Applications of DePIN in Africa

The African Web3 landscape has witnessed the fastest growing cryptocurrency adoption in the world, however, the majority of native Web3 products on the continent are aimed at bridging the notable financial inclusion gap. Africa, as a developing continent, faces numerous challenges, particularly in providing basic infrastructure for its entire population. DePIN provides a unique opportunity to use blockchain technology to scale the development of physical infrastructure and increase access to available infrastructure in Africa. The early DePIN applications in Africa appeared in the wireless network, logistics, and renewable energy industries, and with the recent trend in DePIN advancement and awareness, more DePIN applications are expected to arise.

Keywords—DePIN, Africa, blockchain

INTRODUCTION

The high rate of cryptocurrency adoption in Africa is unusual given the continent's regulatory environment. Most African countries prohibit crypto assets or do not have clear regulatory policies in place. The cryptocurrency market in Sub-Saharan Africa increased by 1200% between 2020 and 2021 [1]. A general outlook at the blockchain ecosystem reveals that DeFi (Decentralised Finance) accounts for the majority of blockchain applications in Africa, with a rise in fintech solutions that could grow to a value of $30 billion (USD) [1]. While developing regions are likely to attract a wide range of blockchain technology applications, Africa has a relatively low diversity of blockchain solutions. DePINs (Decentralised Physical Infrastructure Networks) have the potential to create a variety of blockchain applications throughout Africa. The blockchain technology model has the potential to address Africa's two major infrastructure development challenges: access and quality. The technology model, which is already in use in Africa's logistics and wireless network infrastructure, has the potential to reduce access barriers while increasing the motivation of infrastructure providers to improve service quality.

Abbreviations and Acronyms

dApp	(Decentralised Application)
DeFi	(Decentralised Finance)
DePIN	(Decentralised Physical Infrastructure Network)
IEA	(International Energy Agency)
IMF	(International Monetary Fund)
P2P	(Peer to Peer)
UN	(United Nations)

STATE OF PHYSICAL INFRASTRUCTURE IN AFRICA

According to the UN (United Nations), 33 of the world's 46 least developed countries are in Sub-Saharan Africa [2]. In addition, the IMF (International Monetary Fund) classifies all African countries as “developing countries” [3]. These facts roughly depict how Africa's current physical infrastructure has proven insufficient in meeting the needs of its population. Unfortunately, the continent lacks the financial resources necessary to provide basic infrastructure to its growing population of 1.4 billion. There are two fundamental issues with infrastructural development in Africa access and quality [4]. Various studies conducted by international organisations have shown that most parts of Africa lack access to basic infrastructure such as electricity, transportation, and water. For instance, the IEA (International Energy Agency) reports that 43% of Africans, which amounts to about 600 million people, lack access to electricity [5]. The UN, in a distress call for better road infrastructure in Africa, reports that less than one in every three Africans lives within 1km of public transportation, which is the lowest in the world [6]. Basically, the economic inequality in Africa reveals itself in the limited access to infrastructure, which affects rural and low-income communities. Moreover, the poor quality of available infrastructure affects individuals with high incomes.

POTENTIAL OF DEPIN IN AFRICA

The use of decentralised networks as an economic model for the development of infrastructure in developing regions, such as Africa, has the potential to improve global wellbeing at a faster rate. The underlying technology, blockchain, can help improve traditional systems currently in place to scale infrastructural development in Africa. The current centralised entities with the responsibility of handling funds generated for improving physical infrastructure in Africa are susceptible to corruption. The decentralised nature of DePINs can help foster transparency and security in handling these funds and ensuring a matching impact. DePINs can also promote global participation in infrastructure developments in Africa by implementing a suitable tokenomic model that rewards investments in the development of infrastructure in Africa. DePINs can also reduce the barrier to entry for infrastructure providers by leveraging a network effect that subsidises the cost of operation for local infrastructure providers in Africa.

DEPIN PROJECTS IN AFRICA

An inconclusive list of DePIN projects in Africa includes Wicrypt, Kwik Pik, and M3tering protocol.

A. Wicrypt Network

Wicrypt Network is the first African P2P (peer to peer) network of mobile WiFi devices aimed at increasing access to the internet. Since its inception in 2018, the project has raised about $1.5 million and received numerous grants, including a partnership with the government of Enugu State, Nigeria, to provide WiFi services to over 3 million residents [7]. The native token, $WNT, is mined through Wicrypt hotspot devices and used to incentivize Wicrypt hotspot owners to share internet access. At the time of this study, there are over 26 million $WNT currently in circulation, with a market cap of about $7 million [8]. Wicrypt Network's market expansion has resulted in over 1100 hotspots in 30 countries, with approximately 45,000 registered users [7]. Wicrypt is expected to migrate to Peaq's network in early 2024, with the launch of Peaq mainnet. Wicrypt is the first successful use case of DePIN in Africa. The project also serves as a benchmark for building future DePIN applications with attention to infrastructure development problems in Africa.

B. Kwik Pik

Kwik Pik is a logistics DePIN project aimed at expanding market access for local businesses in Africa. The project leverages blockchain technology to enable efficient delivery services across Africa by tracking and registering drivers’ journeys on the Hedera blockchain network. The project is a

decentralised network that facilitates transparent and secured delivery services between drivers and customers. All transactions on the Kwik Pik dApp (decentralised application) are made using the native token $KPL, which could be converted to fiat for withdrawal. Since 2023, Kwik Pik has recorded over 5000 successful deliveries with over 1200 registered users [9].

C. M3tering Protocol

M3tering protocol is a blockchain protocol aimed at scaling energy access in underserved regions by incentivizing energy providers to provide clean energy solutions in these regions. The protocol's native token, $SLX, is actively mined when energy is generated from the tokenized projects on the protocol. $SLX is influenced by the number of energy consumers and providers on the decentralised network. As the network grows, the value of $SLX increases, which in turn incites more participants to join the network, inevitably scaling energy access across regions with limited access to affordable and reliable energy [10]. The project is expected to launch in Q1 2024 on the IoTeX blockchain network.

REFERENCES

[1] Emurgo Africa, "State of Web3.0 in Africa", 2023. https://www.emurgo.africa/reports/emurgo-web-3-0-research-report.pdf.

[2] The United Nations, "List of Least Developed Countries in The World". https://unctad.org/topic/least-developed-countries/list.

[3] The International Monetary Fund, "List of Developing Countries". https://www.imf.org/en/Publications/WEO/weo-database/2023/April/groups-and-aggregates.

[4] Ibrahim Mayaki, "Why Infrastructure Development in Africa Matters". https://www.un.org/africarenewal/web-features/why-infrastructure-development-africa-matters.

[5] The International Energy Agency, "Africa Energy Outlook 2022". https://www.iea.org/reports/africa-energy-outlook-2022/key-findings.

[6] The United Nations Environment Programme, "Better Infrastructure and Policies can Protect A Billion African Pedestrians and Cyclists". https://www.unep.org/news-and-stories/press-release/better-infrastructure-and-policies-can-protect-billion-african.

[7] Abafor Chima, "Wicrypt Partners With Enugu State Government To Provide Jobs And Cheaper Data With Enugu WiFi.". https://medium.com/wicrypt/wicrypt-partners-with-enugu-state-government-to-provide-jobs-and-cheaper-data-with-enugu-wifi-29124f41e8b9.

[8] Coin Market Cap. https://coinmarketcap.com/currencies/wicrypt/

[9] Kwik Pik. https://kwikpik.io/.

[10] M3tering protocol. https://m3tering.whynotswitch.com/