



LIFTING LIFE

Compendium of Ideas



Compilation of Ideas of the Lifting LiFE – An Idea Contest
A part of the Scoping Workshop on
"Mainstreaming LiFE (Lifestyle for Environment) in Fisheries Management"



“This word is LiFE, which means 'Lifestyle For Environment'. Today, there is a need for all of us to come together and take Lifestyle For Environment forward as a campaign. This can become a mass movement towards an environmentally conscious lifestyle.”

Prime Minister Shri Narendra Modi at COP 26



Dr. M.V. Gupta

Former Assistant Director General, WorldFish (CGIAR)

World Food Prize Laureate

Sunhak Peace Prize Laureate

Foreword

The term LiFE, short for 'Lifestyle for Environment', resonates deeply with those aware of global environmental drives. Introduced by the Prime Minister of India at the Global Conference on Climate Change in Paris in 2021, the LiFE philosophy speaks to the heart of responsible living. It reminds every one of us of the importance and responsibility of valuing our profound relationship with Mother Nature and ensuring environmental sustainability for the prosperity of present and future generations.

I am pleased to note that BOBP-IGO has organized a contest seeking ideas from the University students to share their thoughts for mainstreaming LiFE in fisheries management. This enthusiastic turnout of over 80 entries from the students of Fisheries Colleges in India and its neighbouring countries is a clear indication of the heightened environmental awareness amongst today's youth. Their ideas are not mere musings but represent well-thought-out paths to real solutions. The compilation of winning ideas - "Lifting LiFE" provides a myriad of forward-thinking ideas, each with elements of innovation, collaborative spirit, and a steadfast dedication to environmental integrity, especially focusing on fisheries management.

I hope this volume serves not just as a record but as a guiding light. May it spark inspiration, direct our endeavours, and be a reminder of the vast possibilities when we come together with unified intent and vision. As we steer through the ever-changing landscape of our times, let's remember that when we work together, we can indeed craft a brighter, sustainable future for all.

I congratulate all those, who participated in this novel contest and those who have been selected to present their ideas in front of eminent global experts attending the FAO International Workshop on, "Mainstreaming Climate Change into International Fisheries Governance and Strengthening Fisheries Management in the Indo-Pacific Region," organized in the iconic town of Mahabalipuram during 17-19 October 2023.

I complement BOBP-IGO for its endeavour towards mainstreaming LiFE principles in fisheries management.

M.V. Gupta



Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)

The BOBP-IGO is a regional fisheries advisory body with Bangladesh, India, Maldives, and Sri Lanka as its contracting parties. It is mandated to enhance cooperation amongst its member countries and other countries (especially Indonesia, Malaysia, Myanmar, and Thailand) for sustainable fisheries management in the Bay of Bengal region. The organisation evolved from the erstwhile Bay of Bengal Programme of the Food and Agriculture Organization of the United Nations (FAO), founded in 1979. The BOBP-IGO Secretariat is hosted by the Government of India and is located in Chennai.



National Fisheries Development Board (NFDB)

The National Fisheries Development Board (NFDB) was established in 2006 as an autonomous organization under the administrative control of the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India to enhance fish production and productivity in the country and to coordinate fishery development in an integrated and holistic manner.





Dr. P. Krishnan

Director, BOBP-IGO

Preface

In a world where our environmental challenges grow more pressing by the day, the search for innovative solutions becomes paramount. It is within this context that "Lifting LiFE" – an idea contest, was conducted as part of the Scoping Workshop on "Mainstreaming LiFE (Lifestyle for Environment) in Fisheries Management." This workshop was held in conjunction with the FAO Workshop on "Mainstreaming Climate Change into International Fisheries Governance and Strengthening Fisheries Management in the Indo-Pacific Region" between October 17th and 19th, 2023.

This nationwide open contest welcomed students currently pursuing undergraduate or postgraduate courses in any college or university to participate. In response to our call, we received an overwhelming 80+ entries from various parts of India and neighbouring countries.

These entries present a diverse range of strategies, encompassing innovative technology applications and community-based initiatives, all with the aim of nurturing aquatic ecosystems, supporting the livelihoods of communities dependent on fisheries, and ultimately forging a harmonious coexistence between humanity and nature.

Let this compendium serve as an invitation to all stakeholders in fisheries and aquaculture, policymakers, scientists, conservationists, and concerned citizens to join hands and usher in an era where the term "sustainable fisheries management" transcends mere words and becomes a living reality.

Let's raise our goals, put in more effort, and adopt a lifestyle that cares for the environment.

P. Krishnan

Closing the Circle - Behavioural change for sustainability

As a people, Indians have always believed in the frugal and appropriate use of resources. Our possessions were made to last and making them last was ingrained within us. Recycling, upcycling, and downcycling were practised without being called that – it was the 'normal' way of life. Old cotton saris and dhotis were transformed into dresses, quilts, pillowcases and towels and even layered to filter water. The newspaper was read, neatly collected and sold to the raddiwallah and was used to wrap provisions bought in the local store. We ate what was in season, largely locally grown or harvested. Our use and throw culture was restricted to natural materials (leaves for eating or wrapping fresh produce or food), and hence, waste management was fairly under control.

Things have changed in the last few decades, largely because of globalisation and easier and wider access to what were 'luxuries'. Modernisation and imitating the Western world also resulted in the discarding of many traditional environment-friendly behaviours and an increase in ease of life and the use-and-throw culture. One cannot always blame the user – for example, in fisheries, nets made of synthetic fibres and single-use plastics, especially for retailing fish, are prevalent because of their low cost and durability. However, there is no denying that the result is growing problems regarding the environment with pollution, especially plastic pollution, becoming widespread and scarcity of resources becoming the norm.

How do we reverse this?

More than half a century ago, American biologist Barry Commoner, writing about the sudden huge interest in the environment culminating in Earth Week, opened his book, 'The Closing Circle' thus: "The environment has just been rediscovered by the people who live in it". It was the mass movement triggered by the first Earth Day in 1970 that enabled the environment to appear in the global agenda, beginning with the 1972 UN Conference on the Human Environment in Stockholm. Not only has there been greater awareness about the ecosphere that we live in, but also, a slew of laws and regulations have been brought in to mitigate the damage we have caused to the ecosphere.

At the same time, we are increasingly realising that creating rules and regulations does not always bring us the results we need, especially in terms of environmental



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quality. It is the behaviour of the masses that changes many things. The world is in need of a movement today to ensure that environmental sensitivity percolates into every aspect of our life and environmentally positive behaviour is mainstreamed. Such a movement is LiFE, Lifestyle for Environment, which believes that, as a first step, nudging individuals across the world to practice simple yet effective environment-friendly actions in their daily lives will enable us to move towards sustainability.

As part of the International Conclave on Mainstreaming Climate Change into International Fisheries Governance and Strengthening of Fisheries Management Measures in the Indo-Pacific Region, a contest titled 'Lifting Life' was held asking for submissions of ideas to mainstream LiFE in fisheries management. A total of 85 entries were received from students belonging to colleges from 16 states. Twenty-five entries were chosen. The ideas ranged from using AI to safeguard the fish industry from food fraud and using bioplastics for wrapping fish to using drones in shrimp farms for monitoring water quality as well as supplying feed, and the use of water hyacinth to produce biodegradable ropes and nets. Some advocated raising awareness about the environment through novel know your biodiversity walks while others promoted eating what was in season. A large number of submissions focused on the theme of marine litter and plastics that need to be collected from beaches and nearshore areas, indicating that the concerns of plastic pollution have indeed percolated widely, calling for cleaning water bodies on the one hand while banning single-use plastics and identifying and promoting biodegradable plastics on the other. Similarly, there is a push towards natural feeds and changes in breeding and culturing methods that reduce the use of antibiotics and other synthetics in favour of natural disease control methodologies.

The closed circle that was the hallmark of our ancestors' way of life has been prised open over the last few decades. We now need to once again look at ways of closing that circle by moving towards a circular economy because, as pointed out in the Rig Veda (eka sad viprā bahudhā vadanti, the existent is one though called variously, RV I.164.46.), everything is related to everything else.

E. Vivekanandan & Ahana Lakshmi

Lifting LiFE – An Idea Contest: Summary

The Lifting LiFE Idea Contest held as part of the Scoping Workshop on "Mainstreaming LiFE (Lifestyle for Environment) in Fisheries Management", organized at the sidelines of the International Conclave on Mainstreaming Climate Change into International Fisheries Governance and Strengthening of Fisheries Management Measures in the Indo-Pacific Region" at Mahabalipuram from 16 – 19 October 2023.

Participation was opened to all students pursuing their graduation and master's degree in the BOBP-IGO member-countries. The objective of the contest was to inspire the students to brainstorm ideas to address fisheries management issue in the spirit of LiFE philosophy. The competition was announced on September 5, 2023, with a submission deadline of September 30, 2023. Altogether, eighty-five entries received from India (84 Nos) and from Sri Lanka (01 Nos). A panel of eminent fisheries environmental experts evaluated the entries, and the result declared on 03 October 2023. Top 25 entries were invited to present their ideas during the International Conclave.

In India, students from 21 educational institutions from 16 states participated in the contest. More than half of the participants were women. The overwhelming response was a testament to the sensitivity of the students towards environmental sustainability and fisheries management.

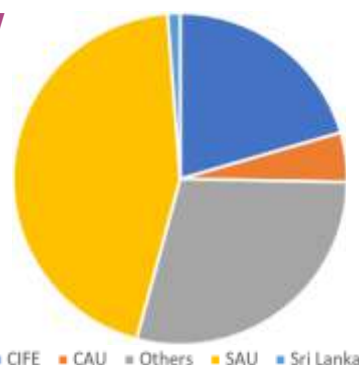
The top three participating states, Kerala, Maharashtra, and Tamil Nadu, collectively accounted for 48% of the total entries. Students native to Kerala (23) and Tamil Nadu (16) were among the predominant participants.

The ideas submitted by the students broadly fall under the following thematic areas: Plastic Pollution; Aquaculture; Fish Consumption; Invasive Species Management; Climate Change; Waste Utilization; Fisheries Management; AI and drones; and Citizen Science.

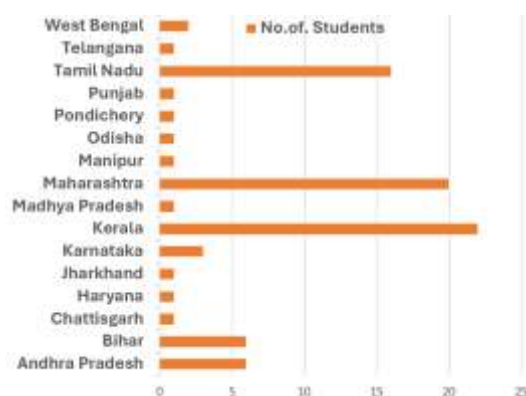
Majority of the ideas were pertaining to applying LiFE principles related to plastic pollution (32%), aquaculture (31%) and fish consumption (20%).

Entries related to invasive species management and climate change accounted for 17% of the total entries.

The Lifting LiFE Idea Contest served as an inspiring platform for students to channel their creativity and intellect towards addressing the pressing environmental challenges in fisheries management. The broad spectrum of participation, with representation from diverse states, institutions, and genders, underscored the reach of the contest. The prominence of themes such as plastic pollution, aquaculture, fish consumption, invasive species management, and climate change showcased the collective appreciation of the principles of LiFE, by the younger generation, in shaping the future of sustainable fisheries and environmental conservation.



Representations from Institutions



Students of institutions from 16 different states participated



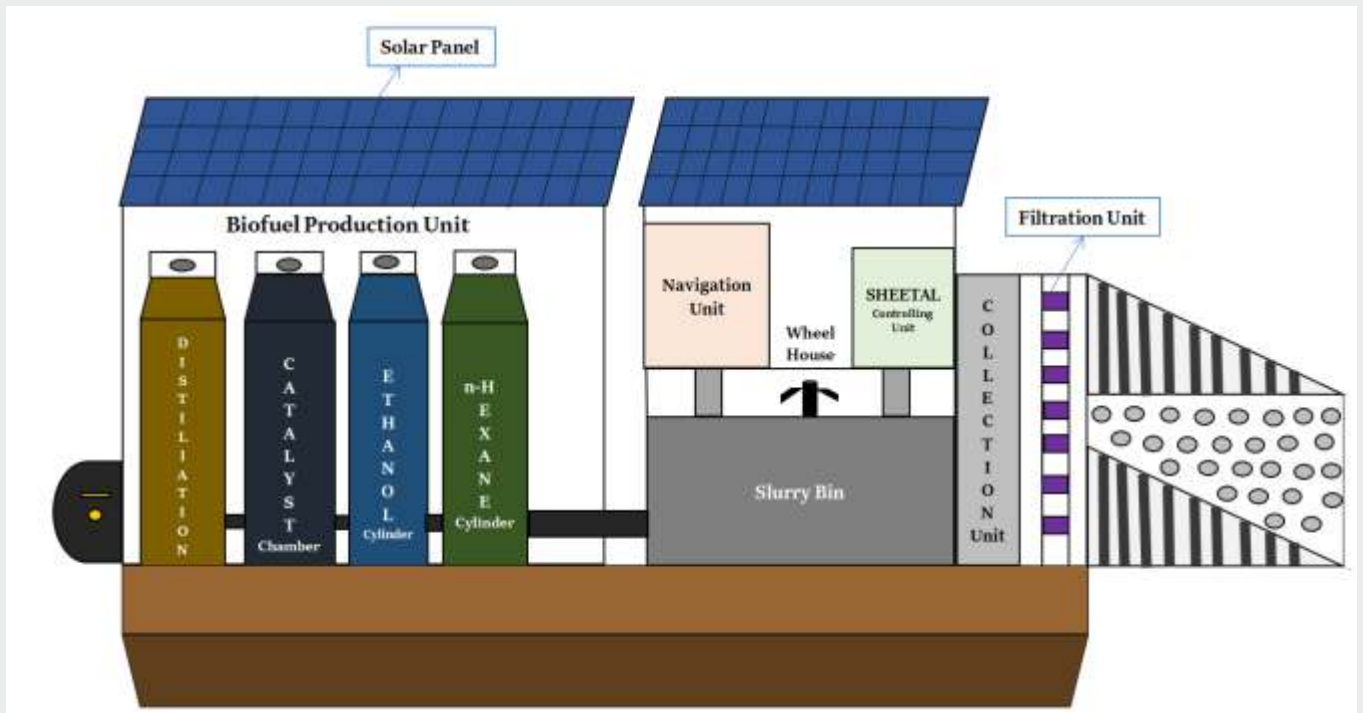
Nativity of the participated students



Thematic areas covered in the contest

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SHEETAL - Sustainable Handling of Energy Efficient Transesterified Algal Biofuel

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Problem Description

Algal blooms are a global concern, notably in India's Arabian Sea and Bay of Bengal. They harm marine ecosystems, deplete oxygen, disrupt food chains, impact livelihoods, and damage tourism and fisheries industries. Mitigating these blooms requires comprehensive environmental management. Harvested algae can be converted into renewable biofuel, addressing emissions from marine fishing. The SHEETAL model (Sustainable Handling of Energy Efficient Trans esterified Algal Biofuel) aims to tackle these challenges and promote eco-friendly fishing practices.

LiFE solution

SHEETAL is a specialised Algal Bloom Control Vessel equipped with state-of-the-art bloom response and biofuel production equipment, offering an eco-friendly solution by converting algal blooms into biofuel. Its primary goal is to reduce and limit greenhouse gas emissions from fishing vessels, making it a significant boon for eco-friendly and sustainable fishing practices.

Description of the model

A cutting system is installed at the forepart of the vessel that includes rotating blades and conveyor belts that will harvest the algae and collect it in a "Collection bin" through the conveyor system. The algae from the collection bin will be transferred to the slurry bin to make a fine paste of algae. The algae paste is transferred toward the biofuel production system unit. This unit involves an n-hexane sealed container and ethanol containing cylinder. The above chemical will be added is the slurry containing bin in a definite proportion. This is left for 3 hours after vigorous stirring. The supernatant is then passed to the fractional distillation unit for purification of biofuel produced from algal bloom.

Source of Inspiration of the Idea

Self



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Aqua Pro Drone

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Problem Description

Traditional water quality analysis methods are slow, labor-intensive, and costly, with limited spatial and temporal coverage. This hampers timely decision-making for public health and aquaculture. For instance, daily water quality tests in fish ponds yield fluctuating results. Conventional check tray methods for fish behavior are inefficient. An urgent need exists for a real-time water quality and feed monitoring system to enhance aquatic environment control and reduce feed wastage.

LiFE solution

'Aqua Pro' is an aquatic drone developed by using Arduino platform and runs with simple javascript thus making it easy to code and modify. This system is equipped with probes that can analyse the water quality and further it has a built-in camera which can be used to check the behavior and the feeding habits of the cultured species. The mobility of the drone is achieved using jet propulsion engine which involves spraying of water at higher pressure, so as to prevent any injury caused to the cultured species during its operation, thus making it distinct from the existing aquatic drones which use propeller for its locomotion. This drone can be controlled using its dedicated controller and it can also follow pre-fixed analysis coordinates in the pond using its built in GPS system. The huge amount of capital and time that is put forth to water quality analyses and disease diagnosis can be saved using this drone. This can easily be adopted by all the farmers as it is user friendly and comparatively affordable economically. Therefore, the prime objective of this project is to have a sustainable and better management of the aquaculture systems through continuous and efficient monitoring.

Source of Inspiration of the Idea

Self



Informed buyer



Fish seller providing details



Better choices for promotion of sustainability



Development of Indian certification system



Restaurants and households including local fishes in their menu



Diversified income for local fishermen and reduced carbon footprint

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Small Ripples, Big Waves: Making Fisheries Sustainable

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Problem Description

In recent years, sustainability concerns have grown due to the rise in illegal, unreported, and unregulated (IUU) fishing practices, which are a primary driver of overfishing. Additionally, the lack of proper labeling and certification for fish products in local markets often leads consumers to make uninformed choices and have lesser credibility.

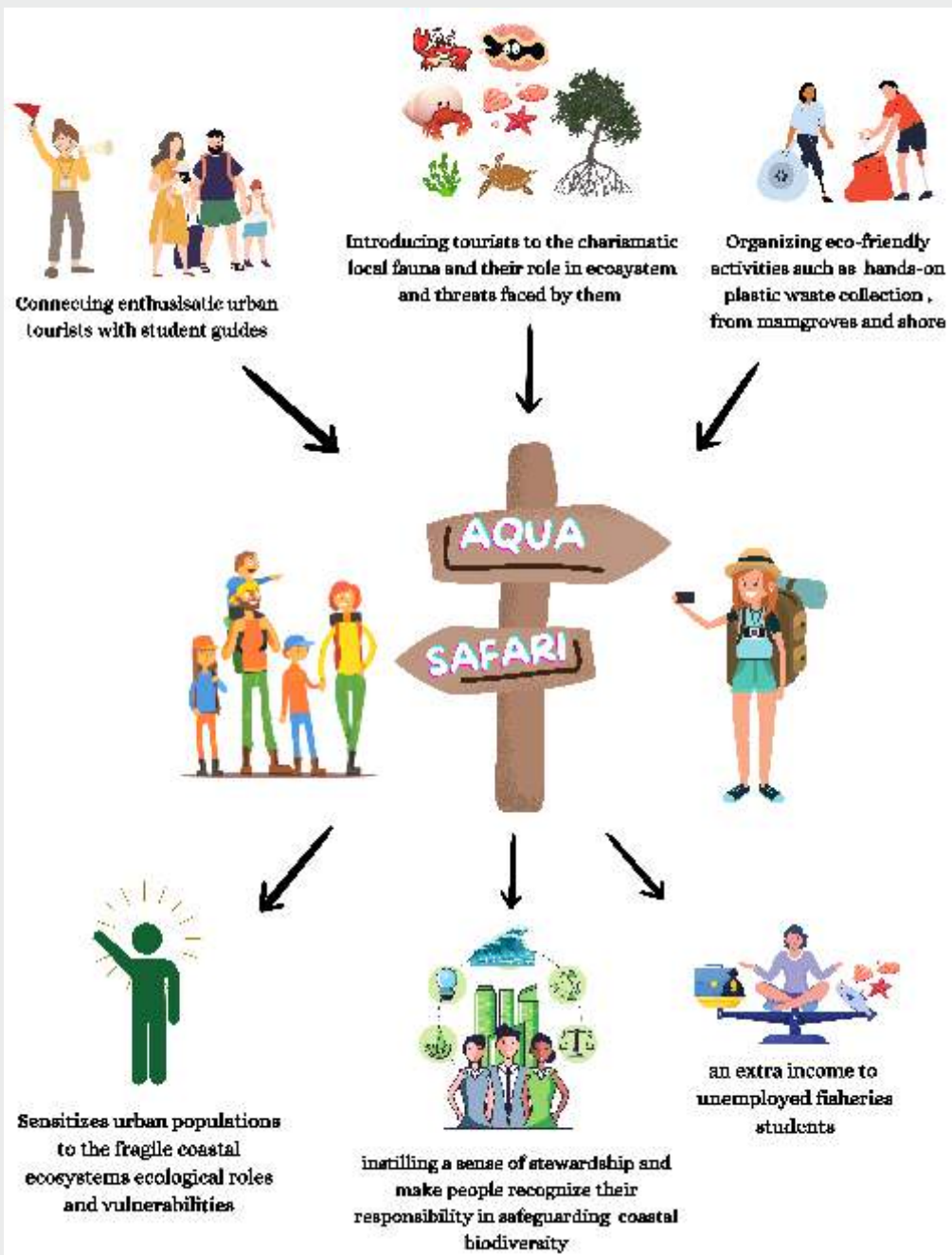
LiFE solution

The changes can start with consumers. Consumers must be aware and ask questions regarding the origin and method of catching fish species. They need to be informed about harmful fishing practices, bycatch (resulting from IUU fishing), and fish breeding cycles. More informed and willing customers will create the necessity for fish sellers to provide details about the fish and its source. This can create a ripple effect across all fish producers and sellers, especially marine fishers, to establish a label or certification stating its source and sustainability (related to overfishing), along with all relevant details.

Changes in people's eating habits can significantly lead to changes in demand and the supply chain. A preference for different varieties and species of fish can be a better option for overall nutrition, rather than focusing on a single species. Restaurant owners and households can play an important role in including a variety of fish in their menus. This will also motivate fishermen to diversify their cultivation and capture practices to accommodate different fish varieties. Additionally, buying and consuming locally caught and cultured fish, rather than importing from other states or countries (like exotic canned fish), will help raise the income of local small-scale fishermen and reduce the carbon footprint from long-distance transportation, promoting better resource utilization.

Source of Inspiration of the Idea

Own and inspired by the Know Your Fish initiative.



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Bridging the Gap: Aqua Safari's Urban Coastal Education

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Problem Description

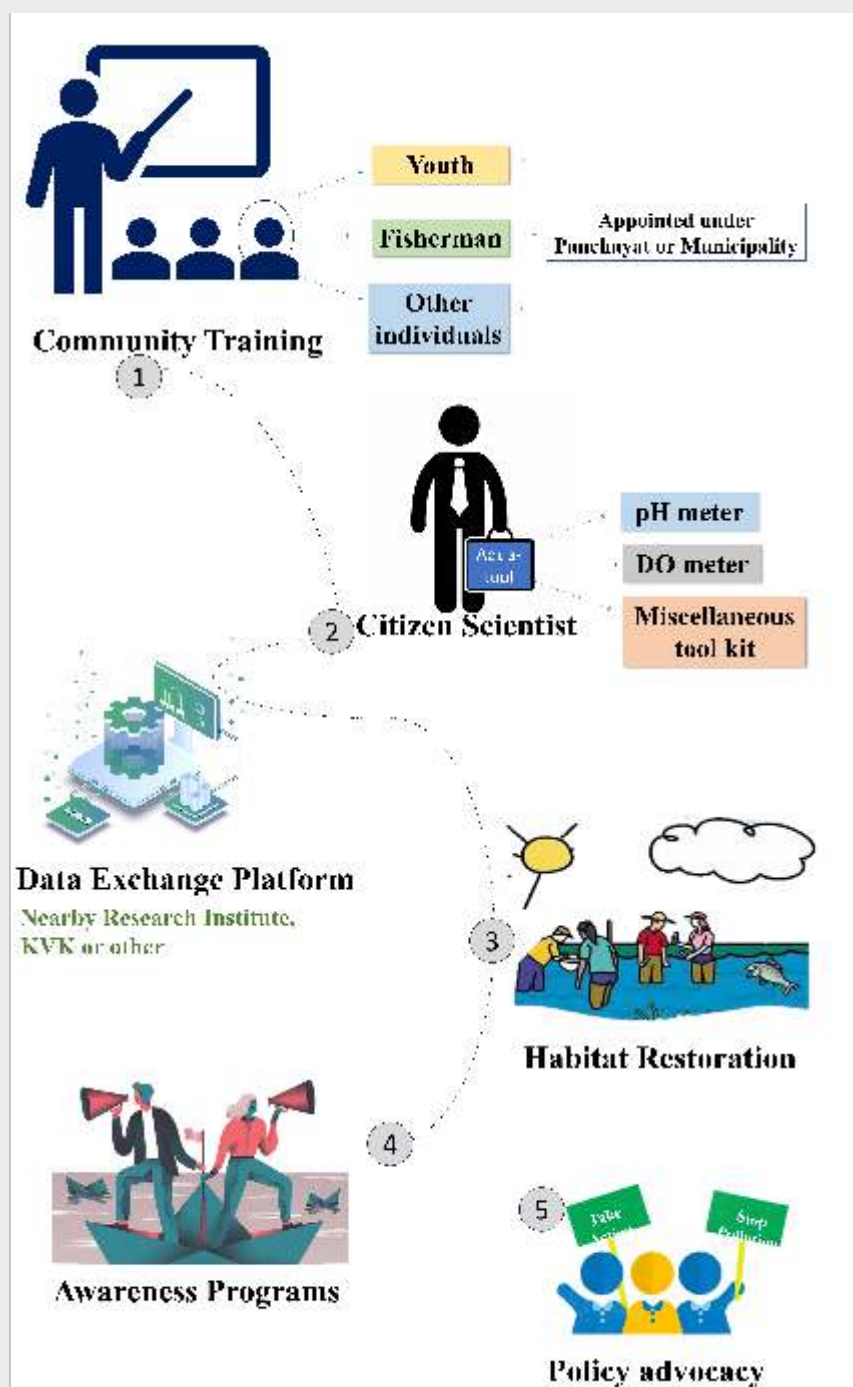
Urban ignorance about coastal biodiversity, and important ecosystems like mangroves, wetlands threatens ecosystems. Uninformed urban actions contribute to waste, releasing plastics and toxins into oceans. This lack of knowledge can fuel unchecked development and waste production, harming biodiversity. Urgent attention is needed to foster sustainable coastal practices, mindfulness, and eco-consciousness.

LiFE solution

To address urban unawareness of coastal biodiversity and harm to ecosystems, "Aqua Safari" emerges, bridging communities and nature through education and engagement. This mobile app satisfies a desire for environmental exploration, tapping into a 2019 survey revealing 4% of urban residents yearn to explore natural wonders. Unemployed students serve as part-time guides, offering immersive educational coastal expeditions. Aqua Safari connects urbanites with their local treasures, providing economic opportunities. It includes beach walks, biodiversity discussions, and eco-friendly activities, raising awareness about marine threats and encouraging conservation. The outcome: an enlightened populace ready to take pro-environmental actions and assume responsibility for safeguarding oceans and biodiversity. This transformative journey exemplifies enlightened urban coexistence with vital coastal ecosystems.

Source of Inspiration of the Idea

The source of inspiration for these ideas is personal. While conducting research on microplastics in coastal ecosystems and their profound impact on coastal biodiversity, I realized the significant influence of human activities on coastal organisms. A critical contributing factor to this problem is the limited awareness among urban populations, which often results in unsustainable practices.



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River-Guardians: Citizen Science for Freshwater Fisheries Conservation

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Problem Description

Rapid industrialization and urbanisation often lead to river pollution due to the discharge of industrial effluents, untreated sewage, stormwater runoff, and agricultural runoff into water bodies. These processes can introduce various pollutants, including chemicals, pathogens, heavy metals, sediment, and nutrients, into rivers, negatively impacting water quality and aquatic ecosystems. So, there is a need of regular monitoring to control it at the earliest possible.

LiFE solution

"River-Guardians" is a unique citizen science project aimed at engaging local communities in the protection and conservation of freshwater fisheries. It empowers residents living along rivers and lakes to actively contribute to frequent data collection, habitat restoration, and sustainable fisheries management. Here, the recruitment of suitable candidates (Youth, Fishermen, or any other individual) can be done by the concerned department. The selected candidate will get training from fisheries experts in nearby KVK or research institutes and will work under the Panchayat or Municipality system. After proper training, the organisation will provide them with different analytical tools like pH meter, DO meter, etc., so that they can easily obtain information on water quality parameters as well as the local fishing activities. The organisation should develop a proper data exchange platform so that the trained citizen scientist can transfer the gathered data to a nearby research institute or KVK and if any alarming situation gets detected, the research expert will take action accordingly and will take appropriate steps towards habitat restoration. If any persistent effect is observed, then the matter will be discussed on a large platform in collaboration with environmental agencies and policymakers to develop mitigation measures. This River Guardian concept will further promote the livelihood of local community along with the upliftment of freshwater fisheries.

Source of Inspiration of the Idea

Inspired by the concept of the Western Australia government they engage the local community for the conservation and preservation of Swan in River.



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GOVGEAR: Fishing for Climate Change Resilience

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Problem Description

In recent times, the surge in unregulated fishing activities within lakes has raised tremendous concerns. These unsustainable practices lead to overfishing, resource disputes and ecological degradation, thereby endangering the delicate balance of such ecosystems. Consequently, the compromised resilience of these ecosystems to climate change underscores the imperative need to address this issue.

LiFE solution

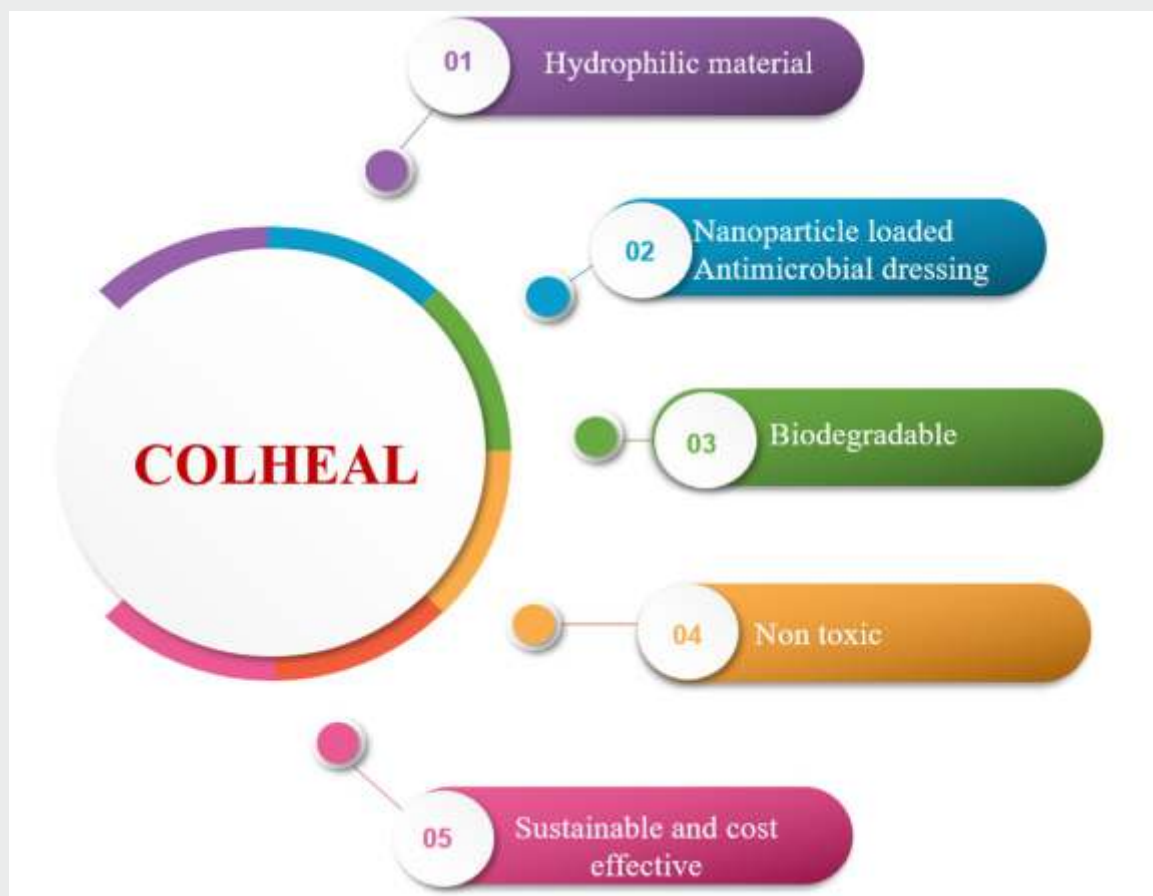
“GOVGEAR” can be a transformative approach to fisheries management for not only addressing the challenges posed by unregulated fishing practices but also for promoting climate change resilience. Under this initiative, registered fishers will be issued Quick Response (QR) coded identity cards that shall serve as their daily access keys to government-issued unique QR-coded fishing gears, known as GOVGEARs. These gears will have standardised specifications to meet government regulations, ensuring sustainable fishing practices such as adherence to permissible mesh size requirements. By preventing the depletion of fish stock and aquatic biodiversity, the GOVGEAR initiative can significantly contribute towards the conservation of lake ecosystems, which serve as vital carbon sinks, aiding in carbon sequestration and mitigating the deleterious impacts of climate change on such fragile ecosystems.

With GOVGEAR, a harmonious balance will be created between responsible fishing, ecosystem conservation, community empowerment, and digital database generation for informed decision-making in fisheries management and climate change adaptation, thereby paving the way for a more sustainable and resilient future.

Thus, GOVGEAR can mark a transformative shift towards holistic fisheries management, addressing multifaceted challenges while fostering climate change resilience. It can be a promising step towards safeguarding our aquatic ecosystems and securing sustainability.

Source of Inspiration of the Idea

GOVGEAR, derived from “government-issued fishing gear”, is my own idea. As a Ph.D. research scholar specialising in Fisheries Resource Management, I have had the opportunity to interact directly with fishers during field visits. These interactions provided firsthand insight into their challenges, including resource disputes, gear disparities, and unsustainable practices.



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Marine Derived Hydrogel Dressing for Wound Healing Application

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Problem Description

The value chain of eel fish fillet processing industries generates a considerable volume of waste which is dumped into natural open waters or nearby shore areas. The improper disposal poses a serious of environmental pollution from the release of organic materials into aquatic ecosystems and it requires an ecofriendly valorisation approach.

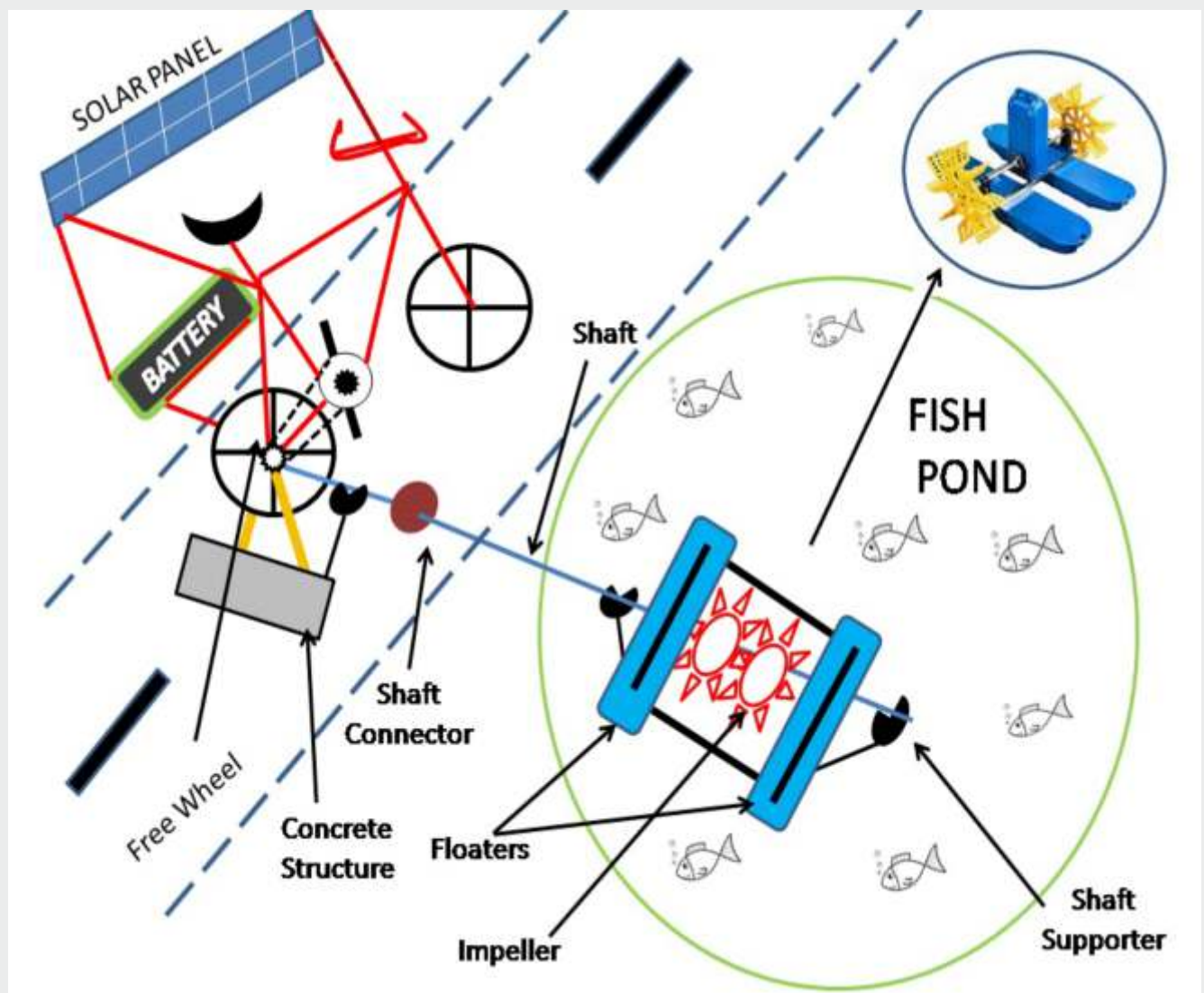
LiFE solution

The recovery of collagen from the discarded skin of eel fish and converting it into a biodegradable wound dressing hydrogel is found to be an effective approach for the sustainable valorisation of fishery waste. COLHEAL is a biodegradable marine-derived hydrogel dressing for wound healing applications. It is a biocompatible and cheaper material which provides a moist environment and whose composition supports the regenerative properties of biological matrices and enhances collagen deposition and fastens wound healing. As it is a hydrophilic material, it overcomes the limitations of conventional gauze dressing material, which does not provide a moist environment and tends to be dry and painful when adhered to the wound. The green methodology (freeze-thaw method) used in the preparation of COLHEAL could be an effective way to conquer human concerns about the usage of synthetic hydrogel material, which is composed of non-biodegradable polymers and toxic chemical crosslinkers.

Indeed, the rising concern of ethical and health risks associated with terrestrial collagen paves the way for the increasing interest in aquatic-derived collagen as a safer alternative. The fish collagen wound dressing promotes the growth of new collagen at the wound site and hence contributes to speedy recovery. The synergetic effect of chitosan and nanoparticle in the hydrogel composition enhances the antimicrobial properties of the dressing, which limit the spread of potential microbial infection.

Source of Inspiration of the Idea

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- Chatterjee, N.K., Chatterjee, N.S. Sukumaran, H.G., Sukumaran, H.G et al. 2022. Nano-encapsulation of curcumin in fish collagen grafted succinyl chitosan hydrogel accelerates wound healing process in experimental rats. Food hydrocolloids for health, 2, 100061.



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Solar Oxy-bicycle

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Problem Description

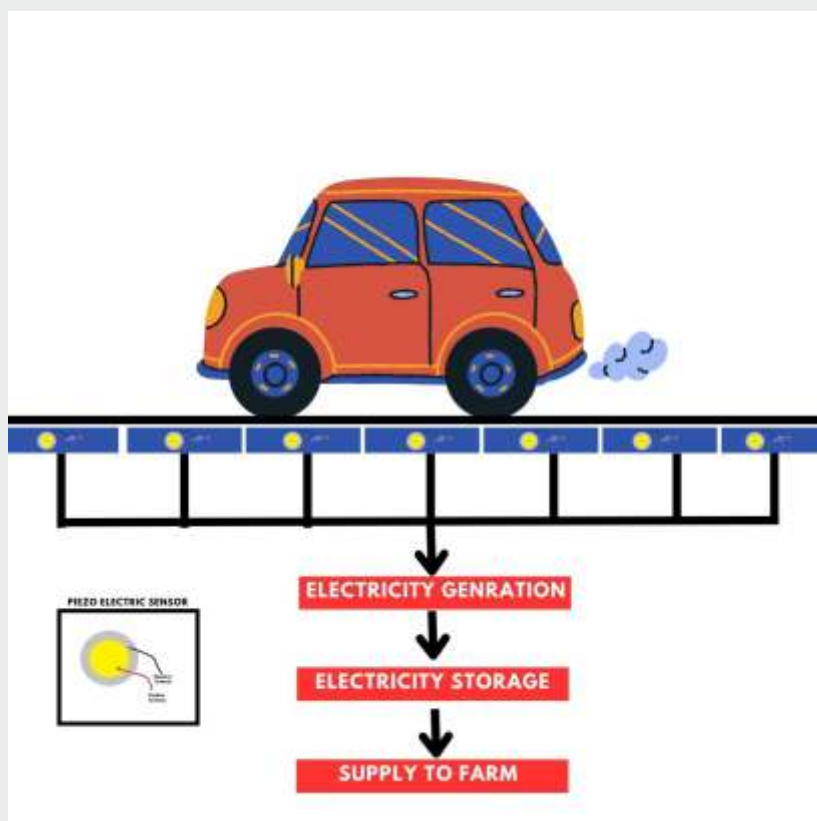
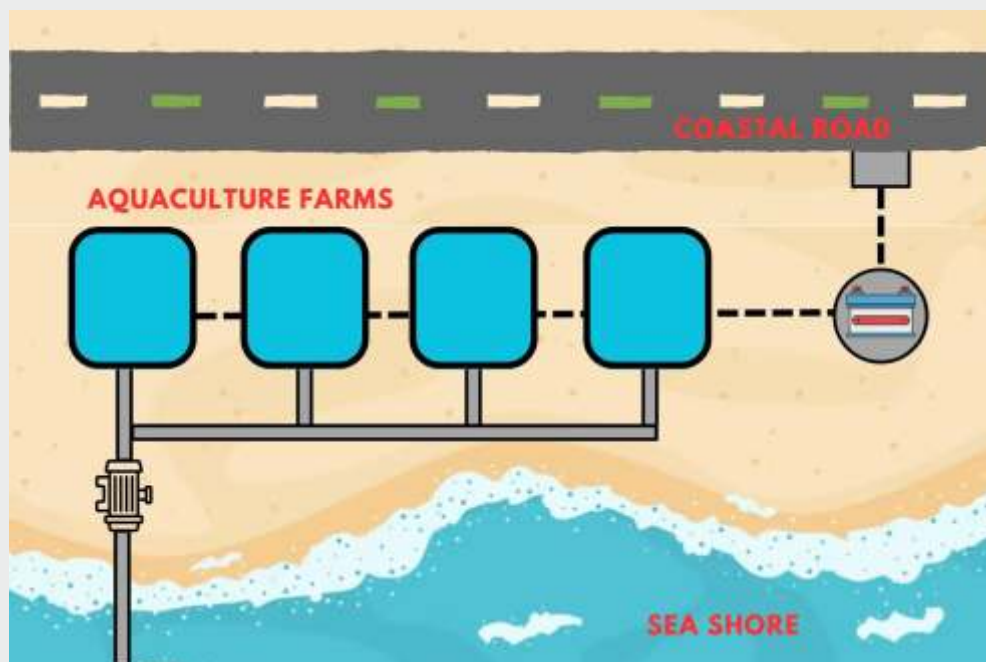
From our perspective to run a profitable fish farm, two biggest obstacles are fish loss and poor growth rates. Aeration is the one factor which kills two birds with one stone for the above-mentioned cause. But aerators available in the market are found to be costly and require continuous electricity supply which makes them unaffordable for the small scale fish farmers. Here comes the concept of Solar Oxy-bicycle which will be working as a Paddle wheel aerator and can be operated manually through the bicycle. Along with this, the solar panel connected to the battery installed at the back of the bicycle will be charged and will power the paddle wheel aerator to rotate during the remaining time of the day cycle. It will help in saving the electricity as well as reduce the cost of service and maintenance.

LiFE solution

This project is based on aerating the water body. Aerators are Connected to Bicycle tyre rings via a Shaft to enable the mixing of air with water. These devices are used for the addition of oxygen to the water. This Project is based on the principle of Centrifugal Force (RPM). If the user drives a Bicycle, free wheel of back rim will rotate and free wheel connects to the Paddle Wheel (Impeller) Aerators through a long Iron Shaft, then Impellers rotates continuously and Split the large water droplets into small water droplets as a result, for gaseous exchange increases thereby leading to increase in DO level. The use of Solar Oxy-Bicycle aerators in aquaculture is important for ensuring better survival, optimal oxygen supply, higher production, and disease-free environment. As in India, most fish culture is done in ponds and in rural areas where people don't have access to electricity can use Oxy-Bicycles, which will lead to an appropriate environment for the management of ponds with optimum level of DO. Oxygenated ponds are also a disease-free environment because many bacterial, fungal and viral infections are spreading in anaerobic conditions and the presence of CO₂. It also removes waste and odour caused due to organic gasses. Increase Dissolved Oxygen content and decrease CO₂.

Source of Inspiration of the Idea

After completing my post-graduation, I joined Bihar's fisheries department in Buxar district. While conducting surveys in remote areas, I discovered that small-scale fish farmers faced a critical issue: inadequate oxygenation in their pond water, leading to fish mortality. These farmers couldn't afford high-tech aeration systems. Recognizing the vital role of oxygen in fish survival, I innovated the Solar Oxy-Bicycle. This affordable solution requires minimal capital and operates without electricity or fuel, ensuring sustainability for our ecosystem and making it accessible to fish farmers in all regions.



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Sustainable Electricity by Friction and Pressure along the Coastal Roads: An Alternate Energy Source

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Problem Description

Growth in aquaculture poses significant challenges, particularly related to the increasing electricity demand of aquaculture farms, which currently stands at Rs. 1-1.5 lakhs per hectare per culture. Furthermore, with the expansion of global trade in seafood, this electricity requirement is expected to rise even further in the near future. Addressing these challenges is of paramount importance. Finding sustainable and renewable sources of energy to power aquaculture operations can help mitigate the environmental impact while ensuring the continued growth and sustainability of the aquaculture industry.

LiFE solution

The problem at hand is the wastage of energy and fuel on highways when vehicles pass over speed breakers, dissipating energy through friction and pressure. We propose two innovative solutions:

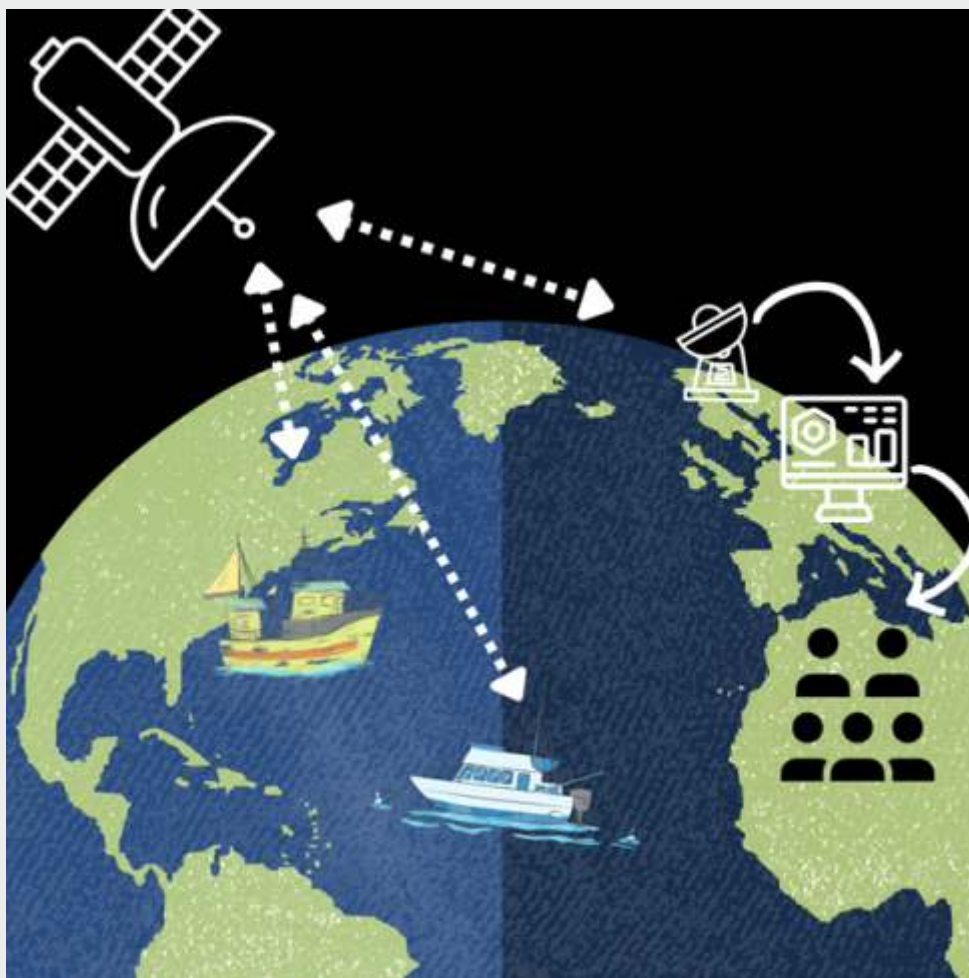
Friction-Based Energy Generation: We will install moving plates on roads, primarily adjacent to aquaculture farms, equipped with a crank mechanism to convert the kinetic energy from the vibrating road caused by passing vehicles into rotary motion, thereby generating electrical energy.

Pressure-Based Energy Generation: Embedded piezoelectric sensors in the roadbed will convert pressure and mechanical energy from vehicles into electrical energy.

Each vehicle yields approximately 4.66 watts of energy per minute, totalling 6052 KW/day or 44000 KWh per year for a 1km stretch of piezoelectric road in a single lane. This energy can be efficiently stored in high-capacity batteries and used to power aquaculture farms during peak demand for equipment like aerators and feed dispensers. Additionally, it can illuminate roads and farms, reducing reliance on thermal and coal plants, thus mitigating climate change and promoting afforestation efforts. This sustainable energy solution aligns with environmental conservation and economic development goals.

Source of Inspiration of the Idea

Self



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Sustainable Fisheries Management through AI-Powered Dynamic Catch Quotas

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Problem Description

Overfishing poses a substantial threat to fish populations and the well-being of fishing communities. Conventional fisheries management relies on fixed catch limits established annually or semi-annually, which struggle to respond to evolving conditions, including climate change, intricate ecosystems, and data limitations. These difficulties result in fish stock depletion, ecosystem damage, and economic instability for fishermen. A comprehensive and adaptable approach is crucial for achieving sustainable fisheries management.

LiFE solution

Sustainable fisheries management is advancing through the integration of AI-powered dynamic catch quotas. This innovative approach combines technology, real-time monitoring, and adaptive management to ensure fish stocks' long-term health and the fishing communities' economic sustainability.

At its core, an AI-powered monitoring system continuously tracks and records crucial data, including catch composition, fish size, bycatch levels, fishing locations, and gear types. This system utilises satellite imagery and oceanographic sensors, covering extensive fishing areas while minimising spatial requirements.

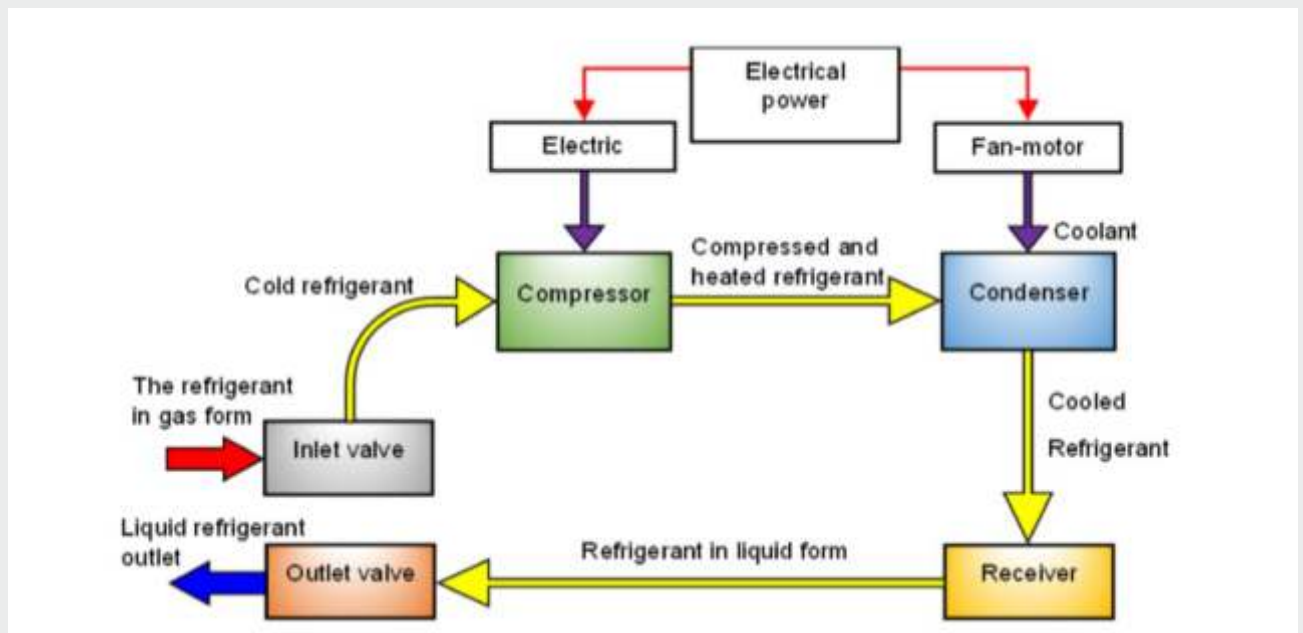
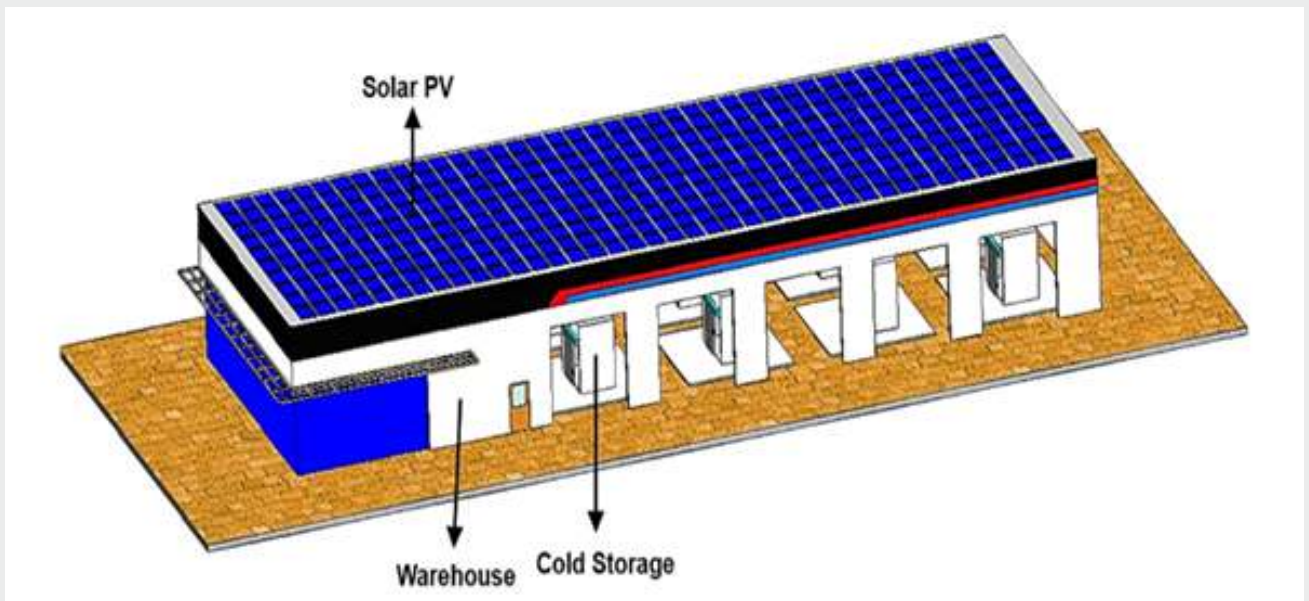
The system's real-time data analysis is crucial. It uploads collected data to a control station, where AI algorithms process it to evaluate fish health, assess ecosystem conditions, and gauge stock sustainability. This analysis empowers the dynamic catch quota system to automatically adjust catch limits when needed, preventing overfishing and ensuring fish stock health.

The benefits are substantial: sustainable fishing, reduced bycatch, economic stability for fishing communities, and adaptability to climate change challenges. This AI-powered system is economically viable and applicable to all vessels. It has a global impact through partnerships with international governing bodies. It is a transformative innovation securing fish stocks' health and fishing communities' livelihoods, addressing overfishing and environmental sustainability.

Source of Inspiration of the Idea

Probst, W. N. (2020). How emerging data technologies can increase trust and transparency in fisheries. *ICES Journal of Marine Science*, 77(4), 1286-1294.

Weerasekara, N. (2017). An Economic Analysis of a Total Allowable Catch-Individual Transferable Quota System in a Developing Country Heterogeneous Fishery: An Application to the Digha Fishery in West Bengal, India.



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Solar-Powered Ice Storage for Sustainable Fisheries

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Problem Description

Fish is a vital food source, but it spoils quickly and can be unsafe if not kept cold. To support fishermen and prevent health risks, we need efficient cooling systems from catch to kitchen. Solar-powered ice storage facilities in fishing communities can reduce reliance on costly and polluting diesel generators, ensuring fresher fish, increased income for fishermen, and reduced greenhouse gas emissions.

LiFE solution

Fishing communities often rely on diesel generators to produce ice to preserve their catch. This contributes to high operating costs, environmental pollution, and greenhouse gas emissions while also making them vulnerable to fuel price fluctuations. The system design is as per the following structure:

Solar Power Generation: A solar photovoltaic (PV) system capable of generating sufficient electricity to power the ice storage facility.

Ice Storage Facility: An ice storage facility with the capacity to meet the community's demand. Incorporate insulation and energy-efficient technologies for ice preservation. Smart designs start with rooms that have insulation that is thicker than 150 millimetres. This enables cold store operators to keep energy consumption low and secure food safety during prolonged power shortages.

This Fish Cold Store uses energy from the sun and natural coolants to make it friendly to the environment. It's also designed to use less energy and be affordable. They even have special crates filled with ice made on-site to make sure the fish stays cold when it's being transported. This whole system helps keep the fish fresh and safe to eat.

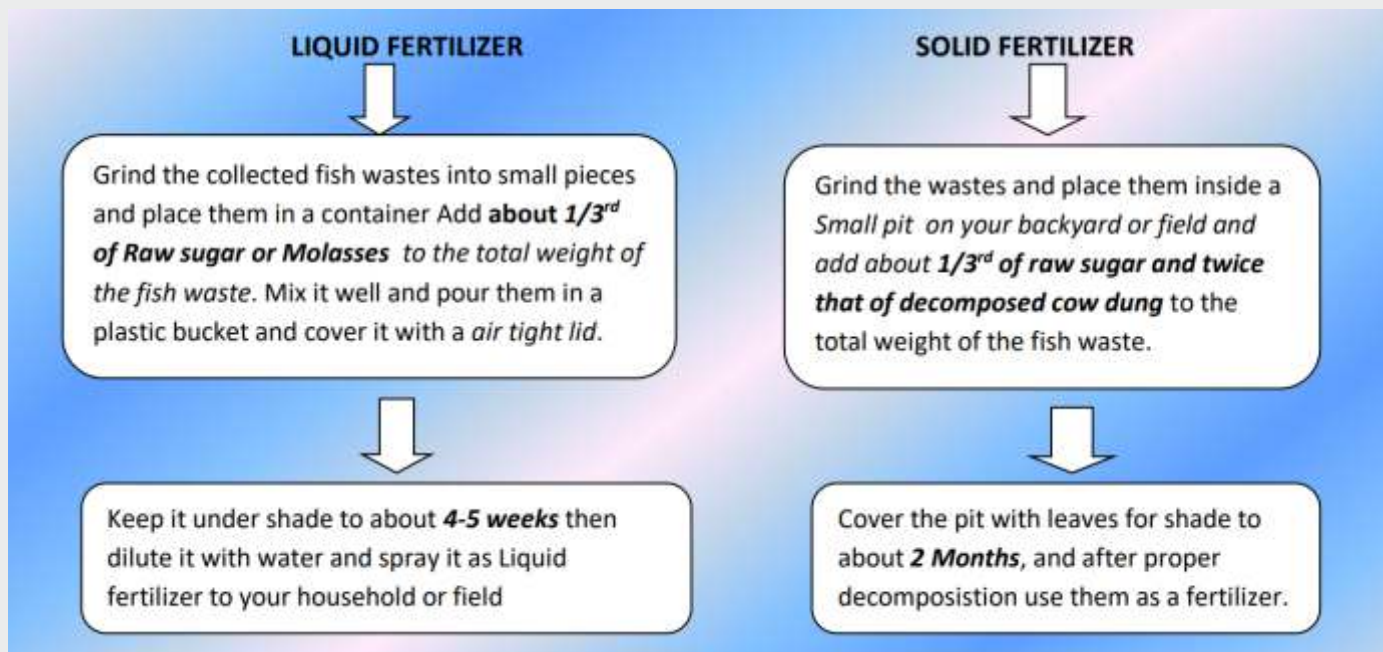
The project initiative shows that fishermen can preserve the quality of their catch efficiently, regardless of weather conditions, enhancing their income and food security. Key findings include:

By curbing diesel generator use, greenhouse gas emissions are significantly reduced, contributing to a cleaner environment and mitigating climate change effects.

Sustainable materials like efficient insulation, eco-friendly refrigerants, and solar panels further align these facilities with environmentally responsible practices.

Source of Inspiration of the Idea

GCI (Green Cooling Initiative) teamed up with private companies to create a special place called the Fish Cold Store in Kenya near Lake Victoria. This is a great example of how to do things well and help rural areas develop in a good and long-lasting way.



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Fish Waste to Fertilizer

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Problem Description

Fish and shrimp are highly preferred and consumed across our country for their nutritional benefits and unique taste. Despite their nutritional value, these seafood products typically yield only 45-70% of their total weight for consumption, leaving a significant amount as waste. The challenge lies in managing this waste, which is often dumped along streets and roads due to the profit-oriented focus of fish shops and vendors. My primary concern is implementing proper waste management measures to control the excess fish waste disposal issue.

LiFE solution

To address the issue of excessive fish waste and the associated environmental hazards and pollution, both individuals and government entities can take essential steps. The key solution lies in collecting the remaining fish waste and converting it into valuable fertiliser, which can significantly benefit agriculture and horticulture. Remarkably, 50 kg of fish waste can yield up to 40 kg of fertiliser, greatly enhancing soil fertility.

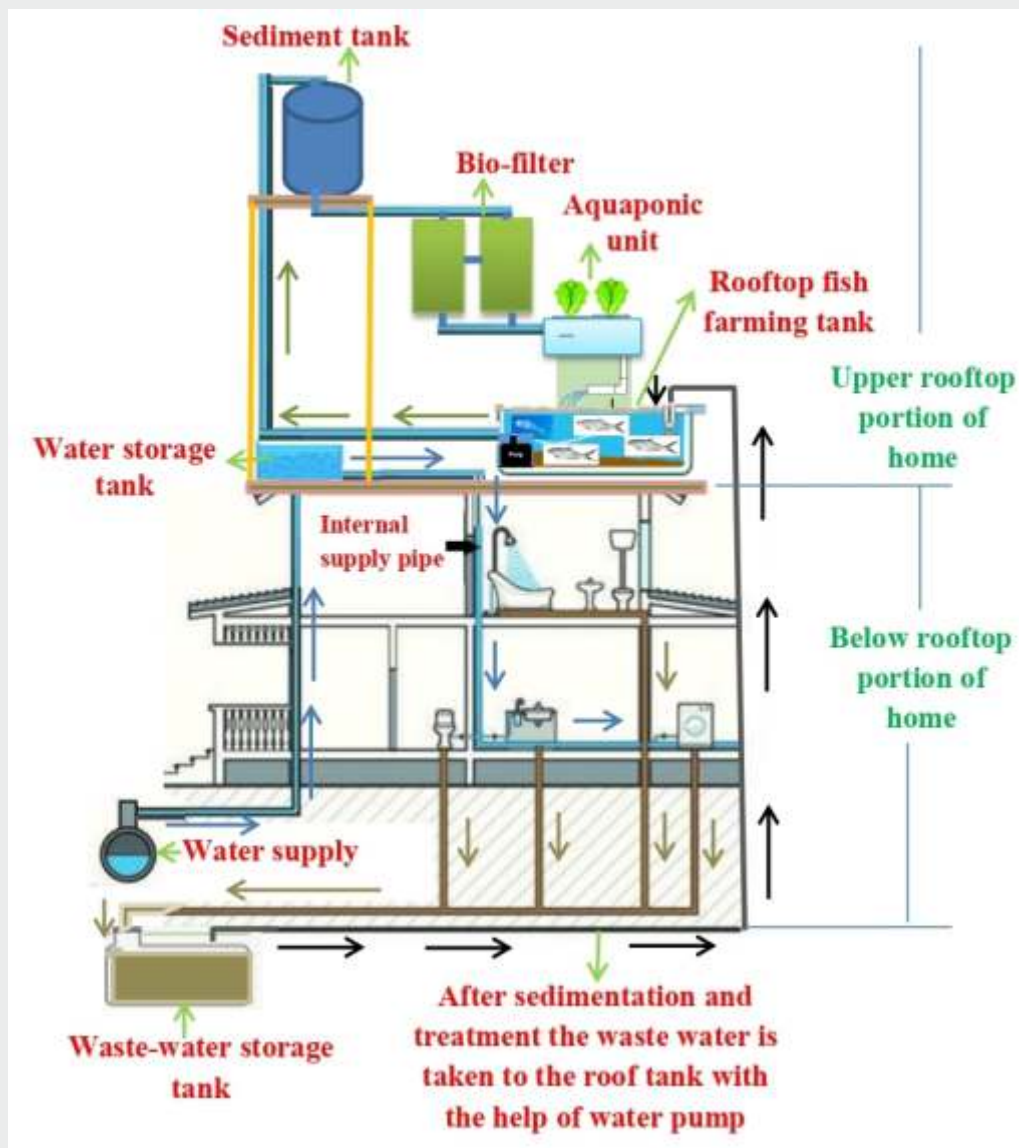
An inspiring example is the "NAMBIKAI Group of Companies" in Chennai, which was initiated as a startup and successfully partnered with the Central Institute of Brackishwater Aquaculture (CIBA) to transform fish waste into fertiliser. Starting production in 2019 with the support of CIBA's equipment and laboratory facilities, they achieved an impressive turnover of 15 lakhs/year by 2021. This collaboration led to the introduction of two innovative products in the market, "Plankton (+)" for improved plankton production and "Horti (+)" for horticultural applications.

However, challenges persist in this business, such as limited scale, insufficient awareness, underdeveloped infrastructure, and limited popularity beyond Chennai and Tamil Nadu's districts.

To address these issues, individuals and government can take steps at both small and large scales. On a small scale, the Fisheries Department can encourage interested individuals, especially women, through training programs and provide the necessary funds and facilities to engage in fish waste recycling. On a larger scale, the government can announce tenders through the Fisheries Department to attract large companies and multinational corporations to participate in the vision of converting fish waste into environmentally beneficial fertilisers, contributing to pollution reduction and sustainable agriculture practices.

Source of Inspiration of the Idea

Startup titled "NAMBIKAI Group of Companies" which partnered with the Central Institute of Brackishwater Aquaculture (CIBA) to transform fish waste into fertiliser.



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Utilisation of Domestic Waste Water through Rooftop Fish farming: An Idea to Reduce Aquatic Pollution

Devarshi Ranjan

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Problem Description

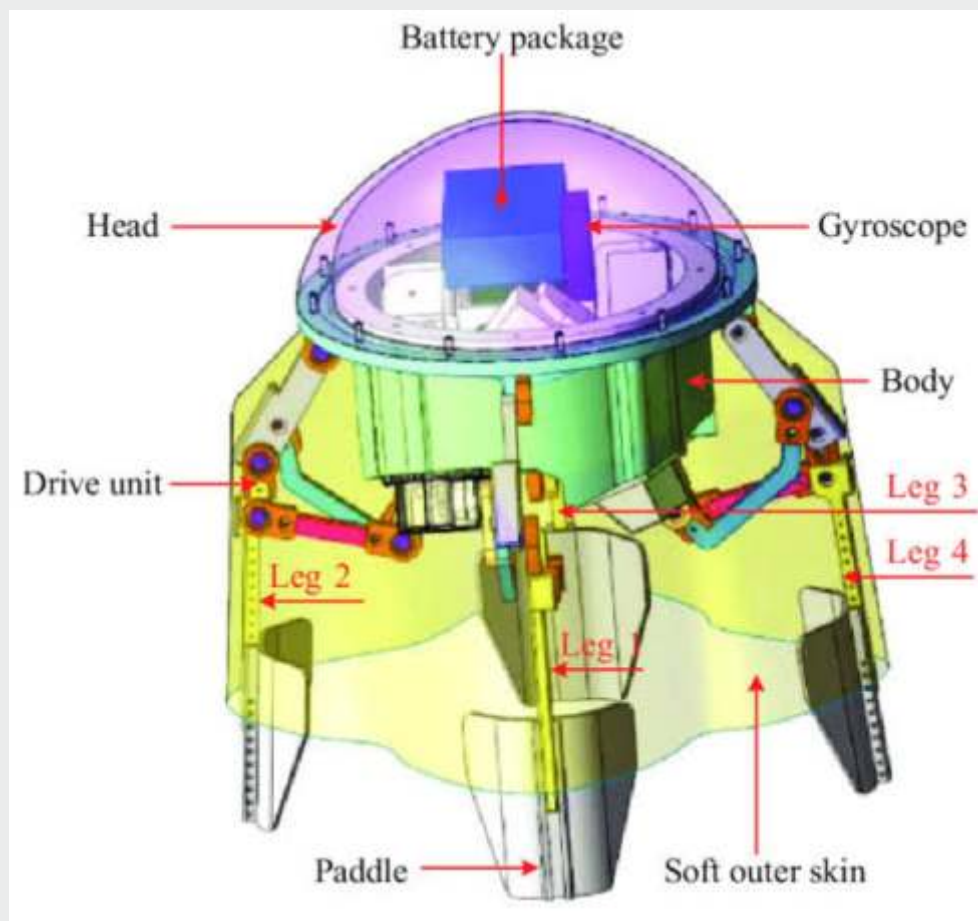
As per time, population and pollution are increasing day by day and space is decreasing. Apart from this, nowadays, instead of going out, people want to do something while staying at home, which can generate their income. But all this is not so easy. For this, we have to do something so that we can easily increase our income and also create a healthy environment for a healthy and happy life.

LiFE solution

Keeping the current problem in mind, today I have come up with an idea concept titled "Domestic Waste Water Utilization through Rooftop Fish Farming: An Innovative Idea to Reduce or Eliminate Aquatic Pollution". This technology will be very helpful in reducing aquatic pollution, generating income, and utilising the vacant rooftop space. This technology would generally be great for urban areas where there are space constraints and difficulty in draining water. In this, wastewater from home can be used for fish farming. With the help of this technology, we can reduce aquatic pollution and generate income by using free space in the house. Apart from this, man can also grow many other vegetables, fruits and other plants by giving it aquaponic form. This type of practice can achieve efficient use of rainwater. So finally we can conclude that rooftop fish farming through waste water can help urban residents to save and earn money by selling fish reared in rooftop tanks. The rooftop fish farming strategy could soon result in green, safe and clean cities. This strategy will bring a modern blue revolution with zero land use in India and the rest of the world.

Source of Inspiration of the Idea

The genesis of this idea began two years ago when I first saw the biofloc system at my university. One day it happened that I had gone to the biofloc system for my research work, then two farmers from the city came there and started asking us about biofloc. We told him all the things related to biofloc. Then a farmer asked us if we could keep it on the rooftop and do fish farming because he was from an urban area and did not have land to keep it. At that time, I told him that it is only for the ground and you cannot keep it on the roof. After he left, we paid attention to his words and started looking for the answer to his question. While searching, I gathered a lot of information and finally prepared a model named "Utilization of Domestic Waste Water through Rooftop Fish Farming: An Innovative Idea to Reduce or Eliminate Aquatic Pollution".



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Innovation in Aquaculture- Soft robots

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Problem Description

Fishermen men face a huge problem in underwater monitoring and removal of micro-plastic waste. Underwater monitoring is used to detect the health conditions of aquatic organisms. This problem of underwater monitoring and removal of micro-plastic wastes is challenging due to limited visibility underwater. The cost involved in monitoring aquatic organisms under currently used technology is huge and it is not easily available to common fishermen.

LiFE solution

A soft robot bio-inspired by a jellyfish is a key to all problems, be it underwater inspection, collection of microplastic waste from deep waters and analysis of water conditions for building a conducive condition for the fish for optimum growth through a sustainable way. The principle involved in the movement of a soft robot is the same as a propulsion mechanism followed by a jellyfish (the bell of the jellyfish expands to fill the cavity with water and close the cavity by ejecting water to move forward) which shows a tremendous use of suction pressure in the movement. This robot will be designed to withstand the high pressure of deep waters by the use of SMA (shape memory alloy) mainly Nickel- Titanium alloy is regarded as the best in this function due to its high elastic and tensile strength, which it can continuously change its shape without being ruptured. This robot will be activated by current stimulation inside them without harming the environment. The onboard camera should be attached for monitoring along with a battery (for power supply) and gyroscope (for controlling the angular velocity). There is a fluid called mucus (also found in jellyfish) which can be filled in the lower side engine of these robots to collect micro-plastic wastes. Sensors fitted in these robots will detect temperature, pH, salinity and the presence of prey organisms (can be detected by sonar sensor if an organism of irregular shape and size enters the water body)

Now, the chief reason this type of robot should be used lies in its efficient propulsion system (it can cover a large distance consuming a small amount of energy), mechanics (easy to build) and cost (it is much cheaper to build if compared by any other modern machines such as drones).

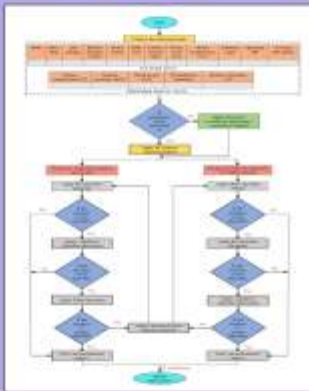
The use of soft robots will be ideal for precision farming and can be used in different types of aquaculture systems for solving major problems in culturing fish.

Source of Inspiration of the Idea

I studied jellyfish, its mechanism and their type of robot then the idea came up to modify this robot to use it as the main aquaculture machinery solving multiple day-to-day problems of fishermen in the best way.

ARTIFICIAL INTELLIGENCE BASED DO MODELLING

Intelligent framework for DO prediction



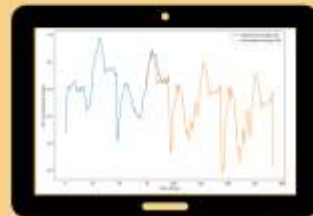
Inclusion of **meteorological parameters** as an independent variable in for the prediction analysis can helps to **improve the model accuracy with climate consideration**.

Smart DO - DO predictive web tool



Smart dissolved oxygen (DO) tool can predict the DO concentration level in the culture ponds. This application can help us to **increase the precision in farming** by smart management approach.

DO pattern Time series forecasting



The aeration pattern in shrimp pond is crucial phenomenon, decide fluctuation of DO level. It can be studied with due consideration given to DO stratification. The **time series algorithms** viz., ARIMA, SARIMA can be used to model the data and predict DO with consistency and reproducibility

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Modelling of Dissolved Oxygen in Aquaculture System using Machine Learning

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Problem Description

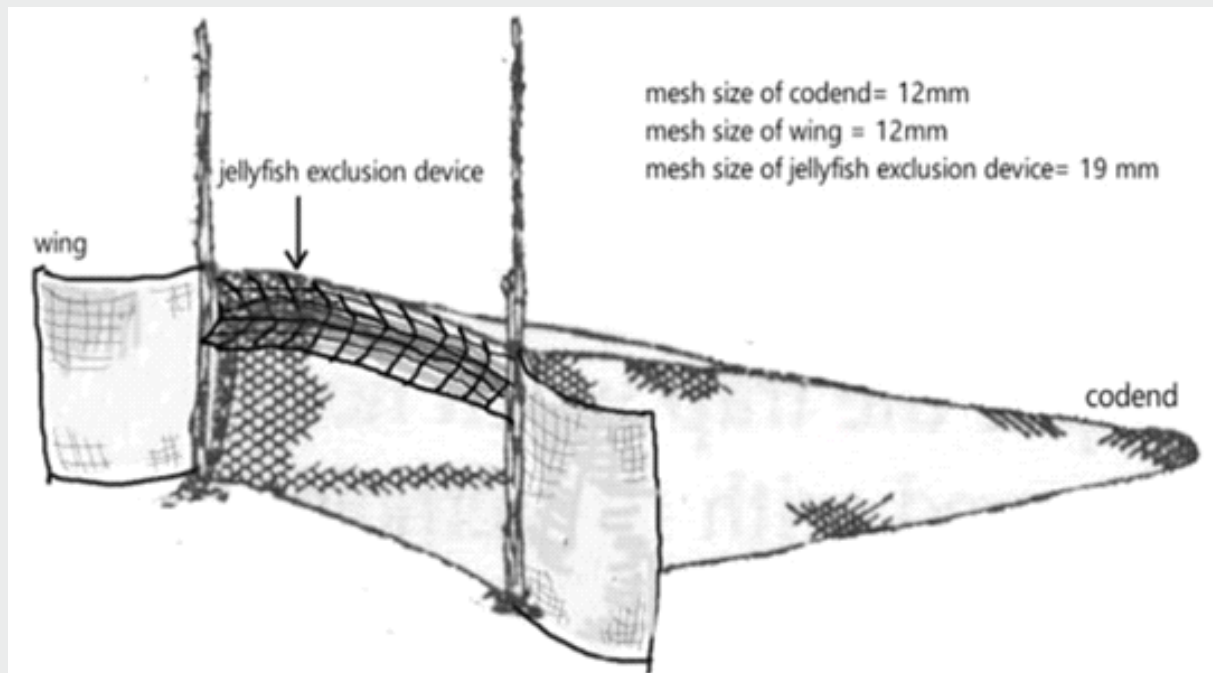
Aquaculture being a vital source of global seafood production, faces increasing challenges due to the impacts of climate change. One critical issue is the fluctuation of dissolved oxygen (DO) levels in aquaculture ponds. Since DO is the crucial life parameter in farming, its control throughout the culture days is inevitable. Climate change-induced factors, such as rising temperatures, altered precipitation patterns and extreme weather events, exacerbate DO fluctuations which can directly impact animal health, growth, and overall production sustainability. It can pose a significant threat to aquaculture operations. However, climate change poses a threat of influencing DO level in culture water due to changing weather patterns. There is no such robust method to detect DO variation in culture water due to weather fluctuations.

LiFE solution

To address this problem, there is a need for the development of DO-level prediction and forecast model considering meteorological parameters in aquaculture systems using AI methods viz., Machine learning, Time series analysis. DO prediction and forecasting model can serve as early warning systems by foreseeing low DO events due to factors like elevated water temperatures or excessive organic matter decomposition so that aquafarmers can adjust their management practices in response to changing conditions. Particularly, the changing weather conditions viz., air temperature, humidity, precipitations, etc has control over the DO level in the pond. DO model also helps to guide the use of aeration systems in aquaculture ponds, so knowing when and where it is needed most can optimise its use and reduce energy consumption and It can also assist in managing water quality by informing decisions related to water exchange, nutrient management, and the use of water treatments to adapt climate change effects. Therefore, prediction and forecasting dissolved oxygen levels in aquaculture ponds is a proactive and adaptive approach to climate change which will enable aquafarmers to protect their investments, maintain sustainable practices, and mitigate the impacts of climate-induced stressors on animal health and productivity.

Source of Inspiration of the Idea

The idea presented is our own, we have conducted extensive research on the development of the intelligent framework, Smart DO tool and Time series DO forecast model.



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Jellyfish Exclusion Device for Stakenets

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Problem Description

The proliferation of jellyfish poses a significant challenge for fishermen, causing them considerable trouble when using stake nets. This often results in net blockages, damage to the equipment, difficulties in separating catches, financial losses, and discomfort when handling their haul and ultimately plays a significant role in reducing their overall catch.

LiFE solution

Jellyfish are a menace in estuarine stake nets operated in Vembanad Lake. The weight of the whole biomass of jellyfish varied from 50-100 kg per net per day, as reported by the fishers. The Gear is modified in such a way that the surface floating jellyfish are excluded from the catch. A screen made of monofilament nylon mesh of size 19 mm is installed on the head rope of the gear, which prevents the entry of jellyfish into the gear, but doesn't block the shrimps, which are the target species. The accumulation of jellyfish may cause the target species to avoid the area, so two wing panels of mesh size 12mm are provided on each side to direct the jellyfish out of the gear and also help in directing the shrimps into the gear.

Source of Inspiration of the Idea

I went through a report published by CMFRI, Cochin, titled, "Jellyfish menace in estuarine Stake nets operated off Kochi, Kerala", depicting the problems caused by jellyfish in the Cochin backwaters. Several studies have reported the increased influx of jellyfish causing many problems, which paved the way for the development of this idea of how an exclusion device can be attached to a stake net to reduce the jellyfish invasion and their segregation.



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Unlocking the Potential of Hyacinth: A Sustainable Solution

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Problem Description

The increased growth of water hyacinth in local water bodies has been observed for quite a long time in natural water bodies. Furthermore, aquatic animals are facing problems due to the remains of synthetic fishing materials. Additionally, there are limited options available for SHGs and cooperatives in fisheries, as noticed by us. These observations underscore the necessity for a comprehensive and sustainable approach to tackle environmental concerns and promote responsible fishing practices in our region.

LiFE solution

The initiative responsibly collects water hyacinth from water bodies, processes its fibres for crafting ropes and nets, and blends these fibres with materials like cotton for versatility.

LIFE stands out for its eco-friendliness. The ropes and nets, made solely from water hyacinth fibres, are fully biodegradable, leaving no harmful residues in water bodies to protect aquatic life. To encourage biodiversity conservation and responsible fishing, larger mesh sizes are recommended to reduce overfishing risks.

At the core of LIFE lies community empowerment, entrusting processes to Self-Help Groups (SHGs) and cooperatives. This approach not only generates employment opportunities but also empowers women, fostering sustainable and equitable living. LIFE embodies more than a solution; it represents a lifestyle that harmonises with the environment while uplifting communities.

Source of Inspiration of the Idea

Since my childhood, I have always been concerned about the issue of water hyacinths in the ponds of my village. Recently, while watching a story on National Geographic, I came across a person who made "Sarees" from water hyacinth. This inspired me to consider its potential utility in the fisheries sector. Additionally, I have often contemplated the idea of creating employment opportunities for Self-Help Groups (SHGs).



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Waste to Wealth

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Problem Description

Fish farmers grapple with a range of challenges stemming from the costly nature of fish meal, a vital aquaculture feed ingredient. This expense escalates production costs, constrains profit margins, and forces reliance on imported ingredients, making farmers susceptible to global market fluctuations. Smaller-scale operators face accessibility issues, and concerns about feed quality, nutritional balance, and sustainability loom large. Moreover, elevated feed costs may lead to higher consumer prices, impacting market demand and competitiveness within the industry.

LiFE solution

Fish feed preparation from poultry rendering products involves the utilisation of byproducts from poultry processing to create a cost-effective alternative protein source for fish nutrition. This innovative approach not only offers economic benefits but also contributes to resource sustainability within the aquaculture industry.

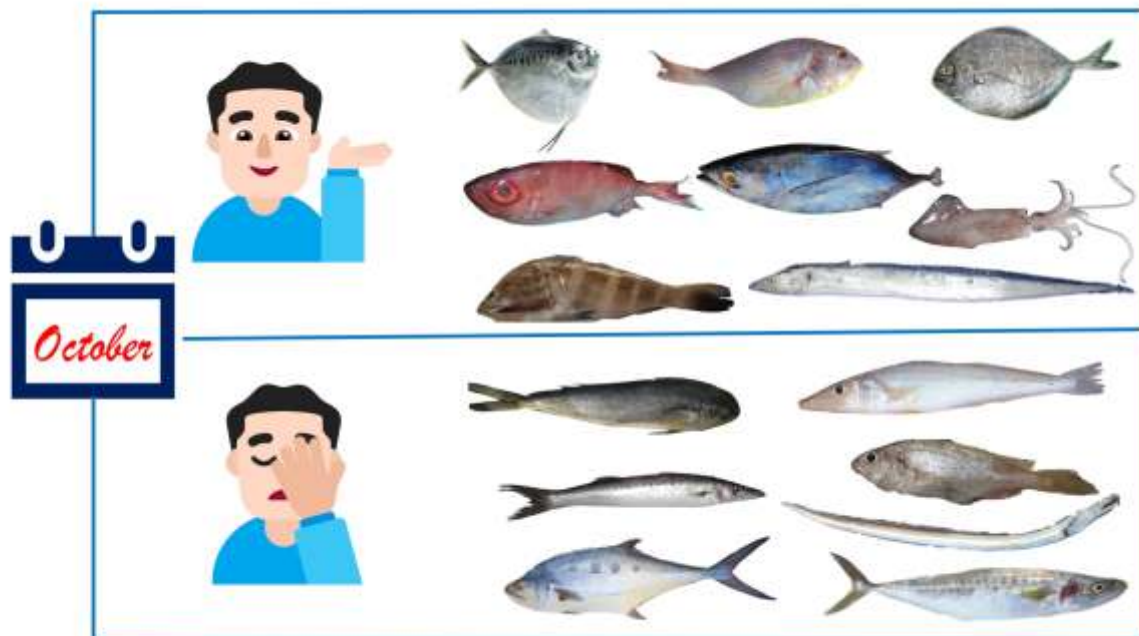
The process typically begins with collecting poultry rendering products, which include leftover poultry parts, feathers, and other by-products. These materials are processed and treated to remove contaminants, ensuring a safe and nutritious feed ingredient. Through various methods such as drying, grinding, and extrusion, the rendering products are transformed into a protein-rich feed supplement.

This poultry rendering-based feed offers a protein content comparable to traditional fish meal but at a lower cost. It provides essential amino acids and nutrients required for optimal fish growth and health. Moreover, it reduces the pressure on wild fish stocks, promoting a more sustainable aquaculture industry.

By incorporating poultry rendering products into fish feed formulation, aquaculture practitioners can achieve cost savings while maintaining the nutritional quality of their feeds. This approach aligns with the principles of circular economy and resource efficiency, benefiting both the environment and the economics of fish farming. Overall, poultry rendering-based fish feed represents an innovative and sustainable solution to address the challenges of expensive fish meals and contribute to the growth of the aquaculture sector.

Source of Inspiration of the Idea

The idea of using poultry waste for fish feed likely emerged from observing practices where raw poultry waste is directly introduced to fish ponds without proper scientific knowledge or understanding of its consequences. While this approach may lead to accelerated fish growth, it raises significant concerns related to meat quality, water quality, and environmental impact.



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Sustainable Seafood Choice for LiFE

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Problem Description

The increasing demand for a limited range of popular seafood species exacerbates fisheries management challenges in the face of climate change. Overexploitation and depletion of these species are intensifying as changing ocean conditions are disrupting traditional harvesting patterns, leading to ecological imbalances and economic losses for fishing communities.

LiFE solution

Drawing inspiration from the Indian tradition of "eating what fishers eat in a season" this solution advocates for a global movement encouraging individual to consume seafood based on what is naturally available and abundant locally during the specific seasons. This climate-smart approach aligns well with the locally available species' ecological cycles and reduces strain on overfished species, thereby fostering biodiversity.

To implement this solution, educational campaigns can be launched with the help of mass media to raise awareness about the benefits of season- and region-specific seafood consumption. Social media platforms offer an excellent avenue for raising such ecological awareness via engaging content like memes and reels. Season- and region-specific seafood calendars and or "Do's & Don'ts" kind of advisories will help consumers stay informed and updated about sustainable seafood choices.

Furthermore, culinary initiatives, such as seasonal seafood festivals and local seafood markets can be organised or established to connect consumers with fresh, sustainable choices. These events can also undertake cooking demonstrations and showcase the regional tastes, thereby unravelling the delicious possibilities of seasonal seafood.

Central to the success of this movement is the integration of indigenous knowledge held by local fishers. Multi-stakeholder engagements can incentivise sustainable fishing practices and promote responsible seafood sourcing through certifications and labelling while mitigating the adverse impacts of climate change.

Source of Inspiration of the Idea

Inspired from local fishers and fellow batchmates belonging to the fishing community.



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Monetize the Monster: Combat Plastic Pollution by LiFE

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Problem Description

Marine plastic debris contributed by single-use plastic bags, plastic bottles, fishing gears i.e; ALDFG and End of Life gear was the prominent litter causing a deteriorative effect on the marine flora and fauna. Irresponsible littering of plastics into the marine environment for discarding our garbage is a selfish act of humans. Microplastics emerging from plastic due to natural weathering enter fish in the Ocean and seriously threaten “Life on Mother Earth.”

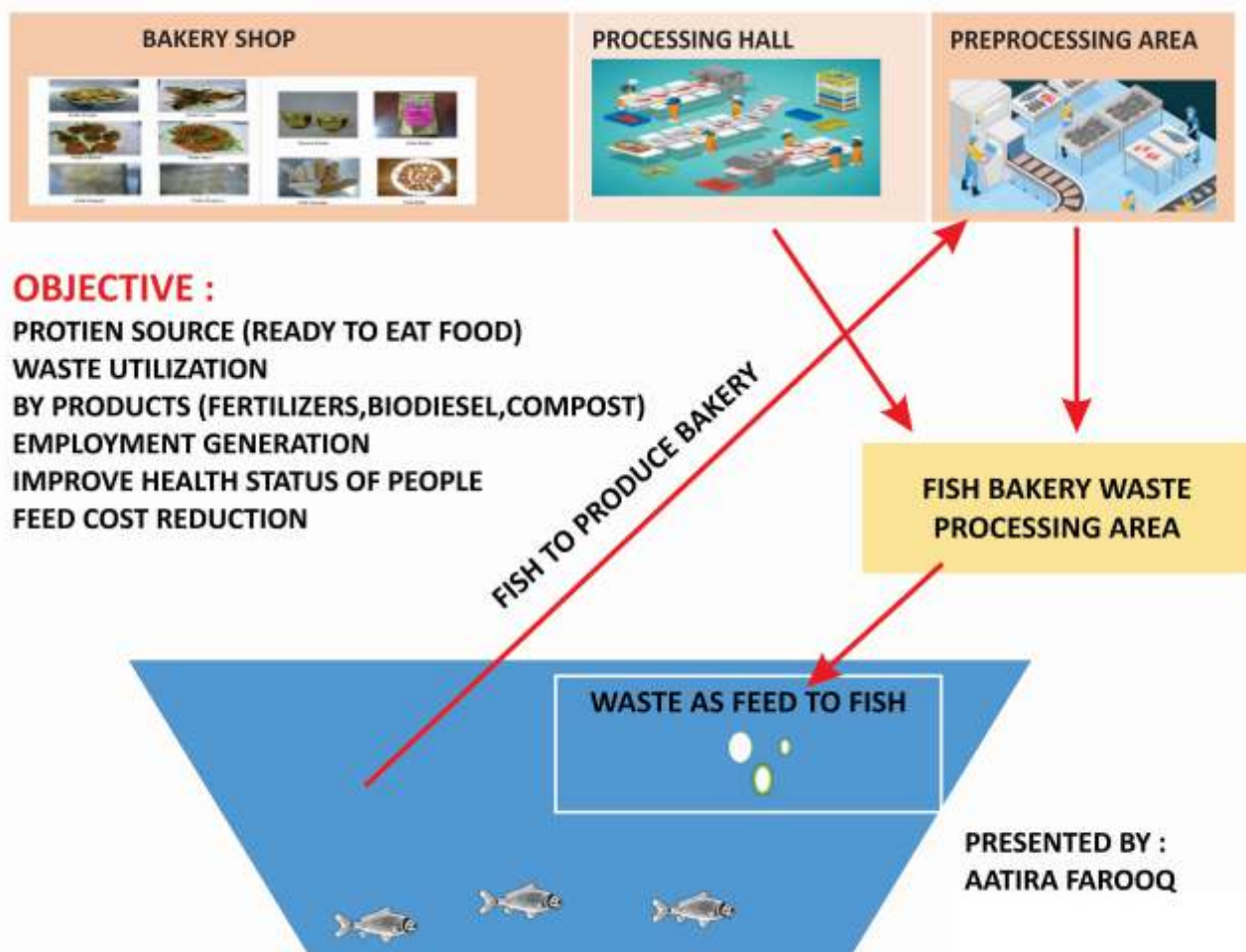
LiFE solution

Mindless consumption to Mindful utilization for becoming Pro Planet People must be upraised as a Mass Movement. As an Individual, I practice LiFE by not using micro-bead-based toothpaste/ facewash, by using biodegradable straws and paper-based earbuds, and by ensuring responsible disposal of my plastic waste. Beach cleaning as a community approach under “Swachh Sagar Surakshit Sagar” in coastal India for improving ocean health through collective action. The End of Life (EOL) gear and plastic bottles collected were used as basement fill for the fish drying platforms to cut down expenditure on infrastructure by fishermen at FLCs in Andhra Pradesh. “Ghost Gear Upcycling” by fishermen in Visakhapatnam, Andhra Pradesh, has turned the plastic into lifestyle accessories. The fishermen at Kollam, Kerala, carried out “Fishing for Litter,” the collected ALDFG and EOL gear was used for road construction under the “Suchitwa Sagaram Sundara Theeram” initiative. Adidas and Parley collaboration intercepted and retrieved indestructible gillnets from the Oceans, shorelines, coastal areas and developed “Primeblue” which is a high-performance yarn made with 50% Ocean plastic which was the upcycled plastic waste. Sea bins, inceptors, bubble barges, and booms used in South-Asian countries promote LiFE by reducing, reusing, and recycling plastic, i.e., through the Circular Economy. Crowdsourcing, Crowdstorming and Crowdfunding for RRR plastics opens a scope for reinventing and redefining the way we live on our “Mother Planet” sustainably as “Vasudhaiv Kutumbakam” such that we inspire and mobilise the Next Generation Creators.

Source of Inspiration of the Idea

My LiFE idea for individual was inspired from my mother who cuts the milk packet in a single piece rather than two and I am told by her that it goes into garbage as a single piece. Being a fisheries professional, straw affected turtle, plastic banded sea lion in a video made me to think on the irresponsible disposal of plastic waste by all of us into the environment that leads into our Oceans and other water resources.

FISH BAKERY **USE OF FISH TO PRODUCE FISH BAKERY PRODUCTS AND INTURN USE FISH BAKERY WASTE AS NUTRITIONAL SOURCE TO FISH**



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Fish Bakery

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Problem Description

With changing lifestyles, people these days prefer ready-to-eat products, most of which are unhealthy. Fish, which is a good source of protein, is the alternative to these products having enormous health benefits. Although in some parts of our country, there are ready-to-eat fish products available there is a lack of value-added fish products and units in Kashmir.

LiFE solution

In Srinagar, which is the summer capital of UT J&K, fish is considered a delicacy. Fish is a rich source of easily digestible protein that also provides polyunsaturated fatty acid, vitamins and minerals for human nutrition. Recovery of flesh by mechanical deboning and the development of value-added products are the most promising approaches. These include surimi and surimi-based products. Surimi is a washed fish mince and used as a base material for making different types of value-added products like fish cutlets, fish balls, fish noddle's fish sev and fish wada, fish fingers, fish Kheema, etc. The production and sale of value-added fish products showed great business potential besides serving as an alternative livelihood for fishermen. These fish products will also improve the health status of human beings. The waste that will be produced in the production of fish bakery can be used as feed to fish or for the production of any other byproduct such as fertilisers, compost, biodiesel etc. The use of this waste as a nutritional source will cut down the cost of feed, which accounts for about 60% of the cost of fish production. The fish bakery will be of great potential to improve the health status of human beings.

Source of Inspiration of the Idea

The idea is my own. During the 4th year of my bachelor's degree, we used to prepare ready-to-eat products like fish cutlet, fish balls, fish pickle for kisan mela, which is held every year in March by our State University. The products we were preparing used to sell in minutes and every time there was a shortage of product. Therefore, I came across the idea of setting up fish bakery in Kashmir, as there is no such unit in Kashmir.



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Diversification of Euryhaline Fish Species towards Adapting to the Impacts of Climate Change

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Problem Description

Anthropogenic climate change is a burning issue in recent times as various anthropogenic activities lead to global warming, which in turn causes extreme weather conditions and emerging diseases. These extreme weather conditions and emerging diseases have a greater impact on the aquaculture sector, leading to a decline in fish production and negatively affecting the livelihood of fisherfolk. So, there is a need to mitigate these losses in the aquaculture sector to improve the food security and livelihood of fisherfolk.

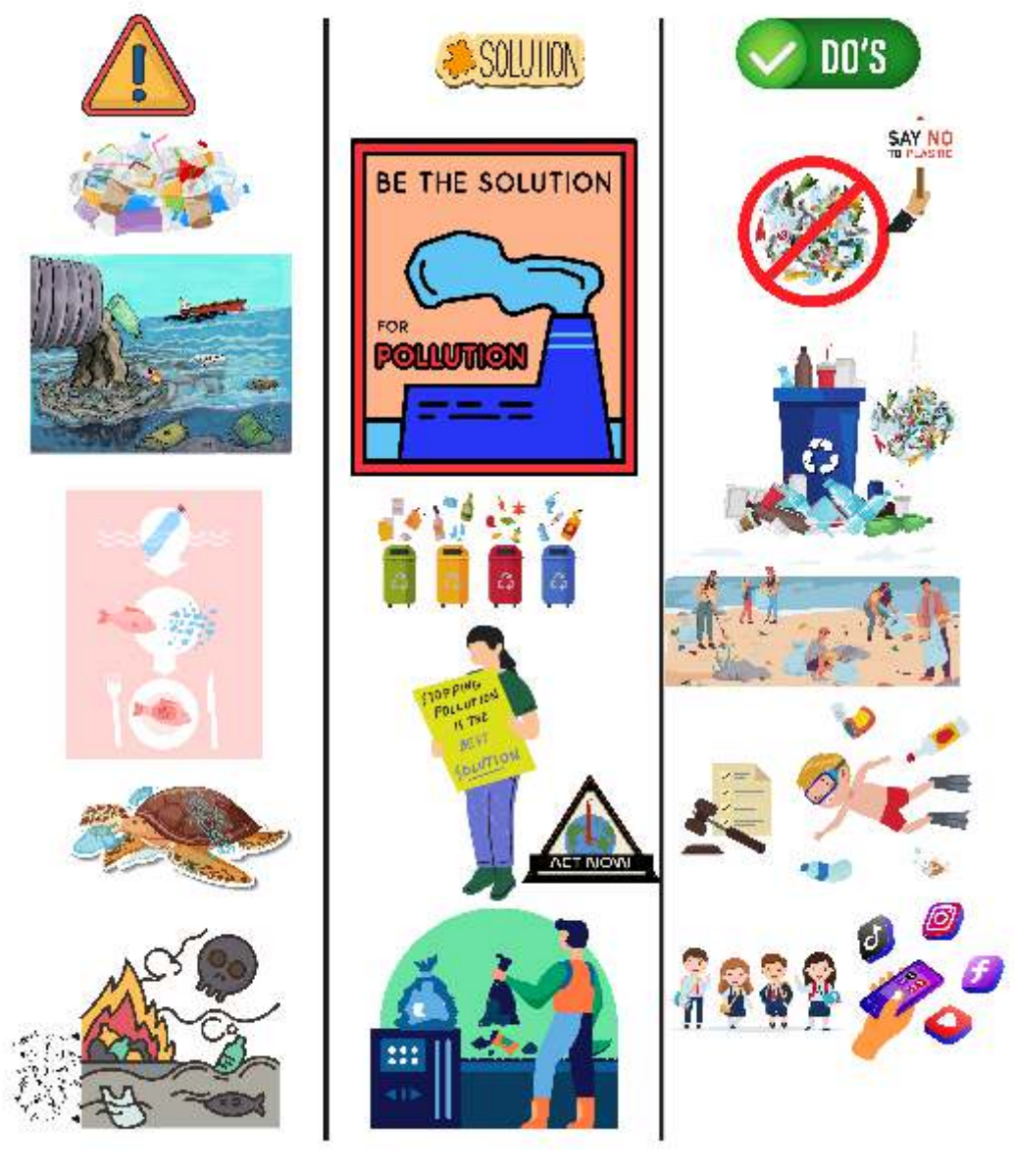
LiFE solution

Species diversification and the development of climate-resilient fish species will help to mitigate the losses in the aquaculture sector and improve the food security of the nation. Many species like milkfish (*Chanos chanos*), pearl spot (*Etroplus suratensis*), mullet (*Mugil cephalus*) and other important candidate brackishwater fish species have the ability to tolerate a wide range of salinity fluctuations (euryhaline species) can be exploited for the development of resilient species. In the present scenario, climate change causes various diseases to emerge that can collapse the present major freshwater candidate species production, which might affect the country's food security and fisherfolk's livelihood. The saline groundwaters also affect the present freshwater aquaculture, and inland saline waters can be utilised for the production of potential euryhaline fish species. Since there is a need to develop such a species that can resist and adapt to the various changes in the environment, euryhaline fish species can stand as a source for species diversification and developing climate-resilient varieties for better food security and livelihood.

Source of Inspiration of the Idea

Idea inspired from my research topic.

**" THE OCEAN DOESN'T NEED MORE PLASTIC. IT NEEDS OUR RESPECT, CARE,
AND COMMITMENT TO A PLASTIC – FREE FUTURE. "**



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Reducing Plastic Pollution in the Context of Fisheries Management

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Problem Description

Plastic pollution is a pervasive crisis that profoundly affects both coastal and marine environments. This widespread plastic waste poses a multifaceted threat, endangering marine life, food safety, human well-being, and coastal tourism. Marine creatures, from seabirds to whales and turtles, often mistake plastic debris for food, leading to starvation, internal injuries, and reduced swimming abilities, ultimately resulting in death. Additionally, "ghost gear," a silent killer of the ocean, entangles marine life and smothers coral reefs as it drifts.

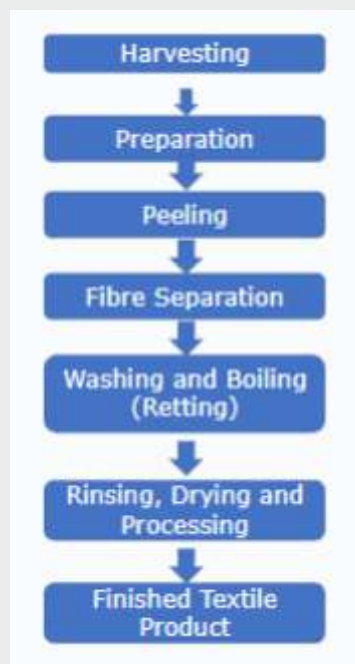
LiFE solution

Plastic, while offering significant societal benefits, has also become a major environmental threat due to its rapid production, particularly single-use plastics, which contribute to extensive pollution, including in our precious marine ecosystems. According to the International Union for Conservation of Nature (IUCN), land-based sources are responsible for a staggering 80% of marine debris, with the remaining 20% originating from marine-based sources. To tackle land-based plastic pollution, a range of strategies can be implemented. Foremost among them is the imperative to reject single-use plastics, urging individuals to choose reusable alternatives. Enforcing stringent measures against illegal plastic disposal and fostering public awareness through collaborative efforts involving governments, private institutions, and NGOs are vital steps in addressing this pressing issue.

Ghost gear, another environmental concern, necessitates a multifaceted approach. Encouraging the reporting and removal of fishing gear when encountered is crucial. Fishing harbours and landing centres should allocate space for the proper disposal of damaged gear. Acknowledging and rewarding fishermen who retrieve lost gear from the ocean can incentivise responsible behaviour and environmental preservation. Transitioning to biodegradable fishing gear rather than fragile synthetic options is a sustainable choice. Implementing compulsory labelling on fishing equipment and using QR codes can streamline gear management and prevent losses. Global collaboration, with more countries joining initiatives like the Global Ghost Gear Initiative, is paramount to effectively combat this issue.

Source of Inspiration of the Idea

My regular visits to the beach offer firsthand experience of plastic pollution, inspiring me to create a poster out of this idea.



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Weeds to Wealth: Saving the Environment with Water Hyacinth Textiles

Dinesh Singh

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Problem Description

The textile industry stands as one of the world's largest and most resource-intensive sectors, notorious for its substantial environmental impact. As the demand for textiles continues to grow, it becomes imperative to seek innovative solutions that not only address environmental concerns but also cater to this rising demand. Water Hyacinth is also a highly invasive plant whose removal is very cumbersome.

LiFE solution

Water Hyacinth as a Textile Component: Utilizing water hyacinth as a textile and dye component can transform this invasive plant into a valuable resource, mitigating its negative impact on the environment.

At “From Weeds to Wealth,” we offer a unique and compelling value proposition that encompasses both environmental stewardship and women’s empowerment. Our mission is to transform a seemingly abundant and troublesome aquatic weed, water hyacinth, into a valuable resource for sustainable textiles while simultaneously uplifting and empowering women in marginalised communities.

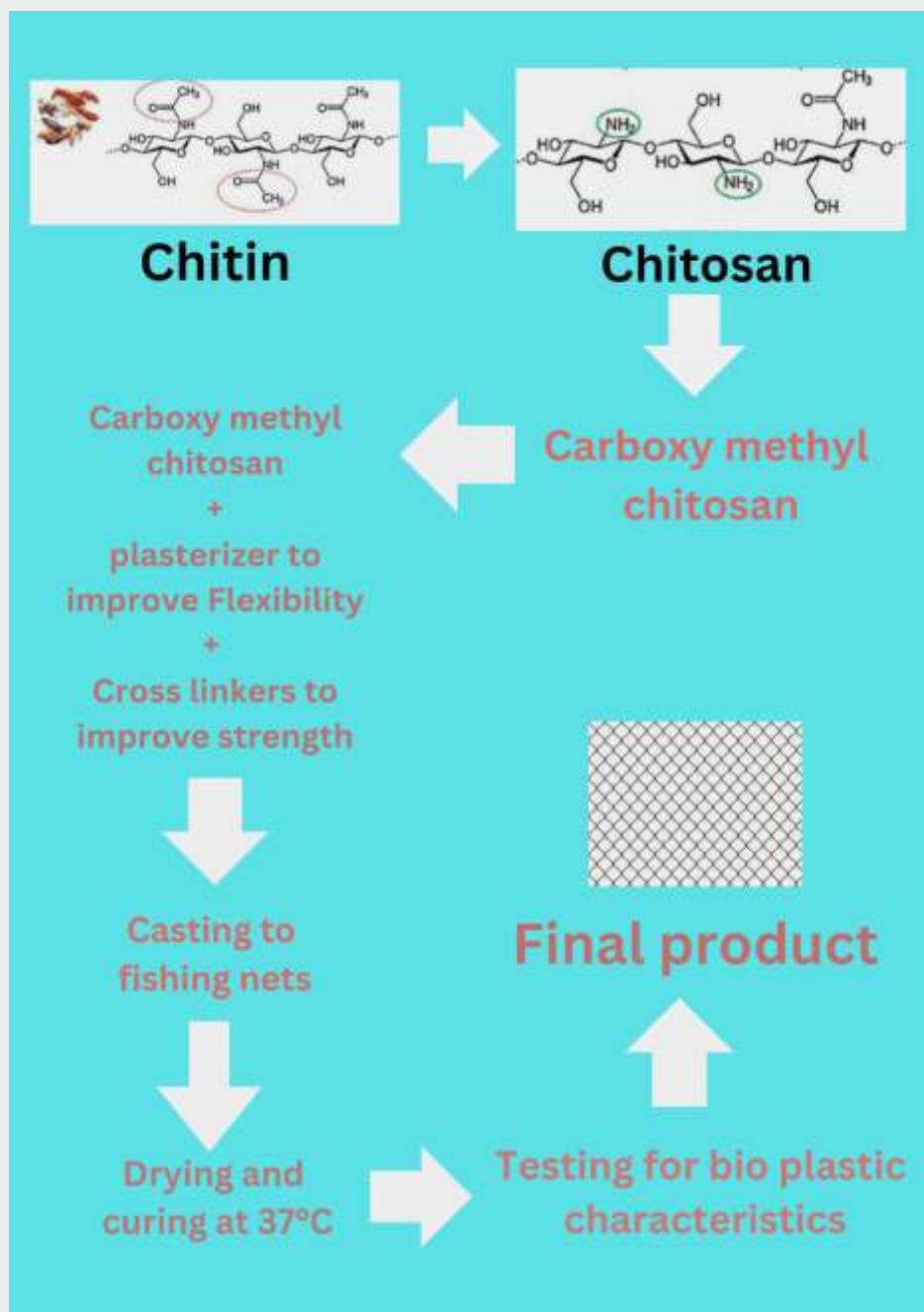
Fibre Extraction: Develop a cost-effective and environmentally friendly method for extracting fibres from water hyacinth. This could involve mechanical, chemical, or enzymatic processes.

Textile Production: Use the extracted fibres to create textiles. Water hyacinth fibres can be blended with other natural or synthetic fibres to enhance their strength and durability.

Dyeing: Develop natural dyeing techniques that use water hyacinth extracts or byproducts to create unique and eco-friendly colourations for textiles.

Source of Inspiration of the Idea

The idea is one I have thought of myself. After seeing a huge amount of weed infestation of Water hyacinth in the derelict water bodies around me. There are a lot of landfills around me too. And the waste management isn't proper. There are also a lot of unemployed women in my area, which made me adopt this idea.



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Replacement of Nylon Fishing nets with Bioplastic Nets

Sivaranjani L

Prathyusha Engineering College, Chennai

Problem Description

Among all the pollution of plastics in the oceans, fishing nets are an important component in the form of “ghost nets” which are nets lost in the sea. As they are made up of nylon, the nets do not degrade and fish and other marine fauna get trapped in them and die.

LiFE solution

To develop a fishing net made of biodegradable plastics from crab shells which may be a replacement for nylon-made nets. Marine pollution is mainly caused due to the accumulation of plastics. The most visible impacts of plastic debris are the ingestion, suffocation and entanglement of hundreds of marine species. To overcome this issue, Chitin which is a polysaccharide found in Crab shell, lobster shell and scales of some fishes, can be used as raw material for making chitosan which can be utilised in making biodegradable plastics. Carboxymethyl Chitosan, a derivative of chitosan, contains a carboxyl group, which accounts for the strength of chitosan. It has the property of pseudoplastics and can be made into any form of plastic utility. Preparation of nets using Carboxymethyl chitosan will have high tensile strength and resistance to salt water which makes them suitable for fishing. As it is made up of biological materials, it degrades over a period of time, thus preventing marine pollution.

Source of Inspiration of the Idea

Self-Developed idea





The Mission LiFE intends to nudge individuals to undertake simple acts in their daily lives that can contribute significantly to climate change adaptation when embraced across the world.

Submit Ideas for Mainstreaming LiFE in Fisheries Management

Recognition of Contributors

- * All contributors will get a certificate as 'LiFE Ambassadors'.
- * Selected ideas would be compiled and published as a compendium.
- * Top 20 contestants will get to attend the special event on LiFE, scheduled as a part of an FAO Workshop on Mainstreaming Climate Change into International Fisheries Governance at Mahabalipuram, Chennai during 16-19 Oct 2023.
- * All cost of participation of Winners will be covered (3AC train/bus, shared accommodation, and food). They will have the scope of meeting international fisheries experts and discuss their ideas.



How to Participate

It is open to all students, currently pursuing graduation or post-graduation course in any college or university. Students from abroad are welcome but travel support will be limited from the port of disembarkation in India to the venue, if selected.

Register & Submit by 30 Sep 2023

<https://forms.gle/9XS4RE7i8VwEuaFG7>

or email to info@bobpigo.org

Guidelines for Submission

Problem Description: 50 Words

LiFE Solution: 150 Words

The submission may include illustrations, pictures, or any other creative presentation and need not be limited to descriptive narration.

Concept Poster: 3 ft x 4 ft (Portrait; Digital)

The solution could be inspired by a traditional/ prevailing practice in India or any part of the world or could be a novel approach relevant to a specific geography or with universal application.



Announcement



Submission deadline



Results



The event

Organized by





The Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), set up in 2003, is a unique regional fisheries body, specifically mandated to assist the member countries in increasing the livelihood opportunities and improving the quality of life of the small-scale/ artisanal fisher folk in the Bay of Bengal region. The current members of the Organisation are Bangladesh, India, Maldives and Sri Lanka while Indonesia, Malaysia, Myanmar and Thailand are cooperating non-contracting parties.

The core objectives of the BOBP-IGO are to increase awareness and knowledge of the needs, benefits and practices of marine fisheries management; enhance skills through training and education; transfer appropriate technologies and techniques for development of the small-scale fisheries; establish regional information networking; and promote women's participation in marine fisheries value chain.

The Organisation evolved from the erstwhile Bay of Bengal Programme of the Food and Agriculture Organization (FAO) of the United Nations (UN) founded in 1979. Over four decades of operation, the Organisation has worked closely with the whole range of the stakeholders including the R&D Institutions to develop pathways to capacity enhancement for a sustainable future of the region. It has set international benchmarks in execution of programs and activities in the field of small-scale fisheries that has translated into measurable benefits for the member countries.

For further details, please see: www.bobpigo.org



Bay of Bengal Programme Inter-Governmental Organisation
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