

Launching West African Cowpea as ingredient and consumer food in Europe

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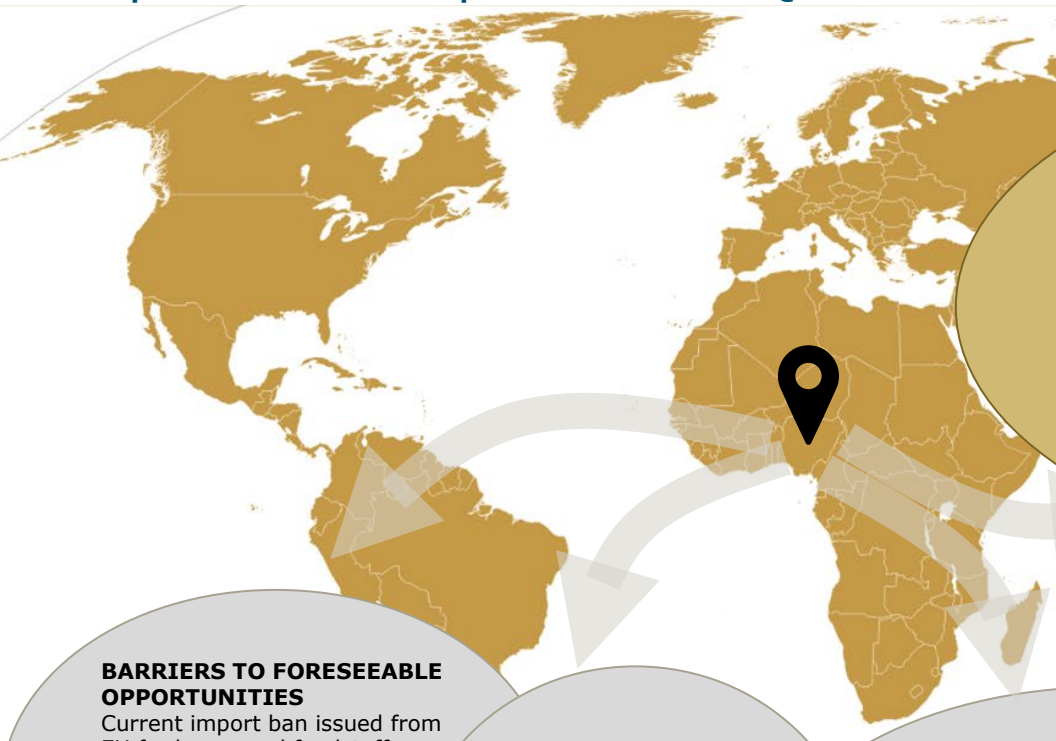
Objective & activities

Objective: develop the basis for launching West African cowpea as ingredient and consumer food in the EU

Main activities:

- Consumer analysis on cowpea-based products
- Piloting Cowpea flour and Cowpea protein-rich flour in milk and bakery applications
- Local market analysis in Ghana
- Innovation workshop with West-African and European companies

Cowpea business potential: A Quick Scan



Baked goods, pasta and noodles

Ingredients for meat analogues

Mousses, Jellies, Drinks

Dairy products

THE COWPEA FLOUR BUSINESS

a local niche and an international opportunity

- The local processing of the flour by SMEs appears to be a female dominated business.
- The flour is suitable for its thickening ability, and it is used in cakes and porridges, dumplings and local products like akara, moi-moi, etc.
- Growing interest from the middle-high class customers in cowpea flour used for quick local dishes preparation.
- Growing product development and innovation knowledge

MULTIPLE POSSIBLE INDUSTRIAL USES

- Suitable as a "Clean label alternative"
- High solubility and High foaming properties
- Up to 25% protein content in the flour
- Simple processing steps needed to separate protein-rich flour, starch-rich flour and fibers

THE NIGERIAN LOCAL SUPPLY CHAIN

- High competition with multiple intermediate actors.
- Business model exploiting the seasonality of the crop with perfect competition.
- Good logistic organisation among Northern production areas and Southern.

COWPEA NUTRITIONAL PROPERTIES

The seeds are rich in protein, lipids, carbohydrates, vitamins, dietary fibers, minerals, and vitamins
23% Protein content;
60% carbohydrates, 10% fibers, 1% fat.

BARRIERS TO FORESEEABLE OPPORTUNITIES

Current import ban issued from EU for beans and foodstuff made of beans from Nigeria
Pest and disease control at production, post harvest and storage levels
Price instability

Cowpea Possible Industrial Uses



Cowpea Possible Industrial Uses

Clean label alternatives are little processed and 'natural' or 'free from' negatively associated ingredients.

Uses based on functionality
High solubility and high foam stability

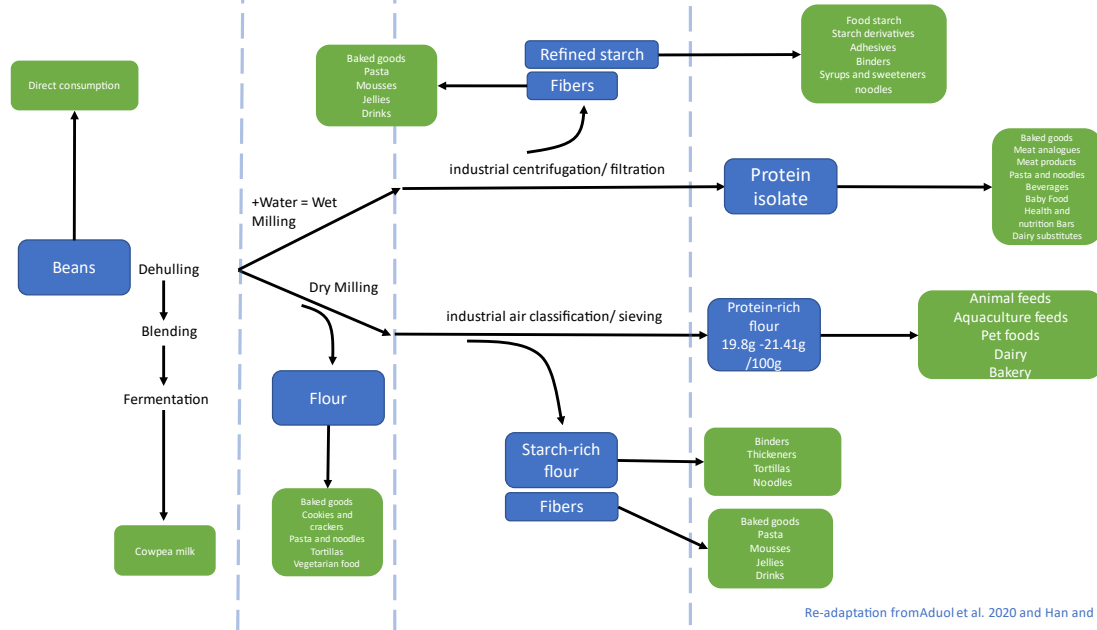
Uses based on nutritional content
protein (23%), carbohydrates (60%), fibers (10%), fat (1%)

The flour

Proteins

Fibers

Starch



Re-adaptation from Aduel et al. 2020 and Han and Tyler 2010.

Industrial Uses: The Flour

The flour

Proteins

Fibers

Starch

Properties:

- High solubility
- Foam stability

Examples:

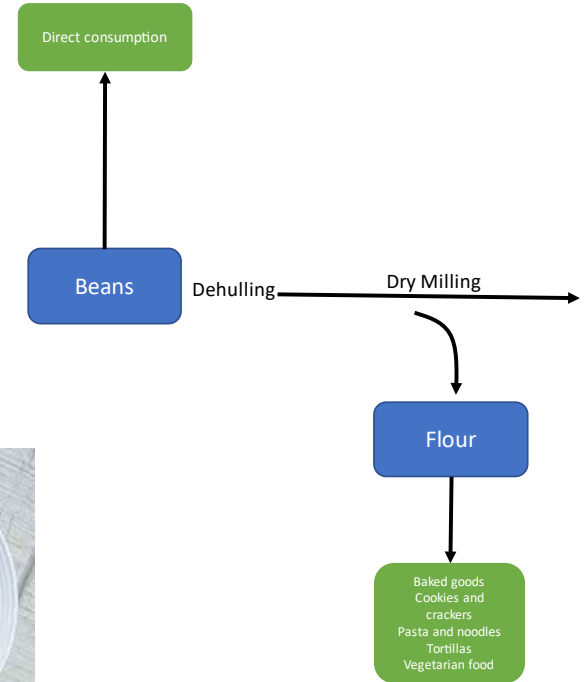
Bread and other baked products, Porridges, Dumplings, Noodles, Akara (beans cake, local dish), Moi moi (beans pudding, local dish), Milk (after blending and fermentation)



Moi Moi (Source: BellaNaija)



Akara (Source: Nigerian Lazy Chef)



Re-adaptation from Aduol et al. 2020 and Han and Tyler 2010.

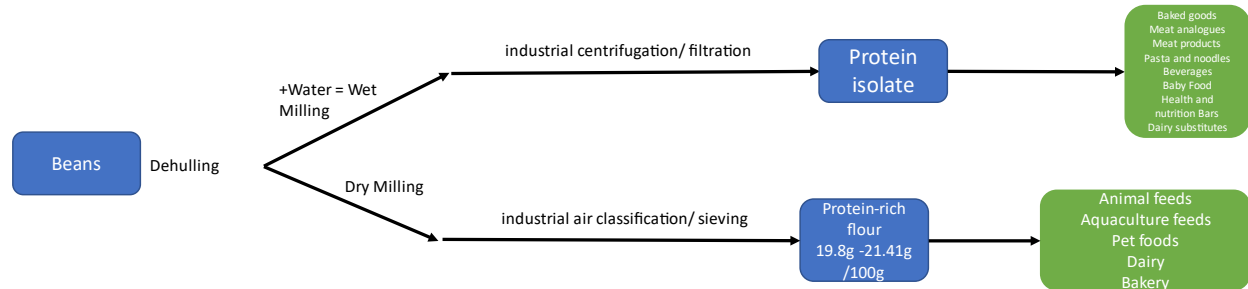
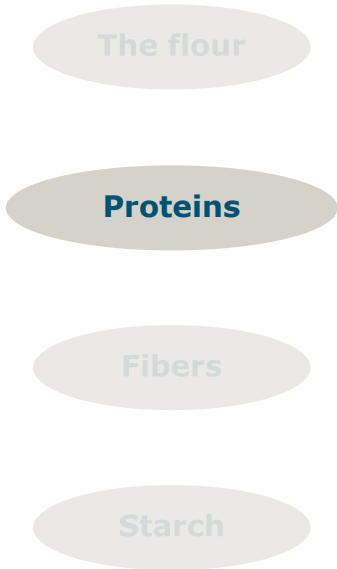
Industrial Uses: The Protein Isolates and Protein Rich Flour

Properties:

- Stabilizer and emulsifiers

Examples:

Dairy, meat analogues and products, baked goods, beverages, baby food, feed and pet food



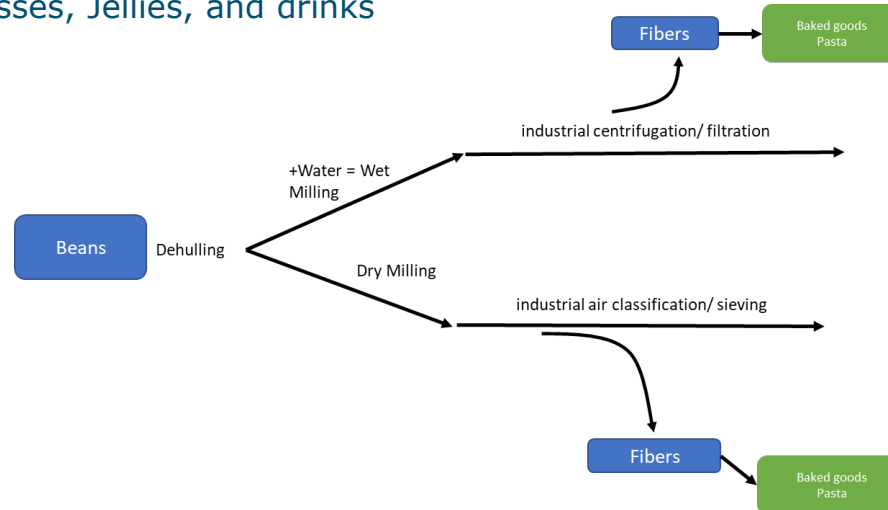
Industrial Uses: The Fibers

Properties:

- Fiber enrichment, nutrient fortification, fat binding and retention, texture modification, and additive replacers

Examples:

Mousses, Jellies, and drinks



The flour

Proteins

Fibers

Starch

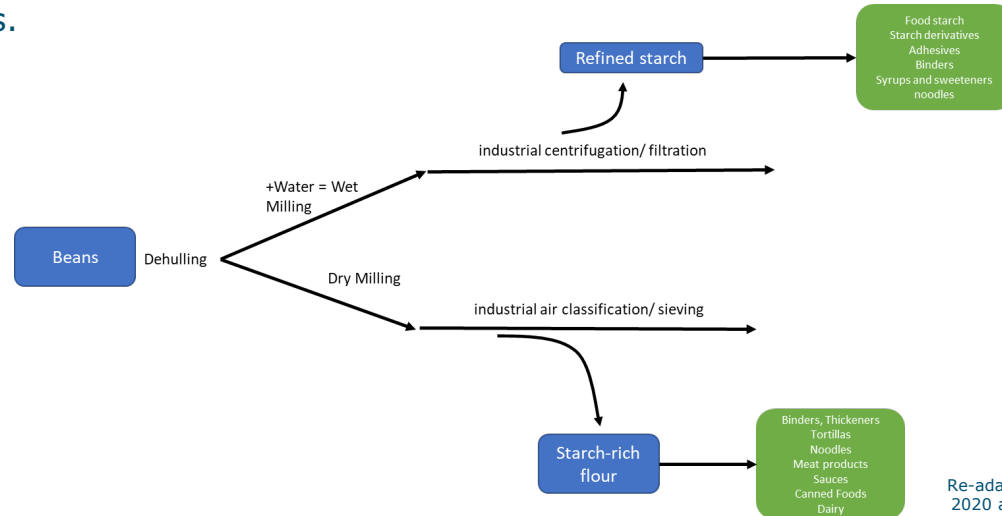
Industrial Uses: The Starch

Properties:

- Thickeners, gelling agents, binders, and stabilizers in different foods, edible coatings, pudding mixes

Examples:

Meat products, sauces, canned foods, dairy products, nuggets, noodles, snacks.



The Nigerian local Market Analysis

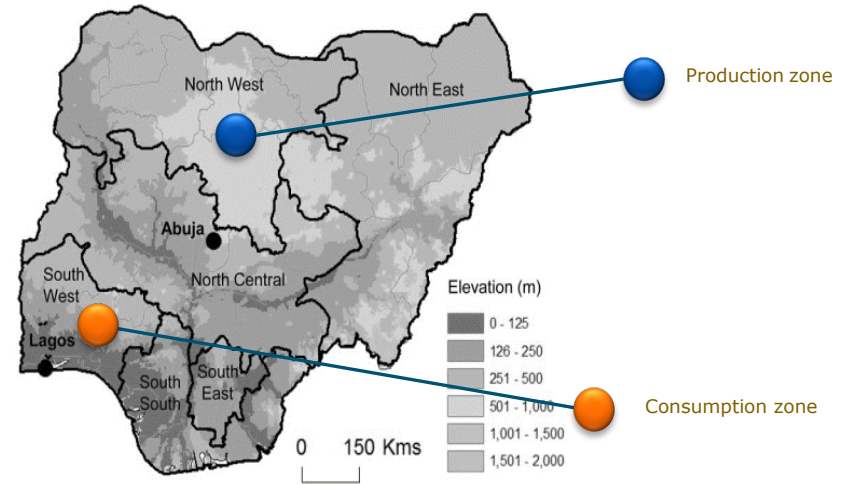


Nigerian Market Insights: Aim and Objectives

AIM: To better understand the business potential of Nigerian Cowpea in the local and international market.

OBJECTIVES:

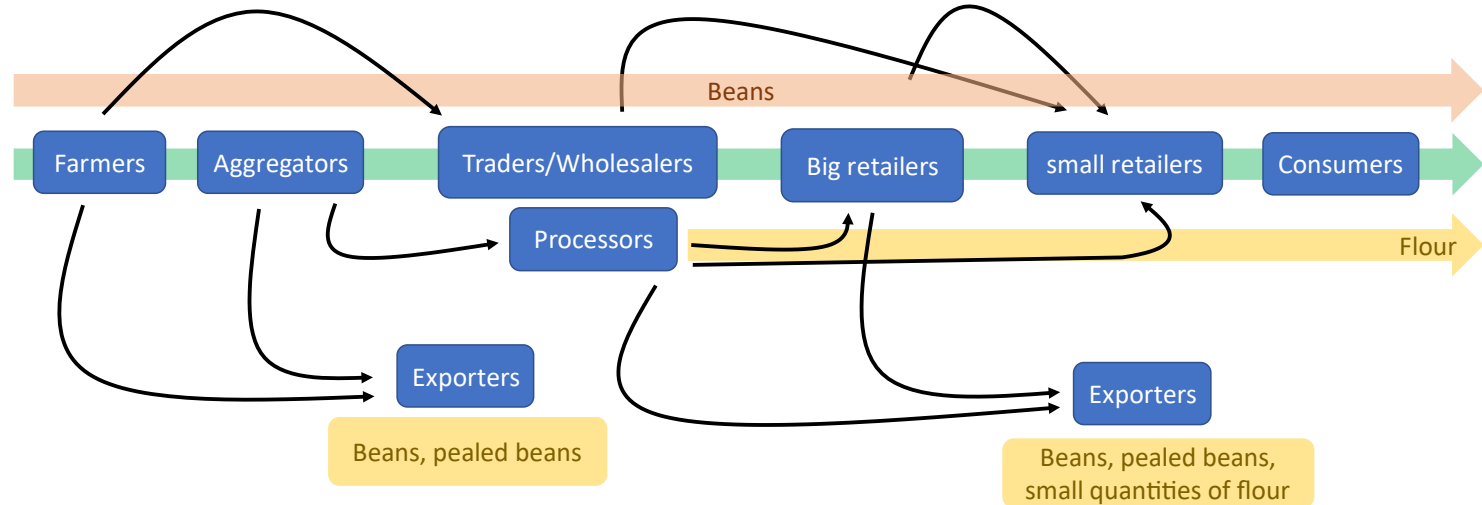
- Identify the major players in the Cowpea supply and value chain in Nigeria
- Define inter/intra relationships among actors
- Identify trading hubs, price changes and supply trends annually
- Identify challenges including food safety concerns
- Estimate the food security concern



Areas: Katsina, Kano, Ibadan and Lagos

Nigerian Market Insights: The Local Supply Chain

- a) Efficient logistical organization between actors – mainly digital communication
- b) Gender distribution: Men in farming and trading, women in processing and retail



Nigerian Market Insights: The local Business Model

Business model exploiting:

1. Seasonal availability of the beans
 - a) High supply (September-January)
 - b) Low supply, scarcity (June-July)
2. Geographical variation: different bag sizes (bags - 100 kg and *Mudu* - 2.5kg/1.3kg)
3. Fragmented supply chain -> margins
4. Competitive pricing and product quality



One mudu bag of beans in the North (2.4 kg).



Beans storage facility built by the government in Dawanu

Traders profit: 20 Naira to 40 Naira (per kg)
(0.02 Euro cents to 0.05 Euro cents per kg)

Processor profit: 25% ROI

Nigerian Market Insights: The local Business Model

Price determination:

1. Demand and supply gluts but also socio-economic drivers.
2. Local market – perfect competition vs processing and export market – monopolistic competition
3. Difference in early maturing varieties

Beans price
Minimum 240 Naira/kg (0.29/kg)
Maximum 800 Naira/kg (0.96/kg)



Traders with samples of cowpea beans

Nigerian Market Insights: Main Risks & Challenges

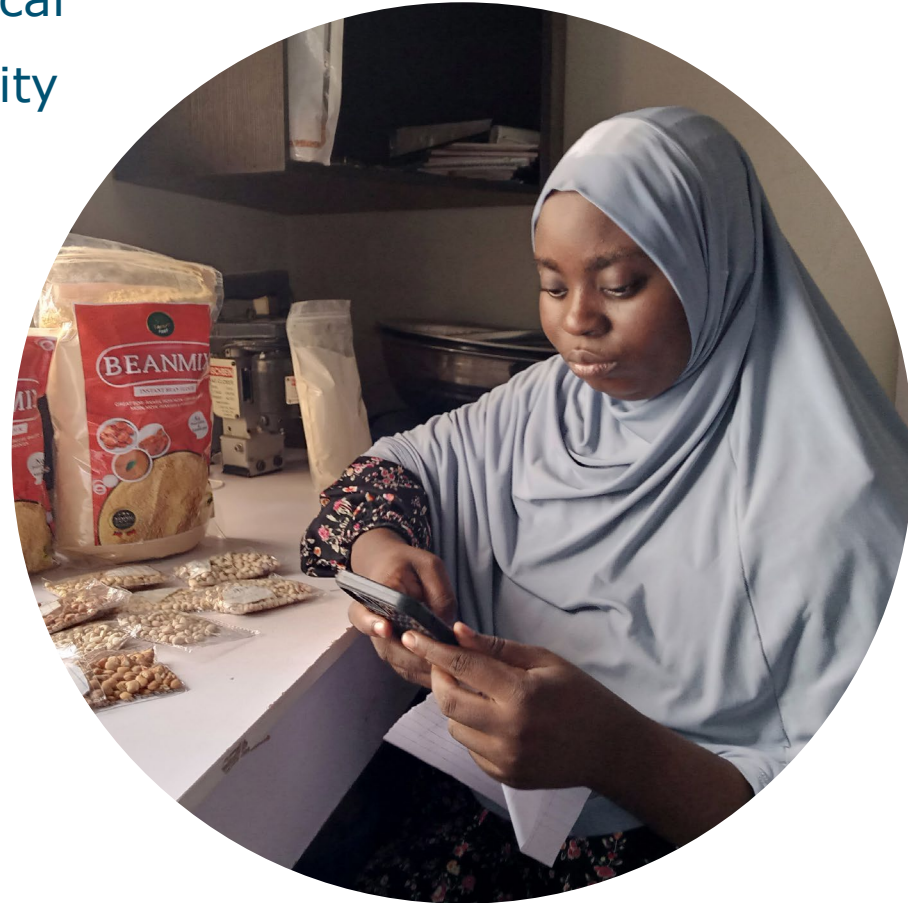
1. Unstable prices
2. Pest infestation in the field, postharvest, and storage
3. Access and affordability to quality inputs
4. Logistics risk: North – South connection
5. Absence of local market and food safety regulation authorities
6. Fragmented supply chain and export regulatory process
7. Still high costs involved in production and logistics



Trader in cowpea storage room

The Flour Business: a woman-led local niche and an international opportunity

- Niche in the market: Undiscovered potential, targeting a specific clientele
- Woman – led established cowpea flour business in Lagos
- Capacity – 1 ton of flour per week
- Formally registered companies with NAFDAC, HACCP and NEPC certificates.



Processor at her desk with beans samples and beans flour mix.

The Flour Business: a woman-led local niche and an international opportunity

Good knowledge of the product potential and technical characteristics by processors.

- Fresh dried beans vs stored
- Varieties and different uses (baby food)
- Bean mixes
- Innovation in drying methods

Flour price

Minimum 800 Naira/kg (0.96 Euros) Maximum 3700 Naira/kg (4.44 Euros)

Profit per package (0.9kg): 200 to 500 Naira (0.24 to 0.62 Euros).

ROI = 25%



Cowpea flour mix (with crayfish).



The Way Forward: Activities in the SMP


Prototyping and Consumer Perceptions

ACTIVITIES

1. Currently, 2 food technology student groups are working on *Cowpea and Bambara*
 - a) Industrial uses identification
 - b) Process diagram flows
 - c) Ethics
2. Prototyping with Wageningen Food and Biobased Research
 - a) Bread from whole flour and protein-rich flour
 - b) Milk from whole flour and protein-rich flour
3. Workshop on sensory perceptions for Cowpea-based products



Thank you for
your attention!



To explore
the potential
of nature to
improve the
quality of life