Experience with monitoring in mangrove forests

8th Meeting of the UN-REDD and FCPF Programme Executive Board
Venue: Himawari Hotel - Phnom Penh
07th August 2014

Presented by: Ouk Vibol and Bun Racy

Copied from Chann Sopheapis report (2013)

- Role of mangrove
  - Maintaining environment: providing more Oxygen, absorption of CO_2
  - Providing feeding, nursing and spawning ground of fish and aquatic animal
  - Physical barrier: preventing typhoon, wave and erosion
  - Social use
- Mangrove cover: 78,405ha (2014)
- Monitoring can help to put on the right actions

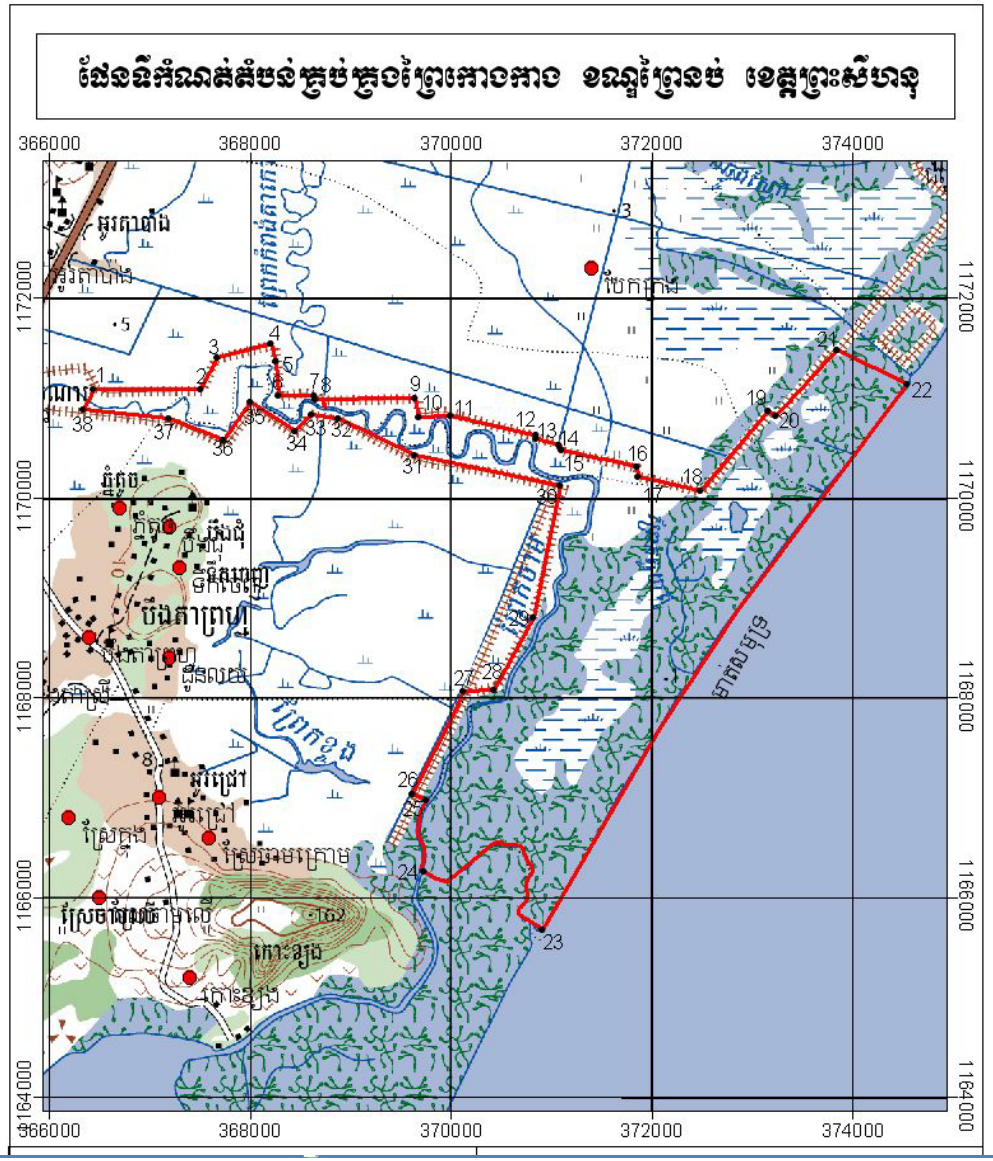
- Monitoring indicators

Management Indicators	Ecological/Environmental Indicators	Socio-Economic Indicators
MANAGEMENT CAPACITY • Formal Management framework • Trained Man-power (No./levels) • Facilities and equipment • Sustainable Financing	• Condition and healthy of mangrove (density, species, biomass) • Abundance of Marine bivalves and crustacean (mud crab) • Abundance of animal that habitat dependent	FISHERIES • Catch per unit effort • Total landing • Income
		TOURISM • Number of visitors • Number of tourism operators • Income
MANAGEMENT APPROACH • Sectoral • Integrated • Community-based • Multiple-use		FORESTRY • Volume of timber • Weight of charcoal product • Income
MANAGEMENT TOOLS • Licensing and permits • Seasonal closure • Zoning		ACTIVITIES OTHER THAN FISHERIES, TOURISM AND FORESTRY • Numbers of people involved • *Per capita* income
		OVERALL LIVING STANDARD • Level of education • Health of the community

UN-REDD PROGRAMME

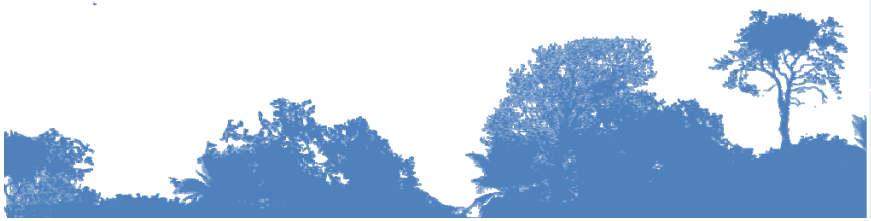
FOREST CARBON PARTNERSHIP FACILITY

FAO UNDP UNEP



- O Okngaheng, Preynup district, PSP
- With the total area of 1,166ha

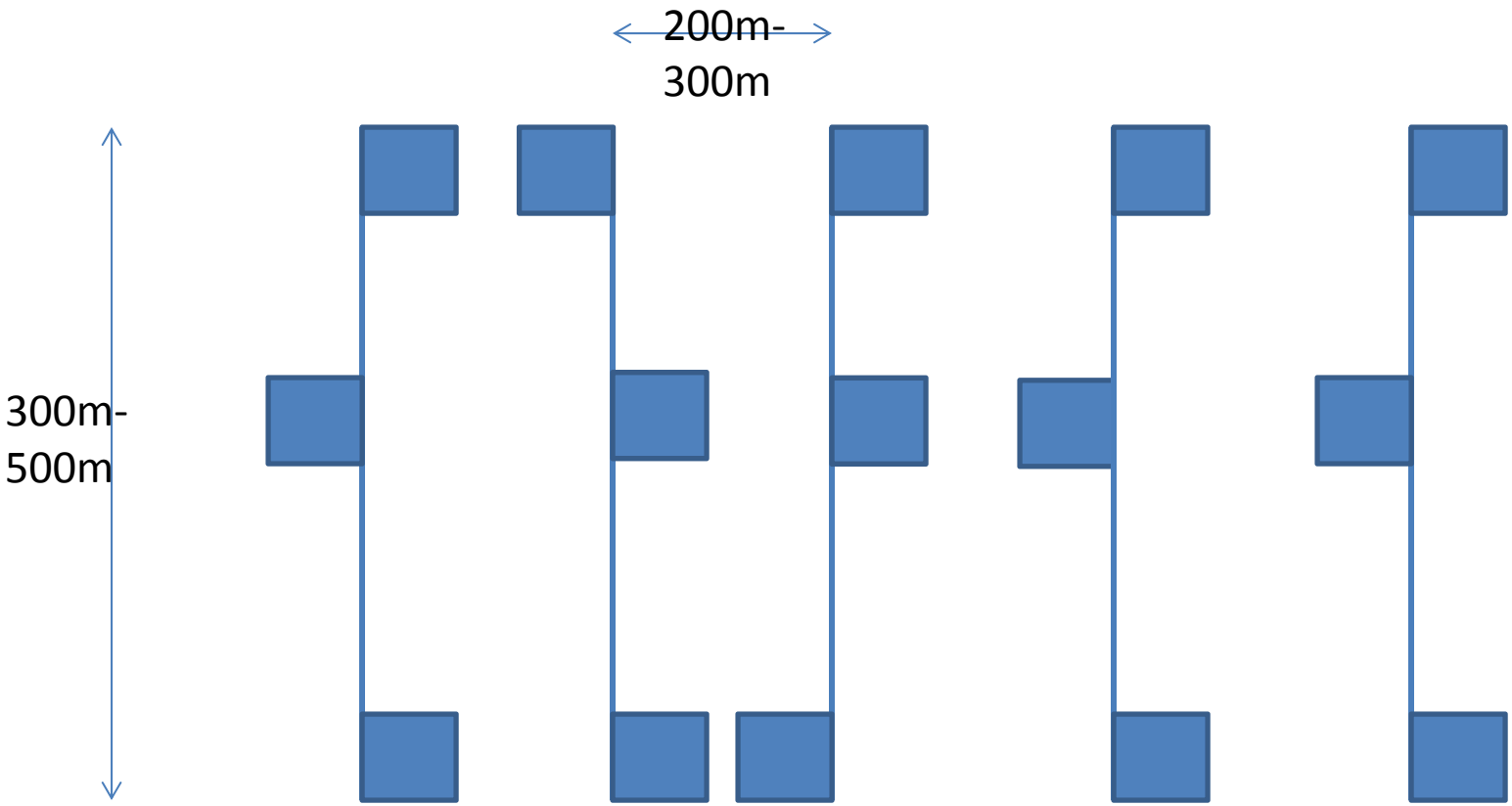
- How to monitor
  - For Management and Socio-Economic indicators
    - Individual and group interview method are used
    - Normally interview would take with 30 to 60% of total residents
    - Questionnaire prepared and focus on main relevant indicators



Category	Indicators
Demographics	• Study area • Age and Gender • Household size • Ethnicity/Nationality • Education • Occupation • Land property • Income
Fishing Practices	• Fishing area • Fishing gears and main targeted species • Catch volumes and evolution in the quantities caught
Economics	• Income generated through fishing • Operation costs
General opinion	• General opinion about the project • Perceived potential positive/negative

– For ecological/environmental Indicators

- Biomass survey
  - Density, species and diameter
  - Case study of pilot site (1,000ha)
    - » 5 transects with 300-500m each and 200-300m interval
    - » 3 replicated quadrate (10mx10m each) for each transect
  - Each quadrat, identify species, count number of mangrove tree and measure diameter
  - Result;
    - » 6 species found in the pilot area
      - *Rizophora apiculatata*: 247tree/ha
      - *Rizophora mucronata*: 27tree/ha
      - Excoecarta agallocha): 3340tree/ha
      - *Bruguiera cylindrica:* 5407tree/ha
      - *Lumnitzera racemasa:* 653tree/ha
      - Other: 7tree/ha
    - » Result on diameter mentioned in the report
  - With reference we can calculate the carbon stock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300m-
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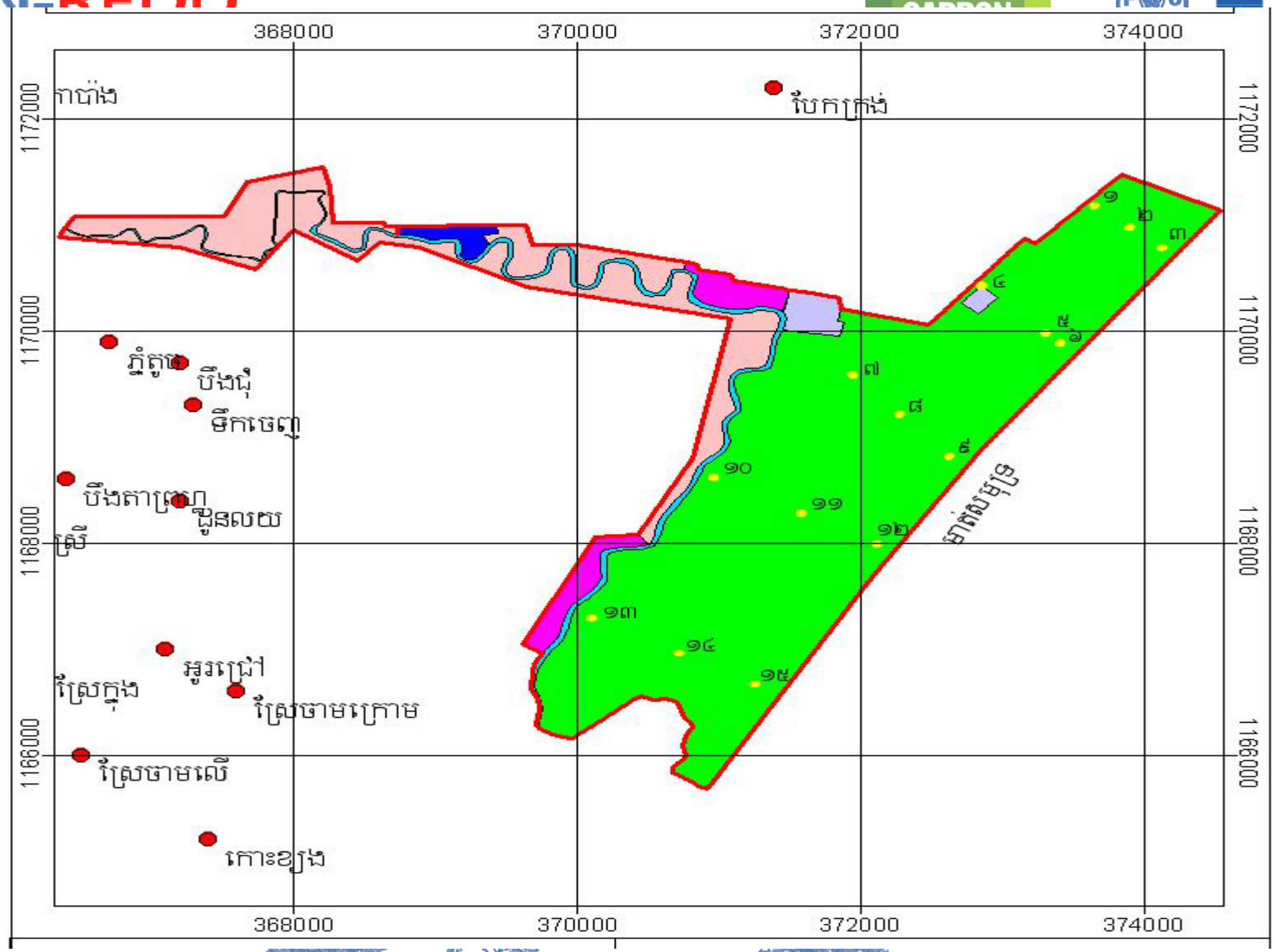
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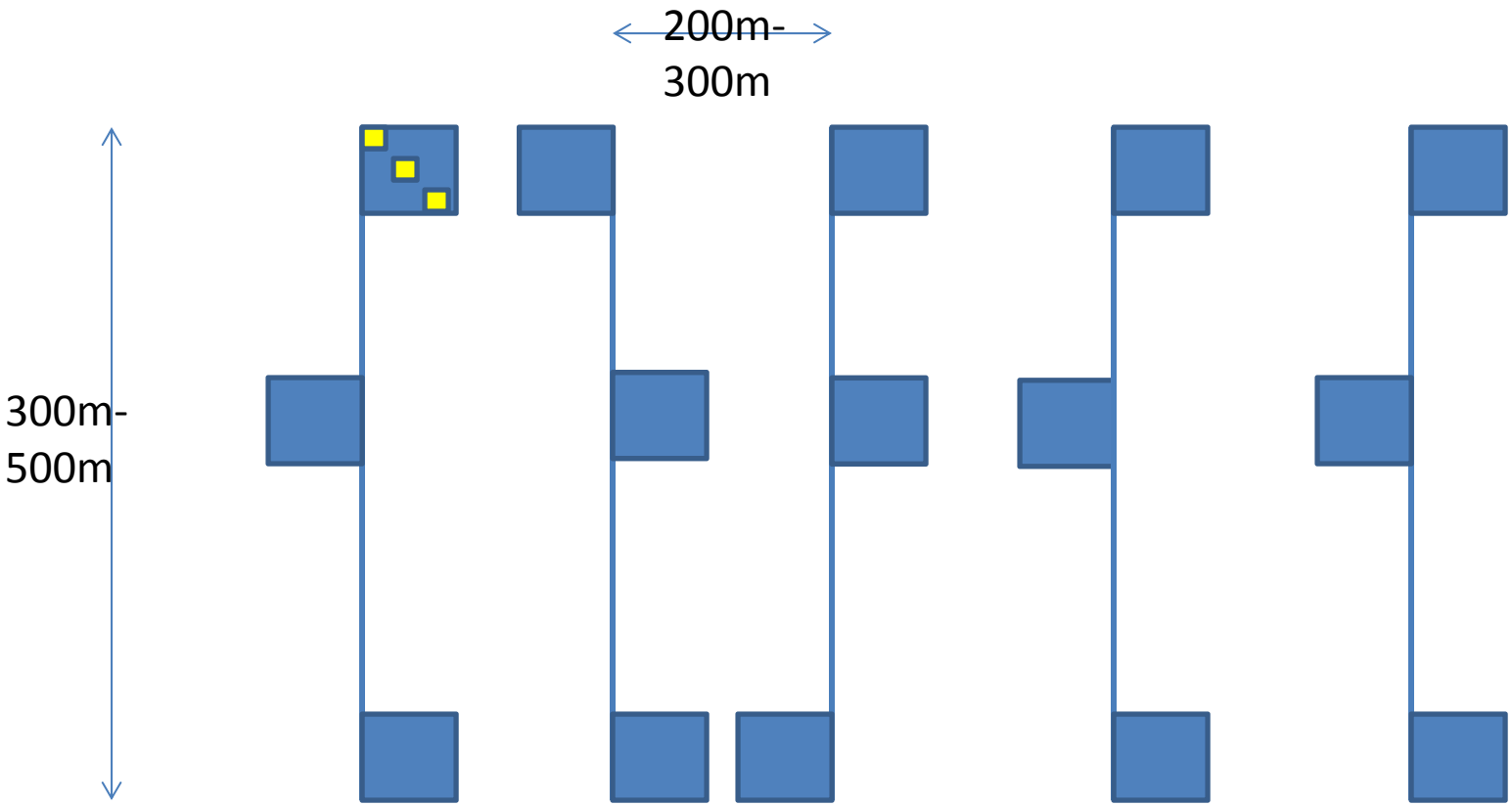
– For ecological/environmental Indicators

- Bio-diversity monitoring
  - Direct interview with fishermen
  - Field study
    - » Randomly check using quadrate
    - » Area of quadrate 1mx1m
    - » 3 quadrate for each replicate of biomass survey
    - » Count all animal within each quadrate


200m-
300m
300m-
500m

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This ecosystem is so importance for daily life Of coastal people