A continuing legacy…
Growing bamboo along creeks and rivers as food source and erosion control: Philippines Experience

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OUTLINE

1. Overview of the paper
2. Bamboo – the Climate Change Crop as Food - Edible Shoots
3. Erosion Control along creeks/rivers
4. Experiences to gather observations - conduct science-based solutions
5. What to do next
6. Food for thought
This paper is inspired by the work of my father (Joe Caasi, Bamboo King of Davao) my family planting bamboo in mid 1970’s and then at my workplace in late 80s-90’s

Damyang Korea 2015 and

Puebla and Xalapa, Mexico 2018

Study bamboo shoots and the importance of bamboo in creeks/rivers.

Consolidated observations in the past and the present concern on the recent events of flooding, landslides and people-made environmental destructions
great venue and opportune time to understand the importance of bamboo and our environment (people, places) in this time of changing climate.
Bamboo clumps growing along creeks and rivers are very good sources of edible shoots in the Philippines. Natural bamboo stands were very abundant in the past for its many uses.

However, with the fast human population growth, expanding agriculture, and rapid urbanization especially in major cities and municipalities, creeks and rivers became vulnerable, hence limiting the supply of bamboo shoots and the serious consequence of soil erosion.
OBJECTIVES

- Experiences in Davao (South) and Laguna (North), how creeks and rivers are sources of vegetable shoots and how planting bamboo resulted to better erosion control and creek/river rehabilitation.

- The responses of growing several bamboo species planted along the creeks, as well as the importance of mixed planting with suitable small dicot species to help stabilize creeks and riverbanks.

- Significant findings generated after several years of observations

- FOCUS on growing bamboo for creeks/rivers
Archipelagic country in Southeast Asia
With 7,641 islands

Area: 300,000 sq. k

Filipino population: 100 M (2018)

coconut milk with leaves of pepper and shrimps

PAKLAY - Native Dish
Shoots with Beef/entrails

Spring rolls
Traditional Dish – Native Chicken cooked in bamboo culms
HIJO RIVER

Experimental site of DENR in the 1970’s
“We need to PROMOTE BAMBOO SHOOTS in the context of environmental protection, an approach to GREENER FOOD, TRULY GREEN ECONOMY - BAMBOO FOR A BETTER FUTURE!”

Started planting in mid 1970's ...CAASI BAMBOO FARM (DAVAO) AFTER 45 YEARS...
HIJO RIVER FROM COMPOSTELA VALLEY
Major mining sites (NORTH DAVAO MINING)
COMPARE THE FARM OPPOSITE OF THE RIVER
PRONOUNCED EROSION IF NOT PLANTED WITH BAMBOO
Bamboo – monocot – shallow rooted spreading

When grown along the creek - roots ramify and lengthen in the presence of water
DAVAO EXPERIENCE – LESSONS LEARN

Planting bamboo: (*Bambusa philippinensis* and *Gigantochloa atter*)

controls soil erosion along the Hijo river with two bamboo species

Initially planted ipil-ipil (*Leucaena leucocephala*) as source of nitrogen before planting bamboo

Initially observed roots abundantly growing besides farm canals (waterways from the hills to the river)

Big challenge in the farm –
6 to 60 families were allowed to live;
15 to 120 children
Dibabawon indigenous clan
1994
LAGUNA EXPERIENCE – BAMBOO PROPAGATION + RIVER REHABILITATION

SAGIP ILOG (SAVING CREEKS AND RIVERS)

KAYAWAN: YAMAN NG LAGUNA – Gov Jose Lina
(BAMBOO: LAGUNA’S TREASURE)
1994
LAGUNA EXPERIENCE – propagated at least 300,000 planting materials and planted bamboo in at least 20 towns in different terrain including creeks and rivers.

After the project, the province did not continue the program

Planting bamboo along Pagsanjan river
LAGUNA EXPERIENCE:
Growing bamboo at IPB CREEK

A CONTINUING EXPERIMENT
Objective:
To determine which bamboo species are suitable to grow along IPB Creek (1999)

Problem/Challenge:
Bamboo are shallow rooted – monocot
A place where thieves hide –
Bamboo can easily lodge esp strong flashflood

Few research on using bamboo for erosion control in creeks and rivers
1999 – started planting along the IPB creek

2006 – SUPERTYPHOON MILENYO
International name: Xangsane
2010
Few years after the supertyphoon
Bamboo stabilizes the soil along IPB creek (2019)
Comparing the creek with and without bamboo

Horseradish tree  
*Moringa oleifera*

Acacia
How bamboo can control soil erosion

Horseradish tree
*Moringa oleifera*
<table>
<thead>
<tr>
<th>Bamboo Species</th>
<th>Date Planted</th>
<th>Diameter (Clump)</th>
<th>Circumference (Clump)</th>
<th>Root Length (m)</th>
<th>Culms No.</th>
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Roots of *Bambusa vulgaris*
1999 survey – growing well along creeks and rivers
TEST OF TIME: How many flooding do we have in this creek if we have an average of 15-20 typhoons a year?

STILL STANDING AFTER SUPERTYPHOOON Protected the creek from eroding 1999-2019; root matting underneath, web of roots/soil/sediments/weeds/ etc
TAIWAN BAMBOO
(Dolichoderus
Schyzustachyum
Thyrsustachyys)
GREEN BUHO
POLE BAMBOO
Challenge:
Get rid of the bamboo in the creek because they are shallow rooted and easily lodge

To determine which small shrubs and trees can be planted beside

*Bambusa vulgaris with a dicot*
Ipil-ipil, river tamarind
*Leucaena leucocepha;*
Horseradish tree
*Moringa oleifera*
All the species of bamboos (eight including three ornamental species) can be planted along small creeks. Have shallow roots but their roots will ramify and lengthen in the presence of water. Roots are living cement to hold the soil and so other plants can grow. They can be stronger when planted with selected dicots (small shrubs/trees).
IPB BRIDGE – venue for bamboo shoot exhibits, cooking and eating
NUTRITIOUS BAMBOO SHOOTS –
should also concern in taking care of our environment

Nutritious bamboo shoots are those in the mountains or plains growing along with other herbs, shrubs, trees. Shoots that are basically growing in an environment with diverse vegetation and diverse microorganism.

GUIDE for a better bamboo shoot

Bamboo shoots grown along creeks and rivers encouraging biodiversity of plants and animals and other life forms.

Avoid harvesting from the wild.

Harvest bamboo shoots from species that is not used for construction material and those that are growing locally
“as an integral part of people and the environment, as food source contributing to improved nutrition, better health and anchored on a safe and better place to live in.
“food security, poverty alleviation, environmental protection and climate change mitigation.
Highlight the importance of growing bamboo along creeks and rivers as a valuable source of vegetable shoots.

Encourage to plant bamboo along creeks and rivers and promote mixed vegetation esp small shrubs and trees (dicots) for soil erosion control.

Case studies that provided significant insights on how we can revegetate our creeks and rivers.
CONTINUE the PASSION

continue the R&D on bamboo and bamboo shoots

SHARE many ideas

CALLING ALL RESEARCHERS (YOUNG and YOUNG ONCE)

and FUNDING AGENCIES...

to conduct studies and generate science-based information.

We can use these initial results...
Extent of Forest Cover Loss in the last 100 years

Landslides
Flooding
El Nino
La Nina
Tsunami
Deforestation
Slash & Burn

10. 9M FILIPINOS

1900
1999
2018?

107. 1M

PHILIPPINE SITUATIONER

Source: Environmental Science for Social Change, 1999
Web of Life
Trees, bugs, animals
Mountains, forests, and the seas
Our lifeline, lifeblood.
HISTORY
CULTURE
FOOD
PHARMACEUTICALS
HANDICRAFT
ARCHITECTURE
INNOVATION
DEVELOPMENT
SUSTAINABILITY
ENVIRONMENT

https://earthobservatory.nasa.gov/images/1863/global-enhanced-vegetation-index
“MOTHER NATURE is now calling on all creatures of EARTH to ponder on the occurrence of calamities and the present phenomenon of EL NINO and LA NINA.

One of the many answers to this call is plant bamboos & trees for economy and ecology.”

JOE CAASI, 1990
CHALLENGE:

LET US PROTECT OUR MOUNTAINS, OUR RIVERS AND OUR STREAMS!

THEY ARE OUR LIFE!

Let’s plant BAMBOO
"To you, the Earth yields her fruit and you shall not want; if you but know how to fill your hands.

It is in the exchange of the gifts of the Earth that you shall find abundance and be satisfied.

Yet, unless the EXCHANGE be in LOVE and JUSTICE, it will lead some to greed and others to hunger.”

- Khalil Gibran
Wolf Robe in
June 1909

Only
when the
last tree
has died
and the last river
been poisoned and
the last fish been
cought will we
realise we cannot
eat money.

Cree Indian saying
Manipur, Dear Manipur

Hail oh Dear Manipur
Land of jewel, the great Nehru has told
Lying perfect in the northeast
Laiden in greens, laiden in gold

Hail oh Dear Manipur
Magnificent mountains and valleys good
Rich in humanity, peoples and traditions
All have homes, all have food

Hail oh Dear Manipur today
Where are your people heading?
Your Imphal heated, your mountain stripped,
The life on hold of breathing

Hail oh Dear Manipur
There is hope, for there is bamboo for thee
Dear people, Nature says “Come back to me!”
Let us get together, for a better place to be.
BAMBOO

ADAPTABLE, DEPENDABLE, ENDURABLE & A VERSATIBLE MATERIAL

- a renewable community resource

Lives after floods, fire, drought, typhoon, earthquake, nuclear disaster, etc

the plant for all seasons with many uses