement. While the Declaration provided a historic policy drive for a shift towards a new paradigm of cooperation and partnership to build a more weather- and climate-resilient world, it also recognized that the WMO community needs a specific guidance for actions at the national, regional and global levels.

The seventy-second session of the WMO Executive Council endorsed the Guidelines for Public-private Engagement as a guiding document for Members pursuing cooperation with non-State entities. The aim of these Guidelines is to inform and facilitate global, regional and national actions by WMO and its Members undertaken to encourage proactive engagement among stakeholders in the public, private and academic sectors for the purpose of providing better services to governments, economies and citizens. I believe these Guidelines will help WMO constituent bodies and Members' National Meteorological and Hydrological Services to understand issues, raise awareness and promote good practices with respect to the highly dynamic processes shaping public-private engagement within the current and future weather and climate enterprise.



(Prof. Petteri Taalas)
Secretary-General

1. INTRODUCTION

1.1 Global factors

The World Meteorological Organization, as a United Nations organization, is driven by the global United Nations agenda. Today, the 2030 Agenda for Sustainable Development (adopted in 2015 and containing 17 sustainable development goals (SDGs)), the Sendai Framework for Disaster Risk Reduction 2015–2030, and the United Nations Framework Convention on Climate Change are the principal global agreements framing the goals and objectives of WMO. Cross-sectoral and innovative partnerships will play a crucial role in achieving these goals and objectives and will involve actors from different sectors working together in an integrated manner, pooling their financial resources, knowledge and expertise.

SDG 17, “Revitalize the global partnership for sustainable development”, recognizes multi-stakeholder partnerships as important vehicles to support the achievement of the SDGs in all countries, particularly developing countries. It seeks to encourage effective collaboration among stakeholders in the public, private and academic sectors, as well as in civil society, building on the experience and resourcing strategies of existing partnerships. The majority of United Nations organizations have adapted, or are in the process of adapting, their respective strategies and policies to reflect the thrust of SDG 17 for public, private and academic engagement.

1.2 WMO context

In 2015, the Seventeenth World Meteorological Congress (Cg-17) defined ‘partnership’ to mean working with international agencies, other organizations, academia, the media and the private sector to improve the range, quality and delivery of critical environmental information and services. The WMO Strategic Plan 2016–2019 sought to strengthen partnerships, some of which were formed decades ago, in order to improve the performance of National Meteorological and Hydrological Services (NMHSs) in delivering services and to demonstrate the value of WMO contributions within the United Nations system and to relevant regional organizations, international conventions and national strategies.

An important milestone in the history of WMO partnering with non-State entities was the adoption by the Twelfth World Meteorological Congress (Cg-XII), in 1995, of a policy and practice for the international exchange of meteorological data and products (Resolution 40 (Cg-XII) – WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities).¹ Annex 3 to Resolution 40 (Cg-XII) provides “Guidelines for relations between National Meteorological or Hydrometeorological Services (NMSs) and the commercial sector” and states, “The purpose of these guidelines is to further improve the relationship between NMSs and the commercial sector. The development of the exchange of meteorological and related information depends greatly upon sound, fair, transparent, and stable relations between these two sectors.”.

The WMO World Weather Open Science Conference (WWOSC), held in Montreal in August 2014, put a special focus on the need for a broad dialogue among actors in the public and private sectors, including the strong engagement of stakeholders in academia and other relevant entities, such as learned societies, in order to respond to the changing landscape of weather, climate and hydrological sciences and services.² The outcomes of the WWOSC discussions led to a series of multi-stakeholder follow-up dialogues in coordination with partner organizations such as the Global Facility for Disaster Reduction and Recovery (GFDRR) of the World Bank Group and the Association of Hydro-Meteorological Equipment Industry (HMEI).

Cg-17 acknowledged the growing involvement of “private sector entities” (private companies, citizen’s associations, bloggers, and so forth) in weather, climate, water and related

¹ World Meteorological Organization, 1995: *Twelfth World Meteorological Congress: Abridged final report with resolutions* (WMO-No. 827). Geneva.

² Hayes. J., H. Ahluwalia and J. Abraham, 2015: *The Future of the Weather Enterprise*. WMO Bulletin 64(1). Geneva.

environmental matters.³ These entities have been active to a varying extent in the full value chain, starting with observations, extending to data acquisition tools and technologies and information generation and processing technologies, and culminating in product dissemination and services. Cg-17 recognized the involvement of these entities in end-to-end service delivery and their support of the WMO vision, mandate and objectives. Cg-17 also highlighted the different, and at times, complementary roles and responsibilities of NMHSs, academic institutions, research and technological agencies, and private sector stakeholders. It was felt that closer interactions between public and private sector stakeholders would stimulate innovation and facilitate cross-fertilization, ultimately benefitting society. Cg-17 noted that WMO has a unique opportunity to initiate such interaction and emphasized that inaction could limit the benefits for users of weather, climate, water and related information services. At the same time, such activities could also lead to the proliferation of different information sources, sometimes without the necessary quality assurance, which could challenge the mandate of NMHSs as the providers of authoritative information and warnings to the public and to disaster management authorities. It was also recognized that, while private sector stakeholders could help increase the availability of services for citizens and businesses, it was of paramount importance to ensure that NMHSs continue to be the providers of the basic infrastructure and services needed by all stakeholders.

Acknowledging the challenges, Cg-17 recognized that a WMO guidance on engagement with the private sector would help NMHSs keep pace with activities at the national and international levels and improve their efficiency and service delivery, including their delivery of services supporting the development of observational and communication infrastructures at the local and regional levels.

Following the directives given by Cg-17, several activities were undertaken to build awareness of public-private engagement (PPE) and to improve interactions among stakeholders in the public, private and academic sectors. In 2016, the sixty-eighth session of the Executive Council (EC-68) held the first special dialogue on the “complementary and cooperative contributions of public and private sector institutions to meteorology and hydrology”.⁴ In 2017, the sixty-ninth session of the Executive Council (EC-69) adopted Decision 61 (EC-69) – Public-private engagement: a road map to the Eighteenth World Meteorological Congress,⁵ and a key element of this road map was the adoption of the WMO Policy Framework on Public-private Engagement by the seventieth session of the Executive Council (EC-70) in Resolution 33 – Public-private engagement, in June 2018.⁶ The aim of this Policy Framework was to assist Members and stakeholders from all sectors by providing a set of guiding principles for a successful partnership and by highlighting the challenges and opportunities that need to be addressed in order to harness the potential benefits of working together for the benefit of society.

In 2019, the Eighteenth World Meteorological Congress (Cg-18) adopted Resolution 80 (Cg-18) – Geneva Declaration – 2019: Building Community for Weather, Climate and Water Actions, a high-level policy document presenting the WMO position, policy and guidance on public-private engagement in support of a sustainable development agenda, climate change adaptation and disaster risk reduction.⁷ This document reflects the new paradigm of cooperation and partnership involving stakeholders from all sectors of the weather, climate and water enterprise (hereinafter, the “weather enterprise”⁸) needed as a collective response to the global societal risks related to extreme weather, climate change, water scarcity and other environmental hazards.

³ World Meteorological Organization, 2015: *Seventeenth World Meteorological Congress: Abridged final report with resolutions* (WMO-No. 1157). Geneva.

⁴ World Meteorological Organization, 2016: *Executive Council – Sixty-eighth session: Abridged final report with resolutions and decisions* (WMO-No. 1168). Geneva.

⁵ World Meteorological Organization, 2017: *Executive Council – Sixty-ninth session: Abridged final report with resolutions and decisions* (WMO-No. 1196). Geneva.

⁶ World Meteorological Organization, 2018: *Executive Council – Abridged Final Report of the Seventieth Session* (WMO-No. 1218). Geneva.

⁷ World Meteorological Organization, 2019: *World Meteorological Congress: Abridged Final Report of the Eighteenth Session* (WMO-No. 1236). Geneva.

⁸ For the definition of “weather enterprise”, see the appendix to the present Guidelines.

An Open Consultative Platform (OCP) entitled “Partnership and Innovation for the Next Generation of Weather and Climate Intelligence”⁹ was launched during Cg-18 as a vehicle for a sustainable and constructive dialogue between interested parties in the various sectors. The platform was created to articulate a vision for the future of the weather enterprise involving key stakeholders from all relevant sectors and to foster mutually beneficial partnerships.

2. OBJECTIVES OF THE GUIDELINES

The Guidelines for Public-private Engagement are designed to inform and facilitate global, regional and national actions by WMO and its Members and to encourage proactive engagement among stakeholders in the public, private and academic sectors in order to provide better services to governments, economies and citizens. The Guidelines outline and promote principles aimed at maximizing the benefits of an inclusive weather enterprise approach.

Developed in line with Resolution 67 (Cg-17) – WMO guidance on partnerships with the private sector, Decision 73 (EC-68) – Cooperation between the public and private sectors for the benefit of society and Decision 61 (EC-69), and updated with the high-level policy directions provided in Resolution 80 (Cg-18), the Guidelines address:

- (a) The evolving potential for engagement with stakeholders in the public, private and academic sectors and civil society in the areas of weather, climate and water;
- (b) Principles for public-private sector engagement based on the “Key issues to be addressed in developing policies and principles for engagement” (Annex 2 to Decision 73 (EC-68));
- (c) The evolving roles of stakeholders at the global, regional and national levels;
- (d) Options for public-private engagement in the legislative landscape, capacity development and other societal issues, with a view to developing a WMO guidance for Members.

The Guidelines are intended to be a living document which will frequently be updated to address emerging issues and to provide guidance for moving forward in a changing environment. The Guidelines seek to strengthen and enhance opportunities for Members, their National Meteorological and Hydrological Services (NMHSs) and stakeholders in the private sector to promote ethical behaviour, enable efficiency and innovation, and adopt an inclusive approach to challenges related to funding basic infrastructure and research activities.

The Guidelines are based on the WMO Convention, existing policies and related regulations and guidance. The WMO Convention has ensured that the world’s nations cooperate to create and sustain an international system to gather observations, make predictions, and provide reliable information and services to support effective decision-making in order to reduce the loss of life and property, support sustainable development, and preserve the environment and the global climate for present and future generations.

The Guidelines are supplemented by the good practices, the latest updates of public-private engagement activities, and the contemporary discussions on emerging issues that are available on the WMO website (<https://public.wmo.int/ppe>), in particular, those that appear under [PPE Resources](#).¹⁰

⁹ World Meteorological Organization, 2019: [Open Consultative Platform – Partnership and Innovation for the Next Generation of Weather and Climate Intelligence](#). Geneva.

¹⁰ The online contents are for information purposes only. Except in the case of official WMO publications and decisions by WMO governing bodies, the information on the WMO website presents the findings of the authors and is not an expression of any opinion whatsoever on the part of WMO concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products does not imply that they are endorsed or recommended by WMO in preference to others of a similar nature which are not mentioned or advertised.

3. **NEEDS AND DRIVERS FOR PUBLIC-PRIVATE ENGAGEMENT**

Over the last two decades, the number of stakeholders in all areas of the value chain of meteorological, climatological, hydrological and related environmental services has grown, and the stakeholders themselves have become more diversified. They now include not only governments and public sector entities, but also actors from academia, the private sector and civil society. The flow of activities and the interconnections among stakeholders in the various parts of the value chain need to be further analysed in the current and evolutionary context.

Such an analysis would allow WMO to identify opportunities to improve the efficiency and quality of products and services through partnership arrangements involving stakeholders in all sectors concerned. These partnerships would, in particular, enable existing gaps in capacity to be bridged and would improve access to essential information and services in the developing world.

3.1 **Historical perspective**

The idea of an “enterprise” involving a multi-stakeholder approach can be traced to the early history of WMO and its preceding international cooperation initiatives. Indeed, one of the first meeting invitations, sent to the international meteorological community in 1872, stated:

“We venture by the present circular to invite the heads of Meteorological Institutes, the Meteorological and other Learned Societies, as well as private scientific men and practical observers in the domain of Meteorology, to this consultative meeting, which is to be held in Leipzig...”

(From the invitation letter to the Meteorological Conference at Leipzig, August 1872¹¹)

The meteorological and related systems and services of the twentieth century were primarily established, operated and funded by the public sector. WMO Member States and Territories collectively built a global infrastructure under the World Weather Watch (WWW) Programme consisting of three core systems – the Global Observing System (GOS), the Global Telecommunication System (GTS) and the Global Data Processing and Forecasting System (GDPFS). WWW was established and made operational on a 365/24/7 basis through an agreed set of global standards for observations, data processing and service delivery, which has ensured the necessary harmonization and interoperability of its constituent systems. A number of global and regional centres hosted by Members’ NMHSs formed the backbone of the communication and numerical modelling needed for the forecasting of the main atmospheric variables. States cooperated, coordinated and collectively invested in building the expensive satellite segment of GOS.

While WWW was primarily a public sector endeavour, it would not have been successful without essential scientific and technological support from academia and private industry. At the early stages, the participation of the private sector in WWW service delivery was generally limited, with the exception of several countries where private companies played a prominent role in the provision of weather services, for instance, to media outlets.

¹¹ The Leipzig Conference (1872) prepared the way for the First International Meteorological Congress in Vienna in 1873.

3.2 **Factors of change**

The recent changes in stakeholder engagement in the value chain have been evident across the globe but with significant variations by region and country. Five primary factors have influenced these changes:

- (a) Scientific and technological innovation;
- (b) A growing demand for meteorological, climatological, hydrological, marine and related environmental information and services from commercial interests, the general public and the government sector;
- (c) Global actions to adapt to climate change, to increase sustainable development, and to reduce disaster risk;
- (d) Public-sector institutional and resource constraints;
- (e) Increased involvement of and investment by the private sector, and increased globalization and consolidation of private sector entities in the weather enterprise.

These factors have shaped trends within the weather enterprise and accelerated the growth of private stakeholder participation and the increase in financial turnover. Within this context, it remains in the interest of all parties to have a robust national and global meteorological and hydrological infrastructure as this forms the information backbone serving all sectors and the whole community. Ensuring the sustainability of this infrastructure requires all countries to reaffirm their commitment to funding and operating national observing networks and means of communication and their adherence to the appropriate standards and procedures. In addition, countries should reaffirm their commitment to the free and unrestricted international exchange of the requisite and quality-assured essential data and products.

The academic sector is involved in the weather and climate enterprise through internationally coordinated scientific and research efforts that underpin operational systems and ensure that they evolve as new innovations arise. The academic sector also encourages continuous human capacity-building through education and training.

Private sector involvement in the weather enterprise, though initially mostly confined to manufacturing equipment and providing media services, has been growing rapidly across the whole value chain, so much so that a number of companies now have 'end-to-end' capability with regional and global coverage. This growth is substantially expanding both opportunities and challenges for all stakeholders, including NMHSs.

3.3 **Impacts and evolving roles**

The changes brought about by the above factors could have a significant impact on the institutional arrangements that are currently widely accepted by WMO Members for the collection, processing and exchange of meteorological, hydrological, climatological and other environmental data, as well as for the generation and provision of the corresponding information and services. The potential exists to improve the efficacy and reach of warnings, forecasts and other services within societies around the world. At the same time, concerns have been raised that these changes could erode the core observational assets usually managed by NMHSs, as well as the status, funding and modes of operation of NMHSs. This could impact sustained long-term, national observing capabilities and thereby harm key activities such as national and global climate monitoring. The role of NMHSs as the (single) national authoritative voice for severe weather warnings and other core governmental purposes could be challenged, which could have negative impacts on the public and on end-users of products and services supplied by NMHSs. Numerous case studies and practices from the meteorological community, as well as examples from other sectors, can inform best practices for effective public-private engagement to mitigate these risks.

Within the weather enterprise, national, regional and international institutions and business models vary greatly. Regardless of the differences, a common goal of the enterprise should be to contribute to the core mission of WMO: protecting life and property, helping to foster economic growth and improving quality of life. Governments, the public sector, the private sector, academia and civil society all play important roles in achieving this goal.

The role of WMO is set in the WMO Convention, which recognizes that “meteorology is best coordinated at the international level by one responsible international organization”. Thus, WMO plays a central global role in facilitating the cooperation of Member States and Territories and their weather enterprise stakeholders.

Historically, the public sector has led the funding and development of the backbone infrastructure of the weather enterprise. Observational networks and weather, climate and hydrological services have been considered “public goods”, and their development and provision has been understood to be the responsibility of national governments.¹² Recently, technological changes and changes in users’ requirements have provided new opportunities for the private sector to contribute to the provision of these services in support of the public interest and to meet specific stakeholder needs.

One of the distinguishing characteristics of weather services is their dependence on observational data from around the globe. No one nation could provide even basic weather services to its citizens without continuous, real-time access to such data internationally. While investments in obtaining these observations are made at the national level, the collective benefits only accrue if: (i) a sufficiently large number of nations decide to make these investments; and (ii) these nations share the resulting data with each other. Members have invested in public sector institutions because weather, climate and hydrological services have proven to be essential to the safety and security of their citizens and because providing these services is a fundamental role of government; this is true even if both public and private sector entities contribute to the collection of data.

At the same time, the private sector is also a valued contributor to the well-being of nations and has been active in the weather enterprise for decades across all elements of the value chain. It serves a number of very important roles, including being a source of investment, a driver of technological development and innovation, a partner in service development and delivery, and an engine for economic growth and employment.

4. **PRINCIPLES OF ENGAGEMENT**

A major role of these Guidelines is to promote a set of basic principles to provide guidance, outline responsibilities and express goals. These principles are based on the core values and goals of WMO as an organization and provide a framework to facilitate the formulation and implementation of partnerships between WMO and the business sector, and at the national and regional levels, between NMHSs and private sector stakeholders, while safeguarding the integrity, impartiality and independence of WMO and preventing and mitigating potential risks of adverse impacts on its core mandate and services. The basic principles are also derived from relevant United Nations policies, strategies and guidelines on public-private engagement and public-private partnerships (PPPs). Furthermore, the Guidelines follow the high-level WMO policy on PPE established in the Geneva Declaration – 2019.

4.1 **‘People first’ principle**

Recognizing the core mandate of supporting local-to-global decisions related to saving life and property and economic productivity by providing essential, meteorological, climatological,

¹² For an explanation of the term “public goods” and its applicability to this context, see Zillman, J., 1999: *The National Meteorological Service. World Meteorological Organization Bulletin Vol. 48, No. 2.* World Meteorological Organization, Geneva.

hydrological and environmental information, WMO adheres to the “people-first” approach to public-private engagement and partnerships that has been promoted by the United Nations Economic Commission for Europe (UNECE) and widely accepted as a vehicle to achieve the United Nations SDGs.¹³

The ‘people-first’ principle sets out a clear statement that out of all the stakeholders, ‘people’ should be the priority and main beneficiary. The focus of PPE and PPPs in the weather enterprise should be on improving the safety and quality of life of communities, particularly those that are fighting poverty. PPE and PPPs should provide increased access to essential, affordable and fit-for-purpose products and services for all, thereby contributing to the resolution of vulnerabilities and sensitivities to weather and climate impacts, which in turn will strengthen the enterprise by creating a new demand and new opportunities for weather, climate and hydrological services.

WMO contributes to the ‘people-first’ principle through its programmes supporting meteorological and hydrological service providers, including NMHSs, and by providing free and openly available data and products.

4.2 **Fair and transparent relationships between non-commercial and commercial entities**

Commercial weather and climate activities have grown during the last three to four decades. A crucial issue for WMO and the meteorological community has been to find optimal solutions to maintain and improve the free international exchange of essential meteorological data and products while safeguarding the economic interests of Members with respect to the sustainability and development of their national meteorological services.

In response to this, the World Meteorological Congress has adopted a policy demonstrating that WMO has committed itself to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products. This policy, detailed in Resolution 40 (Cg-XII), also provides “guidelines for relations between national meteorological or hydrometeorological services (NMHSs) and the commercial sector” (Annex 3 to Resolution 40 (Cg-XII)), with the understanding that the development of the exchange of meteorological and related information depends greatly upon sound, fair, transparent, and stable relations between the public and ‘commercial’¹⁴ sectors. Most of this generic guidance remains valid today; however, it has also been recognized that the adoption and application of these guidelines by Members is highly variable. Cg-18 called for a review and update of the WMO data policy in Resolution 40 (Cg-XII), Resolution 25 (Cg-XIII) – Exchange of hydrological data and products and Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services.

4.3 **Mutual benefit**

Successful and sustainable public-private engagement builds on contributions from both the public and the private sector, with each sector contributing to the success of the other. While the public sector is more likely to invest in long-term programmes and the underpinning core infrastructures needed for sustained high-quality weather and climate monitoring, the private sector can be more responsive to targeted investments to bridge data gaps and to meet special customers’ needs. The private sector is also faster at applying innovation and emerging technologies. The public sector’s deep understanding of societal needs and trusted connection with governing authorities are critical in assuring community safety through responsiveness to authoritative warnings. At the same time, the technological agility of the private sector may present opportunities to meet novel and emerging service needs. WMO offers a strong foundation of science, data and global standards which can inform and influence

¹³ United Nations Economic Commission for Europe, 2019: [Guiding Principles on People-first Public-Private Partnerships in support of the United Nations Sustainable Development Goals](#).

¹⁴ Resolution 40 (Cg-XII) uses the term ‘commercial sector’ with the understanding that the guidelines apply to the commercial sector engaged in meteorological activities, which includes government organizations engaged in commercial meteorological activities. See the appendix to the present Guidelines.

the development of these services and offer assurance to end-users regarding their quality. The private sector depends on the essential scientific and observational underpinning provided by the public sector and can be a powerful advocate for sustained government investment in core public infrastructure and capability.

A fair and equitable exchange of data and products is essential for the success of the entire weather enterprise as data availability is crucial for life-saving missions, such as disaster risk reduction, and for meeting the breadth of societal demands that cannot be met by a single sector, especially in the least developed countries. Putting in place and extending an agreed framework for sustainable and affordable conditions for access to data, equally applicable to the private and public sectors, is essential to fully realize the potential of all sectors.

4.4 **Guiding principles for public-private engagement**

The Geneva Declaration – 2019: Building Community for Weather, Climate and Water Actions urged all stakeholders from the public, private and academic sectors to adhere to the United Nations Global Compact and WMO established principles for successful partnerships. The following is a set of guiding principles promulgated through the WMO high-level policy and these Guidelines.

- (a) **Advancing the overarching goals articulated in the WMO Convention**, namely:
- (i) Protection of life and property;
 - (ii) Safeguarding the environment;
 - (iii) Contributing to sustainable development;
 - (iv) Promoting long-term observation, collection and sharing of meteorological, hydrological and climatological data, including related environmental data;
 - (v) Promotion of endogenous capacity-building;
 - (vi) Meeting international commitments; and
 - (vii) Contributing to international cooperation.
- (b) **Shared value:** Engagement among the public, private and academic sectors should create shared value and seek “win-win” situations whereby both public entities and private businesses can recognize opportunities for innovation and growth, based on science, to meet societal needs. Creating shared value can be done by: leveraging private sector expertise and supporting the transfer of technology; promoting free and unrestricted data sharing based on national circumstances, with intellectual property rights duly respected; accelerating the uptake of research and technological developments into operations and stimulating the generation of new services; translating and disseminating valuable knowledge; investing in local research; and developing human capacity through training, thereby supporting the sustainability of the weather enterprise at all levels.
- (c) **Sustainability:** The public, private and academic sectors should promote the sustainability of the global infrastructure by seeking opportunities for multisector engagements that improve efficiency and better serve society. Collaborative efforts – to share both benefits and risks – are needed to ensure the fiscal sustainability of the basic infrastructure for the key modules of the weather enterprise. This fiscal sustainability, in turn, requires both the long-term sustainability of the public budget and complementary private financing. The public, private and academic sectors should seek to identify opportunities to assume complementary roles, minimizing overlap or competition where these would lead to inefficiencies or be detrimental to the sustainability of the core infrastructure and service provision capabilities.

- (d) **Advancing together:** The rapid development of science and technology carries the risk of widening the gap between developed and developing countries. In addition, the availability of global service providers could lead to the marginalization of national agencies if those agencies cannot meet the quality requirements for the required services. At the same time, there is an opportunity for developing countries to make great strides forward by adopting innovative solutions to implement the activities necessary to carry out what WMO defines as the key role of NMHSs: providing the core observing infrastructure and authoritative voice in public safety services. A new approach involving effective engagement with the private and academic sectors, as well as smart capacity development investment policies, both national and through development financing, should be promoted to enhance the provision of high-quality products and services in all countries based on identified users' needs. This approach should include efforts to help bridge the existing capacity gaps of developing countries, least developed countries (LDCs) and small island developing States (SIDS) through development projects focused on enhancing their capacity to deliver essential services in a sustainable long-term manner. A key principle to be maintained is that all countries, no matter their state of development, should have the possibility, and should be helped, to advance and to benefit from modern science and technology.
- (e) **Level playing field:** Both the public and private sectors have much to offer with respect to advancing collective objectives in support of public goods and specific stakeholder needs. As such, both public and private sector communities should have the opportunity to propose cooperative arrangements or other forms of engagement to facilitate their working together. Weather, climate, hydrological, marine and other environmental services provided by both the public and private sectors should be provided with an assured level of quality. WMO and Members' governmental agencies should engage with the private sector for the purposes of development and the provision of products and services that explicitly support and accelerate achieving the goals of WMO and Member governments. However, to the extent reasonable, engagement should not provide exclusivity or imply endorsement or preference of a particular private-sector entity or its products or services. Moreover, over the past decade, the private sector has invested in various aspects of the weather enterprise, including observational networks and dissemination mechanisms. This has created a unique opportunity for two-way collaboration and sharing, including the sharing of data and expertise, to facilitate the attainment of common objectives and to extract the maximum benefit from the value chain for all involved. In the interest of a commonly supported level playing field, exclusivity of data ownership existing on both the public and private sides of data gathering and dissemination activities should be avoided.

With due regard to national legislation, Members should ensure that access to commercial data with use restrictions is treated equally between the private arms of NMHSs and private sector companies. All enterprise stakeholders, including NMHSs, should comply with relevant national legislation and policy with respect to both data provision and the avoidance of anti-competitive behaviour. Where an NMHS operates both public and private arms, these should be treated as distinct entities when engaging in activities such as the exchange of data and products (including computer model outputs) and the provision of services (including consultancy services). Furthermore, where an NMHS with a private arm receives or generates data or products that it does not completely distribute to commercial users on a full and unrestricted basis under Resolution 40 (Cg-XII), Resolution 25 (Cg-XIII) or Resolution 60 (Cg-17), the commercial activities of that NMHS should be treated in a manner that is equivalent to the manner in which the commercial activities of commercial users are treated.

- (f) **Integrity:** WMO, NMHSs and stakeholders from the public, private and academic sectors should seek to engage in mutually beneficial relationships and partnerships that benefit society. The integrity, as well as the credibility, independence and impartiality, of WMO and the agencies established by its Members should be maintained in the engagement.

- (g) **Sovereignty:** The prerogative of WMO Members in how weather, climate and hydrological services are to be arranged and provided within their sovereign nations should be respected. This includes national or regional policies for making public data and products freely and openly available.
- (h) **Transparency:** Engagement with the private sector should be transparent. Information on the nature and scope of major arrangements should be available to concerned entities and to the public at large.

5. GLOBAL, REGIONAL AND NATIONAL ROLES

Promoting better public-private engagement will require ongoing consultations and actions at the global, regional and national levels, which will include defining the roles of WMO constituencies in their interactions with other stakeholders within the weather enterprise.

5.1 Global level – World Meteorological Organization

WMO facilitates worldwide activities and cooperation around weather, climate and water for the benefit of all nations and peoples. The role of WMO in supporting effective public-private engagement includes:

- (a) **Modernized and clearly articulated standards and recommended practices.** WMO is a recognized standard-setting organization, and its standards and recommended practices are developed to enable a unified global data exchange in the areas of weather, climate, water and environment and highly harmonized data processing and forecasting services. WMO provides services with an acceptable level of quality and at an acceptably high standard to specific economic sectors and the public. Standards are constantly being developed based on evolving requirements and evolving technology. Throughout its existence, WMO (and before it, the International Meteorological Organization (IMO)) has managed to mobilize a global community of expertise to support the development, validation and promulgation of standards and recommended practices. Once these standards and practices are approved by the World Meteorological Congress, they provide the needed level of standardization, interoperability and investment-sharing that has led to today's highly successful global weather and climate enterprise. With the understanding that these regulations are to be respected by all providers in all Member countries, WMO should, in the future, engage more experts from the private sector and academia, including through professional associations such as HMEI and other relevant international bodies, in the standard-setting process in order to ensure shared ownership of these standards. As the work of WMO in standard and practice setting expands to include PPE, care should be taken to avoid prescribing specific solutions; instead, the focus should be on desired outcomes and performance. WMO should also enhance its role to help ensure quality in data and services. In particular, compliance with standards should be promoted in all enterprise sectors and supported by agreed verification and validation measures.
- (b) **Encouraging the free and unrestricted exchange of data.** Governments that signed the WMO Convention have committed to observe and follow the international regulations established by WMO. These include standards and practices related to the collection and sharing of data and products among stakeholders as outlined in Resolution 40 (Cg-XII), Resolution 25 (Cg-XIII), Resolution 60 (Cg-17) and the relevant technical regulations. WMO will develop and adapt a guidance for NMHSs, and other stakeholders as needed, with respect to the free and unrestricted international exchange of data and products, as applied to the current environment, in which the private sector and academic and civil society entities will play a growing role in data provision.
- (c) **Facilitating dialogue among all stakeholders.** Together with its Members, WMO should formulate policies and strategies to better communicate the value of public meteorological and hydrological knowledge and services. WMO has taken the leading

role in stimulating and promoting global dialogue among actors in the public, private and academic sectors, engaging those actors and tracking developments and trends. The Open Consultative Platform (OCP) “Partnership and Innovation for the New Generation of Weather and Climate Intelligence”, launched at Cg-18 in June 2019, will serve as an open, constructive and participatory framework for collaboratively addressing the challenges facing the weather enterprise. In the spirit of mutual respect and trust, the Platform will enable all stakeholders to stay abreast of issues and opportunities, both institutional and technological, to incentivize win-win approaches and nurture innovation. A new cooperation paradigm will incorporate active sharing ideas and stakeholder interactions to move from isolated actions by a single stakeholder to coordinated initiatives that are developed and shared across sectoral and organizational boundaries. The new governance structure of WMO, including its technical commissions, should actively seek to better engage available expertise not only from the public sector but also from academia and the private sector. This inclusive approach will require innovation in the way the technical bodies conduct their business and efficient use of modern communication and collaboration technology.

- (d) **Investigating emerging issues and changing roles.** As the weather enterprise evolves, WMO should monitor issues emerging around public-private engagement that could impact either its Members or the sustainability of the global weather enterprise itself. Among these issues, WMO should investigate the feasibility and desirability of taking on new roles to support the quality assurance of data and services. For example, with an ever-increasing number of potential service providers, there is a pressing need for an international authority to objectively validate the quality of the information and services provided, thus helping users select providers based on principles of quality assurance. WMO programmes and expert bodies have been engaged in the development and implementation of verification methodologies, intercomparison campaigns and quality management guidance, while the verification of forecasts from both private and public service providers has been carried out by independent third parties. In the future, such quality assurance activities should be better coordinated, and criteria should be developed with the participation of the public, private and academic sectors in order to distinguish between a “good service” and a “bad service”. The WMO Secretariat should also look to continue to expand its dedicated expertise in “meteorology as a business”.

5.2 Regional level – regional associations

WMO regional associations interface with their Members, liaise with other stakeholders, and designate and support regional centres in the delivery of regional services to Members. To support engagement with actors in the private sector and with other stakeholders, regional associations are urged to take on other roles, including:

- (a) **Gathering and disseminating information and guidance.** Regional associations are urged to facilitate change management and advocate for inclusive consultations and knowledge and experience sharing in order to enable Members to learn from each other and to provide support as needed for effective public-private engagement. Knowledge can be shared globally through the WMO Secretariat and disseminated at the regional and national levels, or regional associations can share knowledge directly with Members and other stakeholders.
- (b) **Raising awareness and promoting the capacity-development of Members.** Regional associations are urged to provide awareness training to the staff of NMHSs. They are also urged to demonstrate leadership by promoting the value of public-private engagement in providing weather and climate services to benefit society. Efforts to enhance the institutional capacity for public-private engagement should highlight the practical modalities of public-private-academic partnerships with respect to achieving the United Nations SDGs and should be supported with examples of good national practices.
- (c) **Exploring further cooperation in service provision at the regional and sub-regional levels.** Regional associations should inform their Members of ongoing developments

in public-private-academic engagement within the context of the expected growth of demand for and supply of information and services. In particular, regional associations should ensure that their Members understand and take advantage of the increasing internationalization of service delivery. Modern technology allows for the global and regional provision of data and information services which in the past were provided exclusively by national entities. This both poses risks and offers opportunities. Regional associations should inform their Members of these risks and opportunities to help them adapt to this new environment. Regional associations should also study and promote examples of the regionalization of certain services through bilateral or multilateral cooperative arrangements among Members which improve the competitiveness of services and reduce their costs. This sub-regional and regional approach should not be limited to the public sector; regional associations should investigate the possibility of achieving greater efficiency through public-private cross-border engagement without compromising national mandates or quality requirements.

5.3 National level – Members and their NMHSs

Given the increasing participation of the private sector, Members and their designated agencies, such as NMHSs, are urged to take action to maintain and improve stakeholder engagement with the aim of maximizing the corresponding socioeconomic benefits in the short and long term. Effective engagement offers opportunities to strengthen NMHSs, or other designated agencies, and the weather enterprise as a whole. The evolving role of Members in this regard includes:

- (a) **Fostering structured dialogue with the private sector.** Members' designated agencies, such as NMHSs, are urged to reach out proactively to set up structured dialogues among public, private and academic sector stakeholders on issues of common interest. Regular dialogues involving these actors would be an effective way to improve mutual understanding and foster relationships built on trust. In setting up these dialogues, NMHSs, or other designated agencies, may benefit from recognizing opportunities where national objectives converge with those of the private sector.
- (b) **Putting in place appropriate legislation and business models, performing change management and building on core strengths.** In an environment in which private sector engagement in meteorological and hydrological services is likely to continue in the decades ahead, NMHSs should continuously enhance the quality and dissemination of their products and services to allow them to thrive in an increasingly competitive environment. They need to adapt to ongoing changes in their business models, including through enhanced national legislation that enables effective public-private engagement to leverage resources and build upon the strengths of each sector. The increasing stress on the public budget in many States puts considerable stress on the ability of NMHSs to maintain and develop their infrastructure and service capacity. To cope with this stress, Members should enact relevant national legislation to enable effective and equitable public-private engagement and foster 'win-win' solutions that meet societal needs, including strengthening the authoritative role of NMHSs in the provision of services mandated by governments.
- (c) **Promoting the uptake of WMO standards and guidance.** In fulfilment of their commitment as WMO Members, governments need to establish effective oversight over all national players providing information and services within the scope of the WMO business areas to ensure compliance with WMO technical regulations (standards and recommended practices, procedures and specifications). In this way, the success of the global standardization of information and products, as well as the quality of that information and those products, can be guaranteed. Members are urged to promote awareness of and compliance with WMO standards, guidance and other technical regulations among all stakeholders and to introduce effective measures to correct cases of non-compliance.
- (d) **Fostering partnerships with civil society entities.** In an evolving world, with societal vulnerabilities to weather and climate risks growing, designated Member agencies, such

as NMHSs, are strongly encouraged to engage with civil society to extend their outreach to communities, and citizens in particular, in order to improve public understanding and responses to natural hazard warnings.

- (e) **Exploring new national and cross-border partnerships.** In anticipation of increased diversity in the multi-stakeholder weather, climate and hydrological service provision landscape, Members should encourage national agencies to partner with each other or multi-national service delivery models to be established via bilateral or multilateral service agreements. Such models would leverage resources, improve efficiency and allow consistent and seamless services across national borders.

6. PUBLIC-PRIVATE ENGAGEMENT FOR CAPACITY DEVELOPMENT

The United Nations 2030 Agenda for Sustainable Development calls for united efforts to meet common goals and creates a sense of urgency for country-level action. Most of the SDGs are linked to weather-, climate- and water-sensitive areas. Achieving them requires a holistic, multi-stakeholder approach to public-private-academic engagement to develop and expand the capability of societies in order to help reduce their vulnerability to weather and climate extremes. A number of stakeholders have made considerable investments so that the goals set by the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015–2030 and the Paris Agreement can be met. The effectiveness of these investments will depend a great deal on the ability of the new generation of weather and climate intelligence to inform decision-making at all levels.

While demands for information and services are increasing exponentially, many NMHSs in developing countries are being confronted with major performance challenges. Closing this capacity gap will require increased collaboration and the leveraging of expertise and knowledge through strategic partnerships.

Capacity development actions to ensure the production of and access to the high-quality weather, hydrological and climate information needed for sustainable development will require not only the concerted effort of all stakeholders in the global weather enterprise, but also the mobilization of significant financial resources. This challenging task will necessitate bringing on development finance institutions (DFI) as another important partner in the enterprise. The growing flow of resources to build the capacity of hydrometeorological services, including from the Green Climate Fund (GCF), multilateral development banks, and bilateral partners requires a more systematic and complementary approach to sustainable investments. Efforts need to focus on not only “more” but also “smarter” investments to increase the capacity and relevance of NMHSs as key players in their country’s sustainable development planning.

WMO and all stakeholders of the weather enterprise, including DFIs, through open and constructive dialogue, should develop sustainable business models to ensure the best use of the available funding mechanisms in order to raise the capacity of developing countries in a sustainable manner. The interlinkages and interdependencies between the developing and developed world require that there be two main business goals for the enterprise: creating a sustainable global infrastructure to run global services, and enabling developing countries to enhance their local capacity for service delivery based on national needs, with the appropriate utilization of the global services available. The capacity to support local capabilities throughout the WMO community is, and will continue to be, tied to the ability of the private sector to create jobs, especially as the government sector shrinks in the face of contracting budgets. In this regard, a focus on the growth of local expertise in information technology and science-to-service advancements will go hand in hand with the development and growth of local capabilities within the private sector that will be required to sustain the capacity development envisioned for all Members.

Public-private engagement development projects have the potential to provide sustainable solutions that will modernize the national infrastructure and enhance access to and the quality of the requisite services needed by the national economy and citizens. To enable such partnerships,

it is necessary for public and private sector stakeholders to build mutual trust, respect a code of ethics and strive to establish long-lasting engagement. Business models based on leveraging resources and cost and revenue sharing should be further developed and promoted. The academic sector also has an important role to play in these partnerships by providing access to innovation and training, as well as education opportunities.

At the international level, WMO should work closely with DFIs to design projects that are based on prioritized national needs following the 'people first' principle, that are financially viable in order to ensure sustainability, and that reinforce the capability of developing countries to be part of the international exchange of data and products through WMO global systems.

APPENDIX. GLOSSARY OF TERMS

Note: This glossary of terms is a work in progress. The definitions given below are relevant only in the context of these Guidelines and should not be understood to be universally applicable.

Academic sector: Public or private higher education establishments awarding academic degrees; public or private non-profit research institutes whose primary mission is to pursue research. (Source: European Commission¹)

Business sector:²

- For-profit and commercial enterprises of any size, whether privately owned, public, or fully governed by governments;
- Corporate foundations and foundations that are directly funded and/or governed by businesses;
- Business associations, coalitions and alliances, including for example chambers of commerce, employers' associations, cooperatives, and industry and cross-industry initiatives where the participants are for-profit enterprises.

Commercial sector: Governmental or non-governmental organizations or individuals operating for commercial purposes. (Source: Resolution 40 (Cg-XII), Annex 4)

Data and services: The terms "data" and "services" are complementary and often overlapping. Their use and definitions are expected to develop over time.

Engagement with the private sector (or business sector):³ Any type of interaction with private/business entities, with different objectives, ranging from informal talks and discussions, to knowledge-exchange platforms, to full-fledged partnerships entailing funding or brand asset exchanges. These engagements may be implemented through different modalities, including, but not limited to, partnering, and may entail different levels of public exposure.

Private sector:⁴ The part of the economy that is run by individuals and companies and is not state controlled. Therefore, it encompasses all for-profit businesses that are not owned or operated by the government, and in some definitions, it may also include privately-owned organizations (e.g. family foundations or associations) or include influential individuals such as high net worth individuals.

Public-private engagement: Collaboration between NMHSs (and/or other public agents) and private sector entities to produce and deliver weather, climate, hydrological, marine and related environmental information and services while respecting the public interest and the mandates of NMHSs and keeping in mind budgetary constraints.

Public-private partnerships: Voluntary and collaborative relationships among various actors in both the public (State) and private (non-State) sectors in which all participants agree to work together to achieve a common goal or undertake specific tasks. Partnerships may serve various purposes, including advancing a cause, implementing normative standards or codes of conduct, or sharing and coordinating resources and expertise. They may consist of a specific single activity, or they may evolve into a set of actions, or even an enduring alliance, building consensus and ownership with each collaborating organization and its stakeholders. While they vary considerably, public-private partnerships are typically established as structured cooperative efforts with a sharing of responsibilities as well as expertise, resources and other benefits.

¹ See <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/faq/483>.

² See United Nations Sustainable Development Group, [UNSDG Common Approach to Prospect Research and Due Diligence for Business Sector Partnerships, Annex 1](#).

³ Ibid.

⁴ Ibid.

Weather enterprise (or weather and climate enterprise): The multitude of systems and entities participating in the production and provision of meteorological, climatological, hydrological, marine and related environmental information and services. Although the term only contains the word “weather”, the enterprise encompasses all the business areas of WMO, including weather, climate and water, and all the core activities of WMO – observations, modelling, data-processing and forecasting, as well as other related services and research. The weather enterprise includes public-sector entities (NMHSs and other governmental agencies), private-sector entities (equipment manufacturers, service-provider companies, private media companies, and so forth), academic institutions, and civil society entities (community-based entities, NGOs, national meteorological societies, scientific associations, etc.). The weather enterprise has global, regional, national and local dimensions.

The term “global weather enterprise” describes the global dimension of the multi-national, multi-stakeholder weather enterprises which encompass all Earth system monitoring, prediction and service providers from the public, private and academic sectors, as well as from learned societies and civil society entities.

For more information, please contact:

World Meteorological Organization

7 bis, avenue de la Paix – P.O. Box 2300 – CH 1211 Geneva 2 – Switzerland

Strategic Communications Office

Tel.: +41 (0) 22 730 87 40/83 14 – Fax: +41 (0) 22 730 80 27

Email: communications@wmo.int

public.wmo.int