



**INSTITUTO NACIONAL DE METEOROLOGIA, IP**

# **The value of local climate data on society's needs**

Bernardino Nhantumbo, Ph.D.  
(b.nhantumbo@gmail.com)

Regional Training Workshop on Observing the Coastal and Marginal Seas in the  
Western Indian Ocean including the Arabian/Persian Gulf and the Sea of Oman

Eduardo Mondlane University

Maputo, 9 June, 2022

## Global Observing System

...“for every dollar invested, at least twenty-five dollars in socioeconomic returns could be realised.”

Daniel Kull from the World Bank  
World Bank, 2021

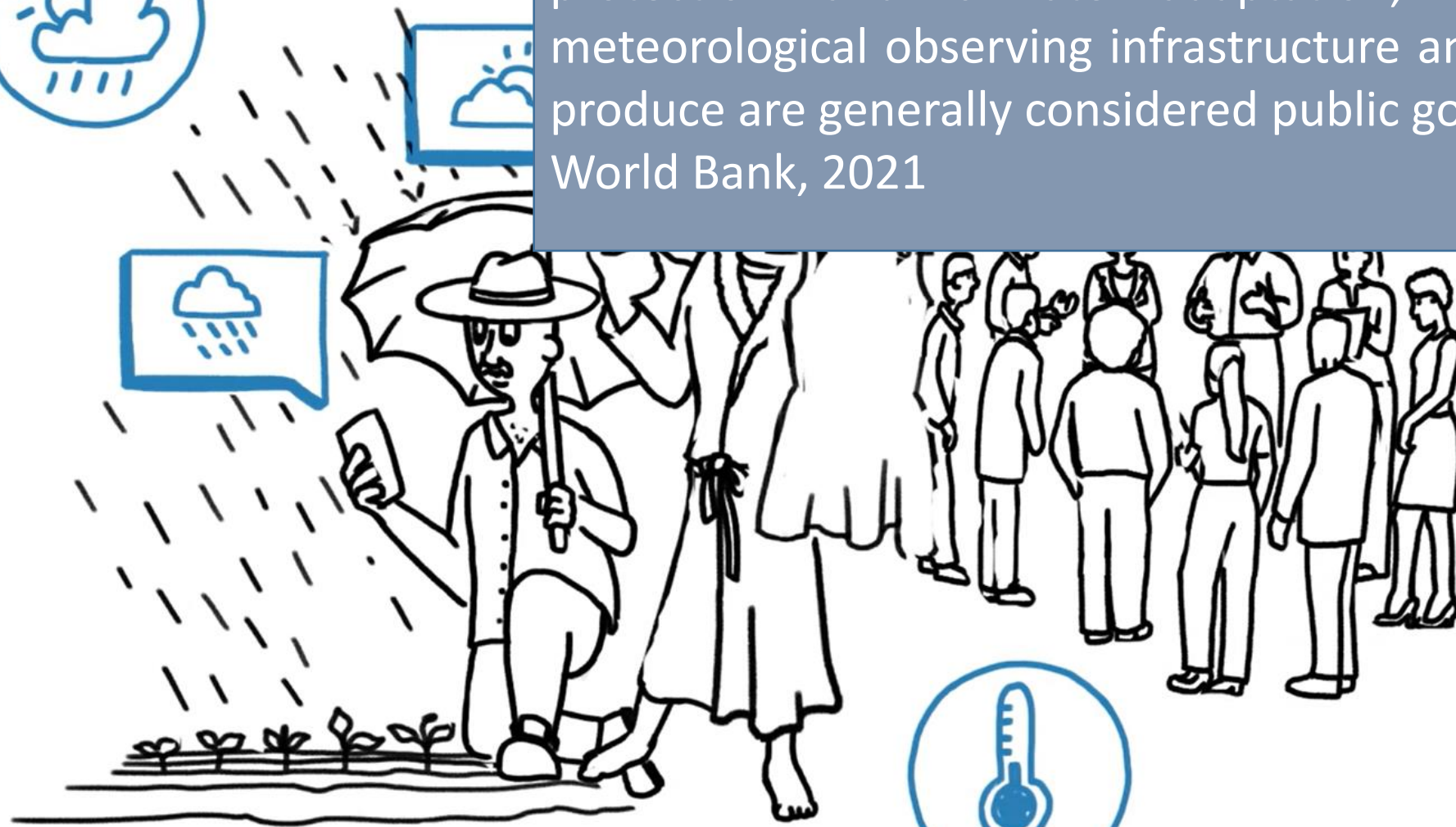
Prior to the emergence of COVID-19, which has logically prioritised focus on global health and related challenges, the World Economic Forum again highlighted extreme weather, climate action failure and natural disasters as three of the top four risks to global economic development.

World Economic Forum, 2020

1. Global numerical weather prediction;
2. High-resolution numerical weather prediction;
3. Nowcasting and very short range forecasting;
4. Seasonal and inter-annual forecasting;
5. Aeronautical meteorology;

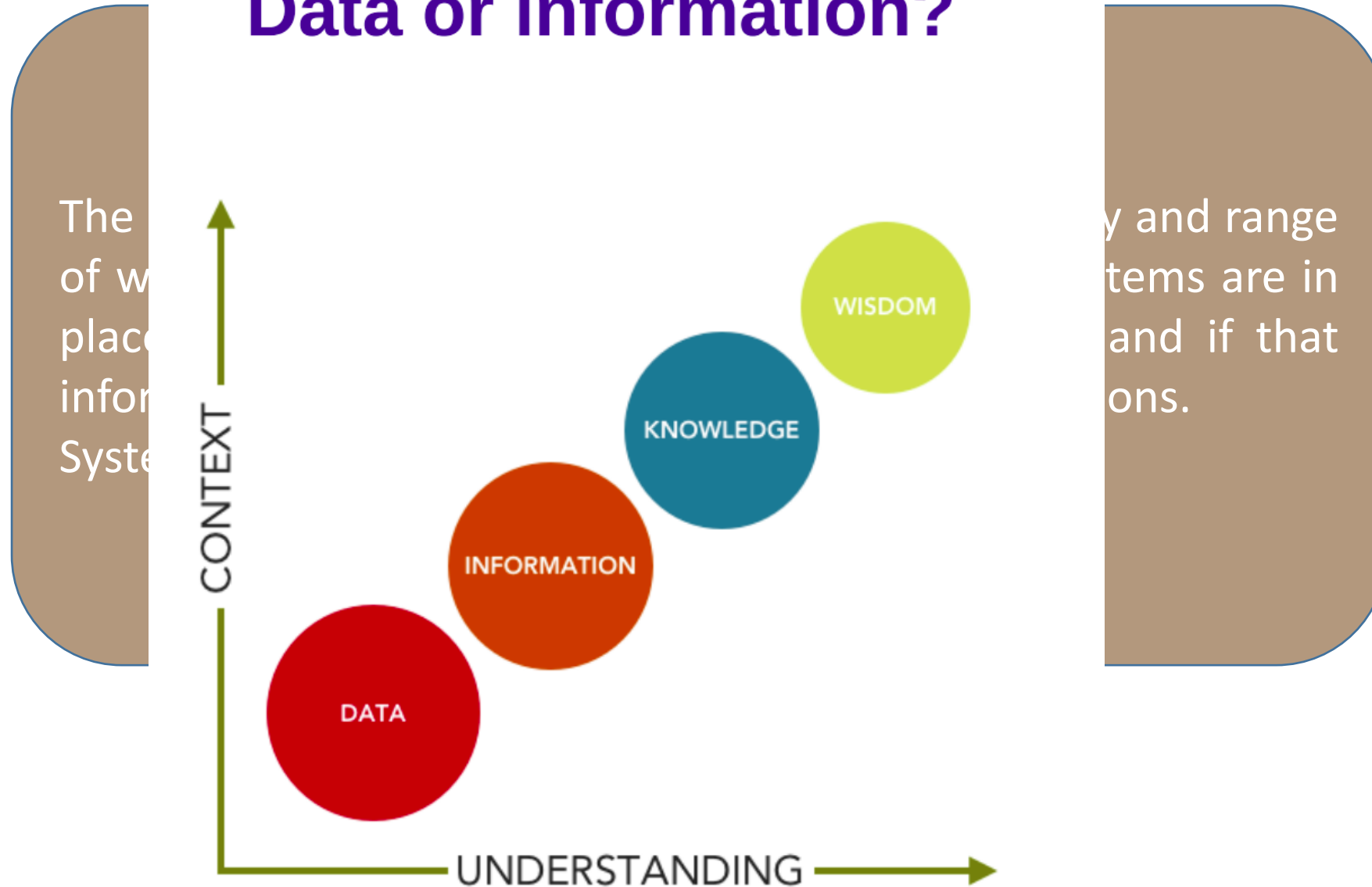
- Lack of observations limits our ability to understand and predict weather and climate patterns, both locally and globally;
- Weather prediction beyond 3-4 days for any location on the globe requires observations from the whole world.

10. Agricultural meteorology;
11. Hydrology;
12. Climate monitoring;
13. Climate applications;
14. Space weather.



Due to the contributions they make to societal well-being, protection and climate adaptation, national public meteorological observing infrastructure and the data they produce are generally considered public goods.  
World Bank, 2021

## Data or information?



The  
of w  
place  
infor  
Syste

y and range  
tems are in  
and if that  
ons.

Estimated regional benefits from improved forecasting due to improved availability and exchange of surface observations. Antarctica is omitted because it does not contribute to global Gross Domestic Product (GDP).

Region	% of global GDP <sup>22</sup>	% of global forecast improvement	Annual benefit (USD)
<b>Global</b>	<b>100%</b>	<b>100%</b>	<b>\$5.19 billion</b>
Africa	3%	26%	\$350 million
Asia	36%	16%	\$2,640 million
S. America	4%	22%	\$670 million
NAM CAM Crb			
SW Pacific			
Europe			

Source: World Bank, 2021

Country income class	% of global GDP <sup>23</sup>	% of global forecast improvement	Weather-related insurance coverage <sup>24</sup>	Annual benefit (USD)	Annual avoided insurance losses (USD)
<b>All</b>	<b>100%</b>	<b>100%</b>	<b>45%</b>	<b>\$5.19 billion</b>	<b>\$1.67 billion</b>
High	63%	21%	53%	\$2,870 million	\$1.510 million
Upper Middle	29%	28%	8%	\$1,830 million	\$140 million
Lower Middle	7%	29%	4%	\$460 million	\$20 million
Low	1%	22%	0.5%	\$30 million	\$0.2 million

Estimated benefits and avoided insurance losses per country income classification from improved forecasting due to improved availability and exchange of surface observations.

The lack of data from Africa, parts of South America and Asia, and from small island states in general is often caused by lack of sufficient resources to generate and exchange the data—in particular to operate and maintain the observing system in the long-term.

World Bank, 2021

Top three causes of missing data, depending on country:

- Data policy;
- Technical capabilities;
- Financial resources.

World Meteorological Organization, 2019

## WMO response

- Global Basic Observing Network (GBON);
- Country Support Initiative (CSI);
- Systematic Observation Finance Facility (SOFF).



# Improving surface-based observations

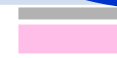
## Presidential Initiative “One District, One Meteorological Station”



Estagio actual: Distritos com Estacao Meteorologica



Province	Nr of districts with weather station	Nr of districts without weather station	Phase I (2020-2024) Nr of districts to be included	Phase II (2025-2030) Nr of districts to be included	Nr of districts with weather station by 2030
Cabo Delgado	4	13	7	6	17
Niassa	6	10	5	5	16
Nampula	5	18	9	9	23
Zambezia	6	16	8	8	22
Tete	8	7	3	4	15
Sofala	6	7	4	3	13
Manica	3	9	5	4	12
Inhambane	4	10	5	5	14
Gaza	6	8	4	4	14
Maputo Province	3	5	3	2	8
<b>TOTAL</b>	<b>51</b>	<b>103</b>	<b>52</b>	<b>51</b>	<b>154</b>



Por modernizar

atica  
atica





Many countries have limited capacity and face significant budget constraints in operating and maintaining observing systems, including having basic maintenance and adequate staff.

Systematic Observations Financing Facility, 2020

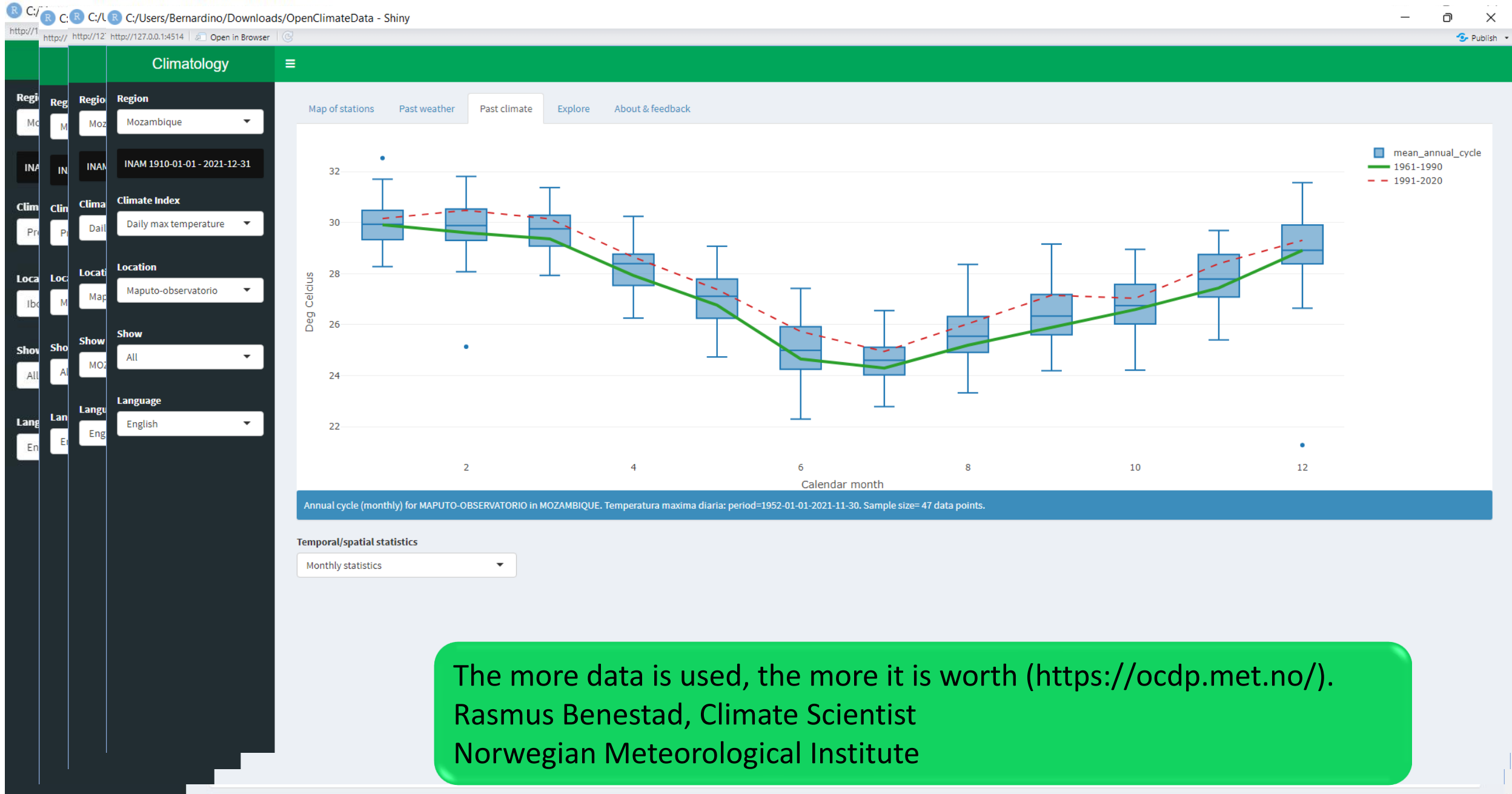


Many development and climate finance partners have invested in 'observing systems', and not in 'observations' which is what is actually needed.

Systematic Observations Financing Facility, 2020



# Observations vs. Observation systems



The more data is used, the more it is worth (<https://ocdp.met.no/>).  
Rasmus Benestad, Climate Scientist  
Norwegian Meteorological Institute



## Summary and conclusions

- Observations are the foundation for smarter decision-making;
- Observations are linked to well-being benefits such as lives saved and poverty reduction;
- Observations are recognized as being critical in supporting disaster reduction and climate change action;
- Accurate weather and climate predictions deliver economic, environmental, and social benefits;
- Climate and weather information are of crucial importance for humanitarian preparedness;
- Better weather and climate predictions, when coupled with good communication and decision-making processes, has the potential to improve the resilience of the world's population;
- Improving our ability to forecast weather events and predict climate change is a foundational step in being able to manage risk effectively and make the right decisions about how and where to invest to build resilience and adaptation measures.



**Obrigado pela Atenção**

**Thank you**

*<http://www.inam.gov.mz>*