BUSINESS PLAN

For

Industrial Research, Process Optimization, and Commercial Production of Sweet Potato-Based Starch Derivatives, Cold-Water-Soluble Starch, Sweet Syrups, Corrugated Packaging Adhesives, and Animal Feed for Agro-Allied and Consumer Markets in Nigeria

Bayero University Kano

October, 2025

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Executive Summary

This business plan outlines an innovation-driven industrial research and commercialization venture focused on transforming Nigeria's abundant sweet potato resources into high-value starch derivatives, cold-water-soluble starch (CWSS), sweet syrups, corrugated packaging adhesives, and animal feed. The initiative leverages over a decade of academic R&D at Bayero University Kano to establish a commercial-scale processing platform that aligns with NASENI's National Research Commercialization Grant (NRCG) objectives.

The project addresses Nigeria's dependency on imported starches and syrups by developing a modular, 500 kg/day production facility employing indigenous technology. It integrates research outputs with commercial manufacturing, demonstrating technological readiness and scalability. The process flow, from starch extraction and modification to syrup conversion, adhesive formulation, and feed production, adopts a circular bioeconomy approach ensuring zero waste through residue utilization.

The business targets a growing domestic market for starch derivatives estimated above ₦200 billion, driven by demand in food, packaging, and textile sectors. With a 25% profit margin and projected daily revenue of ₦400,000, the enterprise anticipates an annual net profit of ₦36 million by the first year, doubling revenue within five years of expansion. It will create direct and indirect jobs, strengthen rural supply chains, and reduce import dependence in line with Nigeria's industrialization and food security goals.

The project's uniqueness lies in its indigenous innovation, cost competitiveness, environmental sustainability, and strong university–industry linkage. It aligns with NASENI's mission to commercialize research-based solutions that drive inclusive growth, technology transfer, and industrial productivity.

Vision/Mission Statement and Goals

A. Vision Statement

To become a leading Nigerian agro-industrial enterprise pioneering the sustainable, commercial-scale processing of sweet potato into value-added starch derivatives, including cold-water-soluble starch, concentrated sweet syrups, corrugated board adhesives, and animal feed serving both consumer and agro-allied markets, reducing national dependence on imported starches, and promoting inclusive agricultural-industrial development across the value chain.

B. Goals and Objectives

The overarching goal of the enterprise is to commercialize an integrated, innovation-driven starch processing platform using locally cultivated sweet potato to manufacture native starch and high-value derivatives that meet industrial and consumer demands.

Specific Objectives:

1. **Establish a Commercial-Scale Production Facility:**

Commission a pilot plant with a daily capacity of 500 kg native starch, with modular lines for CWSS, syrups, adhesives, and animal feed.

2. **Optimize and Standardize Production Processes:**

Refine physicochemical pathways for starch modification, syrup concentration, and adhesive formulation to meet SON and NAFDAC standards.

3. **Ensure Raw Material Security:**

Build a robust supply chain by aggregating sweet potato from major producing states in northern Nigeria, particularly Kano, Katsina, Kaduna, and Jigawa.

4. **Achieve Market Penetration and Brand Positioning:**

Introduce well-packaged CWSS and adhesives into consumer laundry and packaging markets, while establishing B2B partnerships with textile processors, feed mills, and food companies.

5. **Generate Sustainable Profitability:**

Attain a consistent 25% profit margin, targeting daily net profit of ₦300,000 through cost-optimized operations and value-added product mixes.

6. **Drive Employment and Technology Transfer:**

Train local artisans and food technologists, while facilitating the local fabrication of core production equipment in stainless steel to ensure hygiene and scalability.

7. **Promote Import Substitution and Local Industrialization:**

Reduce Nigeria's dependency on imported starch, syrup, and adhesives through domestic innovation and capacity building aligned with national industrial policy

C. Keys to Success

1. **Access to Raw Material Supply Chains:**
2. Reliable procurement of high-starch sweet potato cultivars from structured farmer cooperatives and local aggregators in northern Nigeria will ensure consistent input flow and cost-efficiency.
3. **Process Innovation and Technical Expertise:**
   Adoption of optimized processing techniques hydrolysis, drum drying, and native-to-CWSS conversion backed by previous research, piloting experience, and published data.
4. **Quality Assurance and Regulatory Compliance:**
   Adherence to national food and industrial product standards (NAFDAC and SON) through rigorous testing of starch viscosity, solubility, sugar profile, and feed nutrient content.
5. **Flexible, Integrated Production Lines:**
   Modular system design allows for simultaneous or alternating production of starch, CWSS, adhesives, syrup, and feed, improving equipment utilization and revenue diversity.
6. **Strong Market Linkages and Value Proposition:**
   Competitive pricing, superior packaging (especially of CWSS via pillow-pack machines), and the ability to supply niche industrial clients (e.g., food industry, textile finishers, carton factories) will drive early market penetration.
7. **Skilled Management and Multidisciplinary Team:**
   The project team combines expertise in food chemistry, agro-processing engineering, business development, and market engagement ensuring sound technical and commercial execution.
8. **Strategic Partnerships and Policy Alignment:**
   Alignment with Nigeria's Renewed Hope Agenda and NASENI's Agro-Industrialization thrust offers leverage for support, funding, and visibility

Project/Enterprise Summary

A. Background

The proposed enterprise on Industrial Research, Process Optimization, and Commercial Production of Sweet Potato-Based Starch Derivatives, Cold-Water-Soluble Starch, Sweet Syrups, Corrugated Packaging Adhesives, and Animal Feed for Agro-Allied and Consumer Markets in Nigeria, is an innovation-driven agribusiness initiative poised to transform Nigeria's underutilized sweet potato resource into high-demand industrial and consumer products.

The business is rooted in over a decade of academic research, industrial experimentation, and local innovation led by a multidisciplinary research team affiliated with Bayero University, Kano. Foundational work has included extensive laboratory and pilot-scale studies on starch extraction and modification, resulting in the development of cold-water-soluble starch (CWSS), sweet potato-based adhesives for corrugated packaging, and value-added feeds from processing residues. A peer-reviewed journal article and several national and international conference presentations have further validated the scientific and commercial viability of the project.

This business aims, and hopes to transition from research to industrial upscaling targeting structured commercial production using a 500 kg/day starch platform. It aims to harness local capacity, reduce Nigeria's dependence on imported starches and syrups, and create a value chain linking rural farmers to industrial buyers.

B. Resources, Facilities and Equipment

The production facility will be located within the Technology Incubation Centre, Bayero University Kano. Core equipment includes a drum dryer (procured), stainless-steel wet milling and filtration units, enzymatic hydrolysis tanks, packaging machines, and mixers locally fabricated to food-grade specifications. A 40KVA diesel generator and an industrial borehole will ensure power and water reliability. Human resources will comprise process technicians, machine operators, quality analysts, and logistics personnel, all coordinated by a technical manager

C. Marketing Methods

The company will deploy a dual-channel strategy serving business to business industrial clients (e.g., packaging firms, feed mills, textile processors) and business to consumer segments through retail distributors of CWSS and sweet syrups. Products will be attractively packaged, with CWSS in pillow sachets for laundry consumers. Strategic alliances will be built with agro-processing associations, and promotional efforts will include trade shows, digital marketing, and institutional outreach. Pricing will maintain a 25% profit margin while remaining competitive against imports

D. Management and Organization

The business will be led by a Principal Investigator with expertise in starch chemistry and agro-industrial processing, supported by a core team comprising technical/operations manager, production supervisor, quality assurance officer, and administrative/finance lead. Responsibilities

are functionally structured to oversee daily operations, QA ensures regulatory compliance, and finance tracks budgeting and reporting. A flat structure is adopted initially, allowing flexibility and rapid decision-making during scale-up

E. Ownership Structure

The company will be registered as a private limited liability company under Nigerian law. Initial ownership will reside with the founding research and development team from Bayero University, Kano, pending formal equity distribution. Key founding members will hold shares proportional to their capital, intellectual property, and technical contributions.

The company will obtain required operational permits from NAFDAC (for edible products), SON (for industrial goods), and relevant environmental and municipal agencies. All equipment and facilities will comply with inspection and health safety regulations necessary for food and non-food production lines

F. Social Responsibility

The company will uphold strong environmental and community ethics. All equipment used in starch and syrup production will be stainless steel to ensure hygiene and safety. Wastewater from processing will be treated using eco-friendly methods, and all organic residues will be repurposed into animal feed, minimizing environmental impact.

G. Internal Analysis

Strengths:

- Proven product prototypes (e.g., cold-water-soluble starch, syrups, adhesives).
- Completed R&D with peer-reviewed publication and field validation.
- Access to low-cost, high-starch sweet potato varieties in northern Nigeria.
- Modular, multi-product production design with strong profitability potential.

Weaknesses:

- Limited working capital for large-scale marketing and distribution.
- Initial dependence on in-house expertise for machinery maintenance and scaling.

Core Competencies:

- Starch modification and product diversification using indigenous crops.
- Integration of by-products (residues) into profitable feed production.
- Capacity for process optimization based on prior lab and pilot work.

Opportunities:

- Rising demand for local starch-based adhesives and laundry starch in Nigeria.

- Supportive government policies on agro-industrial import substitution.
- Scalable product line adaptable to industrial or consumer segments.

Threats:

- Market competition from imported starch and syrups.
- Possible fluctuation in sweet potato supply due to climate variability.

The venture will leverage its academic-industry bridge, technical expertise, and raw material proximity to mitigate internal gaps and expand operational resilience

H. Products

The enterprise will commercialize a suite of value-added products derived from sweet potato through advanced agro-processing technologies. These include:

1. **Native Sweet Potato Starch (NSPS):**
   High-purity starch for food and industrial applications, sold in bulk or branded units.
2. **Cold-Water-Soluble Starch (CWSS):**
   Modified starch suitable for stiffening fabrics, caps, and laundry applications, packaged in consumer pillow sachets.
3. **Concentrated Sweet Potato Syrup:**
   A naturally sweet extract derived from the sweet portion of the potato, filtered and thermally concentrated for use in bakeries, beverages, and flavoring.
4. **Corrugated Board Adhesives:**
   Industrial-grade, starch-based adhesive suitable for box-making and packaging industries.
5. **Animal Feed Formulations:**
   Feed pellets or mash produced from protein- and fiber-rich residues of the starch and syrup production process.

All products are designed for optimal yield, safety, market utility, and affordability. Quality control standards will align with NAFDAC and SON benchmarks

I. Market Assessment

1. Examining the General Market

The Nigerian market for starch derivatives, industrial adhesives, and sweeteners is growing rapidly, driven by expanding demand from food processors, textile industries, packaging manufacturers, and feed millers. However, the market is largely import-dependent, with over 90% of modified starch, corn syrup, and board adhesives sourced from Asia and Europe.

i. Market Segments:

- **Food & Beverage:** Demand for natural syrups and native starch in bakeries, confectioneries, and beverages.
- **Textile & Laundry:** High-volume use of CWSS by dry cleaners, laundromats, and local cap-makers.
- **Packaging:** Corrugated board factories needing sustainable, cost-effective adhesives.
- **Livestock & Feed:** Rising feed demand from livestock, poultry and fish sectors.

ii. Unmet Needs:

- Lack of locally sourced, competitively priced modified starch products.
- Poor integration of agro-processing waste into value-added feed.
- Inadequate supply of eco-friendly adhesives for local manufacturers.

iii. Market Growth Potential:
The Nigerian starch and starch-derivatives market is projected to grow at over 6% CAGR (2022–2027), fueled by population growth, urbanization, and government industrialization incentives.

iv. Opportunities and Threats:

- **Opportunities:** Government support via NASENI, import substitution agenda, regional export potential (ECOWAS).
- **Threats:** Exchange rate volatility, raw material seasonality, and weak infrastructure.

Five Forces Summary:

- **Buyer Power:** Medium, buyers demand quality but lack local options.
- **Supplier Power:** Low, sweet potato supply is abundant in Nigeria.
- **Threat of Substitutes:** High, cassava and corn starch alternatives.
- **Threat of New Entrants:** Medium, requires technical capacity and capital.
- **Industry Rivalry:** Low, few local producers of CWSS or starch adhesive

2. Customer Analysis

Target Customers:

i. **Consumer Segment:**

- **Households and Laundry Operators** for Cold-Water-Soluble Starch (CWSS).
- **Bakeries and Local Beverage Makers** for sweet syrups as a sugar substitute.

ii. **Industrial Segment:**

- **Textile Finishers and Cap Producers** using CWSS in fabric stiffening.
- **Corrugated Packaging Companies** requiring eco-friendly, starch-based adhesives.
- **Feed Millers and Livestock Farms** purchasing high-fiber animal feed formulations.

iii. **Customer Needs and Value Proposition:**

- Affordability: 25% margin pricing ensures cost savings over imported alternatives.
- Availability: Local production ensures continuous, reliable supply.
- Product Quality: Safe, biodegradable, and certified products.
- Convenience: CWSS in pillow sachets simplifies usage for small-scale consumers.

iv. **Customer Retention and Support:**

- Quality consistency, flexible packaging, and responsive supply agreements.
- After-sales support, including usage demonstrations for industrial clients.
- Loyalty incentives and direct delivery for bulk buyers.

v. **Customer Support Cost:**
Low for consumer products; medium for industrial clients due to technical onboarding

C. Industry Analysis

Nigeria's starch processing and sweetener industry is still nascent, with heavy reliance on corn, cassava, and imported corn syrup and adhesives. However, increasing demand for indigenous alternatives, driven by policy support and cost inflation on imports, is spurring local industrialization.

Industry Trends:

- Growth in packaged food and laundry sectors is driving starch demand.
- Rising ecological concerns are creating a shift toward biodegradable adhesives.
- Feed ingredient costs have risen, making agro-waste-based feed formulations attractive.

Sweet Potato Industry Insight:
Despite Nigeria being among the top 5 global producers of sweet potato, industrial utilization remains below 10%, limited mostly to direct food use. This opens a significant gap for conversion into starch derivatives and sweeteners.

Barriers to Entry:

- Moderate - requires technical know-how, initial capital for setup, and equipment.
- However, lower raw material cost and available fabrication expertise reduce entry difficulty.

Support Ecosystem:

- Backing from NASENI and other government innovation agencies provides funding and incubation.
- Regional cluster development initiatives (e.g., in Kano, Kaduna, Benue) align with project objectives.

Future Outlook:
The local starch derivative industry is expected to expand with more ventures integrating feed and industrial chemical applications, creating a multi-billion-naira domestic market in the next five years.

D. Strategic Alternatives

In scaling and sustaining the business, the following strategic alternatives are evaluated:

1. **Enterprise Expansion:**
   The business may increase production capacity from 500 kg/day to 1,000 kg/day as market traction grows. Modular expansion will allow capacity enhancement without major overhauls.
2. **Product Line Diversification:**
   Beyond native starch and syrups, further R&D may be pursued to introduce additional starch-based products such as food-grade thickeners or specialty adhesives.
3. **Geographical Expansion:**
   Replication in other sweet potato-producing states such as Benue, Taraba, and Plateau will strengthen sourcing and reduce transportation costs.
4. **Contract Manufacturing and Integration:**
   Outsourcing some production processes (e.g., packaging) to third-party service providers can reduce initial capital expenditure. Vertical integration with sweet potato farmer cooperatives will stabilize raw material supply and price.
5. **Public–Private Partnerships (PPP):**
   Strategic alliances with research institutes, agribusiness clusters, and government extension agencies can unlock shared infrastructure and market access.
6. **Export Market Exploration:**
   Through ECOWAS trade agreements, processed starch and adhesives can be exported regionally, leveraging Nigeria's comparative advantage

Strategic Implementation Plan

Implementation Plan

Phase 1 (Months 1–3): Facility setup, equipment installation, staff recruitment.

Phase 2 (Months 4–6): Pilot production and quality validation.

Phase 3 (Months 7–12): Commercial rollout and market expansion.

Phase 4 (Year 2 onward): Scale-up to 1,000 kg/day and regional distribution.

A. Production

The business will operate a modular production system at a pilot-commercial scale. Daily throughput is projected at 500 kg of native starch**,** with diversified conversion into:

- Cold-Water-Soluble Starch (CWSS)
- Corrugated board adhesives
- Concentrated sweet syrups
- Animal feed from processing residues

Production Flow:

1. **Sourcing & Sorting:**
   Fresh sweet potatoes will be sourced from local clusters in Kano, Kaduna, and Benue States.
2. **Milling & Filtration:**
   Sweet potatoes, washed, grated, and wet-milled. Starch extracted by sedimentation, while the supernatant is reserved for syrup concentration.
3. **Starch Modification:**
   A portion of native starch is chemically or physically treated to form CWSS for laundry and textile use.
4. **Syrup Concentration:**
   The sweet supernatant is filtered and thermally reduced into dense syrup.
5. **Adhesive Processing:**
   A separate line blends starch with modifiers to produce corrugated board adhesives.
6. **Feed Formulation:**
   Fibrous residues are dried, milled, and mixed with protein additives into pelleted livestock feed.

Technology Utilization:

- Stainless-steel food-grade equipment (fabricated or procured)
- Drum dryer (procured) for CWSS and syrup concentration
- Pillow packaging machines for consumer CWSS sachets

Competitive Advantage:

- Indigenous processing method
- Product integration model (zero waste)
- Price competitiveness (25% margin over cost)
- Proximity to raw materials and lower logistics cost

Anticipated Timeline:

- Facility setup: 3–4 months
- Pilot batch production: Month 5
- Market rollout: Month 6 onward

B. Resource Needs

To support efficient production and commercialization, the enterprise requires strategic deployment of human, financial, and physical resources.

a) Human Resources

Skills Required:

- Food technologists and starch chemists
- Machine operators and maintenance personnel
- Sales and marketing officers
- Quality assurance and NAFDAC compliance staff

Acquisition Plan:

- Recruit skilled staff locally and through academic networks (e.g., BUK)
- Provide short-term training on production and quality standards
- Engage consultants for process scale-up and system automation

b) Financial Resources

Funding Requirements:

- Estimated capital requirement: ₦48.76 million
- Sources: NASENI grant, founder contributions, and public–private partnerships

Fund Utilization Highlights:

- Equipment procurement and fabrication
- Pilot facility development and utility setup
- Working capital for raw materials and packaging
- Marketing, logistics, and staff compensation

c) Physical Resources

Key Infrastructure:

- Factory building with food-grade flooring and wastewater management
- Borehole water supply and 40KVA generator for consistent power
- Stainless steel processing lines and reactors
- Warehouse and packaging unit

Capacity Target:

- 500 kg/day native starch output
- Multi-line capacity for CWSS, adhesives, syrup, and feed

C. Sourcing/Procurement Strategy

Procurement Philosophy:

The project will adopt a hybrid sourcing strategy—balancing quality, cost-effectiveness, and reliability through a combination of direct procurement and local fabrication.

Raw Materials Procurement:

- **Sweet Potatoes:**
  Procured directly from farmer cooperatives in high-yield states (e.g., Kano, Benue, Kaduna). Agreements will be formalized through seasonal supply contracts.
- **Additives & Inputs:**
  - Food-grade modifiers, stabilizers, and packaging films sourced from verified chemical suppliers and wholesalers within Nigeria.
  - Feed premixes (e.g., protein additives) sourced from local agro-vet dealers.

Equipment and Tools:

- **Procured Items:**

- Drum dryer (imported or locally distributed)
- Pillow packaging machine (automated for sachets)
- 40KVA diesel generator

- **Locally Fabricated Items:**

- Stainless steel pulpers, hydrocyclones, mixing tanks, reactors, and drying trays—all designed for food and non-food compatibility.

Vendor Engagement Channels:

- National trade exhibitions and online platforms for industrial-grade equipment
- Engineering workshops and research institutions for bespoke fabrication
- Strategic partnerships with agro-machinery distributors

Evaluation Criteria:

- Quality certifications (e.g., NAFDAC, SON, ISO)

- Durability and service warranties
- Post-installation support and spare part availability
- Price competitiveness and local servicing capability

D. Marketing Strategy

Sales Plan:
The business will adopt a dual-channel approach targeting both consumer and industrial buyers:

- **Consumer Products (e.g., CWSS, Syrups):**

- Distribution via supermarkets, laundry supply stores, open markets, and e-commerce platforms.
- Packaging in consumer-friendly sachets and bottles with proper NAFDAC registration and labeling.

- **Industrial Products (e.g., adhesives, native starch, feed):**

- Direct sales to packaging manufacturers, food processors, feed millers, and textile finishers.
- Long-term contracts and supply agreements based on volume and performance.

Promotion and Brand Awareness:

- **Product demonstrations** at trade fairs, farmers' forums, and local cooperatives.
- **Radio jingles and targeted social media campaigns** for regional reach.
- **Sampling programs** and point-of-sale promotions in key urban and peri-urban centers.

Preferred Market Outlet:

- Urban centers like Kano, Kaduna, Abuja, and Lagos, with robust agro-processing industries.

Pricing Strategy:

- 25% profit margin on each product over production cost.
- Competitive pricing benchmarked against cassava- or corn-based alternatives.

Risk Mitigation Tools:

a) **Hedging, Forward Pricing, Options:**
Not applicable at this stage due to the local market focus and absence of commodity exchange for sweet potato starch.

b) **Contracting:**
Production and marketing contracts will be used with suppliers and bulk buyers to ensure input stability and predictable revenue.

c) **Insurance:**
General liability and property insurance will be taken for the facility. Business interruption insurance will be explored in later stages.

E. Performance Standards

To ensure effective tracking of operations, financial returns, and product quality, the following performance benchmarks will be adopted:

Operational Standards:

- **Daily Output Target:**
  Minimum of 500 kg/day native starch processed.
- **Production Efficiency:**
  ≥85% utilization of installed capacity during active cycles.
- **Product Diversification Rate:**
  At least 60% of native starch converted into value-added products (CWSS, adhesives, syrup).

Product Quality Metrics:

- **Starch Purity:** ≥98% for food-grade use
- **Solubility Index for CWSS:** ≥90% in cold water within 60 seconds
- **Adhesive Bond Strength:** Compliant with SON packaging standards
- **Syrup Brix Level:** 72–75° (standard for concentrated sweeteners)
- **Feed Protein Content:** ≥12% in final pellet

Financial Metrics:

- **Gross Profit Margin:** 25% across all products
- **Daily Profit Target:** ₦300,000
- **Break-Even Point:** Within the first 12 months of commercial operation

Monitoring Procedures:

- Daily log sheets for input/output records
- Weekly quality control testing and documentation
- Monthly sales vs. production reconciliation
- Quarterly audits and variance analysis

Accountability:

- Operations Manager oversees production benchmarks
- Finance Lead tracks profitability metrics
- Quality Assurance Officer manages lab tests and compliance

Industry Benchmarks:

- Sourced from SON, NAFDAC, and global agro-processing references

Financial Plan

A. Financial Projections

This financial projection outlines the startup and operational cost breakdown, revenue expectations, and profitability targets for the commercial-scale production of starch derivatives, syrups, adhesives, and animal feed from Nigerian sweet potatoes. The capital budget, production targets, and daily profit expectations are guided by the proposed scale of 500 kg/day output capacity.

1. Capital Expenditure Summary

S/N	Item Description	Cost per Unit (₦)	Total Cost (₦)
1	40KVA Diesel Generator	5,000,000	5,000,000
2	Pillow Packaging Machine	4,000,000	4,000,000
3	Borehole Construction	3,500,000	3,500,000
4	Site Preparation	3,000,000	3,000,000
5	Raw Materials Purchase (Sweet potato, additives)	6,000,000	6,000,000
6	Logistics and Unforeseen	3,000,000	3,000,000
7	Locally Fabricated Processing Equipment & Tools	24,256,000	24,256,000

Total Capital Requirement: ₦48,756,000

2. Monthly Revenue and Profit Estimates

Metric	Amount (₦)	Assumption Basis	Notes
Daily Gross Revenue	400,000	500 kg/day * avg ₦2,400/kg	Sales from starch, syrup, CWSS, adhesives, feed
Daily Profit	100,000	25% profit margin	Profit across entire product line

Monthly Gross Revenue	12,000,000	30 days	Revenue without deductions
Monthly Net Profit	3,000,000	25% of gross revenue	Before tax and depreciation
Annual Net Profit	36,000,000	12 months	Projected return

Assumptions:
Projections assume consistent production throughput, stable input pricing, and adequate demand across both consumer and industrial markets. Breakeven is expected within the first 12 months of operation. Future financing and reinvestment plans will support potential expansion to 1,000 kg/day.

Funding Strategy:
The business will be initially funded through a grant from NASENI. Additional working capital, if required, may be sourced via low-interest loans or cooperative contributions.

Debt and Equity Position:
The desired position is 70% grant (equity-equivalent) and 30% low-interest debt if needed.

Capital Debt Source:
Development finance institutions, agricultural loan schemes, and innovation funds (e.g., BOA, CBN-targeted loans).

Leasing Strategy:
Leasing will be considered for non-core movable assets to reduce upfront capital expenses and enhance liquidity.

External Investors:
Not immediately required, but potential private equity partners may be explored post-pilot success.

Financial Risk Management:
Risks will be mitigated through conservative financial forecasting, raw material price hedging, and multi-product diversification.

Operating Controls:
Cash flow budgets, quarterly audits, and defined spending limits will be enforced for debt servicing and sustainability.

Key Assumptions:
Stable market demand, continuous raw material availability, 25% profit margin, and efficient plant uptime ≥85%.

Monitoring Metrics:
Return on Assets (ROA), Return on Equity (ROE), asset turnover ratio, and working capital cycle.

Performance Monitoring:
Monthly management reports, performance dashboards, and variance analysis against budget projections.

Performance Targets:

- Year 1: Break-even, ≥25% net margin, ₦36 million annual profit.
- Year 5: 2x capacity, >₦80 million annual revenue, ROE ≥30%.

Output/Yield Targets:
500 kg/day native starch yield with 85–90% operational efficiency and >60% value-added product conversion.

B. Contingency Plan

If the primary plan encounters unforeseen challenges such as funding delays, equipment failure, or raw material shortages the business will:

- **Pivot to scaled-down operations** using modular processing until full capacity resumes.
- **Leverage research and proof-of-concept outputs** to attract bridging support from state innovation funds, cooperatives, or short-term microfinance.
- **Engage backup suppliers and alternative input sources** within the northern sweet potato belt to maintain continuity.

Emergency Preparedness:

- Equipment maintenance schedules and safety audits will be implemented quarterly.
- Insurance coverage (property and liability) will protect against operational interruptions.
- A three-month operational reserve fund will be maintained post-grant.

Succession and Management Continuity:

- The organizational structure includes trained technical deputies who can assume critical roles.
- All core operations are documented in SOPs (Standard Operating Procedures) to allow seamless knowledge transfer.
- The advisory team will provide interim oversight if a key team member becomes unavailable

Conclusion
This business plan demonstrates the commercial readiness and economic viability of transforming indigenous research into an industrial enterprise. It provides a practical pathway for NASENI

NRCG support by combining innovation, sustainability, and profitability in Nigeria's starch value chain.