

ARTISANAL FISHING GEARS EFFICIENCY ON KAWAKAWA (*Euthynnus affinis*).

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Abstract:

A survey was conducted along the Kenyan marine Coastline waters to ascertain the most effective fishing gear applied by artisanal fishers to catch Kawakawa (*Euthynnus affinis*). The survey involved administration of structured questionnaires that were administered to fishers by enumerators. Four gears that are predominantly used to catch Kawakawa were selected from among other gears viz. Gillnet, hand lines, trolling lines and long lines. The survey compared the frequency counts of Kawakawa caught per each fishing gear recorded in the questionnaire. The main objective of this study was to identify the most effective gear used to catch Kawakawa, identify which landing sites have the highest frequency of the gear with the aim of recommending appropriate management measures for the fishing gear and the fishery.

For data collection, publicity posters were circulated informing fishers about the survey through structured questionnaires, and with the use of species identification guides. The data collected was digitized using tablets or android phones and laptops.

Enumerators were trained on interviewing techniques to be applied during the survey and species identification to ensure they recorded responses in relation to Kawakawa versus other species caught. The survey covered all 214 landing sites for 3 days. This involved administering Questions to respondents (Fishermen) on the gears used to target Kawakawa.

The results were analyzed using MS excel software. The survey showed trolling lines at 28% and long lines at 27% were the main gears targeting Kawakawa. Hand lines at 14%, Gillnets at 12.5% and other gears at 18.5% were the other respective gears targeting Kawakawa, . Trolling lines are predominantly used by sport fishers while long lines are used mostly by artisanal fishers. The highest concentration of trolling lines was in Kilifi County while the highest concentration of long lines was recorded in Lamu County and the most common used hook sizes were 4-7 inches.

Kenya Fisheries Service in collaboration with other government agencies and stakeholders to should develop management measures for the Kawakawa fishery aimed at addressing both artisanal fishers using long lines and sport fishers using trolling lines targeting the same species. This will ensure sustainable exploitation of the fishery as per the mandate of Kenya Fisheries Service.

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1.0 Introduction;

Kenyan marine fishery is undertaken along the 640 long coastline with most of the artisanal fishers fishing within the territorial waters. Among the target pelagic species harvested by the fishers is kawakawa (*Euthynnus affinis*). (A survey was undertaken to ascertain the most efficient fishing gear used to catch Kawakawa along the Kenyan Coastline. This survey was also to identify and establish landing sites most predominantly used for landing Kawakawa.

2.0 Planning for the exercise.

Prior to implementing the survey, a general framework of conducting the fisheries Survey including publicity, data collection and analysis was set out in a planning meeting with key timelines. Planning meeting was held from 8th to 9th September 2022. During the meeting, all the activities to be undertaken were discussed and an execution plan prepared.

3.0 Publicity of the Survey exercise.

It is vital to create awareness among all stakeholders before undertaking a survey. Publicity posters were printed and distributed adequately to all landing sites and shopping centers near the landing sites. A radio advert was produced and aired in three local language stations a week before the survey. The Beach Management Units (BMU) officials from all over the coastline were also invited for a briefing meeting at selected locations.

TANGAZO KWA WAVUVI WA PWANI
#TunajaliKilaMvuvi

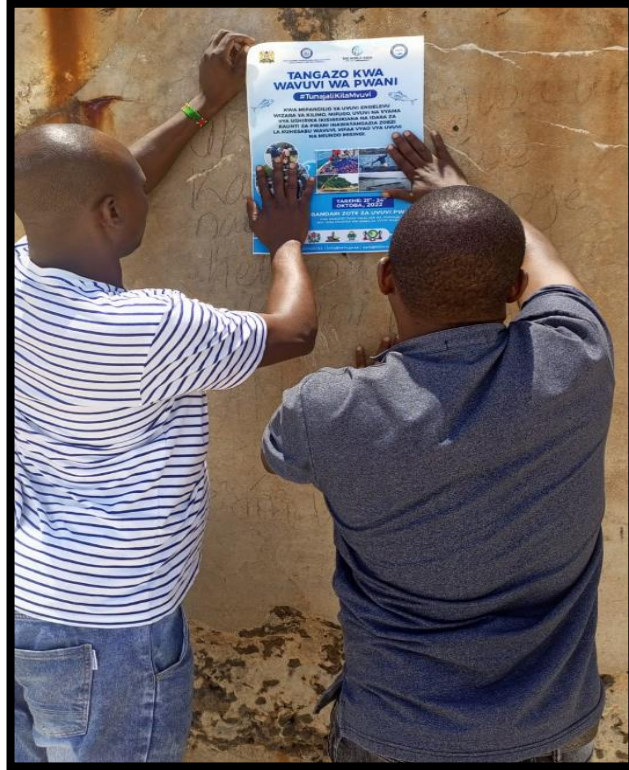
KWA MIPANGILIO YA UVUVI ENDELEU, WIZARA YA KILIMO, MIFUGO, UVUVI NA SERIKALI IKISHIRIKIANA NA IDARA ZA UVUVI KATIKA KAUNTI ZA PWANI USHIRIKA, INAWATANGAZIA ZOEZI LA KUHEBABU WAVUVI, VIFAA VYAO VYWA UVUVI NA MIUNDO MSINGI.

TAREHE: 21. - 24. OCTOBA, 2022

BANDARI ZOTE ZA UVUVI PWANI

KWA MAELEZO ZAIDI WASILIANI NA VIONGOZI WA BMU AMA MAAFISA WA IDARA ZA UVUVI MASHINANI

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4.0 Training of enumerators.

It is important to ensure that the supervisors and enumerators undertake the exercise properly and deliver tangible results. Enumerators were trained on the use of the mobile phone application (ODK Collect) to collect the data. One of the advantages of using the application was to enable real time collection and submission.



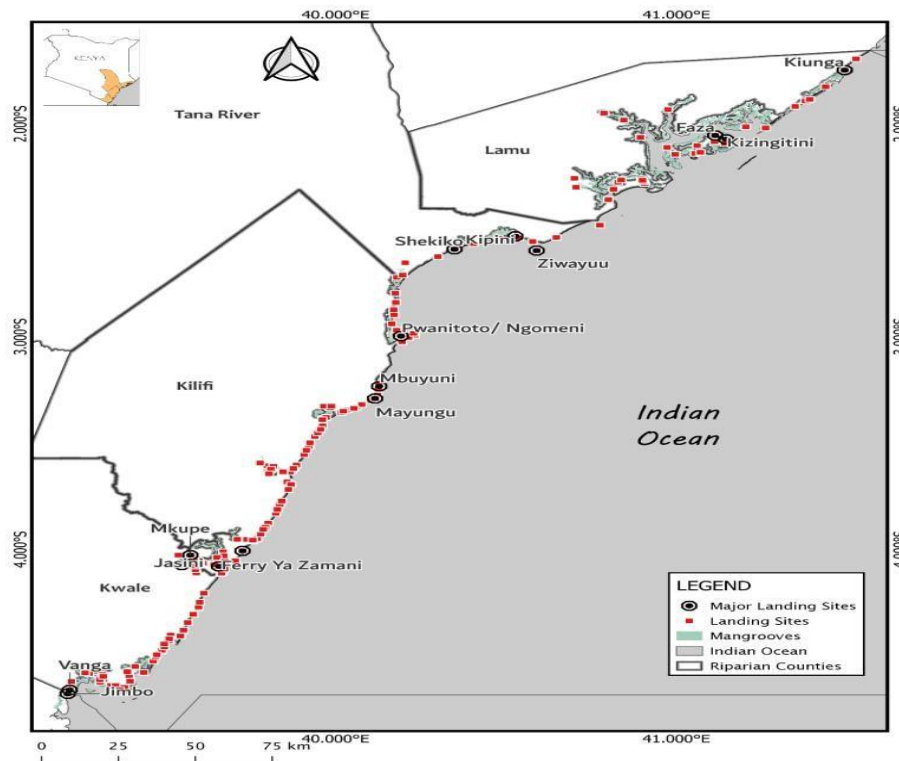
Training of enumerators on species identification.

Data Collection.

Actual data collection was done by field enumerators by means of observation and interviews for respondents and filling the data in the coded four-part standardized questionnaire and on the mobile application ODK Collect.



Data captured by mobile application was submitted to the server.



Survey sites covered.

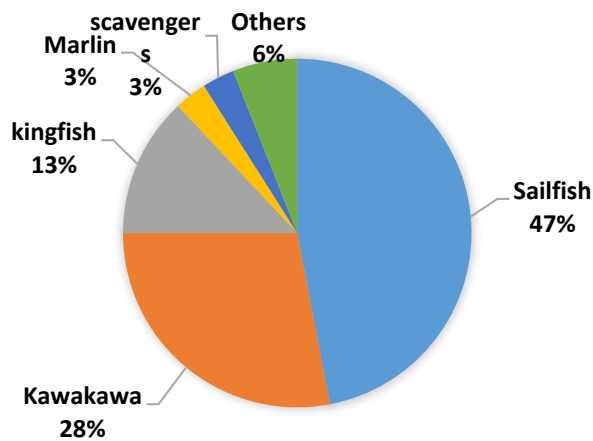
5.0 Data Entry, Analysis and Reporting.

Data entry involved digitization of hard copy questionnaire forms and submission to the database. Data was later exported from the database to MS Excel for cleaning and validation. In cases of disparity of reported data, clarification was done through phone calls and physical visit where necessary to ensure the authenticity of the reported data.

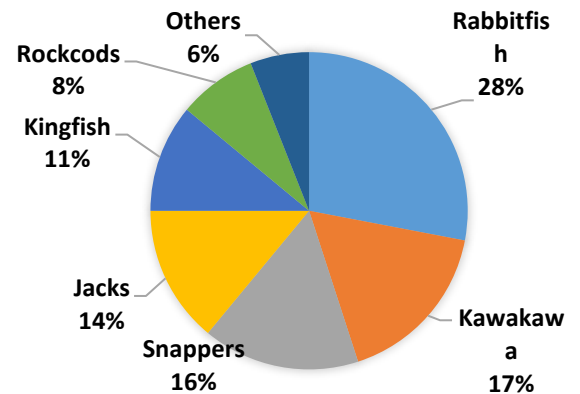
Results and Conclusion.

The survey showed that the main gears targeting Kawakawa were trolling lines at 28% and long lines at 27%. Hand lines at 14% and gillnets at 12.5% were the next main gears targeting Kawakawa while the rest of the gears represented 18.5% of the Kawakawa targets., . Trolling lines are predominantly used by sport fishers while long lines are used mostly by artisanal fishers. The highest concentration of trolling lines was in Kilifi County while the highest concentration of long lines was recorded in Lamu County.

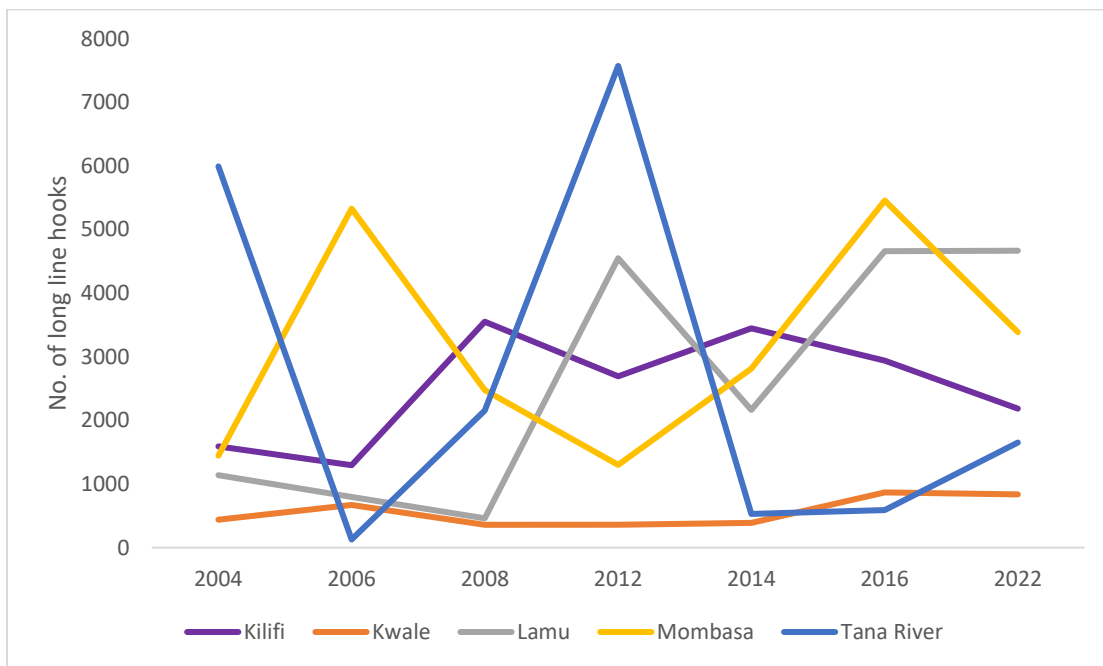
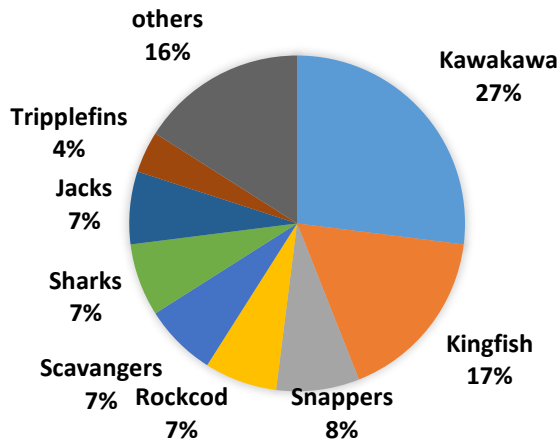
Target Species by trolling lines.

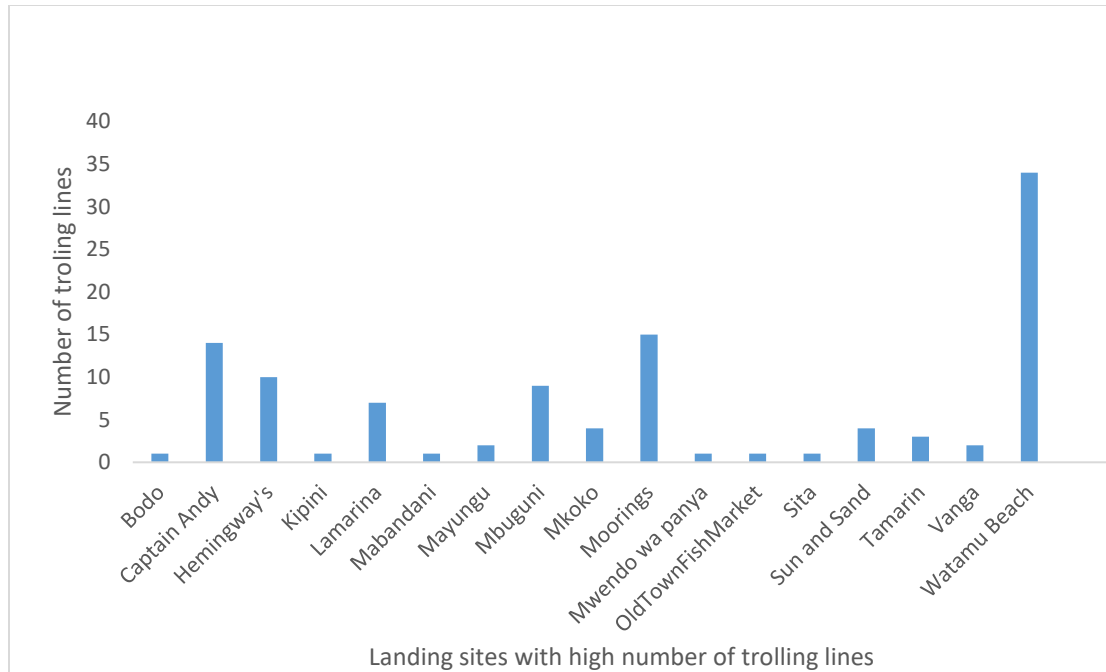


Target Species by hand lines.



Targets Species by Long lines





Conclusion: Kenya Fisheries Service in collaboration with other government agencies and stakeholders to develop Management measures for the Kawakawa fishery for both artisanal fishers using long lines and Sport fishers using trolling lines targeting the same Species *Euthynnus affinis* this will ensure sustainable exploitation of the fishery as per the mandate of Kenya Fisheries Service.

Reference;

Frame Survey report 2022.

Annexes. (A)

(A) FISHING GEARS

A fishing gear refers to any device used to capture fish from the water. It may be a net, a hook, any type of trap, be it traditional or modern, plus all the accessories that go with it. The main categories of fishing gears operated are listed below.

Gillnets (GN): A sheet of net webbing held vertically with help of floats and sinkers and set in a straight line in the water column (seabed, mid or surface water). The gill nets will be classified in-terms of their mode of operation

- Active gill nets (A): are actively operated by pounding or splashing water by the fishers forcing fish to encounter the set net
- Drift (Kuogelesha) gill net (D): A large sheet of jointed gillnets set in the open waters and left to drift as it catches fish. It is set without anchors and suspended in water column unattended.
- Stationary (Malasha) gill nets (ST): are set or anchored at one station throughout the fishing operation.

Mono filament net (nyavu ya mkano) (MF): It is a gill net made from a single nylon filament.

Long line hooks (Dhulumati) (LL): Refers to a single twine (manila) on which a series of Snoods (short branches) are attached at intervals. At the end of each snood is attached a baited hook and mainline anchored in the deep waters to fish by itself.

Seine Nets

- Prawn seine (Kidima) (PS): This is a seine net of two inches mesh size and below supported on either side by a small pole and operated by pulling towards the beach targeting prawns;
- Beach seine (Juya and Kigumi) (BS): Nets usually with varied mesh sizes and has a cod end in the middle where fish are concentrated. They are used to encircle fishing

grounds and hauling is done by thinning the circumference. It has a heavier lead line to enable it sweep the bottom against few floaters. May have a collection area and posts at the two ends to which a long warp is attached. The gear is operated in the shallow waters (Juya) and sometimes offshore (Kigumi);

- Reef seine (Chachacha) (RS):

A seine net operated from two fishing crafts in the reef area.

- Reef Seine (chachacha) Modified (MRS): A long continuous stretch of netting not more than 200m lengths and depths below 20m consisting of a float line and a bottom sink line with small round metallic rings used to encircle a group of fish. This does not include reef seine (chachacha) that does not have round metallic rings.

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Cast Net - Kimia (CN): It is a bell /skirt -shaped gill net tied to a string held by the operator. It is thrown into the water where it spreads out and sinks to the bottom where once pulled out it scoops out what it entraps.

Ring net (Nyavu ya kufunga) (RN): It is a long continuous stretch of netting of varied lengths, depths and mesh sizes consisting of a float line and a bottom sink line fitted with small round metallic rings. A rope running through the metallic rings is used to encircle a group of fish. This does not include reef seines (chachacha) which do not have the round metallic rings. NB. Reef Seine that has a ring to be treated as a ring net.

Ring net (Nyavu ya kufunga) (SRN): A modified reef sein operated by one boat and fitted with small round metallic rings used to encircle a group of fish. And operated as a ringnet.

Handline (HL): Refers to a hand held single twine on which baited hook(s) is/ are attached.

Traps: These can either be Fence (Uzio) or Basket (Malema which are two categories – Small and Big) and are defined as follows:

- Fence trap (Uzio) FT. A fence either made of sticks or netting material which is stationary used to trap fish during high tide ;

- Small Basket trap (Malema) SB. Is a basket trap made of bamboo, palm tree leaves, metal or synthetic fibre etc, wherein bait is put and have mesh sizes up to 3 cm (length 1.2 x width 1 x depth 0.2).
- Big Basket trap (Malema) BB Is a basket trap made of bamboo, palm tree leaves, metal or synthetic fibre etc, wherein bait is put and have mesh sizes above 3 cm (length 2 x width 1.3 x depth 0.3).

Scoop Net (SN): Scoop net (Kimia cha kuteka) is bag like with a frame at the mouth and are operated at the surface and reef rock to scoop fish or individual fish that are close.

Trolling (scud) lines: (TL): Baited hook(s) on a line(s) attached to moving craft as common with sport fishing.

Spear/guns / Bunduki (SG): A handgun made of wood (sometimes tubular metal) with a sharpened tip which is propelled by rubber strips. Fishers use this with face masks and flippers.

Harpoons /Njoro/Mkuki/ (HP): Steel rod sharpened at one end, sometimes barbed, with (Mkuki) or without (Njoro) a wooden handle.

Pointed sticks (PT): A stick with a hook at one end that is used to pull mainly octopus from crevices.

Hooked sticks (HS): A stick with one end sharpened mainly used to extract crabs from the mangrove and octopus from crevices.

Hand gathering (HG): Harvesting of fish and invertebrates by use of hands (Give number of people doing hand gathering.)

Dropline (DL): This is a line with a series of hooks attached with snouts set vertically into the water columns

Pole and Line (PL): Pole and line is a fishing method used to catch tuna and other large pelagic (midwater) species one fish at a time

Other (OT): Other gears apart from the above mentioned.

(B) NAVIGATION AND FISHING AID UNITS

There are three Navigation and fishing aid units namely GPS, Fish-finder and Compass.

GPS unit



A GPS unit, or global positioning system, utilizes a space-based satellite navigation system to give a boat its longitude and latitude. The marine GPS functions on the horizontal plane, showing a boater his or her exact location on a river, ocean, or lake. One of the most visible features on a marine GPS unit is a color screen that shows various land and water features in various shades and allows the boater or sailor to quickly determine what is located around his or her boat. They can also have SD card slots that allow for memory expansion and the storage of more maps for the sailor or boater that travels over a larger range.

Fish-finder unit.



A fishfinder or sounder is a marine instrument used to locate fish underwater by detecting reflected pulses of sound energy, as in sonar. A modern fishfinder displays measurements of reflected sound on a graphical display, allowing an operator to interpret information to locate schools of fish, underwater debris, and the bottom of body of water. Fishfinder instruments are used both by sport and commercial fishermen.

Compass unit.



A compass is a navigation instrument that shows directions in a frame of reference that is stationary relative to the surface of the Earth. The frame of reference defines the four cardinal directions (or points) – north, south, east, and west. The purpose of navigation is to ascertain the present position and to determine the speed, direction etc. to arrive at the port or point of destination.

Navigation and fishing aid units will be coded as follows:

1. GPS
2. Fish finder
3. Compass
4. GPS + fish finder + compass
5. GPS + fish finder
6. GPS + compass
7. Fish finder + compass
8. Others (specify):

Fishing effort Aid

SCUBA

Hookah