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FISHERISTIC

Future of Fisheries, Imagined Now

Future of Fisheries, Imagined Now...

Resilient Hamlet

sustainable farming model for circular bio-economy

Sagar Shinde *(AQC-PB2-07)*
Ashutosh Danve *(AQC-MB1-01)*
Swaraj Adakney *(AEM-MB1-07)*

Future of Fisheries, Imagined Now...

LinguaPiscis

interpreting the language of the fish to sustain them

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Shivkumar *(FNT-PB0-04)*

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Fishergy

generating electricity from fish movement

Anurag Singh *(FEX-MB1-03)*
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FishBind

turning fish bone waste to miracle CSD products

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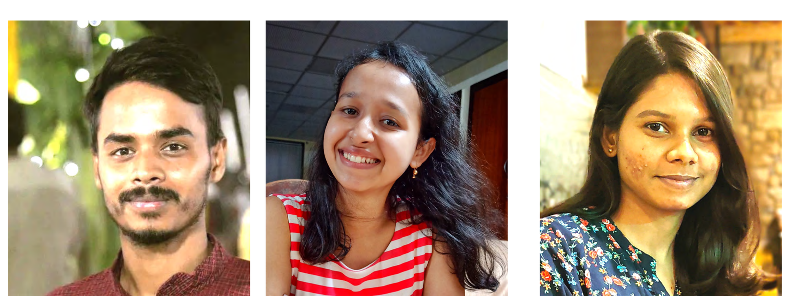
Future of Fisheries, Imagined Now...

FisHerd

the cage that cares

Jerusha S. *(PHT-PA7-02)*
Sandhiya V. *(FPT-PB2-03)*



Future of Fisheries, Imagined Now...

NanoSort

micro-algae to remove nanoplastics from aquatic systems

Pritam Sarkar *(AEM-MB0-04)*
Tanushree Bhowmik *(AAHM-MB1-06)*
Puja Rani Basak *(AEM-MB1-05)*

Future of Fisheries, Imagined Now...

Project SAND

Strategic AquapoNics in Desert, more fish n crop per water drop

D. Bhoomaiah *(CTO, Knowledge Management Unit & IT Cell)*
A. Venkata Sai *(FNFT-MB2-02)*
K. Nagendrasai *(AEM-MB1-04)*
K. Nikhil *(FRM-MB2-05)*
K. Shivarama Krishna*(FGB-MB2-06)*

Future of Fisheries, Imagined Now...

MAAngrove *skincare solutions*

magical health care products from mangrove ecosystem waste

B Chanikya Naidu *(FRM-PB-006)*
Sahana M D *(PHT-PB-003)*

Future of Fisheries, Imagined Now...

AquaTHERM

thermal IR imaging to save aquatic mammals

Sangita Roy *(AAHM-MB1-03)*
Liton Paul *(FEC-MB1-06)*
Tamal Seth *(AAHM-MB1-05)*
Pritam Sarkar *(AEM-MB1-04)*
Bhashwati Roy *(FPB-MB1-03),*

Future of Fisheries, Imagined Now...

BioGlo

bringing life to the light

Poonam Majumder *(FRM-MB1-07)*
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Akanksha *(FRM-MB1-01)*

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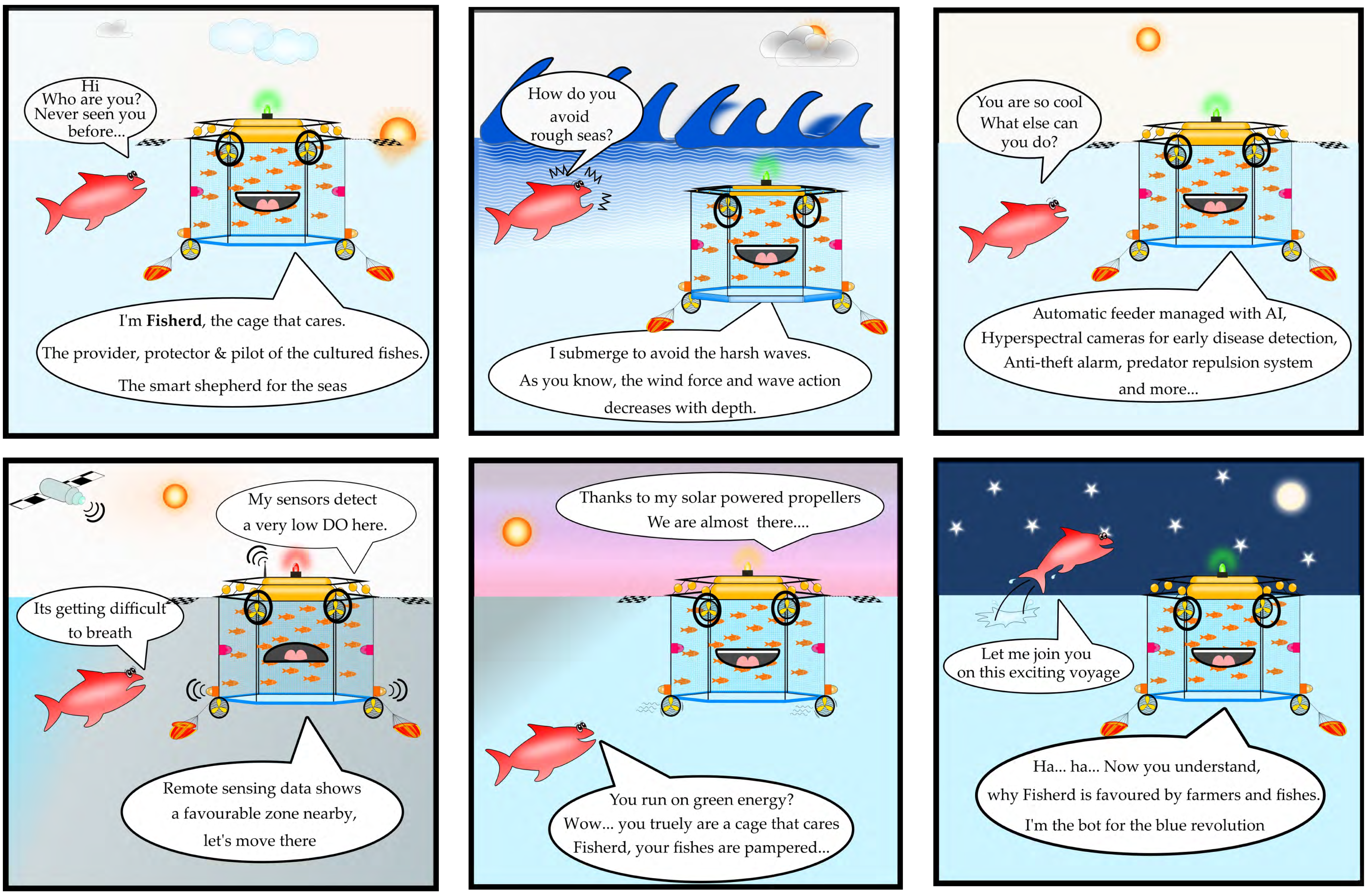
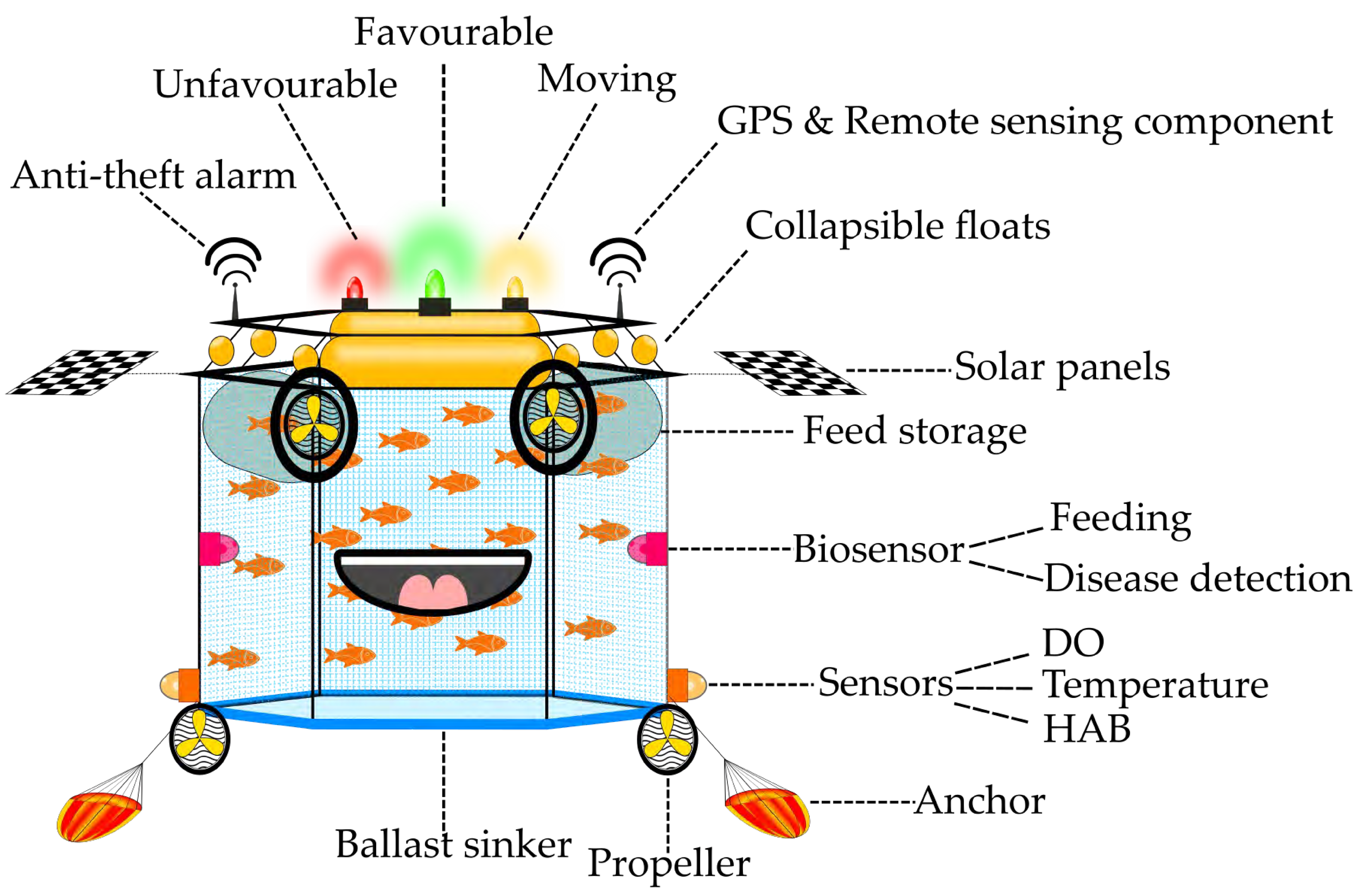




- **Most open waters remain unutilized due to bottlenecks in the current cage culture systems. The fully automated, smart mobile cage bots are aimed to make cage culture possible in otherwise impossible open waters.**
- **Fisherd is a futuristic cage culture system with minimal human interventions.**
- **Fisherd will overcome rough weather by submerging through collapsible floats and ballast-type sinkers.**
- **With biosensors, Fisherd will facilitate early disease detection and precision aquaculture concerning feed management.**
- **LoDo (Low Dissolved Oxygen) is a major roadblock in expanding the cage culture system in open waters since the water quality parameters cannot be controlled. Based on the remote sensing data, the proposed mobile cage Fisherd will move to the nearest optimal DO zone.**
- **The entire system will be powered by solar energy.**

AquaTHERM : *thermal IR imaging to save aquatic mammals*

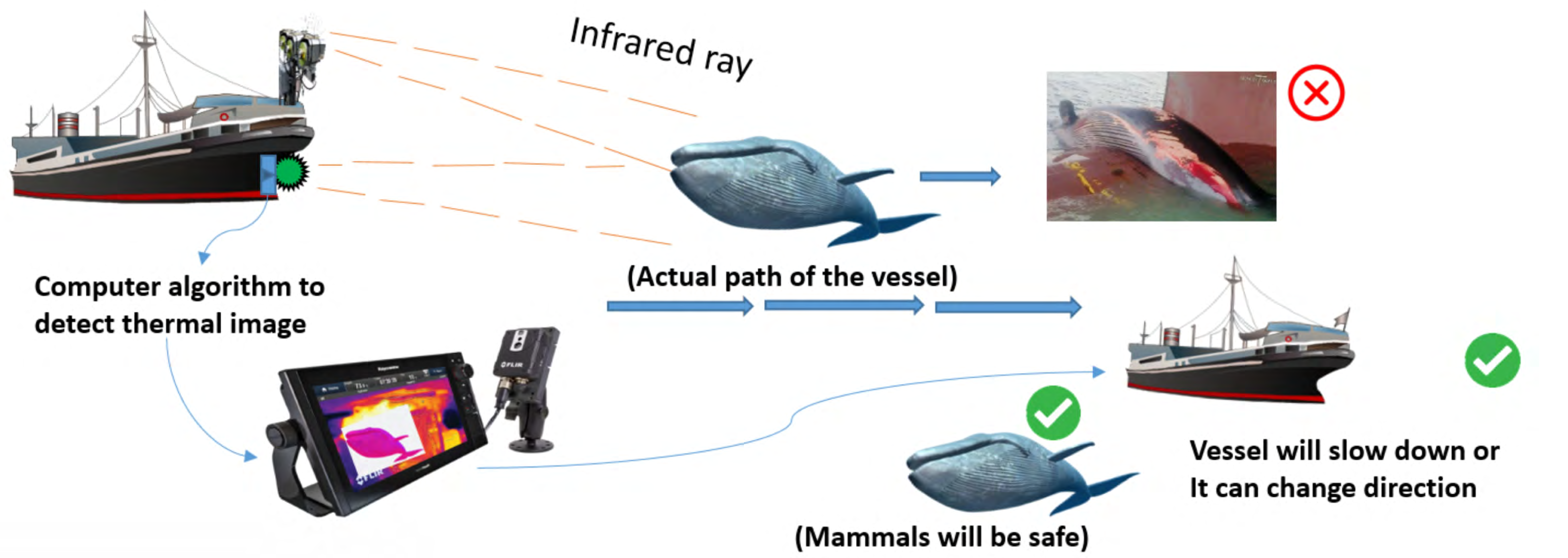
Sangita Roy *(AAHM-MB1-03)*, **Liton Paul** *(FEC-MB1-06)*, **Tamal Seth** *(AAHM-MB1-05)*
Pritam Sarkar *(AEM-MB1-04)*, **Bhashwati Roy** *(FPB-MB1-03)*,

Introduction

Concern about the effects of maritime vessel collisions with marine animals is increasing worldwide.

Vessel traffic has increased significantly in recent decades, making marine animals including smaller whales, dolphins, porpoises, dugongs, manatees, whale sharks, sharks, seals, sea otters, sea turtles, penguins, and fish more vulnerable to ship strikes.

Collisions often result in physical trauma to death of the animal and may cause serious damage to the vessel, while people on board are at risk of injury and mortality.



Description of the Model

Install thermal IR cameras in bottom of the vessel and deck to detect the real-time feedback loop where mariners are alerted to slow down if aquatic mammals are present.

By monitoring the apparent temperature differences between the mammals and the surrounding water and air when they surface and breath, thermal imaging cameras can identify them.

They operate in darkness, unlike other whale detection techniques like human observation from aircraft and boats, they can spot animals at any time.

The cameras are linked to a computer running in the background that will be trained on model images of vessels and whales to minimize the number of falsely-identified whales that are reported by the cameras.

It will have more robust algorithms so they can perform reliably in an environment where some of the objects that come into view may look similar from afar.

Concluding Remarks

In conclusion, thermal IR imaging is a promising technology that can be employed to lessen the risk of collision between aquatic creatures and ships. Vessels can avoid accidents and the resulting injuries and fatalities by detecting the body heat of these animals and taking evasive measures.

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ProjectSAND : Strategic AquapoNics in Desert

Strategic AquapoNics in Desert, more fish n crop per water drop

Dasari Bhoomaiah *(CTO)*, **Avvari Venkata Sai** *(FNFT-MB2-02)*, **Kurapati Nagendrasai** *(AEM-MB1-04)*, **Kottapalli Nikhil** *(FRM-MB2-05)*, **Kotagiri Shivarama Krishna***(FGB-MB2-06)*

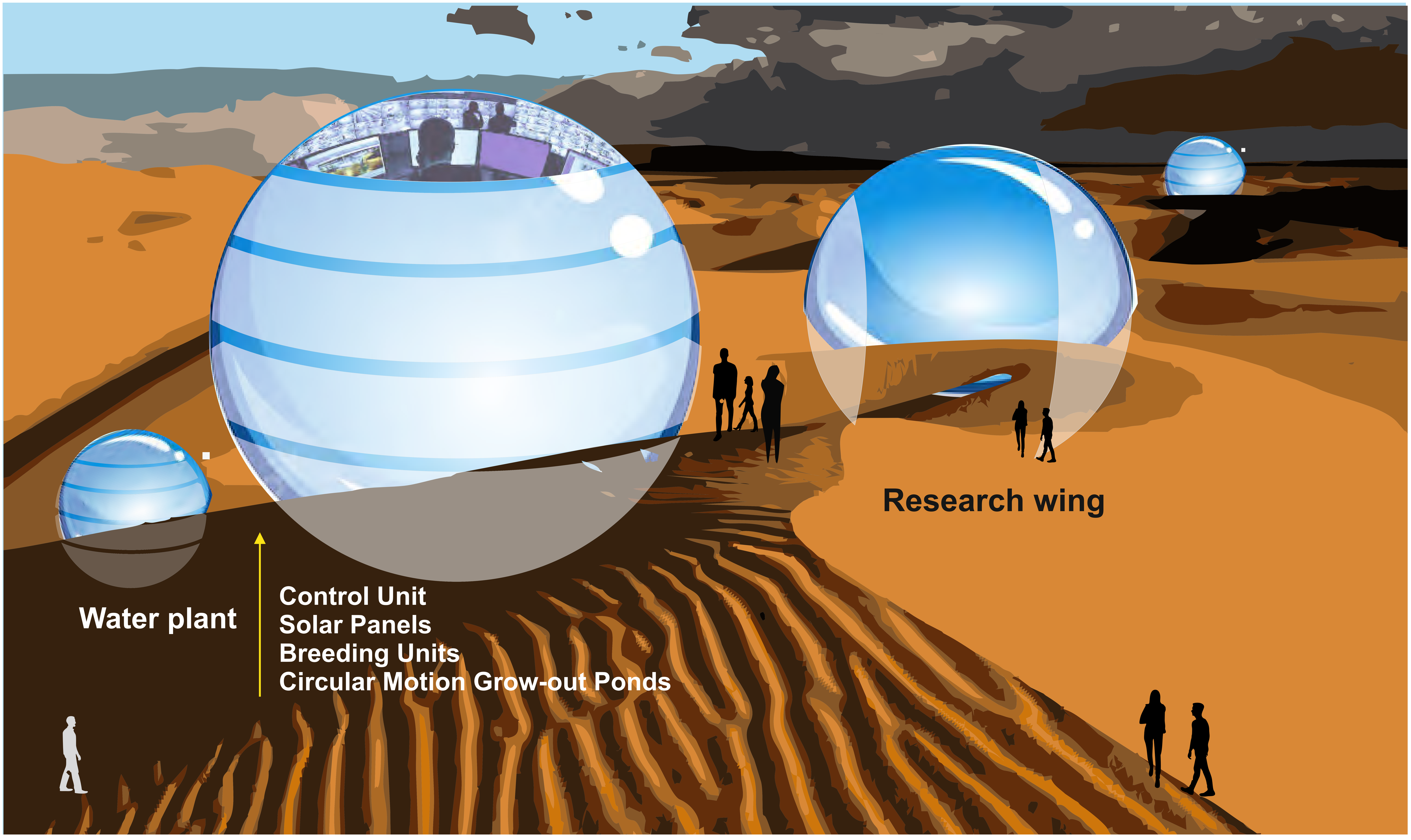
Aquaculture in the desert can be challenging, but it is possible with the use of innovative techniques and technologies. One of the biggest challenges is the lack of water, which is essential for raising fish and other aquatic species. However, there are several approaches that can be used to overcome this challenge.

One approach is to use recirculating aquaculture systems (RAS), which allow for the efficient use of water by recycling and treating it. RAS technology can be used to grow a variety of fish species, such as tilapia, catfish, and trout, as well as shrimp and other aquatic animals.

Another approach is to use brackish water, which is found in many desert regions, to raise salt-tolerant species such as shrimp and some types of fish. Brackish water is typically not suitable for traditional freshwater aquaculture, but it can be used in a controlled environment to raise salt-tolerant species.

In addition to using innovative technologies, aquaculture in the desert can also benefit from sustainable practices, such as using renewable energy sources, minimizing waste, and using natural fertilizers and pest control methods.

Overall, while aquaculture in the desert may present some challenges, it is possible to raise fish and other aquatic species using innovative techniques and sustainable practices.



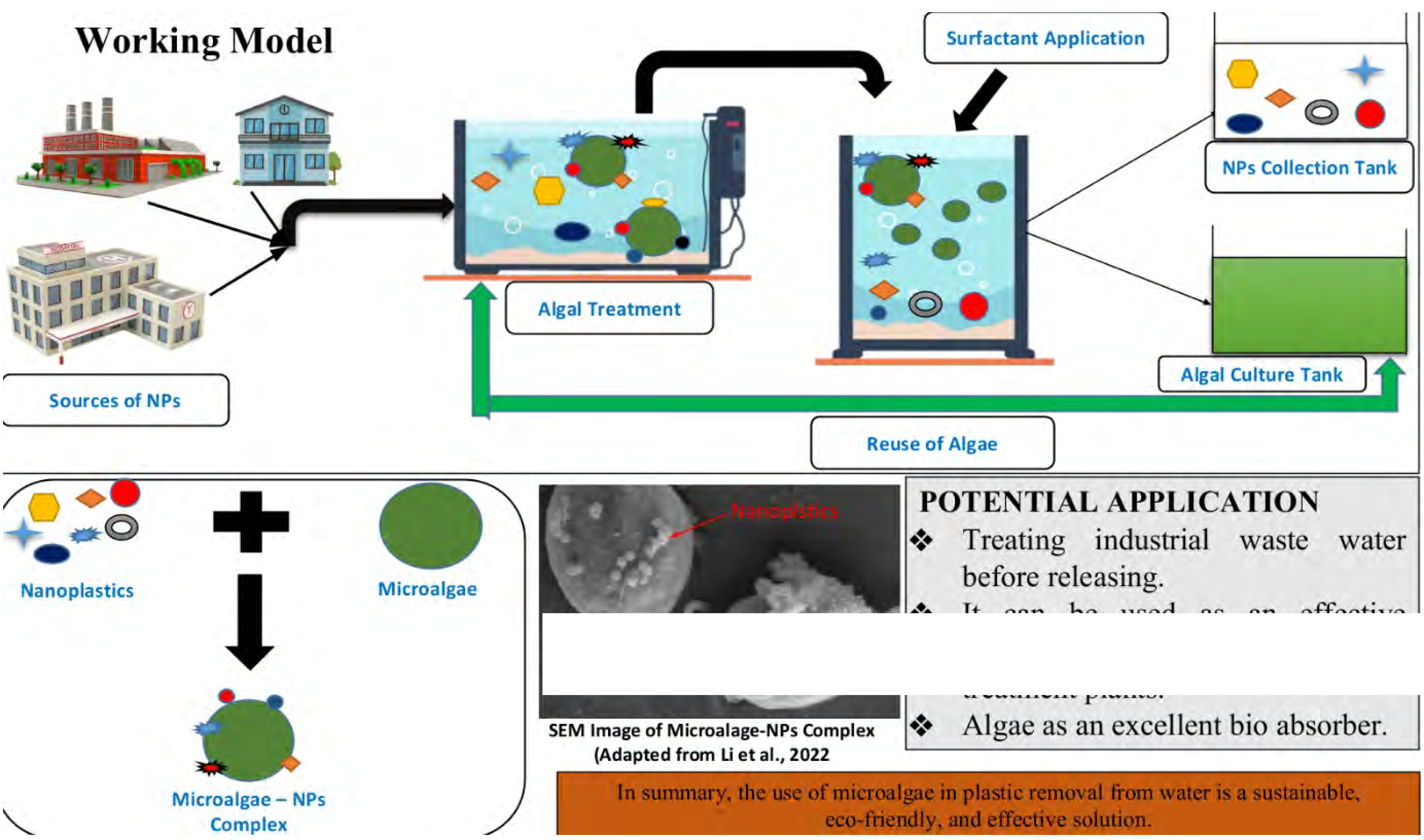
NanoSort

micro-algae to remove nanoplastics from aquatic systems

Pritam Sarkar *(AAHM-MB1-03)*, **Tanushree Bhowmik** *(AAHM-MB1-06)*, **Puja Rani Basak** *(AEM-MB1-05)*

Innovative Approach

Green microalgae are the primary producers of the aquatic environment and are one of the first victim of pollutants. They are already used as an excellent bioremediator of many pollutants. Research findings confirmed that both unicellular and multicellular microalgae can adhere nanoplastics in its surface and the attachment is not disengaged due to wave and wind action. In this view, microalgae can be used as an biological plastic collector from the water treatment plants. After the attachment nanoplastics adhered microalgae can be transferred to further treatment pond. By the application of surfactants both can be detached from each other on the principal of surface tension. Microalgae will again recycled for the same purpose and nanoplastics can be used for further research and developmental work.



In summary, the use of microalgae in plastic removal from water is a sustainable, eco-friendly, and effective solution.

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MAAngrove Skincare solutions

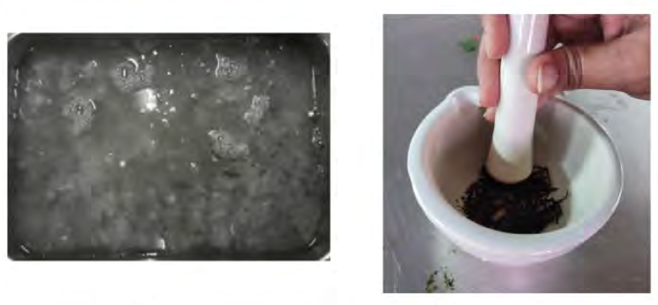
magical health care products from mangrove litter

Chanikya Naidu *(FRM-PB-006)*, **Sahana M D** *(PHT-PB-003)*

WEALTH AND HEALTH FROM WASTE

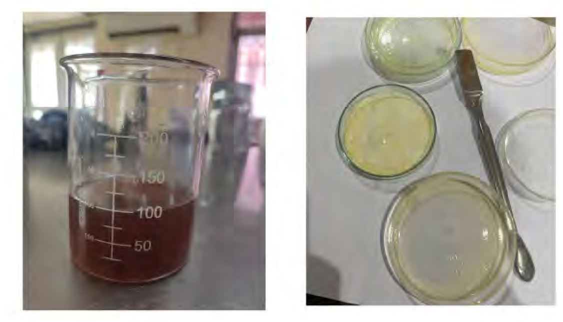
Raw material

→



Preprocessing

→



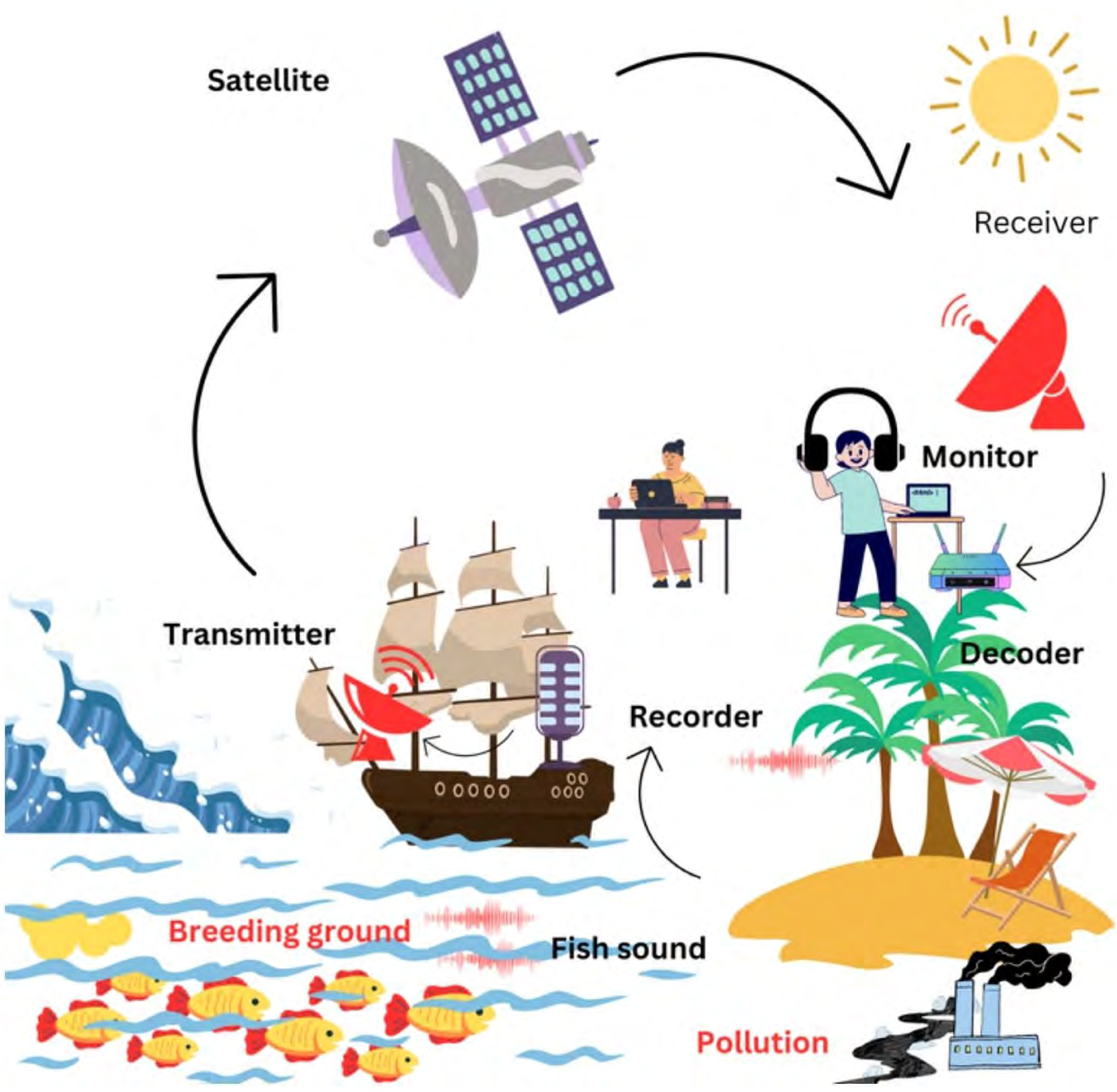
Extraction

Collagen/seaweed/Mangrove/ Chitosan extracts

LinguaPiscis

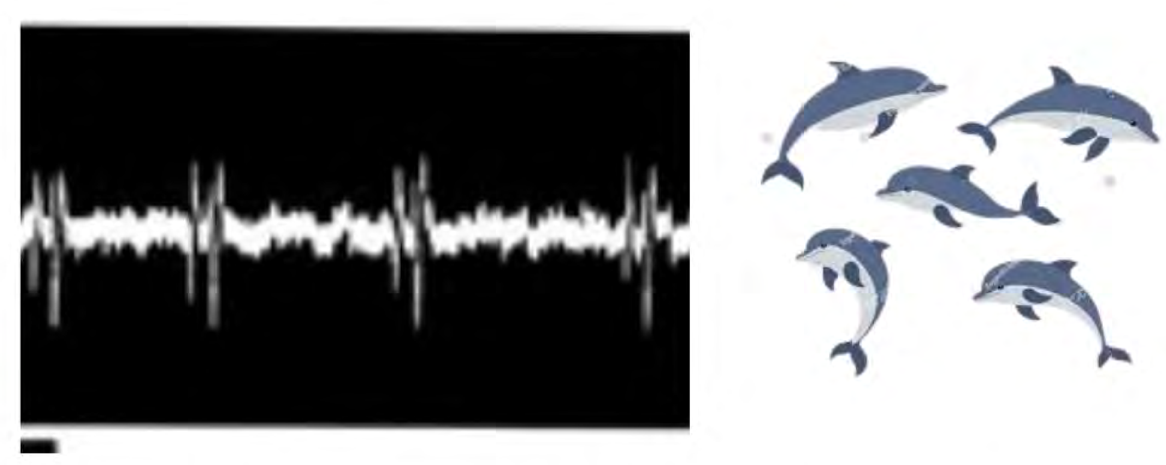
interpreting the language of the fish to sustain them

Dhanalakshmi *(FRM-PB-003) and* **Shivkumar** *(FNT-PB0-04)*

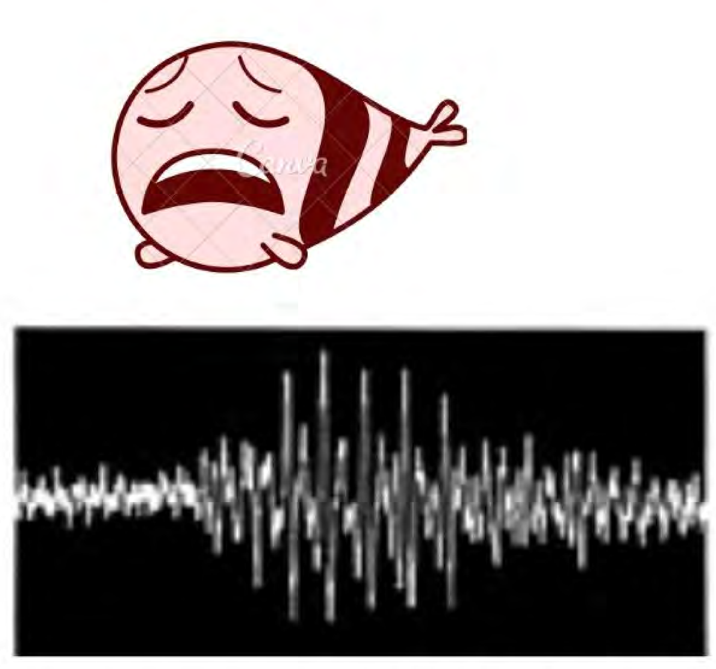


Sound is a primary vehicle used by soniferous species to provide information on individual fitness and can be considered an honest signal

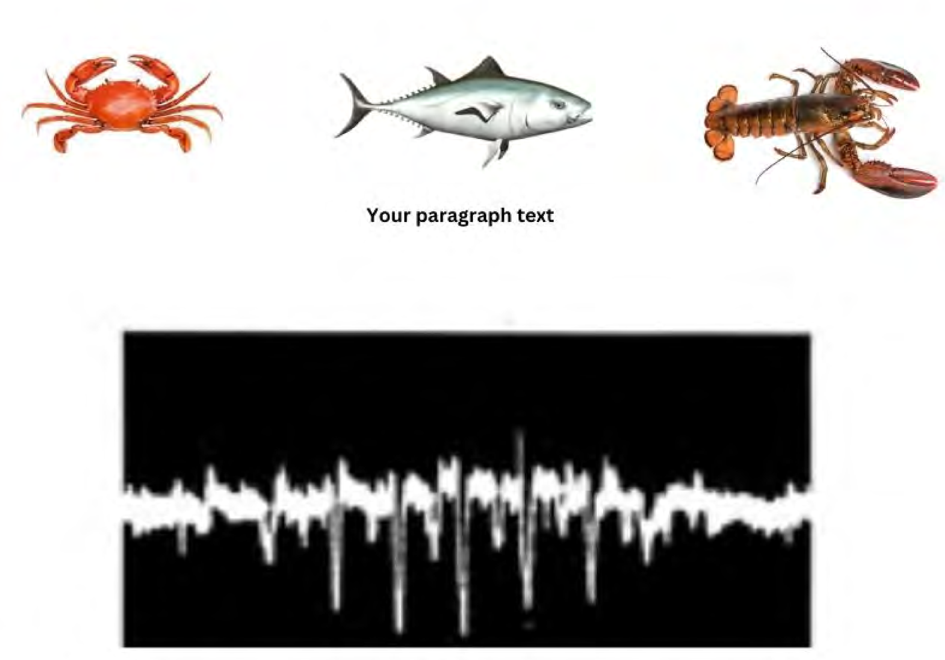
Ocean have a complex sound developed by various organism that can be decoded into useful information to for identifying stress of a fish,predict quality of water,identufy taxonomy of fish species ,to identify the bredding ground of the fish



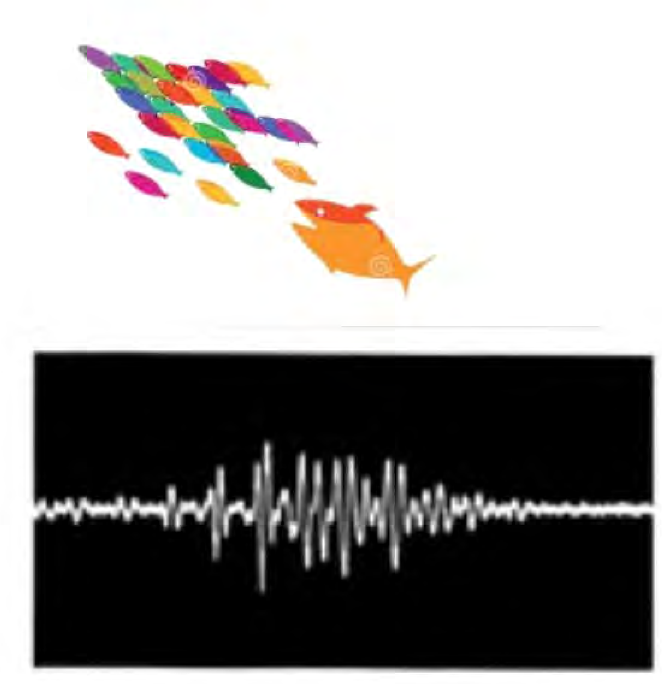
Normal fish sound



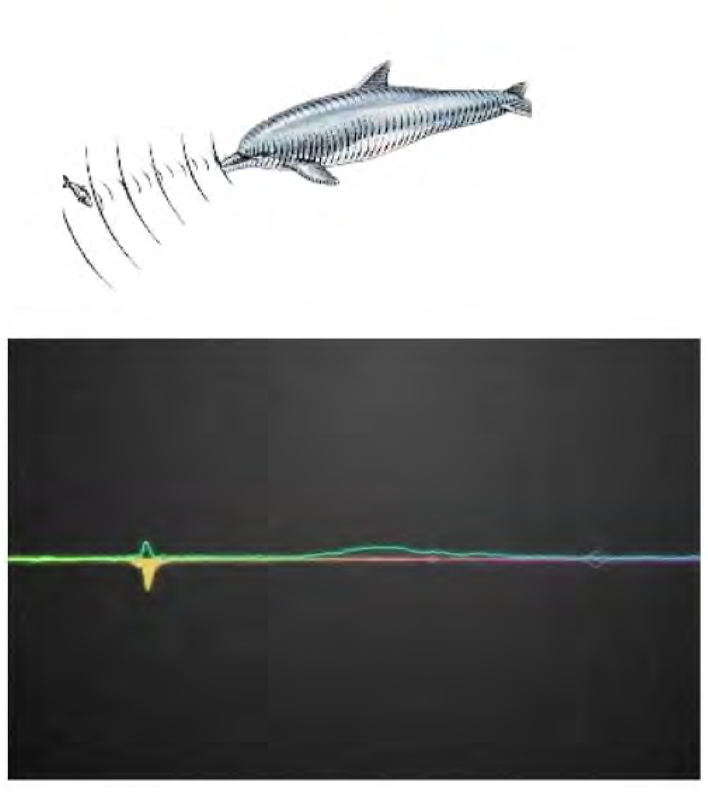
Stressed fish sound



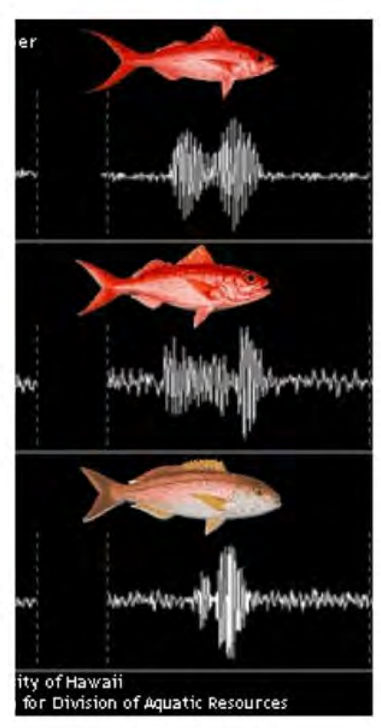
Mixture of aquatic organism sound



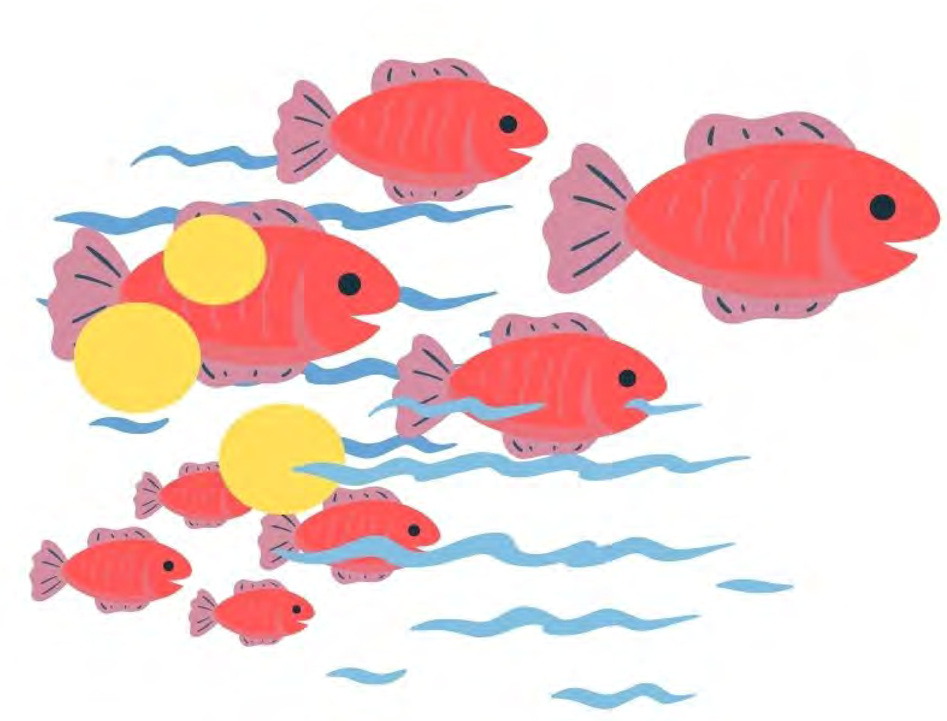
Predator escape sound



Navigation and Communication sound



Taxonomy



Brooders sound

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BioGlo

bringing life to the light

Poonam Majumder *(FRM-MB1-07)*, **Naga kalpitha Shree NN** *(FRM-MB1-06)* **Akanksha** *(FRM-MB1-01)*

Bioluminescence is the production and emission of light by a living organism. Bioluminescent creatures are found throughout marine habitats, from the ocean surface to the deep seafloor.

WHAT IS BIOLUMINESCENCE LIGHT ?

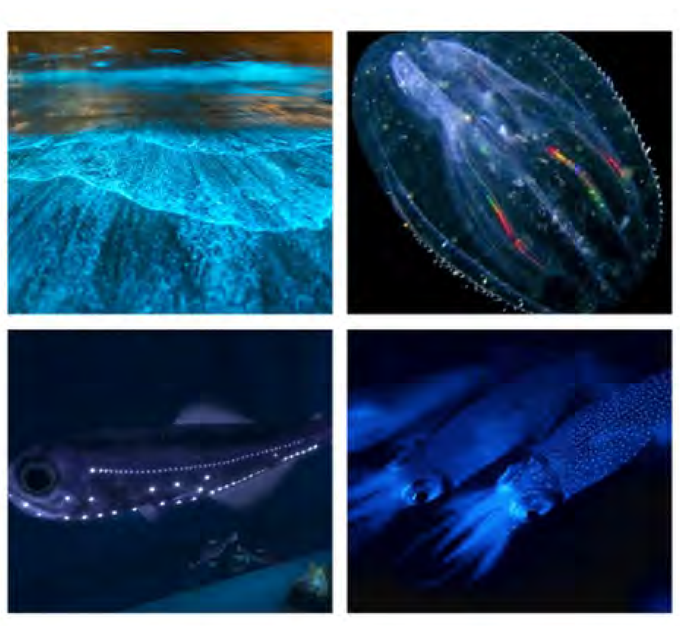
Our goal is to change the way in which cities use light

Bioluminescence by bacteria could be an energy efficient, sustainable way to light up our lives

- **Biodegradable**
- **Consumes less water than manufacturing LEDs**
- **Less carbon foot print**
- **Cold- light is non-toxic compared to traditional light sources**
- **Indicator of pollution level**
- **Bio-sensor for monitoring diseases**

Given that bioluminescent organisms emit light without any cost, it would be wise for us to take advantage of this resource.

1



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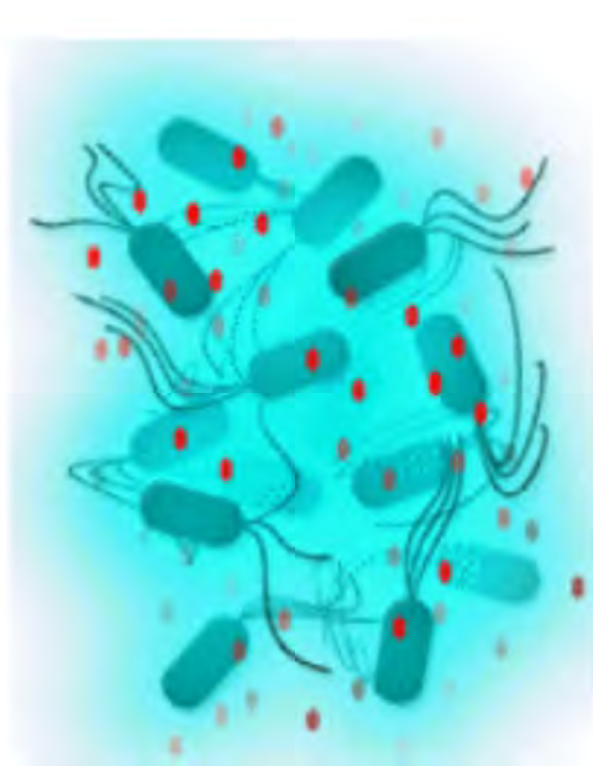
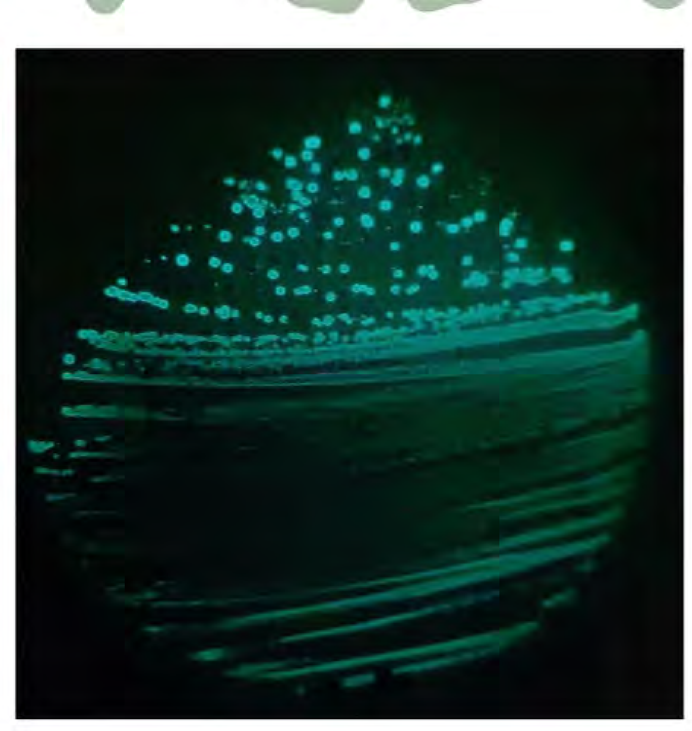


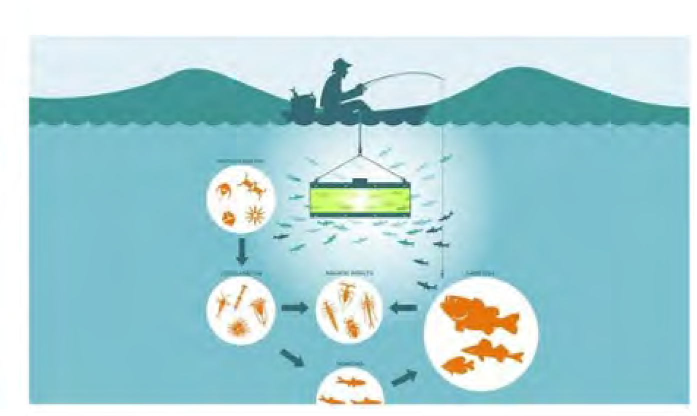
Non-toxic, non-pathogenic bacteria from marine samples

3



Growth of bacteria in nutrient medium

4



Light produced from luminescent bacteria illuminating public places in dark and also used in light fishing.

Resilient Hamlet : *sustainable farming model for circular bio-economy*

Sagar Shinde *(AQC-PB2-07)*, **Ashutosh Danve** *(AQC-MB1-01)*, **Swaraj Adakney** *(AEM-MB1-07)*

With the pressure to transition towards a fully renewable energy system increasing, a new type of power system architecture is emerging: the **microgrid**.

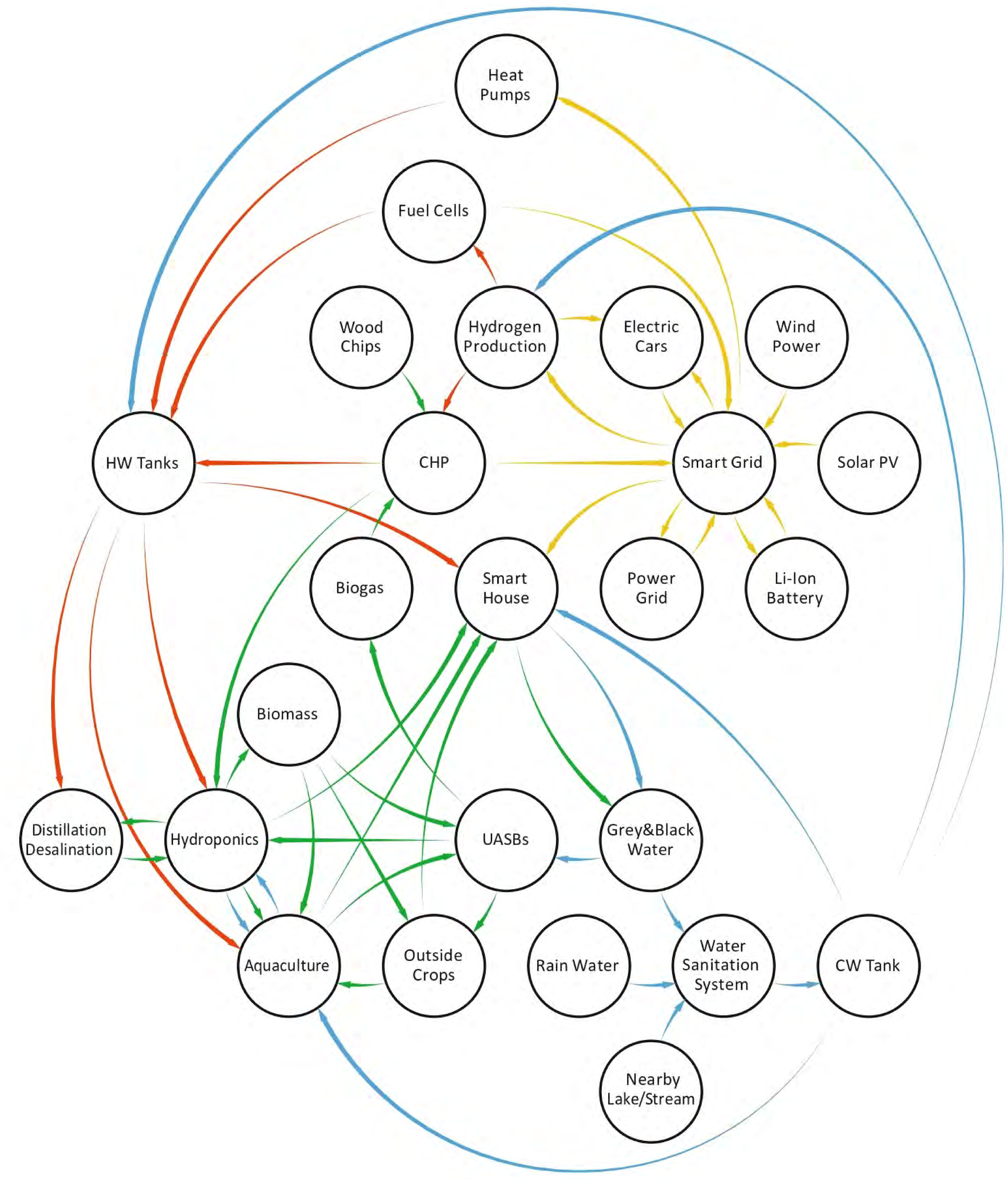
A microgrid integrates a multitude of **decentralized renewable energy technologies** using smart energy management systems, in order to efficiently balance the local production and consumption of renewable energy, resulting in a high degree of **flexibility and resilience**.

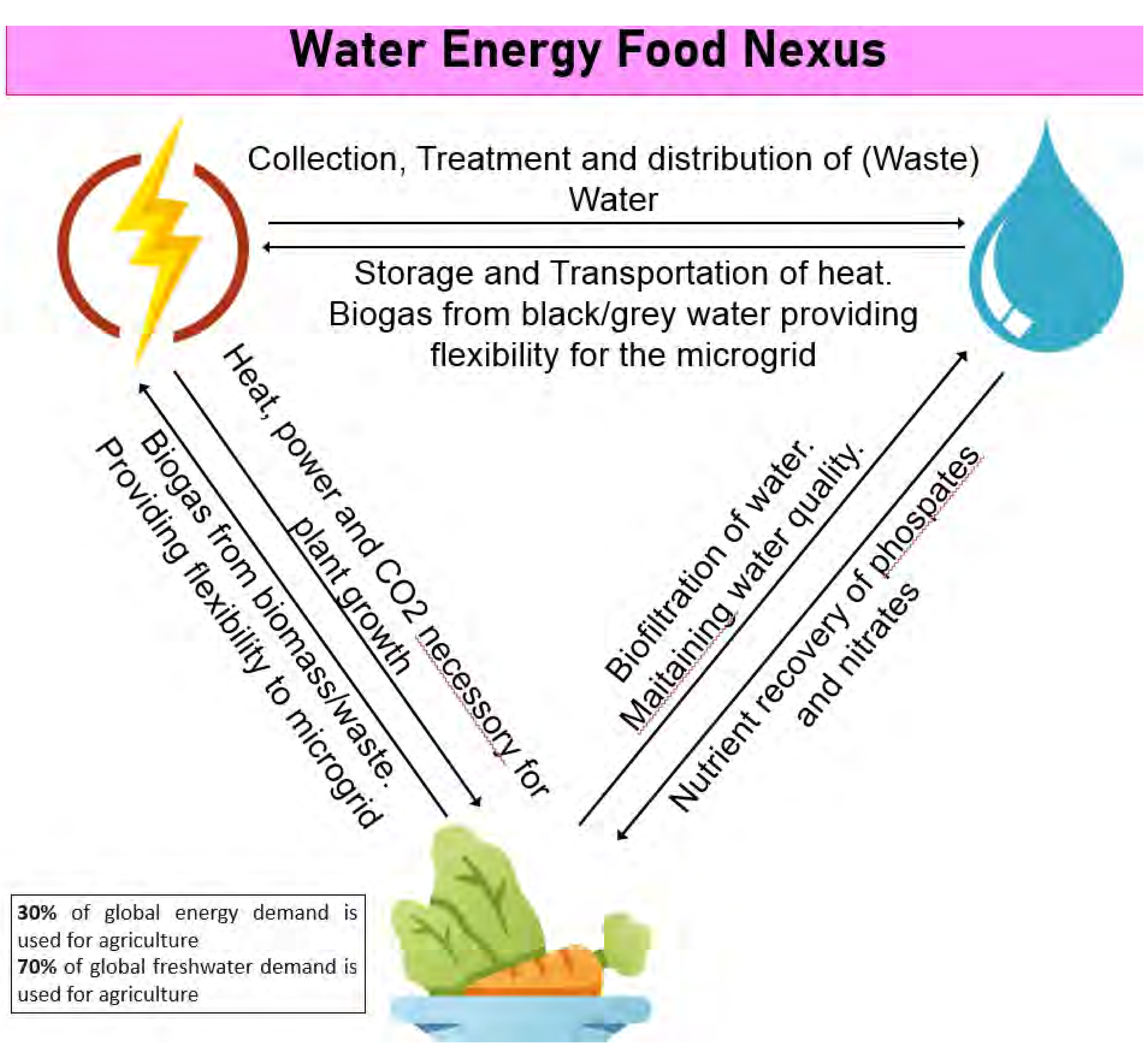
Integrating a neighborhood microgrid with an urban agriculture facility that houses a decoupled multi-loop aquaponics facility improves self-sufficiency and flexibility.

This new concept is called **Resilient hamlet**, where all Food–Water–Energy flows are circularly connected.

In doing so, the performance of the microgrid greatly improves, due to the high flexibility present within the thermal mass, pumps, and lighting systems.

As a result, it is possible to achieve 90 to 95% power and 100% heat self-sufficiency. This can be a promising way toward realizing these fully circular, decentralized Food–Water–Energy systems.





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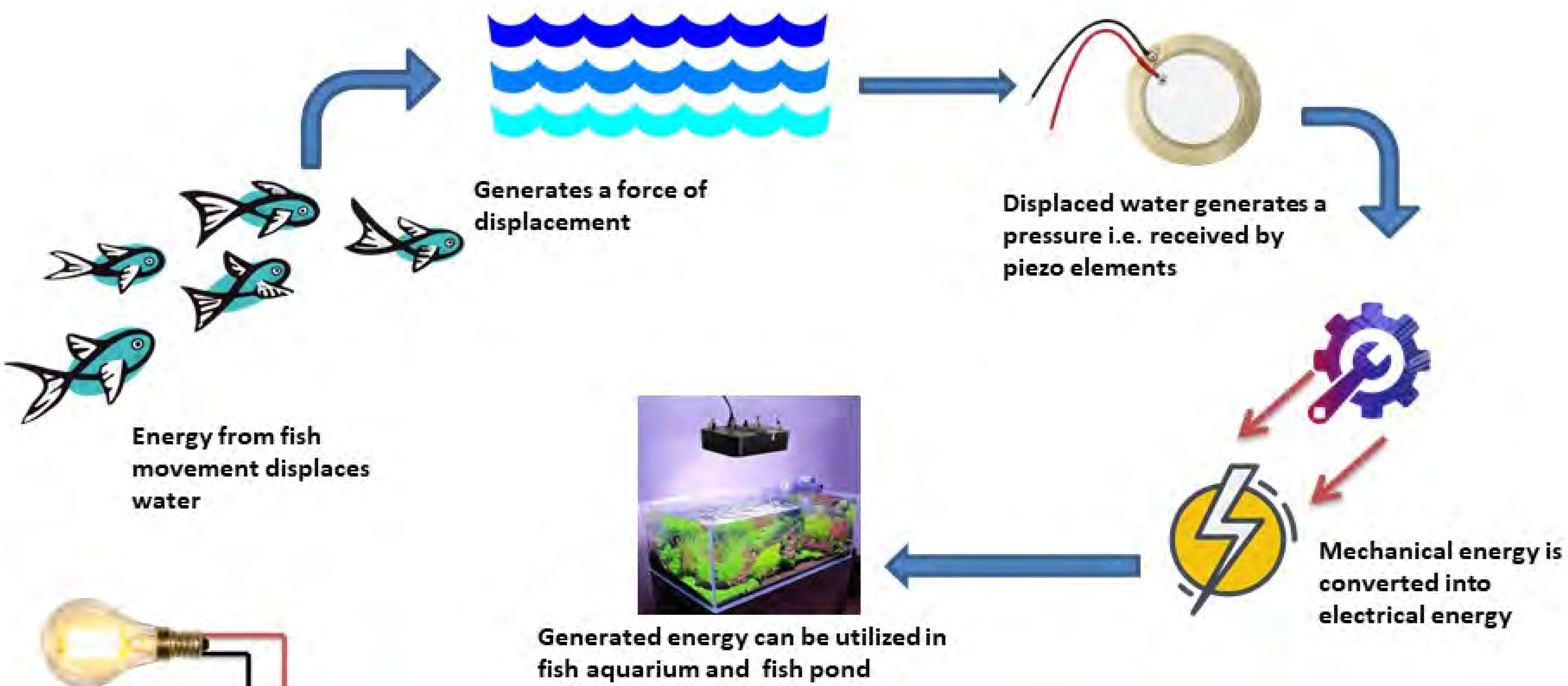

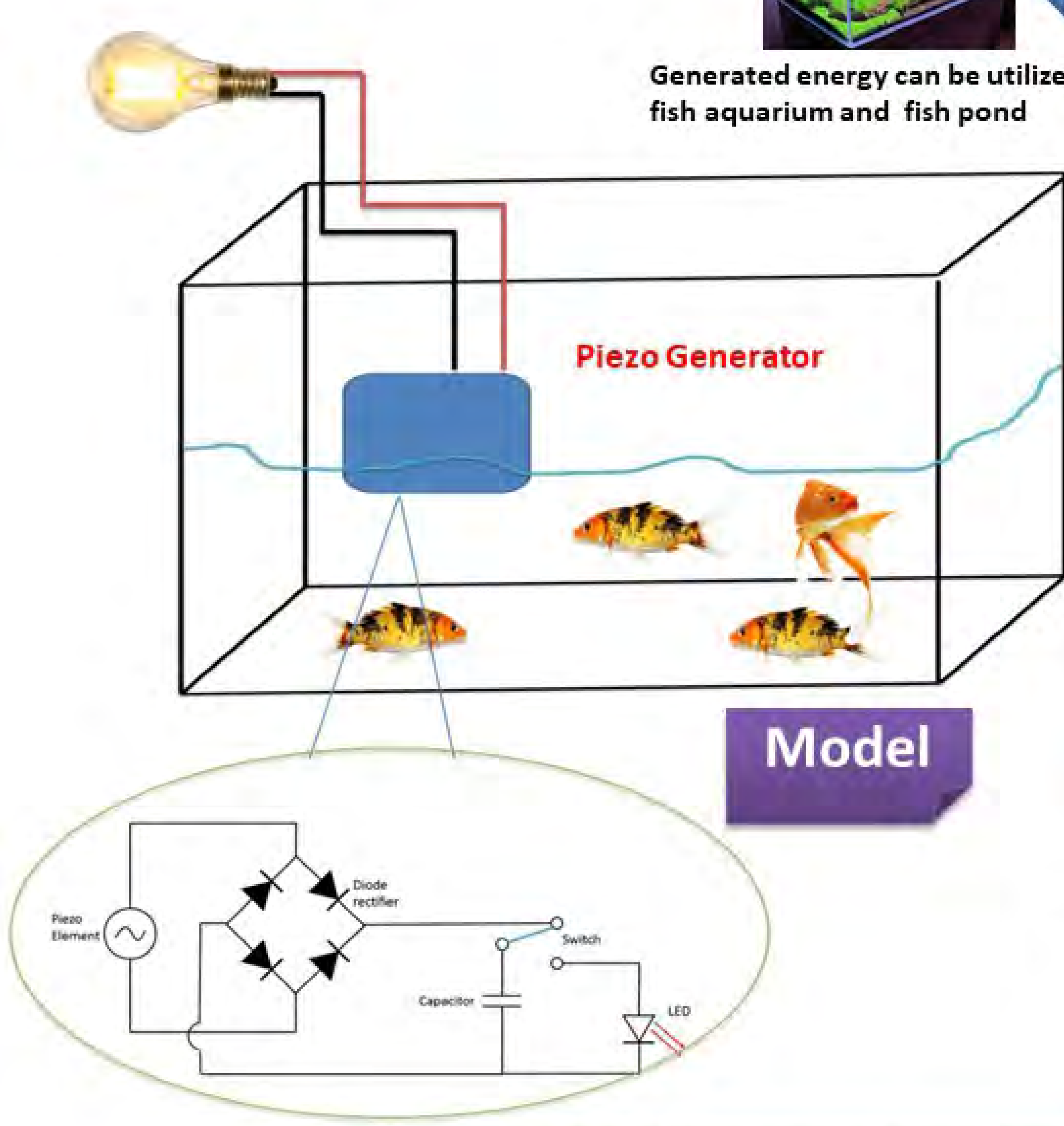

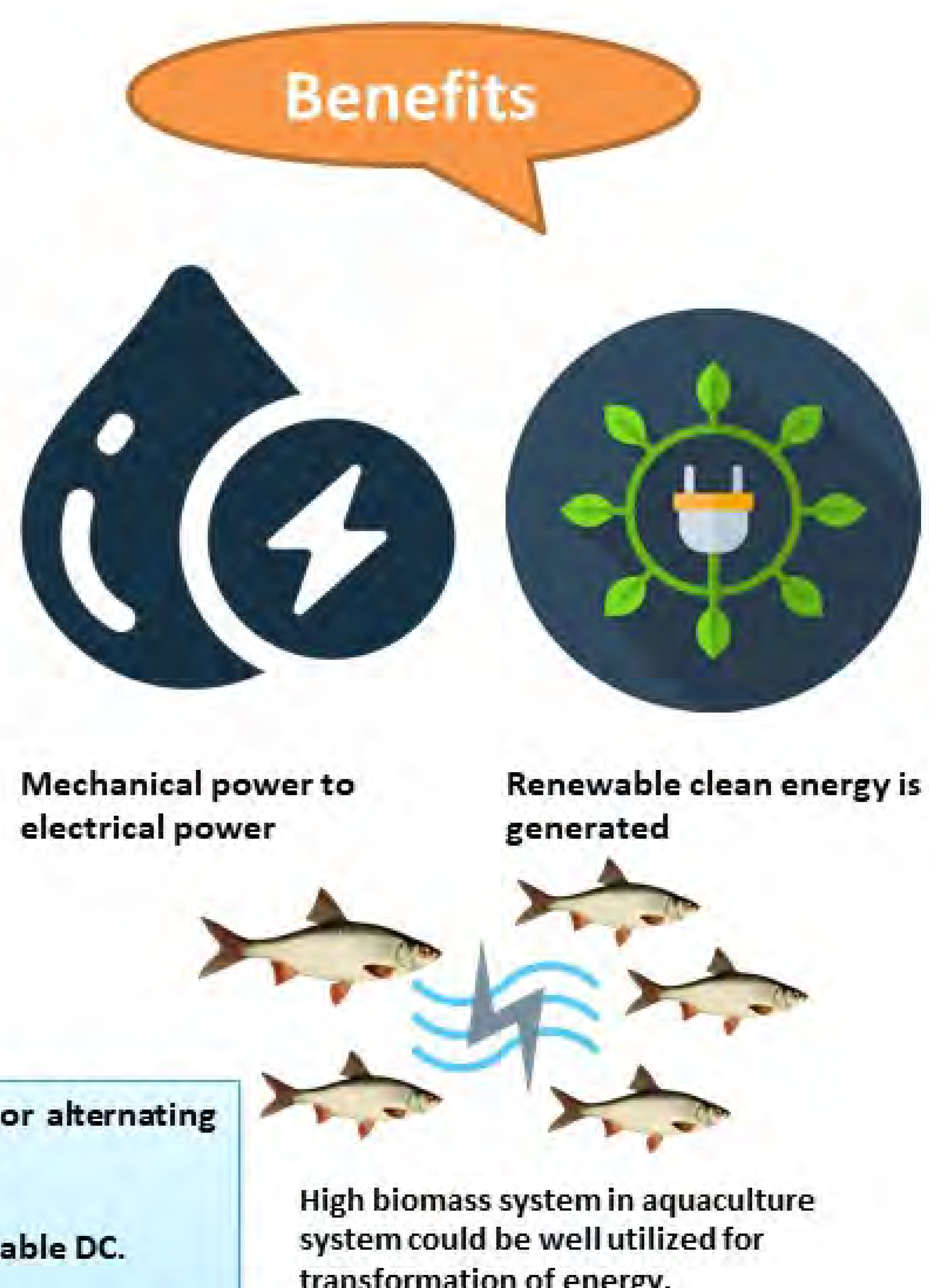

- Piezoelectric Transducer produces a discontinuous or alternating output on applying repeated tapping force over it.
- Hence it has to be rectified to make it storable or usable DC.
- Hence for a higher rectifying efficiency of 80% or above, we are going to use full wave rectifier.
- the alternating output from the piezoelectric transducer is converted into DC and stored inside the output capacitor.
- The stored energy is then dissipated through an LED with controlled output.

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turning fish bone waste to miracle CSD products

Sourav Debnath *(FEX-PB2-05)*, **Suraj Saha***(AAHM-MB2-08)*, **Subam Debroy***(AQC-PB0-05)*

Fish bone to calcium sulfate dihydrate production, a bio-economy model would involve utilizing a waste material (fish bones) as a feedstock to produce a valuable resource (calcium sulfate dihydrate) through a sustainable and environmentally friendly process. This model can create economic, environmental, and social benefits by reducing waste generation, creating new revenue streams, and promoting sustainable practices.

The bio-economy model for fish bone to calcium sulfate dihydrate production can also involve the use of renewable energy sources, such as solar or wind power, to reduce the environmental impact of the production process. This model can contribute to the transition towards a more sustainable and resilient economy, while also addressing global challenges such as climate change and resource scarcity.

Collection of bone from household

Fish bone powder

Calcium Carbonate CaCO3

Calcium Sulphate (CaSO4)

Calcium Sulphate dihydrate (CaSO4, 2H2O)

Plaster of Paris

Soil Conditioner

Dental Implant material

Economic Feasibility

Commercial Production of Calcium sulphate dihydrate will required less input cost for using fish bone

High Fish consuming state like Tripura, Manipur, Assam Households will be benefited by this production process

Profit Margin can be much higher in case of large scale adoption

Average Production Cost 70/kg

Average selling Price-120-150/kg