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Food handling practices of fish and horticulture transporters in Kebbi, Oyo, and Kaduna States

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1. Introduction

Fresh fish and horticultural produce are highly perishable commodities that require appropriate packaging, temperature control, and hygienic handling during transportation. Inadequate post-harvest practices contribute to spoilage, food safety risks, and economic losses for farmers, traders, and consumers. Safe transportation of perishable foods such as fish and vegetables is critical for food safety, public health, and reduction of post-harvest losses. This report evaluates transportation practices among fish transporters in Kebbi State and tomato/vegetable transporters in Oyo and Kaduna States, with emphasis on packaging, temperature management, hygiene, monitoring, and delay handling.

Findings reveal major limitations in cold chain use, hygiene practices, temperature monitoring, and contamination control. Most transporters rely on traditional open baskets without temperature control. Preventive food safety practices are rarely applied, increasing risks of spoilage, contamination, and economic losses. Kaduna shows slightly better adoption of good practices compared to Oyo, but overall compliance with safe transport standards remains very low. The report provides technical and policy-level recommendations to strengthen food safety and reduce post-harvest losses.

2. Data

We leverage on primary data collected from transporters engaged in the movement of horticultural products (tomatoes) and fish across three Nigerian states; Kaduna, Kebbi, and Oyo. For each product, we began by compiling a comprehensive list of transporters operating in the major wholesale markets, which constituted the full universe of wholesale markets relevant to tomatoes and fish in both rural and urban areas. This initial listing was then augmented using two additional sources. First, tomato and fish wholesalers were asked to identify the transporters they regularly patronized, providing the transporters' names and contact details. Second, in key production local government areas (tomato-producing LGAs in Oyo and Kaduna, and fish-producing LGAs in Oyo and Kebbi), farmers supplied further lists of transporters they commonly used. After merging the three lists and removing duplicates (classified by vehicle type), we selected our sample to include the universe of all transporters found. A total of 538 transporters were identified for the horticulture node. Of these, 257 operate in Kaduna State and 281 in Oyo State. For the fish node, 84 transporters were identified to operate in Kebbi State.

3.0 Transport Practices for Fish in Kebbi State

3.1 Packaging Methods Used During Transportation

Fish transport in Kebbi is dominated by traditional packaging methods:

- Baskets – 46%
- Bag and carton combinations – 38%
- Minor use of sacks, metal basins, and plastic bowls - 16%

These materials provide little physical protection and no temperature insulation, exposing fish to mechanical damage and rapid spoilage.

3.2. Condition of Products During Transportation (Covered or Uncovered)

Fish are transported under mixed conditions, with many loads insufficiently protected:

- Use of covered baskets – 27%
- Fish is packed in carton/ tied in tarpaulin – 33%
- Fish was left uncovered in breathable containers – about 10%
- Use of open baskets – 12%
- Use of breathable containers covered or combination of other method – 18%

A significant proportion of fish is therefore exposed to dust, sunlight, pests, and airborne contaminants.

3.3 Temperature and Handling Practices During Transportation

Temperature control during transportation of fish is almost non-existent:

- Only 6% reported transporting fish early in the morning to reduce heat exposure
- 94% reported no special handling practice during transport
- Use of refrigerated vehicles was virtually absent

Given fish's high perishability, this creates serious risks of rapid quality deterioration and microbial growth.

3.4 Practices to Prevent Contamination

Preventive measures against contamination are very limited:

- 14% separated fish from other goods
- 4% sanitized vehicles
- 8% cleaned containers
- 74% did nothing to protect fish from contamination

This indicates high vulnerability to cross-contamination from other goods and dirty transport surfaces.

3.5 Hygiene Practices of Loading and Offloading Personnel

Hygiene compliance among handlers is extremely poor:

- Gloves used – 5%
- Hairnets – 0%
- Protective clothing – 0%
- 95% used no protective gear

This significantly increases the risk of direct contamination from handlers.

3.6 Monitoring of Temperature or Moisture

- Only 1% monitored temperature or moisture
- 99% had no monitoring system

Without monitoring, spoilage and safety risks cannot be detected or managed.

3.7 Transportation Delays and Product Handling During Delays

- 7% experienced transport delays
- 100% of those delayed took no action to protect the fish

This worsens spoilage, especially under high ambient temperatures

4.0 Transport Practices for Tomatoes and Vegetables in Kaduna and Oyo States

4.1 Packaging Methods Used During Transportation

Oyo State

- Baskets – 98% (mostly traditional woven baskets)
- Other materials e.g. Sack, plastic bowl (2%)

Kaduna State

- Baskets – 86%
- Plastic crates – 4%
- Other materials (sacks, bowls, etc.) – small proportions (~10%)

The adoption of improved packaging such as plastic crates is low though Kaduna shows slightly higher adoption than Oyo.

4.2 Condition of Products During Transportation (Covered or Uncovered)

Oyo

- Open baskets – 73%
- Covered baskets – 21%
- Breathable containers – 3%
- Other materials (e.g. sack, jerrican) - 3%

Kaduna

- Covered baskets – 59%
- Open baskets – 20%
- Breathable containers – about 15%
- Other (jerrican or not put in any container at all) – about 6%

Kaduna demonstrates better protection from environmental exposure, while most produce in Oyo is transported uncovered, increasing dehydration and contamination risks.

4.3. Temperature and Handling Practices During Transportation

Oyo

- Temperature-controlled vehicles – 0.4%
- Early morning transport – 22%
- 76% took no temperature-related action
- Others (sprinkle water during transportation) – 1.6%

Kaduna

- Temperature-controlled vehicles – 9%
- Early morning transport – 5%
- 82% took no action
- Sprinkle with chemical – 0.3%
- Others (sprinkle water during transportation) – 3.7%

Kaduna shows some early adoption of cold chain, but the majority of produce in both states is transported without temperature protection.

4.4 Practices to Prevent Contamination

Oyo

- Separation from other goods – 6%
- Cleaning containers – 1%
- Vehicle sanitation – 0%
- Others (mix with other product, spread product on nylon) – about 2%
- 91% took no protective action

Kaduna

- Separation from other goods – 15%
- Cleaning containers – 5%
- Vehicle sanitation – <1%
- 79% took no protective action

Contamination prevention is weak in both states, though Kaduna performs slightly better than Oyo.

4.5 Hygiene Practices of Loading and Offloading Personnel

Oyo

- Gloves – 4%
- Hairnets – 1%
- Protective clothing – 3%
- 92% used no protective gear

Kaduna

- Gloves – 2%
- Hairnets – 0%
- Protective clothing – 1%
- 97% used no protective gear

Handler hygiene is poor in both states, increasing contamination risks.

4.6 Monitoring of Temperature or Moisture

Oyo

- Monitoring – 1%
- No monitoring – 99%

Kaduna

- Monitoring – 8%
- No monitoring – 92%

Temperature tracking is rare, though Kaduna again shows slightly better adoption.

4.7 Transportation Delays and Product Handling During Delays

Oyo

- 6% of transporters of horticultural products experienced delays during their last trip
- Of those who faced a delay, 95% did nothing
- The remaining 5% opened vehicle to allow some ventilation

Kaduna

- 12% of transporters of horticultural products experienced delays during their last trip
- Of those who faced a delay 94% did nothing
- The remaining 6% uncovered the packed product

Lack of protective action during delays leads to accelerated spoilage and economic losses.

5. Conclusion

Across Kebbi, Oyo, and Kaduna, transportation of fish and vegetables is characterized by:

- Heavy reliance on traditional, non-protective packaging
- Minimal cold chain usage
- Very weak hygiene practices
- Little to no contamination prevention
- Almost no temperature monitoring
- Poor response to transport delays
- Mixing of food product with other products

These gaps contribute significantly to post-harvest losses, food safety risks, and reduced market value.

6. Policy recommendations:

- Launch a phased voluntary transition to improved packaging for tomatoes. This could include subsidizing plastic crates for tomato transportation and collaborating with local manufacturers to lower production and distribution costs for the crates. Such efforts to expand the use of plastic crates need to consider all actors along the tomato value chain from farmers to processors, wholesalers, retailers and transporters. Plastic crates reduce post-harvest loss because they are rigid, stackable, ventilated, washable, and non-porous. They prevent mechanical bruising, reduce microbial contamination, improve airflow and heat dissipation, minimize vibration injury, and allow proper sanitation — all of which slow spoilage and extend shelf life
- Establish a simple, affordable Transport Hygiene Certification scheme to promote compliance with basic food safety standards during the movement of food products.
- Ensure the enforcement of the Transport Hygiene Certification scheme via practical and adequately funded programs and strategies. For example:
 - Promoting dedicated food transporters via:
 - Reduced motor park levies for certified food transporters
 - Access to government-backed microcredit schemes (e.g., BOI or state MSME funds)
 - Priority loading access at major markets
 - Public recognition (visible certification stickers)
 - Ensure that food is not mixed with non-food products during transportation
- Broaden the mandate of state agricultural extension services to incorporate structured training on post-harvest handling, safe transport practices, and contamination prevention.

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Reference:

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