WETLAND DEVELOPMENT PROJECT

MUTHA RIVER, PUNE

A CASE STUDY

BY

Jeevitnadi
Living River Foundation

IN ASSOCIATION WITH

LEMNION

oikos
for Ecological Services

About

Jeevitnadi – Living River Foundation

‘Jeevitnadi’ started as an informal group of people passionate for River Conservation in 2014. In 2016, the group acquired the status of a non-profit section-8 company as ‘Jeevitnadi-Living River Foundation’.

Since beginning, the mission of Jeevitnadi has been Revival of Rivers through public participation.

Over the last 3-4-year span, Jeevitnadi has been playing instrumental role in changing the perception of common people towards the river and recreating the lost relationship of society and the rivers in Pune city.

www.jeevitnadi.org

LEARNING

- How a group of motivated citizens can bring about change
- How one can start small and make a big difference
- Help is always available, all we need to do is ASK

WHO IS THIS FOR

- Anybody and everybody wishing to do something for river
- Citizens, citizen groups, students, NGOs, Corporates
- Government agencies, Environment Departments, Education institutions

ABOUT

ADOPT A RIVER STRETCH PROGRAM

We believe that river restoration is not possible without active involvement of the citizens.

With this belief, we launched “Adopt a River Stretch” program in May 2017.

Idea is to adopt a stretch of a stream or river nearby, look after it, work there regularly, keep it clean, prevent pollution, record biodiversity, implement conservation measures, watch it come alive.

PROJECTS UNDER PROGRAM

(AS OF AUGUST 2018)

4 stretches of river Mutha

2 stretches of river Mula

within Pune city

ADOPT A RIVER STRETCH

Mutha river, Vitthalwadi, Pune

Through ‘Adopt a Stretch’ project at Vitthalwadi, we have been getting closer to the river for more than a year now.

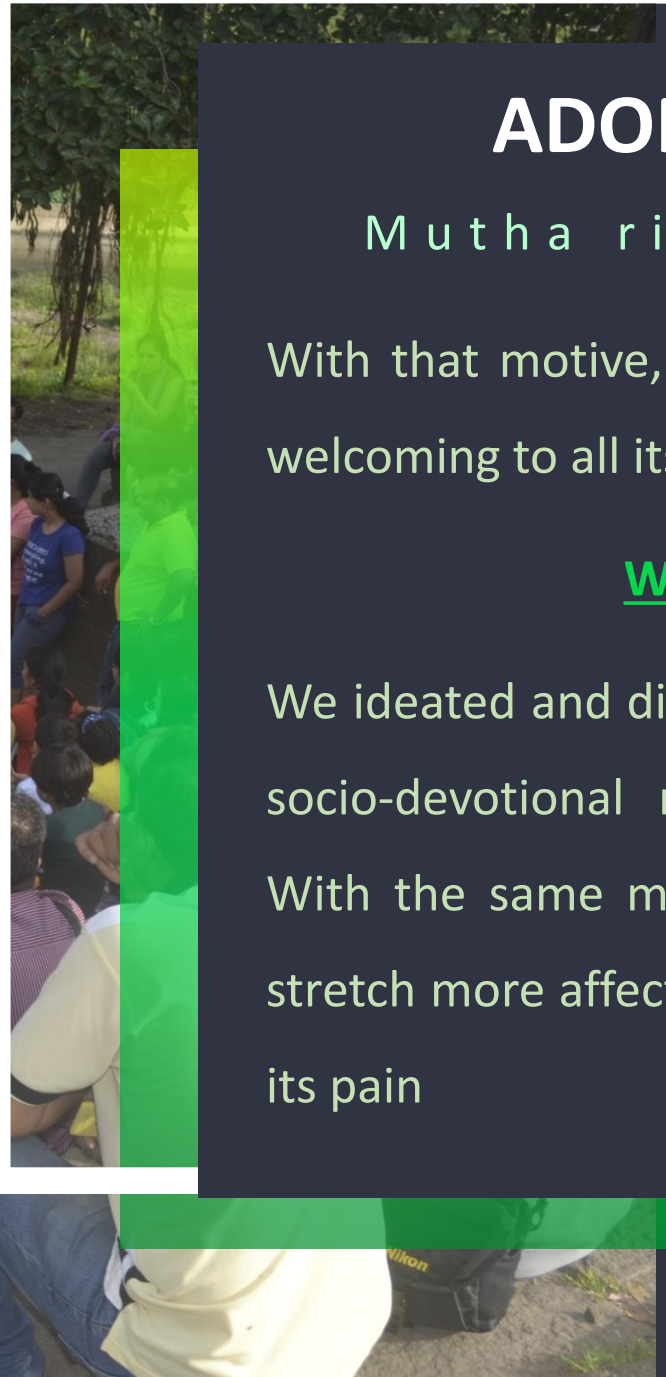
First few months, it was nothing but cleaning! Overwhelming garbage of literally all possible kind was getting dumped in the river banks and river bed. So, could not think of anything else. But, once you make the river your own responsibility just like your home, cleaning will not be enough.

ADOPT A RIVER STRETCH

Mutha river, Vitthalwadi, Pune

Back of our minds, we all knew that we need to do something more. It was important to change the urban perception towards the river.

It’s not a garbage dumping site but it’s our native land, it’s our place to recreate, it’s our place to rejoice, it’s our place to rejuvenate.



ADOPT A RIVER STRETCH

Mutha river, Vitthalwadi, Pune

With that motive, we started thinking how my river will be welcoming to all its citizen.

We must celebrate our river

We ideated and did “storytelling session”, “Kirtan (traditional socio-devotional musical event)” and other celebrations. With the same motive, we started looking at our adopted stretch more affectionately to understand its beauty and also its pain

ABOUT THE STRETCH

Stretch is around 1 km, spanning over both sides of the temple known as Pundalik temple in Mutha riverbed, at Vitthawadi, Pune

https://goo.gl/maps/8pgma48sweH2

Vitthal temple is on the river bank which is around 175 years old. This stretch represents all the stresses a river has in an urban landscape.

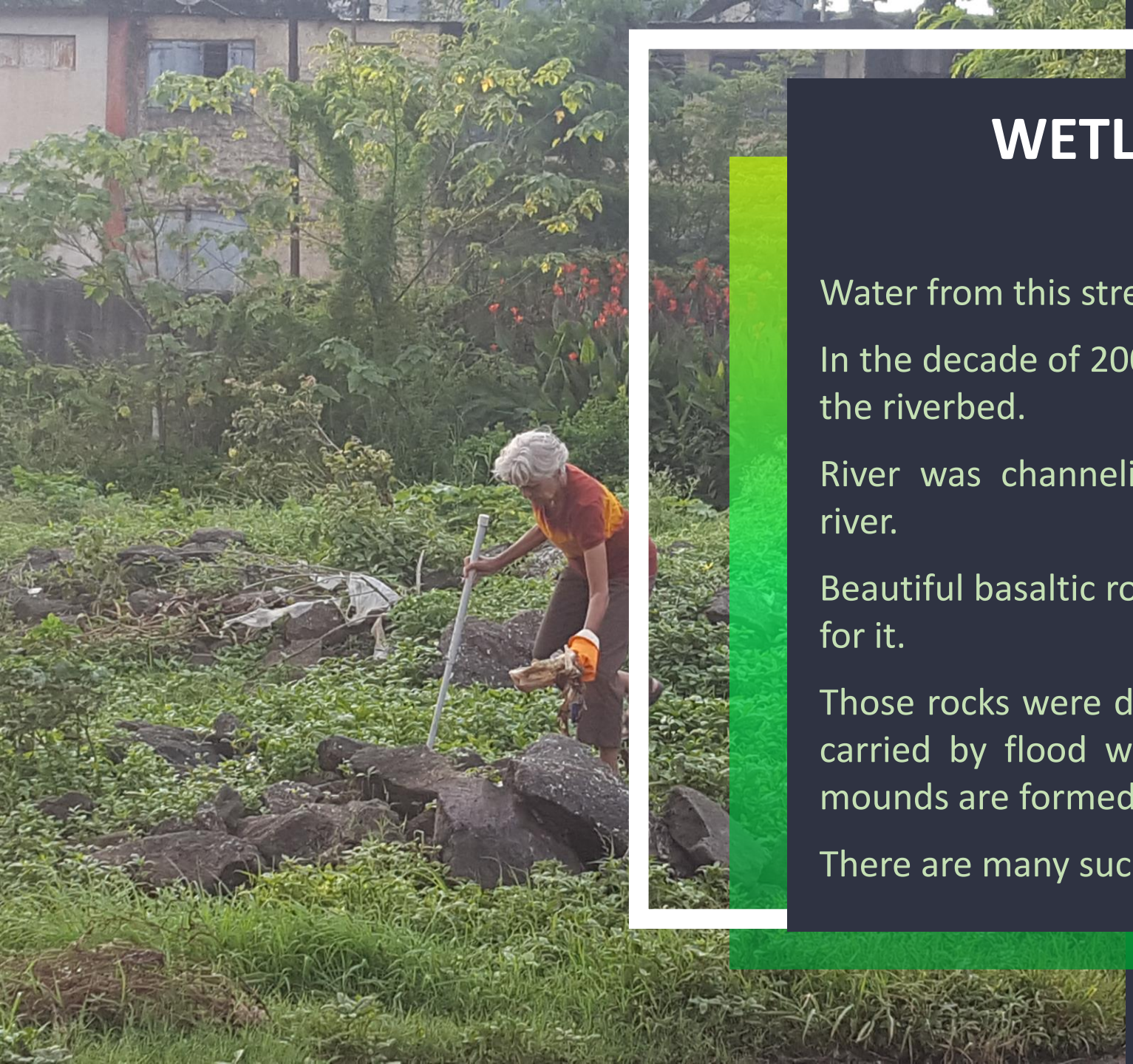
WETLAND DEVELOPMENT

Background

Two *gomukh* are present at the edge of the riverbed, which continuously discharge water.

Gomukh is the structure looking like cow-head, usually made of stone through which water of a live spring/ stream flows. It is a traditional practice of stream conservation across India


GOMUKH AT THE EDGE OF THE RIVERBED



WETLAND DEVELOPMENT

Background

Water from this stream used to continuously feed to the river.

In the decade of 2000-2010, various interventions happened in the riverbed.

River was channelized. Sewage pipeline was laid along the river.

Beautiful basaltic rock in the riverbed was blasted to make way for it.

Those rocks were dumped in the riverbed. Over the years, silt carried by flood waters accumulated in them. A number of mounds are formed, blocking path of water to the river.

There are many such marshy formations in the riverbed.

WETLAND DEVELOPMENT

Background

There are many such stagnant pools in the riverbed.

They stink, provide breeding ground to mosquitos.

As a result, people find river and riverbed repulsive

A WORD ABOUT MARSHES

Marshy place is itself a habitat.

Then why did we interfere?

In this case, it was not the original character of the riverbed. Marshy places happened due to thoughtless development and equally careless execution.

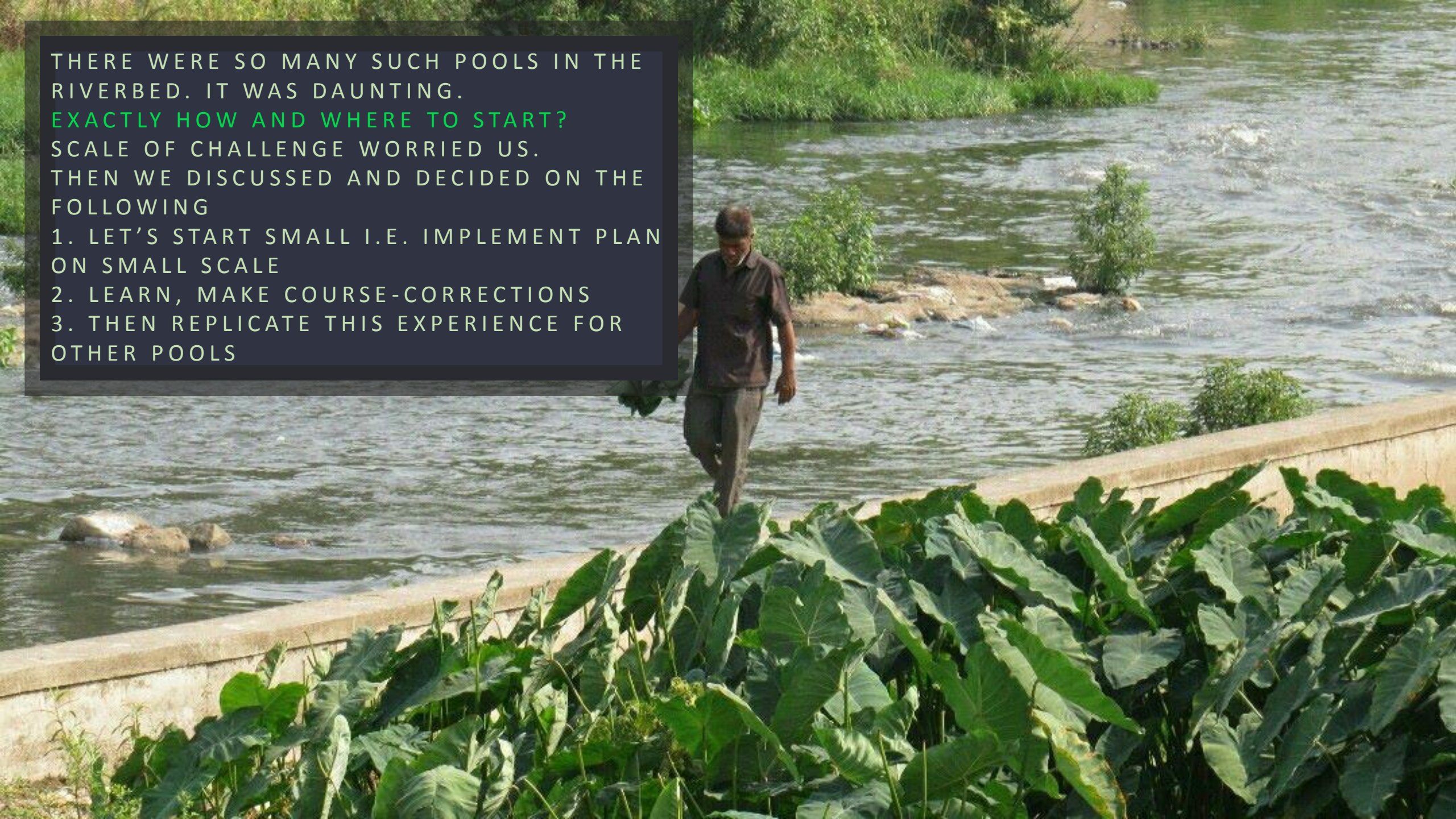
Normally water that should have reached the river, resulted in stagnant pools in the riverbed.

- River thus was deprived of fresh water
- Stagnant pools bred mosquitos
- Stagnation caused water to stink
- People perceived riverbed as an unhealthy and stinky place and avoided it
- Since it became a neglected place, garbage dumping became rampant


STAGNANT POOLS, WITH DUMPED GARBAGE BEFORE PROJECT


TYPHA, TARO,
POLYGONUM
IS TYPICAL
MARSHY
VEGETATION


WHERE YOU SEE THIS VEGETATION, THERE ARE MARSHES



THERE WERE SO MANY SUCH POOLS IN THE RIVERBED. IT WAS DAUNTING.

EXACTLY HOW AND WHERE TO START?

SCALE OF CHALLENGE WORRIED US.

THEN WE DISCUSSED AND DECIDED ON THE FOLLOWING

1. LET'S START SMALL I.E. IMPLEMENT PLAN ON SMALL SCALE
2. LEARN, MAKE COURSE-CORRECTIONS
3. THEN REPLICATE THIS EXPERIENCE FOR OTHER POOLS

NOW OUR TASK WAS EASY. WE SELECTED ONLY 4 POOLS TO WORK ON.
WOW!!
THAT LIFTED BURDEN OFF THE TEAM.
4 POOLS WAS NOT AT ALL SCARY ☺

Sewage pipeline runs parallel to the river in the riverbed. Concrete platform is constructed over the pipeline for protection. Chambers like the one in the picture are present every 100 meters on the platform for maintenance purpose.

Pool2 at the base of the chamber is due to leakage in the pipeline. Leaking sewage creates stinky, unhealthy pool in the riverbed.

Sewage Treatment facility in Pune city could not keep pace with the growing city. Pune Municipal Corporation admits they discharge into river 29% of untreated sewage.

SEWAGE TREATMENT

Hence, instead of sealing the leakage, we decided to treat this pool as part of wetland development

ROLE OF WETLAND

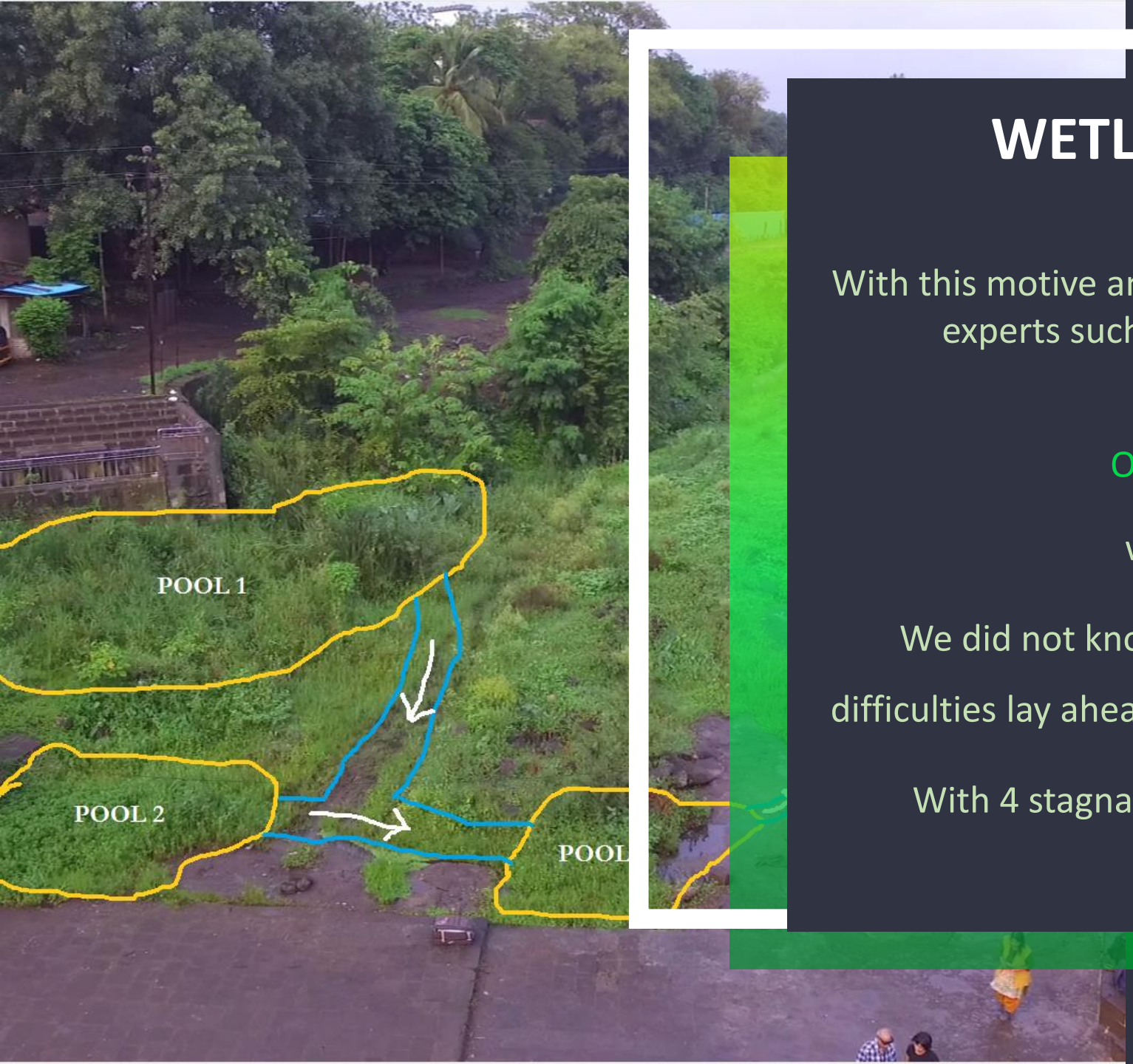
Wetlands play a number of roles, providing services like flood control, waste purification, habitat provision, carbon sink, groundwater recharge, stability of riverbank.

WETLAND DEVELOPMENT

B e g i n n i n g

Thanks to our ecologist experts, we learnt how these wetlands are integral part of the river ecosystem.

We decided to give it a go and convert those stinking places, home to mosquitos into a beautiful phenomenon which will be naturally purifying the drainage mixed water before reaching to the river stream and at the same time a welcoming site for its visitors



WETLAND DEVELOPMENT

P l a n n i n g

With this motive and thanks to our enthusiastic volunteers and experts such as, Lemnion Green Solutions Pvt Ltd

and

Oikos for Ecological Services

we embarked on this task.

We did not know what challenges might crop up, what difficulties lay ahead. We decided to tackle them as they come.

With 4 stagnant pools to start with, we chalked out a

SIX-SUNDAY plan.

WETLAND DEVELOPMENT

P l a n n i n g

We decided to join these 4 pools by digging passage in between.

Thus we would make water flow from

Pool 1 -> Pool 2 -> Pool 3 -> Pool 4

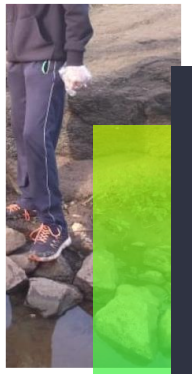
From Pool 4, water would flow into river

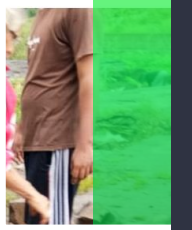
Marshy vegetation was already present, which aided water purification. We enhanced this role by planting some more.

Duckweed in the pools further helped in purification.

Our knowledge told us soil and these plants would be able to purify water, to the extent we expected.

FOR EACH SUNDAY, WE DECIDED A SET OF TASKS FOR EACH POOL AND SHARED WITH THE TEAM ON WHATSAPP GROUP





WETLAND DEVELOPMENT

Execution

Each Sunday morning, team gathered.

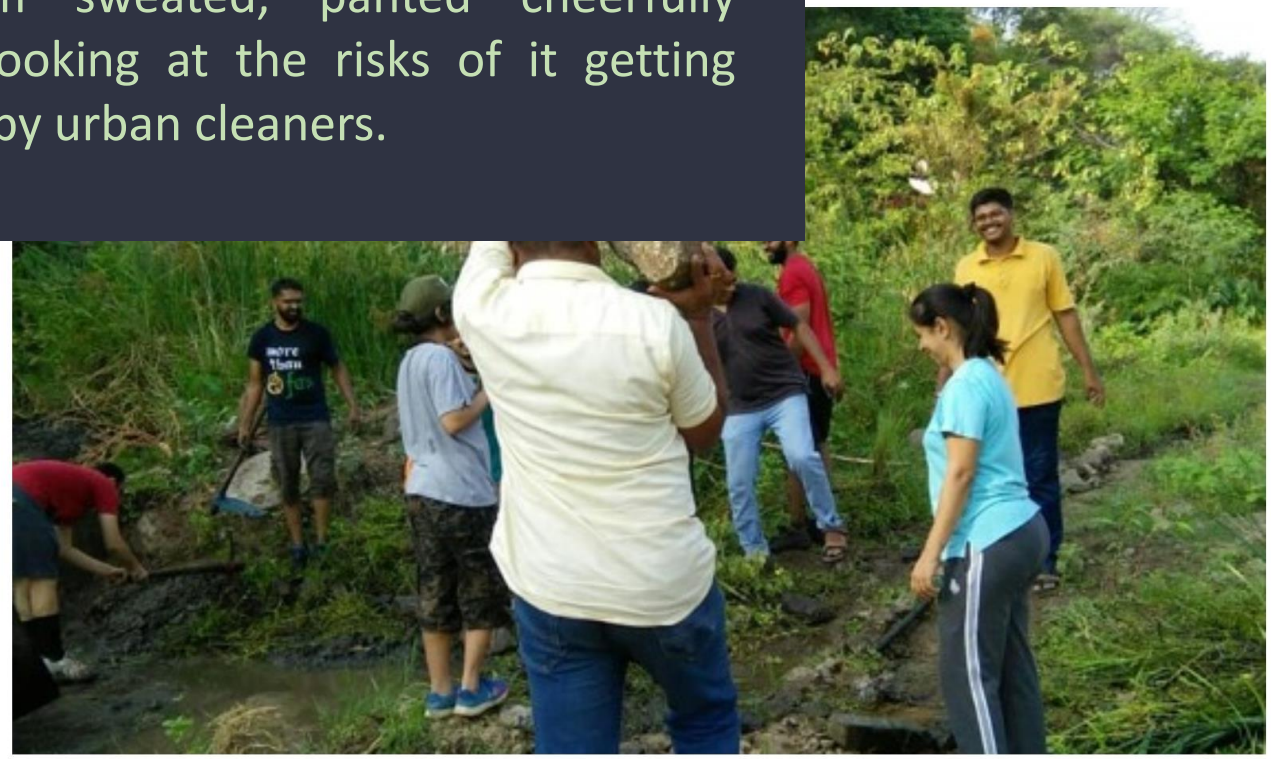
We had 5-minute stand-up meeting.

Tasks distributed, queries answered, the work began

WETLAND DEVELOPMENT

Execution

The team sweated, panted cheerfully without looking at the risks of it getting thrashed by urban cleaners.



WETLAND DEVELOPMENT

Execution

We took all care not to disturb the natural integrity of the wetland, but helped it to sustain by shaping, sizing and streamlining it.

POOL 1, THE RESULT OF WATER FALLING FROM THE *GOMUKH*, TURNED OUT TO BE MOST CHALLENGING.

BEING URBAN DWELLERS, NONE OF US ARE USED TO HARD PHYSICAL WORK.

TYPHA AND TARO PLANTS WERE EVEN TALLER THAN US. THEY BLOCKED VISUAL ACCESS TO THE WAY AHEAD.

WATER HAD ACCUMULATED, DON'T KNOW FOR HOW MANY YEARS. IT WAS BLACK, STINKY.

MARSHY PLACE MADE IT DIFFICULT TO GET A FOOTING. DIGGING TO MAKE PATH FOR WATER WAS A MAJOR CHALLENGE

ENCOUNTERS WITH SNAKES AND CRABS SCARED US.

JUNE HEAT AND HUMIDITY DRAINED OUR ENERGY


BLACK,
STINKY WATER
AND MUD.
RESULT OF
YEARS OF
STAGNATION

MOVING AND LIFTING ROCKS.
LITERALLY HEAVY-DUTY WORK


MADE HUMAN-CHAIN TO TRANSPORT ROCKS TO CREATE BORDER TO THE POOLS. CHAIN MADE OTHERWISE DIFFICULT TASK A LOT EASIER


TRANSPORTED AROUND 100 ROCKS FROM OTHER PLACES IN THE RIVERBED AND MADE BORDER FOR ALL 4 POOLS


CARRYING 100 ROCKS TIRED US. BUT IN THE END IT WAS ALL WORTH IT.

AND THEN IT HAPPENED..

AT LAST IN THE WEEK 4 OF THE PROJECT, WATER STARTED FLOWING OUT OF POOL 1.

EXPRESSIONS OF THE TEAM MEMBERS SAY IT ALL, ISN'T IT?

4 WEEKS OF TOILING IN THE MUD, STINKY WATER FINALLY PAID OFF..

THOUGH COVERED IN MUD AND SWEAT, WE FELT FRESH.

WE REMOVED 3 BINS OF PLASTIC FROM IT.


THIS WAS THE WATER THAT FLOWED FROM POOL 1. BLACK AND MURKY. ONCE ALL STAGNANT WATER WAS GONE, CLEAR WATER FROM *GOMUKH* TOOK ITS PLACE

WETLAND DEVELOPMENT

And it was done!

Water in this newly created wetland system is flowing and clear.

The foul smell has vanished.

Growing duckweed and water skaters which are integral part of a healthy wetland formation are assuring us that we are on the right track.

This wetland system is home to crabs and fish.

Various birds visit it from time to time

WETLAND DEVELOPMENT

Success Story

There were many pools in the riverbed.

However, for a year that we have been working here, we did not have fresh water to wash hands after work.

Thanks to the newly created Wetland System, now we have it right in the riverbed

We received acknowledgement of our work, like we never imagined. On the 6th Sunday, we had just finished our work when this group came by. Kids literally cheered and went to the clear, flowing water. They go biking every Sunday and confessed that they used to pass this stretch, but never felt like coming to river until that day.

WETLAND DEVELOPMENT

After six weeks, what we are left with is the most fulfilling sentiment and confidence to embark on to the next wetland rejuvenation.

SALIENT FEATURES

EVERYTHING WAS ACHIEVED THROUGH COMMUNITY COLLABORATION

GOOD INTENTIONS IN THE SOCIETY COUPLED WITH SOUND ECOLOGICAL KNOWLEDGE, BROUGHT ABOUT THIS CHANGE

SALIENT FEATURES

NO FOREIGN MATERIAL WAS INTRODUCED IN THE RIVERBED.

ROCKS FROM THE RIVERBED WERE USED TO DEMARCATE POOLS.
TARO, TYPHA, POLYGONUM FROM POOL 1 WERE PLANTED ON BORDERS OF POOL 2, POOL 3 & POOL 4.

LESSONS LEARNT ARE TO BE IMPLEMENTED HENCE, WE REPLICATED OUR LEARNING TO FEED RIVER WITH MORE AND MORE GOOD QUALITY WATER.

WE DECIDED TO INITIATE A WETLAND PROJECT ON A STREAM FLOWING NEARBY THE AROGYA KOTHI.

CHALLENGES

Stagnation of stream water, creating breeding place for mosquitos.

Less visibility due to large Taro grown and marshy land.

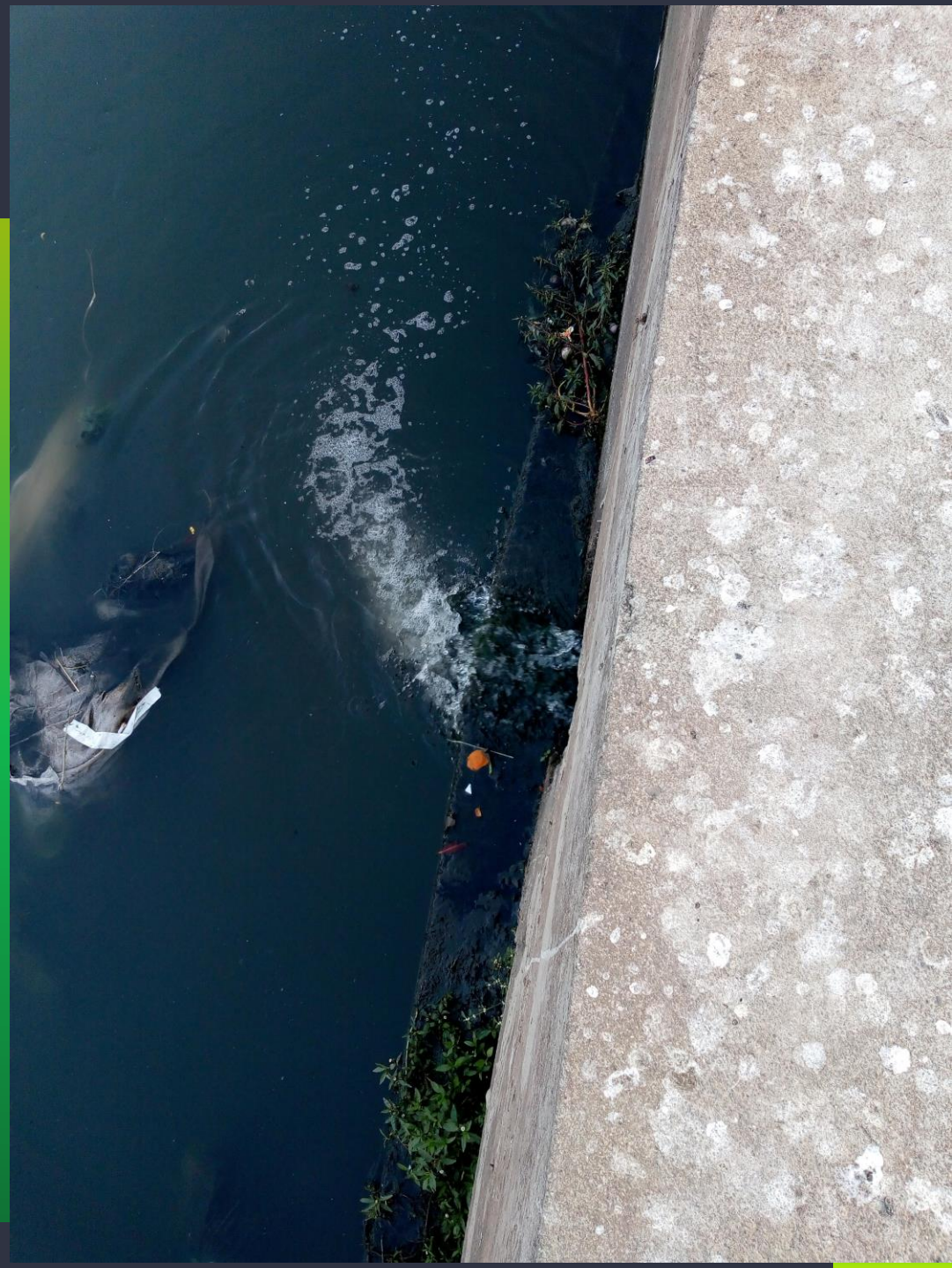
Dump of glass bottles, solid and cremation waste from last few years.

WATER QUALITY OF STREAM WATER

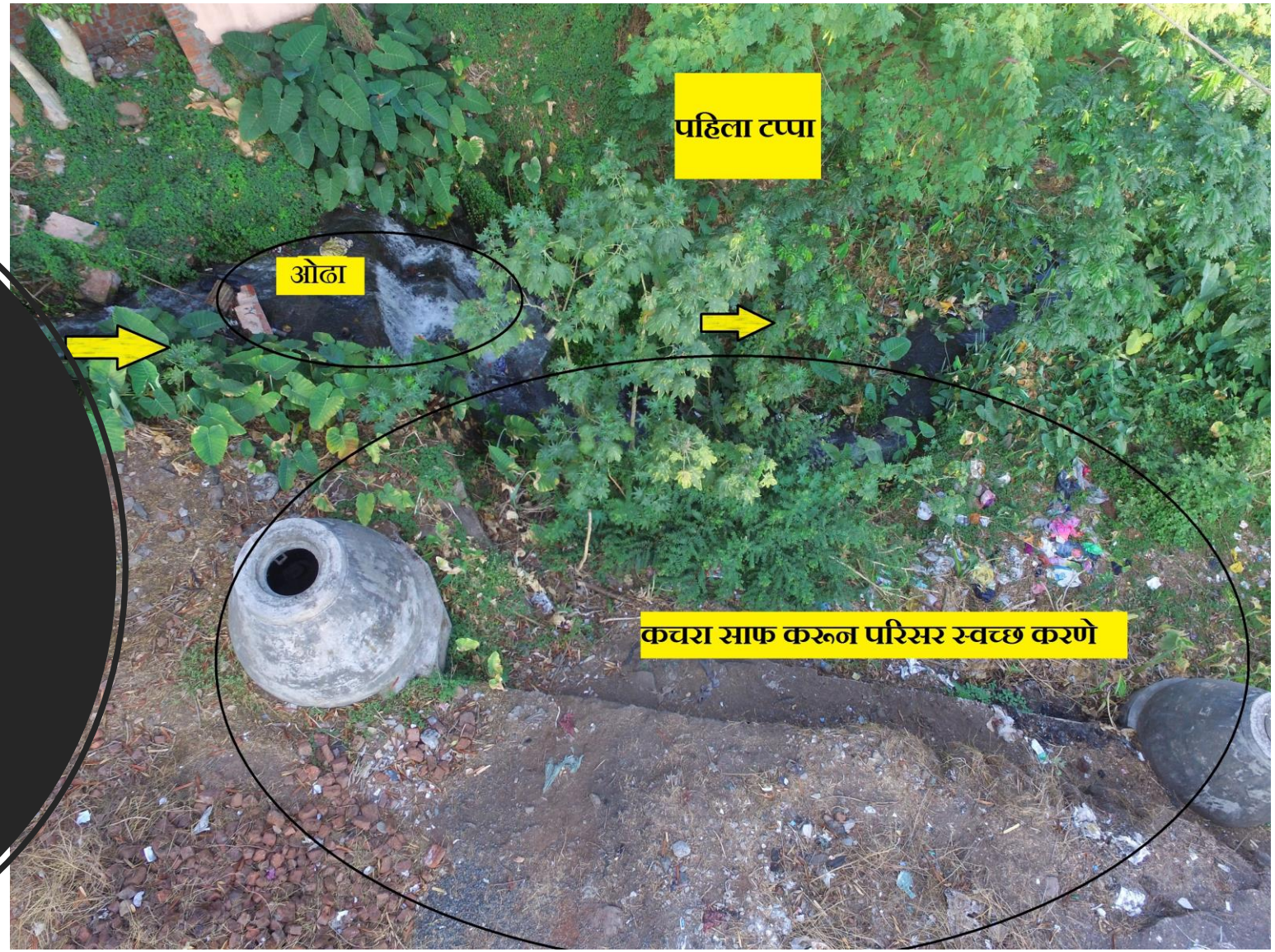
At upstream and downstream water samples were collected.

DO (dissolved oxygen) level found out to be 2.1 ppm clearly indicating presence of sewage and solid waste in the stream.

Hence we were targeting to improve the quality of water to ideal ppm which is 8 ppm to feed good quality water to river.

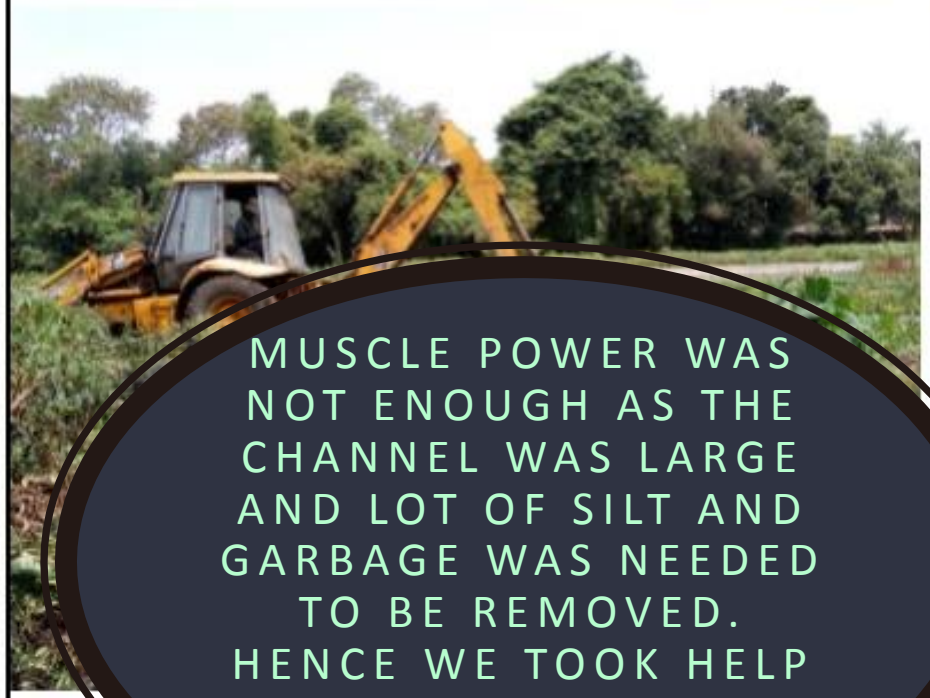


MAIN CHALLENGE IN THIS WETLAND WAS OF SOLID WASTE, HENCE OUR FIRST TASK WAS CLEANING THE STREAM. AGAIN SAME STRATEGY OF PLAN WAS IMPLEMENTED, A SET OF TASKS WERE SHARED EVERY WEEK AND THE TEAM USED TO SPLIT AND PERFORM THE TASKS ON THE SUNDAYS



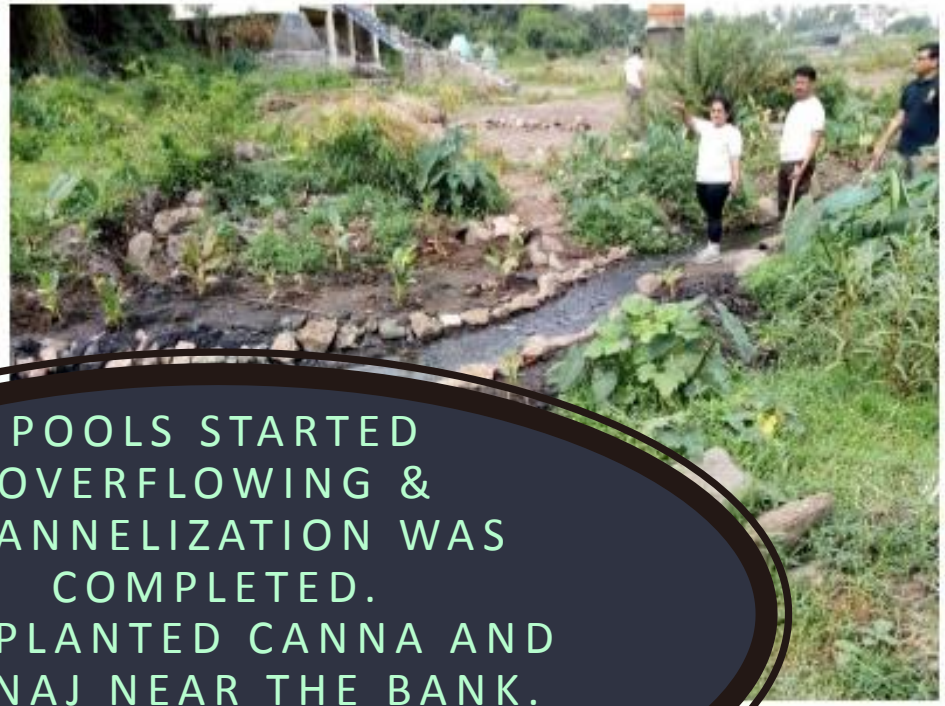
CLEANUP STARTED ACCORDING TO WEEKLY PLANS, FROM UPSTREAM TO DOWNSTREAM

LEMNION GREEN SOLUTIONS HAS ALSO PARTNERED WITH US IN THIS PROJECT.
POOLS AND PONDS WERE IDENTIFIED AND A PLAN WAS CHARTED TO CHANNELIZE THE STREAM WITH PONDS AND POOLS AS WELL AS ROCK STRUCTURES FOR INCREASING WATER TURBULENCE.



MUSCLE POWER WAS NOT ENOUGH AS THE CHANNEL WAS LARGE AND LOT OF SILT AND GARBAGE WAS NEEDED TO BE REMOVED. HENCE WE TOOK HELP OF JCB FOR CHANNELIZATION


POOLS AND PONDS IDENTIFIED WERE CREATED WITH ROCK BUND AND STRUCTURES

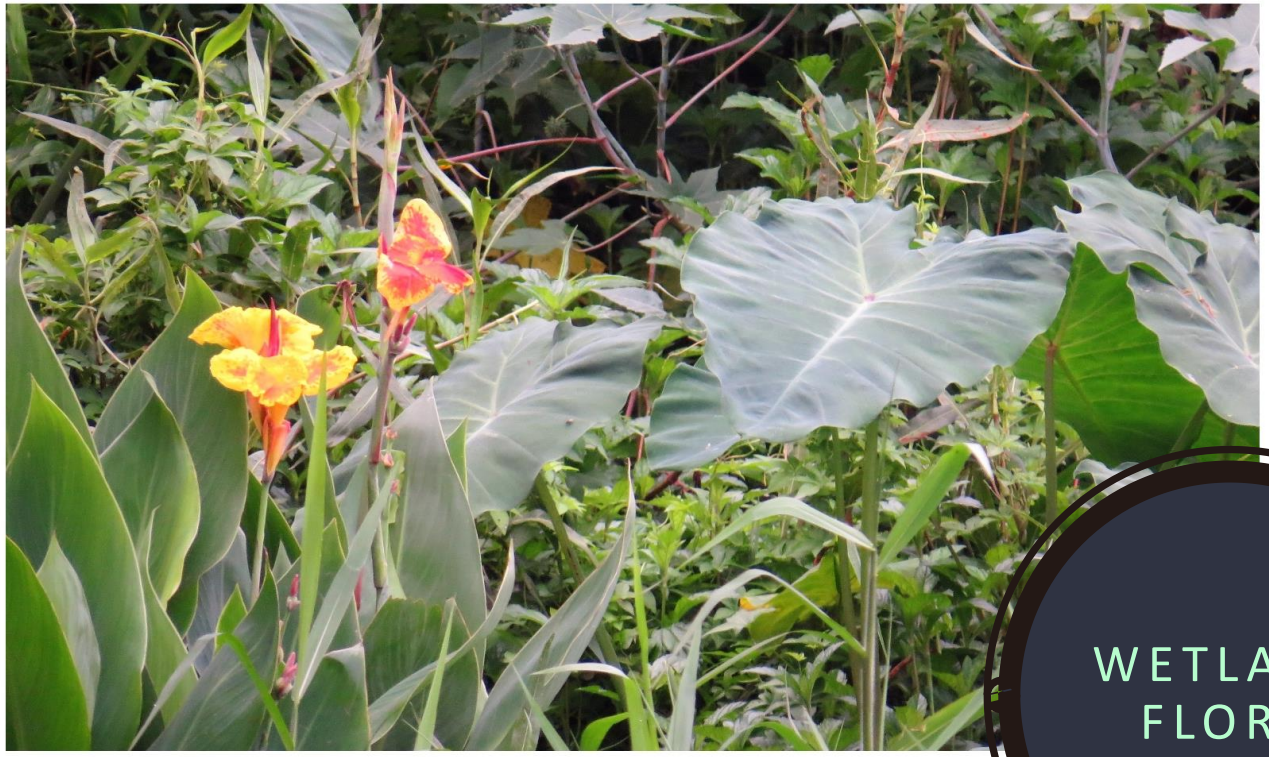


POOLS STARTED OVERFLOWING & CHANNELIZATION WAS COMPLETED.
WE PLANTED CANNA AND KRANAJ NEAR THE BANK.
ALSO REPLANTED TARO AROUND THE BOUNDARIES


INTERMEDIATE ROCK STRUCTURES IMPROVES THE WATER AERATION


ROCK BOUNDARIES PREVENTS THE SOIL TO ERODE IN THE CHANNEL AND ALSO HELPS CREEPERS TO GROW NEAR THE CHANNEL BOUNDARY


AFTER COMPLETION OF THE WETLAND, “DO” TESTING WAS DONE DOWNSTREAM AND FOUND TO BE “5 PPM” WHICH IS NOT LESS THAN AN ACHIEVEMENT FOR US
TREATED WATER FEED TO THE RIVER 24X7.
THIS MODELS CAN BE REPLICATED TO MAJOR WETLANDS ACROSS THE RIVER BANKS



WETLAND FLORA

WETLAND FAUNA

About

Lemnion Green Solutions Pvt. Ltd

Lemnion Green Solutions Pvt. Ltd. promotes and provides tailor-made, green/eco-friendly solutions and services to the environmental problems. These services benefit water treatment and its up-cycling, animal feed, pisciculture, bio-energy and other environmental leads.

www.lemnion.com

About

Oikos for Ecological Services

Oikos provides a spectrum of services catering to different users - private landowners, corporate sector, entrepreneurs, & NGOs - with a specific objective of nature conservation to restore and improve the status of natural resources, processes and biodiversity. We are a social business working for ecological land management since 2002.

www.oikos.in

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MAITHILI PATIL OMKAR GANU VARSHA SHRIPAD MANISH GHORPADE

TANMAYI SHINDE KIRTI WANI ANUP KINIKAR VANDANA KOLARKAR

PRASANNA PACHWADKAR ASHWINI BHILARE MUKTA DEODHAR

APARNA DOLE ARCHANA PACHWADKAR LALIT SHRIPAD

MOHAN DATAR DEVYANI RATHOD PRIYA PHULAMBRIKAR YOGINI PALANDE

SATCHET PACHWADKAR APARNA BRAHME ADISH BARVE PRIYAMVADA PACHWADKAR

PRAVIN JAT MUGDHA NALAVADE NITI DANDEKAR SANJAY RATHOD

MADHAV PATIL VEENA BAGADE RAHUL SANE PURNIMA PHADKE

ADITI DEODHAR NIRANJAN UPASANI SUCHETA SHRINGARPURE

MANJUSHA OAK AKASH SWAPNIL MANGESH BHAGYASHRI

SURABHI NERKAR USHAPRABHA PAGE AJINKYA SHRIPAD SWATI KOTLIKAR

DHRUV ANURADHA KODILKAR ARYA MOTAGHARE

ADITYA TALASHILKAR HEMANT PAWAR BABA WAGHMARE DHARMARAJ PATIL

SHALMALI NALAVADE SHAILAJA DESHPANDE

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THANK YOU