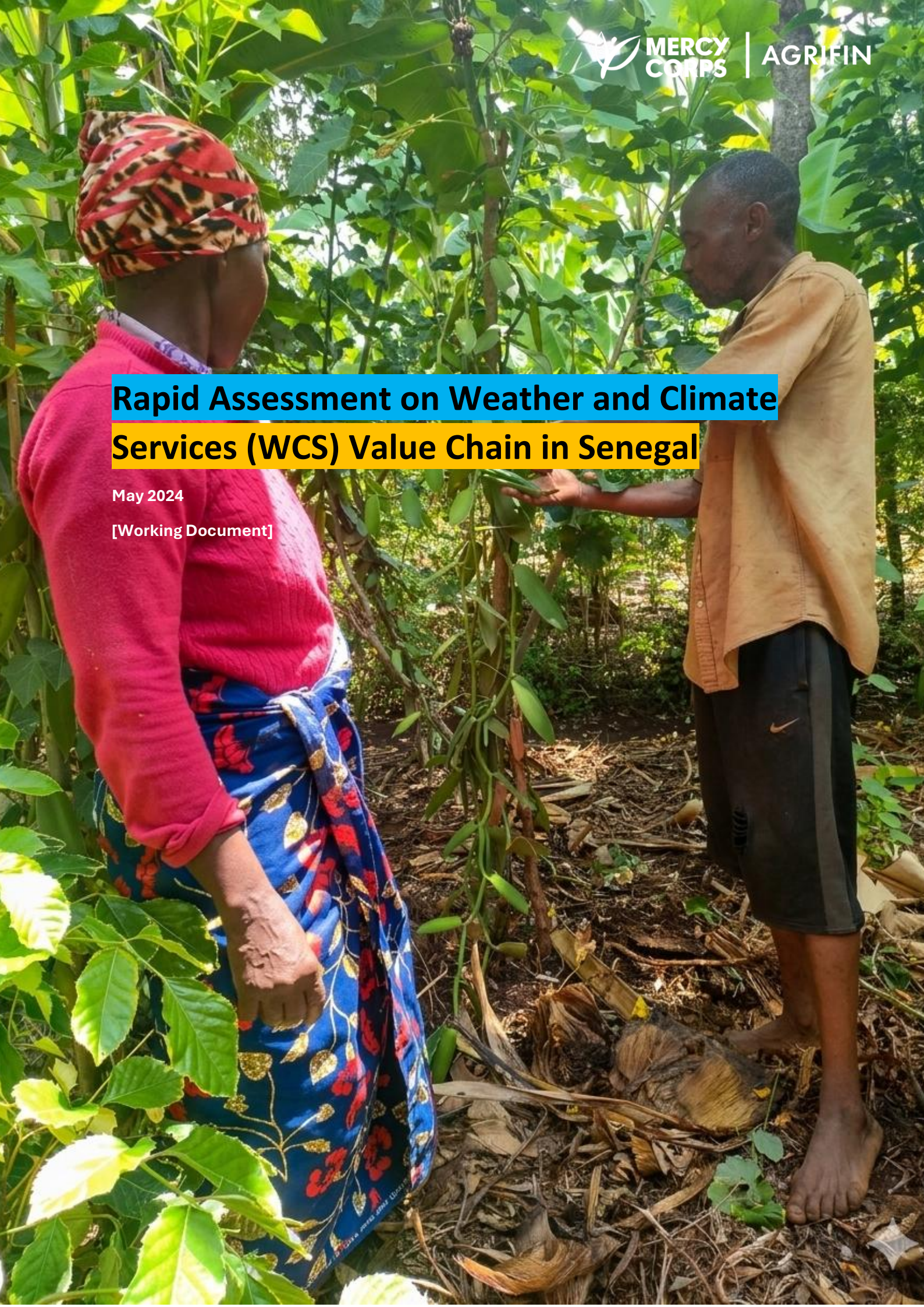


Rapid Assessment on Weather and Climate Services (WCS) Value Chain in Senegal

May 2024

[Working Document]

Table of Contents

Acronyms **3**
1. Introduction **4**
2. The Global Framework for Climate Services **4**
3. Overview on Weather and Climate Services Value Chain in Senegal **5**
3.1. Institutions Providing Climate Services in Senegal 6
3.2. WCS Data and Processing 9
3.3. WCS Dissemination 10
3.4. Challenges in Delivering Weather and Climate Services in Senegal 11
4. WCS infrastructure in Senegal **12**
5. Policy and Regulatory Environment for PPP/PPE Models in Senegal **13**
5.1. Legal and Institutional Framework 13
5.2. Management of PPPs in Senegal 14
5.3. Challenges and Gaps of Senegal's PPP 14
Reference **16**

Acronyms

ADT - Automatic Weather Station Data Tool

AICCRA - Accelerating the Impact of CGIAR Climate Research for Africa

ANACIM- National Agency for Civil Aviation and Meteorology

AWS - Automatic weather stations

CCAFS - Climate Change, Agriculture and Food Security

CGIAR - Consultative Group on International Agricultural Research

CINSERE - Climate Services for Increasing Resilience in Senegal

COMNACC - National Committee for Climate Change

ICT - Information and communication technology

IFAD - International Fund for Agricultural Development

MNOs - Mobile Network Operators

MWGs - Multi-disciplinary Working Groups

NFCS - National Framework for Climate Services

NGOs - Non-governmental organizations

NMHS - National Meteorological and Hydrological Services

PAPs - Plans d'Actions Prioritaires

PPP – Public Private Partnerships

RCCs - Regional Climate Centers

UNECA – United Nations Economic Commission Africa

USAID - United States Agency for International Development

WAEMU - West African Economic and Monetary Union

WCS - Weather and Climate Service

WFP - World Food Programme

1. Introduction

Senegal's unique geography makes it highly susceptible to various natural hazards. These include coastal erosion, droughts, floods, and locust invasions. Climate change is unfortunately exacerbating these existing threats. Average temperatures are projected to rise by 1-3°C by 2060, leading to more frequent hot days and nights(Crick et al., 2018). Rainfall patterns will become more unpredictable, with both increased variability and potentially more intense downpours. This shift in climate is likely to increase the frequency of locust infestations, reduce crop yields, and spread livestock diseases.

Droughts are a recurring problem, particularly in the arid and semi-arid northern regions. Since 1980, droughts have affected over 3 million people. Desertification is already encroaching on the Sahel region, causing a rural exodus towards the capital city, Dakar. Flooding is another major concern, impacting roughly 200,000 people annually and causing significant economic losses. Uncontrolled urbanization and inadequate drainage infrastructure exacerbate flood risks. Additionally, rising sea levels and extreme weather events like storms and cyclones will increase the frequency and intensity of coastal erosion and flooding. A significant portion of Senegal's coastal housing is already vulnerable to erosion (OECD, 2021). A recent example is the coastal erosion in St. Louis that affected 15,000 people making them climate refugees in 2017 (lamaisondesreporters, 2019)

Weather and climate service (WCS) offers a powerful tool to build resilience. WCS equips farmers, herders, and other stakeholders with crucial data on weather patterns, seasonal forecasts, and drought risks. This empowers them to make informed decisions about planting dates, resource allocation, and implementing risk mitigation strategies. For example, early warnings of droughts can prompt farmers to adopt drought-resistant crops or water-saving techniques.

However, effective WCS goes beyond simply providing data. Information needs to be presented in a user-friendly format, considering local languages and cultural contexts. This involves disseminating forecasts through radio broadcasts, SMS alerts, or even integrating them with existing traditional knowledge systems.

Building capacity within communities is also essential. Training programs can help people interpret and apply climate information effectively, allowing them to translate forecasts into concrete actions on the ground. Extension services can play a vital role in this process.

Despite the immense potential of WCS, there are significant challenges to overcome. Reaching remote communities with reliable communication infrastructure remains a hurdle. Bridging the digital divide is crucial for ensuring equitable access to WCS across the country. Additionally, data limitations exist, particularly in remote areas. Investing in expanding weather station networks and improving data collection methods is essential.

Maintaining and scaling up WCS requires sustained funding and commitment from both the government and development partners. Public-private partnerships can play a crucial role in mobilizing resources for long-term WCS development.

By addressing these challenges and continuously improving WCS delivery, Senegal can empower its communities to navigate the complexities of climate change and build a more resilient future. Overall, this secondary research aims to provide a comprehensive understanding of the WCS landscape in Senegal, the importance of WCS, the Public private partnerships in the country and the ongoing efforts to strengthen the WCS.

2. The Global Framework for Climate Services

Climate information services are essential tools for navigating our dynamic climate. They encompass the generation, processing, and dissemination of weather and climate data, aiming to support informed decision-making across various sectors (UNECA, 2011). This information empowers users to understand historical, current, and future climate conditions, including daily, seasonal, and even decadal forecasts (WMO, 2014).

Effective climate information service hinges on delivering accurate and location-specific forecasts and advisories Timely access to such information is crucial, allowing users to plan effectively. This includes historical trends, monitoring data, and forecasts, all tailored to specific needs (Winrock International, 2018).

Climate information service plays a vital role in weather-sensitive sectors like construction, aviation, and transportation. However, its significance is particularly pronounced in agriculture, a sector heavily reliant on weather patterns (UNECA, 2011).

For farmers, access to climate information service translates into improved planning and risk management. With insights into historical weather patterns and future projections, farmers can be better prepared for potential droughts, floods, or pest outbreaks. This knowledge allows them to adopt practices that enhance their resilience, such as selecting drought-resistant crops or implementing water conservation techniques. Ultimately, this translates into safeguarding livelihoods, promoting food security, and fostering economic growth within the agricultural sector (UNECA, 2021).

The importance of climate information services extends beyond agriculture. A UNECA report highlights how sectors like water resources, disaster risk reduction, health, and energy all rely directly or indirectly on timely and reliable climate information service data (UNECA, 2011). This information empowers policymakers to make informed decisions. With access to robust data, they can formulate evidence-based climate policies that promote sustainable development across these critical sectors.

The demand for climate information across Africa is booming, creating a significant market for tailored services. A Winrock International report highlights that over 2.36 million end-users in sub-Saharan Africa already access climate information from private providers. This demand spans various sectors, including farmers, disaster relief agencies, water managers, and even the general public. While national services provide some information, it often lacks the specific focus these groups require. This gap presents a prime opportunity for the private sector to deliver targeted solutions.

3. Overview on Weather and Climate Services Value Chain in Senegal

In today's world, where weather patterns are becoming increasingly complex and climate change poses a significant threat, reliable weather and climate information is more crucial than ever. This information empowers individuals, businesses, and policymakers to make informed decisions that can safeguard lives, livelihoods, and resources. The weather and climate services value chain plays a vital role in transforming raw weather data into actionable insights.

This value chain encompasses a series of interconnected activities that begin with data collection. National Meteorological and Hydrological Services (NMHSs) are the backbone of this system. They are responsible for collecting observations of the atmosphere, oceans, and land through a network of remote sensing technology and on-the-ground monitoring stations (Winrock International, 2018).

This vast amount of data serves as the foundation for accurate weather forecasting and climate analysis.

The value chain doesn't stop at data collection. NMHSs also play a critical role in processing and interpreting this data. Through sophisticated modelling and analysis techniques, they generate weather forecasts, climate projections, and early warnings for potential hazards (Winrock International, 2018). These forecasts and warnings are then disseminated to a wide range of users, including the public sector, private companies, farmers, and disaster relief agencies through different dissemination channels like Radio, TV and social networks.

3.1. Institutions Providing Climate Services in Senegal

Government institutions

A violent storm in 1999, causing substantial deaths and losses, served as a wake-up call for Senegal. This event, coupled with a growing awareness of climate risks, particularly their impact on tourism, highlighted the need for robust climate services (OECD, 2021). In response, the National Agency for Civil Aviation and Meteorology (ANACIM), located under the Ministry of Tourism and Air Transport, has seen its role expand significantly.

Currently, ANACIM leads the charge in collecting, disseminating, and tailoring climate information for various stakeholders. A key initiative is the National Framework for Climate Services (NFCS), a decree signed in 2017. National frameworks coordinate the delivery of climate services at the national level, to ensure that the information provided by climate services to decision-makers are authoritative, dependable and tailored to user needs.(WMO, 2018).

Based on a USAID report, ANACIM presides over an Inter-ministerial Council on Climate Services, ensuring climate data integration into policy frameworks of relevant ministries. The Council also reviews the 10-day meteorological forecast and the status of the rainy season, run-off in the main rivers, and issues related to food security, health, disaster risk management, energy, water management, vegetation growth, and the state of the sea in coastal areas and trade (WMO, 2018). They also conduct training programs to enhance sectoral capacity in utilising climate services. (OECD, 2021)

ANACIM's journey reflects Senegal's growing commitment to climate-informed development. Through collaboration, targeted services, and ongoing capacity building, ANACIM empowers stakeholders to navigate a changing climate and build a more resilient future.

Senegal’s overarching framework

Understanding the importance of climate information for its development goals, the ANACIM, plays a pivotal role in supporting the government national policies and its Plans d’Actions Prioritaires (PAPs).

The Senegal government understands that climate change poses a significant threat to achieving their goals, particularly in sectors heavily reliant on weather patterns like agriculture, water resources, and disaster risk management. Until now, the PAPs have been operational plans that translate the broad goals of the government of Senegal into concrete actions for each priority area.

The data from ANACIM is critical for various PAPs by:

- **Informing decision-making:** ANACIM's data empowers policymakers to develop strategies that consider climate risks and opportunities. Agricultural PAPs can leverage climate forecasts to recommend drought-resistant crops or optimise irrigation schedules.

- **Enhancing disaster preparedness:** Early warnings of extreme weather events issued by ANACIM allow PAPs to implement disaster risk reduction strategies and minimise potential damage.
- **Boosting climate resilience:** By providing long-term climate projections, ANACIM helps PAPs design infrastructure and agricultural practices that are more resilient to changing climate patterns.

In addition to the ANACIM, Senegal also has the National Committee for Climate Change (COMNACC) which is a key institution under Senegal's Ministry of Environment, focusing on climate change issues. Its activities include research, raising awareness, sharing information and tools, engaging in international climate discussions and management and monitoring of the various activities identified in the implementation of the United Nations Framework Convention on Climate Change and its additional legal instruments. It also aims to empower government ministries to integrate climate resilience into their respective sectors. COMNACC brings together various stakeholders: government ministries, private sector (large companies), and civil society (OECD, 2021).

Development organisations and private sector

While Senegal has a strong National Meteorological Agency- ANACIM, development organisations and international institutions play a crucial role in supplementing and supporting their efforts in providing WCS. Contributions can be in the following forms:

- **Long-term Investment:** Development partners have been providing significant funding for climate resilience initiatives in Senegal. According to a USAID report, through projects like Climate Services for Increasing Resilience in Senegal (CINSERE) has invested $7 million to support the ANACIM in the development and use of weather and climate information services. (USAID, 2017). Additionally according to OECD DAC statistics on official development assistance, an average USD 43 million has been invested by providers of development co-operation annually between 2012 and 2018 to help ANACIM maintain its infrastructure, collect data, and develop climate services (OECD, 2021).
- **Capacity Building:** Development organisations also invest in building the capacity of ANACIM and other stakeholders involved in WCS. This involves training for staff, providing technical expertise, and supporting the development of essential data collection equipment.

In addition to development organisations, the private sector is emerging as a significant force in Senegal's WCS landscape. This sector offers a diverse range of services and products tailored to various user groups.

Private companies primarily cater to a broad audience, including the general public, aviation industries, farmers, disaster relief agencies, and local governments. Aviation companies in Senegal rely on private sector providers for critical weather data. Similarly, farmers utilise seasonal forecasts and other insights from these providers to plan and budget their agricultural activities effectively (UNECA, 2021).

Private companies provide tailored Agricultural Information by translating complex climate data into user-friendly formats like seasonal forecasts delivered in local languages. These forecasts, particularly concerning rainfall patterns and planting windows, empower farmers to make informed decisions (UNECA, 2021). Additionally, the private sector provides extreme weather support by offering critical climate information to vulnerable communities and disaster relief agencies. This information helps prepare for and manage the impacts of extreme weather events (UNECA, 2021).

Below is a list of international organisations and private sectors providing different weather and climate services in Senegal.

International organizations and research institutes (not exhaustive)	
WFP (World Food Programme)	WFP collaborated with ANACIM to develop climate services specifically for farmers. This included training workshops and modules on insurance and capacity building, helping farmers adapt their practices based on climate forecasts
USAID (United States Agency for International Development)	Under the Climate Services for Increasing Resilience in Senegal (CINSERE) program USAID has supported the development of Senegal's National Framework for Climate Services (NFCS) under the Climate services for Increased Resilience in the Sahel project , a Global Framework for Climate Services (GFCS) initiative The NFCS ensures the delivery of credible, reliable, and user-specific climate information
Global Affairs Canada	ANACIM worked with Global Affairs Canada and others to deploy meteorological stations in a number of regions, dramatically improving the amount of information available for the benefit of farmers. This has improved the climate services in these parts of the country, with subsequent developments to heighten resilience through the provision of index-based insurance by the national insurance company
IFAD (International Fund for Agricultural Development):	IFAD has created an interactive Facebook community platform with ANACIM to connect agricultural entrepreneurs, share pertinent information and communicate on resilience and risks
Farm Radio International	Farm radio provides weather and climate information for farmers at no cost through a radio communication tool to over a million farmers in 11 countries. By combining radio coverage maps with population density information, it is estimated that stations in Senegal have a combined potential audience of more than 3 million people.
The Consultative Group on International Agricultural Research (CGIAR) Program	• Climate Change, Agriculture and Food Security (CCAFS) project has worked closely with ANACIM to develop and transmit locally relevant climate information services for farmers. They piloted a program in Kaffrine, providing training and seasonal forecasts through rural radio stations. • Under Accelerating the Impact of CGIAR Climate Research for Africa (AICCRA) Senegal, the International Livestock Research Institute (ILRI) worked closely with ANACIM and the International Research Institute for Climate and Society (IRI) to support the design and initial development of the AgDataHub, and to link it with existing ANACIM climate and weather data.

Private sectors (not exhaustive)	
Jokalante	Jokalante is an agriculture-focused social enterprise working with producers to improve their resilience to agricultural risks through education, communication, outreach, and behavioural change. They provide climate risk management by communicating climate information (by translating ANACIM information into local language) and climate-smart innovations and by creating feedback loops to better understand the constraints around adoption.
Mlouma	Mlouma is an agrotechnology company that intervenes across the agriculture value chain, offering a range of digital services for farmers before, during, and

	after production. They communicate ANACIM information to farmers; and produce climate information from their network of rain gauges. They translate and communicate information to producers using tools and platforms that support adoption.
Adcon Telemetry	Adcon Telemetry develops and produces turn-key solutions for all kinds of meteorological data collection, processing, visualisation and distribution activities, focusing on agro-meteorology, hydro-meteorology, and hydrographics. ADCON has supplied automated weather stations (AWS) and capacity building services for national networks for Meteorology, Agro-Meteorology or Hydrology applications in Senegal by working with international organisations
Viamo	Viamo, formerly Human Networks International, is a social enterprise created by development professionals and technologists with a deep understanding of mobile technology and track records of high impact in emerging markets. In 15 countries, including Senegal, Viamo launched and manages a free, on-demand voice and text based mobile information service that is delivered in partnership with Mobile Network Operators (MNOs). The program works with NGOs and government ministries to create local content across a range of topics. Content includes weather information, often in relation to emergency preparedness or agriculture.

3.2. WCS Data and Processing

A diverse range of actors contribute to the production and development of climate services. In most countries, the NMHSs play a central role, mandated to provide essential information like climate data, seasonal forecasts, and regular weather updates. They are often supported by Regional Climate Centers (RCCs) that manage regional climate databases and assist NMHSs based on specific regional needs (UNECA, 2021).

Academic and research institutions play a critical role in transforming raw climate data into usable information. They act as intermediary users, sometimes partnering with NMHSs to interpret data and develop targeted climate services. These institutions focus on data analysis, product development, and user engagement.

In the context of Senegal, similar to other countries, the ANACIM is responsible for collecting weather data across the country. ANACIM operates a network of weather stations that record various atmospheric parameters like temperature, humidity, rainfall, wind speed, and direction. ANACIM also receives data from other sources, including:

- Satellite observations: These provide valuable information on regional weather patterns and cloud cover.
- Automatic weather stations (AWS): These are often deployed in remote areas and transmit data automatically.

Once collected, raw weather data undergoes processing and quality control at ANACIM. This ensures the data's accuracy and consistency. Advanced computer models are used to analyse the processed data. These models consider historical weather patterns, current observations, and global climate trends to generate forecasts.

ANACIM produces various weather products including advisories on drought, storm, and flood based on the analysed data, including:

- **Nowcasts:** These provide very-short-range weather forecasting of the next few hours (upto 2-6 hours ahead based on recent observations.
- **Short-term forecasts:** These provide detailed predictions for the next few days.
- **Seasonal forecasts:** These offer insights into expected rainfall patterns over a longer period, typically for the upcoming rainy season.
- **Climate information services (CIS):** This broader category of services tailors data and forecasts for specific user groups, such as farmers or disaster management agencies.

Despite having the mandate to lead data collection and processing, ANACIM recognizes the value of collaboration. They partner with regional and international actors to access advanced weather models and benefit from their expertise.

Additionally, Senegal benefits from regional agreements with other African countries and the European Union (EU) by gaining access to crucial weather and climate information. This data supports various sectors including agriculture, disaster management, and environmental conservation. Some specific regional agreements and initiatives through which Senegal receives weather and climate information from are, African Centre of Meteorological Applications for Development (ACMAD), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC),West African Science Service Center on Climate Change and Adapted Land Use (WASCAL), African Union's Climate Change and Resilient Development Strategy etc. Through these regional agreements and collaborations, Senegal receives vital weather and climate information that enhances its capacity to predict, adapt to, and mitigate the impacts of climate variability and change

There are also private firms involved in providing specialized weather data and services. For example, Meteoblue, a company that offers weather forecasting services, provides simulated historical climate and weather data for various locations, including Senegal. They offer detailed data on temperature, precipitation, wind speed, and other weather variables, which can be accessed through their platform for a fee.

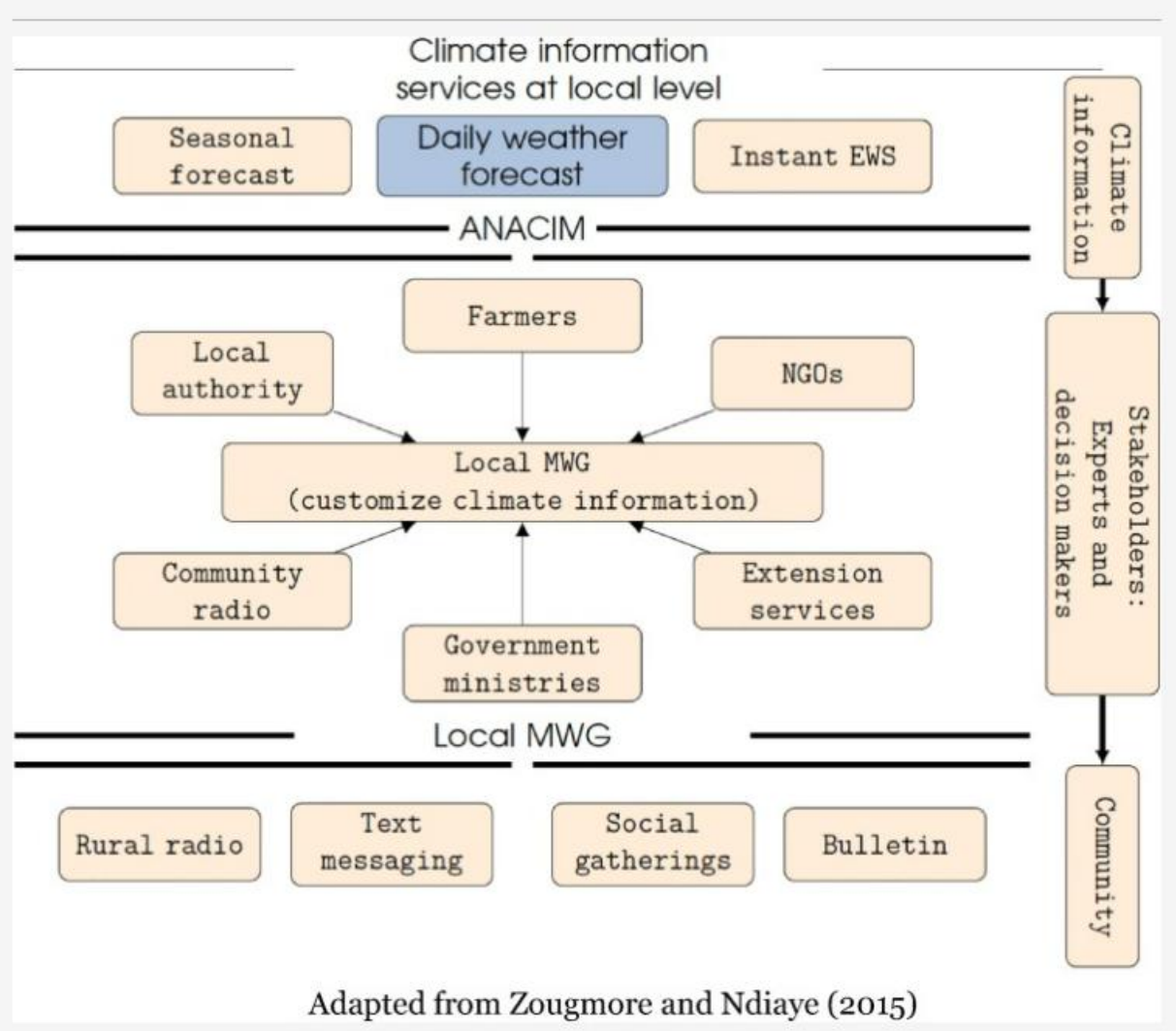
3.3. WCS Dissemination

Senegal's WCS dissemination strategy combines traditional and modern methods to ensure maximum reach. By leveraging radio broadcasts, and the power of social networks, ANACIM and its partners have reached millions of rural Senegalese. This multi-channel approach, coupled with the crucial role of extension agents who translate forecasts into actionable advice, empowers farmers to make informed decisions about their agricultural practices in a changing climate (Lo and Dieng, 2015; CCAFS, 2015).
Local language radio broadcasts proved highly effective in reaching a broad rural audience, with farmers actively participating through interactive programs (Lynagh et al., 2014).
Mobile phone technology has also become a vital tool. Recognizing the widespread mobile coverage in rural areas, ANACIM and private sectors utilise SMS to disseminate critical weather updates.
The extension agents are at the center of the entire dissemination system. They receive the WCS via SMS from ANACIM and relay this to the village level through SMS, phone calls or "word of mouth". Their interpretation of the forecast and related advice on fertiliser use, pesticide application, seed selection, etc. renders the information actionable.
Studies revealed that women often receive weather and climate information indirectly through social networks, particularly at gathering places like boreholes (D'Auria Ryley, 2014). Farmers also play an active role in the dissemination of weather and climate information within their community. Through their network of social relationships, they facilitate access to information for other farmers.

Multi-disciplinary Working Groups (MWGs)

In addition to the above highlighted methods of dissemination, Multi-disciplinary working groups are leveraged to disseminate information. MWGs in Senegal are collaborative bodies focused on improving WCS for farmers. They bring together diverse stakeholders in the agricultural sector, including government agencies (Department of Agriculture), research institutions, extension services, and even private entities like insurance companies (Ndiaye et al., 2013).

A key objective of MWGs is to ensure weather climate information is user-friendly and caters to the specific needs of farmers. This might involve developing localised forecasts, translating complex data into understandable formats, or integrating the information with agricultural advisories. Additionally, MWGs play a role in enhancing communication channels for WCS. They can collaborate with extension services and local media to ensure farmers receive timely and accessible information.



Different research suggests that farmers exposed to MWGs might have a higher awareness of WCS, greater access to it, and be more likely to utilise it in their decision-making. In addition, access to information through MWGs might influence farm decisions, potentially leading to better yields or improved resilience in the face of climate variability.(Ndiaye et al., 2013)

3.4. Challenges in Delivering Weather and Climate Services in Senegal

Delivering effective WCS in Senegal faces a complex web of challenges. These obstacles can be broadly categorised into political, economic, social, technological, and data-related issues.

Political and Economic Constraints:

- **Limited Public-Private Collaboration:** Weak partnerships between national meteorological services and private providers hinder the growth of a robust private sector in WCS (OECD, 2021). This can limit innovation and access to diverse services.
- **High Data Costs:** The high price charged by national meteorological services for weather data can discourage private companies from entering the WCS market (OECD, 2021).
- **Subsidised Competition:** Government subsidies for WCS can distort the market, making it difficult for private companies to compete with free or low-cost alternatives (OECD, 2021).

Social and Technological Barriers:

- **Low Literacy Rates:** Limited literacy in Senegal hinders access to WCS information distributed through written materials (OECD,2021; UNECA, 2021).
- **Language Gaps:** Dissemination primarily in French excludes a large portion of the population who rely on local languages for communication (OECD, 2021).
- **Gender Divide:** Women's limited access to mobile technology creates challenges in targeting them with critical WCS updates (OECD, 2021).
- **Technological Limitations:** Senegal lacks sufficient information and communication technology (ICT) infrastructure and expertise to deliver WCS effectively (UNECA, 2021).
- **High Communication Costs:** The high cost of electronic communication in Africa limits mobile phone subscriptions, a key channel for disseminating WCS information (OECD, 2021).

Data Issues and Information Sharing:

- **Limited Observational Network:** Insufficient weather monitoring stations and data collection equipment restrict the comprehensiveness and accuracy of WCS (UNECA, 2021).
- **Unclear Data Policies:** A lack of clear policies and regulations regarding data access and pricing hinders private sector involvement and innovation in WCS (OECD, 2021).
- **Limited Local Focus:** Regional climate information may not capture crucial weather variations specific to local areas, potentially reducing its usefulness (UNECA, 2021).

Despite these challenges, Senegal is actively working to improve its weather data collection and processing capabilities. Initiatives like the NFCS aim to ensure the delivery of credible, reliable, and user-specific climate information. Additionally, Senegal hosts data collection or production centre, which collects or generates sets of data and provides archiving services for relevant National Centres. These Data Collection or Production Centres collaborate with the Global Information System Centre in Casablanca, Morocco, to compile all African weather and climate data for global distribution (Economic Commission for Africa, 2021)

4. WCS infrastructure in Senegal

In collaboration with international organisations and development partners, Senegal has strategically deployed AWS in remote areas where traditional, manned weather stations are impractical. These AWS collect vital weather data continuously, enhancing Senegal's observation network. However, the network still relies, to some extent, on manual data collection from conventional weather stations (Winrock International, 2018). Different AWS models from various vendors, provided by international organizations, have resulted in inconsistencies. Data formats vary across stations, residing on separate systems. Although there are applications that come with each AWS network to access and visualize AWS data, access to the data is still done manually and station

by station. This complicates data access, processing, and use. In addition, data from the different AWS networks is in different formats, which makes it even more difficult to analyze all the data without additional tools or applications that can convert the data into a common format and combine the data from the different networks. As a result, accessing, processing, and using these data has been a major impediment to the use of data from these varieties of AWS (Rija et.al, 2022).

The Automatic Weather Station Data Tool (ADT) emerges as a solution. This web-based application offers a centralized platform to address these issues. According to a training report on the ADT, ANACIM, recently benefited from ADT installation and staff training. With its user-friendly interface, ADT allows for:

- Unified access to data from various AWS systems.
- Streamlined data processing and quality control.
- Improved data analysis and visualization capabilities.
- Efficient dissemination of weather information.

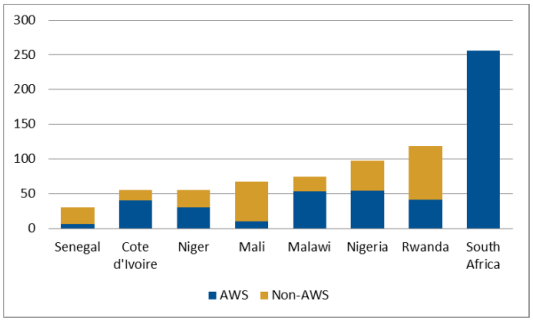
The implementation of ADT signifies a crucial step towards overcoming data management hurdles and maximizing the potential of Senegal's AWS network. This will ultimately lead to a more robust and comprehensive weather observation system for the country. (Rija et.al, 2022)

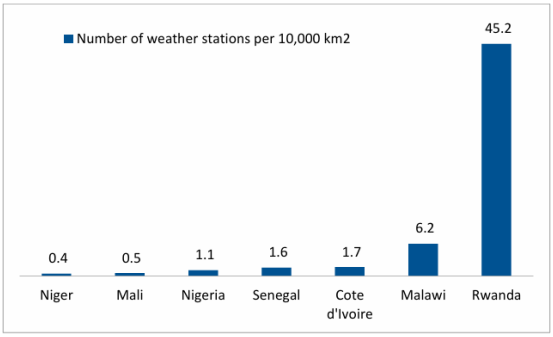
4.1. AWS in Senegal

The figures below, from a Winrock International report provide valuable insights into weather station distribution across Sub-Saharan Africa (SSA). The report analyses two key metrics:

- The distribution of automatic and non-automatic weather stations in selected SSA countries.
- The number of weather stations per 10,000 km2 for each country, based on data from NMHS representatives.

Looking at Senegal specifically, the data reveals a twofold picture: Compared to other SSA countries, Senegal has one of the lowest densities of weather stations per 10,000 km2. Furthermore, only about a quarter of Senegal's stations are automatic, limiting real-time data collection. These limitations suggest there's room for improvement despite Senegal's efforts to enhance its weather monitoring capabilities.





Source: Winrock International (2017)

5. Policy and Regulatory Environment for PPP/PPE Models in Senegal

In Africa, climate information services have primarily been provided through national meteorological and hydrological institutions, which are largely funded by governments. It has been challenging for

governments in Africa to fully support the operations of these institutions and this has resulted in inefficiency in the provision of climate services. Private sector partnership with national institutions to deliver information would help to alleviate the burden on those institutions and ensure more efficient services. (UNECA, 2021)

There is a growing market for climate information services for the private sector. There is also growing recognition that private service providers could invest in essential equipment and deliver quality climate information through public-private partnerships (PPPs). In some countries, such partnerships are helping to bridge gaps in public services in all sectors, and the private sector has begun to provide value-added climate services (Vaughan and Dessai, 2014) for their benefit and to complement the services of NMHS. Many NMHS rely on the private sector for support to some extent, though commercial opportunities have been limited to the private sector actors.

NGOs have contributed to the provision of climate information, but they have generally remained as the communication and awareness-raising component. Not-for-profit organisations and their activities are project-based and may not live beyond the life of a particular project. This is another reason why private sector participation is crucial in making climate information a business and a lucrative venture. The involvement of the private sector will help the multiple fronts of climate information to progress and provide innovative products and services and bring in new capacities.

5.1. Legal and Institutional Framework

Senegal's legal and institutional framework for PPPs underwent a significant update in February 2021 with the enactment of Law No. 2021-23, repealing the former law that was dated on February 2014. The current law is aimed at bolstering the country's infrastructure development need in various sectors such as, water, transportation, social housing and health care (Trinity International LLP, 2021).

Senegal's new PPP law significantly expands the types of projects it covers**.** Unlike the previous law, which only applied to PPPs using public funds, the new law now encompasses both government-funded and user-paid PPPs, including concessions and other agreements (Trinity International LLP, 2021). This broader scope aims to harmonise the public procurement process for these projects. While certain sectors like defence and energy remain excluded, the overall reach is wider. Additionally, the new law establishes clear guidelines for the PPP procurement process, ensuring it aligns with international best practices. Furthermore, it actively encourages greater participation from Senegalese and West African Economic and Monetary Union (WAEMU) companies in PPP projects (Trinity International LLP, 2021).

5.2. Management of PPPs in Senegal

The New PPP Law simplifies the existing PPP institutional framework and management via the establishment of key bodies (Trinity International LLP, 2021). These include:

- **National PPP Support Unit** (*Unité nationale d'appui aux partenariats public-privé*, "**UNAPP**") which replaces the Infrastructure Council (*Conseil des infrastructures*). This body is conceived as being the technical arm of contracting authorities, mandated to monitor the portfolio of PPP projects, assess PPP proposals, and provide expertise in identifying, preparing, negotiating and auditing PPP projects.
- **Inter-ministerial Committee** (*Comité interministériel*) which is made up of representatives from several ministries and is mainly responsible for authorising contracting authorities to initiate procurement procedures for PPP projects.
- **priori Control Body** which will carry an *a priori* review of the procurement procedures for PPP projects.

- **Regulation and Dispute Resolution Body** which is tasked with ensuring effective coordination with the regulatory authority whenever a PPP is implemented in a regulated sector and dispute resolution in relation to the award and performance of PPP contracts.
- **PPP Support Fund**, replacing the *Comité national d'appui aux partenariats public-privé*, which will further foster PPP projects in Senegal by providing support and funding to PPP projects, which may lack the necessary resources to be launched.

5.3. Challenges and Gaps of Senegal's PPP

Despite the recent improvements to Senegal's PPP framework, there are still challenges and gaps that need to be addressed. Here's a breakdown of some key areas:

- **Implementation Capacity:** While the legal framework looks promising on paper, translating it into efficient project implementation remains a concern. There might be a lack of skilled personnel within government agencies to manage complex PPP projects effectively
- **Project Preparation and Bankability:** There have been instances where projects haven't been adequately prepared or structured, making them less attractive to private partners (DLA Piper Africa, 2021). Strengthening project preparation and ensuring bankability is crucial for attracting investment.
- **Transparency and Governance:** Concerns linger around transparency in procurement processes and governance structures within PPPs. This can deter potential investors and raise questions about accountability
- **Risk Allocation and Mitigation:** A clear and fair allocation of risks between public and private partners is essential. Senegal's PPP framework needs to ensure there are mechanisms in place to effectively mitigate risks for both parties (DLA Piper Africa, 2021).
- **Proper PPP Management:** While the new law encourages local participation, building the capacity of Senegalese companies to compete for and manage PPP projects is crucial for achieving this goal (Trinity International LLP, 2021).

Reference

- Crick, F. et al. (2018), How do African SMEs respond to climate risks? Evidence from Kenya and Senegal
- D'Auria Ryley T and McKune S. (2014). Climate change and social networks in Senegal's peanut basin. CCAFS
- DLA Piper Africa. (2021). New Public-Private Partnership Act in Senegal: Key provisions
- Economic Commission of Africa. (2021). Utilization of World Meteorological Organization Mandated Data Sharing Protocols in Africa
- La Maison des Reporters. (2019). Coastal erosion: what happens to the "climate refugees" of Saint-Louis?
- Lo HM and Dieng M. (2015). Impact assessment of communicating seasonal climate forecasts in Kaffrine, Diourbel, Louga, Thies and Fatick (niakhar) regions in Senegal. CCAFS
- Lynagh S, Tall A, and Jay A. (2014). One size does not fit all: considering gender, equity and power in climate information services. CCAFS
- Ndiaye O, Moussa A, Seck M, Zougmoré R and Hansen J. (2013). Communicating seasonal forecasts to farmers in Kaffrine, Senegal for better agricultural management
- Organisation for Economic Co-operation and Development (OECD). (2021). Lessons on engaging with the private sector to strengthen climate resilience in Senegal
- Rija F. and James H. (2022). Automatic Weather Station Data Tool (ADT) Installation and Training at ANACIM
- Trinity International LLP. (2021). Senegal's new law on Public Private Partnerships
- United Nations Economic Commission Africa (UNECA). (2021). Private sector engagement in climate information services in Africa
- United States Agency for International Development (USAID). (2017). USAID Increases Climate Change Resilience in Senegal's Farming and Fishing Communities
- Vaughan, C., and S. Dessai .(2014). Climate services for society: origins, institutional arrangements, and design elements for an evaluation framework`
- Winrock International. (2018). Climate Information Services Market Assessment and Business Model Review
- World Meteorological Organization (WMO). (2014)
- World Meteorological Organization (WMO). (2018)