BANANA GRAYWATER BOG

Villages in Sindh continue to present unhealthy environments, due to open defecation, free roaming of livestock and their droppings of dung as well as stagnant waste water emanating from handpump locations Among Heritage Foundation objectives is to work out steps to deal with factors that contribute to the unhygienic environment of villages. The efficient disposal of gray water is essential in a manner so that it does not pollute the environment.

The Banana Bog – the Kela Chakkar

- Make a circle 2 meters (6 ft) in diameter.
- Dig a dish shaped hole 0.5 (1'6") to 1 metre (3'3") deep in the centre.
- Mound the soil around the outside in a circular ridge.
- Cover the whole circle with wet paper or cardboard, or banana leaves.
- Fill the hollow with mulch materials such as coarse twigs, leaves, straw, decaying logs, rice husks, etc.
- Add scatterings of manure, ash, lime, dolomite or other fertilizers.
- Overfill into a dome; it will sink down over time.
- If stones are available you can bank them around the outside of the rim.
- Now plant banana suckers at 60cm (2'0") intervals around the rim of the mound. Pierce the newspaper and mulch layers and plant into the fine raised soil.
- Alternate with paw paws (check local name?), and fill the spaces on the top and outside of the rim with sweet potato. Ten or so plants will spread to cover the soil with their edible foliage. You can also use other root crops like cassava and Jerusalem artichokes.
- Comfrey (check local name?) can be inter planted as a green manure crop; cut the leaves and add them to the nutrient heap as fertilizer.
- On the inside of the rim you can add shade and moisture-loving plants like taro (check?) and ginger.

Make the centre into a washing area by placing a wooden slatted platform over the mulch in the centre.

Beautify it by placing a circular pathway with sawdust. Encourage schools to make such chakkars.

Ref: http://permaculturenews.org/2008/06/23/build-a-banana-circle/

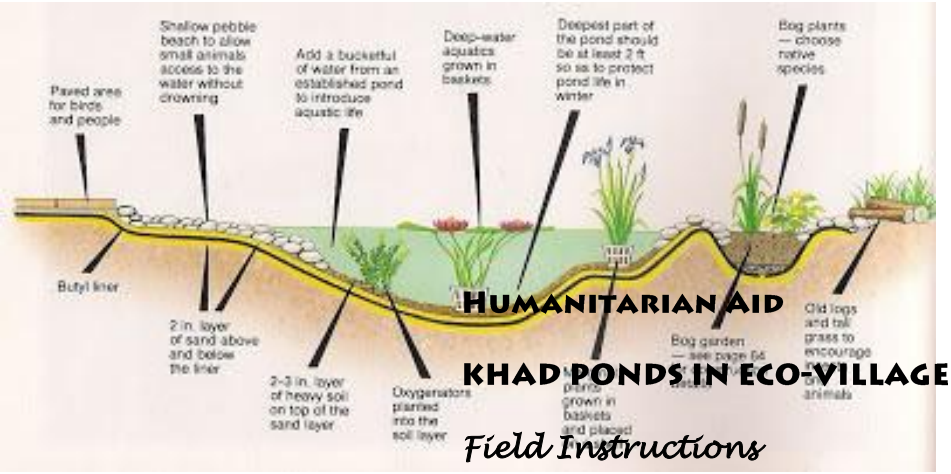
KHAD POND PERMACULTURE

Just as in the case of Karavan EcoVillage Moak Sharif, most villages in Sindh have several khads or ponds. These are large ditches which become ponds during flooding, but were created when soil for houses was obtained. These ponds have gradually lost the water that had accumulated during floods and have now become a reservoir of filth and garbage strewn with plastic bags. These are eyesores and a cause of unhealthy environment. Therefore it has become important for Heritage Foundation to devise ways to convert them into wetlands with biodiversity to make these into a positive feature of the village. The following methodology has to be followed:

Khad Ponds and Ditches for Permaculture

- Clear the pond bottom of debris, rocks, and all other materials.
- Cover the pond bottom and sides completely with animal manure. Apply the slurry of manure in even layers over the inner base and walls in multiple, thin layers.
- Cover the animal manure layer with shredded paper, cardboard, banana leaves, cut grasses, or any vegetable matter. Make sure that all of the manure is covered.
- The compost layer is recommended to be between 6-9 inches thick. (pre-tamp thickness) .
- Cover the compost layer with a thick layer of soil. Tamp the layers down very well.
- Wait 2 to 3 weeks before filling the pond.

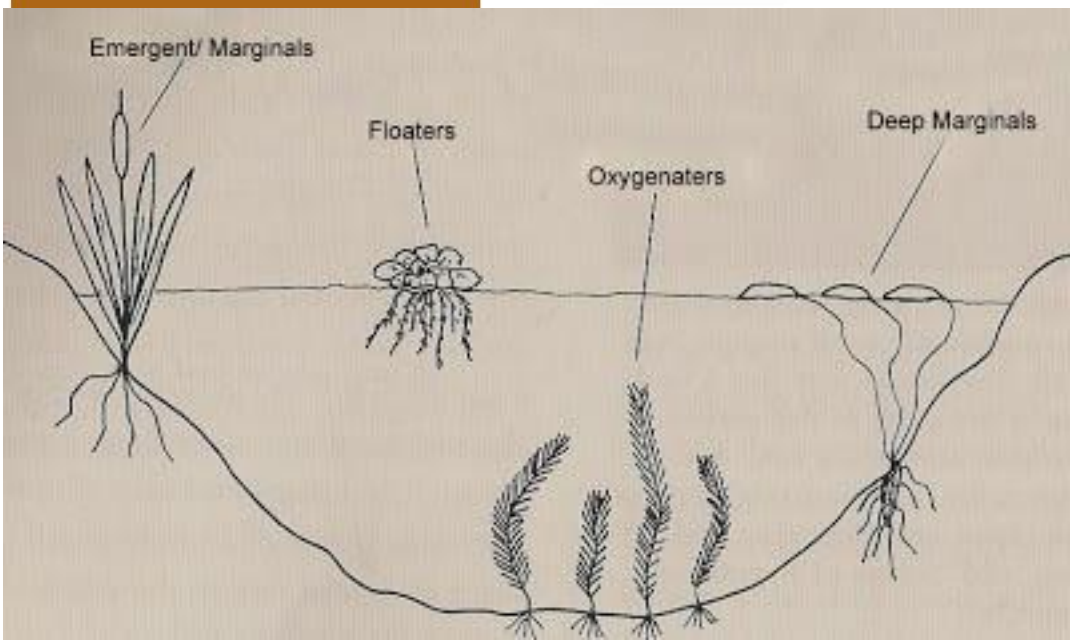
Design the khad to contain raised beds, place for chicken and rabbits, a butterfly garden, a beneficial flower border, rainwater collection, compost, extensive swale system, a bog garden and a forest garden filled with several poly-cultures. This is important to enable plants and land based mammals, birds and insects could flourish. A garden with high biodiversity will not need any chemical sprays or fertilization.

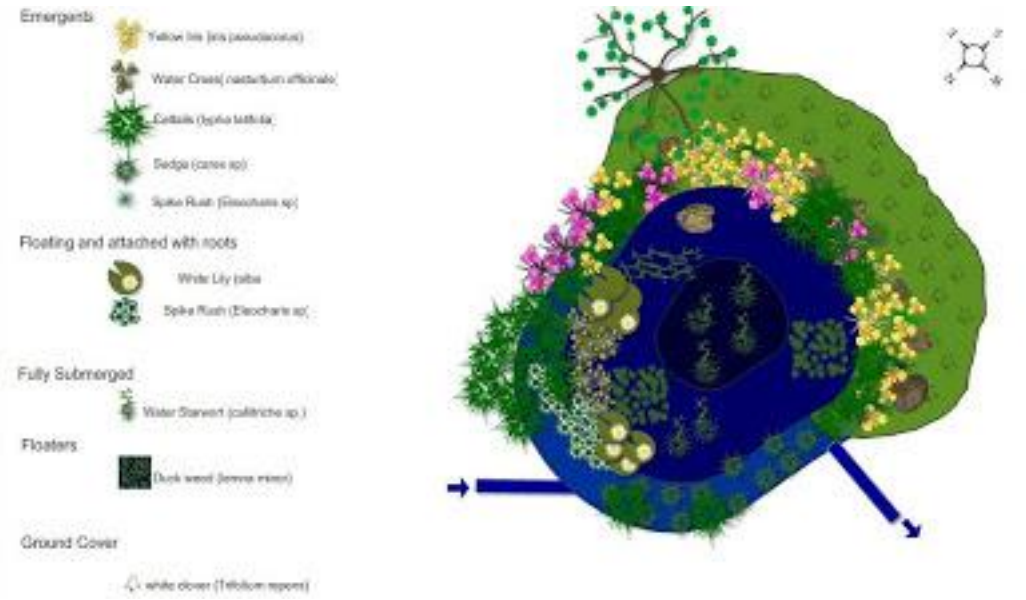


REF: HA - 1302/2

February 2013

Issued: Ar. Y. Lari



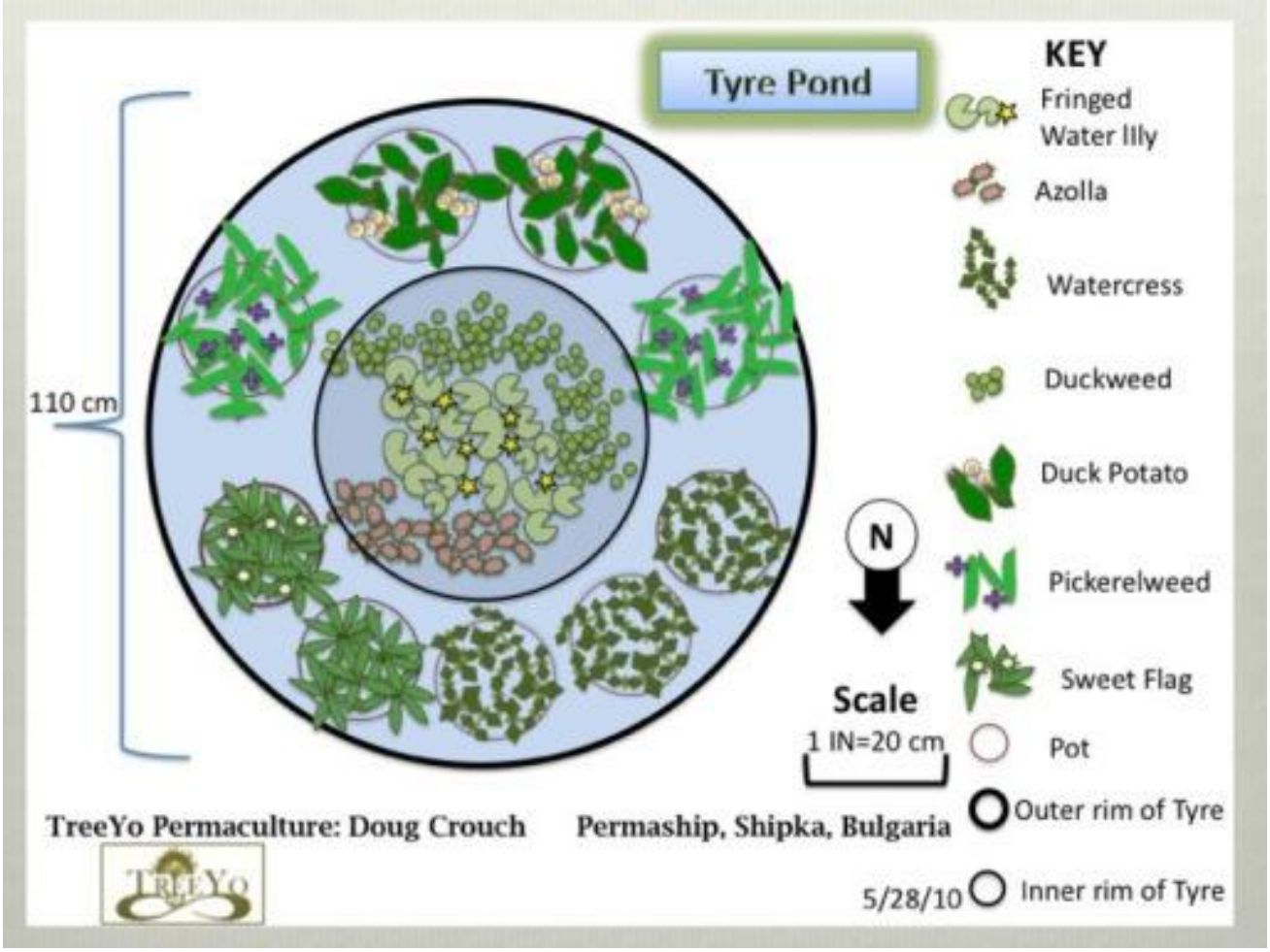


Ref: http://community-permaculture.com/tag/permaculture-pond-technique/

Ref: http://www.ecolandscaping.org/06/edible-landscaping/first-year's-harvest-from-wellesley's-edible-ecosystem-teaching-garden/

DISCARDED TYRE BOGS PERMACULTURE

Since it is important to provide as much plantation as possible to add to biodiversity of the area, the tyre ponds or bogs seem a good way to promote small areas of plantation which will require only small amount of water to keep them as bogs.



The following is the method for creating a small pond with a discarded tyre:
Remove the steel rim by cutting it off to leave the open top of tyre.
Place the tyre in position after excavating according to its size and dig in the centre further perhaps 9”-12” below ground.
Now lay the plastic/tarpaulin sheet (look for green roofing) after thoroughly washing it.
Line the bottom with compost, bottom soil from a pond, and water.
You can also keep the plants in pots on the top of the tyre.

TREES FOR FODDER/REDUCTION OF METHANE EMISSIONS

Among the biggest challenges in the rural areas is the lack of greening and vegetation in village settlements. The current practice of keeping livestock in desolate areas without trees or vegetation needs to be modified which will benefit cattle rearing along with providing a hospitable environment for biodiversity and greater income for the villagers, thus creating a win-win situation for all.

The practice of Silvopastoralism, also known as SPS, is based on "complementary relationship between trees and pasture in a forest products and livestock production system," can provide the desired benefits.

The recommendations include growing "trees deeply rooted, perennial, native and naturalized, multi-purpose, timber tree species that are drought-tolerant and retain their foliage in the dry season. They provide large amounts of high quality fodder and shade that results in stable milk and beef production, maintains the animal's condition, and secure farmers' assets."

Another important factor is that when extreme climate change affects temperatures and rainy seasons, and flooding, it is clear that the livestock areas are extremely vulnerable and thus, forestation in rural areas of Sindh needs to be taken as part of Disaster Risk Reduction strategies.

Among the strategies being developed for livestock in Heritage Foundation's villages being developed requires that livestock enclosures are separated from human habitat. Special fencing arrangements are being worked out which will keep the livestock in contained areas. This methodology will make it possible to apply the above principle of creating SPS areas.

The following methodology needs to be tried out in EcoVillage:

a. Delineate areas for livestock in each cluster of housing units.
b. Construct a fence either made with mud or with LohKhat which is plastered with mud on both sides. Plant climbing vines of flowers and vegetables along the fences.
c. Get the cluster inhabitants to plant a 6'0" high neem tree in the enclosure to provide shade to the animals.
d. Provide a mechanism for collection of dung and making compost.
e. Create a system of drinking water for the livestock.
f. Plant Neem trees as well as fruit trees in the livestock areas.

PLACEMENT OF MOISTURE BARRIER/DAMP PROOF MEMBRANE AT PLINTH

Although so far we have not received any reports regarding moisture ingress into mud walls; however, in areas where flood water stood for several months, the capacity of water absorption must be considerably reduced.Accordingly, the following methodology should be used and drawings issued to cater for moisture barrier in shelters built with mud walls i.e. Shelter Series A and B. Similarly, it has become essential that all structures being built for social infrastructure are all treated similarly at plinth level.

Moisture Barrier at Plinth for Shelter Series A (Mud/adobe walls)

The following procedure is required:

a. Build the mud toe in the usual manner and bring the wall level up to plinth.
b. Apply 2 to 3 thin layers of gobri or cowdung evenly at the base of wall.
c. Apply a layer of straw, tamped into an even layer of minimum 1-1/2" thickness.
d. Build the wall in the superstructure in the usual manner.

Moisture Barrier at Plinth for Shelter Series B (Lime concrete/burnt brick pads and lime mud infill)

The following procedure is required:

a. Build the mud toe in the usual manner and bring the pads and infill upto plinth level.
b. Place 2-3 thin layers of gobri or cowdung evenly to provide moisture barrier below the dassa or plinth to cover the entire 18" width of plinth.
c. Place the bamboo posts and dassas in the usual manner.

Damp Proof Membrane

In areas where the soil is still damp at the time of construction of shelters, the following procedure is required:

a. Place the subfloor in an even manner, ensuring the required slopes for water drainage in case of flooding.
b. Place a 3mm polythene sheet damp proof membrane carefully in order not to puncture it.
c. Ensure that the polythene sheet is tucked in carefully at the joint of the floor with mud wall.
d. Complete the final flooring above the polythene sheet, ensuring that the polythene sheet is not damaged in any way.

The drawings for introduction of moisture barrier in walls and a damp proof membrane at sub base level will be issued asap in order to provide the necessary guidance to HF and IOM field personnel.

This instruction is being issued for immediate compliance by HF field and HF Head office.

CHULAH WORKSHOP FOR DISSEMINATION OF MUD TECHNIQUE

The successful implementation of the KaravanChulah (smokeless stove) at KaravanVillage Moak Sharif has resulted in great excitement among women in the community. Not only should this activity be encouraged in Moak Sharif by providing technical guidance to households, it is important that the technique is spread in surrounding villages and communities as well.
Accordingly, it has been decided to conduct KaravanChulah workshops in neighbouring villages and particularly those where HF is carrying out reconstruction/rehabilitation work.

Scaling up construction of the KaravanChulah

The following procedure is required:

1. Get the first KaravanChulah woman to act as trainer and KaravanChulah franchisee.
2. Provide all information and ensure that she is trained by helping build chulahs for her neighbours.
3. Provide all assistance to her in the form of provision of artisans to make a success of the chulahs in the KaravanVillage.
4. Encourage her to charge Rs. 100 for providing advice and guidance.
5. Get her to talk about the procedures and how she feels other women can take up the construction of the chulah.

Workshop in Kakoo Wasan

1. After 10 chulahs have been constructed in the Karavan EcoVillage, a workshop should be held at Kakoo Wasan.
2. Encourage the most enterprising woman in the community to prepare bricks; provide her with the numbers required.
3. After the bricks are ready, announce the date for holding of the Chulah Workshop.
4. Ask our HF Chulah Franchisee to hold a demonstration by providing assistance to the Kakoo Wasan trainer. The Franchisee should be accompanied by an artisan to help in layout etc., preferably a Kakoo Wasan artisan.
5. After completion of one chulah, the Kakoo Wasan trainer should be asked to help build atleast 10 chulahs in the village, with support from HF.
6. The Kakoo Wasan trainer should become the HF Chulah Franchisee and start providing assistance to others in the community by charging Rs. 100 per chulah.

Remuneration for the HF Chulah Franchisee for conducting workshops

1. The chulah franchisees should be paid Rs. 500 for conducting the training workshops.
2. She should be presented with a gift pack by HF at the conclusion of the workshop.
3. Methodology for spreading the technique should be developed to scale up asap.