



Envisioning a National Climate Service for Malta

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Identifying climate services needs for public policy.

The link between public policy and climate change has never been as strong as it is now. From the most recent international climate change conferences in Paris, Madrid and Glasgow to emissions regulations, resilience and adaptation, national governments forge public policies aimed at managing the impacts of climate change on primary economic sectors. This is also valid locally where manufacturing, agriculture and energy are just three important sectors that are sensitive to a changing climate.

This short article describes the importance of basing our

national public policies on factual information that reflects the real impact of a changing climate on our Maltese assets, and not just on an assumed, theoretical one. It aims to make public officials in the public sector aware of the limitations in the local infrastructure that deals with the documentation, archiving, provision and understanding of how physical climate parameters are changing over time and how these can be used by national authorities to redefine public policies accordingly so as to make them Malta specific. Without this knowledge there is a danger that public policies will be less effective or even counterproductive to a select number of our economic sectors, and ultimately to the quality of life of the Maltese people.

Background

The World Meteorological Organization (WMO) is a specialized agency of the United Nations, tasked with a very important mission, that is to foster international cooperation and coordination on matters related to the understanding of weather and climate and their linkages with Earth System components, and to the distribution of water resources.

After years of negotiation, WMO member states made a landmark decision at the latest World Meteorological Congress (Cg-Ext 2021) held last month. They in fact adopted a resolution making it mandatory for them to collect climatological information over their



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geographical jurisdictions and share it with other WMO members. This new regulation mandates all Member Countries of the WMO to locally collect certain key measurements that weather (and other environmental) orbiting satellites cannot such as air temperature, humidity, surface pressure, and wind information and share it with the wider meteorological community without delay.

Why is this deemed important? After all, in virtue of its nature, weather and climatic data knows no boundaries or artificial human constructs that divide the atmosphere like how we do with the oceans. Actually, WMO's policy related to data exchange has not been updated since 1995, and therefore was still based on the technological limitations and political dimensions that so far have restricted the proper collection and rapid sharing of climate data.

Importance of this new WMO regulation.

Activities related to weather and climate prediction can be used to illustrate this importance. Irrespective of whether we are doing weather or climate predictions, the starting line of both actions is dependent on accurate starting conditions of the state of the weather or climate and their interconnected components (cryosphere, biosphere, lithosphere, hydrosphere, anthroposphere). This is akin to a 100m dash (analogous to a short-term weather forecast for the Maltese islands) or a tougher 4x100m relay race (in the case of a 2100 climate projection of the world) – in both cases, the runners start at the same line, same conditions. Then it is up to their strength, technique, and stamina to give their best performance. Weather and climate models

also need to start from a realistic physical rendition of the starting point in order to produce a reasonably accurate forecast.

This brings us to the point that I wish to make, in that weather and climate phenomena are truly global, meaning that these computer models require in absolute terms information coming from the entire global atmosphere and all its related components. This requirement starts to falter for those countries that do not have the technical capacity to do so. At the same time, we find countries who do have such capability but are not ready to share the information that they have.

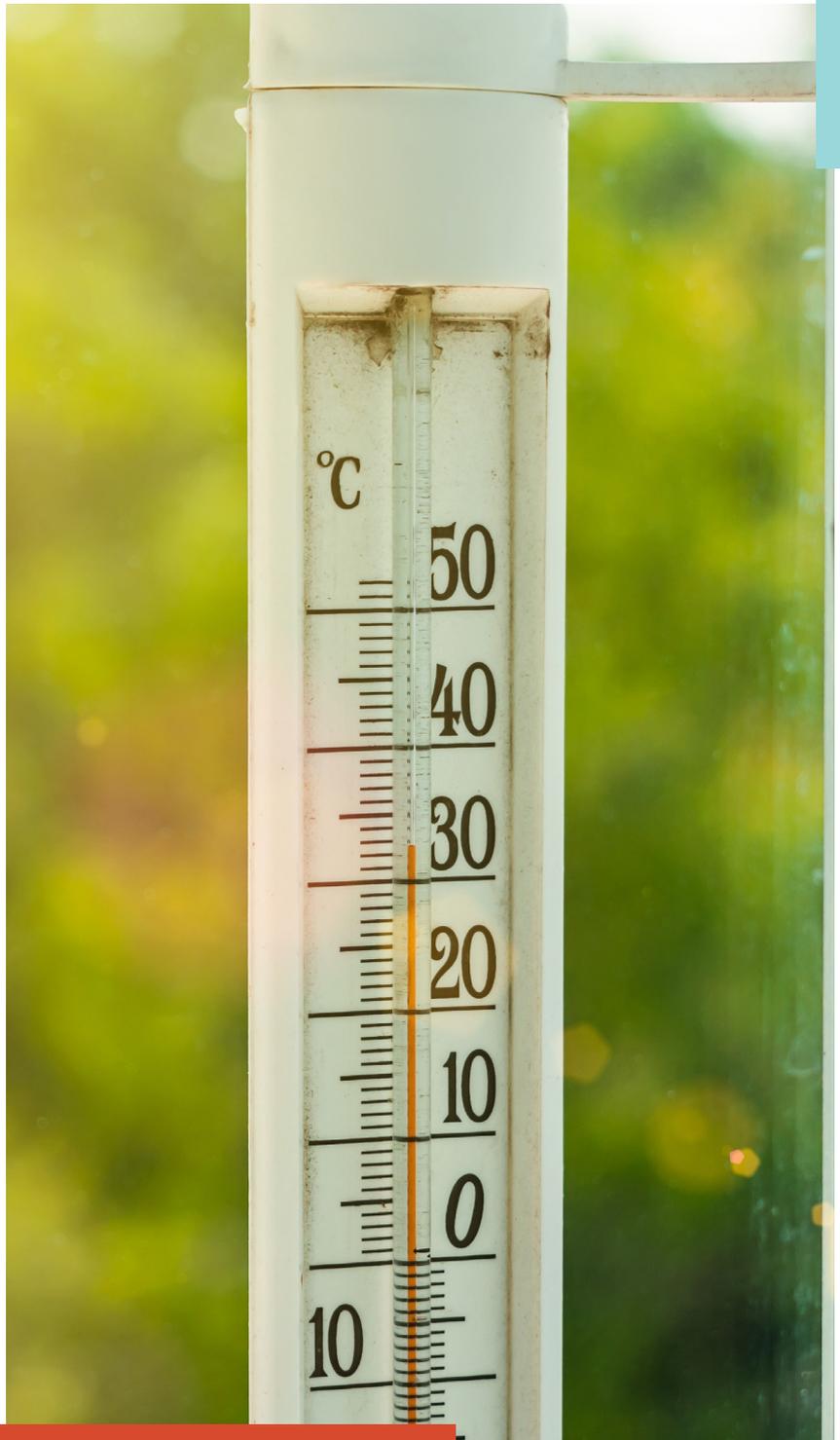
Malta's Position

How will this new regulation affect the local meteorological operations related to weather and climate observations? This question is very pertinent to Malta in view of its small land territory but huge search and rescue zone that extends from off the Tunisian coast to near Crete. As our 24/7 weather forecasters know very well, the weather observations that are needed for Malta's weather forecasts are instead taken from those observed by neighbouring countries where the weather is coming from on that particular day. To be fair, a substantial amount of information also comes from meteorological and environmental orbiting satellites that cover the entire globe; however, there are certain key measurements that have to be taken from the surface. Sea level pressure, which is an exceedingly important weather observation, is a case in point. Updating readers with Malta's situation is an important step that goes a long way. There are two main contentions here that I wish to raise in this article.

Malta's current Weather and Climate Service

Way back in 2001, a decision was taken by the Government of Malta to transfer the Meteorological Office from the then Civil Aviation Department to the Malta International Airport. This was part of the privatization process of the Malta International Airport (MIA) in early 2002, when Vienna airport, which is majority shareholder in a consortium, bought a 40% stake in MIA. However, this transfer was accompanied by an agreement to supply the general public with a basic set of weather-related services without any direct governmental financial compensation.

While this transfer initiated a series of urgently needed upgrading of the Meteorological Office, such as the installation of an expensive doppler weather radar, a network of automated weather stations and new 24/7 fully operational and computational premises, it severed the provision towards any future national requirements as far as new datasets and new weather services are concerned. Moreover, this transition also put into question whether a private company should facilitate Malta's financial obligations



to continue being represented in the WMO. To my knowledge this matter seems to have been only recently resolved after almost a decade of governmental indecision. However, the other pertinent requirement, i.e. the provision of up-to date weather and climate services (which in truth, would require substantial unilateral technical and financial investments by the service provider) remains valid.

Very little direct access to free local climate and weather records

This brings me to the second point that I wish to raise. Information is power, and it is only natural to assume that the strength of any data provider, especially if coming from the private sector, diminishes whenever its core business is freely handed to third parties. Nowadays, there are many entities that are eager to use detailed weather and climate data in order to sustain both their operational activities and decisions concerning future investments that may be reliant on such information. Easy examples include the use of rapid and accurate weather and climate data for the operations of public and private entities engaged in the aviation, maritime, construction, land transport, environmental management, security and military, agriculture and fisheries, tourism, health, etc. The more you think about this the more impressed you become about how much weather and climate information pervades, maintains and stimulates the full functioning of current and emerging markets. As things stand, the way how users of this information request the data services of the Malta Meteorological Office is still very traditional.



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Enriching our National Archives

Our National Archives have recently received more than 4MEur from European Structural and Investment Funds (2014-2020) aimed at protecting, developing and promoting public cultural and heritage assets. The mission of this entity is to preserve Malta's heritage, and I think it is high time that national authorities recognize Malta's written climate archive as a National Heritage that needs to be safeguarded for the current and

future generations in view of its national and global importance.

Malta has one of the longest climate archives in Europe, with official information dating back since 1922. This stems from the fact that the Maltese islands were deemed to be of high strategic value to the British fleet and hence the reason for the continuous weather observations since that time. It was only later in 1947 that the weather services were taken over by the Royal Air Force and transferred to the main military aerodrome at the time – Luqa airfield. During the war period, it was even transferred to Lascaris. However, since 1947, Malta’s climatological station has never departed the airfield. This is indeed a good thing to have since the climatological observations have been carried out more or less from the same location without it being exposed to new environmental conditions.

Having been previously administered by British meteorologists and then passed onto UK-trained Maltese meteorologists in the early 70s, the quality of weather observations and the way how this information

has been transcribed onto tens of Meteorological Registers is indeed impressive. In fact, before the advent of computer digitization at the Malta Meteorological Office to record the synoptic weather observations, manual transcription of detailed weather observations was done using traditional meteorological notation. This process has constituted a continuous snapshot of our local weather conditions for decades. This traditional approach was then terminated by 2007 after which such recording process was transformed into a fully digital one. This shift has of course its pros and cons, perhaps more of the former than the latter in view of the easy way to store, query and retrieve any subset of weather information that has been included in the digital database.

Now, our current climate service provider faces daily challenges when it comes to the safe archiving of this data. One big headache for any data repository is the assurance of data security. The Office must therefore ensure that every bit of Malta’s digital climate data remains safe and at zero risk of access by cybercriminals.

In parallel, there is also the need to protect the 85-years old, paper-based meteorological archives of the Maltese islands, which constitute our sole National climate archive. This is why perhaps a copy (if not the original) should be housed within appropriate facilities such as those provided by the National Archives. If anything, this decision would lead to a full and faithful copy being available at another location.

Envisioning a National Climate Service

The increasing focus on the importance of weather and climate information for climate-resilient socio-economic development has led to a growing need by the international public policy community to develop national climate services. According to Vaughan and Dessai (2014), the aim of climate services is ‘to provide people and organizations with timely, tailored climate-related knowledge and information that they can use to reduce climate-related losses and enhance benefits, including the



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protection of lives, livelihoods, and property'. Europe and elsewhere, this acceptance led to the establishment of effective national climate services for integration into planning, policy, and practice. ClimateEurope2 is the Europe-wide framework for climate services that is made up of relevant stakeholders (see climateeurope.eu). Malta's absence among its main participants, which include the likes of the Intergovernmental Panel on Climate Change (IPCC), the World Climate Research Programme (WCRP), and the European Centre for Medium Range Weather Forecasts (ECMWF), is indeed striking.

I strongly feel that a National Climate Service is urgently needed when considering Malta's current and future societal needs that are now being increasingly sustained through rapid digitalisation. The basic mission of such a Service could be the provision of climatic information to the public and private sector according to established data delivery and format protocols. Below is my take at some of the basic functions of this new service that are urgently needed for public policy work.

- (a) The collection of climate data and provision of Essential Climate Variables (ECVs) would be an important first contribution by the proposed National Service. These products constitute the physical, chemical and biological information that can critically contribute to the characterization of our climate, in what way and how fast it is changing. ECVs provide the empirical evidence needed to understand and predict the evolution of our climate and can aptly guide our National mitigation and adaptation measures. They can also assist national authorities with their risk assessments and enable attribution of climate events to underlying causes. They can also be vital elements in Malta's periodic reporting to the UNFCCC.
- (b) The National Service can also suggest and implement ways how to fill information gaps arising from missing variables that are not in the operational data observational stream of the Malta Meteorological Office. These include those that are relevant to the constant monitoring of Land (eg. soil moisture and groundwater volume change, etc), Atmosphere (eg. aerosols, upper profiles, etc) and Sea (eg. subsurface salinity, inorganic carbon, ocean acidification, etc) processes.
- (c) Appropriate climate-reporting capability and responsibility towards the UNFCCC and the EC in view of its specific climate-related data collection, processing, delivery and archiving remits.
- (d) The National Service can be a permanent discussion platform with Malta's primary stakeholders. So far, this link with stakeholders is very weak at a national level and stakeholder preference of the type of climate services is still unknown to this day. Delaying the formulation of an effective strategy in this respect can significantly push back the country's effective resilience against the rapid pace of climate change, to related extreme weather events, and ultimately to effective climate adaptation.



- (e) On the basis of a series of consultation events with the major user needs of weather and climate data, the National Services could then identify appropriate entry points for targeting climate services in line with national priorities. The presence of bureaucratic/ technical bottlenecks can impede any successful climate change adaptation initiatives and climate resilient development planning (Eisenack et al., 2014) and therefore such bottlenecks must be quickly addressed and tackled by this new institution. In this manner, Malta's medium-term climate decision making can be facilitated and promoted. Based, on expert judgement regarding stakeholder preferences, the following functions can form additional core operations of the National Services.



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1. Support long-term plans based on short, medium and far climate projections tailored for the Maltese islands. Long-term projections can support new long-term investments, such as coastal defence and transportation projects;
2. Provide seasonal forecasts to inform the planning of sectors related to water and energy, agriculture, and disaster management;
3. Address issues of spatial and temporal scale of negative climate attributions on NACE sectors, including accessibility and credibility of climate information by taking note of policy planning cycles, optimize on timing and decrease in mismatch in time-frames;
4. Provision of cross-sectoral climate sensitivity, vulnerability and hazards to Malta's Economic Planning and Development (even extending it to climate attribution to our partner trading countries in view of our insularity and lack of primary resources). The continued absence of a National Climate Service tasked with the collection, processing and transforming climate information can only lead to partly blind (or half-baked) national policies that are devoid of the local context. In fact, the current climate information is viewed as inappropriate to the spatial scales required for local decision making.
5. Provides high quality and credible climate products that are sector-specific; a suitable format that would enable the confidence and willingness of local stakeholders to use this information for planning purposes;
6. Provides enough capability to disseminate early warning well in advance and to strengthen the link between disaster risk reduction and climate change adaptation as in government planning.

Conclusion

Nowadays, Malta has more than sixty international, national and sectoral policy documents relevant to the country's NACE sectors.

These are based on five pillars of economic growth and recovery from the Covid-19 pandemic, which are sustainable economic growth, good governance, education, infrastructural improvements, and carbon neutrality. Moving in parallel with these five pillars of growth is the need for baseline information that can fully inform the future investments aimed at providing a solid foundation in support of this growth within a climate change scenario. One can also link this need within the local and national context when it comes to research, innovation, resource management planning and training needs to make these five pillars more resilient to climate change where weather extremes are already the new norm (Hedegaard, 2021).

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