



**Society for Appropriate Rural Technology for Sustainability (ARTS)**

**Affiliate Member: Indo-American Aquaponics Institute (IAAI)**

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*Society Registration No.:* S/IL/20047 OF 2003-2004

**Project Title:**

**Developing an Aquaponics and Spirulina Eco-park (ASEP) to  
Demonstrate Sustainable Models of  
Urban Aquaculture and Agriculture**

**Reference: MMR-ENV/SOC/5-2011/477/2013**

Sanction Letter dated 22<sup>nd</sup> March 2013

*Title of Report:*

**Status Report – Phase 1**

*Submitted to:*

**Mumbai Metropolitan Region-Environment Improvement Society**

7th Floor, MMRDA Building, Bandra-Kurla Complex, Bandra (East),  
MUMBAI - 400 051.

Version 3; 4<sup>th</sup> July 2014

**Project partners:**

*Project Holder:* Society for Appropriate Rural Technology for Sustainability (ARTS),  
Kolkata

*Coalition Partner:* Central Institute of Fisheries Education (CIFE), Mumbai


**Full contact details of:**

**Project Manager:**

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**CIFE Champion:**

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 SOCIETY FOR APPROPRIATE RURAL TECHNOLOGY FOR SUSTAINABILITY	ASEP Project , Mumbai	Document #: ASEP.SPP1.3	Date: 4 <sup>th</sup> July. 2014
Title: Status Report – Phase 1		Version: 3	

## 1 Background

The construction activities in Phase 1 of the Aquaponics & Spirulina Eco Park (ASEP) Project at CIFE, Mumbai have focused on:

- Completion of the Greenhouse and Reception Area;
- Installing the ASEP Fish Tanks and devices;
- Preparatory work for building the nursery and Wholistic Development Model (WDM) components,
- Consolidate the activities of the ‘Big Event’, to ensure the sustainability of the ASEP.

The building and construction work has unfortunately been complicated by the breach of trust and violation of agreement by Mr. Chandan Halder, BAMBUNE INDIA—in the matter of building the Bamboo-based Greenhouse and Reception Area, for the ASEP at CIFE. This situation is elaborated in Section 3.

Despite this setback, we have been able to complete the needed construction work before the onset of the monsoons, so that we can complete the ASEP in Phase 2, as planned, by December 2014, and as discussed in Section 2

## 2 Construction Activities in Phase 1 (P1)

The chronological record of construction activities from the beginning of the project upto 24<sup>th</sup> June 2014, when the work in Phase 1 (P1) was completed, is shown in *Annex-1*.


It is annotated on the cover page as:

*Annex-2.3: Civil construction work for building the Green House and Reception Area, being built at the chosen site at CIFE for the Aquaponics and Spirulina Eco-Park (ASEP) Project at CIFE, Mumbai*

as this document forms a part of the continuously updated **Master Plan** for the ASEP project.

The photo-diary is composed of:

- Pages 1-2: Flag markers placed on the ground, denoting the boundaries of the greenhouse and the Reception area;
- Pages 3-7 and 33-35: Shows the foundation building activities;
- Pages 8-10 and 36-37: Shows the bamboo construction work
- Pages 11-25: Shows the construction of the Ferro-cement (FC) fish-tanks and laying the foundation of the raft tanks.
- Pages 26-32 and 38-41: Shows the construction work to:
  - Repair the damages and complete the work on the bamboo superstructure, left unfinished by Mr. Chandan Halder of BAMBUNE INDIA;
  - Installation of the green shadenets, 700 micron thick boundary wall at the bottom, and the fixing of the UV Sheets at the roof of the Greenhouse;
  - Fitment of the bamboo-walls for the Reception Area, and its completion
  - Layout of plastic pipes, which can be fitted once the ground is made ready by CIFE.
  - Preliminary layout of Aquaponic fixtures, such as the ‘Green Wall’ and other devices, for which the necessary pipes and fitting have been purchased and stored in the ‘Reception Area’.

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### 3 Complaint filed at Versova Police Station

As noted previously, the building and construction work has unfortunately been complicated by the breach of trust and violation of agreement by Mr. Chandan Halder, BAMBUNE INDIA—in the matter of building the Bamboo-based Greenhouse and Reception Area, for the ASEP at CIFE.

Accordingly, in coordination with senior faculty members at CIFE who have very kindly consented to help us to draft and submit the letter, a complaint addressed to the **Senior Inspector, Police Station—Versova, Mumbai** has been filed on 19th June 2014.

A copy of this complaint is shown in *Annex-2*.

### 4 Big Event

The Secretary of MMR-EIS has focused on the need to ensure the short-, medium and long-term sustainability of the ASEP. Accordingly, we have devoted considerable time and resources to build a network of collaborators, who can help us to achieve this objective.

Keeping this in mind, Dr. Lakra, Vice-Chancellor and Director of CIFE, has tasked the Secretary of ARTS to form a ‘**Think Tank**’ at CIFE, including core members Madam Neelam Saharan, Dr. V. K. Tiwari and Dr. A. K. Verma. In subsequent meetings, it has been decided that we shall add the names of other senior Faculty Members of CIFE to this ‘**CoreGroup**’.

The goal is to organize and implement a ‘**Big Event**’ (BE) at the time of the inauguration of the ASEP, hopefully by the Chief Minister of Maharashtra, towards the end of 2014. As a part of this major event, we intend to hold a policy event, where senior central and state ministry officials of Agriculture, Food, Finance, etc. and business/industry leaders, academics and NGOs will be invited to debate the policy issues for promoting Aquaponics and Spirulina, in India. According to Dr. Lakra, there should be at least 300 invitees at this Seminar/policy event.


We are working with Red Molecule, an Event Management company located at Bandra West, Mumbai, to help us with coordinating our event management activities for the BE.

A ‘Big Event Summary’ of ASEP grant and project proposals for submission to various government and quasi-government agencies, as a part of organizing the ‘Big Event’, is shown in *Annex-3*.

### 5 Aquaponics mediated Eco-Tourism

A major activity in P1 has been to establish the credentials of Aquaponics-mediated technologies to promote Eco-Tourism in a big way. We have started our activities in **Panchgini** in Maharashtra and **Darjeeling** in West Bengal—both being established and respectable hill stations, where **Aquaponics mediated Eco-Tourism (AmET)** can be developed in a big way. We have found two excellent partners in these two tourist spots:

- **Ms. Mona Patrao:** Proprietor of Red Farm, Panchgini, is an experienced Environmentalist, who has agreed to be a mentor for our AmET initiatives;
- **Mr. Swaraj (Rajah) Banerjee:** Principal of Makaibari Tea Estate, who is interested in our Wholistic Development Model, and use bamboo for social development.

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## 6 Flyers and Leaflets

A number of flyers and leaflets have been designed and continues to be improved, both in content and numbers, in the course of implementation of Phase 1 activities, including.

**Flyers:** (*In A4 and A3 sizes*)

- **Aquaponics & Spirulina Eco Park (ASEP) Project** – *sample shown in Annex-4*
- Aquaponics-mediated Eco Tourism
- Digital Badges Program
- Aquaponics-mediated Disaster Response Kits
- Sustainability Management Courses

**Leaflets:** (*In A5 and A4 sizes*)

- The ‘**Language of Food**’ Program – *sample shown in Annex-5*
- Recirculating Aquaculture Systems (RAS)
- Aquaponics-mediated Eco Tourism
- Digital Badges Program
- Aquaponics-mediated Disaster Response Kits

The other samples of these drafts will be made available on request, and finalized during implementation of Phase 2, as an integral part of the ‘Big Event’ formulation.

## 7 Full Utilization Statement for P1 payment of Rs.6.75 Lakhs

The ‘Full Utilization Statement’ for P1 payment of Rs.6.75 Lakhs is being submitted to MMR-EIS separately, including scanned .pdf copies of the bills for P1 and other supporting documents.


## 8 Conclusion

We hope to implement the provisions of Phase 2 of the project by November 2014.

We hope that MMR-EIS will process our claim for full utilization of the ‘Phase 1’ (P1) of the ASEP Project, and release of Rs. 4.5 Lakhs, less TDS deduction of Rs.45,000 = Rs.4.05 Lakhs, for the remaining unutilized portion of Phase 2, so that we can plan and execute the remaining work in P2, expeditiously.

Finally, we hope that MMR-EIS will grant our request for a formal extension of the project by one year to 30th June 2015, mainly to address the problems we have faced with our contractor, for construction of the Greenhouse and Reception Area.

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***Annex-1:***      *Annex-2.3: Civil construction work for building the Green House and Reception Area, being built at the chosen site at CIFE for the Aquaponics and Spirulina Eco-Park (ASEP) Project at CIFE, Mumbai*

*Annex-2.3:*

Civil construction work for building the  
**Green House and Reception Area,**  
being built at the chosen site at CIFE for the  
**Aquaponics and Spirulina Eco-Park (ASEP) Project**  
at CIFE, Mumbai



























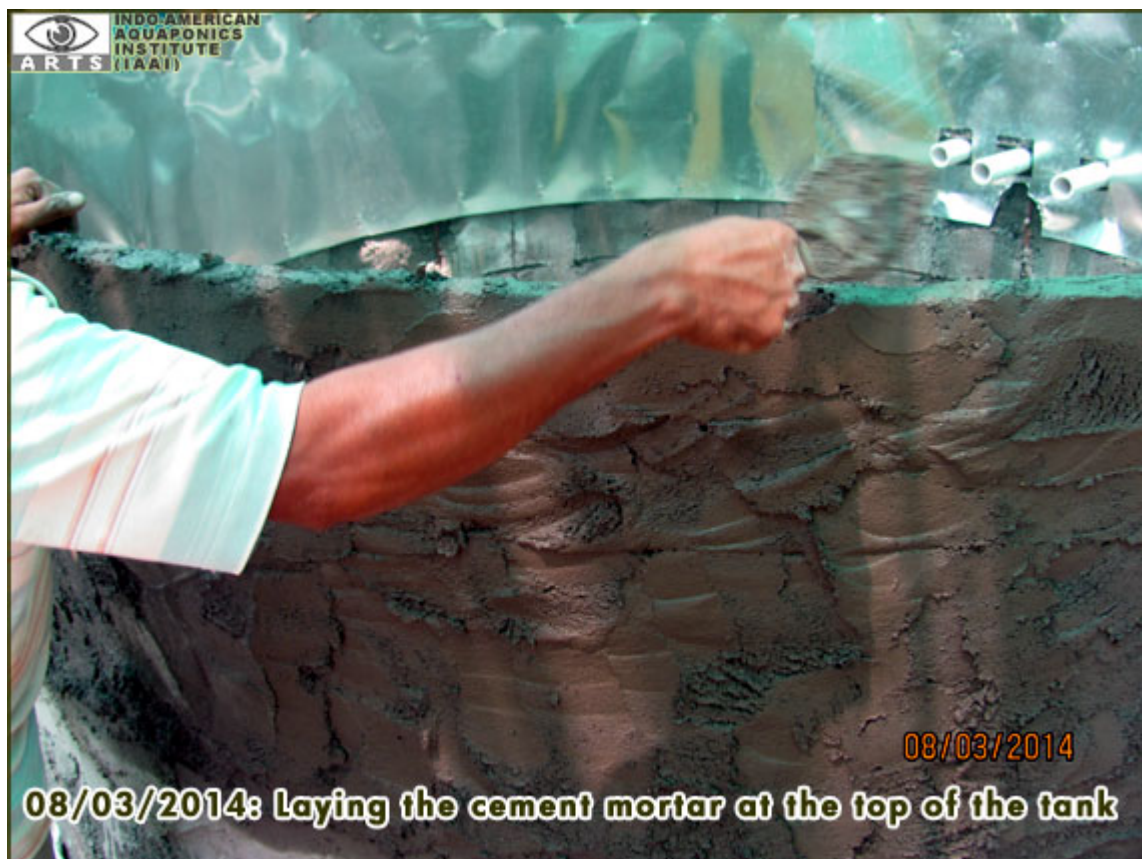






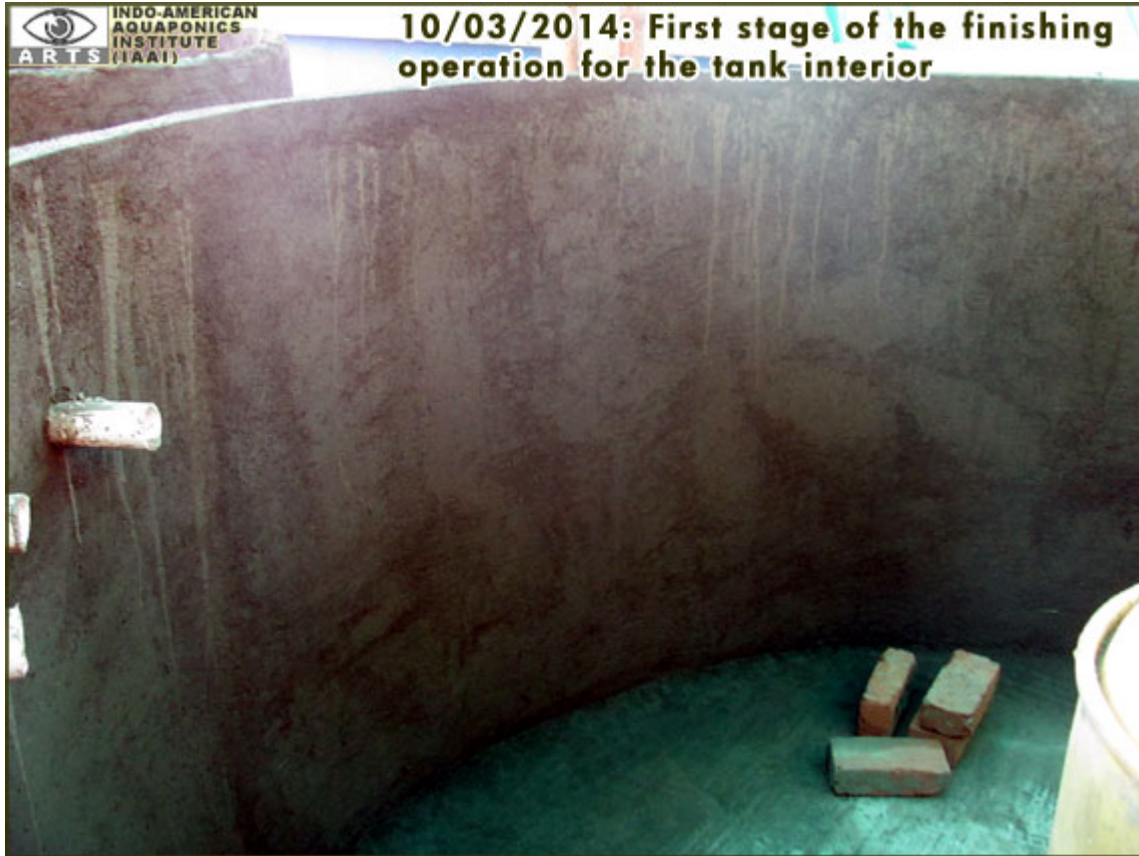




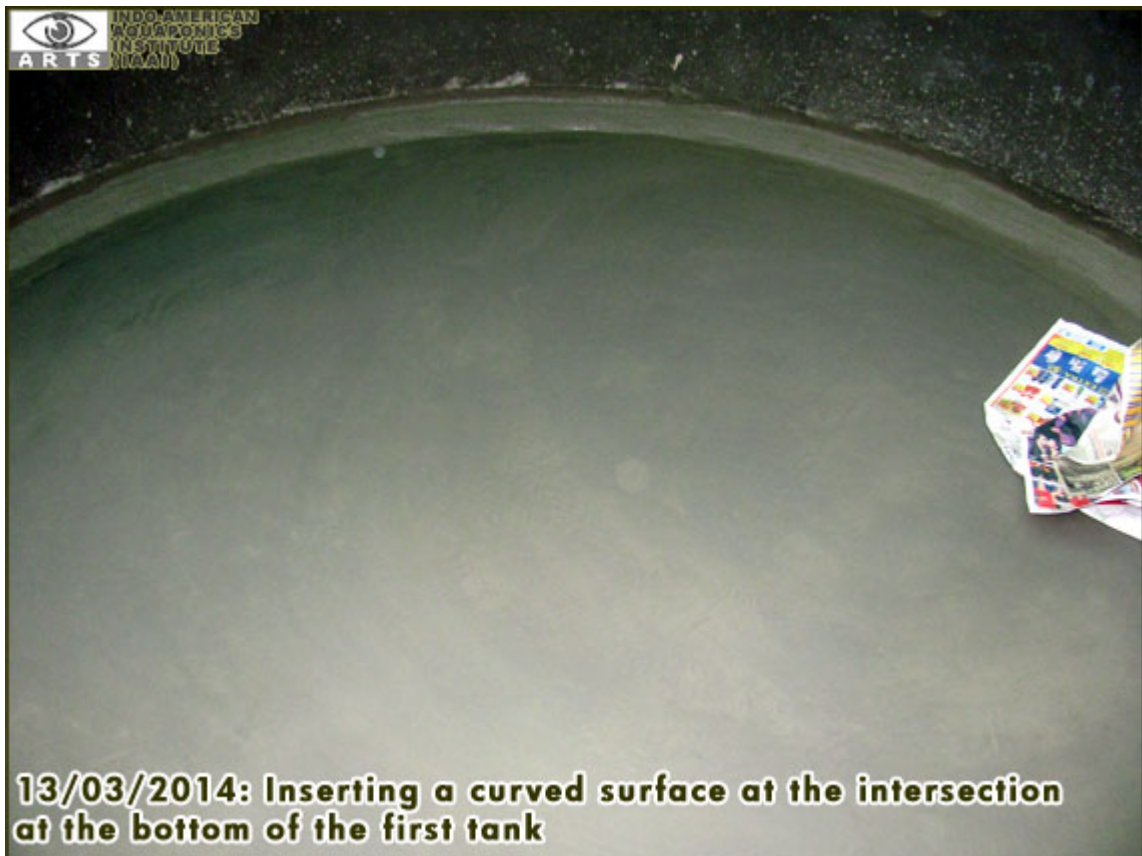


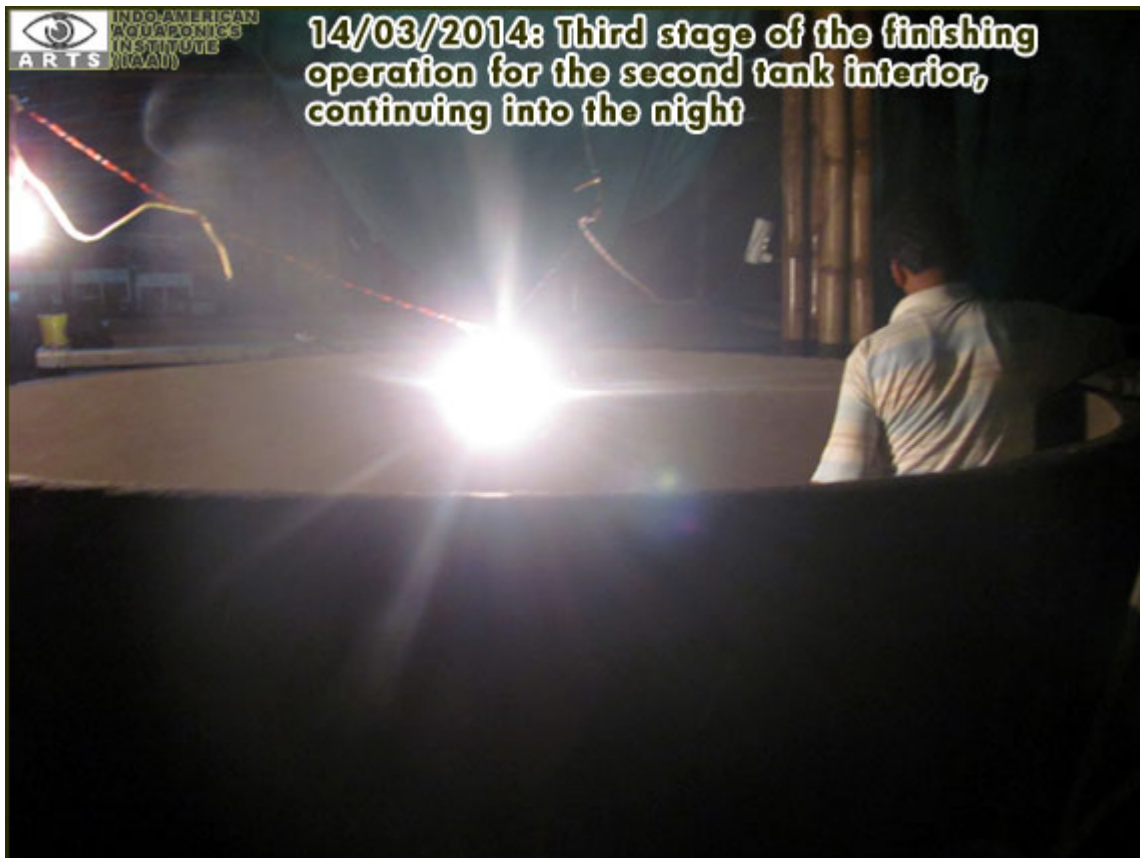






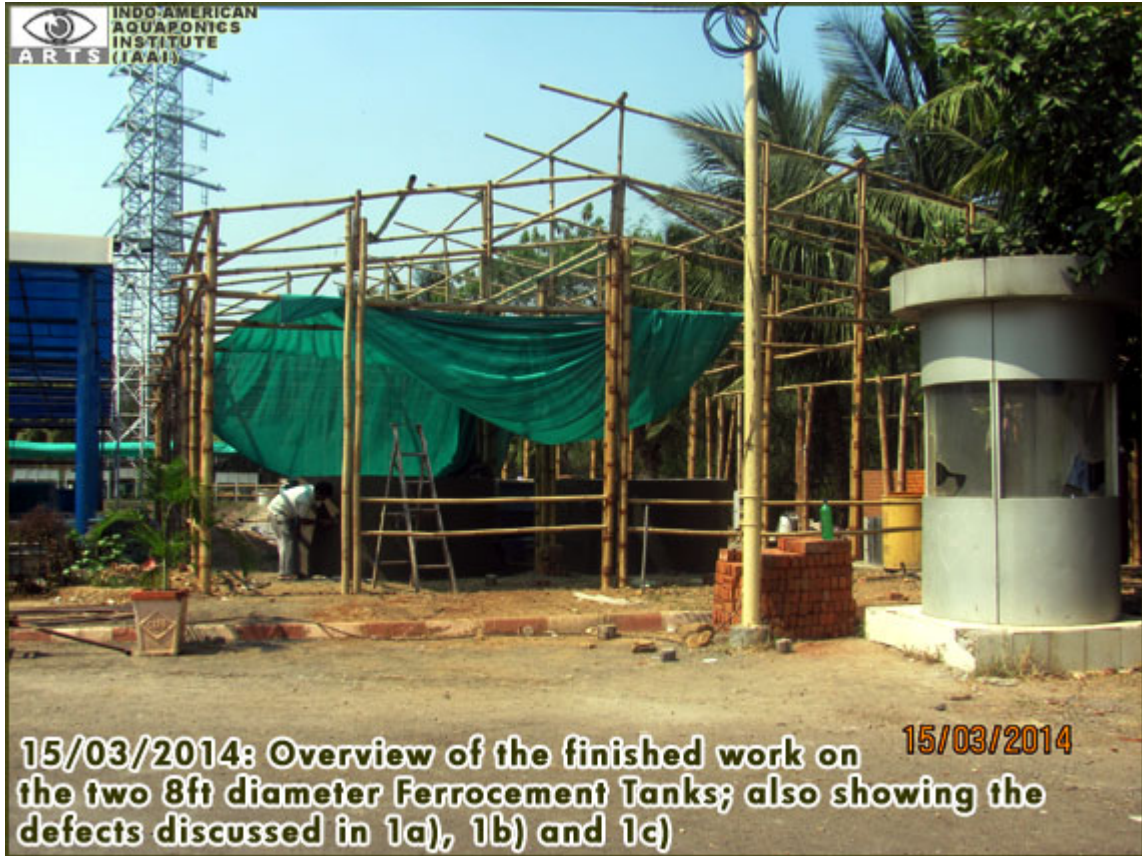


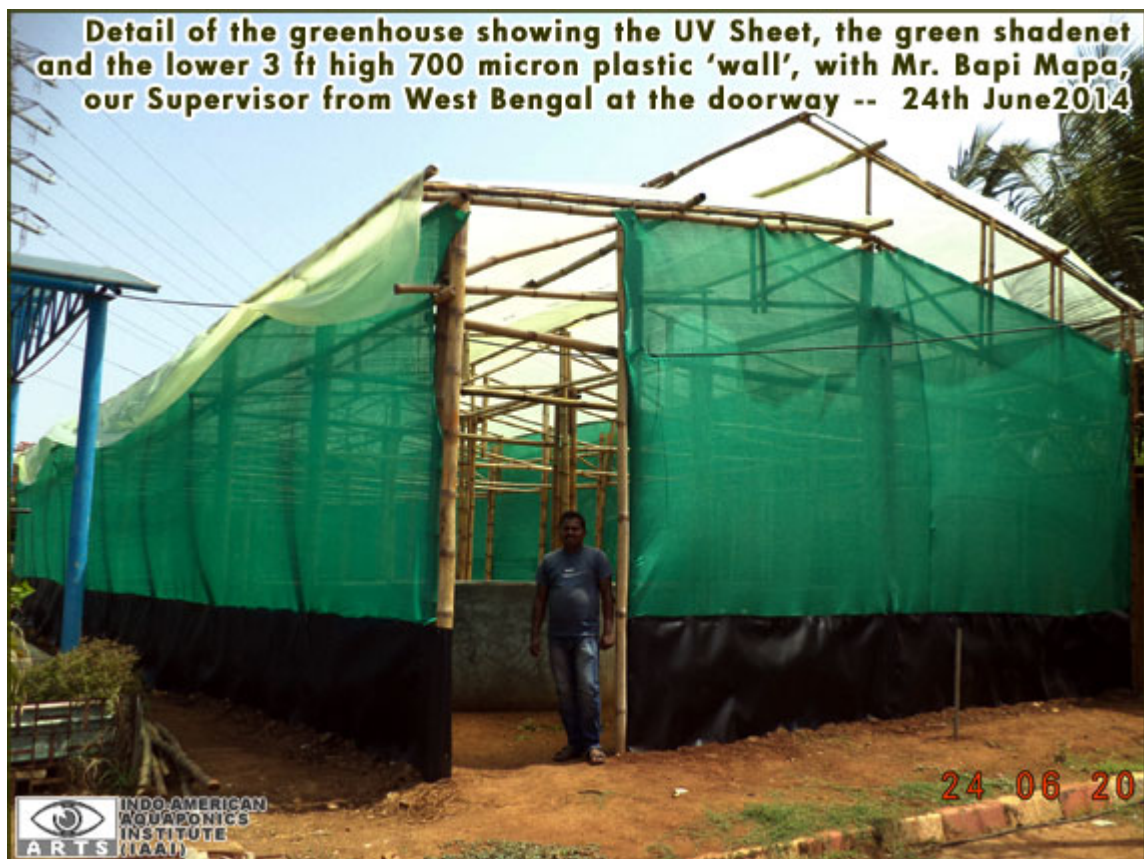
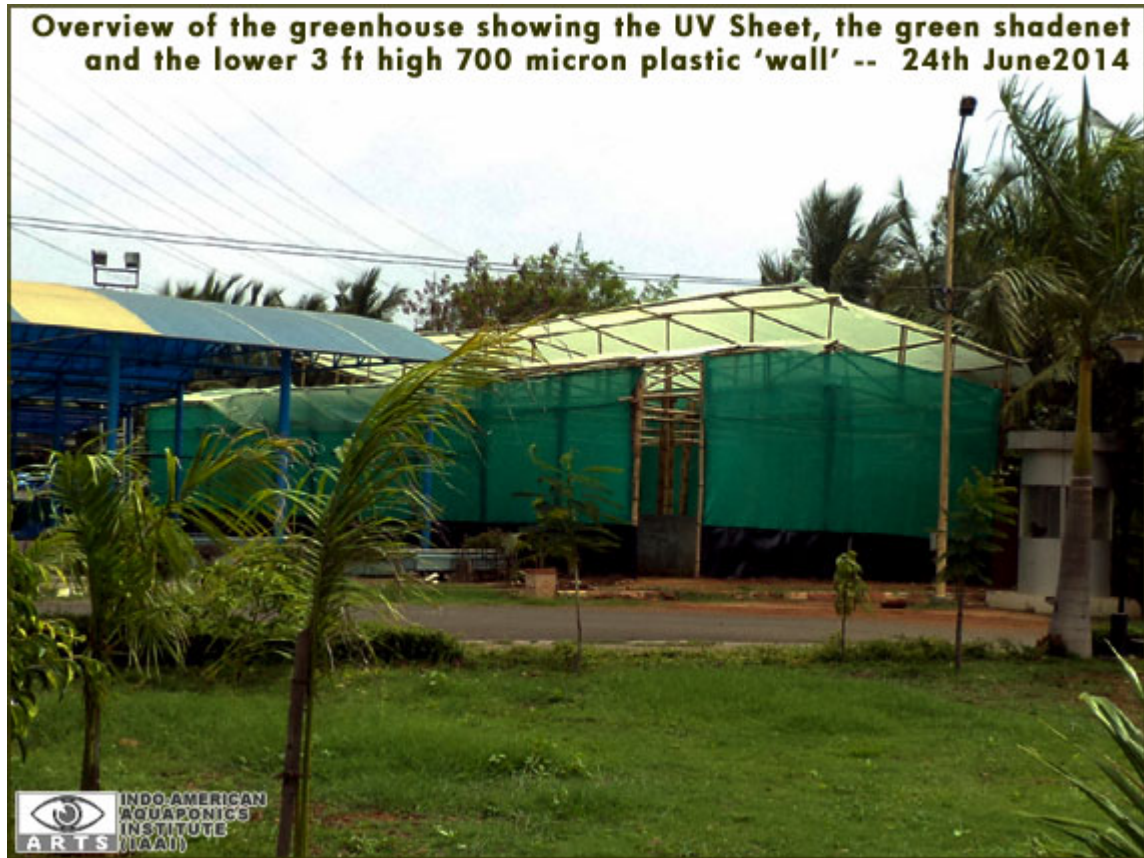




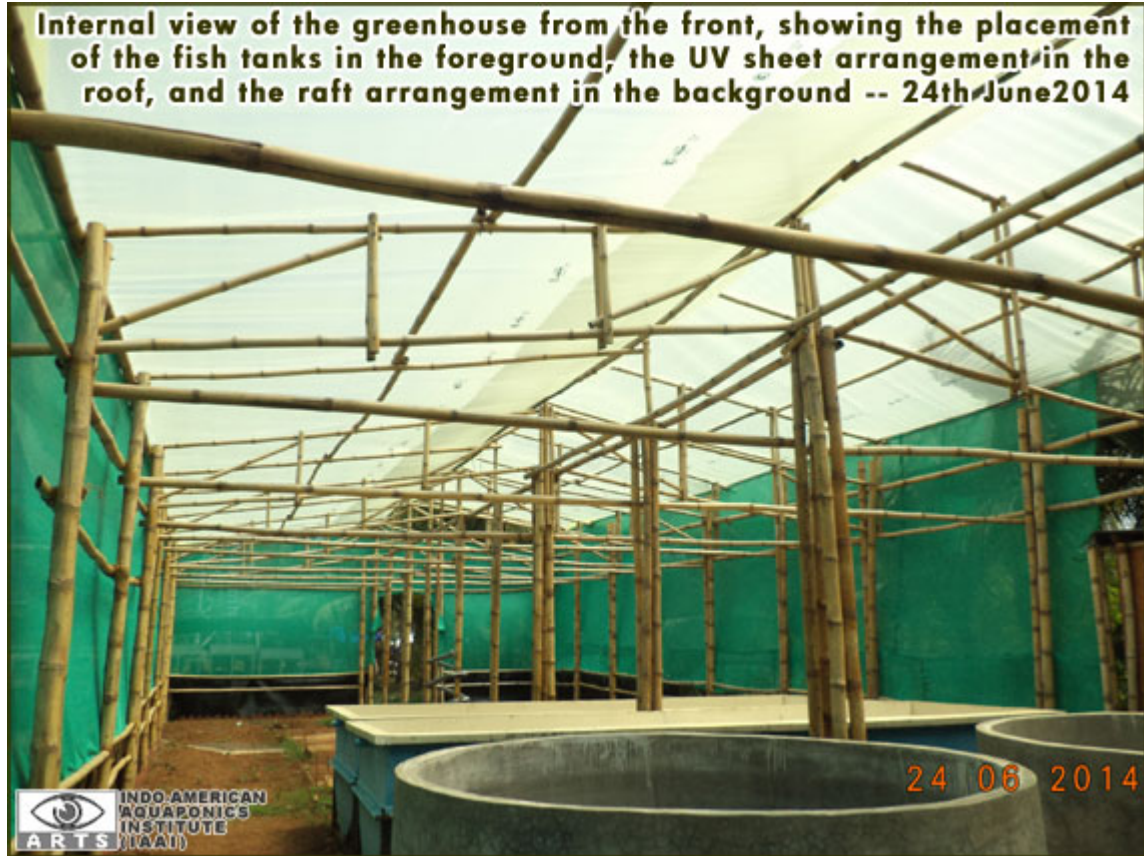


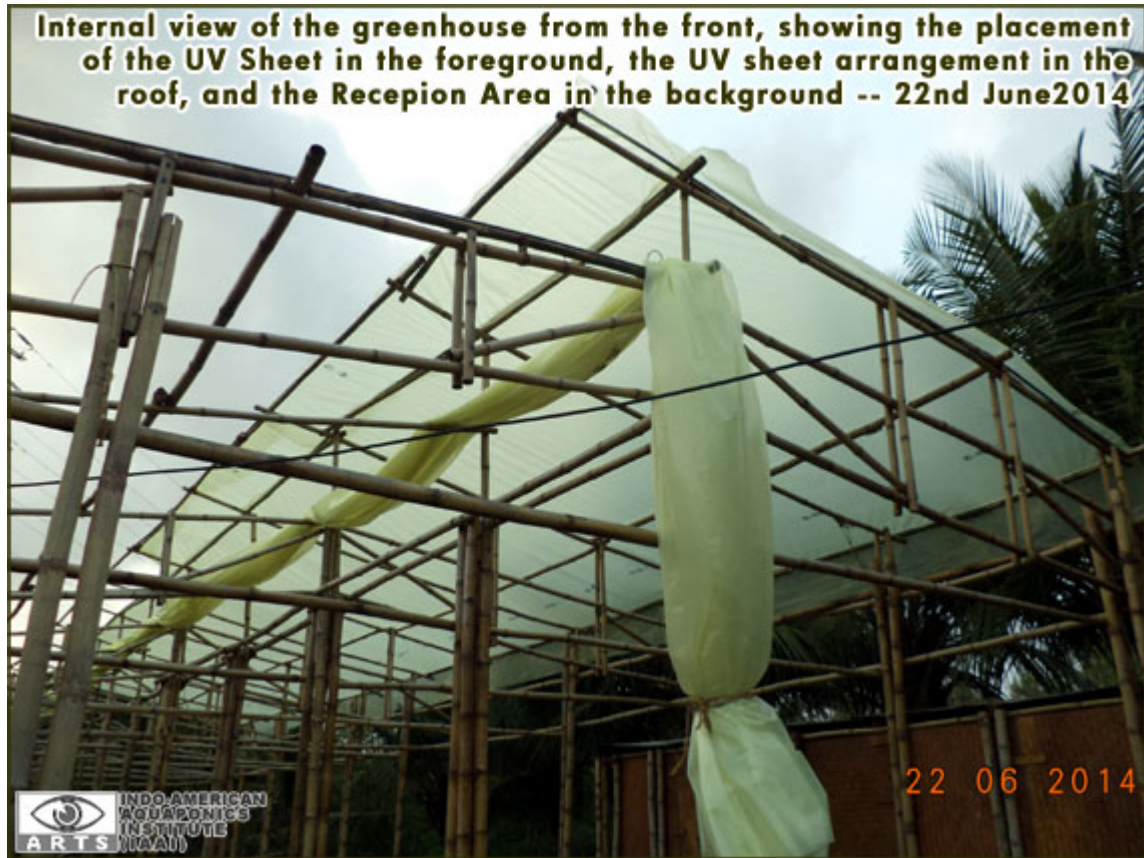




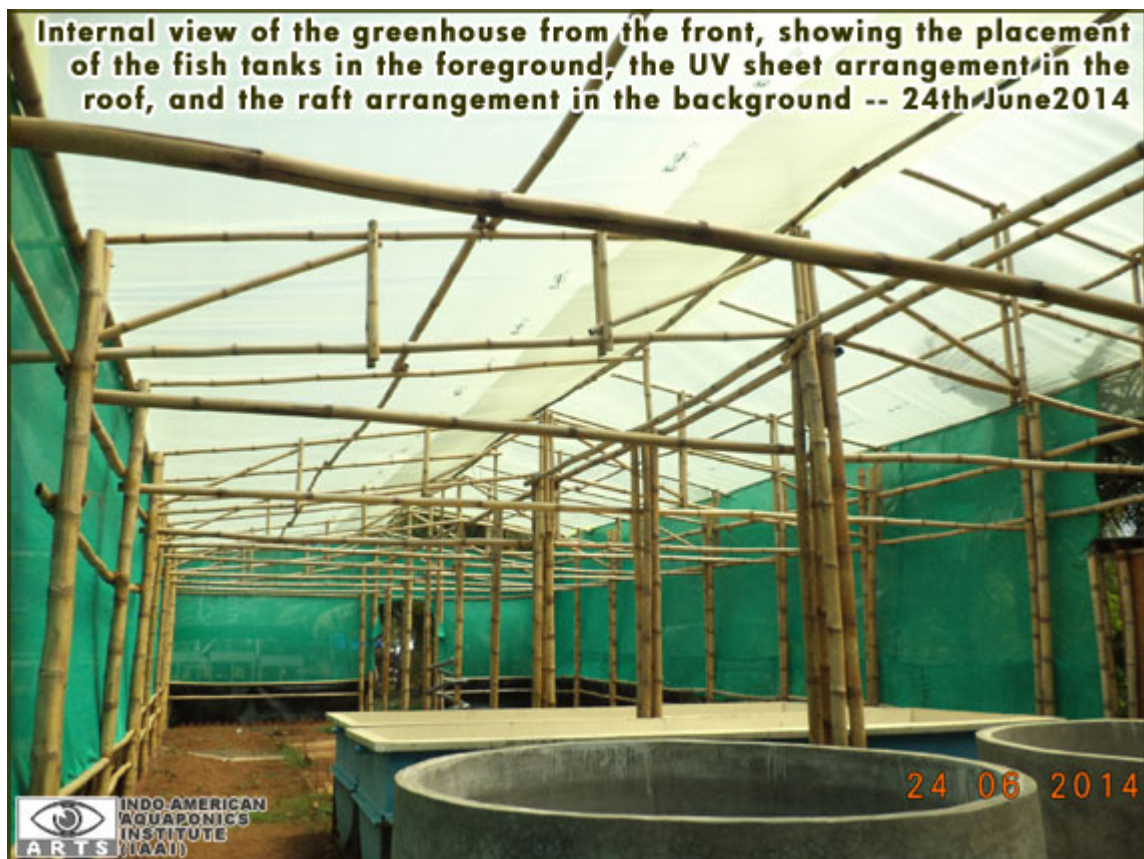
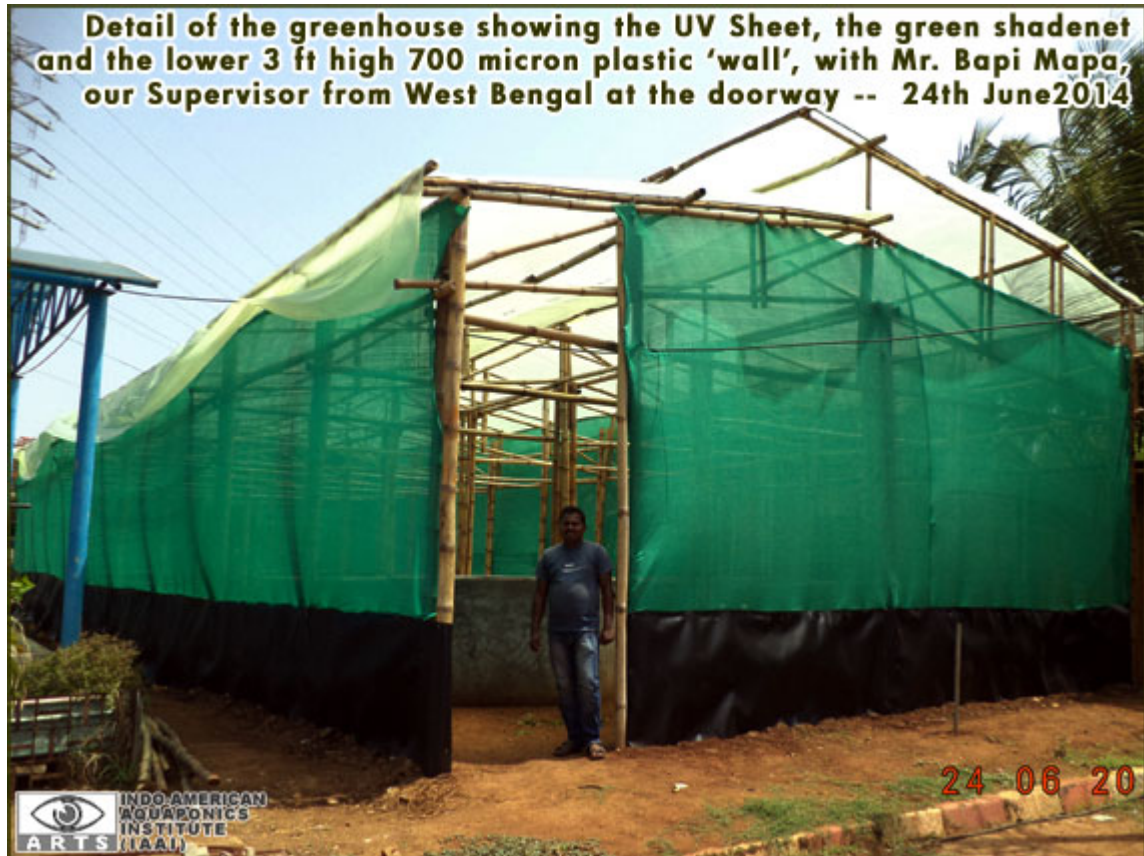


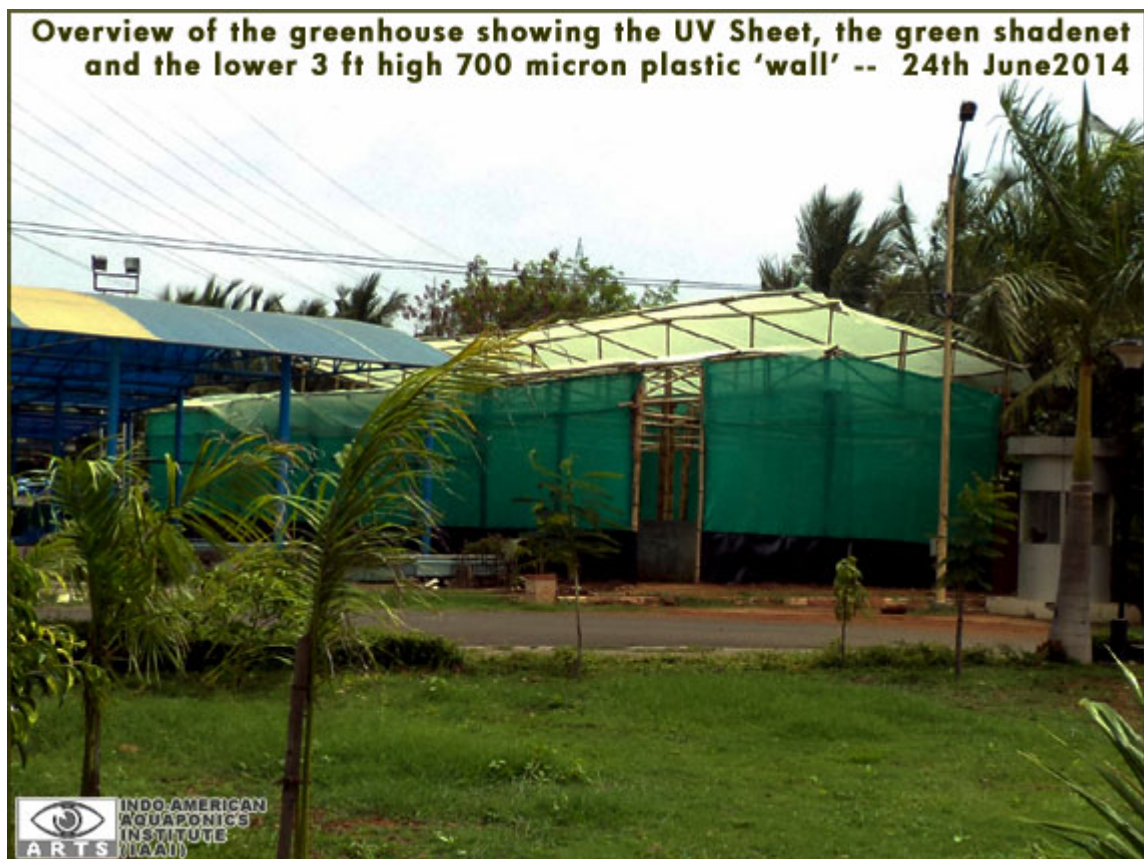














Annex-2.3: Images of construction work on the ground for the ASEP Project at CIFE, Mumbai

















Annex-2.3: Images of construction work on the ground for the ASEP Project at CIFE, Mumbai





**Dr. Subhrankar Mukherjee** *PhD, MBA*

Secretary, Society for Appropriate Rural Technology for Sustainability (ARTS)

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e-mail: [subra@sankalpamfs.org] ; alternate e-mail: [subhmukh@enr.colostate.edu]



Date: 19<sup>th</sup> June 2014

To:

**Senior Inspector  
Police Station—Versova  
Mumbai.**

Subject: Filing of complaint against Mr. Chandan Haldar, BAMBUNE INDIA

**Dear Sir,**

I wish to make a complaint against Mr. Chandan Haldar, BAMBUNE INDIA, for breach of trust and violation of agreement in the matter of building a Bamboo-based Greenhouse and Reception Area, for the **Aquaponics & Spirulina Eco Park (ASEP)**.

**Background:**

The **Aquaponics & Spirulina Eco Park (ASEP)** is being funded by The **Mumbai Metropolitan Region – Environment Improvement Society (MMR-EIS)**, a Society registered under the Society Registration Act and the Public Trust Act, and set up by the MMRDA in 1996 to support research and implementation activities in the areas of Environment Improvement.

The ASEP Project is being implemented jointly by:

- (a) **Society for Appropriate Rural Technology for Sustainability (ARTS)**, a knowledge-based and technology driven non-profit NGO; registered address at P6 Cluster 2, Purbachal, Salt Lake, Kolkata 700097, in collaboration with;
- (b) **Central Institute of Fisheries Education (CIFE)**, Off Yari Road, Panch Marg, Opp. Aarshee Complex, Versova Andheri (W), Mumbai 400061, under the Ministry of Agriculture, Govt. of India and included in the Indian Council of Agricultural Research; CIFE was conferred the Deemed University status in 1989.

The ASEP is being built within the premises of **Central Institute of Fisheries Education (CIFE)**, at Versova, Mumbai.

The goal of the project is to provide a managed green space for the study and promotion of sustainable Aquaponics and Spirulina technologies that are accessible to the academic community at CIFE, Mumbai, and the entire citizenry of Mumbai. The Eco Park is intended for the enjoyment of local visitors and eco tourists from every part of the country and abroad, from the densely populated surrounding communities at Versova to village-based communities and farmers who visit CIFE for continuing training and education programs.

**Bamboo-based Greenhouse and Reception Area:**

The bamboo-based '**Greenhouse**' and '**Reception Area**' are the two major infrastructural components of the ASEP Project.





Based on our discussions with **Mr. Chandan Haldar of BAMBUNE INDIA** :

**Head Office:** Town Rajar Bag, P.O.R.K. Pur, Udaipur, Tripura (S) – 799120, India;

**Branch Office:** 2/B, Swanand Society, Gokhale Road, Naupada, Thane – 400602, Maharashtra, India.

... in August/September 2013, it was agreed that a total payment of **Rs. 388,500** (less 10% as a form of surety deposit for six months) would be made to Mr. Chandan Haldar of BAMBUNE INDIA, for the completion of the ‘Greenhouse’ and ‘Reception Area’ by 20<sup>th</sup> December, in accordance with the following formula for division of costs: (based on his quotation)

- Reception Area                      Rs. 321,700
- Greenhouse                              Rs. 66,800
- **Total Contract Amount      Rs. 388,500**

It was agreed that these payments will be subject to the steady completion of work according to the milestones laid and discussed for this construction contract.

Mr. Chandan Haldar had deposited materials such as bamboo ply and bamboo poles worth about Rs. One Lakh, as a form of surety, at the time of receiving the first payment of Rs. One Lakh from ARTS, in September/October 2013, as advance payment for initiating the construction work.

### **The Breach of Trust**

Mr. Chanda Haldar first pleaded with us to give him more money as advance payments, so that he could make the labor payments for making the Greenhouse. Subsequently, he pleaded with us to give him more money as advance payments, so that he could buy the materials for the Reception Area, including:

- Bamboo panels, mat board and Deco-ply;
- 12 mm toughen Glass. 4’ x 6’;
- Teak wood Door. 3.5ft. x 6ft.;
- 8 mm Bamboo Dap boards with shingles fitted;
- Teak wood / Sal wood skirting and rafter and purling size 3” x 2.5”;
- Treated Bamboo poles of 2” to 4.5”
- Table, chairs, book rake, wall mounted lamps, ceiling lamps, etc.
- Labour charges, and other accessories, rattan, brass pins, self driven nails, etc.

**The direct cost of these items which have still not yet been supplied—based on Mr. Chandan Haldar’s own quotation—works out to about Rs. 1.65 Lakhs.**

As the project was getting delayed and on compassionate grounds, it was decided that Mr. Chandan Haldar should be helped monetarily, in the interest of completing the project, as early as possible. Accordingly, **a total amount of Rs. 2.95 Lakhs, which represents more than 75% of the ‘Total Contract Amount’, was paid to Mr. Chandan Haldar of BAMBUNE INDIA, up to February 2014**, so that he could meet his labour payments, procure the above mentioned materials and complete the work, *as soon as possible*. This figure of

Rs.2.95 Lakhs includes the first tranche of Rs. 1 Lakh paid in September/October 2013, as advance payment for initiating the construction work.

However, soon after Mr. Chandan Haldar received the last instalment amounting to a total of Rs. 2.95 Lakhs, he absconded from the project and ceased work from 02/03/2014, without doing any further work beyond erecting the basic structure of the Greenhouse and the preliminary bamboo structure of the Reception Area, which was subsequently partially dismantled, for no known reason.

There are several serious shortcomings in the construction of the Greenhouse and Reception Areas by BAMBUNE, which Mr. Chandan Haldar has also not rectified, despite repeated reminders; the defects in the constructions, include: (*see photo-diary shown in Annex-1 for details*)

- a. The need to insert a row of bamboo poles at the outer edge of the bamboo poles at the top, so that the channels for the UV sheet can be fixed;
- b. Removing a series of stiffening bamboo poles on the top, which makes it impossible to fix the UV sheet; these will have to be removed and placed at the bottom surface;
- c. Trimming the top edges of the bamboo poles at the top, to enable the UV sheet to be placed so that it will not tear the UV sheet, through abrasion;
- d. Re-inserting the bamboo poles at the top of the Reception Area, which were mysteriously removed for no reason, on the night of 02/03/2014, apparently by the workers of BAMBUNE.

I wish to iterate that Mr. Chandan Haldar has not returned, since early March 2014, to complete the work, rectify the defects in his work, nor to supply the materials needed to complete the Reception Area, despite several broken promises to do so, whenever threatened with legal actions to be taken against him.

Apparently, Mr. Chandan Haldar took advantage of the intervening general elections upto mid-May 2014, which he knew would make it extremely difficult for ARTS, which is a Society registered in Kolkata, to coordinate and follow-up actions to bring him to book for his breach of trust.

In late May (after the elections) and early June 2014, Mr. Chandan Haldar had promised Dr. A. K. Verma of CIFE, that he would begin work and complete the project as planned.

However, when the undersigned reached CIFE on 5<sup>th</sup> June to coordinate the implementation of the ASEP Project, it became clear that Mr. Chandan Haldar was not going to honour either his promises or commitments to Dr. Verma.

It was therefore decided to go ahead and meet the exigencies of the project and complete the project at the earliest with our own project staff brought over to Mumbai from West Bengal.

**The total cost of bringing our project staff from West Bengal, including the direct cost for logistics and materials and the opportunity cost, is estimated to be Rs. 85,000.**



## **Compensation**

This complaint against Mr. Chandan Haldar of BAMBUNE INDIA, in addition to other punitive actions, seeks to recover the following costs:

- |  |                         |
|--|-------------------------|
| 1. Direct cost of items pending supply                 | = Rs. 1.65 Lakhs        |
| 2. <u>Total cost of project staff from West Bengal</u> | = Rs. 0.9 Lakh          |
| <b>3. TOTAL COMPENSATION</b>                           | <b>= Rs. 2.55 Lakhs</b> |

(In words: Rs. Two Lakhs Fifty Five Thousand only)

## **Conclusion**

We hope that you will register this complaint against breach of trust by Mr. Chandan Haldar of BAMBUNE INDIA: **Branch Office:** 2/B, Swanand Society, Gokhale Road, Naupada, Thane – 400602, Maharashtra, India, so that we can request the competent authorities to help us to recover the total compensation of Rs. 2.55 Lakhs, and also to take up further punitive actions as per law, if necessary.

Yours sincerely,

**Subhrankar Mukherjee** *PhD, MBA*

*Secretary,*

Society for Appropriate Rural Technology for Sustainability (ARTS)

*Copies to:*

### **1. Director and Vice-Chancellor,**

Central Institute of Fisheries Education (CIFE),

Off Yari Road, Panch Marg, Opp. Aarshee Complex. Versova Andheri (W), Mumbai 400061

### **2. Secretary**

Mumbai Metropolitan Region – Environment Improvement Society (MMR-EIS)

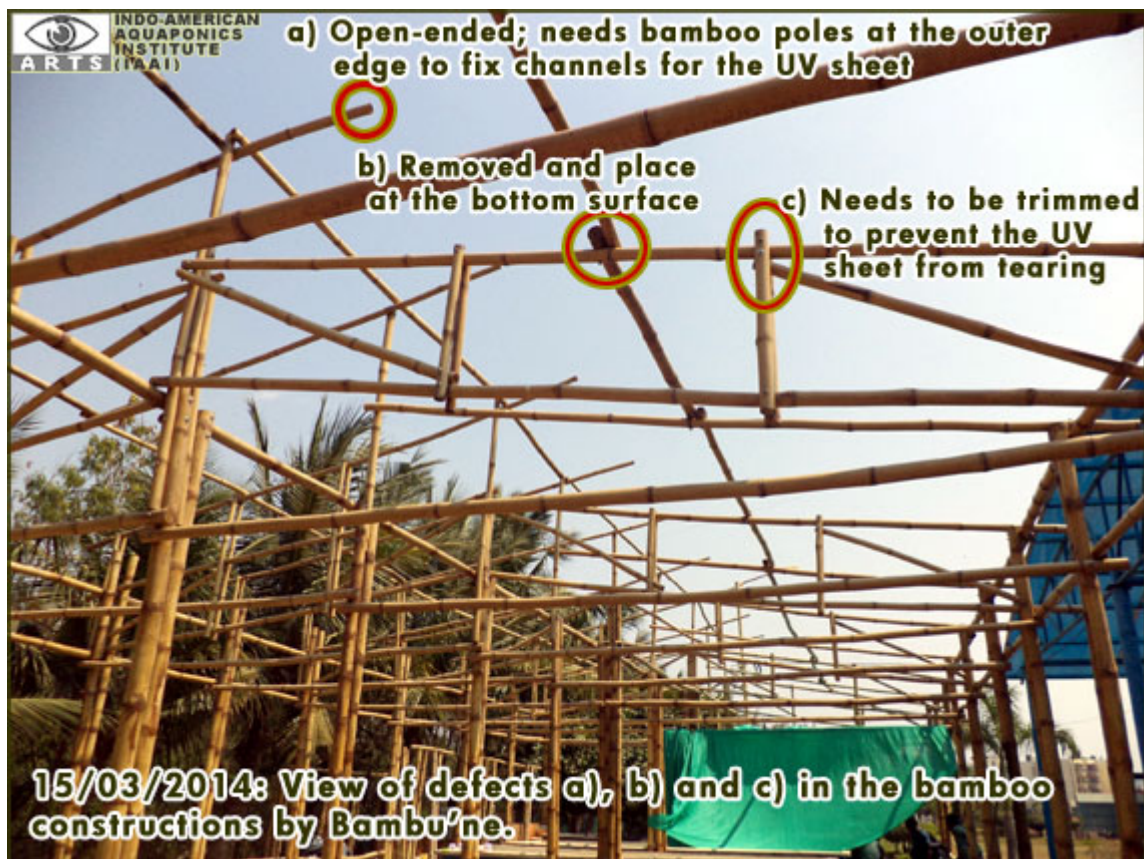
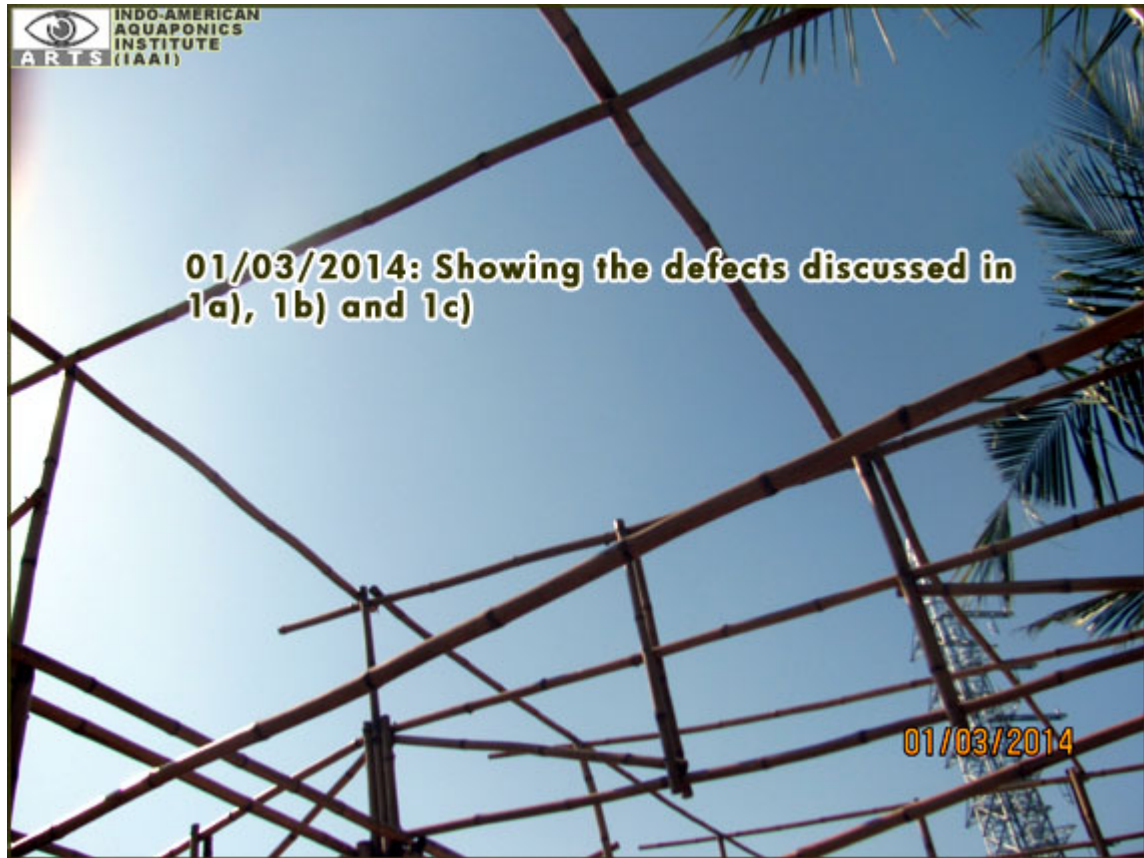
7th Floor, MMRDA Office Building, Bandra Kurla Complex, Bandra (E), Mumbai - 400051

*Annex-1:*

Photo-diary of defects in Bamboo constructions—  
*Contractor:* Bambu'ne

Aquaponics and Spirulina Eco-Park (ASEP) Project  
at CIFE, Mumbai

*Date of preparation:* 18<sup>th</sup> March 2014











**Annex-3: BIG EVENT SUMMARY**

#	Funding Authority	#	Program area/description	Grant Request (in Rs.)	Remarks/Proposal Status
1	Indo US Science & Technology Forum (IUSSTF)	1.1	Bi-lateral Indo-US Workshop on Aquaponics	1,132,900	The proposal in collaboration with Dr. Nathaniel Storey has been submitted to IUSSTF and an acknowledgment received; results will be known in December 2014.
		1.2	Indo-US Training Program on Aquaponics	1,000,000	The 1st Draft of the proposed "Indo-American Training Program on Aquaponics" at CIFE is still in the preparatory stage
		1.3	Indo-US Joint Centre for Aquaponics R&D	4,500,000	The 1st Draft of the proposed "Indo-American Aquaponics Research Center" at CIFE is still in the preparatory stage; inputs from the 'Think Tank' Members at CIFE are welcome
		1.4	United States - India Science and Technology Endowment Fund	25,000,000	This proposal is being developed in collaboration with Sweet Water Foundation, Milwaukee; submission deadline is 16 August 2014
2	National Fish Development Board (NFDB), Hyderabad	2.1	Development of training/demonstration site at the ASEP at CIFE	150,000	Proposal entitled: "Development of training/demonstration site at the ASEP at CIFE for conducting NFDB training programs—to promote social entrepreneurship in rural communities" is ready for submission.
		2.2	Conduct training programs on the cultivation of seaweed/algae	176,500	Proposal entitled: "Conduct training programs on the cultivation of seaweed/algae at the ASEP at CIFE—to promote social entrepreneurship in rural communities" is ready for submission.
		2.3	Conduct training programs on the production Spirulina-mediated seaweed fish-feed	176,500	Proposal entitled: "Conduct training programs on the production Spirulina-mediated seaweed fish-feed at the ASEP at CIFE—to promote social entrepreneurship in rural communities" is ready for submission.
		2.4	Conduct training programs on the cultivation of Ornamental Fish/Aquaponics	529,500	Proposal entitled: "Conduct training programs on the cultivation of Ornamental Fish/Aquaponics at the ASEP at CIFE—to promote social entrepreneurship in rural communities" is ready for submission.
		2.5	Integrated Aquaponics Farm for Fisherman's community near Mumbai	2,500,000	The 1st Draft of the proposed "Fisherman's Aquaponic Farm" at Madh Island is still in the preparatory stage; we have developed a half A4-sized 6-page leaflet, which will be used to strengthen our 'Concept Note' for the proposal.
		2.6	Integrated Aquaponics Farm for School community in Mumbai	2,000,000	We are searching for a new school partner to develop a proposal for the "Integrated Aquaponic Farm" at a school in Mumbai, after St. Annes's school at Malad West informed us that they are not ready to work with us at this time.
		2.7	Integrated Aquaponics Farm for Hospitality Industry in Mumbai	3,000,000	The 1st Draft of the proposed "Aquaponic Urban Farm" at St. Andrew's School, Bandra is still in the preparatory stage, as more discussions with the school authorities are planned in June.
		2.8	Spirulina-mediated Seaweed Fish-feed Manufacturing Program (SmSFfMP) for Koli Community	1,750,000	The 1st Draft of the proposed "SmSFfMP" at a Koli community in Madh Island is still in the preparatory stage, as more discussions with the Koli community are planned in June.
		2.9	Innovative Digital Badging Pedagogy for the Dissemination of Aquaponics and Spirulina	1,500,000	The 1st Draft of the proposed "Digital Badging Program" at CIFE is still in the preparatory stage, as more discussions with CIFE, stakeholders and target beneficiaries are planned in June.
3	Department of Biotechnology (DBT)	3.1	Applied Research of new biotechnology approaches for Aquaponics and Spirulina	2,500,000	Pending inputs from the CIFE "Expert Committee"
		3.2	Bioinformatics Approaches and Metagenomic Analysis of Aquaponic Systems	2,000,000	Pending inputs from the CIFE "Expert Committee", and international network partners, such as Dr. Dave Love of John Hopkins and Mr. Ryan Lesniewski

#	Funding Authority	#	Program area/description	Grant Request (in Rs.)	Remarks/Proposal Status
4	Maharashtra Tourism Development Corporation Ltd. (MTDCL)	4.1	Aquaponics-mediated Eco-Tourism project at Madh Island, Mumbai	3,750,000	The 1st Draft of the proposed "AmET" Project at Madh Island is still in the preparatory stage; we have developed an A5-sized 6-page leaflet, which will be used to strengthen our 'Concept Note' for the proposal
		4.2	Aquaponics-mediated Eco-Tourism project at eco-resorts in Maharashtra	30,000,000	There are at least a dozen sites in Maharashtra, including Ajanta, Arthur Dam, Bhandarpule, Bhathey, Elephanta Caves, Harihareshwa, Ramtek, Lonavala, Khekrana, Mahabaleshwar, Sindhudurg, Pench Forest and Matheran, where we could implement an "AmET" Project.
		4.3	Aquaponics-mediated Edible Landscape Program in Greater Mumbai	1,500,000	The 1st Draft of the proposed "AmELP" in Greater Mumbai is still in the preparatory stage, as discussions with the funding authorities and stakeholders are planned in June, onwards, and will take several more months to coordinate..
5	Mumbai Metropolitan Region Development Authority (MMRDA)	5.1	Aquaponics-mediated Urban Greening & Vertical Farming at Dharavi Slums, Mumbai	7,500,000	The 1st Draft of the proposed "AmUG" & "VFP" in Dharavi Slums, Mumbai is still in the preparatory stage, as discussions with the funding authorities and stakeholders are planned in June, onwards, and will take several more months to coordinate..
		5.2	Aquaponics-mediated Urban Greening for Skywalks & Over-passes in Mumbai	5,000,000	This will be taken up concurrently with #5.1
6	National Bank for Agriculture and Rural Development (NABARD)	6.1	Implementing a 1,000 sq.ft. commercial Aquaponics Farm Project at Jategaonkhurd, a village near Pune	1,000,000	Proposal entitled: "Implementing a commercial 'Aquaponics Farm' Project at Post Jategaonkhurd, near Pune, Maharashtra." has already been submitted to NABARD Pune Regional Office.
		6.2	Direct marketing of Aquaponics products and services from a village near Pune	7,500,000	Proposal entitled: "Direct marketing of village-based produce, products and services from Post Jategaonkhurd, near Pune, Maharashtra." is ready to be submitted to NABARD Head Office, as the project grant requested exceeds Rs.10 Lakhs.
		6.3	Aquaponics-mediated Eco-Tourism project at Panchgini, Maharashtra	2,500,000	This will be taken up concurrently with #4.1
7	MMR-Environment Improvement Society (MMR-EIS)	7.1	ASEP Project Extension at a School in Mumbai	1,200,000	This will be taken up concurrently with #2.6
		7.2	Urban greening/'Language of Food'/'Guerilla Gardening' project	500,000	This will be taken up concurrently with #4.3
		7.3	Publication of Coffee Table Book on ASEP	200,000	For review
		7.4	Publication of Monolog on Aquaponics/ASEP	150,000	For review
		7.5	Publication of flyers for ASEP/urban greening	125,000	For review
8	Prime Minister's Office	8.1	Aquaponics and 'Smarter Cities' in India.	1,093,000,000	Detailed letters and 'Concept Note' submitted to the Prime Minister's Office
<b>T O T A L (Grant/Project Proposals)</b>				<b>1,201,840,400</b>	
8	Fund-raising event to launch the "Aquaponics and Spirulina Eco Park" Project			15,000,000	We are working with Red Molecule, an Event Management company located at Bandra West, Mumbai, to help us with coordinating our event management activities for the BE
9	Online/Crowdfunding fund-raising program for Aquaponics and Spirulina			1,500,000	
<b>T O T A L (Big Event fund mobilization program)</b>				<b>1,218,340,400</b>	

## The Mission Statement

The Aquaponics & Spirulina Eco Park (ASEP) is a center of excellence and life-long learning, to demonstrate and highlight the emerging fields of Aquaponics and Spirulina—engaging eco park visitors and local community beneficiaries, in the art of developing urban and peri-urban agricultural ecosystems, to promote economic and environmental sustainability.

## The Eco Park will be:

- Eco-friendly;
- Integrated into the fabric of the surrounding urban space;
- A model for ecological aesthetics—in landscape and architectural forms—and for management of urban spaces;

The ASEP will deploy and demonstrate appropriate environment friendly operations:

**Composting** is integral to the ASEP, to manage organic materials;

**Water conservation** and rain water harvesting is another important function;

**External pathways** shall permit grass to let rain water sink into the ground;

**Fencing** shall be made suitable for 'Edible Landscapes'.



**Participatory Practices for S.D.:** Break down barriers between experts and community beneficiaries, who help in the evolution and management of the ASEP—designed and developed in partnership with local community members and stakeholders.

## Four primary zones in ASEP:

**Reception Area:** Welcome visitors and facilitate arrival and orientation processes. **Aquaponics Learning Zone:** Demonstration of Aquaponics systems.

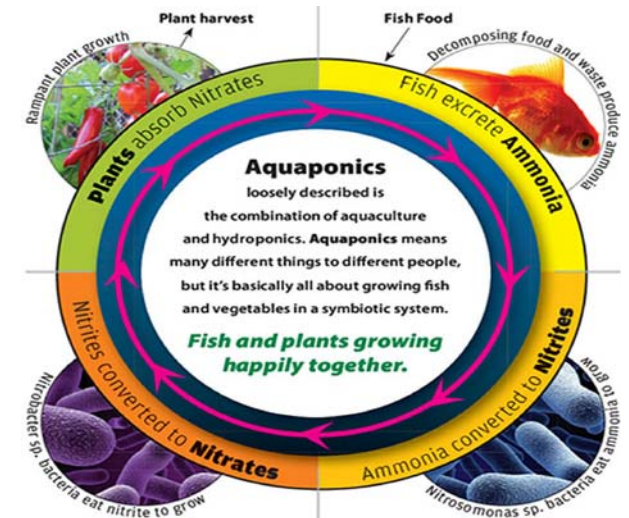
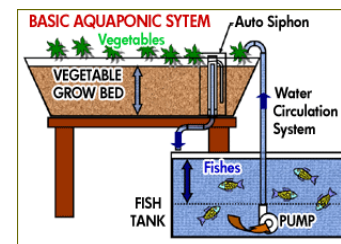
**Spirulina Learning Zone:** Showcases photo bio-reactors and spirulina systems;

**Wholistic Development Model Zone:** Demonstrates biomethanation, vermicomposting, duckweed 'ponds' and other environmental education programs.

## What is Aquaponics?

Aquaponics is 'aquaculture' (intensive fish farming) and 'hydroponics' (soil-less plant culture). The water

flows from the fish tank through a bio-filtering treatment process that also provides the nutrition for the plants, and is finally returned to the fish tank in a continuous, 'Nitrogen Cycle' re-circulation system:

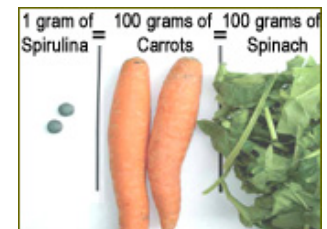


Aquaponics is an eco-friendly, natural and organic food growing method.

## What is Spirulina?

Spirulina is a low-fat, low-calorie, cholesterol-free source of easily-digestible vegetable protein containing all essential amino acids that cannot be produced by the body but are needed to synthesize the non-essential amino acids.

One gram of spirulina per day, ~Rs.1, is enough to correct malnutrition in a small child in a few weeks and improves the physical strength of the body and also the cognitive development of the child.



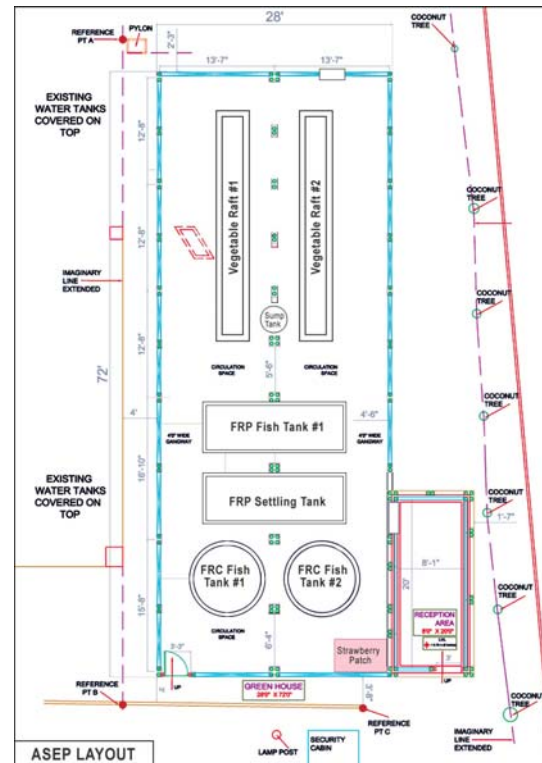
## Interactive Children's Learning

The ASEP would be derelict in its duty to inform and promote lasting social change management programs, without providing an interactive children's learning space within the ASEP, in the form of innovative play areas in the open space in the WDMZ, which would sensitize the children to the importance of biodiversity and urban greening and speak 'The Language of Food', for promoting urban agricultural initiatives, such as 'Vertical Farming'.



## About the ASEP:

The goal of the ASEP is to provide a managed green space for the study and promotion of sustainable Aquaponics and Spirulina technologies that are accessible to the academic community at CIFE, and the citizenry of Mumbai:



For more information, please contact:

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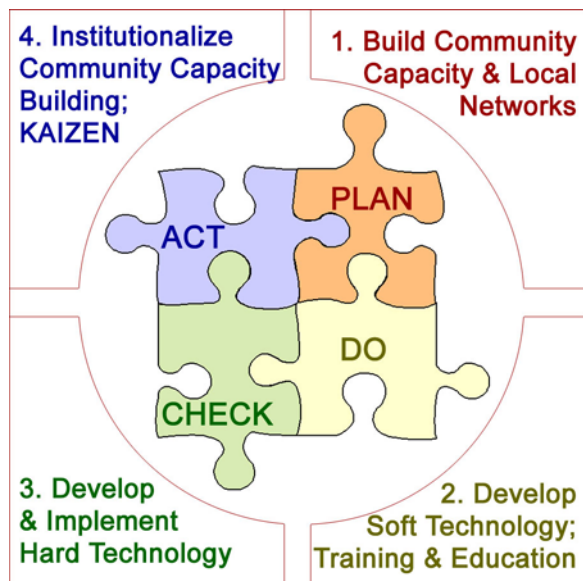
## Aquaponics & Spirulina Eco Park (ASEP) at the Central Institute of Fisheries Education (CIFE), Mumbai



Funded by  
 MMR-Environment Improvement Society (MMR-EIS), Mumbai

Coalition Partners





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 ARTS: [www.sankalpacmfs.org/src/]  
 IAAI: [www.sankalpacmfs.org/cmfs/01coa/aquaponic/iaai.html]



# The Language of Food

AN ARTS & IAAI INITIATIVE

HELP US MAKE IT HAPPEN





Food is a great conversation opener. The language of food is a topic on which most people have a view.

It has evolved traditionally from purely gastronomic issues about the wider society—to the modern, complex and *inter-related* issues concerning *climate change*, *global warming*, *energy* and the *environment* on the one hand, and the *incompatibility* of present patterns of the *production and distribution of food* with the language of ‘*Sustainable Development*’, on the other.

## THE LANGUAGE OF FOOD

One-third of all food produced in India is spoiled and rendered useless before it reaches a consumer.

Supply-chain mechanisms lack infrastructure and are impeded by a system of middle men who delay delivery and force up prices. Worldwide, agriculture produces about a third of all man-made emissions.

We need to think ‘out-of-the-box’ for modern and effective solutions to the problems of growing and distribution of food—both, in urban and rural environments—which will meet the goals of Sustainable Livelihoods and Development.

SUSTAINABLE LIVELIHOODS is a job that gives a decent income, gives some status in society and some dignity and meaning in life. It also conserves and, if possible, regenerates the environment. It provides opportunities for people to work right in their own community instead of having to migrate to the slums of a big city. And the purchasing power and lifestyle provided by such a livelihood would be at least comparable to that of a factory worker in an urban area, where the wages have to be much higher than in the village to compensate workers for higher costs of living.

- Adapted from a lecture by Dr Ashok Khosla at the UN, New York, 30th April 2001.

# EDIBLE LANDSCAPES



[http://misterlandscaper.com/images/Edible\\_landscape.jpg](http://misterlandscaper.com/images/Edible_landscape.jpg)

## Reduce Food's Carbon Footprint: *Grow your own!*

Growing our own food locally is a great way to save money, get fit and reduce the carbon footprint of the food we eat!

A Backyard Aquaponics Farm can produce affordable, healthy, organic and pesticide-free fish and vegetables. Urban residents in apartments may use their unused balcony and roof-top spaces to grow food in 'Vertical Farms'—or develop the community spaces outside. Large-scale development of community areas to produce food for distribution in local food bazaars, will be a ground-breaking achievement.

Please view the TED Talk presentation by Pam Warhurst, from Todmorgen in North England: '**How we can eat our landscapes**', at: [[http://www.ted.com/talks/pam\\_warhurst\\_how\\_we\\_can\\_eat\\_our\\_landscapes](http://www.ted.com/talks/pam_warhurst_how_we_can_eat_our_landscapes)]  
Please view the 6:30 point of the video, in which she speaks about Aquaponics and what we are also trying to do in India. For details on Aquaponics, please see our flyers, or download a concept note at: [[http://www.sankalpacmfs.org/src/wp/Concept.Note\\_Aquaponic.Systems.pdf](http://www.sankalpacmfs.org/src/wp/Concept.Note_Aquaponic.Systems.pdf)]

## SUSTAINABLE LANDSCAPES

A sustainable and edible landscape is one that will, once established, require minimal external resources to keep it going and healthy.

It survives on natural rain water, and provides its own ecology by providing for nutrient recycling, bio-diversity, vermicompost, protection from wind and sun, a healthy soil ecology, and most importantly, little work and small amounts of external resources to maintain the system.

**Green fact** – around 11% of the greenhouse emissions involved in food production are linked to food transportation.

We have heard of the carbon footprint...but what about the **water footprint**? Just 5% of our daily water footprint is from domestic use. The food we eat, the stuff we buy, the things we do and the trips we take uses the other 95%!

This is why Aquaponics is so important as the means for urban agriculture, vertical farming and the future of agriculture itself, as it can produce the same amount of vegetables as traditional agriculture using less than half the amount of water and a tenth of land resources, plus producing fish, over and above the vegetables, in the bargain!

# WE NEED TO LET OUR IMAGINATIONS FLY

A vibrant, fantastical landscape where a path leads through a field of giant broccoli and other vegetables. In the background, a waterfall cascades down a large, reddish-brown rock formation under a blue sky with white clouds. The scene is lush and imaginative, suggesting a world where food is the primary vegetation.

WHEN DESIGNING A LANDSCAPE,  
WHY NOT MAKE IT EDIBLE?

GREEN VEGETABLES, HERBS,  
FRUIT AND NUT TREES, STRAW-  
BERRIES, GRAPES AND MANY  
OTHER VEGGIES ARE BEAUTIFUL  
AND EDIBLE – THE CHOICES ARE  
ENDLESS.

THERE ARE MANY EDIBLE  
PLANTS THAT CAN FILL THE  
SAME NICHEs THAT OTHER  
MORE COMMON PLANTS FILL,  
PLUS THEY PROVIDE FOOD FOR  
US AS WELL AS BEING EDIBLE  
PLANT MATERIALS FOR NATIVE  
WILDLIFE & AID BIO-DIVERSITY.





Edible landscapes in the parks to feed the poor

[http://atyoursenses.files.wordpress.com/2011/06/garden\\_cropped\\_broccoli\\_seed1.jpg](http://atyoursenses.files.wordpress.com/2011/06/garden_cropped_broccoli_seed1.jpg)

## BENEFITS OF EDIBLE LANDSCAPES

Where our food comes from is becoming more and more critical to our health and well-being. Growing food on our own land is a healthy, economical, therapeutic and satisfying endeavor.

Edible plants in our landscape gives a return on investment that is both smart and delicious. When we grow our own food, we create a more sustainable world.

Large scale food production has unfortunately become a money-driven business instead of a health-driven business. Non-renewable resources are used to transport food over thousands of kilometers while losing quality, nutrients and freshness in the process.

## GUERRILA GARDENING

Forget about the pretty shrubs and flower beds ... The new thing is *edible parks*. 'Guerrilla gardeners' are planting in vacant, neglected public lands and everyone is welcome to help in the growth process.

Some fruits, vegetables and herbs are used collectively by the gardeners and the excess is donated to the poor. Some are managed with the concept to go to the needy entirely.

The gardens are maintained by neighborhood groups and non-profits, and the harvested produce is donated to the poor and the hungry.

# THE HOW:

## Based on the P-D-C-A Cycle

People are naturally tuned to speak the 'Language of Food'. However, like any other skill, the quality of the discourse will flourish if it is nurtured, as shown in the schematic figures on the right:

- PLAN:** Select school or community for 'edible landscapes' program; *build community capacity & local networks;*
  - DO:** Develop soft technology inputs for design of 'edible landscape' program; *participatory approach for training and education;*
  - CHECK:** Develop hard technology outputs for building physical structures; *implementation program;*
  - ACT:** Build the 'edible landscapes' *through Community Groups and Resources;*
- KAIZEN:** *Institutionalize the 'Hard' and 'Soft' Technologies needed for continuous improvement of Edible Landscapes, in an iterative cycle, as shown in the schematic, below, on the right.*

