



## PAFO-COLEAD INNOVATIONS SERIES: Innovations and successes of African farmer-led businesses and SMEs

### SESSION N°18

#### Innovations in packaging: opportunities for African entrepreneurs and SMEs

Wednesday 24 April 2024 – 12:00-14:00 UTC (14:00 - 16:00 CET)

Online ([Zoom](#))

*English-French-Portuguese interpretation available*

#### 1. Context

Food packaging can be defined as “a complex and dynamic system aiming to safely prepare foods for transportation, distribution, storage, retailing, handling and end-use, and safely deliver these foods to the consumer in a sound condition (maximum quality) at a minimum cost”.<sup>1</sup>

Food packaging lies at the very heart of the modern food industry as very few foods are sold unpackaged. Packaging contributes also to food loss reduction by increasing the shelf life.

A good packaging protects from physical hazards: shock, heat, cold, dust; chemical hazards: humidity, corrosion, spatters of detergent; microbiological hazards: yeasts, mold, pathogenic germs in food. It protects food from bruising during transport (in the case of fresh fruit and vegetables for example).

Packaging allows simplified storage for wholesalers, rapid sorting for the distributor and easy handling for the customer.

When considering a packaging option, it is important for small and medium sized-enterprises (SMEs) to consider the nature of their products, the preferences of the target market, and the regulations regarding packaging in the specific country or region.

Increasingly crucial to the consumer is the information packaging provides such as regulatory information on the product’s use, traceability about the origin and freshness of the product to be checked against its use-by date and best-before date. The packaging must convince consumers of the product’s quality and motivate them to purchase it. It conveys identity of the product and the company, message and values, shape and ergonomics. The product’s packaging facilitates ease of

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<sup>1</sup> Floros J D, Gnanasekharan V 1993 Shelf-Life Prediction of Packaged Foods: Chemical, Biological, Physical, and Nutritional Aspects. G. Charalambous (Ed.). Elsevier. Publ., London.

use, carton has a pouring lip, the cap becomes a measuring glass, the flask provides a handle, the food container goes in the microwave and becomes a plate, etc.<sup>2</sup>

Food packaging has become more demanding to offer the consumer good quality foods with high standards such as material performance and extended shelf life. Developments such as smart packaging that could bring active compounds, outstanding gas/vapor barrier properties, and biodegradability to reduce plastic waste disposal represent an additional asset in innovative food packaging.<sup>3</sup>

The requirement for options that have a lower environmental impact as compared to traditional plastics has indeed developed a growing market when it comes to biodegradable and compostable packaging. The sustainability factor is important in packaging as it can influence consumer's purchasing decisions. Businesses must also consider the environmental impact of their packaging choices, with a growing trend towards sustainable materials like biodegradable plastics, plant-based packaging, and recycled materials.

### 1.1. Types of packaging

Packaging options vary widely depending on the product, industry standards, and consumer preferences. Some common types of packaging materials include:

- **Cardboard boxes:** versatile and recyclable, used for a wide range of products. There are two main categories of cardboard: corrugated fiberboard and paperboard.
- **Plastic packaging:** includes bottles, containers, and wrappers, often used for its durability and moisture resistance. Plastics can be rigid: (e.g., tin of butter, pot of yoghurt, bottle of water, etc.) or pliable (e.g., pack of juice, pack of spices, etc.).<sup>4</sup>
- **Glass containers:** preferred for their non-reactive nature, commonly used for food and beverages.
- **Metal packaging** (cans and tins). Durable and airtight, suitable for preserving food.
- **Flexible packaging:** Such as pouches or bags, lightweight and often used for snacks and perishables.
- **Natural fiber.**
- **Wood packaging** for bulk packaging and transport of foodstuffs.
- **Multilayers from PE and PP and aluminum** combine different materials to produce stronger, more watertight products.

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<sup>2</sup> Hendrik N.J. Schifferstein, Alie de Boer, Mailin Lemke, Conveying information through food packaging: A literature review comparing legislation with consumer perception, *Journal of Functional Foods*, Volume 86, 2021,104734,ISSN 1756-4646, <https://doi.org/10.1016/j.jff.2021.104734>.

<sup>3</sup> [Innovative Food Processing Technologies. A Comprehensive Review Reference Work](#). 2021. Editors-in-Chief: Kai Knoerzer and Kasiviswanathan Muthukumarappan.

<sup>4</sup> **Polyethylene terephthalate (PET)** is used mainly as support material onto which another film is flattened or coextruded. This material is being used increasingly as a replacement for glass packaging (bottled water and soft drinks, jars of dried fruit, etc.).

**Polyethylene (PE)** is the most popular film for packaging, accounting for 70% to 80 % of the protective film market. It is available in low-density polyethylene (LDPE) and high-density polyethylene (HDPE) forms. PET is used mainly as support material onto which another film is flattened or coextruded. This material is being used increasingly as a replacement for glass packaging (bottled water and soft drinks, jars of dried fruit, etc.).

**Polyvinyl Chloride (PVC)** was questioned for a time because it was not biodegradable. However, it uses less energy and fewer non-renewable resources than other plastic materials, and the technology now exists to recycle it.

**Polypropylene (PP)** stretch-wrapping is suitable for imprinting, lamination, and plating. It can be used in replacement of PE, PET, and other laminated products. In Africa, PP is often used in woven plastic bags.

**Cellophane** is regaining popularity as a food wrap because it is 100% biodegradable.

**Polystyrene (PS)** exists under several forms exist: a hard plastic used to package rigid products or polystyrene can also be expanded or extruded as a foam film, commonly known as Styrofoam, which is an excellent material for vegetable and fruit packaging. Its lightweight and heat-insulating properties make it the most popular form of packaging for food-service applications.

**Nylon** is the base material of polyamide, but it is not a major raw material for flexible packaging.

## 1.2. Legislation

While specific regulations for food packaging in Africa can vary by country, there are some general principles and guidelines that many countries follow such as guidelines set by the CODEX Alimentarius Commission, Prohibition of Harmful Substances, General Hygiene Requirements.

For export markets, especially to the European Union (EU), companies that supply food contact materials and food packaging must comply with EU's food contact regulations. Several regulations control food packaging in the EU, but two regulations stand out: Regulation (EC) No. 1935/2004 and Regulations (EC) No. 2023/2006 on Good Manufacturing Practices (GMPs).

- **Regulation (EC) No. 1935/2004** requires materials that do not release harmful levels of their constituents into foods, do not change the taste, odor or composition of food in an unacceptable way. It also requires that businesses involved in food packaging must establish a system that traces Food Contact Materials (FCMs) at every step from production to distribution.
- **Regulation (EC) No. 2023/2006 on GMPs** ensuring that the food consumers receive is safe to eat is a complex undertaking – retailers must be confident that the food and food packaging supply line is compliant with safety regulations. GMP guidelines are a quality assurance tool that assures retailers and consumers that their food's packaging is safe. Regulation (EC) No. 2023/2006 on GMPs says that manufacturers must create FCMs in compliance with good manufacturing practice guidelines.
- On 30 November 2022, the Commission proposed to revise the **Packaging and Packaging Waste Directive**.<sup>5</sup> This review contributes to reaching the objective of [the European Green Deal](#) and the [new circular economy action plan](#) to ensure that “all packaging on the EU market is reusable or recyclable in an economically viable way by 2030”. It will also contribute to the commitment of the [2018 Plastics Strategy](#) to ensure that by 2030 all plastics packaging placed on the market can be reused or recycled in a cost-effective manner”.<sup>6</sup>

It's important for businesses to stay informed about the specific regulations in their country and to ensure that their packaging materials comply with these standards.

## 2. Challenges in sourcing quality and sustainable packaging

Sustainability and environmental concerns are rising on the agenda. As consumers become more conscious of their ecological footprint, the industry has to innovate and adopt sustainable practices. Limited waste management and recycling infrastructure make it challenging to effectively collect and recycle packaging materials. Consumer education on the environmental impact of packaging waste needs also to be strengthened.

Poor packaging and labelling are some of the main reasons for the failure of locally manufactured products to compete successfully with imported ones. Sourcing affordable and quality packaging is a significant challenge for SMEs in Africa. The scarcity of local suppliers who can meet international standards and consumer preferences often forces businesses import packaging materials.

High cost of packaging equipment and materials as well as the high maintenance and servicing costs remain a challenge for SMEs.

Sustainable packaging materials can initially be more expensive than conventional options. This cost differential can deter companies, particularly SMEs, from adopting sustainable

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<sup>5</sup> DIRECTIVE 94/62/EC amended; consolidated text: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01994L0062-20150526>

<sup>6</sup> [https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste\\_en](https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en)  
[https://environment.ec.europa.eu/publications/proposal-packaging-and-packaging-waste\\_en](https://environment.ec.europa.eu/publications/proposal-packaging-and-packaging-waste_en)  
[Deal on new rules for more sustainable packaging in the EU](#), European Parliament, 2024.

packaging. Furthermore, there is limited knowledge of packaging technologies, product standards and certification and generally, little investment in packaging systems.

While food packaging is an integral component of food industry and helps to store food and beverages in hygienic manner, it can at times be a cause of concern for food safety. Some packaging materials such as certain types of plastic, polythene, and styrofoam can release toxins when they are heated and can be dangerous to consumers. Packaging materials which are irradiated (along with food) can transfer unsafe nonfood substances into the food. To protect consumers effectively, the relevant authority certifies each of these food packaging materials subjecting them to rigorous testing protocols.<sup>7</sup>

### 3. New opportunities for African SMEs in sustainable packaging

Investment in packaging in Africa is increasing, which could lead to more competitive prices and improved access to quality materials for local SMEs.

Many companies are investing in innovation for the development of **sustainable packaging** using alternative materials or even in circular economy models to mitigate the environmental impacts of the food packaging sector.<sup>8</sup> Innovations in packaging present numerous opportunities for African entrepreneurs and SMEs who can respond to a growing global demand for eco-friendly packaging solutions. African SMEs can innovate by developing biodegradable, recyclable, or compostable packaging materials, tapping into this lucrative market and using byproducts from agricultural products. Bio-based materials from agri-food wastes are considered a potential solution to a growing market of bioplastic packaging, with several benefits regarding environmental impacts. They can be categorised into protein-based, starch-based, cellulose-based, chitin-based, lipid-based, and microbial-based materials.<sup>9</sup> Examples of **bioplastics** being developed from agricultural waste and by-products include starch-based bioplastics (use of starch extracted from crop residues like potato peels);<sup>10</sup> cellulose-based bioplastics used to improve mechanical and thermal properties of polymers can be sourced from agricultural waste such as stems, leaves, seeds, and pods<sup>11</sup>; biopolymers from livestock waste such as keratin found in animal waste, are being researched for their potential as additives in eco-composites and bioplastics; plant-based fibers like banana stem, henequen leaves, jute, hemp, and pineapple. These materials are considered for their biodegradability and compostability.<sup>12</sup>

These initiatives not only help in reducing the reliance on fossil fuels but also aim to manage agricultural waste more effectively, contributing to a circular economy approach.

African companies are increasingly using **recyclable materials**, such as paper, cardboard, and glass, for packaging. These materials can be collected and processed more easily in regions with limited recycling infrastructure. Some companies are adopting **circular economy models**, which prioritise the recycling and reuse of materials, creating new economic opportunities.

**Biodegradable and compostable materials**, like bioplastics and plant-based packaging, are gaining popularity. These materials break down naturally, reducing the environmental impact of packaging waste.

<sup>7</sup> R.K. Gupta, P. Dudeja, in [Food Safety in the 21st Century](#), 2017.

<sup>8</sup> Cristofoli, N.L.; Lima, A.R.; Tchonkouang, R.D.N.; Quintino, A.C.; Vieira, M.C. Advances in the Food Packaging Production from Agri-Food Waste and By-Products: Market Trends for a Sustainable Development. *Sustainability* 2023, 15, 6153. <https://doi.org/10.3390/su15076153>.

<sup>9</sup> Cristofoli, N.L.; Lima, A.R.; Tchonkouang, R.D.N.; Quintino, A.C.; Vieira, M.C. [Advances in the Food Packaging Production from Agri-Food Waste and By-Products: Market Trends for a Sustainable Development](#). *Sustainability* 2023, 15, 6153.

<sup>10</sup> Samer, M., Hijazi, O., Mohamed, B.A. et al. Environmental impact assessment of bioplastics production from agricultural crop residues. *Clean Techn Environ Policy* 24, 815–827 (2022). <https://doi.org/10.1007/s10098-021-02145-5>.

<sup>11</sup> Mikus, M., Galus, S. (2022). [Biopolymers from Agriculture Waste and By-Products](#). In: Nadda, A.K., Sharma, S., Bhat, R. (eds) *Biopolymers*. Springer Series on Polymer and Composite Materials. Springer, Cham.

<sup>12</sup> Ahmad, S., Abbas, S., Khalid, N., Ali, A., Ahmed, I. (2021). [Application of Bioplastics in Agro-Based Industries and Bioremediation](#). In: Kuddus, M., Roohi (eds) *Bioplastics for Sustainable Development*. Springer, Singapore.

Many consumer goods companies are using eco-labels and certifications to indicate the sustainability of their packaging. These labels help consumers make informed choices and reward companies that prioritise sustainability.

Active packaging technologies which interact with the food product to extend its shelf life, are gaining traction in Africa as they offer innovative solutions for food safety, shelf-life extension, and consumer engagement.<sup>13</sup> Intelligent Packaging which incorporates technology that provides information about the condition of the food or its environment (i.e., time-temperature indicators, freshness sensors, and Radio-frequency identification (RFID) tags for tracking and traceability) is also expanding in the continent.<sup>14</sup>

#### 4. Way forward

Improving packaging systems will contribute to strengthening the entire food supply chain, improve the competitiveness of enterprises and benefit all food chain actors and consumers.

The need for efficient supply chains and logistics systems which ensure timely and cost-effective delivery of packaged goods remains a complex task.

More and more packaging is no longer considered as a cost item by businesses but as an investment which adds value to the finished product. This is crucial as a consumer's decision to buy is made largely by looking at the packaged product, and consumers are captivated by unique products.

Appropriate packaging has a significant impact in improving food quality and safety, thereby reducing food losses, whilst enhancing the competitiveness of Africa's agro-enterprises and boosting trade. Furthermore, packaging plays a key role in improving the marketing of produce and is an important part of a strategy to enhance competitiveness of agro-SMEs.

To reducing the overall environmental impact of food packaging systems, the continent should also consider the environmental impact of the packaging material itself.

African enterprises must lead in green packaging. To achieve this, they will need facilities to test new packaging designs, information platforms to inform processors about available materials and equipment, and advisory support services to help enterprises adapt production and product design to reduce costs, waste and pollution. Also, there is a need to attract investors to develop scalable and recyclable packaging manufacturing facilities.<sup>15</sup>

#### Key points for discussion:

- What are the opportunities in food packaging for African SMEs and businesses?
- What innovations are required to succeed in regional and export markets?
- What incentives can be provided to SMEs and smallholders to better access packaging locally?

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<sup>13</sup> <https://www.mordorintelligence.com/industry-reports/middle-east-and-africa-active-and-intelligent-packaging-market-industry>.

<sup>14</sup> [Middle East and Africa Active, Smart and Intelligent Packaging Market – Industry Trends and Forecast to 2030](#). 2023.

<sup>15</sup> FAO. Experts define sustainable packaging priorities for Africa. 2018. <https://www.fao.org/africa/news/detail-news/en/c/1152067/>.



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Wednesday 24 April 2024 – 12:00-14:00 UTC (14:00 - 16:00 CET)

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**Agenda**

12:00-12:10 Introduction: *Dr. Babafemi Oyewole, CEO, PAFO*

Moderator: *Isolina Boto, Head of Networks and Alliances, COLEAD*

12:10-13:00 Panel: **successes in packaging in Africa led by businesses**

- *Joan Inés Henry Gad, General Director, Jhines Factories, Benin*
- *Derrick Sarfo, CEO, DercolBags Packaging Ltd., Ghana*
- *Chichi Eriobu, CEO, Phronesis Food, Nigeria*

13:00-13:20 Discussants

- *Zippy Shiyoya, Director, Institute of Packaging Professionals Kenya (IOPPK)*
- *Tom Owuor, Director, Direne Packaging and Business Advisory Services, Kenya*

13:20-13:50 Debate

13:50-14:00 Key takeaways and conclusion



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