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SUSTAINABLE FISHERIES MANAGEMENT PROJECT (SFMP)

Ahotor Oven User Guide

Author:
SNV GHANA

THE UNIVERSITY OF RHODE ISLAND GRADUATE SCHOOL OF OCEANOGRAPHY
Hen Mpoano
Friends of the Nation
SNV SMART DEVELOPMENT WORKS
SSG ADVISORS
Daasgift
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About the manual

This manual provides simple technical pictorial information on the efficient use of the Ahotor oven. It outlines the steps, procedures, and guidelines for smoking fish on the Ahotor oven that can easily be understood by the fish processors.

This manual targets every primary actor in the fish smoking value chain. It explains the step by step use of the Ahotor oven to attain the optimum benefits from the oven and good fish smoking practices to reduce exposure to smoke and use less wood for smoking.

This interactive manual is developed with pictures and in simple English language which can easily be understood and used by processors with limited restrictions.

Sustainable Fisheries Management Project

The United States Agency for International Development (USAID) committed funds to the implementation of a Sustainable Fisheries Management Project (SFMP) in Ghana for five years. The objective is to rebuild marine fisheries stocks and catches through adoption of responsible fishing practices. The project contribute to the Government of Ghana's fisheries development objectives and USAID's Feed the Future Initiative. USAID selected the Coastal Resources Center (CRC) at the University of Rhode Island's Graduate School of Oceanography as lead implementer of the SFMP. In leading the project, CRC is working with the Ministry of Fisheries and Aquaculture Development and the Fisheries Commission along with a consortium of international and local partners, including SNV Netherlands Development Organisation..

Ahotor Oven

Fish processing is the main economic activity for women living in and around the coastal and lake areas of Ghana. Preservation methods include salting, frying and freezing, but smoking is the most prevalent form. Practically all species of fish available in the country can be smoked and it is estimated that about 75% of the domestic marine and freshwater catches are smoked.
The traditional fish smoking ovens mainly the chokor expose the processors to hazards such as heat and smoke inhalation. The smoked products from these traditional ovens also contain high levels of polycyclic aromatic hydrocarbons (PAH), a food safety hazard.

The Ahotor oven is designed to reduce smoke emissions and PAH levels in smoked fish. The Ahotor oven comprises of a combustion chamber fitted centrally inside an outer shell made with cement blocks like the chorkor oven. Situated on top of the combustion chamber, is a fat collecting tray with mushroom like cutouts that allows the heat from the combustion chamber flow up through to cook the fish on the tray, while preventing any fat from dripping into the fire. A primary air inlet supplies oxygen into the combustion chamber to enhance efficient combustion of fuelwood. The grate located in the combustion chamber improves combustion by enhancing oxygen flow around the fuelwood, which allows the wood to burn completely into ash. This reduces the amount of smoke generated. The Ahotor oven is energy efficient (reduces fuelwood use by 32%), emits less smoke and produces smoked fish with low PAH levels of 10.93μ/kg which is less than the EU standard of 12 μ/kg.

Components of the Ahotor Oven

Combustion Chamber

Primary Air Inlet

Grate

Secondary Air Inlet
UPPER

Fuelwood Entrance
LOWER

Fat Collector

Fat Exit

Back view

Front view

COMPONENTS OF THE AHOTOR OVEN AND THEIR FUNCTIONS

Component	Picture	Function
Combustion Chamber		It ensures efficient combustion of fuelwood It reduces smoke emissions It ensures heat retention
Primary Air Inlet		it is the source of oxygen It is the channel for fanning the oven
Grate		The fuel wood is elevated on the grate to allow for better circulation of heat through the combustion chamber. It supports efficient and complete combustion of fuelwood
Secondary Air Inlet UPPER		It supplies cooler air into the combustion tube to mix with the heat from the combustion chamber It ensures fast flow of gases in the smoking chamber
Fuelwood Entrance LOWER		It receives fuelwood It regulates fuelwood use
Fat Collector		It redistributes heat into the smoking chamber It receives fat and other drippings from fish and channel it out of the oven Ash is sprinkled over the collector to absorb the fat droppings for easy cleaning after processing?
Fat Exit		It is the oultet for the fat and other droppings collected during processing

STEP 1

Remove the grate and sweep out ashes from the combustion chamber. Make sure the primary air inlet at the back of the oven is not blocked

STEP 2

Sweep the processing facility to ensure tidiness

STEP 3

Wash your hands with soap under running water and begin with fish preparation

STEP 4

Wash your fresh fish with clean water

Lay them on the fish trays.

STEP 5

Leave the fish for the water to drain out while preparing your fire

STEP 6

Before you start your fire, install your clean fat-collector

Sprinkle fine wood ash on the fat collector.

STEP 7

Position containers behind the ovens to collect fats and other drippings from the fish during smoking

STEP 8

Insert the grate with the elevated part pointed inwards.

Ensure the grate is pushed deep into the combustion chamber to touch the wall of the primary air inlet.

STEP 9

Arrange the fuelwood at the entrance of the combustion chamber

Set your fire

STEP 10

Push the lit fuelwood deep into the combustion chamber to rest on the grate

STEP 11

Fan the fire from the primary air inlet behind the oven to increase oxygen supply into the combustion chamber when required

STEP 12

Wash your hands again under running water






STEP 13

Arrange your trays with fish on the oven to begin smoking

STEP 14

Check frequently and interchange trays when necessary

STEP 15

Control heat level by adding or removing fuelwood as done in the traditional smoking process

STEP 16

After smoking, allow the fish to cool and package them neatly for the market

The smoked fish looks very attractive

STEP 17

Clean your fish trays and prepare them for next smoking session

Remove the fat-collector and drip containers and clean them

STEP 18

Maintaining the Ahotor oven components

*Keep Ahotor oven under shed to avoid exposing it to harsh weather conditions

*After cleaning the fat collector apply cooking oil on the surface before storing, to avoid rust

*Clean trays thoroughly and store under shed to prevent exposure to harsh weather conditions

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