

Construction of raised drying racks for fish ? the experience from Burundi

SUMMARY:

Fisheries play an important part in the economic and social life of people in Burundi. One third of the animal protein consumption in the country stems from fisheries, and the sector employs over 100,000 people. Yet, about 10 to 15% of the harvest is lost in the process. Fish drying, which is the most common processing technique in the country, is done generally on bare ground. This can lead to partial or total alteration of the products, and can considerably reduce both income and livelihoods all along the value chain. In response to these issues, FAO (the Food and Agriculture organization of the United Nations) and the Burundi Fisheries Directorate started a project to improve fish processing methods and reduce losses. Specifically, the use of raised racks for fish drying was promoted. This technology shows how to build and use raised racks for fish drying, which can ensure a higher level of productivity.

KEYWORDS:

[fish](#) [1]

[Drying](#) [2]

[Fish processing](#) [3]

[Natural drying](#) [4]

CATEGORY:

[Fishery & aquaculture](#) [5]

[Post-harvest and marketing](#) [6]

COUNTRIES:

Burundi

DESCRIPTION:

Drying is a fish preservation method widely used by small-scale fish operators in Africa. The principle consists of putting the fish in contact with hot and dry air. In this way, water is removed from the surface of the fish and water moves from the deeper layers to the surface. To ensure an effective drying process, racks should be located in an exposed place, with a relatively low humidity. Sites providing good air circulation are recommended. During the whole operation, the fish should remain dry, and recovered with a tarpaulin, or put under shelter at night or during rainy days. The period of complete drying depends on the method used and the fish species. With the air circulation, the rack sloping system requires an average drying time of 8 hours in an ambient temperature of 42 ° C (10 hours for big fish and 6 hours for smaller ones).



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Why using raised racks?

- Air movement at ground level is usually very slow. This also slows the drying process, and lengthens the drying time. If fish are raised above the ground, even by only one meter, the air movement is greater, and the required drying time shorter.
- Drying fish at ground level allows air to pass only on the upper side of the fish. The use of raised racks allows drying from the upper, lower and lateral surfaces. With a raised sloping rack, the water trapped in the gill is also easily pulled out.
- Raised racks allow total protection of the fish - not only from rain by covering fish with plastic sheets -, but also against water on the ground.
- The fish are difficult to reach for animals and insects, and are not in contact with dust and dirt.

Prototype of metallic raised racks

The images below show the prototype of metallic raised racks promoted by FAO in Burundi. These are drying racks raised 1,10 m above the ground, with metallic or wooden supports. A 12 m long x 2 m large raised rack can receive up to 22 removable trays, with an average capacity of 12 kg of fish per tray.



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Dimensions: length 12 m; width 2 m; height 110 cm.

Materials to be used:

Tube 40 x 40	10 pieces
Wood rod	1 pack
Cutting disc	2 pieces
Rust	2 liters
Grinding disk	1 piece
Cement	3 bags of 50 kg each
Sand	2 m ³
Gravel	1 m ³

For the trays, the frames are ideally hardwood boards, resistant to heat, fungi, and insects attacks. The base of the frame is made by assembling pieces of wood nailed together. The mesh is placed underneath the frame with small nails. Then the 1,5 cm height batten is mounted from the lower bottom of the frame to maintain firmly the mesh in place. The planks are wider at the level of the frame (10 cm).



[10]

Dimensions: length 114 cm; width 90 cm; length of the handle 12 cm; height of the batten 110 cm.

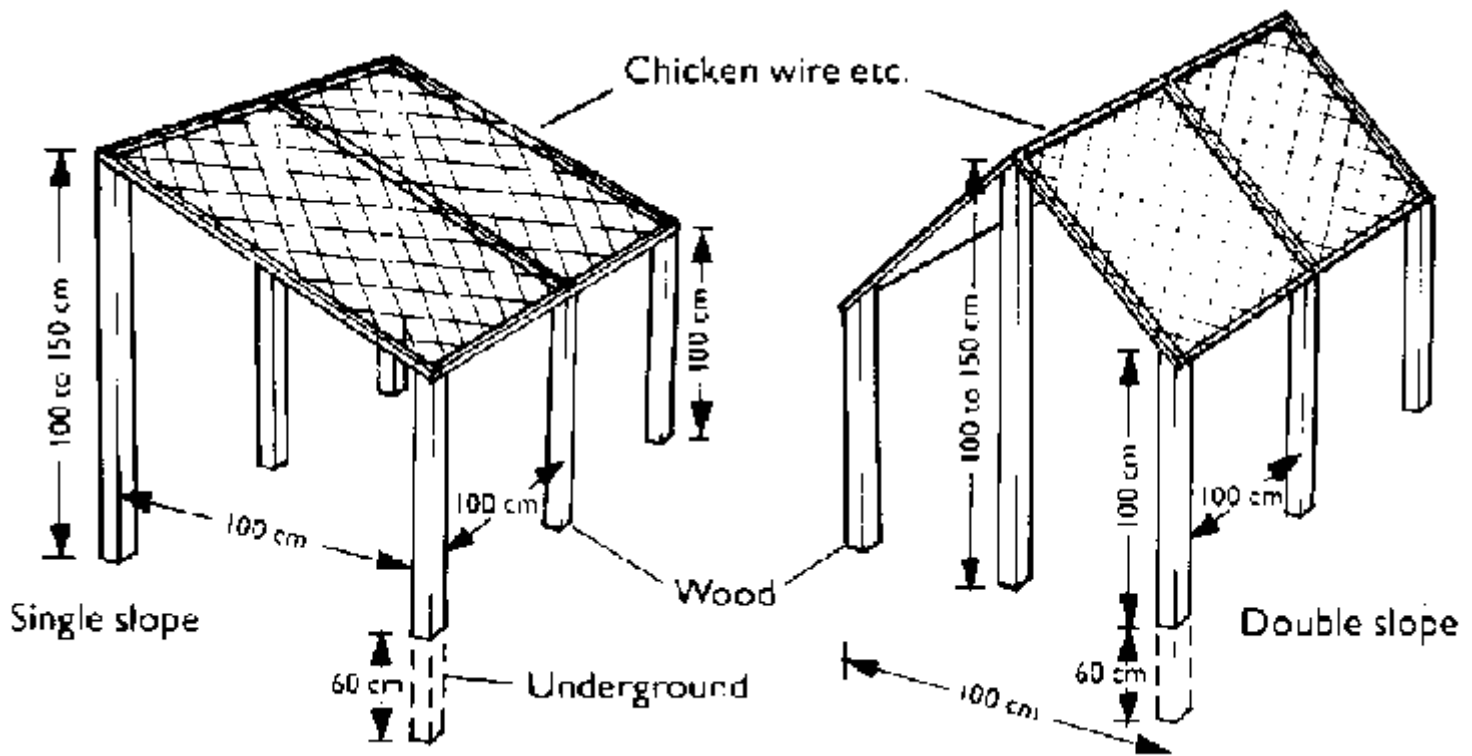
Materials to be used (on the basis of 50 trays):

Beam for the body (width: 12 cm; thickness: 5 cm; length: 3,5 m)	60 pieces
Beams for the batten	10 pieces
7 cm nails	10 kg
4 cm nails	5 kg
Netting	55 meters
Antitermite liquid	10 liters

Building raised racks made with wooden materials

The image below shows two sketches of constructed drying racks, based on a 1 m height timber. A taller pole of 1,5 m is used in the center or on one side of the rack, depending if a single or a double slope is needed.

To make the rack, 160 cm of timber are cut, and buried in the ground to a depth of about 60 cm. The distance between two lines is 1 m, which corresponds to the width of the drying rack. Lighter pieces of wood or bamboo are fixed between the top of the poles, before fixing other materials such as chicken wires, mosquito nets, or old fishing nets to support the fish.



[11]

Benefits and replicability of raised racks for fish drying

Using raised racks for fish drying has ensured a high level of productivity of the sector in Burundi. The level of post-harvest losses, due to inadequate drying practice, has more than halved. End-products supplied to consumers are of a better quality, and fish prices more than doubled from 4 to 9 Burundian francs (2.5 to 6 US dollars). Racks-dried fish are highly appreciated by consumers, and fish operators and traders reap higher incomes. This positive evolution has also led to an influx of working population towards fish processing and trade activities in Burundi.

The use of raised racks has contributed to an innovation in the livelihood of men and women fish operators. Their productivity and income have considerably increased. In particular, the role of women in ensuring household food and nutrition security has been enhanced.

The Burundi good practice experience could be replicated elsewhere through a participatory approach from all relevant stakeholders. The use of raised racks, which has already been replicated in many neighbouring countries on the shore of Lake Tanganyika, could still be extended to other African fishing countries which suffer from huge amount of post-harvest losses due to inappropriate processing methods.

Raised racks are easily replicable and are not necessarily made with metallic materials, as many women fish operators in Burundi demonstrate. Fish processors who cannot afford the metal racks use racks made with cheaper materials, for example wooden, or nets of different mesh sizes. Those latter are usually of lower quality and with much shorter life span, but they still offer the opportunity for the most vulnerable to benefit from the advantages of this innovation.

For some testimonies about the project implementation and results, the factors of the success and the future perspectives, see the following video:

SOURCE:

[Fisheries and Aquaculture Department in FAO \(FIPM\)](#) [12]

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