

# Ecosystem Diversity and its Contribution in Peri-Urban Agriculture : The Context of Eastern India



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# Ecosystem Services : The Benefits People Obtain From Ecosystems



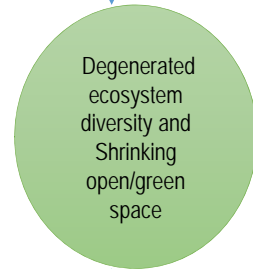
# How an Ecosystem is Degenerating in the Peri-Urban Area

## Primary Causes

- Rapid urban population growth
- Exploitive government policies
- Poverty
- Failure to include ecological services in evaluating ecosystems resources
- Illegal construction on flood plain
- Poor implementation of master plan
- Lack of enforcement cell

## Secondary Causes

- Soil mining
- Increasing input cost
- Distress selling of land
- Limited access/provision to credit and agricultural schemes
- Chemical farming
- Physical infrastructure



## Changes in Peri-Urban Ecosystem in Eastern India

Changes in Ecosystem	Gorakhpur (U.P)	Basirhat (WB)	Saharsa (Bihar)	Jorhat (Assam)
Water bodies	82 % Natural water bodies like ponds, lakes are encroached	30% ponds are contamination by restricted hybrid fish (Clarias gariepinus) rearing.	7 water bodies are being encroached out of 19 ponds	10.09 % individual ponds and 2.3 % common water bodies are lost
Agriculture	7.2% agricultural area converted into residential area	10-15 % change in land use converted to fish ponds	125 brick kiln developed on the agriculture land around Saharsa city	1.05 % agricultural area converted into residential area (total agriculture area specified is 37 %)
Horticulture/ orchards	3.3% area of orchards converted to housing construction	Old Mango orchards cut down and used for residential building	No orchards in PUA	Old orchards are cut and sold out for construction purposes
Forest	No change	Very little forest cover in PUA	No forest area in PUA	30 hectare of forest land is converted into commercial buildings
Open spaces / vacant land	15% area is covered by unauthorized colonies	7.23 % of open spaces are converted into housing and road construction	841 illegal new houses were constructed in PUA	1.63% of vacant land covered by housing and encroached
Flood plain	33% flood plain area converted into residential area	54 acre of land along the bank of the Ichamati river is mostly encroached in brick kiln and housing	City has no master plan	No demarcation of flood plain in the master plan.
Bamboo plantation	N/A	8-10 % of bamboo plantation area are left out and converted into buildings	N/A	presently 30-35% of bamboo plantation area is shrinking in peri urban areas.

**Source:** Google Earth Image, 2004-2005 Review by town and century planning office Jorhat Development Authority and Town and country planning 2009-2010 Master plane review 2011, Gorakhpur Development Authority City Development Plan (2010-30) SAHARSA House hold survey and FGD data Basirhat municipality



## Observed Changes

- Decreased green cover or 'breathing' spaces
- Expanding urban centres (on the horizon) threaten vital peri-urban agricultural ecosystem
- Interruption of supply chains of vital food (food grains, vegetables, dairy products etc.) items to cities
- Disruption of livelihood patterns of those living in these areas
- Over-exploitation of resources
- Lack of natural drainage/storage of excess storm water and dangerous construction on flood plains  
and Pollution of wetlands.



# Resilience Practices for Conserving Ecosystem

## Farm level

- Permanent Raised Bed
- Loft farming
- Raised low tunnel poly-house
- Climber farming
- Raising crops in *thermocool* boxes and jute bags
- Water tolerant crop varieties
- Roof top nursery raising



## Ecosystem Level

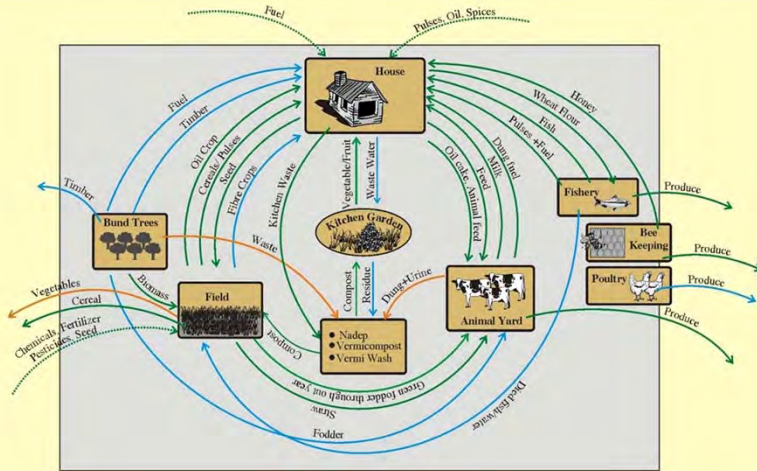
- Soil management
- Open space management
- Conservation of water bodies
- Drainage improvement

## Community level

- Capacity building through institutions building (FFS,ASC,FC etc.)
- Climate services through (SMS)
- Farm Exposure
- Cross learning



# Example of Integration of Farm Sub System



## Key Messages : for Action and Policy

- Rich ecosystem and biodiversity needed in cities and peri-urban areas.
- Maintaining functioning peri-urban ecosystems can significantly enhance human health and well-being.
- Peri-urban ecosystem services and biodiversity can help contribute to climate change mitigation and adaptation.
- Increasing the biodiversity of urban and peri-urban food systems can enhance food and nutrition security.
- Ecosystem services must be integrated in urban policy and planning.
- Successful management of biodiversity and ecosystem services must be based on multi-scale, multi-sectoral, and multi-stakeholder involvement.
- Peri-urban offer unique opportunities for learning and education about a resilient and sustainable future.



**Thanks!**

