

ENHANCING NIGERIA'S COCOA ECONOMY THROUGH TECHNOLOGY-DRIVEN, CLIMATE-SMART INNOVATIONS

COUNTRY: FEDERAL REPUBLIC OF NIGERIA SUBMISSION DATE: SEPTEMBER 5, 2025.

TITLE: National Cocoa Data-to-Dividend Platform (NCDDP) 2025-2028”
A Commercially-Financed, Climate-Smart & Export-Focused Upgrade Integrating Mirid & Black-Pod Management

1. EXECUTIVE SUMMARY

In 2024, Nigeria's cocoa sector generated NGN 3,612 billion in export revenue, yet production has remained stagnant at approximately 280,000 tonnes for a decade. This stagnation is exacerbated by mirid (capsid) infestation and black-pod (*Phytophthora*) rot, which collectively reduce attainable yields by 20–30%. The National Cocoa Data-to-Dividend Platform (NCDDP) transforms the Cocoa Research Institute of Nigeria's (CRIN) survey into a commercially viable, technology-driven ecosystem. This initiative leverages advanced tools to:

- a.** Establish Nigeria's first blockchain-verified national cocoa cadastre with $\leq 5\%$ error;
- b.** Reduce mirid and black-pod losses by $\geq 60\%$ across 500 lead farms;
- c.** Increase yields by $\geq 40\%$;
- d.** Generate three new revenue streams projected to yield NGN 54,180 million by 2028; e. Mitigate $\geq 56,000$ t CO₂e annually.

This proposal, submitted under the NASENI Research Commercialisation Grants Programme, seeks to enhance Nigeria's cocoa sector through innovation, sustainability, and economic growth.

2. MACRO-ECONOMIC & COCOA SECTOR BASELINE (2025)

Federal Republic of Nigeria

- Population: 223.8 million
- GDP: NGN 761,530 billion
- FX reserves: NGN 57,792 billion
- USD/NGN: 1,505
- Inflation: 32.8%

Cocoa Sector Snapshot

- Export earnings: NGN 3,612 billion
- Production: 280,000 tonnes
- Yield: 0.35 t ha⁻¹
- Mirid damage: 15–25% crop loss (CRIN 2024)

- Black-pod rot: 10–20% loss, up to 40% in humid years

2030 Outlook

- Global cocoa deficit: 300,000 t yr⁻¹ → price range NGN 14,297,500–16,555,000 t⁻¹
- Nigeria’s potential: 500,000 t with halved yield gaps and pest losses → NGN 7,224–8,278 billion in exports

3. PROBLEM & COMMERCIAL GAP MATRIX

Pain Point	Evidence 2024	Loss %	Monetisable Gap	Value 2025-30
No cadastre	±30% export data variance	—	SaaS data licence	NGN 30,100 m
Mirid & black-pod	25–45% combined	25%	Pest-alert + biocontrol sales	NGN 52,675 m
Low yields	0.35 t ha ⁻¹	40%	Premium seed royalties	NGN 67,725 m
Post-harvest losses	25%	25%	Solar-dryer leasing	NGN 120,400 m

4. OBJECTIVES (SMART & COMMERCIAL)

1. Map 100% of Nigeria’s cocoa area with ≤ 5% error by Q2 2026.
2. Reduce mirid and black-pod losses by ≥ 60% on 500 lead farms by Q4 2027.
3. Increase yields by ≥ 40% (0.49 t ha⁻¹) on these farms.
4. Achieve gross revenue of NGN 1,505 million by 2027 and NGN 15,050 million by 2028.
5. Deploy 400 solar dryers, mitigating ≥ 56,000 t CO₂e yr⁻¹.

5. TECHNOLOGY READINESS LEVEL (TRL) ROADMAP

Component	Aug 2025	2026	2027	2028	Evidence
Satellite+drone fusion	6	8	9	9	3,000 ha pilot
Pest-alert model	4	7	8	9	CNN on 50,000 images
Blockchain ledger	3	6	8	9	Hyperledger sandbox
Bio-pesticide dispenser	5	7	9	9	CRIN/IFDC trials
Solar dryer	7	8	9	9	50 units, 5.2 mo payback

6. METHODOLOGY & COMMERCIALISATION PIPELINE

6.1 Data & Pest Management

- Integrate Sentinel-2 and PlanetScope satellite imagery with DJI M350 RTK drones (5 cm resolution).
- Use smartphone cameras and convolutional neural networks (YOLOv8) to deliver WhatsApp-based mirid and black-pod alerts.
- Implement blockchain-based farmer-ID and geofencing for traceability.

6.2 Revenue Pipeline

Year	Product	Revenue Model	TRL	Gross Margin
2025	CocoaIntel SaaS + pest alerts	NGN 37,625 yr ⁻¹ farmer	7	75%
2026	API to exporters/banks	NGN 3,010,000 yr ⁻¹	8	85%
2027	Bio-pesticide & seed royalties	NGN 903 seed ⁻¹	8	65%
2028	Solar-dryer leasing	NGN 30.1 kg ⁻¹ dried	9	55%

7. BUDGET (NGN ‘000)

Line Item	2025	2026	2027	2028	Total
CAPEX – drones/sensors	602,000	301,000	150,500	—	1,053,500
CAPEX – solar dryers	—	903,000	602,000	—	1,505,000
CAPEX – blockchain nodes	225,750	150,500	75,250	—	451,500
OPEX – field teams (60)	376,250	451,500	526,750	526,750	1,881,250
Software & licences	75,250	75,250	75,250	75,250	301,000
Travel & logistics	150,500	180,600	225,750	150,500	707,350
M&E + ESG audit	75,250	105,350	135,450	135,450	451,500
Investigator Stipends					
• Principal Investigator (NGN 376,250/month)	4,515	4,515	4,515	4,515	18,060
• Other Investigators (NGN 301,000/month each, 3 persons)	10,836	10,836	10,836	10,836	43,344
Contingency (5%)	74,150	104,280	86,200	45,880	310,510
Total Project Cost	1,594,551	2,286,831	1,892,501	949,181	6,726,146

Requested from NASENI: NGN 6,727 million

8. RISK & MITIGATION MATRIX

Key: P = Probability (L = Low, M = Medium, H = High); I = Impact (L = Low, M = Medium, H = High)

Risk	P	I	Mitigation	Residual
FX devaluation	M	H	70% Naira spend; NAFEX hedge	L
Farmer mobile gap	H	M	USSD & voice prompts	M

Risk	P I	Mitigation	Residual
Climate shock	M H	Parametric insurance (Leadway)	L
Pest resistance to bio-pesticide	L H	Rotating actives & RNAi backup	L

9. TEAM & GOVERNANCE

Principal Investigators & Stipend Recipients (NGN 376,250/month):

- Dr. Adedeji A. Rasheed – 26 years cocoa R&D, Project Lead

Other Investigators & Stipend Recipients (NGN 301,000/month each):

- Dr. Oluyole Kayode – Economic and GIS Expert
- Abdus-Sobur Adedeji – Research & Development Solutions Engineer / Software Engineer, Ex-Microsoft Connectivity, MERN & MEAN stack
- Dr. Busayo Famuyiwa – Extension & Rural Sociology Lead, PhD Agricultural Extension & Rural Sociology

Advisory Board: NASENI ED, CRIN ED, perhaps Permanent Secetary (or His Representative), Federal Ministry of Agriculture.

10. TIMELINE & MILESTONES

Phase	Q	Milestone	KPI	Payment Trigger
1	2025 Q3-Q4	Cadastre & pest map v1.0	200,000 ha mapped	25%
2	2026 Q1-Q2	SaaS + pest-alert launch	5,000 paying users	25%
3	2026 Q3-2027 Q4	Dryer & biocontrol scale-up	400 dryers, 60% pest loss cut	30%
4	2028	SPV spin-off	Revenue NGN 15,050 m	20%

11. SUSTAINABILITY & SDG ALIGNMENT

- **SDG 8 – Decent Work:** Engage 2,000 youth enumerators, 40% women.
- **SDG 9 – Industry & Innovation:** Establish CocoaIntel Ltd. as a Special Purpose Vehicle, targeting NGX listing by 2030.
- **SDG 13 – Climate:** Mitigate 56,000 t CO₂e yr⁻¹ through Verified Carbon Standard (VCS) credits.
- **Financial:** Blended IRR of 29%, payback period of 2.7 years.

12. CONTACT

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