



# TOTAL FOOD CHAIN MANAGEMENT IN SELECTED FISH PRODUCTS (Dried and Extruded) CHAINS IN INDIVIDUAL THIRD COUNTRIES

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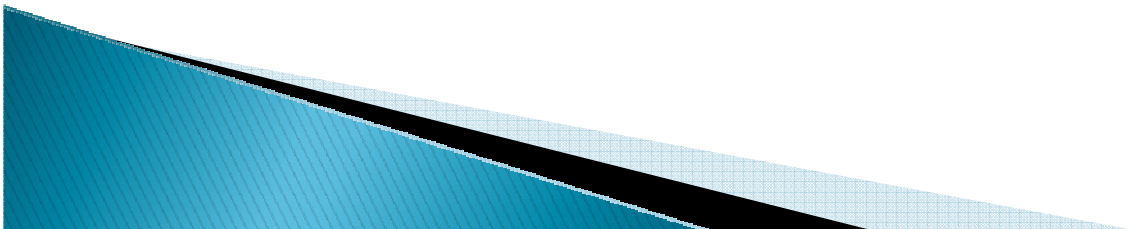
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## Objectives

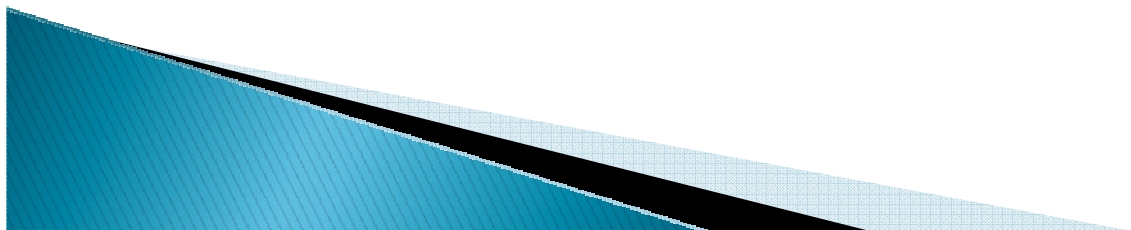
To implement the technological advances for developing three selected fish products.

To evaluate the quality management tool in the three selected fish product chain case studies in Africa (Kenya, Namibia, Ghana), Asia (India and Malaysia) and Latin America (Argentina) to include different economic, cultural and social conditions.



# Technological advances

- ▶ Solar drier powered by wind mill
- ▶ Solar biomass hybrid dryer
- ▶ Solar extruder
- ▶ CAFD



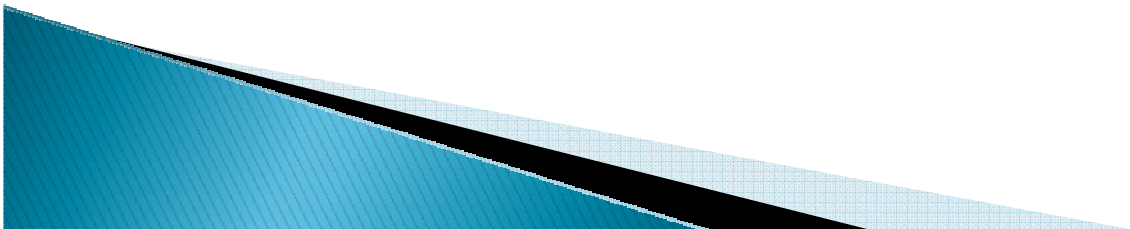
# Open sun drying

20–40 % of post harvest losses in fisheries sector

Nutritional security of

Sustainable utilization of available resources?????

Livelihood????



# DRIED FISH PRODUCTS

- ▶ Instead of open air sun drying, enclosed solar or wind powered dryers and biomass dryers were used to dry the fish.
- ▶ In Kipini, Kenya, solar powered and wind powered driers were used.
- ▶ A guide for smoking and drying fish was distributed to local fishing communities.
- ▶ In Ghana and India hybrid biomass-solar powered driers were installed and used.
- ▶ This technology has been taken up by SMEs in India and Kenya and is being replicated along the coast.





# Dried Fish Products using Solar-Biomass Hybrid Dryer



Anchovy dried in Solar-Biomass Hybrid Dryer ready for marketing



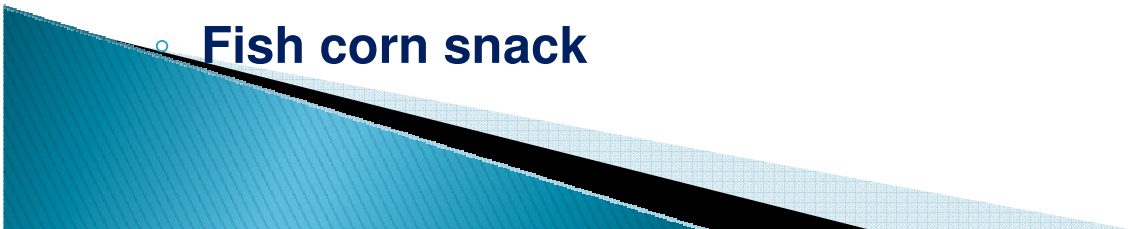
Drying of ready to fry spiced Anchovy in Solar-Biomass Hybrid Dryer



# Extruded Fish Products

Fish and tapioca starch or maize flour were extruded to give a number of products including:

- Snacks from short-bodied mackerel (*Rastrelliger brachysoma*) and yellow split pigeon peas (*Cajanus cajan* L.)
- Breakfast cereal from round scad (*Decapterus maruadsi*) and chickpeas (*Cicer arietinum* L.)
- Crackers from green banana (*Musa paradisiaca*) powder
- Snacks incorporated with mango peel powder
- Breakfast cereal incorporated with spinach
- Biscuits
- Instant fish-rice porridge
- Instant soup powder
- Fish corn snack



# FISH BREAKFAST CEREAL



Fish breakfast cereal



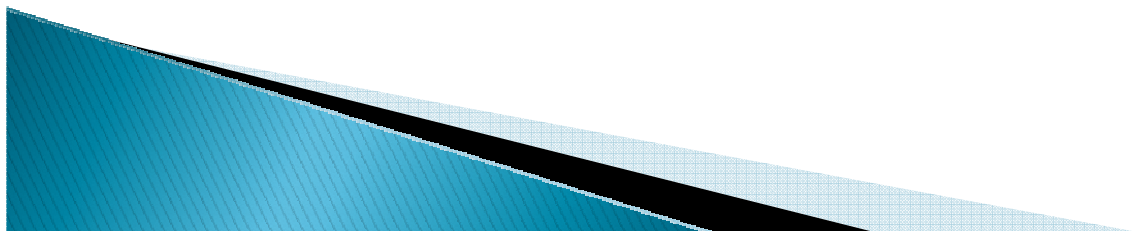
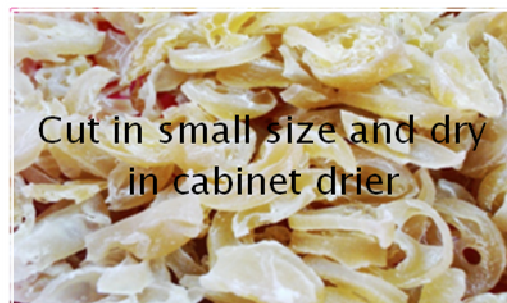
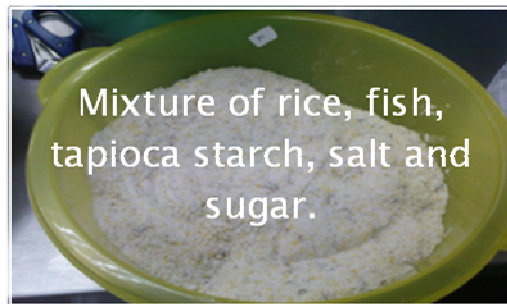
Pack in aluminium foil  
with zip on top



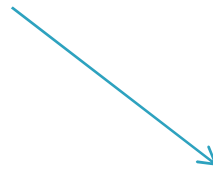
# EXTRUDED FISH BISCUITS



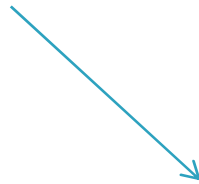
# Production of instant Fish Rice Porridge



# instant Fish Rice Porridge



# INSTANT FISH AND MAIZE SOUP POWDER





# FRIED FISH SNACK

## COMPARISON BEFORE AND AFTER FRYING

Before frying:



After frying:



# Baked fish snack

## COMPARISON BEFORE AND AFTER BAKING

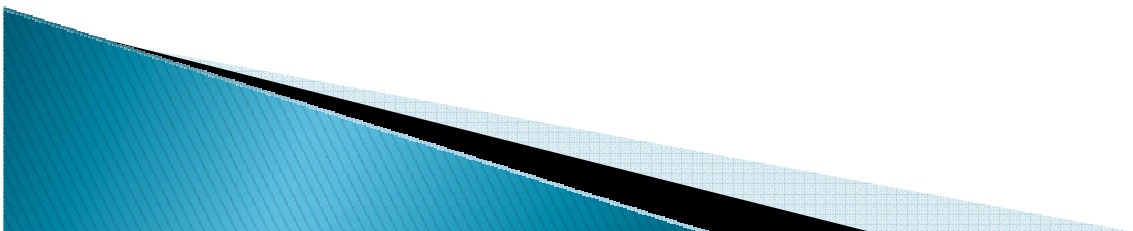
Before baking:



After baking:



# Extruded Fish Products



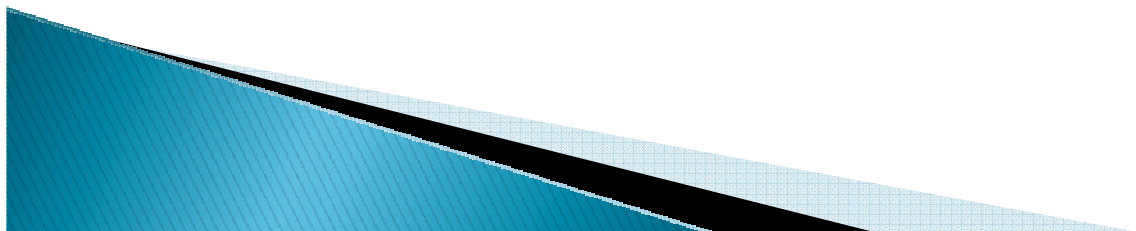
# SMEs

Ebbens Engineering Ingenieursbureau b.v. **Netherland**

Millennium Exports, India

Karnataka Fisheries Development Corporation, India

Peche Foods, Kenya



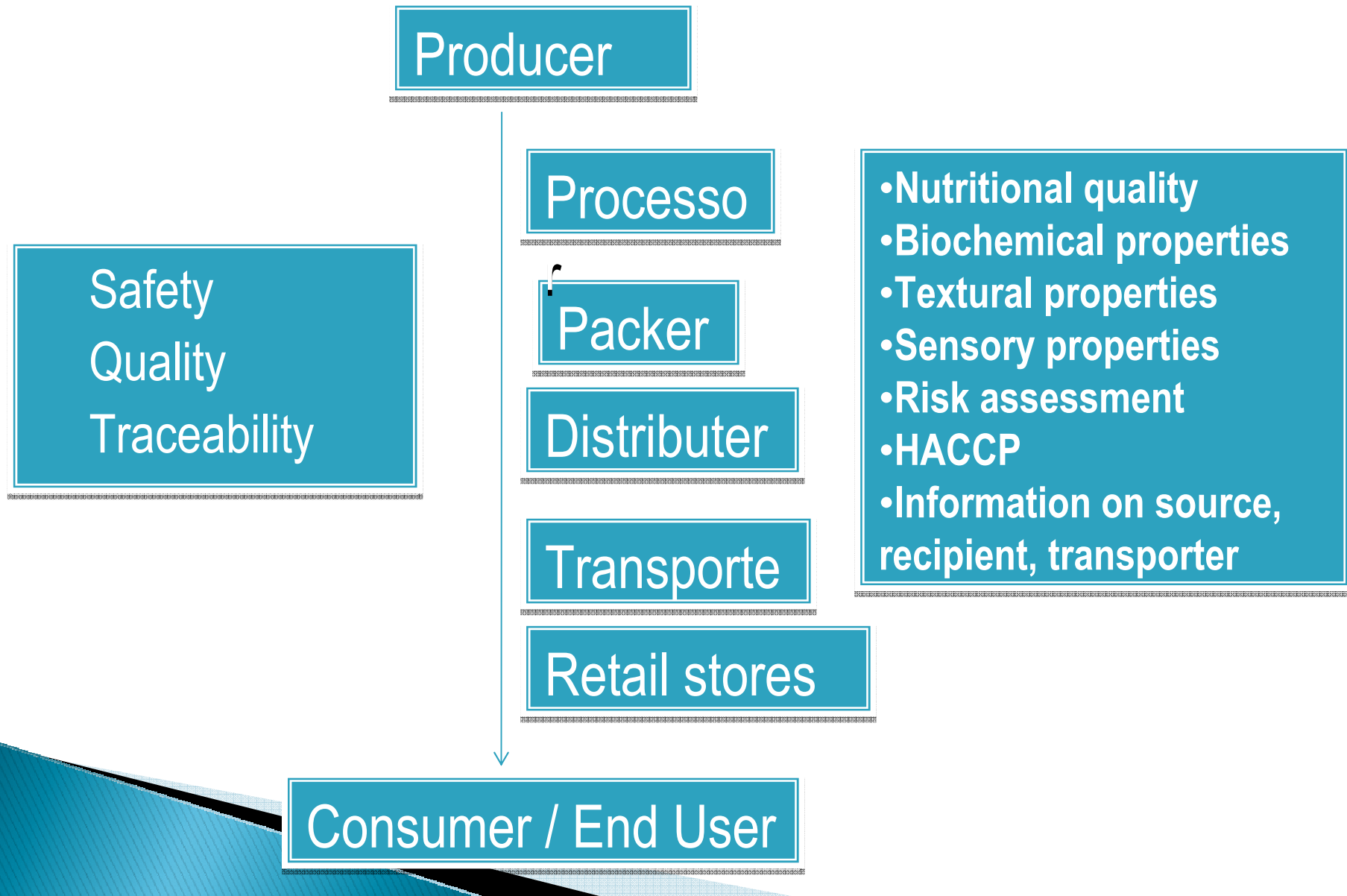




Technology for solar–biomass hybrid drying has been transferred to Karnataka Fisheries Development corporation (KFDC), Mangalore, India  
Three such units are currently being operated

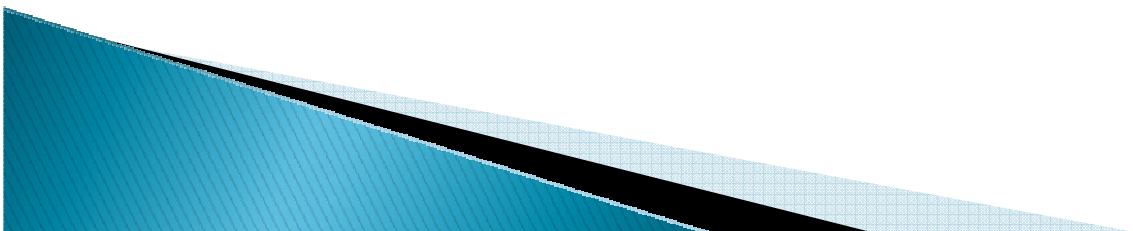


# Total Food Chain Management



# CONCLUSIONS

- ▶ Safe, nutritious and good quality dried and extruded fish products were made using sustainable technologies.
- ▶ These products have been taken up by SMEs, NGOs and marketed.



Thank you  
for your attention

