



WorldFish Partnerships and Support to Aquatic Animal Health in Africa

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Training of National Focal Points for Aquatic Animal Health
2-4th October 2023, Kigali - Rwanda



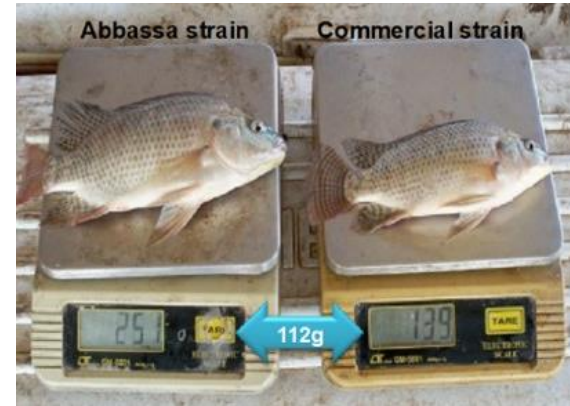
Introduction

- WorldFish and partners have supported several initiatives regarding Aquatic Animal Health in Africa
 - National Aquatic Organisms' Health Strategy (support during development and implementation)
 - Technical support - surveillance (EUS and TiLV) – Zambia
 - Training- Egypt, Malawi (short courses – LUANAR)



Introduction cont...

- Disease-free Genetic Improvement Programs (GIPs) – Emphasis on disease screening and biosecurity
 - *Oreochromis niloticus* – Abassa, Egypt
 - *O. andersonii*- Zambia
 - *O. Shiranus* in Malawi



WorldFish support through

- The Zambia Aquaculture Enterprise Development Project(ZAEDP)-FAO, DVS, DoF, UNZA –Vet – research and development
- Fish (broodfish- GIP) screening and biosecurity measures – focus on hatcheries



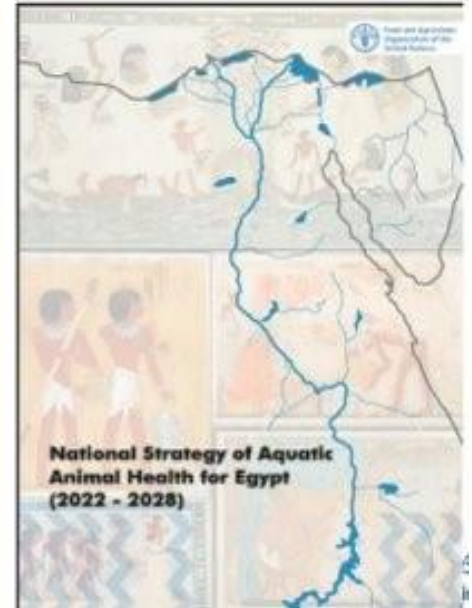
• <https://digitalarchive.worldfishcenter.org/bitstream/handle/20.500.12348/5332/33c1c9edb671d39a1ab53c4319416161.pdf?sequence2>

WorldFish support through

- FISH CRP- Built on earlier work- Research done with the DoF, DVS, and UNZA - quick surveillance in hatcheries across the country
 - indicated a negative - Tilapia Lake Virus and EUS
 - Previous work had already established the presence of EUS in the wild.
- All work was necessary for the support of the Government in the development of the AAHS for Zambia

Support to governments in NAAHS/NAAOHS

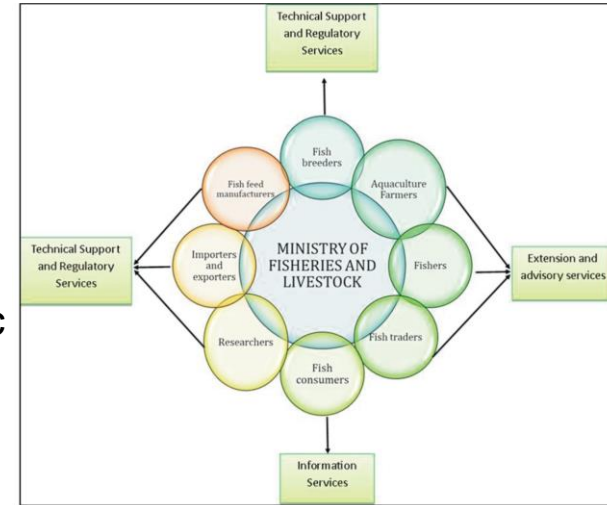
- In partnership with FAO
- Worked with DVS to generate initial information used to support the development of AAHS
- Stakeholder engagement and participation in the strategy development – Zambia and Egypt
- Stakeholders – Vet services, Fisheries, academia and industry



The National Aquatic Animal Health Strategy and Implementation Plan - Zambia

This strategy was led by the Ministry of Fisheries and Livestock – working with partners. (launched in May 2021)

- The National Aquatic Animal Health Strategy (NAAHS) consists of five strategies
- Implementation Plan (2021 – 2024) to actualize the five strategic objectives.
- Objective 1: **Enhance Aquatic Animal Health Management**
- Objective 2: **Enhance AAH Research and Development**
- Objective 3: **Enhance collaboration with stakeholders**
- Objective 4: **Improve the AAH Institutional capacity**
- Objective 5: **Operationalize AAH Laboratories and support services**



Program for Improving Fisheries Governance and Blue Economy Trade Corridors in SADC Region (PROFISHBLUE)

Funded by AFDB, SADC has sought our support to implement 2 major components of the PROFISHBLUE

Component I: Improving collaborative governance of transboundary fisheries and genetic resources

- Promote genetic improvement and aquaculture programs/regional hatchery support and training and research
- Develop digital fisheries information systems (DFIS)

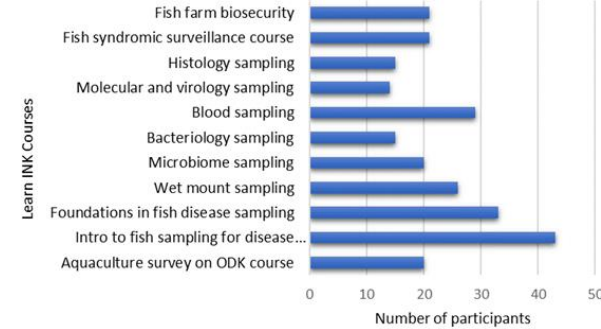
Component II: Policy harmonization and trade facilitation towards intra-regional trade.



Capacity building in Aquatic Animal Health-NORAD funded project

Under the Increased Sustainability in the Aquaculture Sector in SSA through Improved Aquatic Animal Health Management project

- Participants – trained (Ghana, Kenya, Malawi, Mozambique and Zambia) in sustainable aquatic animal health including
 - Targeting veterinary scientists and other experts involved in aquatic animal health (DVSs and DoFs)
 - <https://worldfishcenter.org/project/increased-sustainability-aquaculture-sector-sub-saharan-africa-through-improved-aquatic>

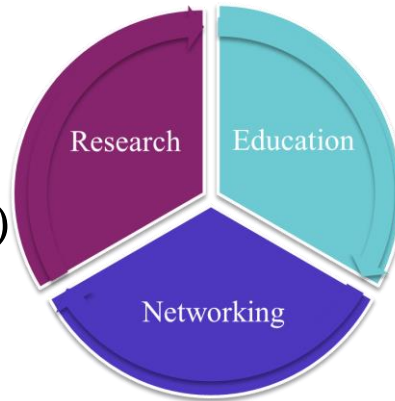


Increased Sustainability in the Aquaculture Sector in SSA through Improved Aquatic Animal Health Management (AHA project)



In partnership with

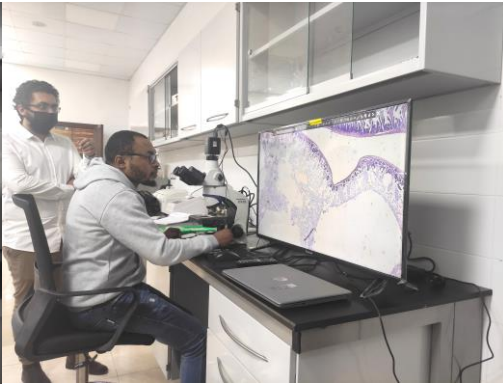
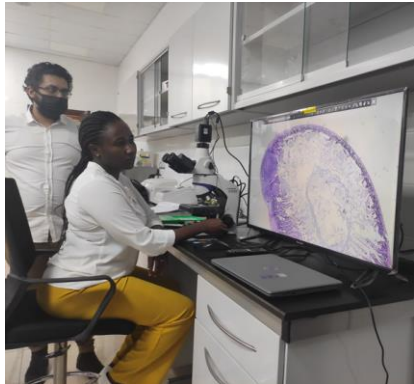
The college of Agriculture
& Veterinary Sciences (CAVS)
of the University of Nairobi



The College of Basic &
Applied Sciences (CBAS) of the
University of Ghana (UG)

Increased Sustainability in the Aquaculture Sector in SSA through Improved Aquatic Animal Health Management

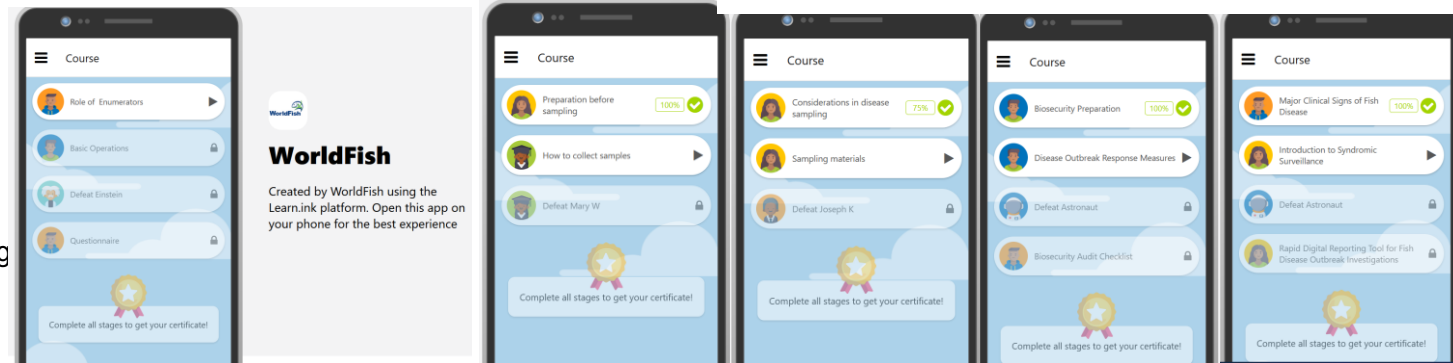
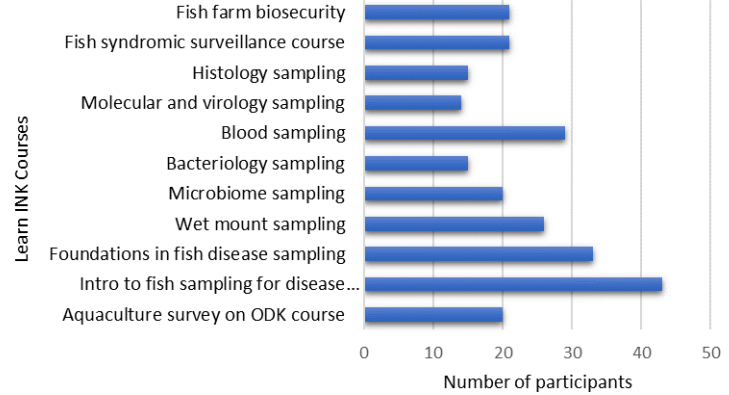
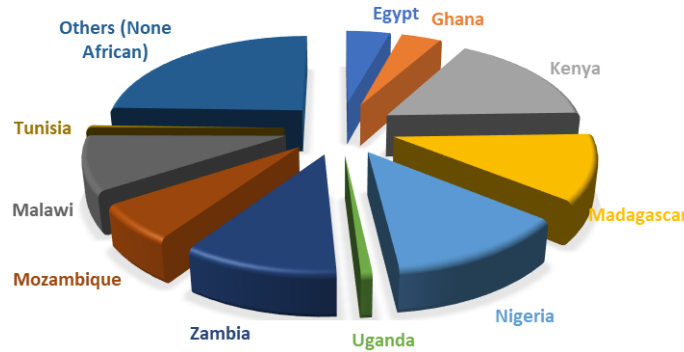
Research



Aquatic Animal Health resources developed for research and education

Education

- Introduction to fish disease diagnostics: <https://bit.ly/39Rfh00>
- Foundations in fish disease sampling: <https://bit.ly/3kVQm1W>
- Wet mount sampling: <https://bit.ly/3ojMTfT>
- Microbiome sampling: <https://bit.ly/2XZ5931>
- Blood sampling: <https://bit.ly/3F82nd4>
- Bacteriology sampling: <https://bit.ly/3oljnX2>
- Molecular Diagnostics & Virology sampling: bit.ly/3yGre6e
- Histology sampling: <https://bit.ly/3zUCKs4>

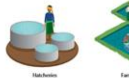


Aquatic Animal Health resources developed for research and education

Education

Quick protocol for antimicrobial susceptibility testing (AST) in aquatic animal species from aquaculture and fisheries
Disk diffusion method (based on CLSI guideline Vet03¹)

1 Collect bacteriological samples for AST and environment (e.g. fish, shrimp, pond water) using aseptic techniques. For sea-living animals kept on ice.



2 Bacterial isolation on appropriate media.



3 Confirms bacterial identity (e.g. gram stain tests, molecular identification, etc.). Note: Follow standard protocol for those!



4 Incubate fresh pure culture at appropriate temperature (e.g. 28-30°C/82°F).



Quick fish sampling guide for disease diagnostics

Blood sampling guide

Choose the appropriate size of fish.

10g Juvenile fish (1-5 cm) (CLSI pg. 14)



100g Juvenile fish (5-10 cm) (CLSI pg. 14)



Adult fish 1 kg, 3 kg or 5 kg sample



Note: The higher the number the better.

Quick fish sampling guide for disease diagnostics

Molecular diagnostics sampling guide

1 Euthanize fish according to standard operating procedures.



2 (a) For eggs, remove embryo and wait 10-15 min, use whole specimens without dissection. (b) For >200 fish, use organ dissection with sterile scalpel blade and keep organs for diagnostic.

Place (a) or (b) in 100% molecular grade ethanol (previously decontaminated) or transport media (see diagnostic).

Pre-weigh and label organ or media for the block and store specimens until the preservation date is reached within 24 hrs.



Use appropriate tube size based on amount/volume of specimens needed.

3 Label tubes using a solvent resistant permanent marker pen or sharp object on clean containers.

4 Record all relevant sample data on the fish health maintenance and sample record form – (e.g. date, species, weight, sex, tissues collected, clinical signs, etc).

5 QR code

Barcode

6 Date Species Weight Sex Sex Phenotype Clinical signs

7

8

9

10

Quick fish sampling guide for disease diagnostics

Wet mount sampling guide (for ectoparasites & fungi)



1 Label slides; skin mucus, gill clip, fin clip, lesion/slide of any.

2 Add 2-4 drops of water using a pipette.

3 Place the euthanized fish on a clean surface.

4 Skin mucus or lesion/ulcer sampling

5 Scope mucus and epithelial cells behind the peritoneal fins and along the belly.

6 Lesion/ulcer sampling

7 Scope some selected tissues.

8 Place the mucus/epithelial cells from the skin or lesion/slide onto the slide by rubbing it off in circular motion and then transfer.

9 Place a cover slip over the sample and the slide.

10 Gill clip sampling

11 Use a tweezers and scissors to remove the fish operculum and expose the gills.

12 Cut a small segment of the tips from a few gill filaments.

13

14

15



WorldFish Biosecurity Check List



Biosecurity manual for the WorldFish Abbas breeding facility



Better management practices for tilapia hatcheries in Egypt

Tilapia major clinical signs (الأعراض الشائعة الأكثر شيوعاً لإفراز أسماك التيلapia)

المرض من هذا القبيل هو أكثر الأمراض انتشاراً ويؤثر على جميع أنواع التيلapia في جميع أنحاء العالم. في كثير من الأحيان، يحدث المرض في الأسماك التي تم تربيتها في المزارع السمكية. يمكن التعرف على المرض من خلال الأعراض التالية:

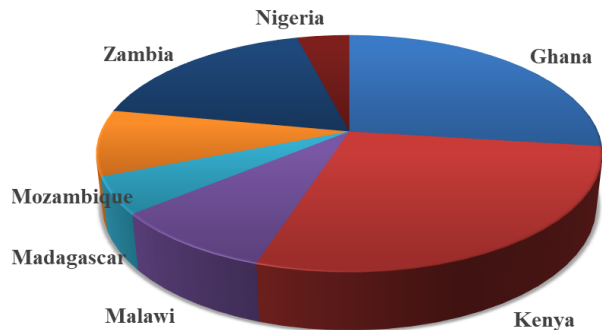
- 1. تورم البطن (Bloating)
- 2. فقدان الشهية (Anorexia)
- 3. انخفاض الوزن (Weight loss)
- 4. إفرازات بيضاء (White discharge)
- 5. تورم الخياشيم (Gill edema)
- 6. تورم الخياشيم (Gill hyperemia)
- 7. تورم الخياشيم (Gill necrosis)
- 8. تورم الخياشيم (Gill fungus)
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Face-to-face training programs for SSA; Physical training at FAIH/Egypt



<https://worldfishcenter.org/project/increased-sustainability-aquaculture-sector-sub-saharan-africa-through-improved-aquatic>

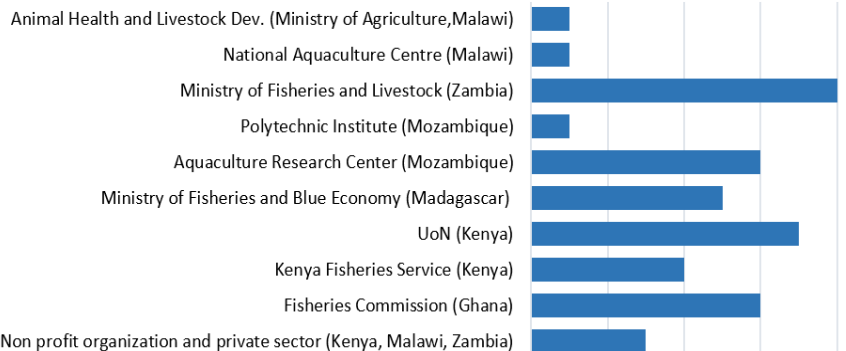
Face-to-face training programs for SSA; Physical training at FAIH/Egypt



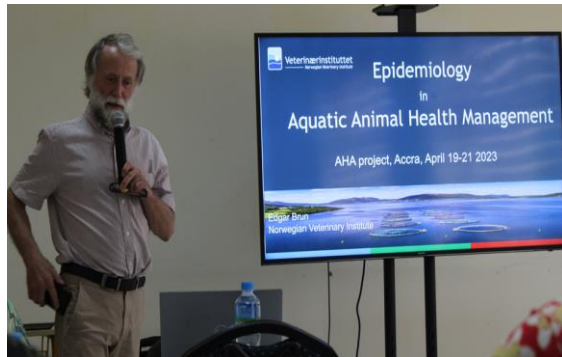
NEXT?
Molecular training



| A | B | C | D | E | F | G | H | I | J | |
|-------------|--|-------------|----------------------|----------------------------|-------|--------------------------------|--|---|---|--|
| Institution | Country | Description | Name | Gender | email | position | | | | |
| 1 | Fisheries Commission | Ghana | AHA project trainees | Linda Bana | F | linban74@yahoo.com | Fisheries Manager | | | |
| 2 | and Development centre of W | Ghana | AHA project trainees | Mercy Johnson-Ashun | F | mercysashun@gmail.com | Principal Technologist | | | |
| 4 | Fisheries Commission | Ghana | AHA project trainees | Joyce Buernorki Lutterroot | F | lutterrootjoyced@gmail.com | Assistant Fisheries Manager | | | |
| 5 | Fisheries Commission | Ghana | AHA project trainees | Jonas Amanor | M | jonastetteh44@yahoo.com | Technical Fisheries Officer | | | |
| 6 | Fisheries Commission | Ghana | AHA project trainees | Kwaku Applah Duodu | M | dkwakuapplah@gmail.com | Veterinarian | | | |
| 7 | Kisumu county government | Kenya | AHA project trainees | Joseph Maragu Mwacharia | M | joemacharia84@gmail.com | Sub County Fisheries officer | | | |
| 8 | County government of Nyeri | Kenya | AHA project trainees | Jebio Mwiti | M | jebiomwiti@gmail.com | Officer - Head of Sub county fisheries office | | | |
| 9 | County government of | Kenya | AHA project trainees | Ann Nyaguthi Kimotho | F | ankimotho@yahoo.com | of Fisheries and head of extension services | | | |
| 10 | County government of | Kenya | AHA project trainees | Lucy Mwachiki Chege | F | lucywaki@yahoo.com | Assistant fisheries officer | | | |
| 11 | County government of | Kenya | AHA project trainees | Meshack Nzioka | M | mesh.nzioka@gmail.com | Chief Fisheries Officer | | | |
| 12 | County government of nyeri | Kenya | AHA project trainees | Morris Muriithi James | M | Jammorris11@gmail.com | Sub County Fisheries officer | | | |
| 13 | Aquaculture Research Center | Mozambique | AHA project trainees | Bene Balbena Nhambe | M | penenhambe71@gmail.com | Aquaculture Engineer | | | |
| 14 | Aquaculture Research | Mozambique | AHA project trainees | Carla da Graça | F | carlabrica3@gmail.com | Ad of the Hatchery Department | | | |
| 15 | The second and third training cycle 16-29 July 2022 | | | | | | | | | |
| 16 | Ministry of Fisheries and Livest | Zambia | AHA project trainees | Brian Mutoloki | M | bmutoloki14@gmail.com | Aquaculture technical officer | | | |
| 17 | Government of Zambia under li | Zambia | AHA project trainees | Arihertone Jere | M | arthurdum@gmail.com | Aquaculture Research Officer Solwezi Aquaculture Pie | | | |
| 18 | Department of Veterinary Servi | Zambia | AHA project trainees | Mwansa Songe | F | dsonge@yahoo.com | Senior Vet. Research Officer/Head of Aquatic Animal H | | | |
| 19 | Ministry of Fisheries and Livest | Zambia | AHA project trainees | CHANDA CHITALLA | F | chitalla@yahoo.co.uk | Veterinary Research Officer | | | |
| 20 | Ministry of Fisheries and Livest | Zambia | AHA project trainees | Patricia Bwalya | F | trishbwalya20@yahoo.com | Veterinary Officer | | | |
| 21 | National Institute for Aquacultu | Mozambique | AHA project trainees | Constância Federico Balane | M | balaneconstancia@yahoo.c | Technology and commercialization of fish | | | |
| 22 | National Fisheries Research In | Mozambique | AHA project trainees | Nelson Blanze | M | nelsonfranciscozanze@gmail.com | Trainer of aquaculture and navigation courses | | | |
| 23 | Polytechnic Institute Mami Citi | Mozambique | AHA project trainees | Clara Armando Miteca | F | claramiteca@gmail.com | Director Regional of Fisheries and Blue economy at the | | | |
| 24 | Ministry of Fisheries and Blue | Madagascar | AHA project trainees | Longendhaza Miaratsoa | F | mriatsoa@yahoo.fr | Freshwater Aquaculture Manager | | | |
| 25 | MINISTRY OF FISHERIES AND | Madagascar | AHA project trainees | RANDIMBARISON Bakoliari | F | rbakoliar@gmail.com | Regional director of fisheries and Blue economy | | | |
| 26 | MINISTRY OF FISHERIES AND | Madagascar | AHA project trainees | ANDRIAMANANTSOA Jaspé | M | tsosajasper@gmail.com | DIRECTOR OF AQUACULTURE | | | |
| 27 | MINISTRY OF FISHERIES AND | Madagascar | AHA project trainees | RASDAMANANJARA Harika | F | ririharika2008@yahoo.fr | CHIEF OF SERVICE OF FISHERIES AND AQUACULT | | | |
| 28 | MINISTRY OF FISHERIES AND | Madagascar | AHA project trainees | MILAMY Fagnahy Andriess F | M | fagnahy@yahoo.fr | Assistant Aquaculture Manager | | | |
| 29 | Inland Management and Aquacul | Ghana | AHA project trainees | ANTHONY WASIP | M | anthonywasipe@gmail.com | Veterinarian | | | |
| 30 | Fish Health Unit of the Fisherie | Ghana | AHA project trainees | Kwaku Applah Duodu | M | dkwakuapplah@gmail.com | Veterinarian | | | |
| 31 | Fish Health Unit, Fisheries com | Ghana | AHA project trainees | STANLEY HENRY OBERESI | M | hobresi@gmail.com | Veterinarian | | | |
| 32 | Fish Health Unit, Fisheries com | Ghana | AHA project trainees | Ewurabena Nimaah Bedak | F | eburabenedak@yahoo.com | Veterinarian | | | |
| 33 | Fish Health Unit, Fisheries com | Ghana | AHA project trainees | Kofi Nyarko | M | kan301in@gmail.com | Veterinarian | | | |
| 34 | FISHERIES COMMISSION OF | Ghana | AHA project trainees | CHARLOTTE NDAH | F | cdnah38@gmail.com | AQUACULTURE MANAGER | | | |
| 35 | KENYA FISHERIES SERVICE | Kenya | AHA project trainees | FINNAN OKOTH AGENG'O D | M | finnansengng@gmail.com | FISHERIES OFFICER | | | |
| 36 | KENYA FISHERIES SERVICE | Kenya | AHA project trainees | VICTOR DIMONDI OGWENYI | M | vogweny@gmail.com | FISHERIES OFFICER/ AHA MSC | | | |
| 37 | MSc - University of Nairobi | Kenya | AHA project trainees | MERCELINE NINDIA NDAM | F | mndind37@gmail.com | AHA-MSc- UoN | | | |
| 38 | The fourth training cycle 16-21 October 2022 | | | | | | | | | |



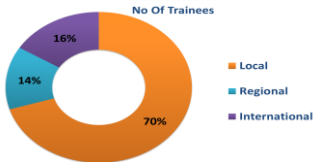
Face-to-face training programs for SSA; Basic Epidemiology and Outbreak Investigation in Aquatic Animals



Face-to-face training programs for SSA; Physical training

The screenshot shows a mobile application interface. At the top left, there is a 'Main Menu' with an 'ODK Collect' button and a yellow arrow pointing to it. Below this, there is a 'Contents lists available at ScienceDirect' section for the journal 'Aquaculture'. The journal homepage is listed as www.elsevier.com/locate/aquaculture. The current issue is 'Volume 560, 15 November 2022, 738607'. The main article title is 'Is tilapia mortality a latent concern for the aquaculture sector of Bangladesh? An epidemiology and health economic impact study'. The authors listed are Partho Pratim Debnath, Jérôme Delamare-Deboutteville, Channarong Rodkhum, Mona Dyerdal Jansen, Chastog Vishnumurthy Mohan, and Ho Thanh Dong. At the bottom of the article preview, there are buttons for 'Go Up', 'Go To Start', and 'Go To End', with 'Go To Start' and 'Go To End' circled in red. Below the article preview, there is a dashboard with various charts and maps, including a world map showing tilapia production and a pie chart showing the distribution of tilapia species.






Training activities Abbassa, Egypt




 **5243** participants
 **115** countries



 Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Foreign Affairs FDFA
Swiss Agency for Development and Cooperation SDC



 Norwegian Embassy
Cairo



Veterinærinstituttet
Norwegian Veterinary Institute



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Thank You

