

## A collaborative Study between the National Institute of Hydrology (Roorkee) & Centre for Ecology & Hydrology (UK)

### Main Aims of Study

- 1) To assess the improvements in water quality and ecological health following implementation of a constructed wetland treatment system to treat village grey water (Domestic Wastewater)
- 2) Evaluate the potential economic and health benefits of improvements to the local village

### Methods



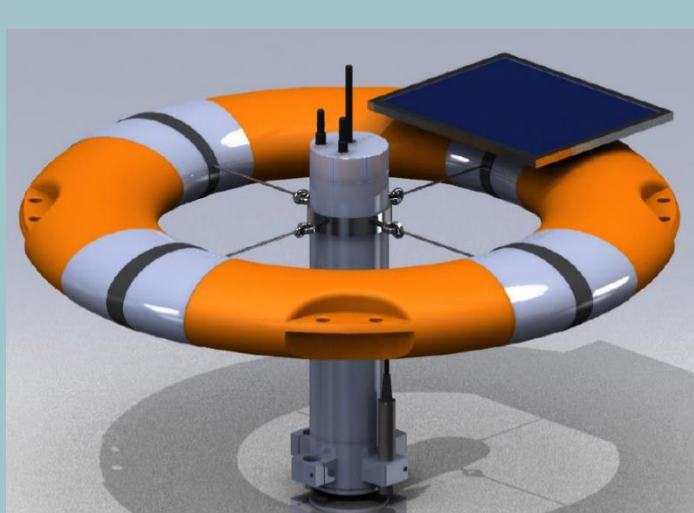




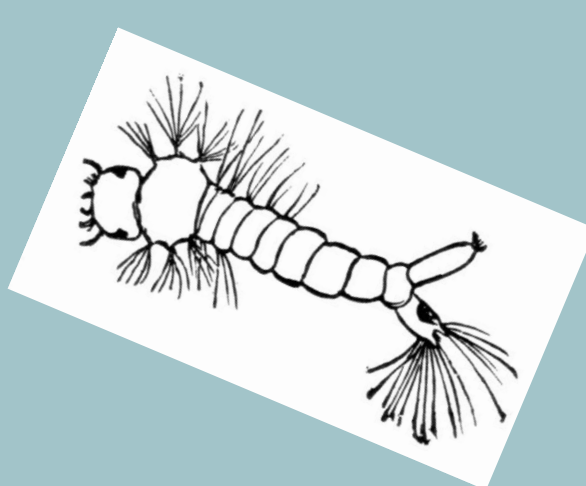
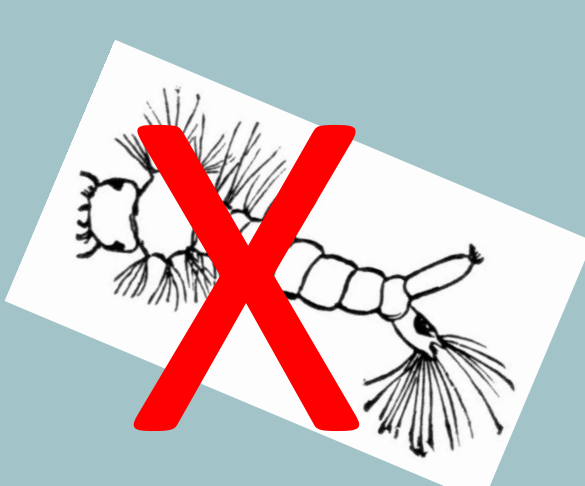



1. Develop a set of indicators of water quality and ecological health that indicate environmental quality relevant to UN Sustainable Development Goals (water quality, food production, health)
2. Evaluate the benefits by comparing indicators at two village ponds: a control pond with no water treatment (Fig. 1) and a pond with constructed wetland treatment implemented (Fig. 2)

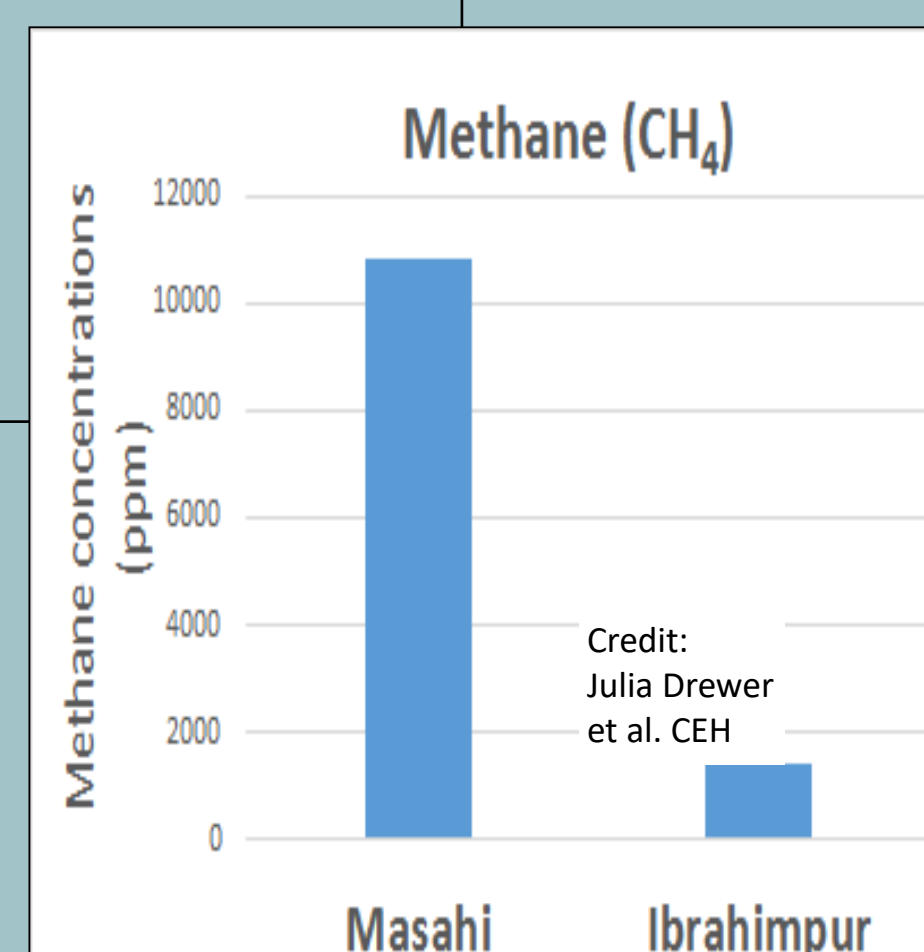


**Fig. 1 Masahi Kala Pond**  
{Without treatment System}



**Fig. 2 Ibrahimpur Masahi Pond**  
{With CW based Natural treatment System}

Indicator		Masahi Kala Pond	Ibrahimpur Masahi Pond
Water Quality: faecal coliforms and pathogens (health)		>4000 MPN/100 ml	Absent
Water Quality (nutrients, Secchi, chlorophyll-a)		Very turbid (<0.1 m Secchi depth)	Clear water (>1m Secchi depth)
Water Quality – dissolved oxygen / methane (fish health)		DO sensor to be installed Methane >10,000 ppm	DO sensor to be installed Methane 1,400 ppm
Ecological Quality: plant species and abundance (habitat, crops)		 Filamentous algae	 Water hyacinth
Ecological Quality: mosquito larvae abundance (human and animal health)		 Mosquito larvae present	 No Mosquito larvae
Ecological Quality: fish catch per unit effort (sustainable fishery)		 No Daphnia	 Abundant <i>Daphnia</i> zooplankton



### Conclusions

Immediate benefits of water treatment are clearly visible and are having measured positive impacts on water quality and ecological health that, if sustained, should lead to health and economic benefits

**Further information: NIH, Roorkee/Laurence Carvalho, CEH Edinburgh, U.K.**