



SDG BLOCKCHAIN ACCELERATOR

Prototype (PoC) Report

1. Project Information

- **Project Name:** AFRIKABAL
- **Challenge & UNDP Office:** Malaysia
- **Document Version:** 1.0.0

2. Project Overview

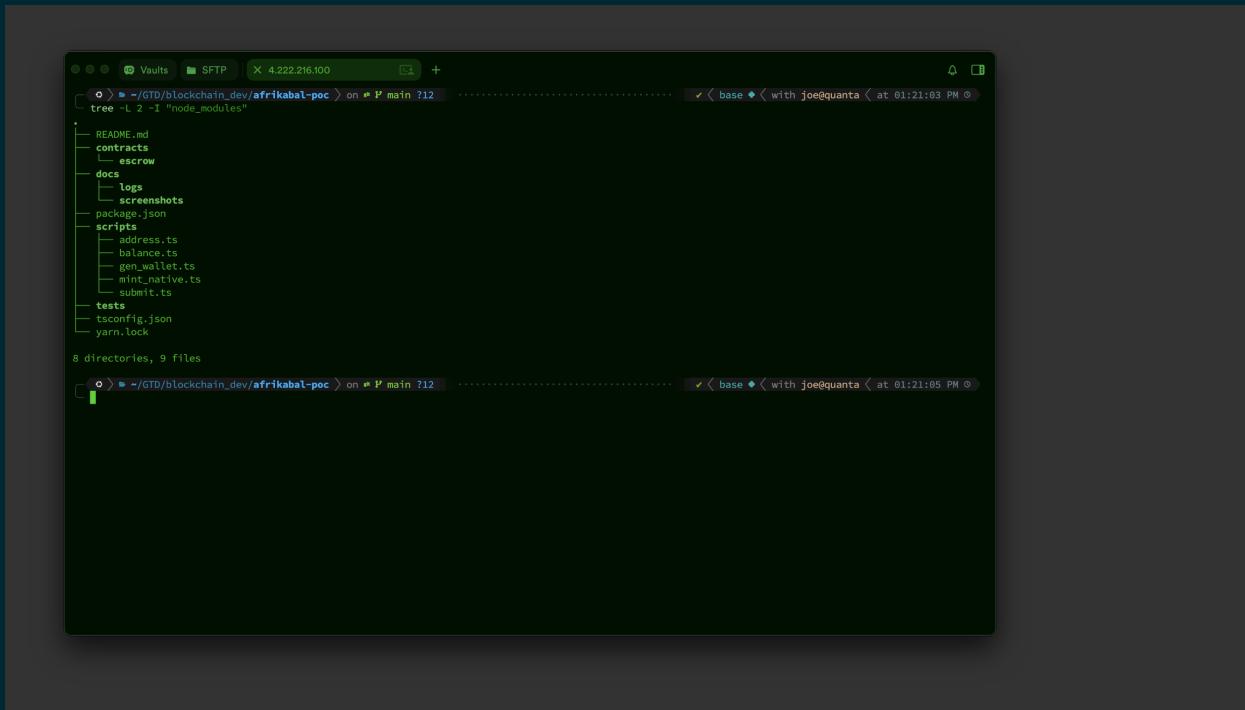
AFRIKABAL delivers a production-style, repeatable pipeline on Cardano Preview for transaction submission and native asset minting. The PoC confirms sprint readiness: builds are deterministic, transactions confirm on-chain, and evidence is captured for audit.

On-chain references: submit TX

32dd4dfcf4e3c44417d212e73b135f23b2265e38fd38600eae41229f9ad733ab; mints
20b44b056f1537bfad20b4857a5f9ce05c679a3eed54c82d0ca6459de6cc17ba,
feed2ef46e9dc926d7556d81ef981eb454ed2b1fb1dabea2e67ccc95686215a1 under policy
35a500e7c84ac216ec87b9965410b6a8f68030f132e9746683c30a94 (asset
AFRIKABALPROOF, supply 2).

3. Repository Structure

Monorepo skeleton (PoC focus):



```
o > ~/GTD/blockchain_dev/afrikabal-poc > on ✨ P main ?12 ..... ✓ base ⚡ with joe@quanta ⌂ at 01:21:03 PM ⌂
tree -L 2 -I "node_modules"
.
├── README.md
├── contracts
├── escrow
├── docs
│   └── logs
│       └── screenshots
├── package.json
├── scripts
│   ├── address.ts
│   ├── balance.ts
│   ├── gen_wallet.ts
│   ├── mint_native.ts
│   └── submit.ts
├── tests
└── tsconfig.json
yarn.lock

8 directories, 9 files
```

4. Build Instructions:

Prerequisites:

- Aiken v1.1.17 (stdlib 2.2.0)
- Node 20+, Yarn 4
- Provider token for Blockfrost (Preview)

Environment variables (.env):

```
PROVIDER=blockfrost | NETWORK=Preview | BLOCKFROST_KEY=previewXXXXXX |  
PRIVATE_KEY_CBOR=ed25519_sk...
```

Build steps:

- 1) `cd contracts/escrow && aiken check && aiken build`
- 2) `cd ..` (project root) → `yarn install`

5. Test Instructions

Preflight: verify provider key

```
`curl -s -H "project_id: $BLOCKFROST_KEY"  
https://cardano-preview.blockfrost.io/api/v0/blocks/latest` should return JSON.
```

Integration (managed provider path):

- `yarn submit` → creates a pay-to-self TX; wait for confirmation, record hash
- `yarn mint` → mints 1 unit of AFRIKABALPROOF; wait for confirmation, record hash
- `yarn burn` → burns 1 unit (if available) to validate policy control; record hash

Verification:

- `yarn addr` and `yarn balance` to corroborate UTxOs
- Confirm on explorer: address, policy, and asset pages

6. Deployment Instructions

Managed provider (Lucid) — PoC used approach:

- Configure .env (Preview Blockfrost key) → `yarn submit` → `yarn mint` → confirm TXs via explorer/API

Self-hosted (validate capability):

- Run cardano-node, use cardano-cli to build/sign/submit; use proper `--testnet-magic` for Preview from your node config.
- Example (placeholders):

```
cardano-cli transaction build --testnet-magic <MAGIC> --tx-in <UTXO> --tx-out <ADDR>+1000000 --change-address <ADDR> --out-file tx.raw
cardano-cli transaction sign --tx-body-file tx.raw --signing-key-file payment.skey --testnet-magic <MAGIC> --out-file tx.signed
cardano-cli transaction submit --testnet-magic <MAGIC> --tx-file tx.signed
```

7. Testnet / Emulator Results

Transaction ID	Contract Action	Status	Notes
32dd4dfcf4e3c44417d212e73b135f23b2265e38fd38600eae41229f9ad733ab	Pay-to-self (pipeline proof)	Success	Confirms build→submit→confirm
20b44b056f1537bfad20b4857a5f9ce05c679a3eed54c82d0ca6459de6cc17ba	Mint AFRIKABALPRO OF	Success	Policy 35a500e7c84ac216ec87b9965 410b6a8f68030f132e9746683 c30a94
feed2ef46e9dc926d7556d81ef981eb454ed2b1fb1dabea2e67ccc95686215a1	Mint AFRIKABALPRO OF	Success	Policy 35a500e7c84ac216ec87b9965 410b6a8f68030f132e9746683 c30a94

- Screenshots:

Figure 1 — Pay-to-self TX confirmed:
`32dd4dfcf4e3c44417d212e73b135f23b2265e38fd38600eae41229f9ad733ab`

The screenshot shows the Cardano Explorer transaction detail page for a Pay-to-self TX. The transaction hash is `32dd4dfcf4e3c44417d212e73b135f23b2265e38fd38600eae41229f9ad733ab`. Key details include:

- Assurance:** 84
- Transaction Size:** 0.23kB (0.23kB)
- Block Size (TX Count):** 0.23kB (1)
- Minted by:** GRADA Gratis ADA PreView

Figure 2 — Mint TX confirmed (AFRIKABALPROOF):
`20b44b056f1537bfad20b4857a5f9ce05c679a3eed54c82d0ca6459de6cc17ba`

The screenshot shows the Cardano Explorer transaction detail page for a Mint TX. The transaction hash is `20b44b056f1537bfad20b4857a5f9ce05c679a3eed54c82d0ca6459de6cc17ba`. Key details include:

- Assurance:** 82
- Transaction Size:** 0.39kB (0.39kB)
- Block Size (TX Count):** 1.26kB (2)
- Minted by:** Capital-ADACT-CardanoBI-Orcfax-AI

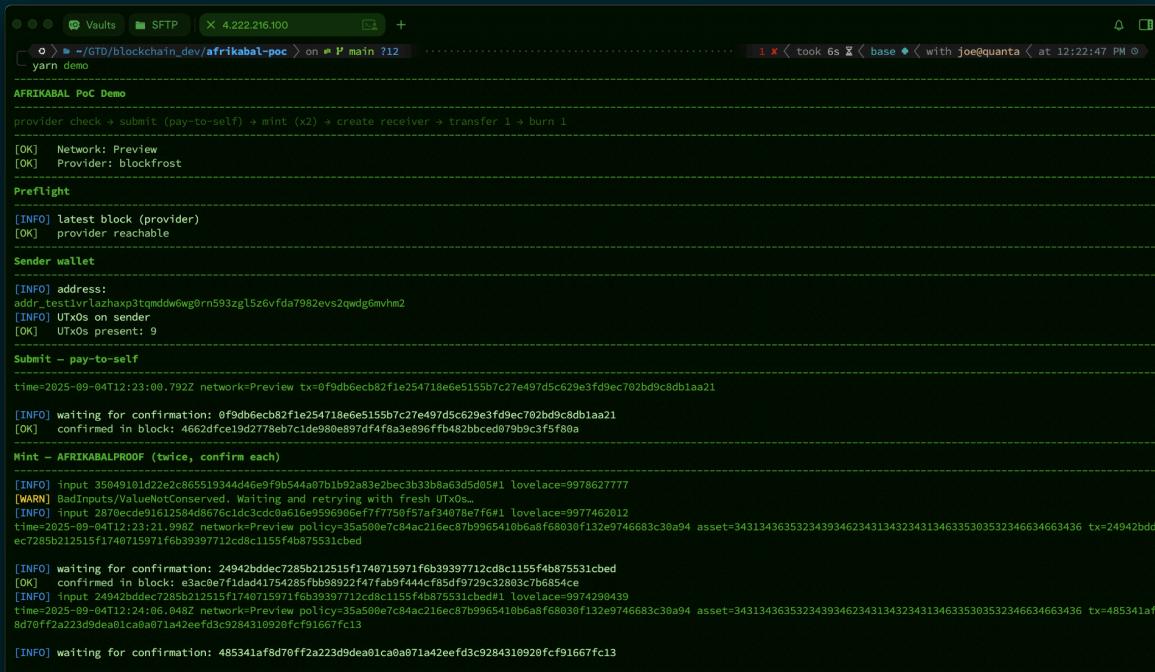
Figure 3 — Policy detail (assets/mints):
 35a500e7c84ac216ec87b9965410b6a8f68030f132e9746683c30a94

Figure 4 — Address TX list showing mints:
 addr_test1vrlazhaxp3tqmddw6wg0rn593zgl5z6vfda7982evs2qwdg6mvhm2

8. Dependencies & Environment

- Aiken CLI - *Aiken v1.1.17 (stallib 2.2.0)*
- Off-chain client - *Lucid 0.10.x (TypeScript)*
- Testnet used - *Blockfrost (Preview) on Cardano Preview (testnet)*
- Provider / Network - *Node 20+, Yarn 4*

9. Demo / Walkthrough



```
AFRIKABAL PoC Demo

provider check → submit (pay-to-self) → mint (x2) → create receiver → transfer 1 → burn 1

[OK] Network: Preview
[OK] Provider: blockfrost

Preflight

[INFO] latest block (provider)
[OK] provider reachable

Sender wallet

[INFO] address:
addr_testvrlazhaxp3tqmdw6wg0rn593zgl5z6vfd7982evs2qwdg6mvhm2

[INFO] UTXOs on sender
[OK] UTXOs present: 9

Submit - pay-to-self

time=2025-09-04T12:23:00.792Z network:Preview tx=0f9db6ecb82f1e254718e6e5155b7c27e497d5c629e3fd9ec702bd9c8db1aa21

[INFO] waiting for confirmation: 0f9db6ecb82f1e254718e6e5155b7c27e497d5c629e3fd9ec702bd9c8db1aa21
[OK] confirmed in block: 4662dfce19d2778eb7c1de980e897df4f8a3e696ff4b482bbced079b9c3f5f80a

Mint - AFRIKABALPROF (twice, confirm each)

[INFO] input 35049101d22e2c865519344d46e9f9b544a07b1b92a83e2bec3633b8a63d5d05#1 lovelace=9978627777
[WARN] BadInputs/ValueNotConserved. Waiting and retrying with fresh UTXOs...
[INFO] input 2870ecde91612584d8676c1d3cdc9a616e0596906eff7750f57af34078e7f6#1 lovelace=9977462012
time=2025-09-04T12:23:21.998Z network:Preview policy=35a500e7c84ac216ec87b9965410b6a8f68030f132e9746683c30a94 asset=34313436353234393462343134323431346335303532346634663436 tx=24942bdd
ec7285b212515f1740715971f6b3997712cd8c1155f4b875531cb6

[INFO] waiting for confirmation: 24942bddec7285b212515f1740715971f6b39397712cd8c1155f4b875531cb6
[OK] confirmed in block: e3ac0e7f1dad41754285fb98922f47fafb9f44cf85df9729c32803c7b6854ce
[INFO] input 24942bddec7285b212515f1740715971f6b39397712cd8c1155f4b875531cb6#1 lovelace=9974296439
time=2025-09-04T12:24:06.048Z network:Preview policy=35a500e7c84ac216ec87b9965410b6a8f68030f132e9746683c30a94 asset=34313436353234393462343134323431346335303532346634663436 tx=485341af
8d70ff2a223d9dea01ca0a071a42eefd3c9284310920fcf91667fc13

[INFO] waiting for confirmation: 485341af8d70ff2a223d9dea01ca0a071a42eefd3c9284310920fcf91667fc13
```

```

Vaults SFTP 4.222.216.100
[INFO] waiting for confirmation: 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13
[OK] confirmed in block: 11a2ed5df6be7c4fcfe09fd5dc365696739385c4a84daef7f18ed31cd9d3
[OK] policy: 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94 asset: 343134363532343934623431346335303532346634663436
[INFO] asset unit (policy-hex): 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94414652494b4142414c50524f4f46

Create receiver wallet
[INFO] receiver:
addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf

Transfer - 1 343134363532343934623431346335303532346634663436 to receiver
[INFO] using token UTxO 24942bddc7285b212515f1740715971fb639397712cd8c1155f4b875531cbef#0 (lovelace=3000000)
[INFO] using ADA UTxO 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13#1 (lovelace=9971118866)
time=2025-09-04T12:24:31.18Z network=Preview policy=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94 asset=AFRIKABALPROOF transfer_tx=72eff6887c99eb9a3b2274fb583193bf68e7a139085c21c3fa39707faa8ee14

[INFO] waiting for confirmation: 72eff6887c99eb9a3b2274fb583193bf68e7a139085c21c3fa39707faa8ee14
[OK] confirmed in block: 00e3084c7947013131f6f7e49595b1c94dac14fb4a130fd48a9e51f718012

Pre-burn check - ensure token present at sender
[INFO] sender token balance for unit=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94414652494b4142414c50524f4f46 : 10

Burn - 1 343134363532343934623431346335303532346634663436 from sender
[INFO] burning from UTxO 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13#0 (lovelace=3000000)
time=2025-09-04T12:24:43.900Z network=Preview policy=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94 asset=AFRIKABALPROOF burn_tx=f162572ab0fee768bcadc0b51c09e4741584e8bd74430

[INFO] waiting for confirmation: f162572ab0fee768bcadc0b51c09e4741584e8bd7443066e236ad78d04a9448
[OK] confirmed in block: 1760f06fb93afdf8a85b6bababdd4dca88708ae8103eb785176fa55a60416541
[INFO] sender token balance after burn: 9

Summary
sender : addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf
receiver : addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf
policy : 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94
asset : 343134363532343934623431346335303532346634663436
unit : 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94414652494b4142414c50524f4f46
submit : 0f9dbdecbb2f1e254718ee5e155b7c27e497d5c29e7d9ec702bd9c8eb1aa21
mint-1 : 24942bddc7285b212515f1740715971fb639397712cd8c1155f4b875531cbef
mint-2 : 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13

```

```

Vaults SFTP 4.222.216.100
[INFO] receiver:
addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf

Transfer - 1 343134363532343934623431346335303532346634663436 to receiver
[INFO] using token UTxO 24942bddc7285b212515f1740715971fb639397712cd8c1155f4b875531cbef#0 (lovelace=3000000)
[INFO] using ADA UTxO 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13#1 (lovelace=9971118866)
time=2025-09-04T12:24:31.18Z network=Preview policy=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94 asset=AFRIKABALPROOF transfer_tx=72eff6887c99eb9a3b2274fb583193bf68e7a139085c21c3fa39707faa8ee14

[INFO] waiting for confirmation: 72eff6887c99eb9a3b2274fb583193bf68e7a139085c21c3fa39707faa8ee14
[OK] confirmed in block: 00e3084c7947013131f6f7e49595b1c94dac14fb4a130fd48a9e51f718012

Pre-burn check - ensure token present at sender
[INFO] sender token balance for unit=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94414652494b4142414c50524f4f46 : 10

Burn - 1 343134363532343934623431346335303532346634663436 from sender
[INFO] burning from UTxO 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13#0 (lovelace=3000000)
time=2025-09-04T12:24:43.900Z network=Preview policy=35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94 asset=AFRIKABALPROOF burn_tx=f162572ab0fee768bcadc0b51c09e4741584e8bd74430

[INFO] waiting for confirmation: f162572ab0fee768bcadc0b51c09e4741584e8bd7443066e236ad78d04a9448
[OK] confirmed in block: 1760f06fb93afdf8a85b6bababdd4dca88708ae8103eb785176fa55a60416541
[INFO] sender token balance after burn: 9

Summary
sender : addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf
receiver : addr: testivzh2l2zy23f6rfdk7makvm77glyzq2vta0ayhe7hshp4vmsx2klrf
policy : 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94
asset : 343134363532343934623431346335303532346634663436
unit : 35a500e7c84ac216ec87b965410b6a8f68030f132e9746683c30a94414652494b4142414c50524f4f46
submit : 0f9dbdecbb2f1e254718ee5e155b7c27e497d5c29e7d9ec702bd9c8eb1aa21
mint-1 : 24942bddc7285b212515f1740715971fb639397712cd8c1155f4b875531cbef
mint-2 : 485341af8d70ff2a223d9dea01ca0a071a42eef3c9284310920fcf91667fc13
transfer : 72eff6887c99eb9a3b2274fb583193bf68e7a139085c21c3fa39707faa8ee14
burn : f162572ab0fee768bcadc0b51c09e4741584e8bd7443066e236ad78d04a9448
[OK] evidence JSON under docs/logs/

```

[Check out the video](#)

10. Remaining Issues / Next Steps

No blocking issues on Preview path.

Next: Integrate buyer/producer flows (escrow + attestations); pre-prod dry run; SLO dashboards.

Annex — Hashes & Policy

- PAY : 32dd4dfcf4e3c44417d212e73b135f23b2265e38fd38600eae41229f9ad733ab
- MINT : 20b44b056f1537bfad20b4857a5f9ce05c679a3eed54c82d0ca6459de6cc17ba
- MINT : feed2ef46e9dc926d7556d81ef981eb454ed2b1fb1dabea2e67ccc95686215a1
- BURN : c8038ef332543dd72c5309cbe444ef288a6edb3d8bdc778a8137c9c6871c7178
- POLICY: 35a500e7c84ac216ec87b9965410b6a8f68030f132e9746683c30a94 (AFRIKABALPROOF)