



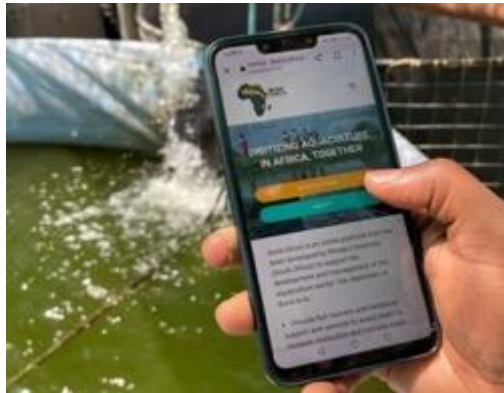
# Formation des points focaux nationaux pour la santé des animaux aquatiques (Cycle IV)

8 - 10 juillet 2024 Tunis, Tunisie



Developing a fish health function in Buna Africa: an online aquaculture platform [www.bunafrica.org](http://www.bunafrica.org)

Développer une fonction de santé des poissons à Buna Africa : une plateforme de l'aquaculture en ligne [www.bunafrica.org](http://www.bunafrica.org)



Qurban Rouhani  
Director: Rural Fisheries Programme  
Rhodes University, South Africa



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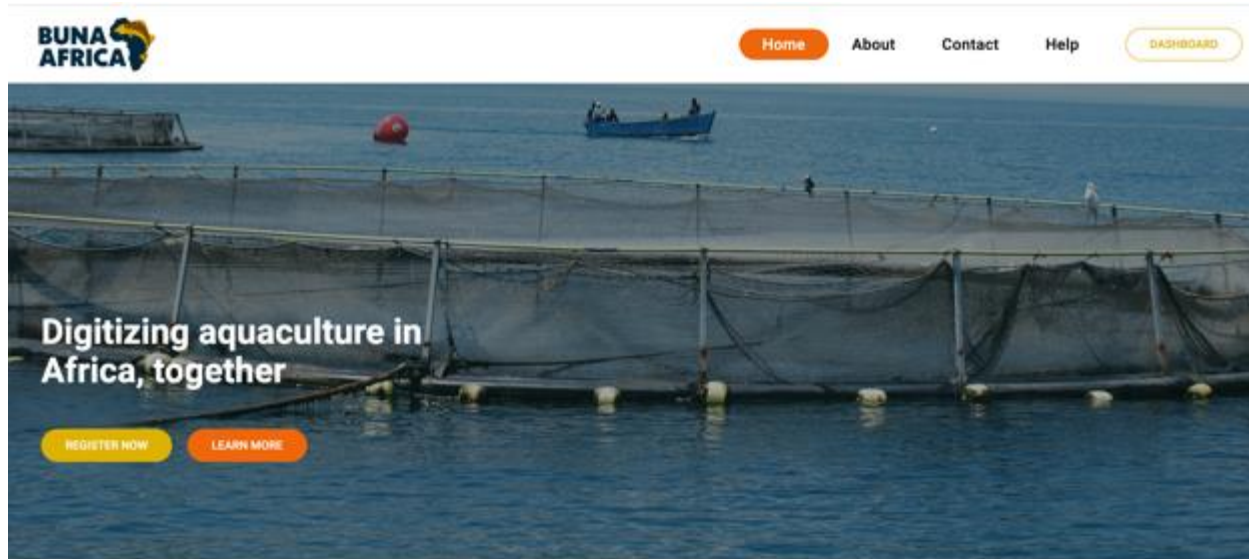
**RURAL  
FISHERIES  
PROGRAMME**  
Department of Ichthyology  
& Fisheries Science  
Rhodes University



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# About Buna Africa

# A propos de Buna Africa



Buna Africa is platform designed to support the development and management of the aquaculture sector in Africa. Our goals are to:

- Buna in Sepedi language means *to harvest*
- The IP of Buna belongs to Rhodes University

- Buna en langue Sepedi signifie *récolter*
- La propriété intellectuelle de Buna appartient à l'Université de Rhodes



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## What problem is Buna trying to solve?

Governments need to have access to production data in real time.

- Production data is needed to inform policy.
- Sector putting demands on government
- Institutions like FAO, AU WOAAH dependent on governments to provide them with data that is reliable.

## Quel problème Buna essaie-t-il de résoudre ?

Les gouvernements doivent avoir accès aux données de production en temps réel.

- Les données sur la production sont nécessaires pour éclairer les politiques.
- Le secteur impose des exigences au gouvernement
- Des institutions comme la FAO, l'UA WOAAH dépendent des gouvernements pour leur fournir des données fiables.



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But to solve this problem, we must first fix another problem

Mais pour résoudre ce problème, nous devons d'abord résoudre un autre problème

To get farmers to provide production data, in exchange we need to provide them with services

Pour amener les agriculteurs à fournir des données de production, nous devons en échange leur fournir des services

- As the sector commercializes and grows farmers are needing increased levels of technical support and services
- In the age of 4IR farmers need these services in real time and in a digital format.

- À mesure que le secteur se commercialise et se développe, les agriculteurs ont besoin de niveaux accrus de soutien et de services techniques.
- À l'ère du 4IR, les agriculteurs ont besoin de ces services en temps réel et au format numérique.



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# How does Buna work?

# Comment fonctionne Buna ?

- Buna is an online platform designed to perform two inter-related functions

**FREE**

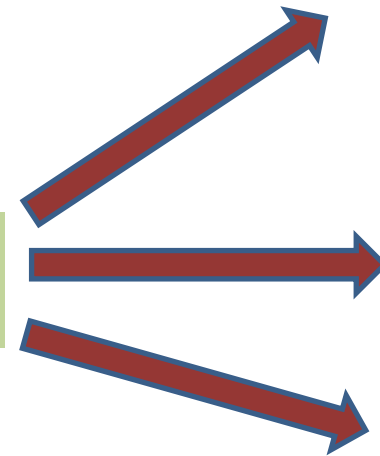
Farmer level

1) Provide technical information & services to fish farmers

**Subscription fee**

Government Level

2) Provide a pathway for fish farmers to submit farm production data

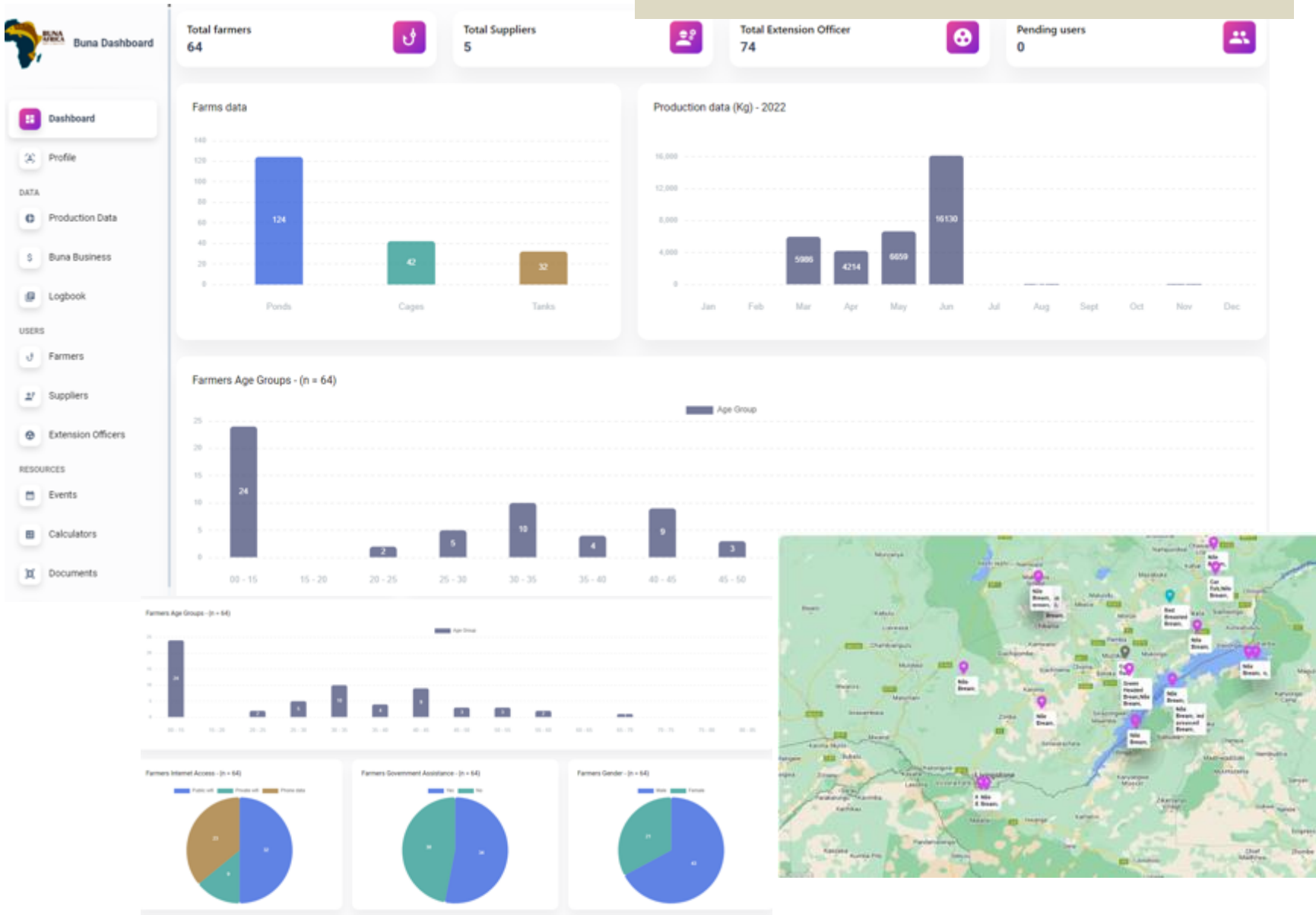


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# FP (gov) dashboard

# Tableau de bord PF-Point Focal (gov)



## Why is Buna fish health relevant to WOAAH?

- Fish health in Africa is underdeveloped and therefore a risk for all.
- We need a unified fish health solution for both notifiable and non-notifiable diseases.
- Buna fish health will leverage data.

## Pourquoi Buna Fish Health est pertinent pour WOAAH ?

- La santé des poissons en Afrique est sous-développée et représente donc un risque pour tous.
- Nous avons besoin d'une solution unifiée pour la santé des poissons, tant pour les maladies à déclaration obligatoire que pour les maladies non déclarables.
- Buna fish health exploitera les données.



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# How Buna fish health will feed in WAHIS

# Comment Buna fish health influencera le developpement dans WAHIS

Reporting (WAHIS)

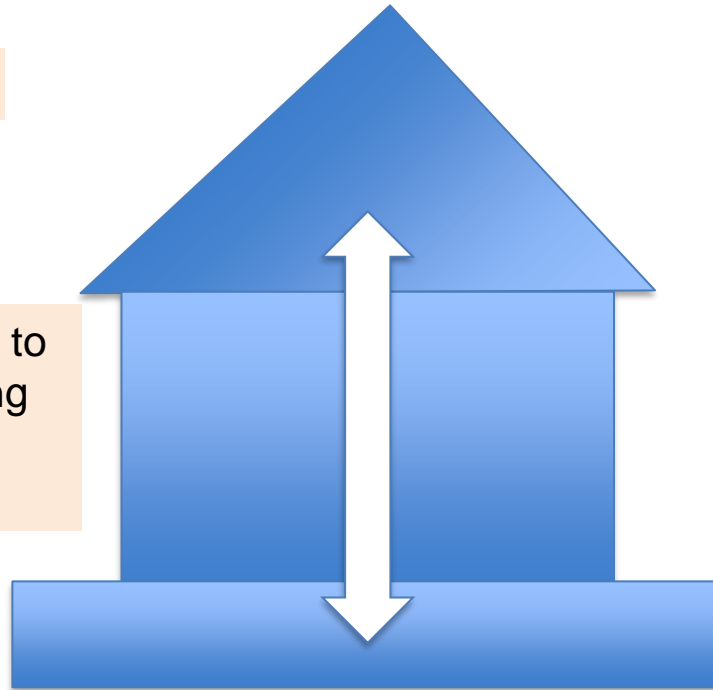
Rapports (WAHIS)

Buna: connecting farmers to vets, vets to vets, providing fish health services, collecting data.

Buna : connecter les agriculteurs aux vêts, les vêts aux vêts, fournir des services de santé aux poissons, collecter des données.

Technical capacity

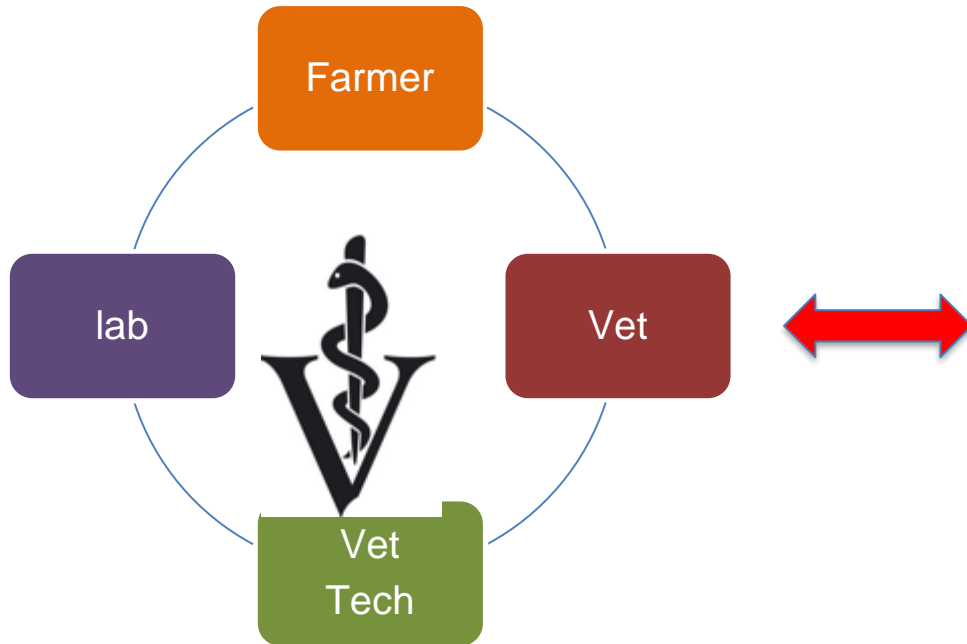
Capacité technique



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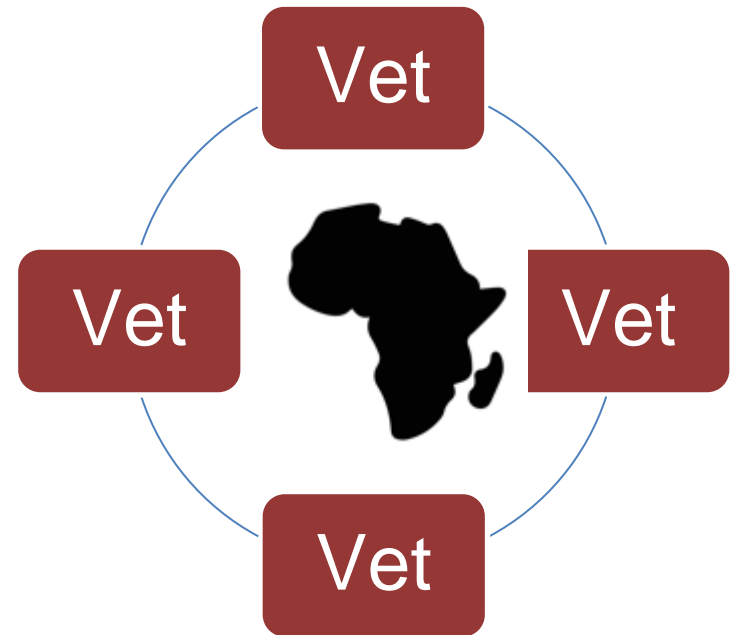


# How Buna Fish Health Works



1. Provide fish health services to farmers

# Comment fonctionne Buna Fish Health



2. Create a network of vets to support each other



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BUNA  
AFRICA



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PROGRAMME  
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& Fisheries Science  
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Farmers dashboard...log's in

Tableau de bord des agriculteurs...connexions

Welcome to Buna Fish Health

### LOGIN

Welcome back

**Username \***


**Password \***

[Forgot password ?](#) [Not registered ?](#)

[Login](#)

### Farmer

**Overview** Cases




**John Doe**  
pau\_farmer  
FARMER

[paulchisenga.pg@gmail.com](#)  
(254) 748270860  
08 Jun, 1995  
FEMALE

**Location**  
Country : zambia  
province : southern  
district : chikankata  
constituency : chikankata  
ward : chikani

Map Satellite



**UPCOMING MEETINGS 0** [See All](#)

There is Nothing To See.

**CASES** [See All](#)

<b>ACTIVE</b> 1	<b>NEW</b> 1	<b>RESOLVED</b> 1
--------------------	-----------------	----------------------

[New Case](#)



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# The Farmer...building case history

# L'agriculteur...établir l'histoire des cas

**+ New Case**

1. Production Parameters

2. Clinical Signs

3. Disease Outbreak Epidemiology

5. Treatment

6. Attachments

Please describe in as much details the problem you are facing? \*

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi aliquam interdum enim imperdiet malesuada. Integer ac fringilla orci. Integer blandit massa nunc, eget vehicula tortor gravida eu. Vestibulum pulvinar in velit in placerat. Fusce sapien lacus, tincidunt in orci et, pharetra iaculis erat. Nulla facilisi. Sed mattis sit amet urna vel varius. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean luctus tellus in nibh congue, sed convallis nisi tristique. Sed augue quam, ultrices ac malesuada ac, iaculis ac purus. Nunc feugiat semper

Cancel Submit

2. Clinical Signs

Have you noticed any changes in the behaviour of the fish? When did you notice? \*

mm/dd/yyyy

Have the fish shown any signs of weakness (lethargy)? \*

Yes  
 No

Has there been a reduction in feed consumption or loss of appetite? \*

Yes  
 No

What erratic swimming patterns have you observed? \*

None  
 Swimming in circle  
 Tilting to one side  
 Struggling to maintain balance

Have you noticed the fish gasping for air? \*

Yes  
 No

What changes have you noticed in the skin of the fish? \*

Pale  
 Darker  
 Abnormal pigmentation patterns  
 Reddish

Cancel Submit



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# The Farmer...building case history

6. Attachments

Upload 2 pictures of the diseased fish

Select

Upload 1 picture of the pond or cage

Select

Upload 1 picture of the medication.


Select

Please describe in as much details the problem you are facing? \*

Cancel Submit


# L'agriculteur...établir l'histoire des cas

Upload 2 pictures of the diseased fish



Select

Upload 1 picture of the pond or cage



Select

Cancel Submit



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# The Vet's dashboard

# Le tableau de bord du vét



## Veterinarian

Overview Cases Shared Cases

**Paul Chisenga**  
demo\_vet VET

paulchisenga.p@gmail.com  
(260) 967481652  
15 Jun, 2023  
MALE

**Location**  
Country : zambia  
province : lusaka  
district : lusaka  
constituency : lusaka central  
ward : kabulonga

UPCOMING MEETINGS 0  
There Is Nothing To Show

NEW CASES 2

Case ID : 11-Sep-2023-ZM-21  
Created at : 11 Sep, 2023  
By John Doe

Cat fish, *Clarias gariepinus* (Miamba),  
*Coptodon rendalli* (Chilinguni).

Case ID : 12-Sep-2023-  
Created at : 12 Sep, 2023  
By John Doe

Cat fish, *Clarias gariepinus* (Miamba),  
*Coptodon rendalli* (Chilinguni).

A new case has been created. **click to view**  
12 Sep, 2023 - 09:53 AM

You have assigned a user to a case. **click to see details**  
11 Sep, 2023 - 01:23 PM

You have assigned a user to a case. **click to see details**  
11 Sep, 2023 - 01:23 PM

[Go to notifications](#)

The vet...see's the farmers request

Le vet...voit la demande des agriculteurs

## Veterinarian

Overview **Cases** Shared Cases

1 New Case — 2 Post Mortem — 3 Tentative Diagnosis — 4 Lab Results — 5 Definitive Diagnosis

Case Details

Case ID: 12-Sep-2023-ZM-31  
12 Sep, 2023

Case File

Submitted by



John Doe  
FARMER

Country : Zambia

Province : Southern

District : Chikankata

Constituency : Chikankata

Ward : Chikani



12-Sep-2023-ZM-31

NEW

CASE ID :

12-Sep-2023-ZM-31

Submitted at : 12 Sep, 2023

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi aliquam interdum enim imperdiet malesuada. Integer ac fringilla orci. Integer blandit massa nunc, eget vehicula tortor gravida eu. Vestibulum pulvinar in velit in placerat. Fusce sapien lacus, tincidunt in orci et, pharetra lacus erat. Nulla facilisi. Sed mattis sit amet urna vel varius. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean luctus tellus in nibh congue, sed corvallis nisi tristique. Sed augue quam, ultrices ac malesuada ac, lacus ac purus. Nunc feugiat semper odio. Sed sed luctus risus, sed congue metus. Quisque accumsan elit a metus euismod efficitur. Nunc pulvinar tempor porttitor. Donec sit amet ante non lacus condimentum agetas in id augue. Mauris a volutpat erat. Pellentesque imperdiet interdum elementum. Phasellus eget augue eget eros pretium mattis in in diam. Ut auctor condimentum leo, et imperdiet felis pharetra non. Suspendisse potenti. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia curae; Donec quis ante sit amet urna facilisis maximus nec eu felis. Nulla vel eros aliquam, mollis massa laoreet, bibendum nulla. Maecenas imperdiet, nisi et blandit blandit, diam risus semper est, ut dignissim ligula mi sed lacus. Cras gravida accumsan ante, vel dapibus magna nunc hendrerit viverra. Fiam curtos vitae mauris at nislacrat. Sed

Accept case

Pictures Of The



pietro-caspani-hdellEY  
25K0-unsplash.jpg



richard-bell-rChymaIN  
WJg-unsplash.jpg

Picture Of The Pond/Cage :



pond-01.jpg

Picture Of The Medication



medication-01.jpg

CASE HISTORY

Production parameters

Clinical signs

Disease outbreak epidemiology

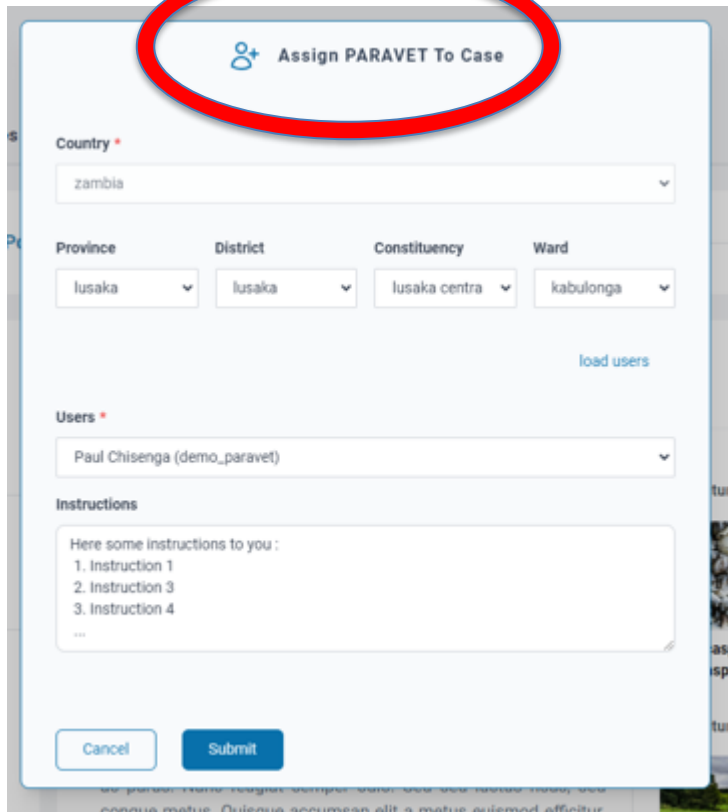
Treatment



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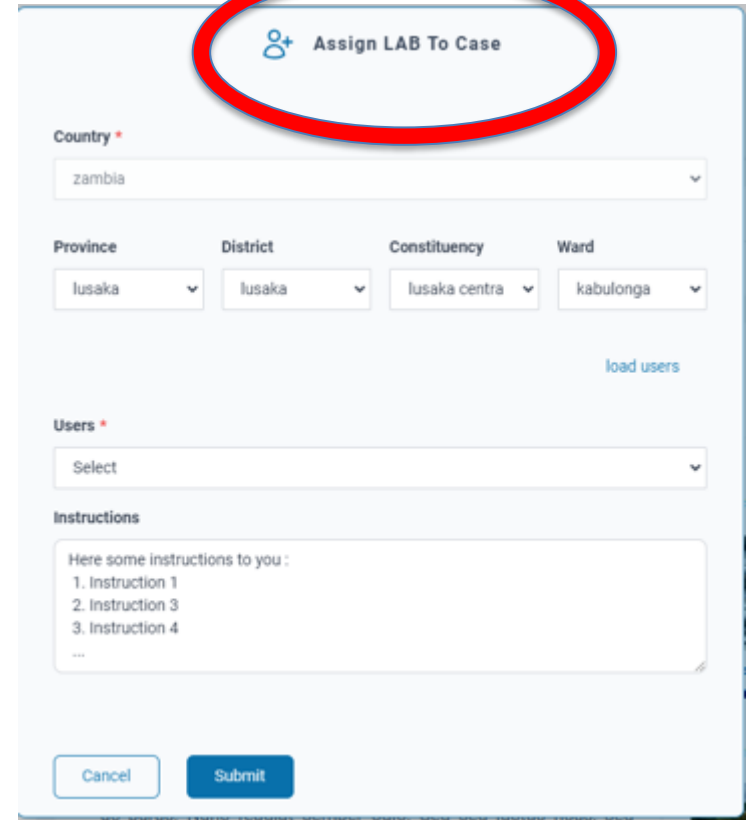


The Vet...assigns  
vet tech & lab



A screenshot of a web form titled "Assign PARAVET To Case". The title is circled in red. The form includes a "Country" dropdown menu with "zambia" selected. Below it are four dropdown menus for "Province" (lusaka), "District" (lusaka), "Constituency" (lusaka centra), and "Ward" (kabungonga). A "load users" link is positioned below these dropdowns. The "Users" dropdown menu shows "Paul Chisenga (demo\_paravet)". At the bottom, there is an "Instructions" section with a list of instructions and a "Submit" button.

Let Vet...assigne le  
tech vet & le lab



A screenshot of a web form titled "Assign LAB To Case". The title is circled in red. The form includes a "Country" dropdown menu with "zambia" selected. Below it are four dropdown menus for "Province" (lusaka), "District" (lusaka), "Constituency" (lusaka centra), and "Ward" (kabungonga). A "load users" link is positioned below these dropdowns. The "Users" dropdown menu shows "Select". At the bottom, there is an "Instructions" section with a list of instructions and a "Submit" button.



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Vet technician...gets notified

Le tech vet...est informé

The image shows a user interface for a 'Vet Technician' profile. On the left, the profile for Paul Chisenga is displayed, including contact information and location details. On the right, there are sections for 'UPCOMING MEETINGS 0' and 'CASES'. A notification overlay is shown on the right side, listing three notifications with green checkmarks. A red arrow points to the notification bell icon in the top right corner of the interface.

### Vet Technician

**Overview** Cases

**Paul Chisenga**  
demo\_paravet  
PARAVET

paulchisenga.p@gmail.com  
(260) 967481652  
08 Jun, 2023  
MALE

**Location**  
Country : zambia  
province : lusaka  
district : lusaka  
constituency : lusaka central  
ward : kabulonga

UPCOMING MEETINGS 0

CASES

- ✓ You have been assigned to a case, click to view  
12 Sep, 2023 - 09:57 AM
- ✓ You have been assigned to a case, click to view  
11 Sep, 2023 - 01:23 PM
- ✓ A definitive diagnosis has been submitted for a case, click to view  
11 Sep, 2023 - 01:06 PM

[Go to notifications](#)

Vet technician...sees the case file

Let tech vet...voit le dossier

## Vet Technician

Overview

Cases

1

New Case

2

Post Mortem

3

Tentative Diagnosis

4

Lab Results

5

Definitive Diagnosis

Case details

Case ID: 12-Sep-2023-ZM-31

12 Sep, 2023

Case File

Submitted by



John Doe  
FARMER

Country : Zambia

Province : Southern

District : Chikankata

Constituency : Chikankata

Ward : Chikani



### INSTRUCTIONS

Here some instructions to you :

1. Instruction 1
2. Instruction 3
3. Instruction 4

...

12-Sep-2023-ZM-31

ACTIVE

Actions

CASE ID :

12-Sep-2023-ZM-31

Submitted at : 12 Sep, 2023

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi aliquam interdum enim imperdiet malesuada. Integer ac fringilla orci. Integer blandit massa nunc, eget vehicula tortor gravida eu.

Pictures Of The Diseased Fish :



# Vet technician...site visit

# Le tech vet...La visite du site

Post Mortem Form

Basic

Body Measurements

External Examination

Internal Examination

Direct Microscopy (optional)

Cancel Submit

Post Mortem Form

External Examination

Fin \*

5 / 5 Normal 1 / 5 Frayed 5 / 5 Haemorrhagic 4 / 5 Eroded

Body Surface \*

3 / 5 Normal 2 / 5 Excess Mucus 0 / 5 Irregular Colour 3 / 5 Ulceration

0 / 5 Haemorrhagic 0 / 5 Necrotic 2 / 5 Granuloma 0 / 5 Parasites

1 / 5 Missing Scales

Eyes \*

3 / 5 Normal 4 / 5 Corneal Opacity 4 / 5 Exophthalmic 4 / 5 Haemorrhagic

Gills

Cancel Submit



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# Bringing in the lab

### Laboratory Sample Submission Form

**Sample Information**

**Name of Laboratory \***

Paul Chisenga

**Sample Type(s) \***

whole

**Sample Collection Date \*** **Time \***

mm/dd/yyyy [calendar icon] --:-- [clock icon]

**Brief Description of Sample \***

Nunc at magna ante. Nam et felis consectetur, vehicula lectus non, sollicitudin orci. Sed porta et leo quis laoreet. Curabitur gravida ante blandit consectetur dapibus. In non velit lacus. Nulla non urna pharetra, posuere risus mollis, malesuada justo. Donec

**Diagnostic Tests Requested:**

Please specify the tests you would like us to perform on the submitted sample(s)

**Test Name \***

Test 1

Cancel Submit

# Inclure le laboratoire

### Laboratory

Overview **Cases**

1 New Case 2 P

**Case details**

**Case ID:** 12-Sep-2023-ZM-31  
12 Sep, 2023

Case File

Submitted by

John Doe  
FARMER

**Country:** Zambia  
**Province:** Southern  
**District:** Chikankata  
**Constituency:** Chikankata  
**Ward:** Chikani

### Lab Results

Result \*

Lab Results

Cancel Submit

**Sending results back to the vet**

# Back to the vet

# Retour au vet

MY DASHBOARD MY MEETINGS

## Veterinarian

Overview Cases Shared Cases

**Paul Chisenga**  
demo\_vet **VET**

UPCOMING MEETINGS 0

19

**Lab samples for a case have been submitted. click to see details**  
12 Sep, 2023 - 10:02 AM

**A post... been assigned to a case. click to see details**  
12 Sep, 2023 - 10:01 AM

**You have assigned a user to a case. click to see details**  
12 Sep, 2023 - 09:57 AM

[Go to notifications](#)

# Information available to the vet

# Informations dispose au vet

- Farmer's history
- Vet technician report
- Lab report

- L'histoire d'un agriculteur
- Rapport du tech vét
- Rapport du lab

**Veterinarian**

Overview **Cases** Shared Cases

1 New Case 2 Pe

Case details

Case ID: 12-Sep-2023-ZM-31  
12 Sep, 2023

Case File

Submitted by

**John Doe**  
FARMER

Country : Zambia  
Province : Southern  
District : Chikankata  
Constituency : Chikankata  
Ward : Chikani

**Share Case**

Country \*  
zambia

Province  
lusaka

District  
All district

load users

Users \*  
Mary Lane (mary\_vet)

Instructions

Here some instructions to you :

1. Instruction 1
2. Instruction 3
3. Instruction 4

...

Cancel Submit



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# 2<sup>nd</sup> Opinion Vet

**Veterinarian**

Overview Cases Shared Cases

**Mary Lane**  
mary\_vet VET

mary@gmail.com  
(260) 967481652  
28 Jun, 1992  
FEMALE

**Location**  
Country : zambia  
province : lusaka  
district : lusaka  
constituency : kabwata  
ward : libala

UPCOMING MEETINGS 0

NEW CASES 1

Case ID : 11-Sep-2023-ZM-21  
Created at : 11 Sep, 2023  
By John Doe

Cat fish, *Clarias gariepinus* (Miamba),  
*Coptodon rendalli* (Chilinguni),

# 2ème avis, Le Vet

A case has been shared with you,  
click to view

12 Sep, 2023 - 10:08 AM

A new case has been created.  
click to view

12 Sep, 2023 - 09:53 AM

A new case has been created.  
click to view

11 Sep, 2023 - 01:22 PM

[Go to notifications](#)



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## 2<sup>nd</sup> Opinion Vet

Case Review

Your Recommendations \*

Mauris pretium pretium mauris et accumsan. Nulla auctor tempor felis dictum convallis. Maecenas ac fringilla arcu. Nam maximus lobortis libero gravida consectetur. Suspendisse potenti. In hac habitasse platea dictumst. Morbi aliquam urna sit amet sapien tristique, et aliquet lorem convallis. Nulla laoreet porttitor massa ut dapibus. Nullam dignissim quam quis arcu pharetra fermentum quis a velit. Morbi ac tortor sed ipsum sagittis aliquet ac id erat. Donec molestie purus mauris, non luctus libero aliquam nec. Fusce tempor ornare tortor, rhoncus vehicula dui. Sed interdum

Upload any files that can help (optional)

buna.txt  
2 kb

Select

Cancel Submit

## 2ème avis, Le Vet

By enabling a vet to share their case with another vet, we are:

1. Building a network of vets across Africa
2. We are building capacity amongst vets, by sharing their knowledge.

En permettant à un vétérinaire de partager son cas avec un autre vétérinaire, nous:

1. Créons un réseaux de véts à travers l'Afrique
2. Créons la capacity parmi les véts, en partageant leur connaissances



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Back to the primary  
vet...reporting back to farmer

Retour au vet principal...Faire  
rapport à l'agriculteur

**Schedule Meeting**

Title \*

Date \*  Time \*



**Definitive Diagnosis**

Master Problem List (laboratory Results, History and Post mortem)

Problem 1 \*

Recommendations \*

Mauris pretium pretium mauris et accumsan. Nulla auctor tempor felis dictum convallis. Maecenas ac fringilla arcu. Nam maximus lobortis libero gravida consectetur. Suspendisse potenti. In hac habitasse platea dictumst. Morbi aliquam urna sit amet sapien tristique, et aliquet lorem convallis. Nulla laoreet porttitor massa ut dapibus. Nullam dignissim quam quis arcu pharetra fermentum quis a velit. Morbi ac tortor sed ipsum sagittis aliquet ac id erat. Donec molestie purus mauris, non luctus libero aliquam nec. Fusce tempor ornare tortor, rhoncus vehicula dui. Sed interdum fincidunt velit ac dapibus. Sed scelerisque posuere lorem quis tristique. Maecenas

Definitive Diagnosis \*

Vet's dashboard...visualising spread of fish diseases

Le tableau de bord du vet...visualiser la propagation des maladies des poissons

**Veterinarian**

Overview Cases Shared Cases

**Paul Chisenga**  
demo\_vet  
VET

paulchisenga.p@gmail.com  
(260) 967481652  
15 Jun, 2023  
MALE

**Location**  
Country : zambia  
province : lusaka  
district : lusaka  
constituency : lusaka central  
ward : kabulonga

**UPCOMING MEETINGS 0**  
There is Nothing To See.

**NEW CASES 3**

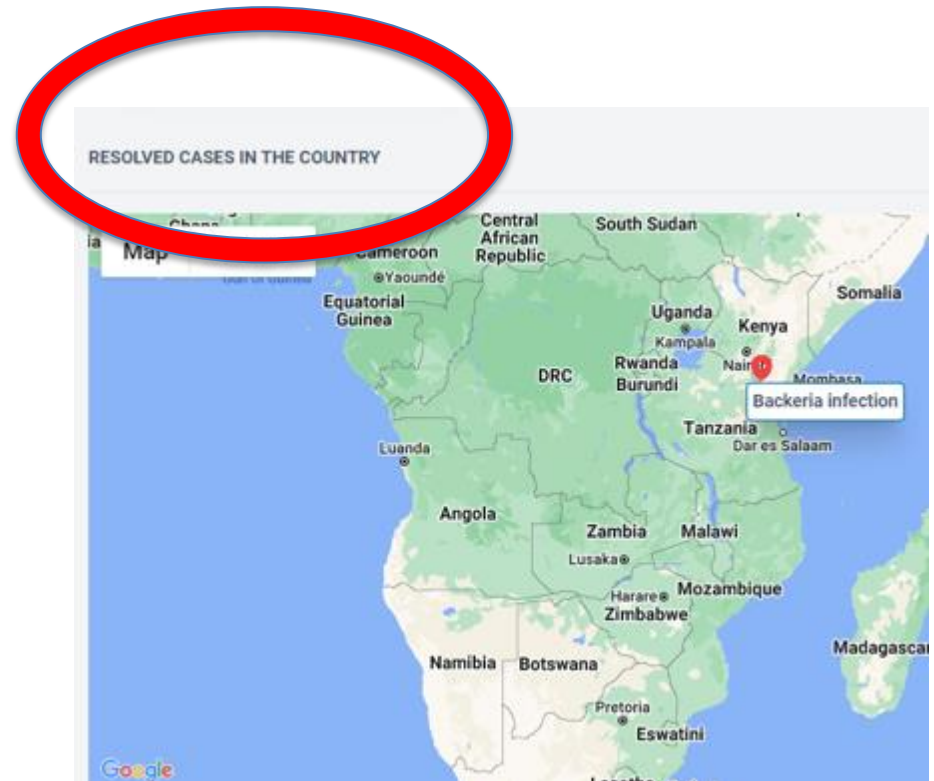
**Case ID : 11-Sep-2023-ZM-21**  
Created at : 11 Sep, 2023  
By John Doe

**Case ID : 12-Sep-2023-ZM-31**  
Created at : 12 Sep, 2023  
By John Doe

Map Satellite

Uganda Kenya  
Kampala Nairobi  
Ankara Mombasa

Cat fish, *Cirarias gariepinus* (Mianoba),  
*Cyphodon rendali* (Chitiqueni)



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# Conclusion

- Buna Fish Health is building a digital fish health ecosystem.
- Data on notifiable diseases cannot be extracted in isolation.
- Buna Fish Health is creating a network of vets around real-life cases.
- Buna Fish Health is not a reporting system (e.g. WAHIS), but rather a tool that feeds into reporting systems.
- We see Buna as a service towards WOA objectives

# Conclusion

- Buna Fish Health construit un écosystème numérique pour la santé des poissons.
- Les données sur les maladies à déclaration obligatoire ne peuvent pas être extraites de manière isolée.
- Buna Fish Health crée un réseau de vétérinaires autour de cas réels.
- Buna Fish Health n'est pas un système de rapport (e.g. WAHIS), mais plutôt un outil qui influence le développement des systèmes de rapport.
- Nous considérons Buna comme un service vers les objectifs de WOA



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