COMMUNICATIONS REGULATION REPORT 2023

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Autoridade Reguladora das Comunicações

COMMUNICATIONS REGULATION REPORT 2023

TECHNICAL SHEET

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Communications Regulation Report - 2023

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LINGUISTIC REVISION
MA Solutions Lda

LAYOUT E PAGINATION
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TRANSLATION
MA Solutions Lda

MISSION

To promote and facilitate the development of the postal and telecommunications industries, with a view to providing quality communications infrastructures and services, within a competitive environment and at affordable prices, ensuring universal access service, pursuant to the terms defined by law.

VISION

To regulate the postal and telecommunications industries with excellence for the development of Mozambique.

VALUES

Integrity;

Transparency;

Non-discrimination;

Impartiality;

Accountability.

MESSAGE FROM THE CHAIRPERSON OF THE BOARD OF DIRECTORS

Helena Lopes Fernnandes Tomás

Chairperson of the Board of Directors
National Communications Institute of
Mozambique

I am very pleased to present the 2023 Communications Regulation Report of the National Communications Institute of Mozambique (INCM). This document reflects the INCM's ongoing commitment to strengthening the communications industry in our country, promoting digital inclusion, socio-economic development and market competitiveness.

The year 2023 was marked by significant transformations, driven by the growing demand for telecommunications services, especially in rural areas, and the challenges brought about by rapid technological evolution. In this context, INCM remained steadfast in its role as an independent regulator, promoting innovation and ensuring compliance with national and international norms and standards.

I would like to highlight, with satisfaction, the progress made in expanding the telecommunications infrastructure and in implementing universal access initiatives, such as the Digital Libraries, which have been bringing the most remote communities closer to the benefits of the digital world. These initiatives reinforce our commitment to ensuring that no Mozambican citizen is left behind in the digitalisation and modernisation process of the country.

At the same time, the regulation of the radio spectrum, the inspection of services and the continuous monitoring of

quality were priority areas of action to ensure that operators offer excellent services, thus, meeting the expectations and needs of consumers.

Through this report, INCM reassures its commitment to acting transparently and responsibly, overcoming challenges and consolidating its position as a cornerstone in the development of communications in Mozambique.

I would like to thank all our partners, employees and the INCM teams for their commitment and dedication. Together, we will continue to work to promote an increasingly resilient, inclusive and efficient communications industry, contributing to the growth and progress of our country.

Helena Lopes Fernandes Tomás
Chairperson of the Board of Directors National
Communications Institute of Mozambique

EXECUTIVE SUMMARY

The Communications Regulation Report for 2023 provides a consolidated view of the performance and regulatory actions in the telecommunications and postal industries in Mozambique. This document shows the ongoing efforts of the Communications Regulatory Authority of Mozambique to promote a balanced, inclusive and competitive environment, in line with the pillars and strategic objectives of its Strategic Plan for 2021-2024.

Starting with the big picture, the telecommunications and postal industries faced significant challenges in 2023, such as the need to expand services to rural and remote areas, as well as dealing with the impacts of natural disasters and other factors. However, both sectors experienced important advances that reinforce their relevance for digital and economic inclusion.

Starting with the postal industry, it faces structural challenges related to infrastructure modernisation. In 2023 there was a decrease in the volume of traffic, thus, stressing the need to continually adapt to technological trends and consumer preferences.

As for the telecommunications industry, it recorded revenues of 47.5 billion Meticais, representing 3.6% of the national GDP. Investments amounted to 14.36 billion Meticais, an increase of 74% compared to the previous year, reflecting the focus on expanding and modernising the infrastructure. Around 30% of revenue was reinvested in capital expenditure, demonstrating the commitment to sustainability and long-term growth.

As challenges and recommendations, we suggest Integrating the Industries - expanding synergies between the two industries, especially in digital inclusion initiatives in rural areas; Resilient Infrastructure - investing in networks and infrastructures capable of withstanding natural disasters and supporting the expansion of connectivity, and of course, Market Competition and Innovation - promoting policies and revision of legislation

to stimulate the entry of new players and the diversification of services in the two industries.

As future prospects, the report reinforces the commitment of the Communications Regulatory Authority of Mozambique - INCM, to ensure the sustainable development of the communications industries, prioritising:

1. **Digital Inclusion:** Expand connectivity and postal services to marginalised populations.
2. **Economic Sustainability:** Ensuring a balance between economic growth and strategic investments.
3. **Digital Transformation:** Accelerating the adoption of emerging technologies to improve the efficiency and quality of services.

With this approach focused on progress and innovation, INCM reassures its mission to continue boosting the communications industry as a driver for economic and social development in Mozambique.

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LIST OF ACRONYMS AND ABBREVIATIONS

2G – Second Generation of Mobile Networks
3G – Third Generation of Mobile Networks
4G – Fourth Generation of Mobile Networks
5G – Fifth Generation of Mobile Networks
ASMS – Advanced Multimedia Satellite Systems
ATU – African Telecommunications Union
BSS – Base Station Subsystem
CA – Board of Directors
EMF – Electromagnetic Fields
COVID19 – Coronavirus Disease
CPM23-2 – Second Session of the Preparatory Meeting for the World Radiocommunication Conference 2023
CSET – Science, Engineering, Technology and Mathematics
EDM – Electricity of Mozambique, E. P.
ESIM – Satellite Earth Stations in Motion
FM – Frequency Modulation
FSAU – Universal Access Service Fund
FSS – Fixed Satellite Service
GABINFO – Information Office (Mozambique)
ICNIRP – International Commission on Non-Ionizing Radiation Protection
IMT – International Mobile Telecommunications Services
INAMAR – National Maritime Institute of Mozambique
INCM – National Institute of Communications of Mozambique
IoT – Internet of Things
ITU-MIFR – International Telecommunication Union Master Frequency Registry
IVR – Interactive Voice Response
MDAP – Mozambique Digital Acceleration Project

MER – Modulation Error Rate
MPDC – Maputo Port Development Company
MTC – Ministry of Transport and Communications
GDP – Gross Domestic Product
PPP – Public-Private Partnerships
QoS – Quality of Service
RF – Radio Frequency
SADC – Southern African Development Community
SIM – Subscriber Identification Module
SMA – Aeronautical Mobile Services
SMS4DC – Spectrum Management System for Developing Countries
ICT – Information and Communication Technologies
TMT – Transport, Multiplexing and Transmission
ITU – International Telecommunication Union
USSD – Unstructured Supplementary Service Data
VASP – Virtual Asset Service Provider
VPN – Virtual Private Networks
VSAT – Small Satellite Antenna Terminal
WebCP – Web Control Panel
WRC – World Radiocommunication Conference

1. INTRODUCTION

The 2023 Communications Regulation Report of the National Communications Institute of Mozambique (INCM) marks a year of significant transformations and challenges in the communications sector. The development of telecommunications and postal services in Mozambique continues to play a key role in digital inclusion, infrastructure expansion and the promotion of universal access, in line with the country's strategic objectives of modernisation and socio-economic development.

Throughout 2023, INCM strengthened its role as an independent regulator, promoting competitiveness and innovation in the telecommunications and postal services markets, while ensuring compliance with national and international standards and regulations. This report provides a comprehensive overview of the performance of the regulated markets, highlighting the expansion of infrastructures, the evolution of telecommunications services and the impact of the regulatory measures adopted in the year under review.

With a growing demand for telecommunications services, especially in rural areas, INCM played a pivotal role in coordinating mobile network expansion projects and implementing universal access initiatives, such as the Digital Squares and the expansion of mobile phone coverage. Additionally, the postal sector, although less dynamic, continued to respond to communication and logistics needs, especially in areas where digital services are still scarce.

Regulation of the radio spectrum also stood out as a critical area in 2023, with continuous monitoring and management of frequencies to guarantee the quality of the services provided and mitigate interference, as well as the approval of equipment that meets quality and safety requirements. This year, INCM strengthened its inspection and control capacity, applying sanctions and promoting corrective actions aimed at improving the quality of the services provided to consumers.

The report is divided into chapters that explore in detail the different areas regulated by INCM, from the analysis of the telecommunications and postal services markets to inspection activities, spectrum monitoring and the promotion of service quality. Through this document, INCM seeks to provide a detailed and transparent overview of its activities, as well as the challenges faced, and the goals achieved in 2023.

2. MARKETS

2.1. Telecommunications

2.1.1. Structure of the Telecommunications Market

According to Article 4(1) of the Regulation on Licensing of Telecommunications and Scarce Resources, the provision of telecommunications services for public and private use, the establishment, operation and management of telecommunications networks in Mozambique are subject to mandatory licensing.

The structure of the telecommunications market in Mozambique operates under a licensing regime that fosters a competitive and constantly expanding environment. The industry has both public and private operators, active government regulation, and faces logistical and economic challenges. Each segment of the market is dominated by key companies, as follows:

a) Unified Licence

This licence is granted to operators who have the right to establish telecommunications networks and offer a full range of services. By 2023, the three leading operators in the country, all vertically integrated, were in order of market entry:

1. **Moçambique Telecom, SA (TMCEL):** the first mobile phone operator, established in 1997, initially a subsidiary of Telecomunicações de Moçambique (TDM). It is now facing greater competition, which has reduced its market footprint;
2. **Vodacom Moçambique, SA (VODACOM):** A subsidiary of the multinational Vodacom Group, the company entered into the market in 2003 and is now recognised for its wide coverage and innovative services;
3. **Movitel, SA (MOVITEL):** entered into the market in 2012 and stood out for its expanded coverage of rural areas and technological innovations.

b) Class A Licence

Class A licensed operators have the right to establish telecommunications infrastructure and networks. By 2023, the following companies stood out, either in terms of turnover or market share, all of them fundamental to the expansion of networks and access to connectivity in Mozambique:

1. **Unified Licence Operators:** besides operating in the mobile sector, TMCEL, VODACOM and MOVITEL are investing in fibre optic infrastructure and expanding their networks to hard-to-reach areas;
2. **SEACOM:** it was the first high-speed fibre operator in the country, connecting Africa to Asia and Europe;
3. **WIOCC-EASSy:** it's the operator who owns a submarine cable system that connects the countries of East and Southern Africa, with a high transmission capacity of up to 10 Terabits per second;
4. **TVCABO MOÇAMBIQUE:** this operator stands out as a leader in fixed Internet and pay-TV services, with a strong fibre-optic infrastructure;
5. **TELEFIBRA:** this operator uses the fibre optic infrastructure of *Electricidade de Moçambique* (EDM) to expand its telecommunications services. This business model, known as 'Shared Infrastructure', allows EDM to diversify the services it offers.

c) Class B Licence

This type of licence is granted to operators who use existing infrastructure to provide services directly to consumers, with emphasis on the following categories of services:

- **Gateway Services:** Interconnection between national and international networks;
- **VoIP Services:** Internet telephony, offering reduced costs;
- **ISPs:** Internet providers with a variety of offers (including satellite);

- **Other Value Added Services:** They encompass customised solutions for corporate clients, including server hosting, cloud computing services, VPNs (Virtual Private Networks) and specialised technical support. These are solutions that meet the specific demands of companies, promoting greater efficiency, security and connectivity.

At Class B level, by 2023 the following operators stood out:

1. **Starlink:** Licensed at the end of 2022, the company leads the market in the segment of providing fixed Internet services via satellite. Its rapid expansion is evidenced by a significant increase in the number of subscribers, especially in remote areas where traditional connectivity is limited.
2. **TV Cabo Moçambique:** A subsidiary of the TMCEL Group (Telecomunicações de Moçambique), TV Cabo holds a prominent position in the market, being the leader in the fixed Internet supply segment via fibre optics. This position is due to its robust infrastructure and the high quality of the services it offers, especially in urban areas, where there is greater demand for a stable, high-speed connection.

d) Class C Licence

Focused on the installation and maintenance of equipment and infrastructure, as well as import and distribution, this licence supports the telecommunications value chain. Among the companies operating until 2023 the following stood out:

1. Televisa Moçambique, Lda
2. Huawei Technologies, Lda
3. Multiredes, Lda

e) Numbering Licence

This licence is intended for value-added services, such as premium messaging and telecommunications solutions, and

covers around **348 providers**, who must obtain a numbering licence to do so. Companies in this licence category complement basic services with offers such as USSD, cloud services and other digital solutions.

2.1.2. Revenues and Investments in the Industry

a) Revenues

In 2023, revenues from the telecommunications industry in Mozambique reached **MZN 47,507,943,112.06** (forty-seven billion, five hundred and seven million, nine hundred and forty-three thousand, one hundred and twelve Meticais and six cents), representing **3.6% of the national GDP** (as illustrated in the image below). After the decline experienced during the COVID-19 pandemic (2019-2022), the industry began a process of recovery, registering a **1.06% growth in revenue** compared to the previous period.

More than 80% of revenues were generated by mobile phone operators, namely: TMCEL, VODACOM and MOVITEL. These companies are characterised by vertical integration, which allows them to control not only their own network infrastructure and communication lines, but also to offer a wide range of services.

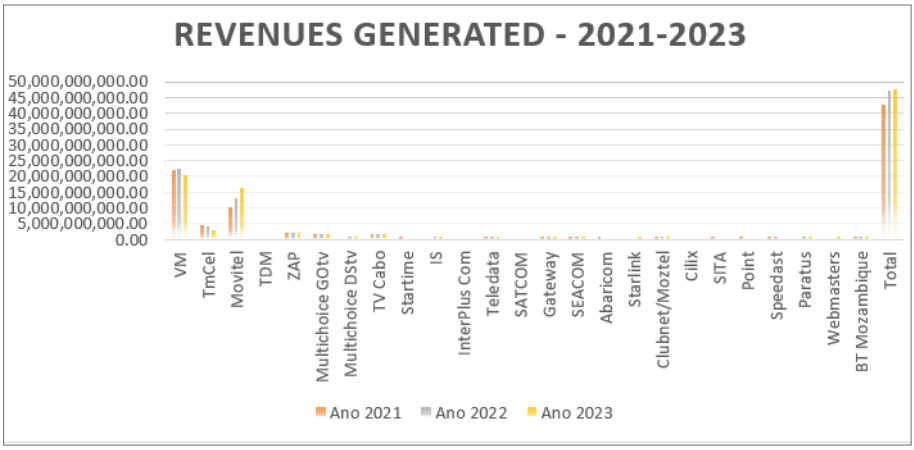


Figure 1- *Revenues from the Telecommunications Industry in 2023.*

This model of vertical integration offers several advantages, including:

- Greater control over costs and quality because operators can efficiently manage their operations, ensuring better services and resource optimisation;
- Diversification of services because operators can cover areas such as mobile telephony, internet, data and corporate solutions, meeting different market needs;
- Flexibility for innovation given the internal control that allows faster adaptation to changing consumer demands and technological trends; and finally,
- Efficient expansion because they facilitate the implementation of infrastructure, especially in rural and hard-to-reach regions, thus, promoting digital inclusion.

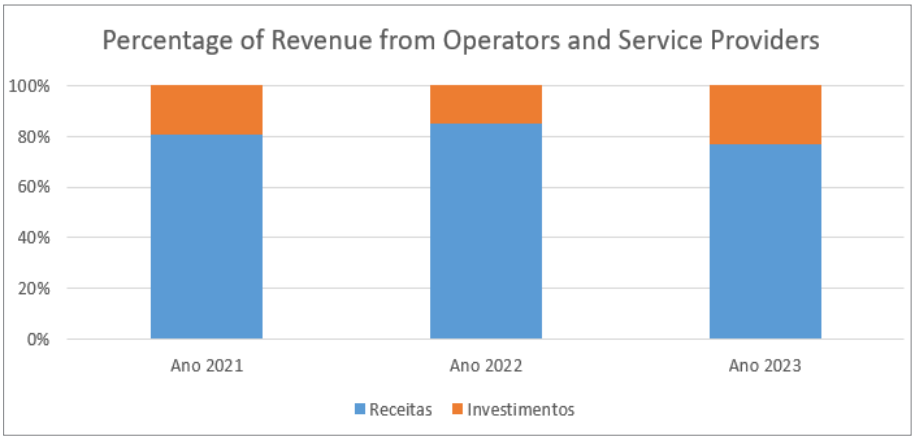


***Figure 2** - Revenues from the Telecommunications Industry in 2023.*

The dominant position of these operators in the market, all of whom hold the Unified Licence, speaks to their ability to manage and integrate all aspects of operations, from building networks to customising services for different consumer segments. This strategic approach strengthens their role in the digital transformation and expansion of access to telecommunications in Mozambique.

b) Investments

Investments in the telecommunications industry play a crucial role in promoting the adoption of Information and Communication Technologies (ICTs) and fostering innovation. In 2023, investment in the sector experienced significant growth of 74 per cent compared to the previous period, reaching a total of MZN 14,356,409,671.37 (fourteen billion, three hundred and fifty-six million, four hundred and nine thousand, six hundred and seventy-one Meticais and thirty-seven cents). This increase reflects the need to address specific challenges in the sector, such as: the restoration of infrastructure resulting

from the repair of networks affected by natural disasters and acts of vandalism); and expansion into rural areas resulting from the acceleration of the implementation of networks in remote regions to increase digital inclusion.

Despite this progress, it is essential to remain focused on continuous investment to: modernise the infrastructure ensuring modern and efficient networks; expand connectivity reaching more locations, promoting equal access and finally; preserve market competition by keeping up with global trends and meeting growing market demands.

c) Investment and Revenue Ratio

In 2023, the investment/revenue ratio for the industry was 30%, which means that for every MZN 100.00 generated in revenue, approximately MZN 30.00 was reinvested in capital expenditure.
These investments were mainly directed towards: upgrading infrastructure to improve technical and technological capacity, and expanding networks to increase the range and quality of services.

This index demonstrates the commitment of the industry to sustainability and long-term growth, as well as promoting continuous innovation in its operations.

d) General Perspective

In general, the perspective of the sector for 2023 was summarised in the following three points:

1. **Recovery of the Industry:** Revenue growth indicates a recovery after challenging periods marked by the COVID-19 pandemic. However, a future reduction in investment could jeopardise the pace of innovation and infrastructure expansion;

2. **Concentration of Revenue:** The dominance of the market by the three main mobile phone operators highlights the need to stimulate competition and market diversification in order to promote a more balanced environment;
3. **Infrastructure Resilience:** Given challenges such as natural disasters and political conflicts, it is crucial to invest in more resilient infrastructures, ensuring the continuity of services in a sustainable way.

Therefore, the ability of the industry to balance revenue growth and strategic investments will be the determining factor in its development and contribution to the country's economic and digital progress.

2.1.3. Active Subscribers

2.1.3.1. Telecommunications

In 2023, a total of 20,246,791 active subscribers were registered in the telecommunications sector in Mozambique. The distribution by operator was as follows: 52% of subscribers belonged to the operator Movitel, SA, 45% to the operator Vodacom, SA, and 3% to the operator Tmcel, SA.

Compared to 2022, the following behaviour was observed in the number of subscribers: Movitel, SA.: registered a 17% reduction in the number of subscribers, Vodacom, SA.: registered a 1% decrease in subscribers, and Tmcel, SA.: also registered a 14% reduction in the number of active subscribers.

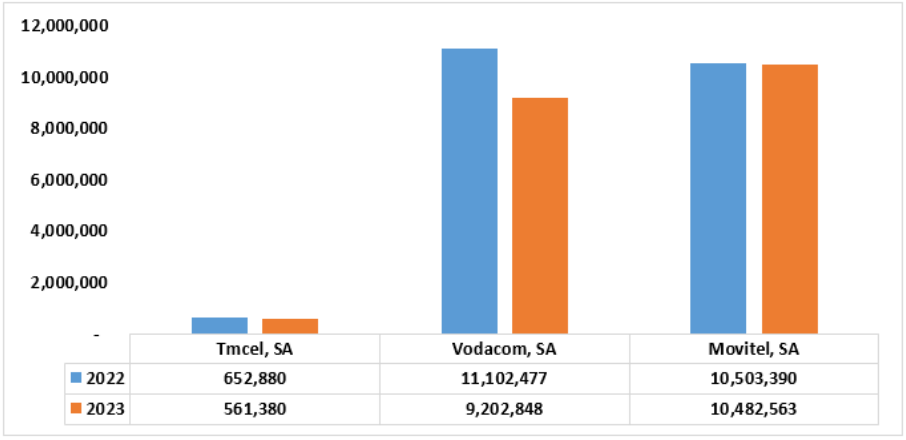


***Figure 3**- Number of active subscribers in 2022 and 2023.*

2.1.3.2. Television

In the period under review, the pay-TV market registered a total of 1,428,00 (one million four hundred and twenty-eight thousand) subscribers. The breakdown by operator was as follows:

- **MULTICHOICE:** combining the DStv (11.4%) and GOtv (30.3%) brands, Multichoice holds 41.7% of the market. The company has stood out for its commitment to the digitalisation of pay-TV services, consolidating its leading position in the industry.
- **TMT:** represents 40.8% of the total number of subscribers. Both TMT and Startimes, which has approximately a 3% share of the market, play important roles in the process of adopting digital television in Mozambique. Both companies have been commissioned by the government to drive digital migration.
- **MSTAR / ZAP:** this operator holds third position with an 11% share of the market. ZAP is recognised as the main competitor of the Multichoice brands (DStv and GOtv),

standing out for its wide territorial coverage, diversity of content and quality of services offered, consolidating itself as a competitive alternative in the sector.

- **TVCABO:** holds a 1% share of the market, offering pay-TV services integrated with fibre-optic broadband Internet solutions. Its operations in the market are more concentrated in urban areas, where there is greater demand.

The chart below summarises market shares in terms of number of subscribers, highlighting the distribution between the main operators.

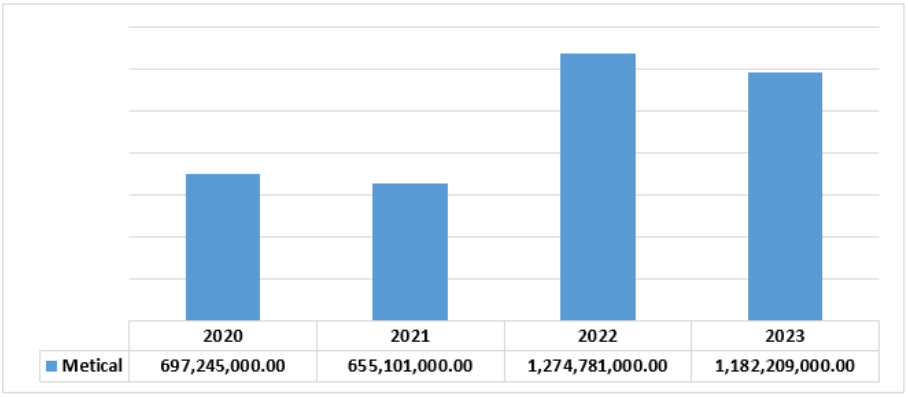


***Figure 4**- Market share of television services in 2023.*

2.1.4. National Traffic

On-net Traffic

In terms of on-net traffic, which is traffic generated within the operator itself, Movitel, SA. has recorded the highest volume of on-net traffic over the last three years. In 2023, Movitel, SA. generated around 74 % of the total traffic, and Tmcel, SA. generated just under 1 % of the total traffic generated during the year.

Movitel, SA. recorded an increase in its traffic volume of around 55% between 2021 and 2023, while Tmcel, SA. recorded a reduction in its traffic volume of around 38% over the same period. Vodacom, SA. generated around 26% of total traffic in 2023, and also experienced a reduction in its traffic volume of around 12% between 2021 and 2023.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	350,635,696	188,035,573	132,717,389	**0.39%**
Movitel, SA	13,936,343,674	19,288,247,625	25,232,740,924	**74.07%**
Vodacom, SA	9,776,750,312	8,719,852,141	8,702,556,681	**25.54%**
TOTAL	**24,063,729,682**	**28,196,135,339**	**34,068,014,994**	
TOTAL ANNUAL EVOLUTION (%)		17%	21%	

***Table 1**- On-net traffic generated during the period 2021 to 2023.*

Off-net Traffic

In terms of off-net traffic, Movitel, SA. generated the largest volume of traffic in 2023, around 72% of total traffic. Vodacom SA. and Tmcel, SA. generated around 22% and 6% of total traffic respectively in the same period.

Tmcel, SA. experienced a reduction in its traffic volume between 2021 and 2023, while Movitel, SA. experienced an increase in its traffic volume of around 27% when comparing the traffic generated in 2023 with that generated in 2021. Vodacom, SA. experienced a significant increase of around 200% in its traffic volume between 2021 and 2023.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	396,538,739	172,449,143	282,030,986	**5.99%**
Movitel, SA	2,302,036,349	3,138,929,926	3,389,563,547	**72.03%**
Vodacom, SA	311,369,238	449,142,806	1,034,251,586	**21.98%**
TOTAL	**3,009,944,326**	**3,760,521,875**	**4,705,846,119**	
TOTAL ANNUAL EVOLUTION (%)		**24%**	**25%**	

***Table 2** - Off-net traffic generated between 2021 and 2023.*

Data Traffic

Movitel, SA. generated the largest volume of data traffic, around 65%, Vodacom, SA. recorded around 31% of total data traffic and Tmcel. SA., only around 4%. All operators in 2023 recorded almost double the amount of traffic compared to the traffic generated in 2021.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	12,954,367	16,598,458	20,248,422	**4.08%**
Movitel, SA	123,417,040	208,859,386	324,446,970	**65.34%**
Vodacom, SA	70,147,983	106,992,550	151,866,412	**30.58%**
TOTAL	**206,519,390**	**332,450,394**	**496,561,804**	
TOTAL ANNUAL EVOLUTION (%)		60%	67%	

***Table 3**- Data traffic generated between 2021 and 2023*

USSD Traffic

As for the use of the USSD (Unstructured Supplementary Service Data) service, in 2023 Vodacom, SA. generated around 89% of the total USSD traffic, and Tmcel. SA., recorded only 0.50% of the traffic.

Movitel, SA. saw an increase of around 94 % in its traffic volume between 2021 and 2023, while Vodacom, SA. experienced a reduction in its traffic volume of around 23% between 2021 and 2023.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	138,991,908	90,414,265	63,583,072	**0.50%**
Movitel, SA	716,142,757	1,531,007,360	1,392,299,408	**10.97%**
Vodacom, SA	14,665,635,554	13,850,958,263	11,232,789,896	**88.53%**
TOTAL	**15,520,770,219**	**15,472,379,888**	**12,688,672,376**	
TOTAL ANNUAL EVOLUTION (%)		-0.31%	-8%	

***Table 4**: USSD traffic generated from 2021 to 2023*

2.1.5. International Traffic

Outbound International Traffic

Regarding international traffic, in 2023, Vodacom, SA. was the operator that generated the highest volume of outbound international traffic, around 56% of total traffic. Between 2021 and 2023, the operator recorded a reduction in its volume of outbound international traffic, which totalled around 33% in 2023, compared to the traffic it recorded in 2023.

Between 2021 and 2023, Tmcel, SA. recorded a reduction in its traffic volume, which totalled around 45% between 2021 to 2023. In 2023, the operator generated only 1.47 % of the total outbound traffic recorded.

Movitel, SA. generated around 43% of total outbound international traffic, and traffic has increased over the years in 49% comparing 2021-2023.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	1,712,100	762,100	763,023	**1.47%**
Movitel, SA	10,859,952	13,161,517	22,248,589	**42.77%**
Vodacom, SA	38,835,472	32,284,149	29,006,278	**55.76%**
TOTAL	**51,407,524**	**46,207,766**	**52,017,890**	
TOTAL ANNUAL EVOLUTION (%)		-10%	11%	

Table 5: *Outbound international traffic generated between 2021 and 2023.*

Inbound International Traffic

Vodacom, SA. generated the largest volume of inbound international traffic in 2023, around 60% of total traffic, and Movitel, SA. around % in the same period. Tmcel, SA. generated only 1.36% of total inbound international traffic.

OPERATOR	2021 (minutes)	2022 (minutes)	2023 (minutes)	2023 (%)
Tmcel, SA	3,171,841	1,346,585	839,096	**1.36%**
Movitel, SA	34,330,331	35,541,304	23,639,540	**38.28%**
Vodacom, SA	50,737,433	45,058,424	37,278,661	**60.36%**
TOTAL	**88,239,605**	**81,946,313**	**61,757,297**	
TOTAL ANNUAL EVOLUTION (%)		-8%	-25%	

***Table 6**: Inbound international traffic generated between 2021 and 2023.*

2.1.6. Interconnection Costs

The legal provision governing the interconnection of operators in Mozambique is Decree 32/2017 of 17 July - Regulation on the Interconnection of Telecommunications Networks. This sets out the principles to be complied with by operators operating in the Mozambican market for the provision of mobile telecommunications services.

Resolution 12/CA/INCM/2021, of 29 June 2021, approved the interconnection tariffs to be in force from 2020 to 2024. The interconnection fees applied for the period from 2020 to 2024 are illustrated in the table below.

YEAR	Interconnection Fee
2020	0.37 Mt/min
2021	0.31 Mt/min
2022	0.25 Mt/ min
2023	0.18 Mt/ min
2024	0.12 Mt/ min

***Table 7**: Interconnection costs during the 2020-2024 period*

2.2. Postal

2.2.1. Structure of the Postal Services Market

Postal services comprise activities that include the acceptance, processing, transportation and distribution of postal items, under to Postal Law No. 1/2016, of 7 January. These services

are provided through the granting of a licence, in accordance with article 24(1) of the Postal Law, and which, according to article 5 of the Postal Service Licensing Regulations, approved by Decree No. 67/2016, of 30 December, can be of the Provincial, Interprovincial, National and International type, and are distinguished as follows:

- **Provincial:** For operations within a single province;
- **Inter-provincial:** For operations covering more than one province, identified by southern, central and northern regions;
- **National:** For services covering the entire national territory;
- **International:** For services involving the transport of mail and orders abroad.

By 31 December 2023, 44 entities were licensed to provide postal services in the national territory. This diversity of operators indicates a dynamic postal sector, where each company fulfils regulatory requirements to offer a range of services, from local deliveries to international services. The presence of multiple providers stimulates competition and innovation, resulting in greater efficiency and quality in customer service.

2.2.2. Industry Revenues and Investments

In 2020, despite reduced investments, reflecting a conservative approach, possibly influenced by the uncertainties generated by the COVID-19 pandemic, revenues remained relatively stable. However, the cautious approach to investments showed caution with regard to the unstable economic environment.

In 2021, we experienced a drop in revenues compared to 2020, but a sharp increase in investments and a recovery in traffic volume. This suggests that investments have been directed towards capitalising on growing demand and preparing the

industry for a market recovery, potentially in infrastructure and logistics capacities.

The companies aimed to expand their capacities to meet the increase in traffic volume, despite the drop in immediate revenues.

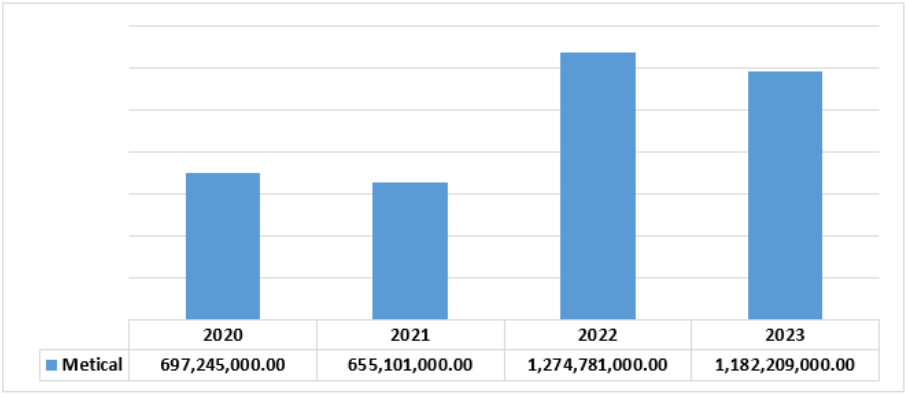


***Figure 5**- Postal Sector Revenues from 2022 to 2023.*

2022 was a remarkably successful year, with revenues soaring by 94.6% compared to 2021, in response to the peak in traffic volume and the continued investments of previous years. The alignment between increased traffic and expanded operational capacity suggests that investments have been effective in scaling operations to meet high demand. The success of 2022 stressed the importance of strategic investments and forward planning to capture market opportunities.

In 2023, revenues remained high, reflecting a strategic adaptation in response to a potentially volatile market environment. The significant investment in 2023 may indicate a strategy of strengthening and modernisation, seeking to consolidate earnings and optimise operations to face digital competition and new market demands

The analysis of the last three years shows that the postal sector has been able to respond to market fluctuations with a proactive investment strategy, which has proved effective in preparing to take advantage of peaks in demand and traffic volume. The success of 2022, in particular, stresses the importance of a strategic alignment between operational capacity and market demand.

However, 2023 suggests a phase of renewal and strengthening, with a focus on optimising resources and consolidating recent gains, preparing the basis for sustainable development in the face of an uncertain economic environment. The interdependence between revenues, investments and traffic volume emphasises the complexity of business management in a sector influenced by substantial external variables.

During the period from 2020 to 2023 the investment strategy in the postal sector reflected fluctuations in the volume of traffic and economic conditions. In 2020 initial investment was modest, amounting to MZN 259,000.00 (two hundred and fifty-nine thousand meticais), due in part to the uncertainties generated by the COVID-19 pandemic. The companies adopted a cautious approach, focussing on maintaining essential operations during this period of instability.

In 2021 there was a significant increase to MZN 35,621,000.00 (thirty-five million, six hundred and twenty-one thousand meticais), indicating an aggressive stance to take advantage of the economic recovery and expand operational capacities. This increase in investment coincided with a recovery in traffic volumes, demonstrating the operators' confidence in a growing market.

2022 maintained the growth trend with investments of MZN 49,775,000.00 (forty-nine million, seven hundred and seventy-five thousand meticais), suggesting a consolidation of the expansion strategy and continued optimism about its return.

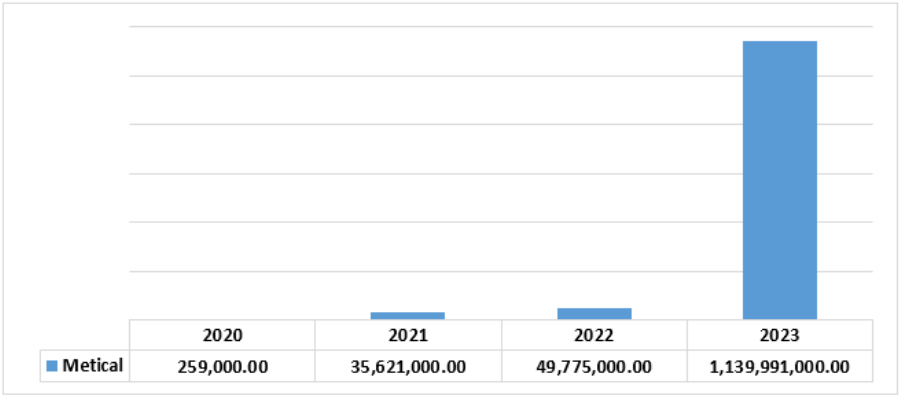


***Figure 6** - Investments in the Postal Sector from 2022 to 2023.*

In 2023 investments increased dramatically to MZN 1,139,991,000 (one billion, one hundred and thirty-nine million, nine hundred and ninety-one thousand meticais). This significant increase can be interpreted as a strategic move to consolidate market position and face new economic and technological challenges. The massive investment reflects confidence in future expansion and the need to modernise and expand operational capacities to meet new demands, especially in an environment of growing digital competition.

2.2.3. Traffic volume

The volume of postal traffic in Mozambique has fluctuated significantly over the last four years, directly reflecting the country's economic and social conditions. In 2020, traffic volumes were notably low, reflecting the direct impact of the COVID-19 pandemic, which affected business operations and reduced demand for postal services due to the lockdown and restrictions on movement. This phenomenon has been observed across the SADC region and beyond, where countries such as South Africa and the United States also experienced a drop in mail volumes due to social confinement measures and the transition to remote working.

The year 2022 marked the peak of postal items traffic in the sector, indicating continued robust growth. This increase may be the result of greater digitalisation of business, which has expanded e-commerce and raised demand for delivery services. Similarly, Tanzania experienced an increase in the volume of postal packages, reflecting the growing penetration of e-commerce and the digitalisation of business services.

During the period under review (2023), one million five hundred and sixty thousand seven hundred and forty-four postal items were sent, corresponding to a decrease of 18% compared to the previous period, which registered a total of one million nine hundred and four thousand seventy-one items.

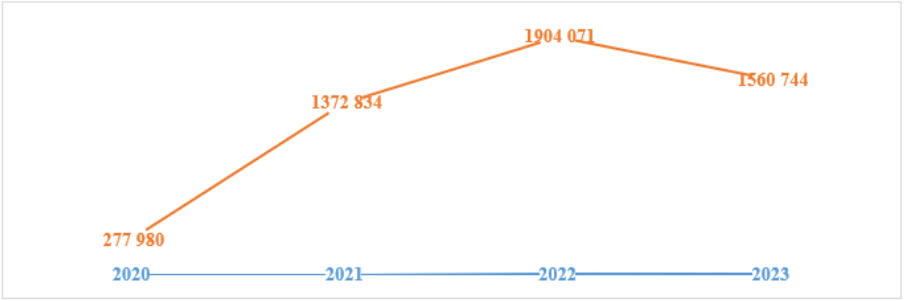


***Figure 7** - Traffic of postal items from 2020 to 2023.*

The reduction in traffic volume verified in 2023 is possibly due to a combination of market saturation, increased competition, digital alternatives and economic or regulatory challenges faced by the postal sector. This decrease in traffic volume has stressed the need to continually adapt to technological trends and consumer preferences.

2.2.4. Postal Per Capita

During 2023, an average of 48 postal items were sent per inhabitant, i.e. less 12 items per capita compared to the previous period, as illustrated in the chart below.

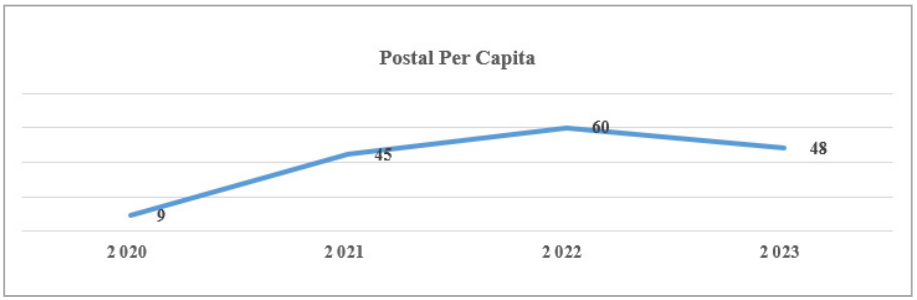


***Figure 8**- Volume of postal items per inhabitant from 2022 to 2023.*

2.3. Regulatory Measures with an Impact on the Market

In the regulatory sphere, in order to adopt new regulatory measures and legislation, meetings were held with operators and civil society to hold public consultations for the drafting and revision of various regulatory instruments. In this context, several regulations were revised, in particular the following:

I. **Revision of Decree No. 75/2014, of 12 December**, which approved the Regulations on Telecommunications Traffic Control, resulting in the approval of Decree No. 38/2023 of 3 July, due to its inadequacy to the current technological context. There has been a significant increase in the flow of data traffic to the detriment of voice traffic, as well as the emergence of various digital services of great relevance to society, such as financial services supported by telecommunications networks. As such, the need has been identified to ensure a regulatory framework that allows effective control and monitoring of these new forms of traffic.

II. **Revision of Decree No. 13/2023 of 11 April**, which approved the Regulation on the Registration of Subscribers. Essentially, this regulation introduced the following innovations:

1. The improvement and standardisation of subscriber registration procedures;
2. Extension of the scope of registration of all types and forms of Subscriber Identification Modules, commonly known as SIM cards, including registration of all subscribers to telecommunications services, registration of terminals and registration of distribution agents used by operators to register their subscribers;
3. The implementation and management of a central database for the identification of subscribers, distribution agents, operators of telecommunications services, operators of public services based on telecommunications networks;
4. The establishment of mechanisms to validate records;
5. The establishment of a Risk Centre to register all subscribers, a subscriber identification module and fraudulent or suspicious communications devices;
6. The adequacy of the sanctioning regime;
7. The implementation of mechanisms for blocking and/or interrupting service to subscribers and communications devices in the event of non-compliance and/or fraud; and
8. Extension of registration mechanisms to devices used for the Internet of Things and virtual subscriber identification devices in telecommunications networks.

In addition to the Regulation on the Registration of Subscribers, approved by Decree No. 13/2023, resolutions were issued by the Board of Directors of INCM establishing the Technical Regulations on the Registration of Subscribers to Telecommunications Services, approved by Resolution No. 3/BR/INCM/2023, of 16 August, and the Technical Regulations on the Operation of the Risk Centre, approved by Resolution No. 4/BR/INCM/2023, of 20 June.

In addition, a review of the proposals for the following regulatory instruments has begun:

III. **Proposal for the Regulation on Postal Services –** the proposal for the Regulation of Postal Services has been approved by the Technical Council and the Consultative Council of the Ministry of Transport and Communications, pending only the scheduling for presentation to the Council of Ministers.

IV. **Proposal for the Regulation on the Universal Access Service Fund** – The Universal Access Service Fund (FSAU) is, under the terms of article 32(2) of Law No. 4/2016, of 3 June, the Telecommunications Law, in conjunction with article 33(1) of Decree No. 39/2021, of 17 June, the Organic Statute of the Communications Regulatory Authority of Mozambique, an autonomous property under the management of the INCM. As a result, there is a need to review, among other things, the scope, governance model, operation, sources of revenue and to establish a basis for addressing sustainability issues. Accordingly, a proposal for regulations was drawn up and submitted to the Secretariat of the FSAU. After approval by the Board of Directors of the INCM, it will be submitted to the Technical Council and Consultative Council of the Ministry of Transport and Communications for appraisal.

V. **Proposal for the Regulation on Infrastructure Sharing –** The revision of the Regulation on Infrastructure Sharing has been included in the actions to be financed by the World Bank's Mozambique Digital Acceleration Project (MDAP). The terms of reference have already been drawn up and their implementation is scheduled for 2024.

VI. **Proposal for Drafting the Regulation on National Roaming** – The proposal has been favourably appraised by the Ministry and submitted to the Council of Ministers for a decision. The proposal establishes a set of rules for the implementation of National Roaming in order to meet the needs of consumers of telecommunications services, especially in terms of expanding and improving the coverage of telecommunications operators' networks.

Among the various motivations behind the proposal for the Regulation on National Roaming, the following should be stressed:

1. To promote the expansion of telecommunications network coverage in geographical areas without a network, especially in areas with poor coverage or rural areas covered by a single operator;
2. To ensure the entry of new operators without deploying their own infrastructure, especially in the initial operating phase;
3. To stimulate competition by maximising benefits for end users;
4. To encourage the provision of quality services.

VII. Revision of the Regulation on Postal Licensing, to indicate the designated operator – with the extinction of the company Correios de Moçambique - CDM E.P, by Decree No. 32/2021, of 31 May, the country was left without the Designated Postal Operator, an entity that was also the provider of the universal postal service, aimed at satisfying the needs of the population and economic and social activities through the provision of services at prices accessible to the entire population under conditions of equality and non-discrimination. As a result of the need to fill this gap, the existing entities in the market that offer the necessary guarantees to ensure the continuity of the provision of services by a Designated Postal Operator were identified, the companies operating in this sector were evaluated, and the proposal to appoint the Designated Operator was submitted to the Council of Ministers. In order to allow the appointment of a private company, it was necessary to revise the postal licensing regulations to accommodate this possibility.

3. ENGINEERING AND INSPECTION

3.1. World Radiocommunication Conference

The World Radiocommunications Conference (WRC) is an event that aims to address issues relating to the allocation of radio frequency bands for the various radiocommunications services, such as land mobile, aeronautical, maritime, satellite, space research and broadcasting.

The WRC aims to promote discussions with the aim of building consensus for the benefit of the universal community, promoting socio-economic growth and development, without neglecting the international obligations of the various states.

3.1.1. Mozambique's Role in the Preparation of WRC-23

As part of the WRC-23, Mozambique organised the Fifth Preparatory Meeting of SADC for WRC-23, convened in a hybrid format and held from 29 May to 2 June 2022 in Maputo.

The purpose of the event was to prepare participants for the following meetings organised by the ATU (African Telecommunications Union):

- The ATU Working Group Meetings (ATU WG), which took place from 26 June to 1 August 2023, and;
- The Fourth African Preparatory Meeting for WRC-23 (APM23-4), held from 7 to 11 August 2023 in Yaoundé, Cameroon.

The purpose of the event was also to harmonise positions on the WRC-23 agenda items, and a script was drawn up with the updated agenda items, based on the information and decisions of the latest meetings of SADC, ATU and CPM23-2 (the second meeting of the Contribution to the Global Preparatory for the 2023 Radiocommunication Conference).

3.1.2. Mozambique's participation in WRC-23

In 2023, WRC-23 was held in Dubai, United Arab Emirates, with the purpose of addressing issues that could help facilitate equitable access to and rational use of the limited resources of the radio spectrum and satellite orbits, as well as enabling the efficient and effective operation of all radiocommunications services. During the event, the technical and regulatory framework for the provision of radiocommunications services in all countries, at space, maritime and terrestrial level, was also modelled.

Mozambique was represented at the event by the INCM, with a delegation led at the highest level. It's worth noting that Mozambique took part as the Maritime and Aeronautical Services Coordinator, as well as acting at African level through the ATU as the coordinator for the identification of the digital broadcasting spectrum (470-696 MHz) for the International Mobile Telecommunications Service (IMT) and for the identification and sharing of the frequency spectrum of the fixed and mobile satellite service for the Earth Satellite Stations in Motion (ESIM).

During the conference, the ITU Radiocommunications Regulation was revised with the purpose of supporting spectrum sharing and technological innovation. 43 new resolutions were approved, 56 existing resolutions were revised and 33 resolutions were deleted. A recommendation from the Radiocommunications Regulatory Board was also approved, which will allow 41 countries (including Mozambique) to acquire new, usable orbital resources for satellites and broadcasting. These countries have been unable to utilise the orbital slots allocated in recent years due to factors such as lack of coordination and interference from other satellite networks. The decision aims to enable the countries to implement sub-regional satellite systems.

With regard to IMT, additional radio frequency bands (3,306.4

GHz and 4,864.99 GHz bands) have been identified for international mobile telecommunications, with the purpose of facilitating the development of future generation networks.

As recommendations to member countries, it will be necessary to adopt regulatory measures to ensure adequate protection of the terrestrial broadcasting service in the 470-694 MHz band, including satellite earth exploration services, radiolocation and other passive services. Additionally, countries must ensure that the bands identified for IMT are harmonised worldwide in order to facilitate global roaming and promote the mass production of equipment in order to obtain the benefits of economies of scale.

During WRC-23, preparatory meetings were held for the next conferences, WRC-27 and WRC-31. At this preparatory meeting, the necessary study groups and working groups were identified for the preparation of these events, where the future of radio spectrum allocation will be defined, from satellite communications to mobile technology.

WRC-27 agenda items were also assigned to the existing working groups, including the groups that will carry out the specific study of the agenda items. Initial working groups were also appointed to gather information on the WRC-31 agenda items.

3.1.3. The Focus on Resolution 559 at WRC-23

Resolution 559 of the International Telecommunication Union (ITU), adopted during the 2019 World Radiocommunication Conference (WRC-19), establishes a special procedure for eligible administrations to replace degraded designations in the Region 1 and 3 Plans, prioritising them in new geostationary orbit (GSO) points.

The resolution seeks to assist administrations whose designations in the Region 1 and 3 Plans have been significantly degraded,

allowing them to replace these designations with new ones in newly available orbital positions.

The ITU identified 55 administrations according to the established criteria, and notified them in February 2020. Out of these 55 administrations, 45 submitted requests to replace their degraded designations, following a specific procedure:

1. Eligible administrations must identify suitable new orbital positions and channels;
2. Requests must be submitted within a specific period;
3. The Bureau publishes the submissions in a Special Section, initiating the protection and coordination period;
4. Administrations must coordinate with others potentially affected in order to avoid harmful interference;
5. After coordination, administrations must submit detailed information for final evaluation;
6. The Bureau examines the submissions and, if favourable, includes the new designations on the List.
7. Administrations can request WRC-23 to replace the current designations with the new ones approved.

This process seeks to ensure that the affected administrations can restore their radiocommunication capacities in an efficient and coordinated manner, while maintaining the integrity and smooth operation of satellite services in Regions 1 and 3.

Also within the scope of Resolution 559, regarding the implementation of satellite orbits for African countries, the orbital slots/frequency spectrum reserved for developing countries in the BSS and FSS Plans were affected as a result of a lack of resources to conduct proper coordination. In this context, thirty-one (31) ATU countries have successfully achieved the implementation of Resolution 559.

3.2. Radio Spectrum Management

With the purpose of introducing new tools, improving frequency management and ensuring the process of licensing and registering radiocommunications stations in Portugal in the ITU database, known as MIFR - Master International Frequency Register, INCM optimised the Radio Spectrum Management, Planning and Engineering System. To this end, the Frequency Coordination (SMS4DC - Spectrum Management System for Developing Countries) and HTZ Communications Engineering tools were updated..

Also in 2023, INCM allocated additional spectrum to two mobile operators, Vodacom, S.A. and Movitel, S.A. Vodacom, S.A. was allocated the 900/1800 MHz and 1900/2100 MHz bands for a period of five (5) years. Movitel, S.A. was allocated the 1800 MHz band for five (5) years, to improve and optimise its 2G, 3G and 4G network, on a rental basis.

In coordination with INAMAR (National Maritime Institute of Mozambique), a survey was carried out of maritime mobile service stations at national level, and this information was notified to the ITU for subsequent validation and publication in the MIFR database.

A spectrum auction is due to be held in the 700 MHz, 2.6 GHz, 3.4 GHz and 26 GHz frequency bands for the implementation of emerging technologies such as 5G and IoT (Internet of Things). To this end, a discussion paper was drawn up on holding this auction, taking into account the contributions of all the mobile phone operators in Mozambique.

The proposal to hold the auction was approved by the Technical Council and the Consultative Council of the Ministry of Transport and Communications, and was subsequently submitted for approval by the Council of Ministers.

3.2.1. Radiation Spectrum Monitoring

During the period under review, measurements were taken at radio stations to check compliance with the technical parameters required by the Radio Regulations, namely: frequency deviation, modulation and signal level.
The main findings were as follows:

- Identification of a radio station which, despite being duly licensed, was not in operation.
- Identification of 8 radio stations transmitting outside the parameters, having identified excess modulation caused by frequency deviation and modulation deviation. As a corrective measure, the radio stations were notified to adjust the modulation deviation up to 77 kHz.
- On the other hand, 10 radio stations were identified as transmitting within the required technical parameters.
- Identification of 6 radio stations that were not on air during the measurement.

3.2.2. Interference Resolution

Interference resolution is essentially aimed at identifying and eliminating sources of radio signal emissions that are harmful to the proper functioning of radio stations, networks or systems, providing the public with a good quality service.

In the period under review, INCM received 8 requests for interference resolution from the different licensed operators, namely:

- One (1) request to resolve interference in the 11 GHz band affecting the quality of satellite television signal distribution services.
- Four (4) requests to resolve interference in the 800 MHz and 1900 MHz bands, which caused degradation of the signal and quality indicators of mobile telephony services.

- Two (2) requests to resolve interference in the aeronautical mobile services (AMS) band affecting aeronautical activity.

Through the use of fixed and mobile monitoring equipment and the application of different interference resolution techniques to geolocalise and identify the source of the interfering radio signal, it was possible to identify and localise the source of the interference. Measures to mitigate the negative impacts of the interfering signal were applied to the above-mentioned interference, enabling operators to provide adequate levels of quality of service and to ensure the efficient and safe operation of aeronautical activity.

3.3. Licensing

3.3.1. Licensing of Postal Services

Postal service licences are granted to public and private entities operating in the postal sector, whether at provincial, interprovincial, national or international level. In 2023, postal service licensing remained stable in terms of the number of licences issued, with a total of five licences granted.

Although specific details on the split between national and international licences are not provided for this year, the comparison with 2022, where five of the six licences were for international operations, suggests a continuity in interest in services that transcend national borders. This maintenance in the number of licences indicates a constant demand in the postal sector, without major fluctuations in the need for new operations or significant expansions.

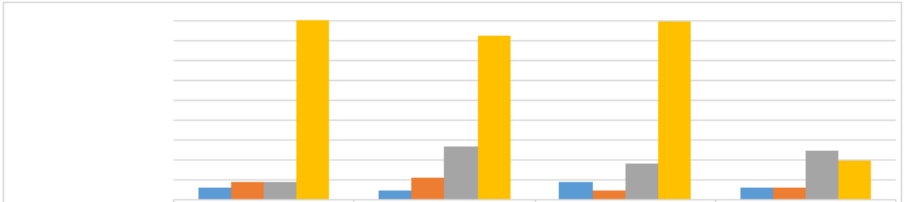
Analysis of this data suggests that the postal services market in 2023 focused on sustaining existing operations, possibly reflecting a stabilisation after previous periods of expansion or adjustment.

3.3.2. Licensing of Telecommunications Services

In 2023, the telecommunications services received 57 licence applications, which represents a significant reduction of approximately 53% compared to the previous year, which received 122 applications. This notable decrease is especially evident in the Alphanumeric category, which experienced a drastic drop from 90 to just 20 applications.

An analysis of data from the last four years in the telecommunications industry reveals that 2023 experienced the lowest volume of applications for classes A and B, with both categories receiving only 6 applications each. The volume of licences for Class B in 2023 remained stable compared to the previous year, with both occasions registering 6 applications.

On the other hand, there was a notable reduction for Class A, which experienced a decrease from 9 applications in 2022 to just 6 in 2023. In contrast to the declining trend observed in these classes, Class C stood out in 2023 with 25 applications, just two less than the peak of 27 applications in 2021. This suggests a renewed and growing interest in services covered by Class C, standing out as an area of robust demand despite the general scenario of a reduction in the industry.



	2020	2021	2022	2023
Classe A	6	5	9	6
Classe B	9	11	5	6
Classe C	9	27	18	25
Alfanumérico	91	83	90	20

***Figure 9**- Entities licensed by the telecommunications industry by 2023.*

The drastic reduction in the total number of licences from 2022 to 2023 was mainly driven by the significant decrease in the Alphanumeric category, which suggests a change in market preferences or adjustments in licensing policies. Meanwhile, the resilience of class C may indicate an adaptation or an increase in demand for specific services that this class covers, potentially reflecting new market dynamics or emerging needs in the telecommunications industry.

3.3.3. Licensing of Numerical Resources

National numbers (also known as short numbers) are unique numbers, circulated nationwide, without the need for an operator identification code, bringing reliability to the company as they are numbers of up to 5 (five) digits, easy to memorise.

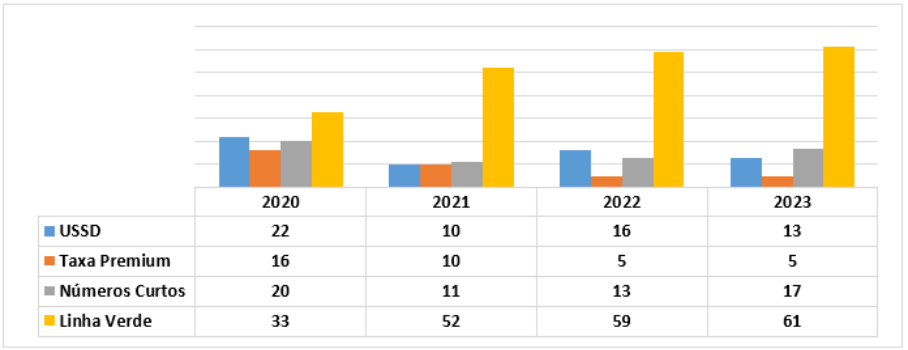
The year which registered the highest request for national numbers was 2020, with 91 (ninety-one) numbers allocated, followed by 2022 with a total of 90 (ninety) numbers allocated and, lastly, 2021, with a total of 85 (eighty-five) allocations. The analysis of national numbers in 2023 reflects a stabilisation and, in some cases, a recovery compared to previous years.

USSD allocations, which had reached their peak in 2020 with 22 registrations, showed a significant reduction in subsequent years, stabilising at 13 in 2023 after a sharp drop in 2021 and a brief increase in 2022. This figure represents an improvement compared to the minimum of 10 allocations in 2021, but still reflects a decrease compared to the peak year.

Regarding Premium Rates, after a peak of 16 in 2020, there was a sharp drop to 10 in 2021, remaining at 5 allocations since 2022. This indicates a considerable reduction of 68.75% from the initial peak, suggesting a decreasing demand or saturation in this market segment.

Short Numbers, after falling from 20 allocations in 2020 to 11 in

2021, showed a moderate recovery to 17 in 2023. This increase suggests a revival in interest in these numbers, reflecting a possible recovery in the market or an adaptation to consumer needs.



	2020	2021	2022	2023
USSD	22	10	16	13
Taxa Premium	16	10	5	5
Números Curtos	20	11	13	17
Linha Verde	33	52	59	61

Figure 10 - *Numerical resources by 2023.*

Overall, 2023 showed a mixed picture of stability and recovery in different segments of the national figures, with the Green Line showing the greatest continuous growth over the period under review, reaching 61 allocations, a significant increase compared to previous years. This trend underlines the growing popularity and importance of customer support services in a competitive market.

3.3.4. Licensing of Television Broadcasting

In 2023, the distribution of television stations in the national territory showed a relatively balanced structure between the country's various provinces, with Maputo City and Maputo Province standing out slightly, each with five stations. This configuration reflects both the population concentration and the economic and administrative centrality of these regions,

this may also reflect a greater variety of content available to people living in these areas, potentially including a greater number of private and specialised channels, compared to other provinces which may be more focused on public and community service channels.

In the remaining provinces, where each has four stations, there is a balanced distribution of television media services. This balance indicates a conscious licence distribution policy aimed at comprehensive coverage, ensuring that information and entertainment are accessible to a wide range of the population.

The uniform presence of stations in the provinces indicates that, despite the concentration of resources and infrastructure in Maputo City and Maputo Province, there is a commitment to maintaining a comparable level of service in other regions.

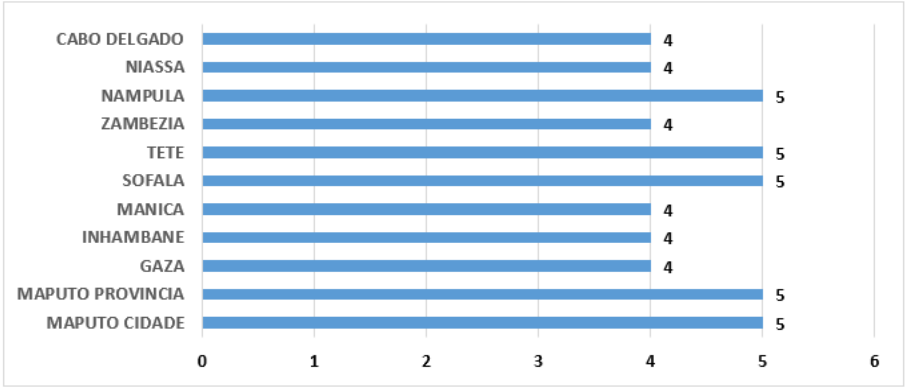


***Figure 11**- Television stations by 2023.*

3.3.5. Licensing of Radio Broadcasting

In 2023, the licensing of radio broadcasting stations in Mozambique reflected a diverse and regionally distributed

picture, showing the growth and expansion of media services in the country. The analysis of the data reveals an asymmetrical distribution between the regions, with some provinces leading the way in terms of the number of licensed stations.

The southern region showed a significant concentration of stations, especially in Maputo City, which leads the way with 39 (thirty-nine) licensed stations. This high concentration can be attributed to Maputo's status as the country's capital and economic centre, where the demand for media services is presumably greater. Maputo Province, with 13 stations, shows a moderate presence, while Gaza and Inhambane, with 35 and 26 stations respectively, also show a strong interest and investment in radio broadcasting.

The central region stands out with a robust number of licences, especially in Sofala, which has 48 stations, followed by Zambézia with 42 stations. Tete and Manica have a modest number, with 38 and 28 stations respectively. The strong presence of stations in Sofala may be influenced by its strategic position and significant commercial and cultural activity.

Nampula stands out as the province with the highest number of licensed stations in the whole country, with 51 stations. This number not only reflects the dynamism of the province, but also its growing role as a vital media centre in northern Mozambique. Niassa and Cabo Delgado, with 29 and 32 stations respectively, show substantial engagement, although less intense than in Nampula.

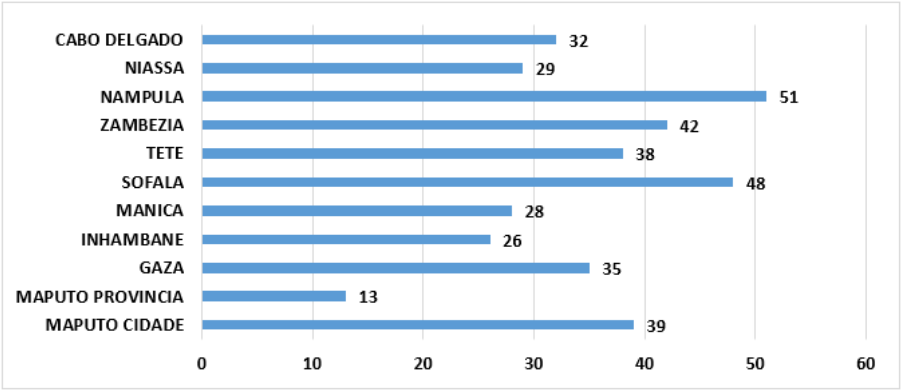


***Figure 12**- Radio broadcasting stations by 2023.*

The distribution of radio stations in Mozambique shows a clear correlation with the economic and demographic dynamics of the regions. Regions with more developed urban centres and greater economic activity tend to have more stations, which is evident in the high numbers in Nampula and Maputo City. Furthermore, the expansion of licences for new stations in 2023 suggests a vibrant and growing media environment, reflecting a society that values information and communication as pillars for development and democracy.

This scenario indicates fertile ground for future investment in communication technologies and the expansion of broadcasting services, in line with demographic growth and the social and cultural aspirations of local populations.

3.3.6. Licensing and Cancellation of Radiocommunication Services

As part of the licensing of radiocommunications services, 66 radiocommunications licence applications were received, corresponding to a total of 1,164 stations, and 22 cancellation applications were received, corresponding to a total of 324 stations.

Within the scope of radio frequency licensing, the following licences were awarded:

- VODACOM was awarded an additional spectrum licence in the 900 MHz frequency band, with an increase of 2x2 MHz, from the previous 2x8 MHz to 2x10 MHz.;
- VODACOM was awarded an additional spectrum licence in the 1800 MHz frequency band, with the increment of a further 2x5 MHz for a period of 5 years renewable once only;
- VODACOM was awarded an additional spectrum licence in the 1900 MHz frequency band, with the increment of a further 2x5 MHz for a period of 5 years renewable once only;

MOVITEL was awarded an additional spectrum licence in the 1800 MHz band, with an increment of 2x5 MHz for 5 (five) years, renewable only once, to improve and optimise its 2G and 4G network.

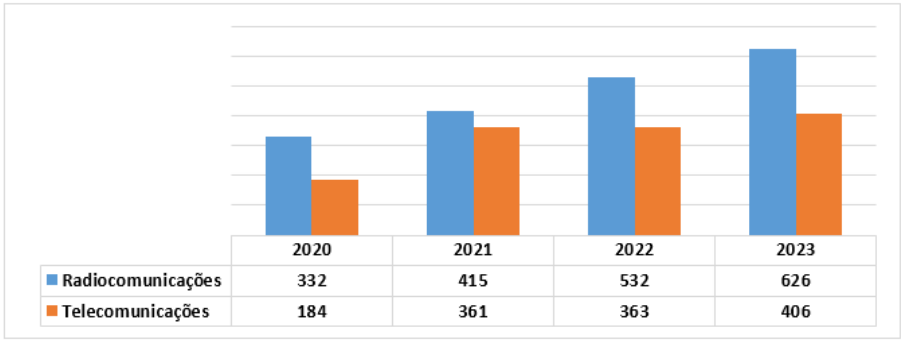
3.4. Equipment Approval and Sealing

As for the approval and sealing of equipment, 1,032 approval certificates were issued in 2023, 626 in the radiocommunications sector and 406 in the telecommunications sector. In the same period, 1,355,764 equipment were sealed in coordination with the CSET Consortium.

The sealing of equipment began in July 2022, and as a way of encouraging adherence to it, in 2023 the INCM launched an extraordinary sealing programme lasting six (6) months for equipment existing in Mozambique since 2018. The process consists in sealing all radio and telecommunications equipment entering national territory.

3.4.1. Number of Approved Equipment

The analysis of the data on radio and telecommunications equipment approvals shows continuous growth over the last few years, culminating in 2023 with the highest figures of the period under review. In 2023, 626 radiocommunications devices were approved, representing an increase of 17.7% compared to 2022, which registered 532 approvals. This continued growth demonstrates a robust and growing demand for radiocommunications infrastructure, possibly reflecting the expansion of emerging services and technologies in this sector.



	2020	2021	2022	2023
Radiocomunicações	332	415	532	626
Telecomunicações	184	361	363	406

***Figure 13**- Chart of approved equipment by 2023.*

In the telecommunications industry, growth was also significant, although lower in radiocommunications. In 2023, 406 telecommunications devices were approved, an increase of 11.8% compared to 2022, which registered 363 approvals. This increase suggests continued evolution in the telecommunications infrastructure, which continues to expand to support the growing demand for connectivity and digital services.

The overall picture since 2020 shows an upward trend in approvals in both fields, indicating an expanding market and

constant adjustment to new technological requirements. 2023 particularly stands out not only for the high number of approvals, but also for the industry's ability to sustain progressive growth, reflecting significant investment and a continued commitment to modernising communications.

3.5. Inspection

As part of the activities to inspect the terms and conditions of telecommunications licences, scarce resources and the postal service, inspections were carried out in the three regions of the country.

A survey of licences and registrations of entities was carried out on ASMS system and on the Virtual Shop of INCM, which resulted in the consultation of 748 files of licensed and registered entities in the regulator's database as a way of preparing for the inspection activities. As a result, 284 licensed and registered entities were inspected.

There was also an inspection of the obligations of users of radiocommunications and radio broadcasting stations, which included mapping inactive radio broadcasting stations and a survey of expired licences. Also as part of this action, INCM received 19 requests from GABINFO to licence radio broadcasting stations. Out of these, 4 were granted licences and 15 were returned due to the unavailability of FM frequencies for the locations requested.

Regarding the inspection and technical verification of radio emissions, the data of the Radiocommunications System was updated; field activities were carried out in twenty-one (21) administrative posts and districts in Maputo Province.

3.5.1. Measurement of Electromagnetic Radiation Fields

INCM, among other duties, also monitors compliance with the reference levels for the intensity of Electromagnetic Fields (EMF) emitted by radio stations, in order to ensure the protection of the population from EMF exposure.

During the period under review, EMF measurements were carried out in the provinces of Manica and Zambézia, at different points covered by 20 radio stations, of which 6 broadcasting stations and 14 mobile phone service base stations in 2G, 3G and 4G technologies. The tests were carried out using the Narda SEM 3006 selective analyser, with an electric field probe from 200 MHz to 3GHz. The measurements were carried out in outdoor locations that were easily accessible to the public, with the probe positioned at a height of 1.5 metres.

As a result of the measurements, it was found that no station is transmitting outside the reference levels established by the International Commission on Non-Ionising Radiation Protection (ICNIRP) regarding human exposure to radiation.

3.5.2. Survey Inspections

As part of the survey and inspection activities, the video and communications control rooms and the signalling control room from the company *Caminhos de Ferro de Moçambique* (CFM) were visited, where it could be seen that the tests are taking place without any interference with the route of the Ressano Garcia line. The final implementation of the telecommunications network complies with the recommendations of the UIC (International Union of Railways), which ensures support for railway signalling, in accordance with the project submitted to the INCM.

Also in this activity, INCM left recommendations for the company to ensure the smooth running and regularisation of certain aspects such as:

- The approval, import and sealing of all network equipment under INCM inspection;
- Licensing of the private network according to the project and payment of the due fees; and
- The joint planning of the route along the Ressano Garcia line, to carry out an inspection of all the sites deployed.

Still within this context, the CFM's Railway Telecommunications System was inspected and technically checked in order to monitor the installation tests of the advanced mobile network, based on LTE to provide data, voice and video services for railway applications, as part of the request for the use of frequency spectrum.

As part of the inspection of the terms and conditions of the licences, a campaign was carried out to check the registration and purchase of SIM cards and the sale of top-ups from mobile phone operators in neighbouring countries (Malawi, Zambia and Zimbabwe). This activity took place in Tete city and Moatize, in the districts of Changara, Marara, Cahora Bassa, Mágoè, Chiúta, Chifunde, Macanga and Tsangano. Top-ups from the NetOne and Econet operators were also verified in the Mágoè-Mucumbura border district.

Visits were made to the authorised agents and resellers of the national mobile phone operators to assess the degree of compliance with the regulations on SIM card registration and activation. This inspection revealed the existence of SIM cards that had already been registered by the resellers of the mobile operators (Vodacom, SA and Movitel, SA) and were available for immediate use. These cards were registered using the identity cards of family members and friends of the resellers and sold to the public at a cost ranging from 30.00 MT (thirty meticais) to 100.00 MT (one hundred meticais). This action resulted in the seizure of 88 (eighty-eight) SIM cards, 72 (seventy-two) of which in the districts of Mágoè - Mucumbura border, two (2) in Tsangano and 13 (thirteen) in Chifunde - Cassacatiza border.

As a way of dissuading this type of business, there was an awareness-raising campaign for employees and resellers, calling on them to abandon these practices, at the risk of losing their resale rights or, in the worst-case scenario, being accused of crimes perpetrated through the cards they have registered, since the purpose for which the respective numbers have been or will be used is doubtful.

In the districts of Changara, Marara, Cahora-Bassa, Chiúta and Macanga, the sale of registered SIM cards and top-ups from neighbouring countries was not found. The agents of the national operators duly register the SIM cards and they were encouraged to continue with good practice.

It was noted that in all the districts visited, there is speculation about the selling price of SIM cards, which vary between MZN 10.00 (ten meticais) and MZN 50.00 (fifty meticais), with the SIM Card of Movitel, SA being the most expensive. Therefore, there is a need to approach the operators to find out the price recommended to their authorised agents and then harmonise it.

A visit was also made to the cities of Tete and Moatize and to the banking institutions holding VSATs, to ascertain their legality. During this visit, it was found that none of the banks had any documentation proving their rights to use the VSATs.

Thus, the entities were notified to contact their providers to present the licences to carry out telecommunications activities to the Tete Provincial Delegation of INCM. As these were institutions based in Maputo City, the case was handed over to INCM headquarters to proceed with the next steps.

In the city of Nampula, an inspection was carried out of the companies Youlan Segurança, G4S, Dk Segurança, Arkher, EDM and Sky Net, to assess the extent to which they comply with the industry's operating rules. It was found that all of the companies visited were operating irregularly in the industry, had not provided proof of payment of spectrum

fees, and were using unallocated frequencies, among other irregularities. These entities were notified by INCM to provide clarification and correct their irregularities under penalty of facing severe sanctions.

In Niassa province, the districts of Lago and Lichinga were visited. In these districts, the company CANAS was inspected at the Meponda administrative post, where it was notified for using radiocommunications services. After checking their legality, it was found that they are PMRs (Personal Mobile Radio) which simply need to be approved.

An inspection visit was carried out to the province of Inhambane to check the terms and conditions of the licenses of telecommunications, postal and radiocommunications service operators, importers and equipment resellers, so that they are prepared for the process of sealing telecommunications equipment for sale, as well as locating dubious entities for sending invoices.

In the places where the INCM visited, it was found that, overall, all the entities that operate radio stations do not have the equipment (transmitter, cables and antennas), so they were notified to regularise this detail.

3.5.3. Penalties and Sanctions

INCM fined 77 (seventy-seven) entities in 2022, where it was found that 16% of inspection interventions are related to entities that do not have a Class 'C' Licence, resulting from the screening of imported equipment at customs clearance at borders, 23% for failure to request Cancellation, 26% related to Approvals, 14% with payment of the Annual Spectrum Fee, 20% Radiocommunications Licence and 1% with payment of a fine.

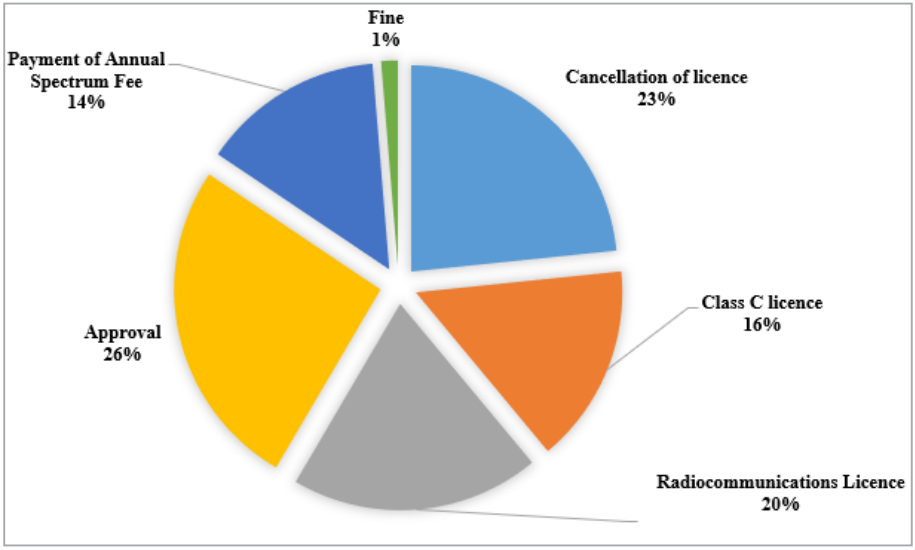


***Figure 14** - Summary of infringements in 2023.*

4. QUALITY OF SERVICE

This chapter presents a comparative analysis of the performance of operators TMCEL, VODACOM and MOVITEL in 2G, 3G and 4G technologies, highlighting the challenges they face in terms of coverage and quality of service. TMCEL has greater difficulties, especially in 3G coverage and the absence of services in several locations. VODACOM shows a more consistent performance, although it still needs to improve in specific 2G and 4G areas. MOVITEL, with intermediate performance, needs actions to strengthen its 2G networks and improve consistency in 3G and 4G. The chapter suggests that specific interventions are needed for each operator to improve the quality of service for users.

4.1. Mobile Telephony Network Coverage

The figure below represents the extent of mobile telephony coverage in Mozambique by the end of 2023, classified by locality, and shows a variable distribution of telecommunications infrastructure throughout Mozambican territory. According to the legend, in terms of:

- **Areas with strong coverage:** the locations with the highest density of antenna sites (between 377 and 1122), highlighted in dark blue, are mainly concentrated in urban and economically active areas, especially Maputo Province and Maputo City and some provincial capitals in the centre and north of the country. These regions have a high level of connectivity, reflecting targeted investments to meet high population and economic demand.
- **Intermediate coverage:** the locations with an average density of sites (between 135 and 376), highlighted in blue and lighter green, are more widely distributed, covering suburban and semi-urban areas. This suggests efforts to expand the infrastructure, but still with some limitations regarding universal access.

- **Limited coverage:** locations with a low density of sites (between 42 and 134) or very low (between 1 and 41), highlighted in cream, are concentrated in rural and hard-to-reach areas. These regions face significant challenges in terms of connectivity, limiting access to digital and communication services.
- **Areas without coverage:** The map also identifies locations without coverage, highlighted in yellow. These areas are predominantly in remote regions, indicating the need for additional initiatives to ensure digital inclusion.

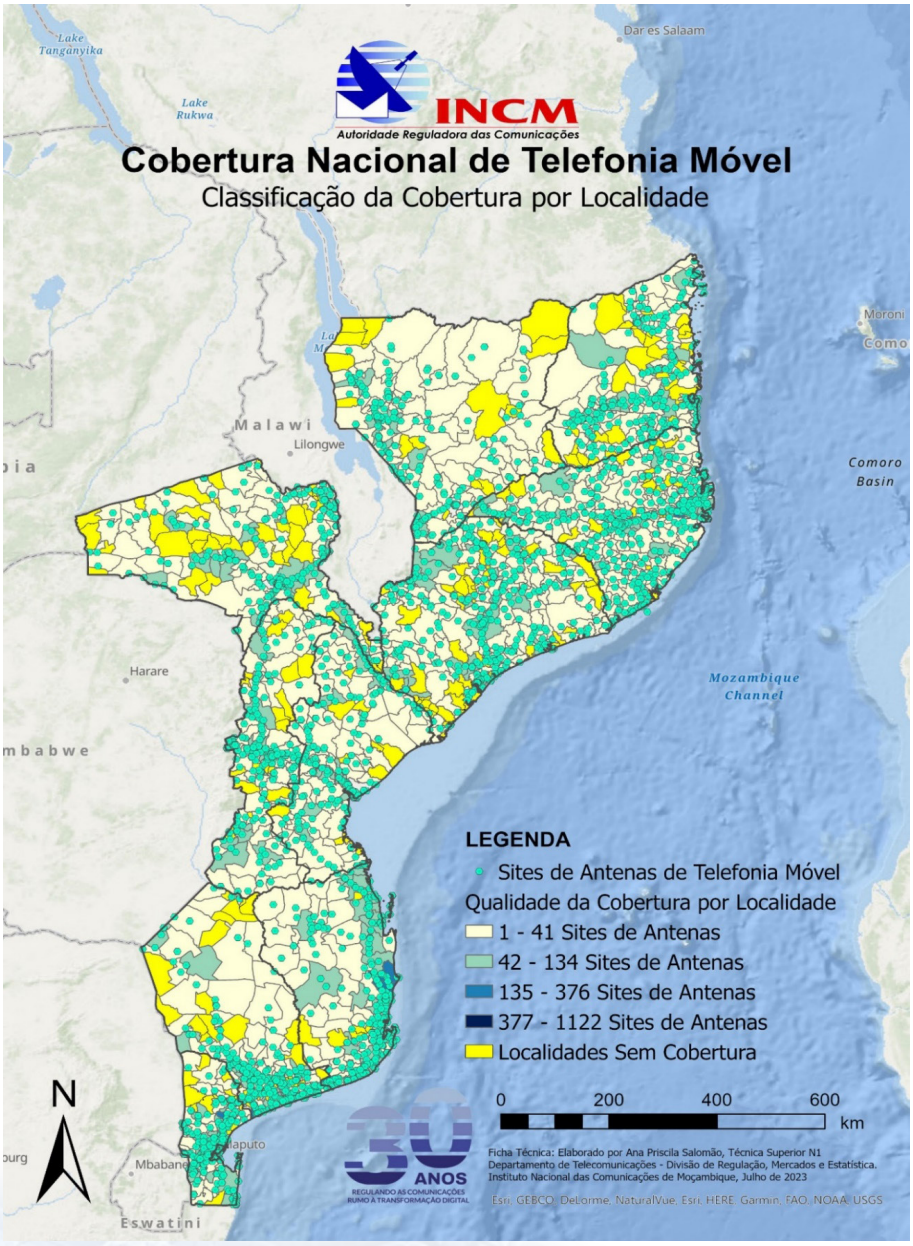


Figure 15 *- Mobile telephony coverage by 2023.*

By the end of 2023, Mozambique will have made significant progress in mobile telephony coverage, but there are still significant geographical discrepancies. Expanding infrastructure to rural and uncovered areas should be a strategic priority, considering the importance of connectivity for socio-economic development. The Mozambique Digital Acceleration Project (MDAP) can play a key role in strengthening this coverage.

4.1.1. Evolution of the 2G Mobile Network

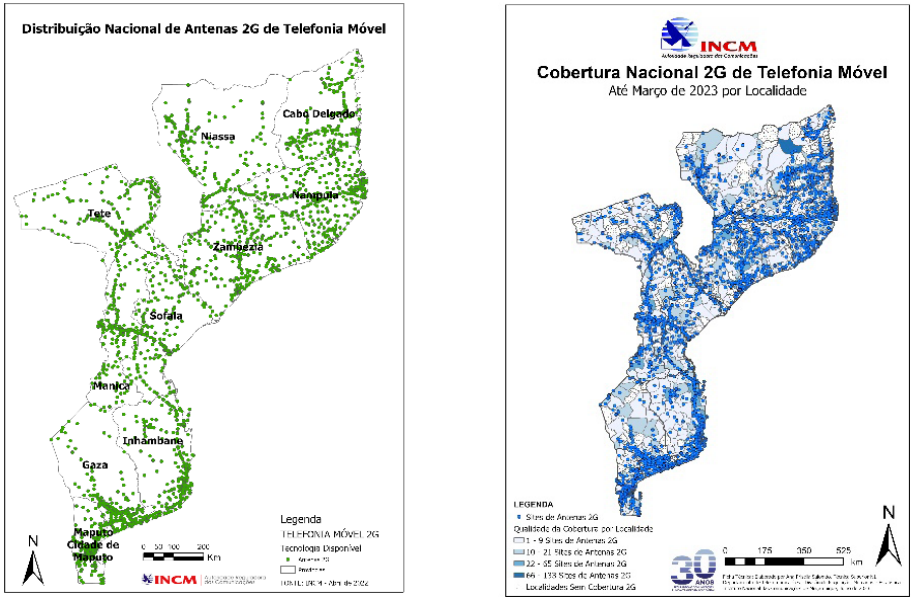


***Figure 16**- Analysis of the 2G mobile telephony network from 2020 to 2023.*

The map on the left (2020-2021) shows a moderate presence of antennas distributed throughout the country, with a higher density in urban areas and along the main transport corridors. Some inland regions have gaps in coverage, especially in the more remote provinces such as Gaza, Tete, Niassa and Cabo

Delgado. On the other hand, coastal areas and cities such as Maputo, Beira and Nampula have a higher concentration of sites, reflecting the focus on more economically and demographically relevant areas.

The most recent map, on the right, shows a significant expansion in 2G coverage, with an increase in the number of antennas visible in almost all provinces. For example, areas previously without coverage, especially in inland regions such as Tete, Zambézia and Niassa, show a considerable improvement in the density of 2G sites. In addition, the legend details the quality of coverage by location, with a classification based on the number of sites (1-9, 10-21, 22-65 and 66-133). This approach provides a more detailed view of coverage capacity, and while the number of sites without coverage has decreased, there are still isolated areas without access to the network.

As conclusions on the evolution of the expansion of the 2G mobile telephony network by 2023, it can be said that from the perspective of geographical expansion, there has been a clear expansion of the infrastructure, evidenced by the greater number of sites in previously unserved regions. More remote provinces, such as Niassa and Cabo Delgado, have received greater attention, reflecting efforts to reduce inequalities in access. Despite advances and improvements in network planning by mobile phone operators, some areas remain uncovered, which indicates opportunities for new investment and expansion of the 2G network.

4.1.2. Evolution of the 3G Mobile Network

From the distribution perspective of 3G antennas, in 2020-2021 (the map on the left) coverage was evident in several provinces of the country, but it can be noted that the density of antennas is mainly concentrated in coastal regions and urban areas. In 2022-2023 (the map on the right) the density of 3G antennas increased substantially, with a significant expansion compared to previously less covered areas, including rural and remote regions.

This means that from the perspective of the level of geographical expansion, the 3G network, which was previously limited to areas of greater population or economic density, by 2023 will cover a larger portion of the national territory, reaching remote locations. For example, the southern region, which already had good coverage, in 2023 shows an even greater density of antennas, consolidating access, while growth in provinces such as Niassa, Cabo Delgado and Zambézia is significant, indicating policies aimed at increasing coverage in these regions.

In conclusion, it can be said that there has been significant progress in 3G network coverage in Mozambique. This progress reflects the impact of investments in infrastructure and a deliberate effort to reduce inequalities in digital access, especially in rural regions. However, there is room for improvement on the part of mobile phone operators, particularly in the locations that remain without 3G coverage, with a focus on the countryside of the provinces of Niassa, Tete, Gaza and Inhambane.

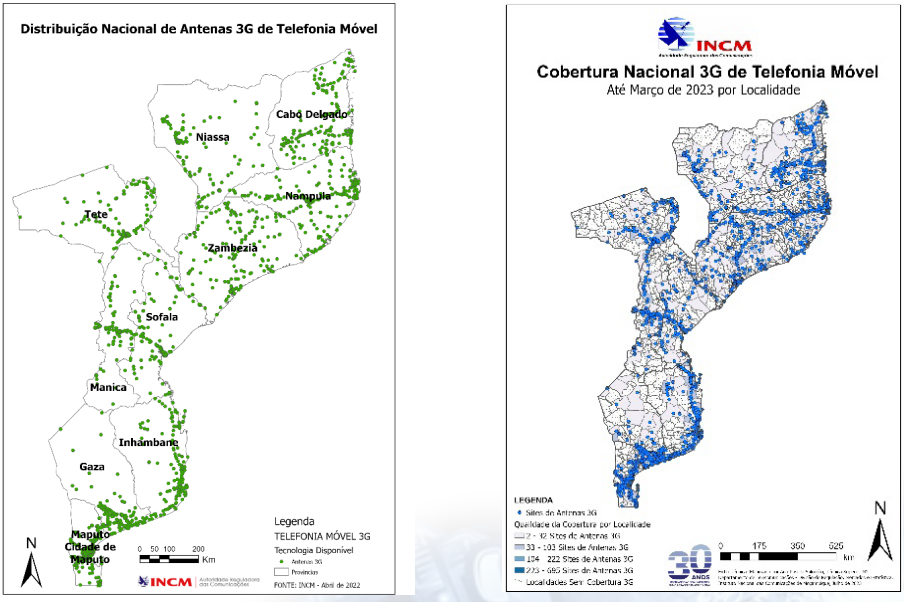


Figure 17 *- Analysis of the 3G mobile phone network from 2020 to 2023.*

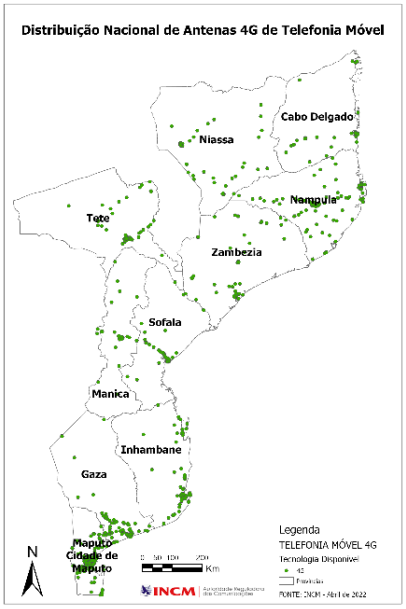
4.1.3. Evolution of the 4G Mobile Network

In 2020-2021 (map on the left), 4G coverage was more limited and concentrated mainly in the provincial capitals and some cities of greater economic importance, such as Maputo, Nampula and Beira.

In 2023, however, there was a significant expansion in the distribution of 4G antennas, covering many more locations and extending coverage to rural and inland areas. The map details the quality of coverage, with a greater density of antennas in specific locations, which indicates greater capacity and improved service.

The southern region, which already had good coverage in 2020-2021, experienced network consolidation and densification, and the provinces in the centre and north, such as Niassa, Cabo Delgado and Zambézia, witnessed the greatest expansion, with a significant number of new locations covered by the 4G mobile phone network.

In terms of the impact of digital inclusion, the expansion of the 4G network reflects an ongoing effort by mobile phone operators to improve digital inclusion in Mozambique, ensuring that more people have access to high-speed internet services.



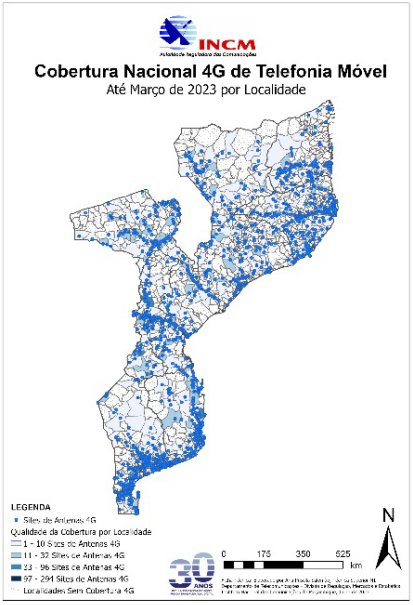


Figure 18 *- Analysis of the 4G mobile phone network from 2020 to 2023.*

Thus, it can be concluded that by 2023 there has been substantial progress in 4G network coverage in Mozambique. The increase in the density and distribution of antennas demonstrates significant investments in telecommunications infrastructure and in reducing the digital divide. However, there are still challenges in the more remote regions, where additional efforts will be needed to achieve universal coverage.

4.2. Uncovered Areas

4.2.1. Administrative Posts Not Covered

The analysis of mobile telecommunications coverage in Mozambique identified gaps in 13 administrative posts that remain without coverage in 2023. These posts are spread across seven (7) provinces and twelve (12) districts, revealing regional inequalities in access to telecommunications services.

The lack of coverage at these administrative posts, as indicated in the table below, represents an obstacle to digital inclusion, thus, hindering access to basic digital services and limiting possible opportunities for local development.

PROVINCE	DISTRICT	ADMINISTRATIVE POST
Tete	Cahora Bassa	Chintholo
Tete	Marávia	Chipera
Niassa	Ilha Licom	Ilha Licom
Niassa	Ilha Risunodo	Ilha Risunodo
Maputo	Marracuene	Machubo
Gaza	Chongoene	Madzucane
Cabo Delgado	Mocímboa da Praia	Mbau
Niassa	Nipepe	Muipite
Manica	Macossa	Nguawala
Cabo Delgado	Namuno	Papai
Cabo Delgado	Ibo	Quirimba
Cabo Delgado	Macomia	Quiterajo
TOTAL		**12**

Table 7: *Administrative positions not covered until 2023.*

4.2.2. Localities Not Covered

In terms of localities, by 2023 Mozambique had considerable coverage with a total of 1225 localities throughout the country, of which 989 have coverage and 236 localities remain without coverage. Analysing the distribution of coverage:

- 989 localities (approximately 80.7% of all localities) have telecommunications coverage, representing most localities in Mozambique. This figure indicates a significant advance in telecommunications infrastructure, with a positive impact on access to essential services such as health, education and digital connectivity;
- 236 localities (approximately 19.3% of the total) still lack coverage, meaning that a considerable part of the population, especially in rural and remote areas, remains disconnected from the telecommunications infrastructure. The lack of coverage in these localities, particularly in more remote areas, demonstrates the need for continued investment to guarantee digital inclusion and reduce regional disparities.

As solutions and recommendations, Public-Private Partnerships (PPPs) should be considered to encourage collaboration between the government and operators to develop infrastructure in hard-to-reach areas; the use of alternative technologies to explore options such as satellites and alternative mobile networks to cover remote areas and finally government subsidies: with a view to implementing tax and financial incentives for operators who choose to invest in infrastructure in these localities.

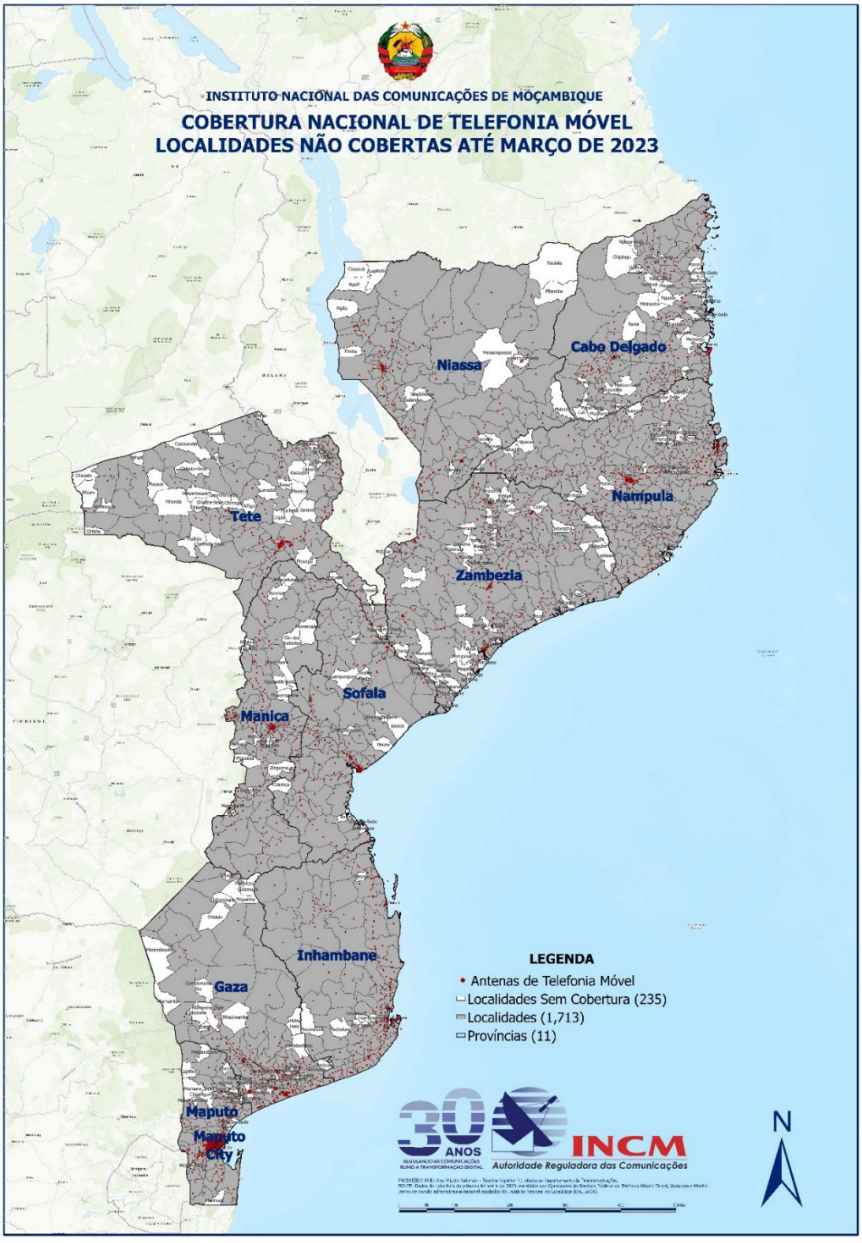


***Figure 19** - Analysis of areas not covered by localities.*

4.3. Monitoring the Quality of Services of Telecommunications Operators

Within its powers, INCM is responsible for monitoring the quality of the service provided by operators in the licensed telecommunications industry, to guarantee consumer protection and encourage competition.

In accordance with Article 10 of the Regulation on the Quality of Public Telecommunications Services, approved by Decree No. 6/2011 of 3 May, INCM carried out nationwide Drive Test campaigns covering different cities, municipalities and districts in 31 geographical areas.

The Drive Test consisted of tests to assess the quality of mobile telecommunications services in voice and data services. The assessment of coverage was carried out in 29 (twenty-nine) geographical areas, in the cities of Maputo, Matola, Xai-Xai, Inhambane, Beira, Chimoio, Tete, Quelimane, Nampula, Nacala Porto, Lichinga and Pemba.

In the districts, the assessment of coverage was carried out in Nova Mambone, Buzi, Balama, Manica, Angónia, Marrupa, Catandica, Mossuril, Chókwè, Massingir and in the municipalities of Vilankulo, Bilene, Moatize, Ilha de Moçambique, Lago, Namaacha and Montepuez.

Still within the scope of monitoring the quality of services provided by mobile telecommunications operators, a test was carried out to assess the deployment of 5G technology on the Vodacom, SA network.

4.3.1. Summary of 2G Coverage Targets

The analysis of 2G coverage targets reveals specific challenges faced by operators TMCEL, VODACOM and MOVITEL in different localities. The target set for reception (Rx Level) should be equal to or greater than -85 dBm in 95% of measurements. However, each operator failed in several areas.

TMCEL failed to meet the target in 15 localities, with the districts of Lago and Marrupa standing out, where coverage levels were particularly low, with only 15% and 1% adequate coverage, respectively. Other areas, such as Inhambane (68%) and Xai-Xai (77%), also showed insufficient coverage, signalling the need for substantial improvements.

In comparison, VODACOM faced even greater challenges, with the highest number of sites (18) not in compliance. The districts of Balama and Nova Mambone were particularly problematic, with coverage levels of just 72% and 59% respectively. Thus, it is necessary for VODACOM to intervene more comprehensively to improve its coverage and consequently reach the targets set.

On the other hand, MOVITEL had the lowest number of localities (11) off target. However, coverage in the district of Nova Mambone was particularly low at 67%, followed by Vilankulo at 82% and Manica at 77%. Although MOVITEL has performed relatively better, there are still areas that require attention to ensure full compliance with the target.

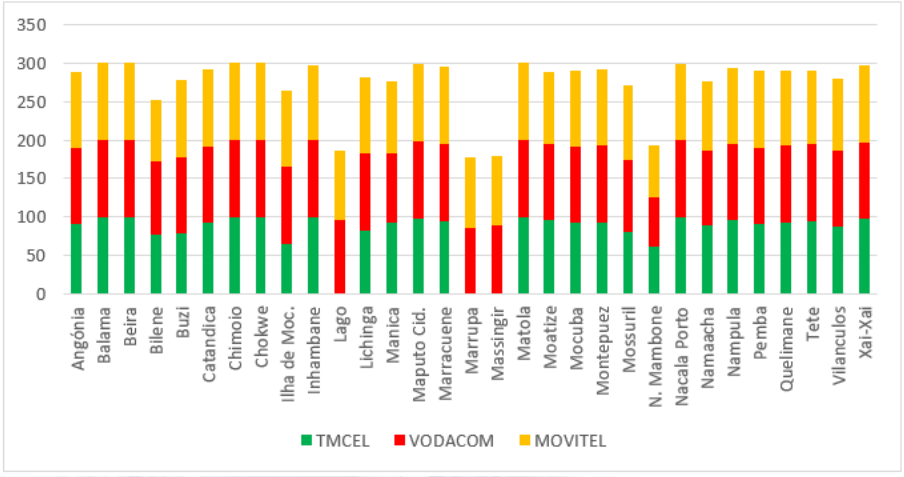


***Figure 20**- 2G Coverage Targets.*

4.3.2. Summary of 3G Coverage Targets

The comparative analysis between the operators TMCEL, VODACOM and MOVITEL regarding the 3G coverage targets in the localities where Quality of Service (QoS) tests were carried out reveals significant differences in the performance of each. The target set for all of them is an Rx Level equal to or greater than -95 dBm in 95% of the measurements. However, each operator faces its own challenges in meeting this target.

During the QoS process, TMCEL failed to meet the target in 19 localities, which indicates significant challenges in its network infrastructure. Critical problems were observed in Nova Mambone, with coverage of just 61%, and Ilha de Moçambique, with 65.01%. Other areas, such as Lichinga (82.52%) and Mossuril (80.12%), also had insufficient coverage.

The total absence of services in Lago, Marrupa and Massingir is a particularly disturbing issue, highlighting the urgent need for significant improvements to their 3G network.

On the other hand, VODACOM performed better compared to TMCEL but still failed to reach the target in six localities. Nova Mambone, with 64.4% coverage, was the most problematic area for VODACOM. Despite having fewer localities off target, the operator still needs to improve in Bilene (94.98 per cent) and Mossuril (94.46 per cent), where coverage was slightly below expectations. Overall, VODACOM demonstrated more consistent coverage but still faces specific challenges that need to be addressed.

Finally, MOVITEL failed to meet its target in nine localities, particularly Nova Mambone, with coverage of just 67.4%. Other problem areas include Vilankulo (92.27%), Manica (94.24%) and Marrupa (91.79%). Although MOVITEL has fewer off-target localities compared to TMCEL, it needs specific actions to improve its coverage in critical areas and reach the required 95%.

To improve 3G coverage, each operator needs to adopt strategies targeted at its problem areas. TMCEL should prioritise the restoration of service in places without coverage and strengthen its infrastructure in critical areas. VODACOM should focus on increasing coverage in its specific problem areas, while MOVITEL should concentrate its efforts on improving coverage in localities where it is close to the target, thus ensuring an overall improvement in its quality of service.

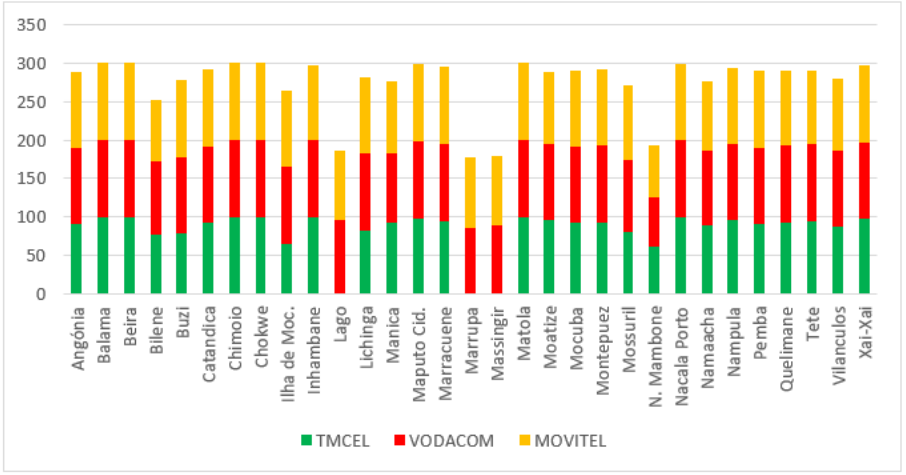


***Figure 21**- 3G Coverage Targets.*

4.3.3. Summary of 4G Coverage Targets

The analysis of the 4G coverage targets reveals different challenges faced by operators TMCEL, VODACOM and MOVITEL in several localities. The target is to achieve a reception level (Rx Level) equal to or greater than -105 dBm in 95% of measurements. The operators experienced difficulties in meeting this target in several areas, as detailed below:

TMCEL failed to reach the coverage target in 14 localities. The problem areas include Nova Mambone, with coverage

of just 52.15%, and Mossuril, with 64.03%. In addition, localities such as Bilene (81.84%) and Mocuba (79.68%) fell short of the expected target. The total absence of services in Buzi, Catandica, Lago, Marrupa and Massingir stresses the urgent need for interventions to improve coverage in these places.

On the other hand, VODACOM outperformed TMCEL, but still failed to meet the target in seven localities. The main problem areas for VODACOM include Nova Mambone, with 83.15%, and Mossuril, with 88.13%. Lago (93.96%) and Namaacha (94.68%) are also among the areas in need of improvement, although they are closer to achieving the target.

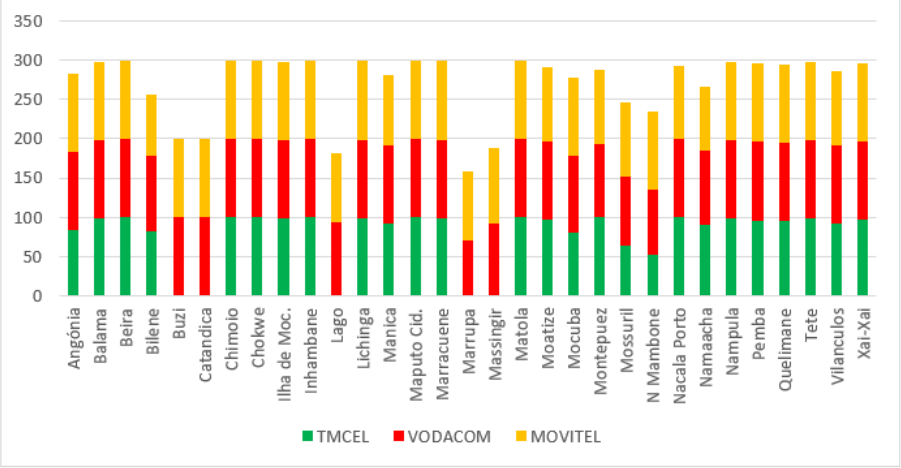


***Figure 22**- 4G Coverage Targets.*

Finally, MOVITEL failed to meet its coverage target in nine localities, the areas with the lowest coverage being Namaacha (81.41%) and Bilene (78.18%). Followed by Nacala Porto (92.22%) and Manica (89.25%). These results indicate that MOVITEL needs to implement specific improvements to achieve the coverage target in all critical areas.

In general, these analyses stress that although operators differ in their performance, they all face significant challenges in certain localities. Improvements focused on network infrastructures are needed if each operator is to achieve the 4G coverage target that has been set.

4.4. Quality of Television Services

The migration from analogue to digital television ended in December 2019, with the installation of 60 transmitters making it possible to switch off analogue transmitters and retransmitters throughout the country.

During the period under review, using a broadcasting signal analyser, which enables the demodulation and decoding of digital TV signals, measurements were taken to assess the quality of the digital television service in the provinces of Maputo City, Maputo Province, Inhambane and Manica, for the 578 Mhz and 650 Mhz frequencies. The measurements were made at 21 points located at an average distance of 15 kilometres from the transmitter.

By analysing the Modulation Error Rate (MER) parameter, which is the parameter that indicates the stability of the service, as a result of the measurements, it was concluded that all the measurement points showed an average level of service stability ranging from acceptable to high.

4.5. Consumer Protection

The development and implementation of communication and customer service platforms are key to ensuring that

citizens can exercise their rights effectively and get adequate support when needed.

This section looks at two crucial initiatives: the Consumer Portal and the Customer Service, created with the purpose of making INCM more accessible, inclusive and comprehensive. Call statistics and the types of interactions carried out are analysed, as well as highlighting the trends, challenges and opportunities for improving these platforms.

4.5.1. Customer service

The Customer Service, available on 1789, is operational 24 hours a day and offers service in six (6) languages: Portuguese, English, Xi-changana, Xi-sena, E-makua and Echuwabo. The service is free for all customers of the three national mobile phone operators.

Created with the purpose of making the regulator more accessible, inclusive and comprehensive, the line has played a fundamental role and is currently the platform most used by consumers in the sector. This scenario reflects a reality characterised by a high illiteracy rate and limited purchasing power for devices with internet access in the country. The line is crucial to ensuring that all consumers, regardless of their circumstances, can communicate and interact with the regulator effectively.

During 2023, the line received a total of 7,105 calls, which reflects the continued demand and importance of this communication channel for Mozambican consumers, of which 1,602 were handled by agents, demonstrating the line's ability to provide direct support to consumers.

MONTH	INCOMING CALLS	CALLS HANDLED BY AGENTS	AFTER-HOURS CALLS	CALLS HANDLED BY IVR	DROPPED CALLS
March	1686	392	593	304	397
April	352	108	83	75	86
May	438	104	114	103	117
June	583	119	144	114	206
July	604	106	242	115	141
August	721	148	274	116	183
September	606	118	233	111	144
October	668	121	305	109	133
November	517	121	189	99	108
December	930	265	310	175	180
TOTAL	**7105**	**1602**	**2487**	**1321**	**1695**

***Table 9**: Customer Service Calls.*

However, 2,487 calls were registered outside of business hours, which underscores an opportunity to optimise opening hours or improve communication about available hours. Additionally, 1,321 calls used only the IVR (Interactive Voice Response) without the need for interaction with agents, suggesting that a significant proportion of consumers access the service to obtain automated information. On the other hand, 1,695 calls were dropped before being answered, which may indicate subscriber frustration or the need for improvements in service efficiency.

This data provides valuable information on the use of the 1789 line, pointing to areas of potential improvement, both

in service and in the management of time and resources, with the purpose of improving the consumer experience and reducing the number of unanswered or dropped calls.

4.5.2. Consumer Portal

The Consumer Portal, launched on 15 March 2023, can be accessed by any Internet-enabled device via the link https://consumidor.incm.gov.mz/ . Since its launch until December 2023, the portal has been visited 2,755 times, reflecting its growing reach and importance as a tool for empowering Mozambican consumers.

The Portal offers information, tools and services that allow consumers to exercise their rights, as well as acting as a direct channel of communication with the INCM. It has proved to be essential in promoting consumer education and protection, registering 44 submitted complaints up to the date of this report.

The telecommunications industry registered a high number of complaints, totalling twenty-five (25), which reflects a significant demand for improvements and problem-solving in this segment. In contrast, the broadcasting industry registered only two (2) complaints, indicating a lower incidence of problems or dissatisfaction among consumers. Similarly, postal services also accounted for two (2) complaints, suggesting relative stability or satisfaction with the services offered. Furthermore, there were fifteen (15) complaints relating to issues outside the Portal's scope of action, which may indicate the need for greater clarity for consumers about the platform's functions and limitations.

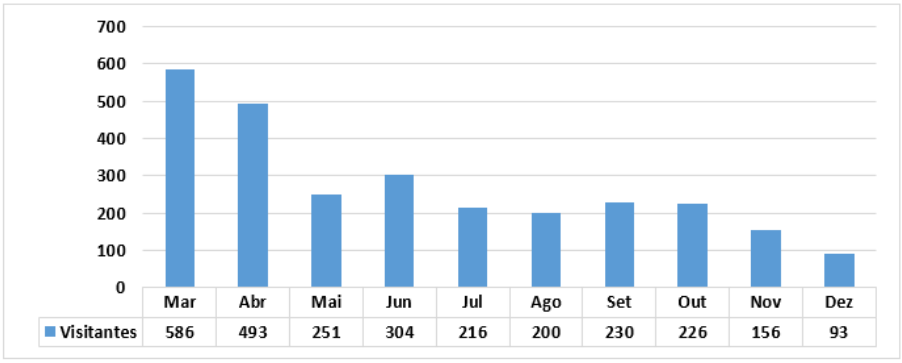


***Figure 23** - Visitors to the Consumer Portal from March to December 2023.*

Interactions by users of communication services reflect the growing impact and usefulness of the Consumer Portal, categorised as follows:

- **Requests for Information:** Most interactions, representing 68% of the total, were related to requests for information, totalling 1,355 registrations. This demonstrates the educational and informative role of the Consumer Portal, which is widely used by the public to clarify doubts and obtain guidance on their rights and duties, reinforcing its effectiveness as a citizen support tool.
- **Complaints:** Complaints, which make up 13% of interactions, totalled 265 registrations in 2023. These figures reflect a considerable level of dissatisfaction or the need for mediation between consumers and suppliers, stressing the importance of the Consumer Portal as an official and reliable channel for settling disputes and protecting consumers' digital rights.
- **Other (outside the scope of the Portal**):. A total of 384 interactions (19%) were registered which, although outside the direct scope of the Portal, demonstrate the continuous search by consumers for information and support, even in areas not directly covered by the services offered. This shows the trust placed on the Portal as a source of guidance and assistance on a range of consumer issues.

5. UNIVERSAL ACCESS SERVICE

This chapter looks at the initiatives implemented by the Universal Access Service Fund (FSAU) in 2023, with a focus on strengthening the digital and educational infrastructure in Mozambique. Among the projects highlighted are the installation of Computer Rooms to enhance learning in selected schools, the implementation of Digital Squares to offer free internet access in public spaces, and the creation of Digital Satellite Television sites in remote areas to improve access to information and entertainment.

Furthermore, the project to expand the cellular mobile phone network seeks to revitalise inactive stations, ensuring that previously underserved communities have access to communication services. These initiatives not only promote digital inclusion, but also contribute to sustainable development, social equity and improved quality of life throughout the country.

5.1. Funding for the Computer Room at the Opening of the School Year

Every year, FSAU plays a crucial role in strengthening Mozambique's educational infrastructure. In collaboration with the Ministry of Education and Human Development, the FSAU selects a school to receive funding to equip classrooms. The purpose of this support is to purchase modern IT equipment and essential furniture to create more dynamic and inclusive learning environments.

The choice of beneficiary school is aligned with the central opening ceremonies of the school year, which traditionally take place between the end of January and the beginning of February. In 2023, Mocubela Secondary School, located in Zambézia Province, was selected for this significant project. The institution received not only computers and school

furniture, but also air conditioning equipment, ensuring a more comfortable and efficient learning environment for students and teachers.

This funding programme not only improves the material conditions of schools, but also seeks to promote digital inclusion, enabling students to develop crucial skills for the 21st century. The FSAU initiative reflects an ongoing commitment to quality education and the sustainable development of the Mozambican education system.

The positive impact of this project can be seen in increased motivation among students and teachers, as well as improved academic performance. Access to modern technologies that facilitate the implementation of innovative teaching methodologies and prepare students for the challenges of the global labour market.

5.2. Project for Digital Television in the Localities

The Project for Digital Television in the Localities is a strategic initiative of the FSAU, which seeks to bring entertainment, education and up-to-date information to communities in remote areas of the country. The central purpose of this initiative is to create public places to access digital satellite television in districts or localities that currently don't have this service, thus promoting digital inclusion and access to information for everyone.

By the end of 2023, the FSAU had delivered porches equipped with digital television technology to the following localities:

- Locality of Hate-hate, in the district of Chibuto, province of Gaza;
- Locality of Bongonhe, in the district of Mossurize, Manica province; and
- Localities of Nemone and Iaba, in Zambézia Province;

These porches act as essential community centres, providing communities with a meeting place and access to educational and entertainment content. With this initiative, the FSAU not only reduces the digital divide, but also improves the quality of life in rural areas by promoting digital inclusion. The project ensures that all citizens have equal access to information and knowledge, fostering sustainable development and promoting social equity in the country.

5.3. Cellular Mobile Phone Network Expansion Project

The cellular mobile phone network expansion project aimed to revitalise abandoned FSAU-funded stations. This project was carried out in partnership with the operator Vodacom, SA. Nine decommissioned sites were restored, ensuring that these communities once again had access to mobile phone services.

Besides revitalising abandoned sites, the FSAU also promoted the sharing of infrastructure at three sites that were in operation under MOVITEL's management. These sites, originally built with funding from the Fund, now offer support for multiple operators, optimising resources and extending network coverage to areas that still suffer from a lack of connectivity.

This initiative not only improves telecommunications infrastructure in areas without coverage, but also strengthens strategic partnerships between operators, promoting the efficiency and sustainability of mobile phone services. By ensuring that more communities have access to communication services, the project contributes to digital inclusion, economic development and improved quality of life in the beneficiary regions.

Revitalisation and infrastructure sharing are important steps to ensure that mobile connectivity expands in a sustainable and effective way, aligning with national development objectives and promoting a more competitive environment in the telecommunications industry.

5.4. Digital Squares Project

In 2023, the FSAU focussed on restoring and maintaining the Digital Squares that are not in operation. The Digital Squares Project proved to be unsustainable, since the FSAU not only had to install the squares but also cover the costs of providing internet services. The FSAU will carry out studies of sustainable models from a social and financial point of view.

The Digital Squares Project seeks to offer free broadband internet access in public spaces, promoting digital inclusion and facilitating access to information for all citizens. This initiative seeks to transform squares and other public places into connectivity zones where people can study, work and communicate with the digital world free of charge.

In 2023, the FSAU focussed on replacing and maintaining the Digital Squares, thereby facing significant sustainability challenges. As well as installing the squares, the FSAU also had to cover the ongoing costs of internet services, which proved to be unsustainable in the long term.

In order to address this constraint, the FSAU intends to conduct studies to develop sustainable models from both a social and financial point of view. The study will explore alternatives, such as public-private partnerships, which could help share operating costs and ensure the continued viability of the Digital Squares.

Additionally, the FSAU is analysing the possibility of involving

local communities in the management of the squares, promoting shared responsibility and the efficient use of resources. Collaboration with technology companies and internet providers could also offer innovative solutions, such as the use of renewable energies to power the facilities and the implementation of more cost-efficient technologies.