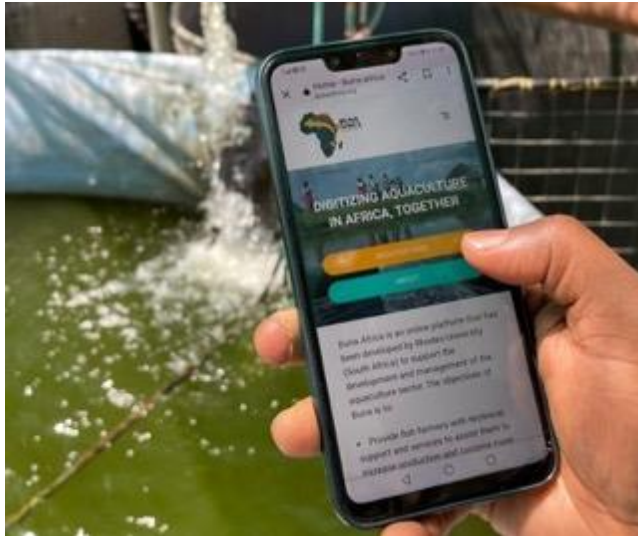


Developing a fish health function in Buna Africa: an online aquaculture platform www.bunafrica.org



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



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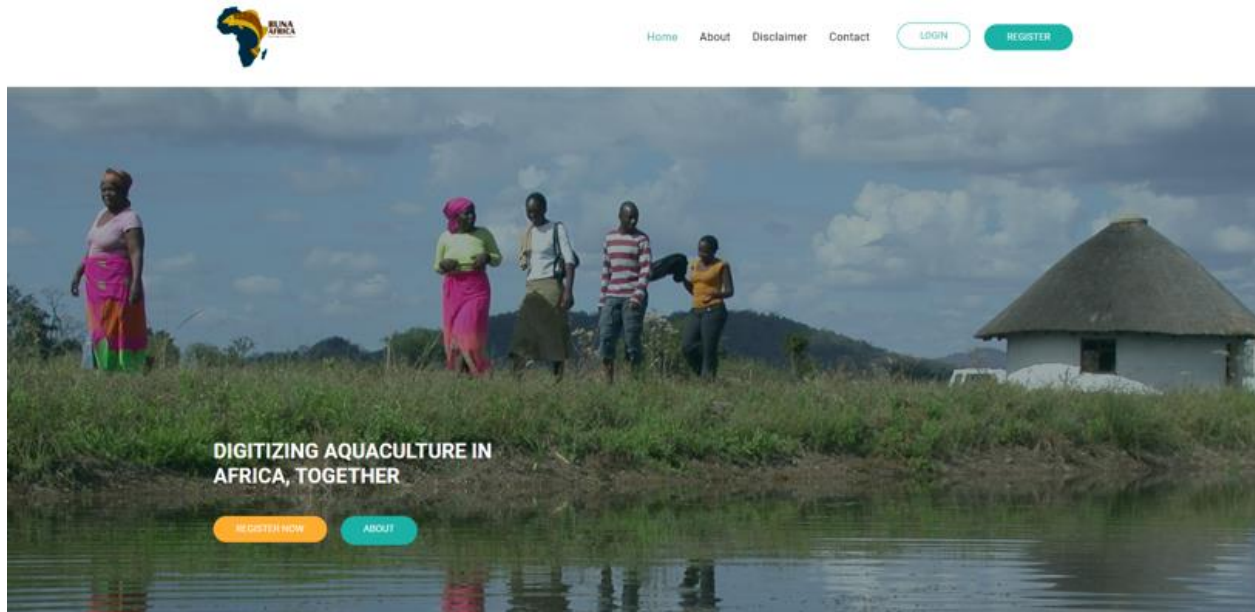


**RURAL
FISHERIES
PROGRAMME**
Department of Ichthyology
& Fisheries Science
Rhodes University



RHODES UNIVERSITY

About Buna Africa



- Buna in Sepedi language means *to harvest*
- The IP of Buna belongs to Rhodes University
- Hosted on AWS to provide industry level security



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What problem is Buna trying to solve?

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

- The aquaculture sector is growing fast and it is putting demands on governments.
- Production data is needed to inform policy.
- Institutions such as the FAO, AU even WOAHA are dependent on governments to provide them with data that is reliable.



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

To get farmers to release their production data, we need to in exchange provide them with 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.



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BUNA
AFRICA
Aquaculture Association



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

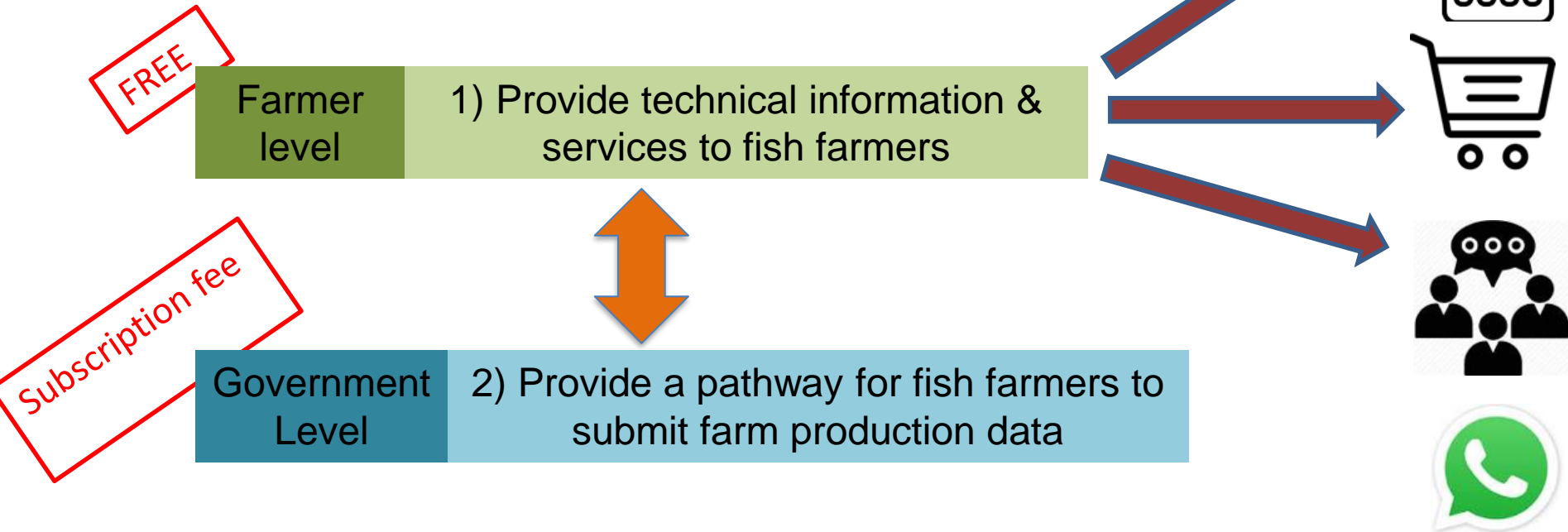


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What is Buna Africa?

www.bunafrica.org

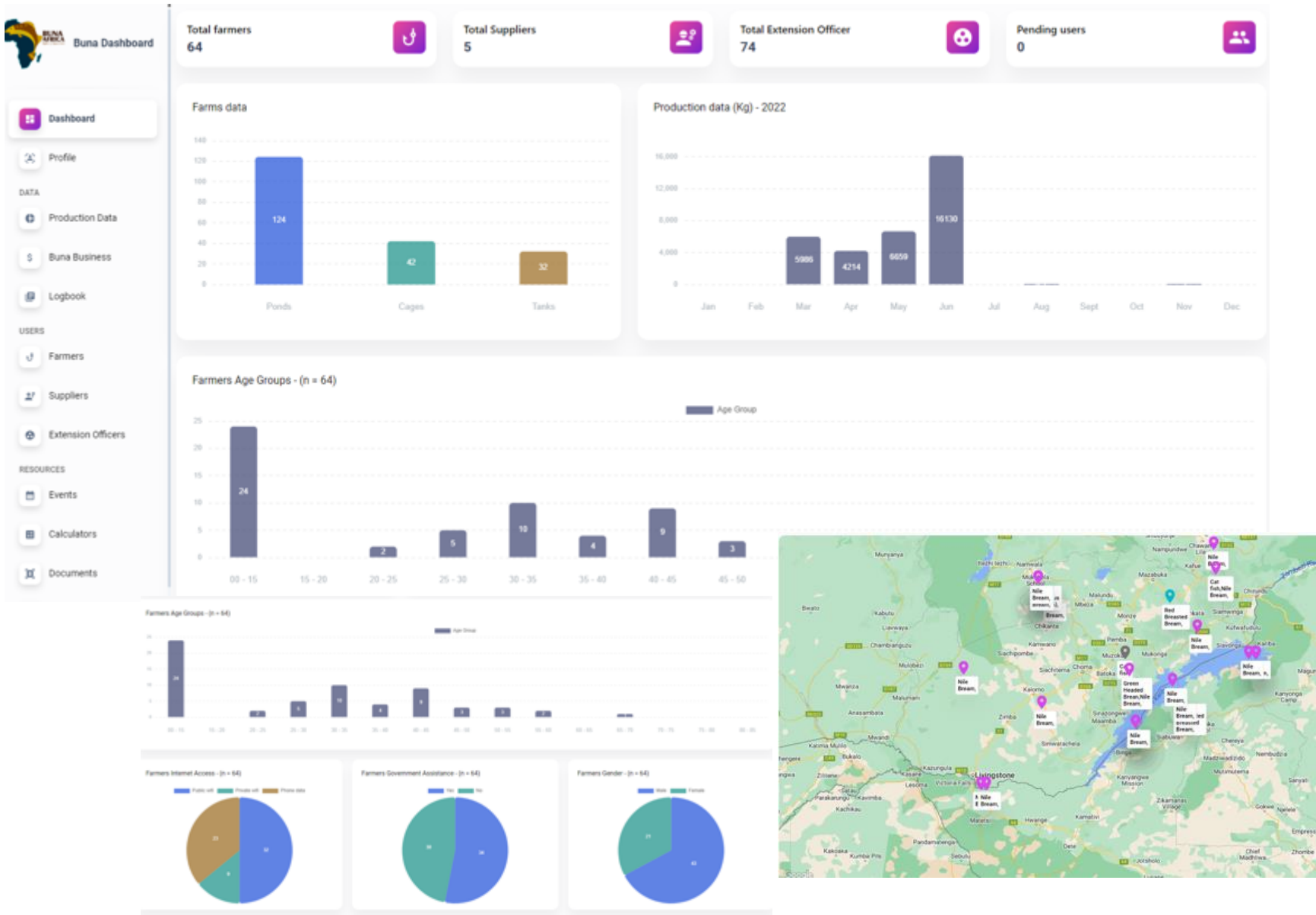
- Buna is an online platform designed to perform two inter-related functions



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FP (gov) dashboard



Why are we developing a fish health component to Buna, and why is this relevant to WOAH?

- Fish health services on the continent is still underdeveloped & out of reach for many farmers, therefore this presents a considerable risk.
- We need a fish health solution for both notifiable and non-notifiable diseases. Otherwise, we may risk alienating farmers and this could have unintended consequences.
- For Governments (and WOAH) both sets of data, from Buna Africa (production data) and the fish health data sets are equally important and relevant to each other.

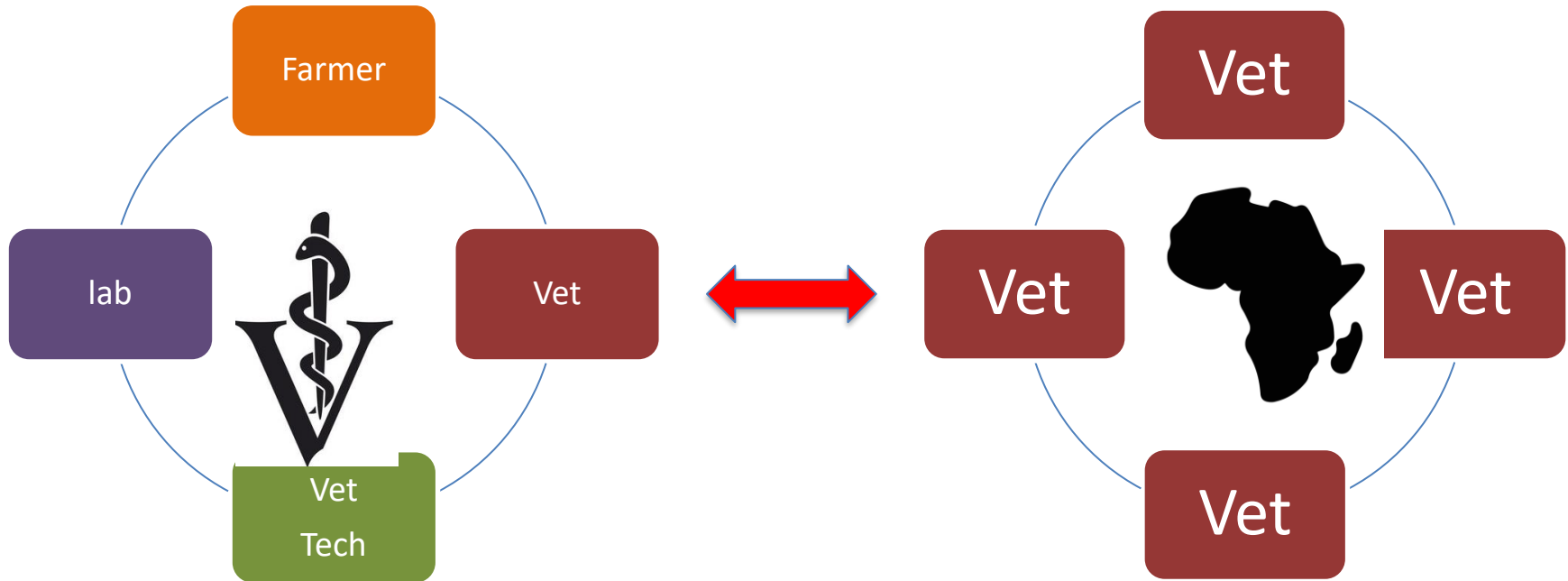


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How Buna Fish Health Works



1. Provide fish health services to farmers

2. Create a network of vets to support each other



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Farmers dashboard...log's in

Welcome to Buna Fish Health

LOGIN

Welcome back

Username *


Password *


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


[Login](#)


Farmer


Overview Cases




John Doe
pau_farmer 
FARMER

 paulchisenga.p@gmail.com

 (254) 748270868


 08 Jun, 1995

 FEMALE

Location

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

Map Satellite



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



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The Farmer...building case history

+ 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 nisl tristique. Sed augue quam, ultrices ac malesuada ac, iaculis ac purus. Nunc feugiat semper

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



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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

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



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 : kabalonga

UPCOMING MEETINGS 0

NEW CASES 2

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

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

Map Satellite

Uganda Eldoret Kenya Kampala Nairobi Arusha Mombasa

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

15

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



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The vet...see's the farmers request

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

Map Satellite




Cat fish, *Clarias gariepinus* (Mlamba),
Coptodon rendali (Chitungo).

12-Sep-2023-ZM-31
NEW

Accept case


CASE ID:
12-Sep-2023-ZM-31
Submitted at : 12 Sep, 2023

Picture Of The Pond/Cage :




pond-01.jpg

Picture Of The Medication




medication-01.jpg

Picture Of The Case :



pietro-caspani-h0eLLEY
29KI-unsplash.jpg



richard-bell-rChymalN
WJg-unsplash.jpg

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 nisl tristique. Sed augue quam, ultrices ac malesuada ac, iaculis 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 egestas 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 condimentum viverra. Ftiam cursus vitae mauris at placerat. Sed

CASE HISTORY


Production parameters

Clinical signs

Disease outbreak epidemiology

Treatment

The Vet...assigns vet tech & lab

 Assign PARAVET To Case

Country *
zambia


Province District Constituency Ward
lusaka lusaka lusaka centra kabulonga

load users

Users *
Paul Chisenga (demo_paravet)

Instructions
Here some instructions to you :
1. Instruction 1
2. Instruction 3
3. Instruction 4
...

Cancel Submit

 Assign LAB To Case

Country *
zambia

Province District Constituency Ward
lusaka lusaka lusaka centra kabulonga

load users

Users *
Select

Instructions
Here some instructions to you :
1. Instruction 1
2. Instruction 3
3. Instruction 4
...

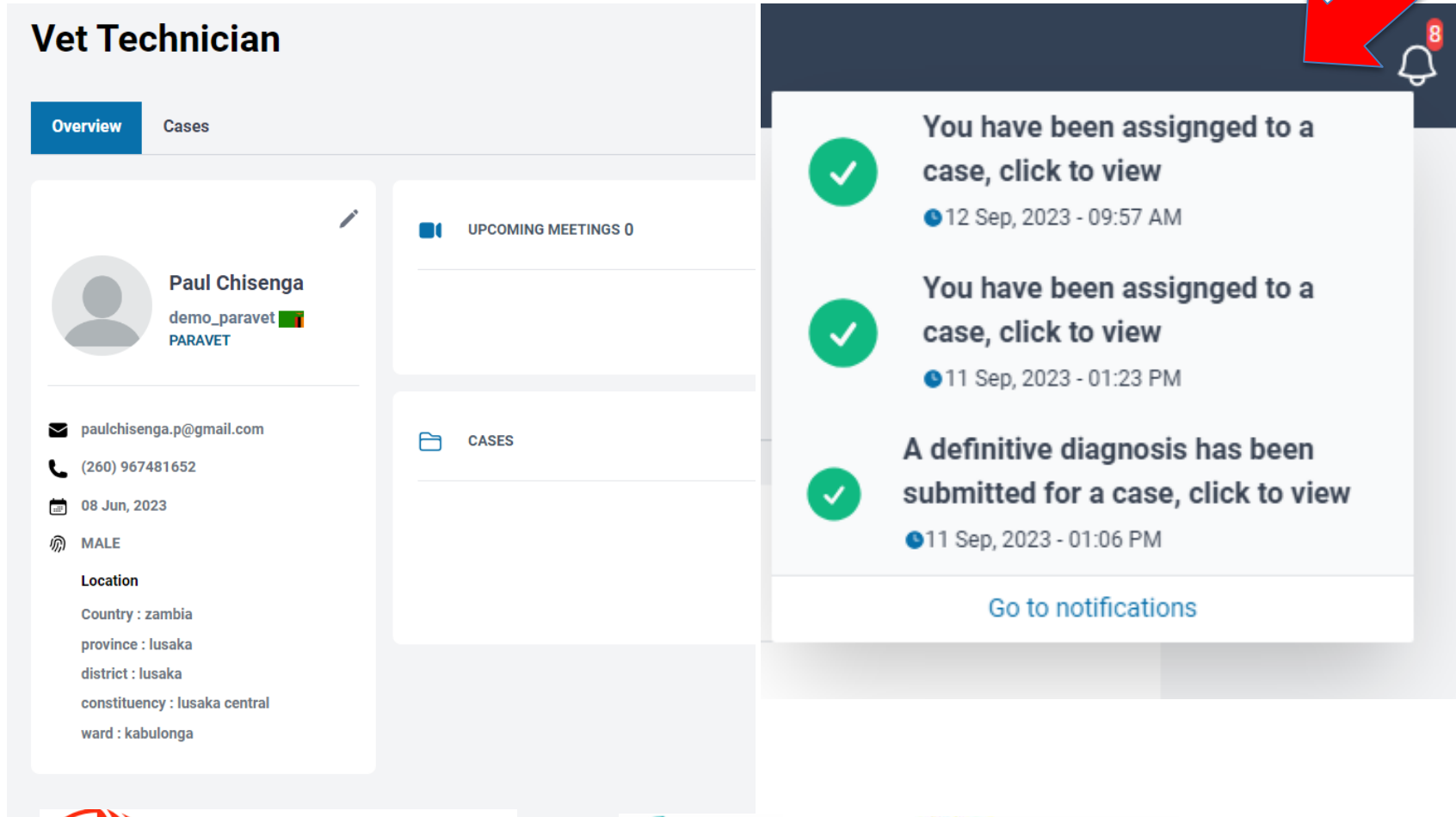
Cancel Submit



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Vet technician...gets notified



The image shows a user interface for a vet technician. On the left, the profile for Paul Chisenga is displayed, including contact information and location details. On the right, a notification overlay lists three recent assignments with green checkmarks and a 'Go to notifications' link. A red arrow points to a 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](#)



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Vet technician...sees the case file

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

12-Sep-2023-ZM-31
ACTIVE

INSTRUCTIONS

Here some instructions to you :


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

...

CASE ID :
12-Sep-2023-ZM-31
Submitted at : 12 Sep, 2023

Actions ▾

Pictures Of The Diseased Fish :



Map Satellite

Vet technician...site visit

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 --:--

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

Laboratory

Overview **Cases**

1 New Case 2 P

Case details

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

Submitted by

John Doe
FARMER

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

Lab Results

Result *

Lab Results



Sending results back to the vet


Back to the 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 has 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

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

Veterinarian

Overview **Cases** Shared 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

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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2nd 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

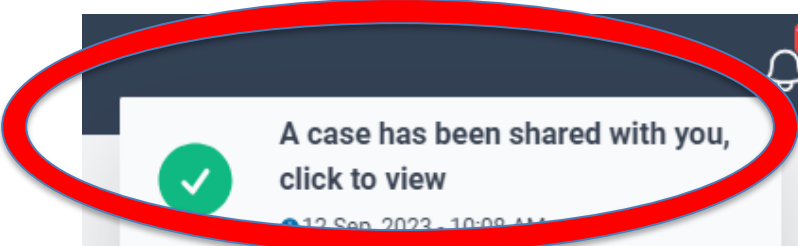
UPCOMING MEETINGS 0


NEW CASES 1


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




Cat fish, *Clarias gariepinus* (Miamba),
Coptodon rendali (Chilinguni),
Tanzania



 **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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2nd 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

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.



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

Schedule Meeting

Title *

Date * Time *

My Meetings

September 2023

SUN	MON	TUE	WED	THU	FRI	SAT
					1 0	2 0
3 0	4 0	5 0	6 0	7 0	8 0	9 0
10 0	11 0	12 0	13 0	14 0	15 0	16 0
17 0	18 0	19 0	20 0	21 0	22 0	23 0
						30 0

Definitive Diagnosis

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

Problem 1 *

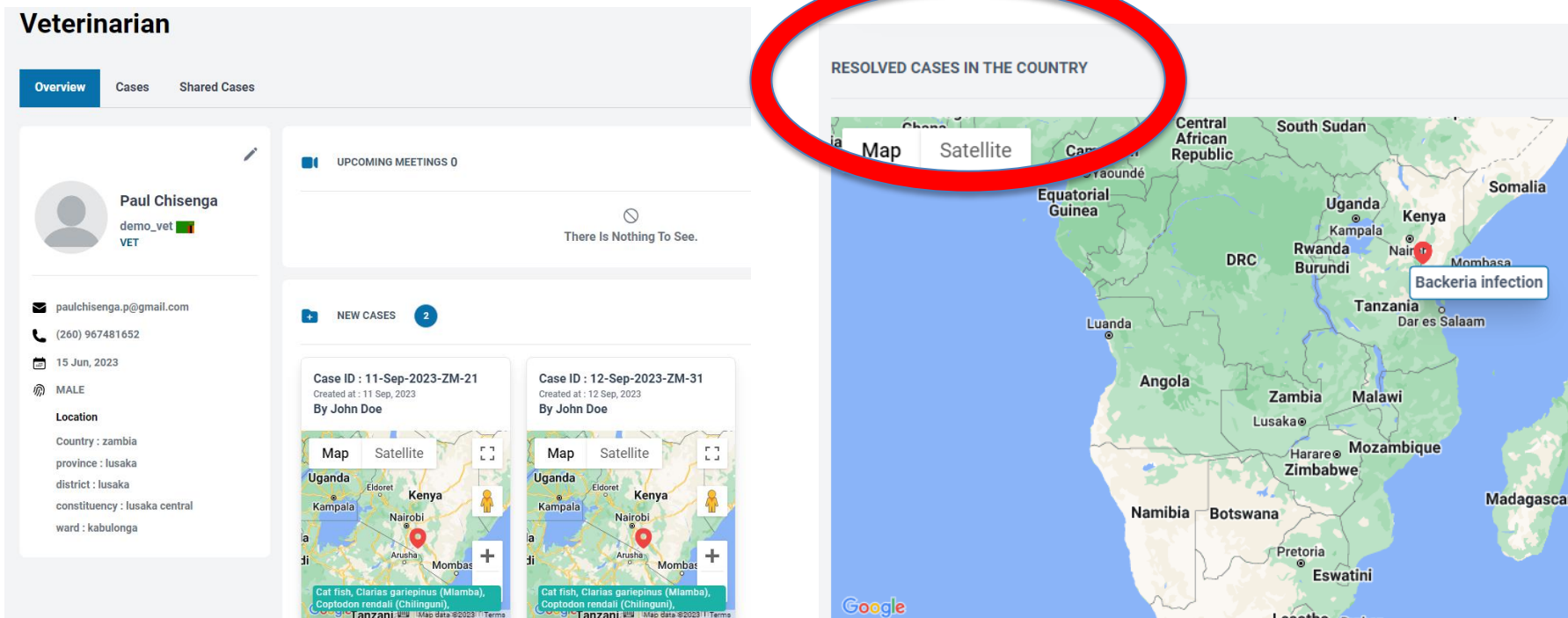
Recommendations *

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 tincidunt velit ac dapibus. Sed scelerisque posuere lorem quis tristique. Maecenas

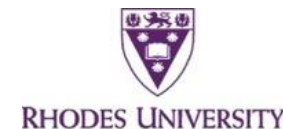
Definitive Diagnosis *



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



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Conclusion

- Buna Fish Health is not only about providing services to the farmer, but it is also about creating a **digital fish health ecosystem**, that builds capacity across the board.
- Buna Fish Health is creating a network of vets / fish health practitioners around real-life cases.
- Buna Fish Health is not a reporting system (e.g. WAHIS), but rather a tool that feeds into reporting systems.
- Next step would be for a collaboration between Rhodes University (Buna Africa) & WOAH to pilot the fish health function.



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& Fisheries Science
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