

### WHAT ARE SMALL-PELAGICS

Small-pelagic fisheries are an important source of food and employment for thousands of people in the SmartFish Region. The importance of small-pelagics is described, as well as some of the challenges faced by producers and traders. In addition, SmartFish efforts to improve quality and markets for processed products; and ideas for future development efforts are discussed.

Small-pelagics or pelagic cyprinids, are small sardine-like fish found in various lakes throughout Eastern and Southern Africa. Table 1 provides some examples of the major species and resources.

#### Important small pelagics

| Scientific name                 | Local Name                                       | Main water bodies                       |
|---------------------------------|--|---|
| <i>Rastrineobola argentea</i>   | Mukene (Uganda), Dagaa (Tanzania), Omena (Kenya) | Lake Victoria, Lake Kyoga               |
| <i>Stolothrissa tanganicae</i>  | Kapenta, Ndagala, Chilwe                         | Lake Tanganyika                         |
| <i>Limnothrissa miodon</i>      | Kapenta  | Lake Tanganyika, Lake Kariba, Lake Kivu |
| <i>Poeciothrissa mweruensis</i> | Chisense   | Lake Mweru                              |
| <i>Brycinus nurse</i>           | Ragogi / Ragoge                                  | Lake Albert                             |
| <i>Neobola bredoi</i>           | Muziri   | Lake Albert                             |
| <i>Engraulicypris sardella</i>  | Usipa  | Lake Malawi                             |

These fish typically have an average length of up to five centimetres and a maximum weight of fifteen grams. They feed on phytoplankton and have a short natural lifecycle. They are caught in large quantities usually at night using methods which rely on light attraction.

### WHY ARE THEY IMPORTANT?

Small-pelagics have become an important source of protein, fats (e.g. Omega 3) and minerals such as calcium, phosphorous and iron for consumers throughout the region, particularly for less well-off or vulnerable consumers in rural and urban areas. After processing, much of the fish enters the regional trade arena with significant quantities of product are transported long distances by road to major markets in Burundi, DRC, Rwanda, South Sudan, Sudan, Malawi, Zambia, Zimbabwe and beyond. Their importance in eastern Africa particularly has grown with the decline of key resources such as Nile perch (*Lates niloticus*) and Nile tilapia (*Oreochromis niloticus*) from Lake Victoria. Small-pelagics also provide an ideal product for food programmes such as those co-ordinated by the World Food Programme (WFP). Another important use of small-pelagics is as an ingredient in formulated poultry and aquaculture feeds.

### KEY ISSUES

Small-pelagics are often caught and processed in large quantities making it difficult to handle them well. Poor on-board handling often means that quality deterioration begins before landing. Once ashore the fresh fish are commonly preserved by sun drying. Often the drying takes place on the ground or rocks in fish landing sites. This leads to contamination with sand and dirt. Some fish are eaten by birds during processing and further losses occur at this stage due to poor weather conditions, which prolong the drying process, leading to quality deterioration and possible physical loss. Unfortunately, large catches or fishing seasons on some water bodies coincide with the "rainy season". Extended storage times and problems during storage and transport lead to fat rancidity, which causes the product to turn from a silvery colour to brown and develop a rancid flavour. Normally very little attention is given to product which is destined for animal feed



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and this is usually of a poorer quality or product which has spoiled during processing. Up to 80% of small pelagics from Lake Victoria are thought to end up as animal feed. Although from other fisheries, such as Lake Kariba, a greater proportion is for human consumption.

Opportunities to improve quality and diversify product type to satisfy the growing demand for fish and tap into a burgeoning urban middle-class market exist. Simply producing a "sand free" product has been proved to be a major step forward in the improvement in quality, selling price and value. A strong demand exists for this type of product. Kirumba market in Mwanza on Lake Victoria has become a large centre for collecting, sorting and marketing "dagaa". It is the largest fish market by volume in the region and has been the focus of SmartFish work to ensure the efficient and sustained use of this important wholesale centre.

Within the region it is possible to find examples of where handling, processing and marketing is carried out better or worse. For example, Kapenta from Lake Kariba (a lake shared between Zambia & Zimbabwe) are mostly caught using fishing rigs which provide the space to handle and store the fish on-board more appropriately. Salt is added soon after capture to stabilise the product and maintain its silvery appearance. Furthermore, the fish are dried on raised drying racks in fenced off areas. Some producers pack their processed product in well labelled, retail friendly size packs for sale in shops and supermarkets. The merits of transferring these simple improvements to other parts of the region cannot be over-emphasised.

Whilst there is a strong demand for small-pelagics, at the same time supply can suffer, with some fisheries now showing the symptoms of over-fishing, with catch per unit effort declining (not least the Kapenta fishery indicated above).

As well as sun drying, smoking, frying and freezing are other appropriate processing and preservation methods. Dried products can also be kept in cold storage to improve storage life and prevent rancidity. Fish are also sold fresh when it is possible to transport them to market quickly, or where there is ice available.

Here are some basic ways, promoted by SmartFish, to achieve better quality and a better price for small-pelagics as well as maximise the storage time of the end product:

- Use fishing boats and gears which make it easy to handle the fish on-board.
- Store freshly caught fish in clean plastic baskets or drainable containers.
- Mix salt with the fish immediately after catching (at least 30 g of salt to 1 kg of fresh fish).
- Ensure the boat and all equipment which comes into contact with fish is clean.
- Fishermen should be clean and wear clean clothes.
- Dry fish quickly and avoid any form of contamination with dirt, sand and bacteria.

# Small-pelagics – improving access to regional markets

- Use raised racks made from non-corrodible material for drying.
- Drying area should be fenced off.
- Final product should be approximately half or 50% of the fresh weight.
- Dried fish should be packed in clean dry sacks of 20 kg for wholesale trade and storage.
- Fish stores should be cool and maintain a good air flow, as well as be protected from rain, insects, rats and other animals.
- Sacks stacked on pallets to keep them off the floor.
- Labelled and sealed plastic bags with 50 g to 5 kg of product used for retail sale.

## INTERVENTION FOR TRADE AND VALUE-ADDITION

One of the impediments to intervention has been the lack of knowledge about markets and value-chains. SmartFish has tried to address this through a number of practical studies. As well as a value-chain analyses, a "Regional fish trade in eastern and southern Africa: products and markets" guide was developed for fish traders. This describes the major commercial freshwater species in the region, the types of product, processing methods, nutritive values, associated regulations and provides information on potential new markets. Much of the information is focussed on small-pelagics.

Market research has also been carried out on value-added small pelagic products from Lake Albert, Uganda. Blanched and sun-dried, powdered and deep-fried products were test marketed in Kenya and Rwanda in 2012. The results suggested that deep-fried products are likely to be acceptable to consumers across the spectrum e.g. from school children to middle-class office workers. Results also showed that women liked the powdered product due to its versatility. Investigation of the retail sector highlighted an interest from major retailers as well as wholesale traders. For example, the marketing manager of a major supermarket chain in Kenya was interested to secure US\$ 16,000 worth of product per month.

Enabling producers to meet or make contact with potential buyers and vice versa has been a fundamental strategy of the Programme. To facilitate this, high profile regional trade events have been held in Zambia (April 2012) and Uganda (January 2014). These have brought key players together from all over the region and have given the Programme an opportunity to showcase its activities and allow beneficiaries to advertise new and innovative products and find potential buyers. The event in Zambia significantly stimulated demand for small-pelagic products from Lake Victoria and Lake Albert.

As well promoting marketing and trade, the Programme has also tried to upgrade skills and knowledge. Many small-pelagic producers and traders have benefitted from capacity building in improved handling and processing skills and knowledge through training workshops in Burundi, DRC, Malawi, Rwanda, Tanzania, Zambia and Zimbabwe. Through support for community based trainers, this initiative has promoted improved quality and value-addition.



SmartFish training © SmartFish database

## CASE STUDIES

SmartFish has assisted specific groups or entrepreneurs as a way of demonstrating the benefits of improved practices and value-addition. "Chisense", harvested from Lake Mweru in Zambia, is traditionally dried on the ground, resulting in a poor quality product that fetches a low price for fishers and traders in the DRC, Tanzania and Burundi. Working hand in hand with local communities on Kilwa Island, the Programme helped introduce improved drying slabs made of cement that reduced the contamination. Packaging equipment and materials were also provided and proper labelling introduced. This has resulted in the production of better quality products that are sold for higher prices through supermarkets in the Copperbelt region, previously not available to these fish.

In another intervention on Lake Albert the Programme has provided a fishing association with improved fishing rig technology to help tap into the under exploited "Ragogi" and "Muziri" resources. This will enable better on-board handling and more consistent supply as demanded by markets in the region. Support has also been provided to an entrepreneur processor to upgrade their processing facilities and introduce drying racks, fencing and labelling technology. Market development support has also helped explore new markets for better quality products (deep fried and dried) in DRC and Kenya. This includes the establishment of a new border retail outlet to help access the DRC market.

On-going work includes support for a women's "Mukene" processor group based in Kiyindi, on Lake Victoria in Uganda. This initiative is providing drying racks and better preservation technologies and training in improved handling, packaging and marketing to increase the groups' income and promote the consumption of value-added small-pelagics both in Uganda and the region. One interesting aspect of this work is the support for the establishment of a retail outlet for the group in Kampala, a major urban market for fish.

## WAY FORWARD

Small-pelagics are an important source of food, income and livelihoods for thousands of people throughout the region, yet the true value of the available resources has not yet been fully realised. Some key opportunities for future development support include:

- Improved on-board handling with landing site and market infrastructure development to reduce losses and add-value;
- Encouragement for value-addition through improved quality, innovative products, retail packaging and market support for processors and traders to optimise income
- Marketing and advertising to educate consumers about the benefits of small-pelagics and innovative products to develop high value.

Phase II of the programme will see further support for the development of the small-pelagic sector.



Small pelagics drying © SmartFish database

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