

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(SOUTHERN ZONE BENCH, CHENNAI)**

ORIGINAL APPLICATION NO. 27 OF 2021

In the matter of:
Tribunal on its own motion
Suo Motu based on the news item in
The Hindu E- Paper, Edition dt. 28.01.2021,
"Faecal Contamination high in perandoor,
Edapally Canals"

-VS-

The Principal Secretary to Govt. Of Kerala,
Environment Department,
Room No.406, 4th Floor Annex II,
Secretariat, Thiruvananthapuram and Ors.

----Respondent(s)

**ACTION TAKEN REPORT FILED BY ADDITIONAL CHIEF SECRETARY,
ENVIRONMENT DEPARTMENT/1ST RESPONDENT**

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Dated at Chennai on this the 11th October, 2023.



M/s. E.K.KUMARESAN

Standing Counsel for State Government of Kerala - NGT(SZ) Chennai Bench

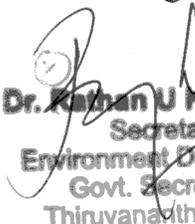


**Action Taken Report filed by Secretary to Government,
Environment Department, Government of Kerala
before the Hon'ble National Green Tribunal (SZ)
in Suo Motu in OA No.27/2021 & OA141/2021.**

It is submitted that as per the order of the Hon'ble NGT dated 22.09.2023 in OA 27/2021 & OA 141/2021, the Member Secretary, Kerala State Pollution Control Board (KSPCB) has submitted an action taken report in compliance to the order of Hon'ble NGT. The report submitted by KSPCB based on the details furnished by NEERI regarding the project proposal on Phytorid Waste Water Treatment Technology and also the eradication of water hyacinths and their productive use, as per the order of the Hon'ble NGT, is submitted as follows:

2. CSIR- NEERI has submitted revised proposal for Feasibility Study on Development of Process Package for Domestic Sewage to meet Environmental Compliance at Pallikkalar and Edappally- Perandoor Canal for an amount of Rs.45 lakhs + GST with a duration of 15 months and sanctioning order was issued to CSIR NEERI.

3. Regarding eradication & utilization of water hyacinths it is noted that some activities are being undertaken by various agencies in Kerala. A letter was issued to Harithakeralam Mission, Suchitwa Mission, Irrigation Department, Directorate of Agriculture, KIDS Kottapuram, Dr.G.Nagendra Prabhu, Professor and HOD, SD College, Alappuzha), Shri.Anuroop.G. (Payal Jwala Resource Management Pvt. Ltd.) and


Dr. Kishan U Kelkar IAS
Secretary
Environment Department
Govt. Secretariat
Thiruvananthapuram.

Kochi Metro Rail Ltd. requesting to share the activities regarding removal, productive use and disposal of water hyacinth. As per the reports received, actions are being taken for the utilisation of water hyacinth in the State.

4. State Government is taking earnest efforts for the proper treatment and disposal of waste to ensure protection of water bodies. Harithakeralam Mission under Navakeralam Karmapadhathi-II took action in collaboration with Rope Home Décor and Lifestyle along with Neelemperoor Grama Pnachayath and Alappuzha Municipality to make productive use of this plant to make several products like bags, mats etc. for national and international markets. Rope have tie up with international brands like Walmart and they expressed willingness to collect plants from Thiruvarp Panchayath in Kottayam District. 1904.28T of plants have already transported to Madurai factory and remaining portion is planning to make compost. Under Navakeralam Karmapadhathi-II, initiatives are being taken to promote local entrepreneurs in the State.

5. Centre for Research on Aquatic Resources, SD College, Alappuzha is making value addition of water hyacinth through rural technologies. Collection of weeds is being done with participation of public like affected parties and stakeholders for the production of multipurpose value added products, modified biomass briquettes, mushroom cultivation and biogas production. Products include exclusive paintings on special canvas for niche markets, handicrafts, biodegradable, ready to plant nursery pots, file boards, woven items, handmade paper, toy/ educational aids such as fruit/ vegetable/ animal models. Biogas plant for use in household kitchens, small scale canteens etc. were developed by "Paayal Jwala".


Dr. Roshan U Kelkar IAS
Secretary
Environment Department
Govt. Secretariat
Thiruvananthapuram.

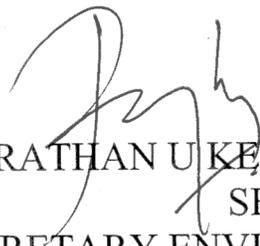
6. Kottapuram Integrated Development Society (KIDS), Thrissur is also working on natural fibre craft using water hyacinth. They have a research and development wing which is constantly experimenting with available natural fiber in the local area. Water hyacinths are collected from the water bodies usually by manual method. Then the leaves and roots are removed and used for making vermin compost and biogas plant. The stalk/stem is very fibrous and is used for making different products such as bags, mats, file boards, decorative items etc.

7. Reports received from Navakeralam Karmapadhathi-II, KIDS Kottapuram, Dr.G. Nagendra Prabhu are submitted herewith.

8. Thus it is humbly prayed that the above action taken report in compliance to the order dated 22.09.2023 of this Hon'ble National Green Tribunal may kindly be accepted.

Dated this the 10th day of October, 2023.

(X)


DR RATHAN U KELKAR I A S
SECRETARY
O/O SECRETARY ENVIRONMENT
Dr. Rathan U Kelkar IAS
Secretary
Environment Department
Govt. Secretariat
Thiruvananthapuram.

☎ General: 0471- 2312910, 2318153, 2318154, 2318155 Chairman: 2318150 Member Secretary: 2318151
e-mail: chn.kspcb@gov.in; ms.kspcb@gov.in FAX: 2318152 web: kspcb.kerala.gov.in



KERALA STATE POLLUTION CONTROL BOARD

കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്

Pattom P.O., Thiruvananthapuram – 695 004

പട്ടം പി.ഒ., തിരുവനന്തപുരം - 695 004



KSPCB/245/2023-AE-13

Date: 03/08/2023

From

Member Secretary

To

1. The Coordinator
Harithakeralam Mission
Opposite Bhaarateey Jeevan
Bema nigam, Pattom,
Thiruvananthapuram – 695004
2. The Executive Director
Suchitwa Mission
Swaraj Bhavan
Nanthancodu, Kowdiyar
Thiruvananthapuram – 695003
3. The Chief Engineer
Irrigation Department
Public Office Building
Museum P.O.
Thiruvananthapuram
4. The Director
Directorate of Agriculture,
Vikas Bhavan,
Thiruvananthapuram – 695 033
5. Fr. Paul Thomas Kalathil
Director of Social Action
Kottapuram Integrated
Development Society (KIDS)
KIDS Campus,
Kottapuram – 680 667
6. Dr. G. Nagendra Prabhu
Professor and HOD,
Department of Zoology
SD College

7. Shri. Anuroop. G

Payal Jwala Resource Management Pvt Ltd
C /o Kanjirathinkal house ,
Opp. Fire station , Cherthala,
Kerala – 688524

8. Kochi Metro Rail Ltd.

JLN Metro Station, 4th Floor, Kaloor
Ernakulam – 682 017

Sub:- Water Hyacinth removal and productive use

Ref: Order dated 16.02.2023 and 17.07.2023 of the Hon'ble NGT (SZ) in OA No. 141 of 2021

Sir,

The Hon'ble NGT vide order dated 16.02.2023 and 17.07.2023 in OA No. 141/2021 directed to explore the possibilities of using water hyacinth as a resource. It is noted that you have done some works on removal, productive use and disposal of water hyacinth. Hence you are requested to share the activities carried out in this regard. Kindly treat this as an urgent matter and report the details with regard to the eradication of water hyacinths and its productive use immediately as next posting of the case is on 31.08.2023.

Yours faithfully,

Shree A1

MEMBER SECRETARY

Copy to:

The Chief Environmental Engineer
Regional Office
Thiruvananthapuram



6

Ref 5



Dr. T.N. Seema (Ex.M.P)
Coordinator

Nava Keralam Karmapadhathi
Government of Kerala

No. NKP/A1/1729/2023/HKM

09/08/2023

To

The Member Secretary
Kerala State Pollution Control Board
Thiruvananthapuram

Sir,

Sub: Water Hyacinth Removal**Ref: Your letter No.KPSB/245/2023-AE-13 dated 03/08/2023**

Water Hyacinth (*Eichhornia crassipes*) is a fast growing invasive species, now spread across many water bodies in the State. These aquatic plants form a mat on the surface of the water body substantially reducing Dissolved Oxygen (DO) in water making the water body not suitable for other natural species to survive. Clogging of waterways makes boating, fishing and other activities difficult. These plants double itself in 5 to 15 days. Climatic conditions in Kerala are favourable to its growth. Pollution of the water bodies also promote its growth by supplying nutrients.

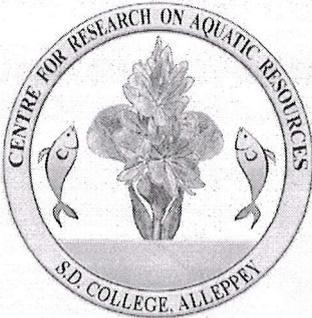
Water hyacinth is native to South America, the only continent where natural predators such as weevils and moths keep it at bay. Cutting a plant into pieces will not destroy it. It produces thousands of seeds in an year.

As overgrowth of these weeds is resulting in severe environmental issues. Harithakeralam Mission collaborated with Rope Home Decor and lifestyle along with Neelamperoor Grama Panchayath and Alapuzha Municipality to make productive use of this plant. Rope Home Decor makes several products like bags, mats etc for national and international markets. They have tie up with international brands like Ikea, Walmart and famous national super markets. Rope is making payment for the plants that are cut and partially dried before sending it to their factory at Madurai. Now, they have expressed willingness to collect the plants from Thiruvarp Panchayath in Kottayam District also.

We have transported 190428 Kg of plants so far. The plant is rich in biomass. Therefore, we are planning to make use of the remaining portion of the plants in making compost. However, this attempt alone would not help in keeping our water bodies free of this menace. Harithakeralam Mission has initiated this as a model. There are other agencies as well making useful products out of water hyacinth. We may also think of promoting local entrepreneurs to tie up with technical institutions capable of providing support in making innovative products from water hyacinth.

Yours faithfully

Dr. T.N. Seema



Centre for Research on Aquatic Resources

S. D. College, Univ. of Kerala
Alappuzha – 688 003, Kerala, India
(Accredited by NAAC with A+ Grade)
Phone: +91-9495017901(Mobile)
E-mail : prabhugn@sdcollege.in

Prof. Dr. G. Nagendra Prabhu
Principal Investigator

14-08-2023

To

The Member Secretary,
Kerala State Pollution Control Board
Pattom P. O, Thiruvananthapuram - 695004

Respected Madam,

Sub:- Proposal for productive use of water hyacinth – regarding

Ref:- Your letter No. KSPCB/245/2023-AE-13 dated 03-08-2023

Greetings from CRAR, Sanatana Dharma College, Alleppey, Kerala, the oldest and one of the largest grant-in-aid colleges under the University of Kerala with A+ grade of NAAC (third cycle), recognized by UGC and supported under the FIST programme of the Dept. of Sci. & Tech, Govt. of India.

In response to your letter referred above, I am submitting a proposal entitled "**Value Addition of Water Hyacinth Through Rural Technologies**", for kind consideration. The rural technologies mentioned in the proposal were developed by us through more than 25 years of research. They are easy to adopt and can be implemented without much investment, at the same time providing additional livelihood opportunities for the local population as well as control the unchecked growth of these weeds.

If any further details or information are required, I shall be happy to submit the same. Looking forward to hearing from you. With warm regards.

Yours truly,

Dr. G. Nagendra Prabhu

Encl:- Soft copy of the proposal and details of CRAR

Proposal on

Value Addition of Water Hyacinth Through Rural Technologies

Submitted by

Professor (Dr.) G. Nagendra Prabhu

Principal Investigator, Centre for Research on Aquatic Resources
Head, P. G. Department of Zoology & Research Centre
S. D. College, Univ. of Kerala, Alleppey – 688003
Ph: 9495017901; Email: prabhugn@sdcollege.in

in association with

EichhoTech

Student Start-up

*No 1, SDC-TBI, S D College Campus
Alleppey – 688003
[Training & Marketing Partners]*

submitted to

Smt. Sheela A M

Member Secretary, KSPCB
Thiruvananthapuram

August 2023

Proposal on

Value Addition of Water Hyacinth Through Rural Technologies

The Weed & Its Impacts

Water Hyacinth (*Eichhornia crassipes*) is the most troublesome weed in the World. Under favorable growth conditions, these weeds will double within about a week's time and cover the entire surface of the water. This **mat-forming nature** degrades natural habitats in several ways.

- ◆ The live plant-mat prevents the entry of sunlight & atmospheric oxygen from entering the water. The decaying ones consume dissolved oxygen needed by fish and other aquatic life – **increase in Biological Oxygen Demand (BOD)** & causes the **greatest threat to biodiversity**.
- ◆ Their growth **affects livelihood** of thousands of people in Kerala.
- ◆ Disease spreading vector species of mosquitoes breed freely in the static waters enhancing the chances of **mosquito borne diseases**.
- ◆ The water quality loss makes it unsuitable for human use – **decrease in potability**. This puts pressure on Water Authority.
- ◆ Many reports suggest that the rate of emission of methane (a Green House gas) from weed infested water is more, thus contributing to **global warming**.



Eichhornia crassipes (Water Hyacinth)

Aquatic Weed Management Strategies

While the Government and other agencies have tried to control the weed by physical removal, chemical control and rarely by biological control, none has proved to be successful. The **only solution lies in the economic utilization** of these plentiful “natural resources” by sustainable, simple, innovative and economically viable techniques - the concept of **Management through Utilization – Use to Reduce**. Our research @ Centre for Research on Aquatic Resources, S D College during the last 25 years has focused on developing strategies for the utilization of these weeds. The following strategy on sustainable management of water hyacinth and similar aquatic weeds is presented in the light of our innovation and experience.

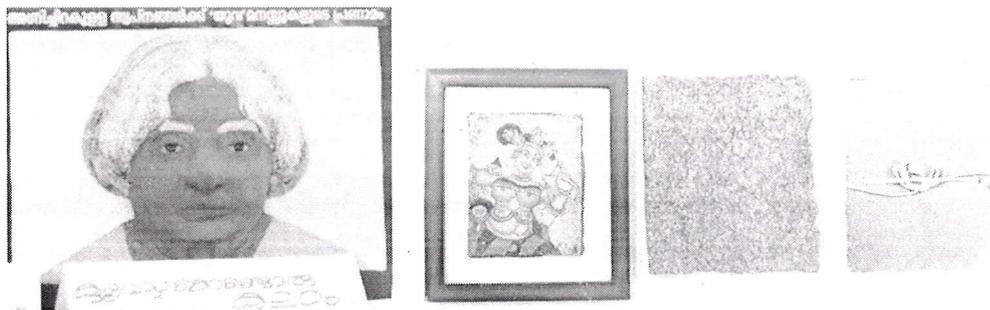
Action Plan on Value Addition

Integrated, Decentralized, People-participatory Model – low investment, easy to adopt, environment friendly, sustainable and *ensuring alternate livelihood* to those who are living near the water ways, especially **in the post-flood & post-COVID scenario**.

Utilization Strategy – Small & Medium Scale, easily replicable model

- Collection of Weeds – **People Participatory** involving affected parties and stakeholders.
- Product Range - Multipurpose **Value-added products, Modified Biomass Briquettes, Mushroom cultivation and Biogas production**.

Multipurpose Value Added Products – Ecofriendly or “green” products from aquatic weeds; great diversity in range; 100 % community based and ensuring gender equity, employment and income generating in the post-flood and post-COVID scenario. Products include **exclusive paintings on special canvas for niche markets, handicrafts, biodegradable, ready-to-plant nursery pots, file boards, woven items, handmade paper, toys/educational aids** such as fruit/vegetable/animal models.



Models and multipurpose boards made using water hyacinth pulp

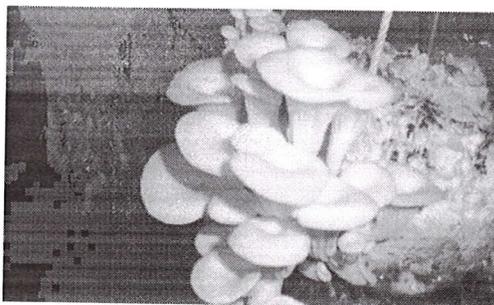


Disposable plate and biodegradable nursery/indoor pot



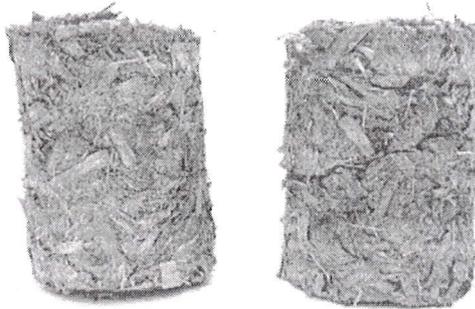
Premium value added products from Water Hyacinth handmade paper and dried stem

Mushroom Cultivation – edible mushrooms can be cultivated on special beds prepared from aquatic weeds. Ensures regular income and contributes to nutritional security. **Care has to be taken to use water hyacinth from non-polluted areas such as paddy fields.**



Mushroom cultivation on water hyacinth

Modified Biomass Briquettes using dried water hyacinth – For use in domestic and small-scale kitchens like hostel mess, Kudumbasree Canteens, hotels etc. Can be used as smoke-less alternate fuel for processing of clams.



Modified biomass briquettes

Biogas production - using existing or newly installed biogas plants (digesters) for use in household kitchens, small scale canteens etc. Developed by “Paayal Jwala”



Low-cost Weed Chopper, Biogas Digester and Briquetting Machine

All the products mentioned above are available for inspection and testing. They can be produced by people of all ages, sex and abilities. Several other innovative products are also developed in our lab.

Large scale utilization options (organic manure, floating agriculture and industrial scale briquettes) are also available as mentioned in the Project flow-chart provided at the end of this document.

Marketing of Products

Both **offline and online platforms** can be used. Products can be sold through existing Government / Tourism outlets, Art Galleries, other Government / Semi-Government / Private agencies; corporate gifts; as innovative gifts at all functions organized by District Administration, Kochi Metro, Cochin Shipyard etc.

Sustainability

- Ensuring people participation through small incentives at various levels
- Sale of value added products
- Sponsorships by various companies and corporate groups and lake side resorts
- Can use defunct or under-utilized factories or open spaces near the water bodies.
- The work force under MGNREGA and self-help groups can be employed for the purpose.
- Support of various Government Schemes can be obtained.

Mode of Implementation

Training programmes **can be arranged in the Community Training Centre at S. D. College or on-site proposed by KSPCB.**

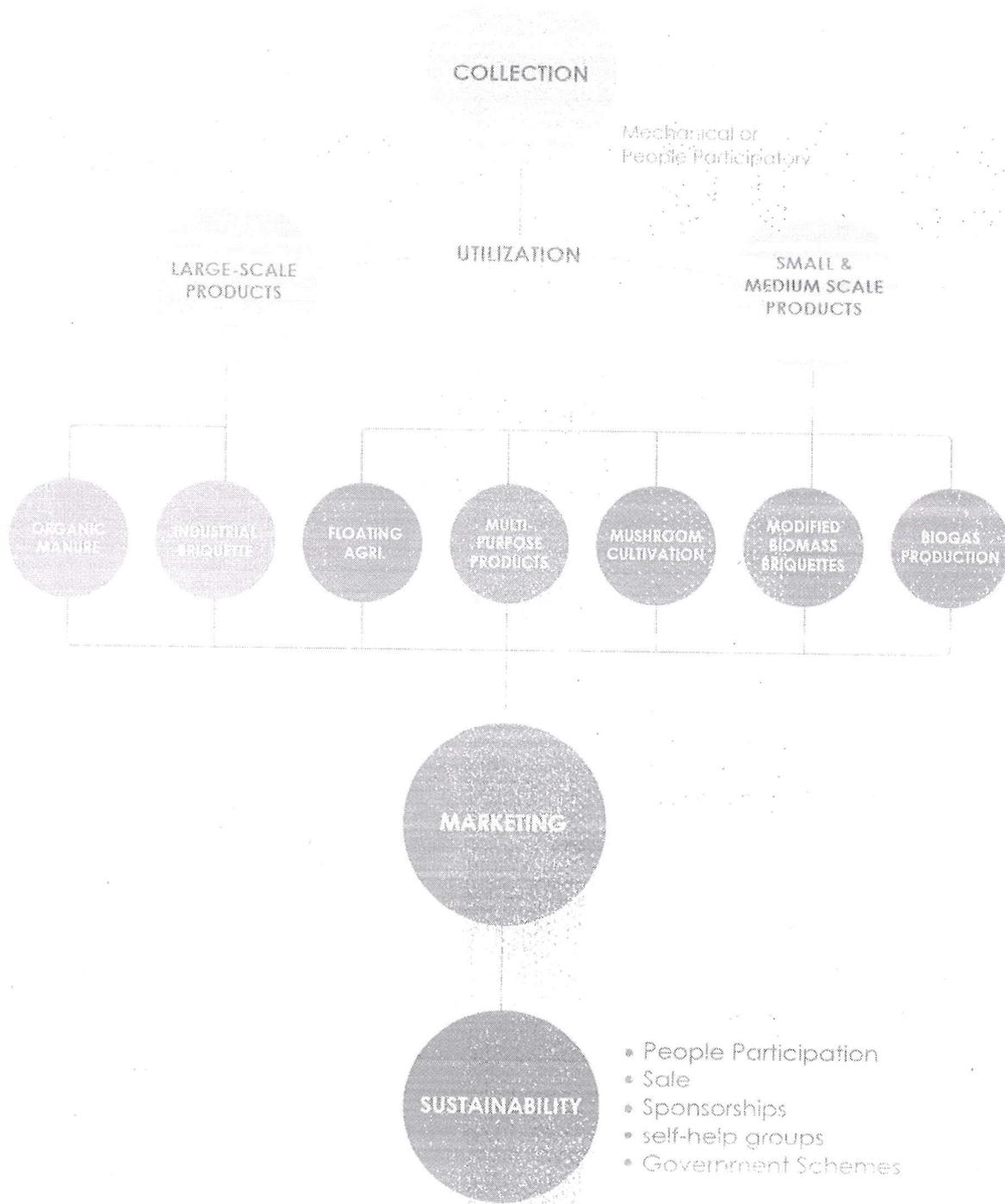
Agreement regarding financial aspects, acknowledging CRAR, SDC and profit sharing needs to be reached, as per mutually agreeable terms and conditions. The project can be started immediately upon reaching formal agreement.

Further information or clarification will be provided. An expert team from KSPCB are welcome to visit our College for familiarizing with the products and personal discussions.

Photos of Training sessions at the Community Training Centre since 2017 (selected ones only)



Project Flowchart



Alleppey
14th August 2023

Dr. G. Nagendra Prabhu
Dr. G. Nagendra Prabhu
Principal Investigator, CRAR



Brief details about
CENTRE FOR RESEARCH ON AQUATIC RESOURCES
S. D. College, Alleppey - 688003

CRAR is an interdisciplinary research centre attached to the P. G. Department of Zoology & Research Centre of S. D. College, Alleppey. The College is the first aided College affiliated to the University of Kerala, recognized by UGC under 2 (f) and 12 (B), and re-accredited by NAAC with A+ grade in the third cycle. The P. G. Department of Zoology & Research Centre is an approved research centre of the University of Kerala. The CRAR is an extension of the Microbial Biotechnology Unit established by Dr. G. Nagendra Prabhu during 1998 and re-organized during March 2011 with specific aims and objectives of developing suitable technologies for the water rich regions, especially Kerala. An interdisciplinary team of researchers and faculty work together in the Centre.

The Centre has not only developed several technologies for the utilization of aquatic weeds namely:

1. Production of Cellulase enzyme using bacteria and fungi using water hyacinth and *Salvinia* under Solid State Fermentation.
2. Isolation and Characterization of Siderophore producing bacteria from Kuttanad.
3. Mushroom cultivation using aquatic weeds.
4. Pulp based products from water hyacinth.
5. Biomass Briquettes – for both industrial and household purposes.
6. Animal feed using water hyacinth (under development)

Major Achievements of CRAR

- Currently collaborator for a major international (Indo-UK) collaborative project on water hyacinth monitoring using satellite imagery, drones and field based sensors. Total project fund to the tune of Rs. 3 crores by the Royal Academy of Engineers, UK (2020-23).
- The efforts of CRAR has resulted in the inclusion of a provision of Rs. 5.00 lakhs in the budget for the financial year 2018-19 for the establishment of a centre for value addition of aquatic weeds through CDS-Kudumbasree of Alleppey Municipal area.
- Approved training provider for Kudumbasree, Alleppey Municipal Council, Inmates of Alleppey District Jail, BUDS Schools and BUDS Rehabilitation

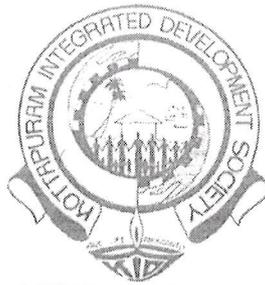
Centres of Alleppey District, Science & Arts Teachers of various schools from Haripad Educational Zone, ATREE, Bangalore and several Colleges, Schools NGOs and SHGs throughout Kerala.

- Produced three (3) Ph. D. degrees of the University of Kerala. Currently, one scholar is on the rolls.
- Handled eight (8) Research and Extension Projects funded by DST, Govt. of India, UGC, Govt. of India, KSCSTE, Govt. of Kerala and Kerala Biotechnology Commission, Govt. of Kerala.
- Launched a Community Training Centre during February 2017 for offering training to various stake-holders on value addition of weeds.
- The PI has received several awards and fellowships at the International, National, State and Regional levels.
- Organized Awareness Sessions, Exhibitions and Training Programmes at CUSAT, M G University, CMFRI, Engineering Colleges, Polytechnics and Schools throughout Kerala.
- Submitted suggestions to Expert Team appointed by Govt. of India during 2017 which resulted in a project report on the utilization of water hyacinth in Kuttanad to the tune of Rs. 98 crores in 2018.
- The suggestions by the PI have been incorporated in the Report of the Legislative Committee on Environment, Kerala during 2018.
- Suggestions have been given to the State Planning Board during 2016 and 2018 and also at National level through the MyGov portal.
- The activities of the Centre have been extensively covered in various national and international media – online, press and TV. Several scientific articles and reports have been published in national/international journals.
- Mentor to two Student Startups at Govt. Engg. College, Barton Hill, Trivandrum (Ecoloop360) and S. D. College, Alleppey (EichhoTech).
- EichhoTech is the only college team in Kerala to successfully exit the YIP 2019-20 of KDISC, Govt. of Kerala.
- Their work has been recognized through various awards such as winners of the India Plastic Challenge Hackathon 2021 by Ministry of Environment, Forests and Climate Change, Govt. of India; Regional Rural Innovators Award of KSCSTE, Govt. of Kerala (2022) and Nature based Solutions Challenge 2023 of UNEP and KILA.
- EichhoTech has successfully supplied ecofriendly, designer gifts and stationaries to Kerala Start-up Mission (2022), Nehru Trophy Boat Race Society (2022 and 2023), S. D. College Management (since 2019) and many other agencies and individuals.

Prasanna

**USE OF INVASIVE WEED WATER HYACINTH IN
NATURAL FIBRE CRAFT SO AS TO EFFECTIVELY
REDUCE IT AND ENSURE LIVELIHOOD SECURITY**

Submitted by



KOTTAPURAM INTEGRATED DEVELOPMENT SOCIETY [KIDS]

KIDS' Campus, N.H. 17, Kottapuram

Kodungallur – 680 667, Thrissur Dist., Kerala, India

Phone: +91 480 2803165, 2807638

E-mail: kidskottapuram@gmail.com

Website: www.kidskottapuram.org

“USE OF INVASIVE WEED WATER HYACINTH IN NATURAL FIBRE CRAFT SO AS TO EFFECTIVELY REDUCE IT AND ENSURE LIVELIHOOD SECURITY”

1.0. INTRODUCTION

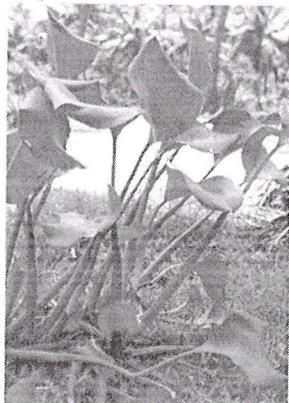
WATER HYACINTH - A Menace turned into Resource

The inland waters of Kerala is having a major feature of the presence of large floating mats of nuisance weeds called *Eichornia crassipes*. This weed, commonly called as water hyacinth is very common in stagnant waters of the area. However, whenever the flow becomes low, explosive increase of *E. crassipes* also occur in river mouths. Domestic sewage and the residues of chemical fertilizers reaching the water bodies through agricultural runoff result in the enrichment of the aquatic system and in turn boost the growth of this weed.

Excessive growth of water hyacinth causes grave hardship to inland navigation, irrigation, local fishing and domestic washing. The water infested by water hyacinth has obnoxious smell and suspended particulate organic matter, making it unfit for human consumption. The mats effectively cut off all light from underlying waters and also produce significant reduction in dissolved oxygen concentrations. Fish deaths are common in certain areas which are infested with water hyacinth. In general (This invasive species is known to cause severe detrimental effects to the health of aquatic eco systems, biodiversity, fisheries, agriculture and other human enterprises, as well as on human health).



Water hyacinth – an invasive alien species and its control:



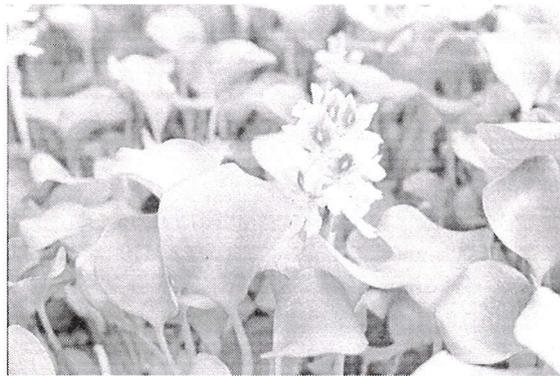
Water hyacinth (*E. crassipes*) is native to South America but now is an environmental and social menace throughout the tropical and subtropical world. This weed can double its biomass once in every 8 to 10 days in warm nutrient rich waters. Its annual organic production is around 50 to 70 tons/ha. Undoubtedly, water hyacinth is one of the most successful invasive alien species in the world. Scientists have tried for developing both biological and chemical control of this weed. The main draw back with biological control of water hyacinth is the time required (4-5 years in tropical environments and it is influenced by extent of

infestation, climate, water chemistry etc). As the weed infestation increases and extensively spread, biological control is least effective. Chemical control is less expensive but least ecologically friendly as the herbicide residue levels may be high and its detrimental effects upon other aquatic communities and fish are alarming.

As both biological and chemical methods for the effective control of water hyacinth are not found to be effective, proper and efficient utilization of the weed is a highly sustainable and sensible option. However this has not been efficiently developed.

Potential of Water hyacinth fiber in the natural fiber craft:

KIDS is having a Research and Development wing which is constantly experimenting with every available natural fiber in the local area. They found that the petiole of water hyacinth is an excellent soft and spongy natural fiber which can be weaved as such for making wall mattings, door mats, cushions, hats, purses etc, or can be easily blended with other materials like coir, banana



fibre, screw pine, reeds, bamboo, sedges, sea grass, jute etc. Water hyacinth fibre is very soft and spongy which can effectively reduce the rigidity and hardness of all the above mentioned hard natural fibres. This is a rare and highly desirable quality in natural fibre craft. Many of the general utility items which can be made in this manner can be ideally used as alternatives for many non-degradable plastic products. Water hyacinth fibre is found to have great affinity for basic dyes. By using the mordent, natural dyes also can be conveniently used for colouring this fibre.

Processing

1. Collection of raw materials

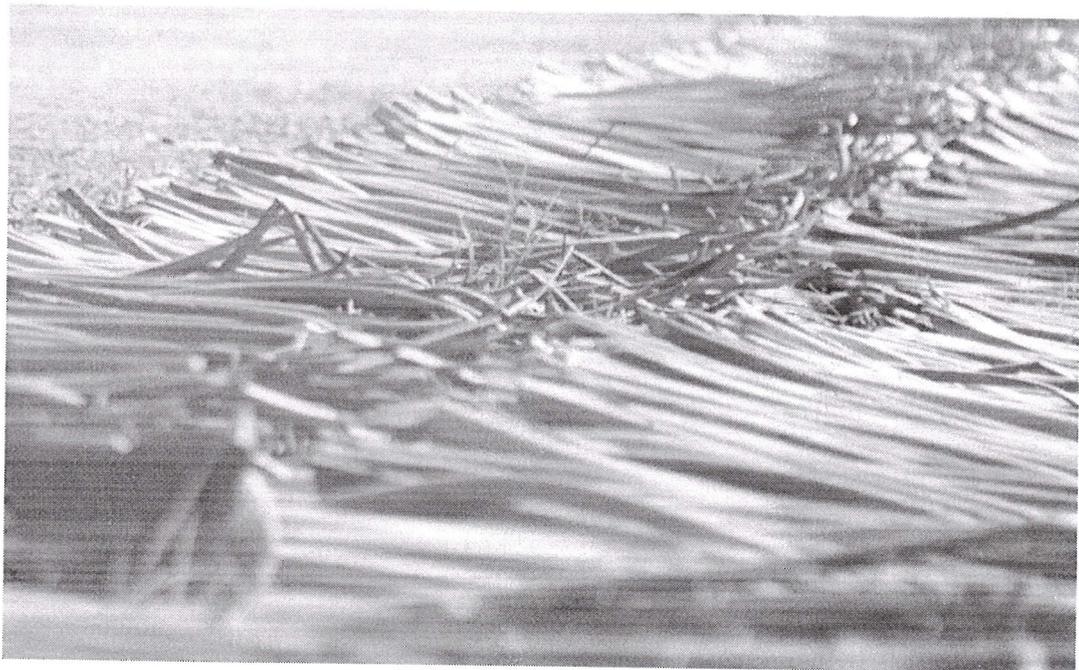
Water hyacinth plants are collected from the water bodies. Usually this is collected by manual method. These are taken for making different products. The water hyacinth has got a bulb like structure at the end of the stalk which grows and elongates to form long stalks. The stalks would be **30 cm to 45cm length. Then only we can use it for production.**



2. Cutting – Removing Leaves and Root



The leaves and roots are removed carefully which is used for making vermi compost and biogas. The stalk/stem is very fibrous and is used for the making of different products.

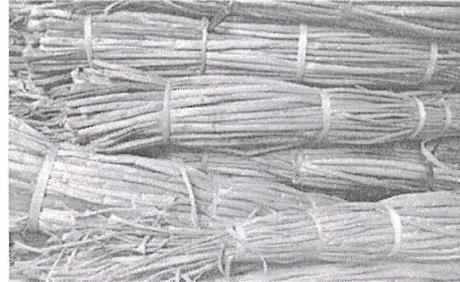
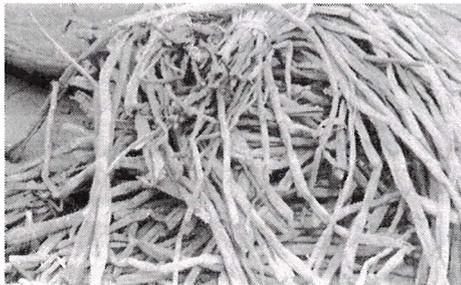


3. Drying

Almost 96% of the plant is filled with water. So as to remove the water content this stalks are dried in sunlight for one week. If not dried properly, this would lead to deteriorating the quality of the product. The stalk is very spongy; due to this it has a foamy effect.



Drying



Dried Water Hyacinth

4. Cleaning

When the stalks are soaked in water it becomes soft and cleaning process is easier in this stage. For cleaning the pith inside the stalk, first they are split into two. The pith is removed by scrapping using a knife. The pith is soft and is easy to scrap out. While scrapping, care should be given for not damaging the thinner stalk sections.



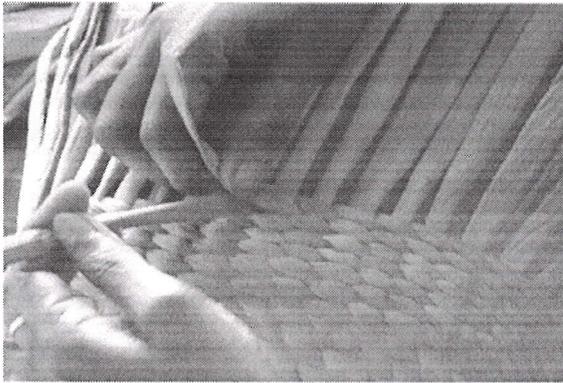
5. Dying

The cleaned strands are dyed accordingly for their use. Then they weave these dyed strands into beautiful products.

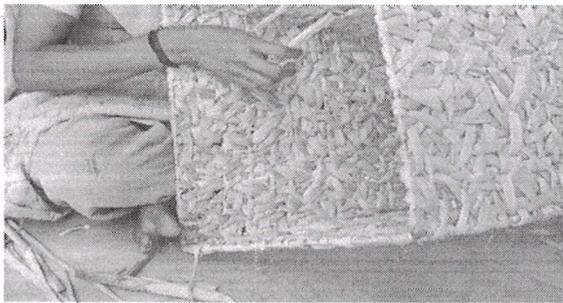


6. Weaving

The dried water hyacinth strands are cleaned and hand woven according to customers purposes. There are different types of weaves Circular weave, Designer weave, Pattern weave.



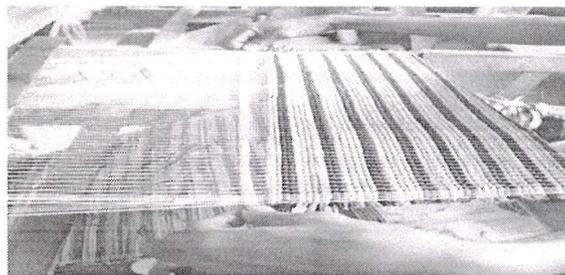
Weaving



Wild Weaving



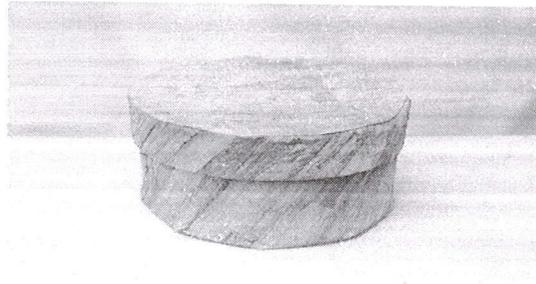
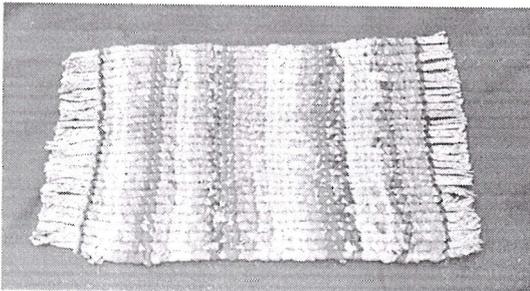
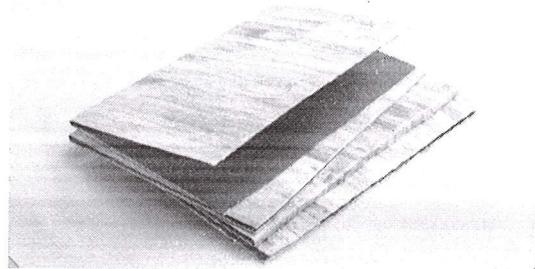
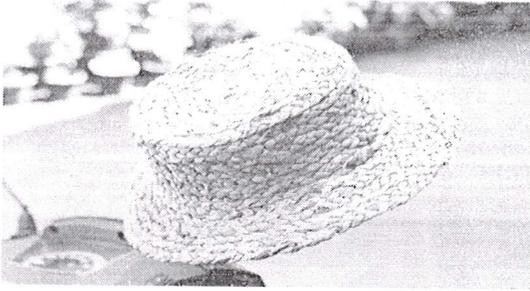
Water Hyacinth Looms

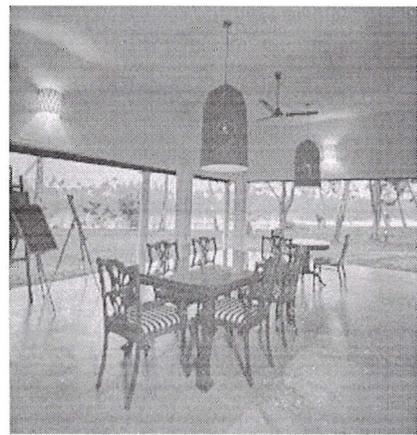
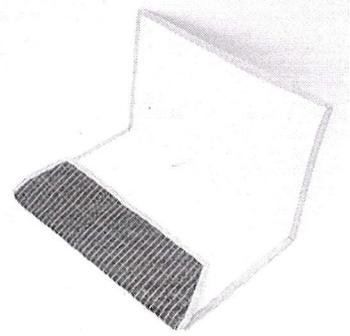


Loom Mat Weaving

KIDS developed the Water Hyacinth loom, the first of its kind in the world.

SOME PRODUCTS DEVELOPED OUT OF WATER HYACINTH





2.0 BACKGROUND - THE PROJECT

2.1 Problem Analysis

Problems or issues the project intends to address and proposed solutions:

(i) Impact of Water hyacinth on aquatic biodiversity:

Water hyacinth absorb large amounts of nitrogen, phosphorous, other nutrients and elements from water, thus depriving these vital things to the phytoplantation, zooplantation and fish stocks. Conversely the decomposition of large amounts of this weed leads to oxygen deficiency and anaerobic conditions under floating mats of weeds. This again ends up in fish death and changes in the fish community by eliminating most of the species at the expenses of air breathing species. Stationary mats of water hyacinth also shade out bottom growing vegetation, thereby reducing the food and spawning grounds of several species of fishes.

(ii) Effect of water hyacinth on aquatic plant community, structure and succession.

Water hyacinth replaces aquatic plants and develops floating mats of interlocked water hyacinth plants which are colonized by several semi aquatic plant species. As succession continues, floating mats dominated by large grasses may drift away or be grounded. This processes can lead to rapid and profound changes in wetland ecology, eg: shallow areas of water will be converted to swamps.

(iii) Effect on inland navigation:

Water hyacinth mats are difficult or impossible to penetrate with country boats (which is the only method navigation practiced in the area so far). This can have a severe effect on local transport.

(iv) Impact on flow:

In slow moving water bodies, water hyacinth mats physically slow the flow of water, causing suspended particles to be precipitated leading to silting. The reduced water flow also causes flooding and adversely affects irrigation schemes.

(v) Increased water loss by evapo-transpiration:

Water hyacinth is reported to cause substantially increased loss of water by evapo-transpiration compared to open water. Displacement of water by water hyacinth can mean that the effective capacity of water reservoirs is reduced

upto 400m³ of water per hectare, causing water levels in reservoirs to fall more rapidly in dry periods.

(vi) Impact on human health:

The conditions created by water hyacinth encourage the sectors of human diseases, eg. Most mosquito sectors like Malaria and filariasis. In Kerala, the once eradicated Malaria is reported to be coming back again. The water infested by these weeds has bad smell contains suspended particular organic matter making it difficult for human consumption.

(vii) Impact on the livelihood of the fishermen:

Infestation of water hyacinth makes access to fishing grounds increasingly time consuming or impossible. Physical interference with fishing nets makes fishing more difficult or impractical. In the proposed project area, there are regulators at certain rivers for checking the intrusion of saline water into the inland areas. When the shutters of the regulators are closed the weed get blocked in the upstream of the regulator and when the regulator gets opened, the weeds enter into the semi saline waters where it can't survive. Naturally they sink down the decaying process is very slow and whenever the traditional fishermen use their nets, large quantities of semi decayed weeds get into them. This is a nightmare for fishermen obstructing them from abandoning fishing and resulting in severe poverty and several sociological problems. The proposed project area contains more than 75000 traditional inland fishermen.

(viii) Problem of plastics on the health of this planet.

The alarming increase of the use of plastic is threatening the life of the people and the health of this planet. Attempts are made around the world to reduce the non-degradable plastics. The present project could certainly come forward with several general utility items which are able to be used as alternatives for many plastic products.

(ix) Poverty faced by craft workers.

The natural fibre artisanal community in the area is facing severe poverty as their level of skill is for making mats alone. They make both screw pine mats and reed mats. KIDS with the assistance of the Ministry of Textiles encouraged the Screw pine artisanal people to make more value added products which are having good market. Good design experts were of great help in this regard. This has helped nearly 400 poor rural women to find year round and dependable income. But the area consists of 60,000 artisanal families and the water hyacinth craft cluster to be formed as part of this project shall provide assured and increased income for around 300 families. We have already many artisans who is best in weaving and looming water hyacinth products.

2.2 Goal, Purpose & Benefits

Project Goal:

To contribute to Kerala's capacity to promote environmentally sound development in land and water sectors.

Project Purpose:

1. Development of model of value addition to the traditional natural fibre craft utilizing water hyacinth, leading to its control and management.
2. Facilitation of self supporting and participatory approaches for sustainable livelihoods of poor rural women based on natural resources.
3. Influencing policy formulation for the management and development of inland water resources infested by water hyacinth.

Benefits of the project:

- Popularisation and marketing of water hyacinth products.
- Production of alternatives for certain plastic products.
- Development of marketable designs for water hyacinth products.
- Better standard of living for poor rural women.
- Cleaner water bodies.
- Reduction in costs incurred on deweeding.
- Encourage dialogue on better management practices for infested areas.

2.3 Project Strategies

(1) Strengthening of Haritha Karma Sena/Kudumba Shree members/Self Help Groups (SHGs):

The project shall be implemented through **Haritha Karma Sena/Kudumba Shree members/ women Self Help Groups of KIDS**. At least 20 members shall be in each SHG. A total of 10 SHGs shall be formed as part of this project if needed or Government can use its own machineries like Haritha Karma Sena or Kudumbashree for the collection of water hyacinth. KIDS is facilitating several screw pine artisanal SHGs who have shown interest in working on water hyacinth. These SHGs could do artisanal work in water hyacinth better than anybody else.

(2) Awareness Programme:

Proper awareness to different sections of the Society regarding the negative environment effects of plastic and the use of natural fibre products as an alternative for the same has to be done – Different sections of the Society shall include SHG members, elected representatives of local bodies, Government officials, trade unions, NGO members etc. Awareness regarding the possibilities of using water hyacinth in natural fibre craft is also has to spread to the public in general and policy makers in particular.

The project envisages coming out with a model for utilizing the notoriously known invasive species water hyacinth as an ideal raw material for natural fibre cottage industry so that the control and management and the livelihood of the poor rural women will be ensured. This replicable model could be of great use for the government, PRIs and other NGOs.

(3) Mechanical collection of water hyacinth:

Water hyacinth from the infested areas shall be physically collected using manual labour (**Haritha Karma Sena/Kudumba Shree members/ women Self Help Groups of KIDS**). A variety of grass, hooks and other tools can be used for this purpose. In lakes or rivers these tools can be operated by sitting in country boat. The collected plants shall be transported to the drying yard. **The stalks would be 30 cm to 45cm long.**

(4) Drying, fibre extraction, dyeing and Production:

The spongy fibre of water hyacinth can be easily extracted by drying in the sun. The leaves and roots shall be removed. The long petiole has the best fibre which is very convenient to be isolated and stored for long periods. **Artisans (Women & Differently abled)** under KIDS will use it to make products.

(5) Development of a marketing network.

A proper marketing network for the sales of the products generated by the workers shall be established. As soon as the project is completed this network shall be managed by the federation of SHGs. Products shall be supplied in the Indian markets and also to the exporters.

- **Exhibitions** are a must for proper dissemination of the idea of the availability and use of such eco-friendly products. Exhibitions shall be conducted in important cities of the country like New Delhi, Mumbai, Calcutta, Chennai, Bangalore, Kochi etc. etc. 4 such exhibitions of 15 days duration shall be conducted. A special team for this purpose shall also be formed. Apart from these exhibitions products made as part of this project shall be supplied to the routine exhibitions of the

Ministry of Textiles. KIDS is already empanelled under Department of Handicraft coming under Ministry of Textiles.

- We can find the market through **outlets and online sale.**
- If we can get a free **outlet in Water Metro and Kochi Metro Stations** we can ensure better publicity and sales for our products. This will make additional value to the project and to the travellers.

(6) Skill Training

KIDS is an empaneled agency under Kudumbashree for skill training in water hyacinth and if needed, we can give skill training to the people in needy and premises and this would be done with the help of Grant.

3.0 THE APPLICANT INSTITUTION

Name of the Organization	: Kottapuram Integrated Development Society (KIDS)
Address	: Executive Director, KIDS, Kottapuram P.O., Kodungallur, Thrissur Dist, Kerala - 680 667.
Telephone	: 0480-2803165, 2807638, 9446995834
Email	: kidskottapuram@gmail.com
Website	: www.kidskottapuram.org
Name of Chief functionary	: Fr. Paul Thomas Kalathil
Legal status	: Registered under charitable Societies Act Reg. No. 64/1988

About the Society:

The Kottapuram Integrated Development Society (KIDS) duly registered with the Government got established in the year 1987. Its main area of operation is within Thrissur, Ernakulam, Palakkad and Malapuram Districts of Kerala State. The Society has its Headquarters at Kottapuram, which is by the side of NH-17 connecting Kochi with Mangalore.



KIDS essentially envisage an enabling process through which the target population lives a life of their own with dignity, self-reliance and prosperity. KIDS give utmost priority for environmental conservation and natural resource management. Within the last 35 years of functioning, the Society has really succeeded in attaining the objectives to a great extent. 350 Mahila Mandals and 900 Self Help Groups are at present facilitated by KIDS.

Natural Fibre Sector

KIDS give its prime importance to the natural fibre sector from the year 2000 onwards. Research and development department under KIDS studied the potential of the locally available natural fibre namely screw pine and water hyacinth. KIDS has successfully implemented various income generation projects for utilizing the potential part of these fibers and thereby introduced a novel income generation activity to the SHG – Kudumbashree members under the operational area of KIDS.

Craft Based Resource Centre for Natural Fibre Craft



In 2001 KIDS was awarded a cluster project for the enhancement of natural fibre craft based at Kodungallur in Thrissur district by the office of the Development Commissioner (Handicraft), Ministry of Textiles Government of India. The development of this cluster is considered as a model for the entire country. In recognition of the remarkable achievements of the cluster, **KIDS has been awarded a craft based resource centre for natural fibre craft.** The CBRC is a part of the eleventh five year plan of the country. There is not even a Board or a Corporation for the promotion of the wide variety of natural fibres of the country. The Govt. of India considers this resource

centre as the solution of all the problems they faced by thousands of poor rural artisanal workers for the country.

Water hyacinth, a menace turned into resource and its milestones by KIDS Kottapuram.

- KIDS developed above 200 prototypes in water hyacinth craft through Design development workshops.
- Created hundreds of job opportunities among the differently abled and rural women.
- Received an award from Govt. of Kerala for the remarkable services among the differently abled.
- Promoted the handloom in water hyacinth craft and uplifted handloom workers simultaneously.
- Ensured online marketing with the association of leading online service providing companies like amazon, qalara, etc.
- KIDS is selected as a Skill Training Institute of Kudumbashree Mission, Govt. of Kerala.
- Enrolled rural women artisans as master craft persons of the Ministry of Textiles (Handicraft) Government of India.
- Provided craft training to similar organisations and students of schools and colleges.
- Ensured the networking with the renowned design institutes like NID, NIFT, IICD, and NCDPD for the development of the craft.
- Participated in numerous exhibitions in the prominent cities of the country and gave the awareness about the water hyacinth craft to the general public.
- Achieved Fair Trade Forum (India) certification.

4.1 Logical Framework Analysis

<u>Purpose</u>	<u>Expected Results</u>	<u>Indicators</u>
1. Utilization of water hyacinth in natural fibre craft leading to its control and management.	1 (a)improved local fishing, inland navigation and water quality (b) Diseases will decrease. (c) Water travel without hurdles	1 (a) Increase in the number of Persons engaged in fishing. (b) Inland navigation channel made cleaner. (c) Extent of water quality improved visually.

2. Development of model of value addition to the traditional natural craft utilizing water hyacinth.	2. (a) Value addition to the traditional skills (b) Development of new designs. © Production of alternative for certain plastic items.	2. (a) Increase in the income of artisans through values added to traditional skills by using the fibre of water hyacinth. (b) Number of new products formed using water hyacinth fibre © Number of new products developed as an alternative for plastic.
3. Facilitating self supporting and participatory approaches for sustainable livelihoods of poor rural women based on utilization of water hyacinth	(a) Improved capacity of SHGs in natural craft using water hyacinth. (b) Water hyacinth craft cluster, federation manages the project.	3. (a) New skills developed in the SHG members. (b) Federation mgmt plan developed.
4. Development of model of eco-restoration of local water bodies infested by water hyacinth.	4 (a) Documentation and dissemination of results.	4 (a) Adoption of the model by local bodies and others.

4.4 Assumptions or Risks

- Learning skills of artisans may vary.
- In the peak monsoon season for a few months, it may not be possible for drying the fibre in the sun.
- Both the raw materials and the finished products are to be kept safe from the attack of fungus and rats.

WORK PLAN

1. Harita Karma Sena, Kudumbashree members, and self-help groups of KIDS collect water hyacinth from various water bodies, extract only stems of the specified length (30-45 cm), and supply them to the agency (KIDS).

2. The agency uses it to produce various craft products by the traditional artisans who are working under the agency (Women and Differently abled people). The production process involved drying, cleaning, dying and weaving.

3. Eco-friendly products manufactured in this way are marketed with the cooperation of the government & other methods (Exhibitions, Outlets in Water Metro and Kochi Metro stations, online sale & other outlets)

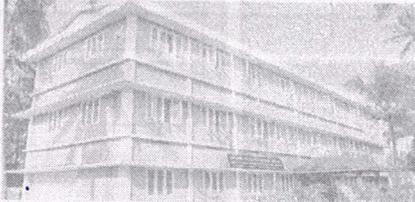
- In this way, it will be possible to find a sustainable solution to the problems caused by Water-hyacinth in the water bodies, provide employment to many people and bring up the traditional craft sector which is disappearing.
- We are ready to provide the necessary training and instructions for manufacturing products from Water Hyacinth anywhere in Kerala. We have been selected as the **empaneled agency of Kudumbashree**.
- This is only a proposal for the implementation of the project. Suitable changes may be made in this after detailed discussions. Due to various reasons, the natural fiber craft sector is facing a major economic crisis and this project can be successfully implemented only with the help of the government.

NEWS PAPER CLICKZZZ...

കോട്ടപ്പുറം കിഡ്സിൽ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ ഉദ്ഘാടനം നാളെ

കോട്ടപ്പുറം, കോട്ടയം താലൂക്കിലെ കിഡ്സിയിൽ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ ഉദ്ഘാടനം നാളെ (15) കോട്ടപ്പുറം കിഡ്സിയിൽ കീഴിൽ ആയിരിക്കും. ഇന്ത്യയിലെ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ റിസോഴ്സ് സെന്റർ ഏകദേശം 10 ടിംഗർമാർ ഉൾക്കൊള്ളും.

പ്രകൃതിദത്ത നാരുകളെപ്പറ്റി സാധാരണ അറിയില്ലാത്തവർക്ക് അറിയാൻ ഉദ്ദേശിച്ചാണ് ഈ സെന്റർ. ഇതിൽ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ ഉദ്ഘാടനം നാളെ (15) കോട്ടപ്പുറം കിഡ്സിയിൽ കീഴിൽ ആയിരിക്കും. ഇന്ത്യയിലെ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ റിസോഴ്സ് സെന്റർ ഏകദേശം 10 ടിംഗർമാർ ഉൾക്കൊള്ളും.



നാളെ കോട്ടപ്പുറം കിഡ്സിയിൽ പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്റർ.



കോട്ടപ്പുറം കിഡ്സിയിൽ കീഴിൽ ആയിരിക്കുന്ന പ്രകൃതിദത്ത നാരുകളുടെ റിസോഴ്സ് സെന്ററിൽ റിസോഴ്സ് സെന്റർ ഉദ്ഘാടനം നടക്കുന്നു.

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Remarkable achievements and certifications



OFFICE OF DEVELOPMENT COMMISSIONER (HANDICRAFTS)
MINISTRY OF TEXTILES, GOVT. OF INDIA

CERTIFICATE OF EMPANELMENT

Empanelment No: KL/2009/0014674 Year: 2017

It is hereby certify that M/s. Kottapuram Integrated Development Society located at Kottapuram Integrated Development Society (KIDS), KIDS Campus, Kottapuram, Thrissur District, Ker has been empanelled under the category 2 with O/o Development Commissioner (Handicrafts), Ministry of Textiles, Govt. of India

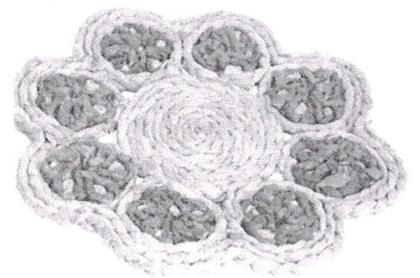
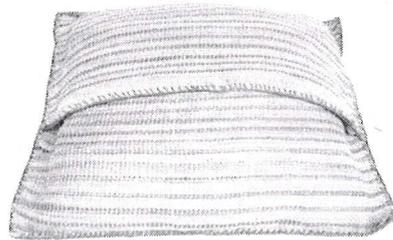
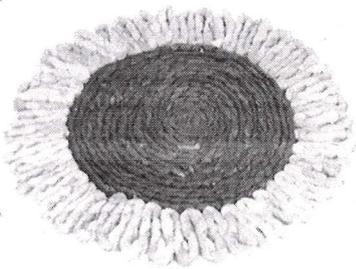
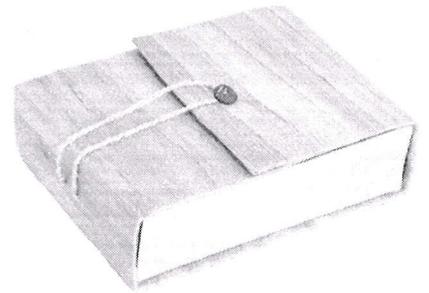
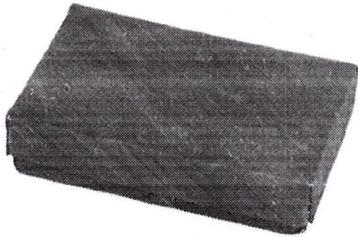
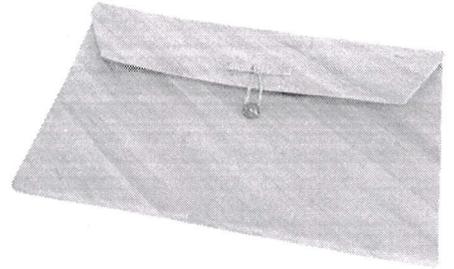
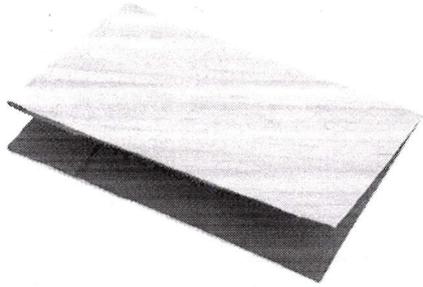
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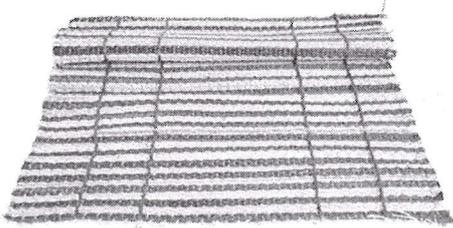
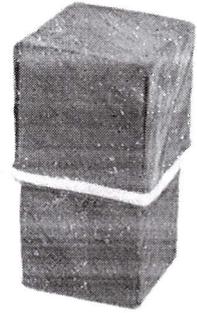
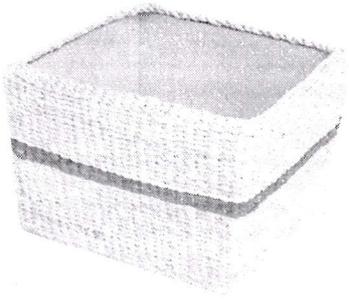
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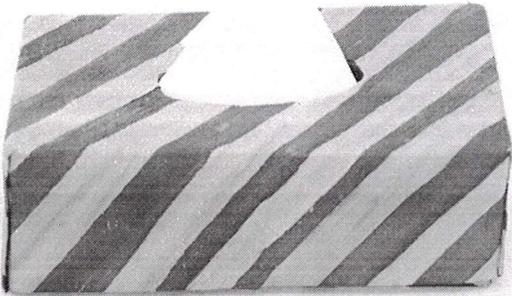
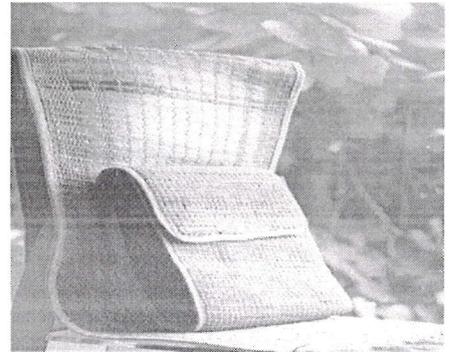
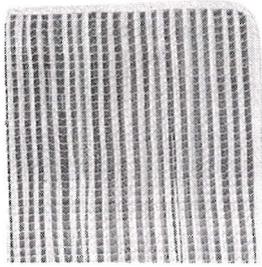
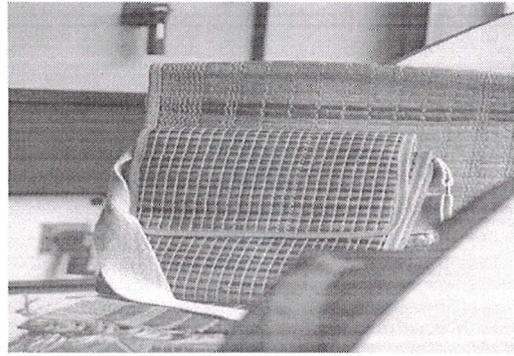
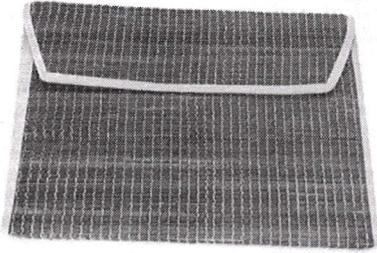
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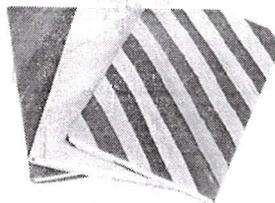
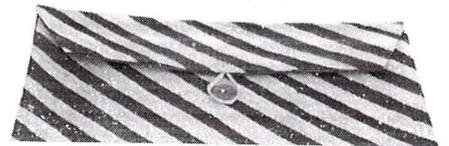
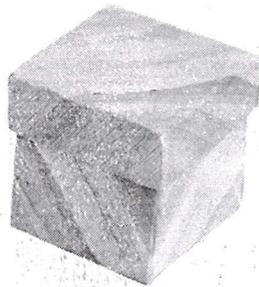
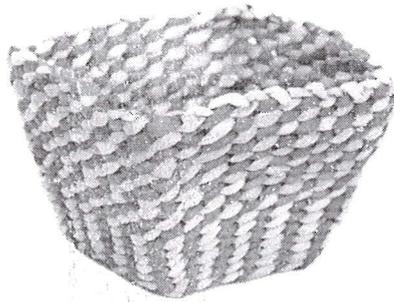


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THANK YOU

**BEFORE THE HON'BLE NATIONAL
GREEN TRIBUNAL
(SOUTHERN ZONE BENCH, CHENNAI)**

**ORIGINAL APPLICATION NO. 27 OF
2021**

In the matter of:
Suo Motu " Faecal
Contamination in perandoor
edapally canals"

-VS-

The Principal Secretary to Govt. Of
Kerala,
Environment Department, Kerala
and others

----Respondent(s)

**ACTION TAKEN REPORT FILED
BY ADDITIONAL CHIEF
SECRETARY, ENVIRONMENT
DEPARTMENT/1ST RESPONDENT**

E.K. KUMARESAN,
Standing Counsel for Government
of kerala

No.6, Indian Chambers (SICCI)
Annex Building, Ground Floor,
Esplanade, Chennai - 600 108.

Cell No: 94443 98701