



## KNOWLEDGE AND EXPERIENCE SHARING SYMPOSIUM

### Towards Highly Rewarding and Inclusive Flood-based Livelihoods

Supporting sustainable and inclusive flood-based livelihoods in the Ayeyarwady Delta, Myanmar

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IWMI, WLE

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VOI WILDLIFE LODGE, TAITA TAVETA COUNTY, KENTA





RESEARCH  
PROGRAM ON  
Water, Land and  
Ecosystems



*“sustainably managed agricultural food systems are the key to healthy, functioning ecosystems and human well-being”*

**Regenerating degraded landscapes**

**Land and water solutions (Agricultural water and irrigation)**

**Rural-urban linkages (Reusing organic waste/ wastewater, city food systems)**

**Variability, risks and competing uses water-related disasters /competition**

**Gender, youth and inclusivity**

IN PARTNERSHIP WITH:

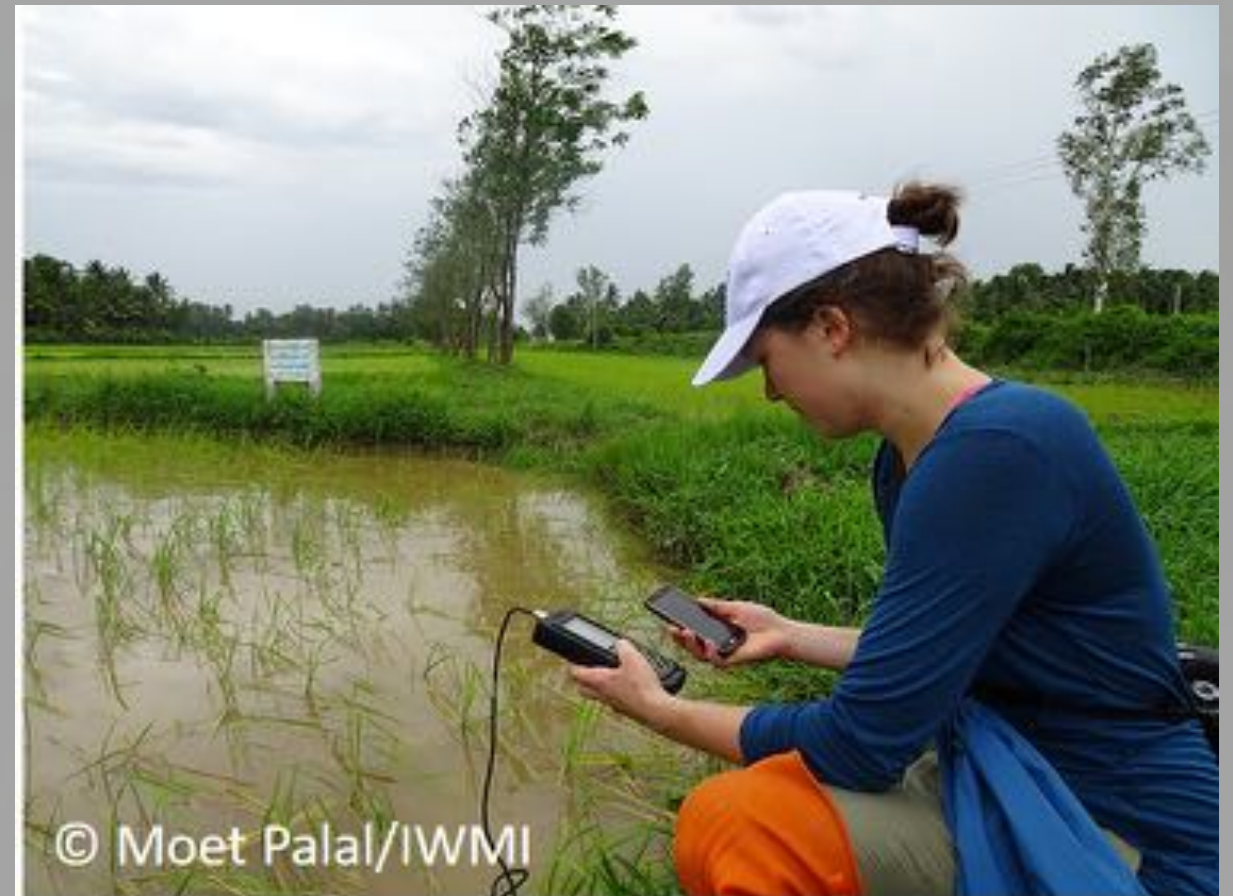




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5. Building local capacities
6. Influencing at scale



# Myanmar





# Context: Ayeyarwady Delta

River-floodplain systems among most productive ecosystems.

Myanmar has extensive floodplains and deltas.

Ayeyarwady delta region

- 35,034 sq km
- (5% of Myanmar land area)
- Supports 6m people
- “Rice Bowl of Myanmar”
- Fisheries highly productive, (driven by annual flooding)
- Highly flood-prone - significant damage

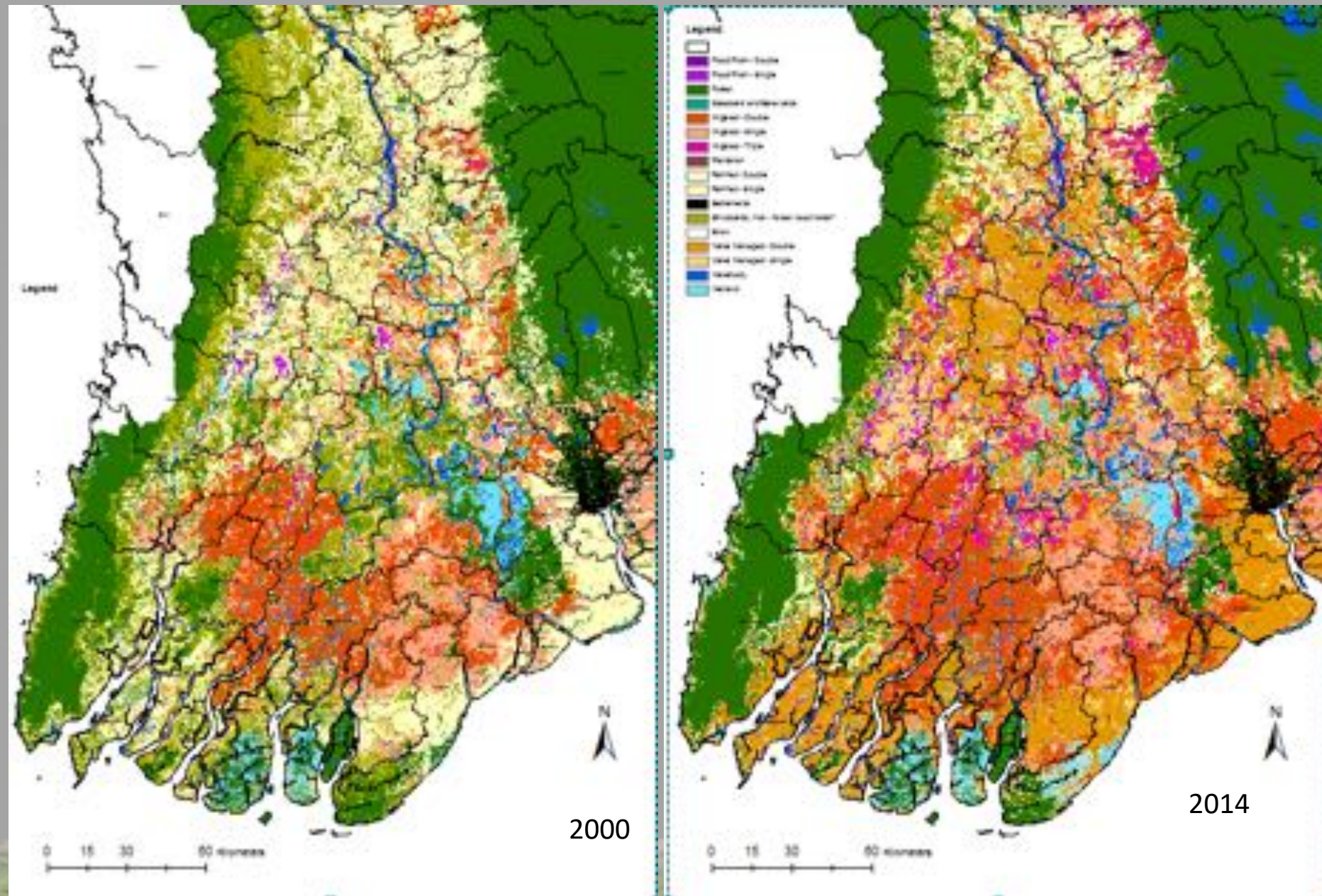




# Context: Land use change

The Delta region is changing fast

- Infrastructure investment
- Water tolerant varieties
- Mechanisation
- Migration





# Context: Development & Trade-offs

Floodplain development	Trade-offs
Intensification of agriculture	Loss of fish habitat / decline in catch
Infrastructure (roads, canals, dykes)	Loss of biodiversity and associated ecosystem services
Cities and towns	Decline in water quality
Flood diversion / protection	Change in flood patterns, risk and damage

Ayeyarwaddy delta

Choices

Bangkok floodplain



## Key Questions:

- What will Myanmar's floodplains look like in the future?
- What are the trade-offs?
- How can we maximize benefits from floods, while minimizing their negative impacts



# Objective

To build capacities at local, national and intermediary scales to promote inclusive growth in the *Ayeyarwady* delta





# Strategy

Three main areas:

- 1. Understanding contexts at multiple scales**
- 2. Building capacities**
- 3. Influence at scale**



# Understanding contexts at multiple scales

To provide the best advice to policy and planning and to build capacity, we need to understand:

- What changes have occurred in flood-based agriculture?
- Why are these changes happening?
- What are the benefits and trade-offs?
- Who is affected? How?
- What are the opportunities to adapt to these changes?
- What will Myanmar's floodplains look in the future with planned/future investments?
- How can we maximize benefits from flood-prone areas, while minimizing negative impacts of floods?





# Understanding contexts at multiple scales

## Activities

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- Local case studies on current production systems in the flood season, change trends and their drivers
- Understanding the water environment in the delta
  - Water as common denominator of flood-based livelihoods systems
  - Understanding the water environment as an entry point into key planning processes and forums
- Assessment of larger scale ongoing and planned change processes (feeds into work on influence at scale)



# Understanding contexts at multiple scales

Case studies of livelihoods dynamics and their drivers

## Case studies: Understanding changing patterns in flood-based farming and their drivers

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- 8 case studies with Yangon and Hinthada Universities, covering 5 themes:
  - Trends in farmer crop choices and their drivers
    - Placing FBFS within the overall rural household economy
    - Migration and the availability of agriculture labour
    - Technology adoption in farming
    - Perceptions of benefits and costs of seasonal flooding, and flood management needs

*16 locations around the Ayeyarwaddy Delta*





# Understanding contexts at multiple scales

Understanding the water environment as an entry point into key planning processes and forums

## Surface water maps: Analysing inundation patterns in the delta using JRC remote sensing data

- Entry point for dialogue with large-scale planning processes/ committees that are poised to shape the delta's agro-ecological characteristics and livelihoods e.g.
  - Myanmar Water Resources Management Committee
  - World Bank's Ayeyarwady Integrated River Basin Management Project
  - Delta Strategy (ARCADIS, DGIS)
  - Flood management (ADB)
- Helps us understand how these maps can support these processes, and what further analysis is needed, e.g.:
  - Need identified for Rice and Rice/Fish Suitability mapping
  - Providing input on how fresh water flows can support strategic wetland wise use, under the national wetlands inventory process (Norwegian funding) (in discussion)



# Understanding contexts at multiple scales

Understanding the water environment as an entry point into key planning processes and forums

## Surface water maps: Analysing inundation patterns in the delta using JRC remote sensing data

Outputs: Maps showing Occurrence, Recurrence, Extent, Change in intensity, Seasonality and Transitions

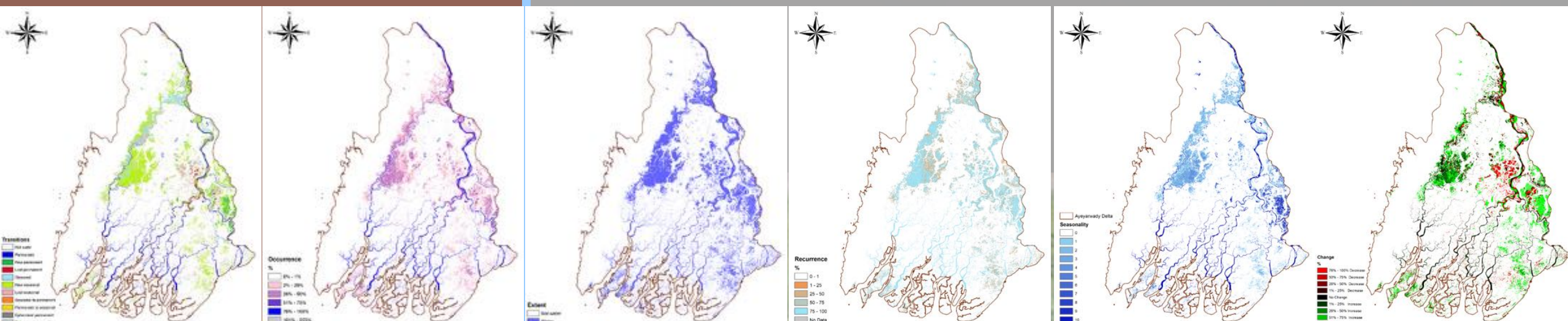
Trends:

Increase in rainfall, highest in west (increases up to 32 mm/year), lower increase in east

Increase in surface water in east and west

Decrease in surface water in central region

East and west of the basin has longest periods of open water.



# Building local capacities

## **2. Building capacities**

- Training of farmers and extension officers
- Awareness and training videos for wider uptake
- Building capacity for local collective action
- Supporting university students and faculty staff to explore livelihoods dynamics and present findings





# Building local capacities

Agriculture extension



## Farmer training on floating rice cultivation

- Seed selection, soil quality, marketing and value addition
  - Collaboration with An Giang University, Vietnam and Australian National University.
  - Sessions converted to Burmese language video online
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- *Floating rice is non-polluting and ecologically positive, but labour intensive, with a low market rate*



# Building local capacities

Agriculture extension

## Managing Golden Apple Snail (Training & Video)

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- Primary pest of flood season rice (1,200ha+ damage in 2018)
- Only one demo site in the delta - limited impact
- Video provides DoA the resource to train farmers across the delta
- Video provides theory and in-field guidance in Burmese
- DoA to train 12,000 farmers in 26 townships, and distribute the DVD to farmers
- Video accessible via
  - Myanmar Agriculture Network Facebook (1800 watches so far)
  - Various local Facebook groups (Agricultural in Myanmar group, friends who love planting, sources for agricultural techniques group)
  - International Social Media eg FBFS Facebook
  - Green way phone app





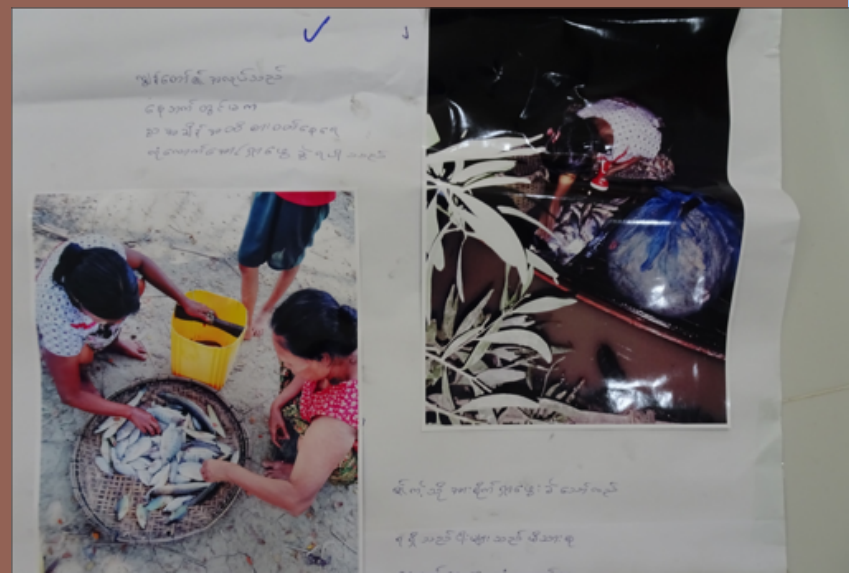


# Building local capacities

Building capacity for local collective action and conflict management around water management

## Improving sluice gate operation to enhance capture fisheries in Kyonkadun village

- 1,000 sluice structures across the delta to support agriculture
- Sluices alter fresh water flows, driving decline in capture fisheries (50% loss in this village)
- No integrated management of sluice gates
- Testing approach to develop local collective action for inclusive management, for consensus between farmers and fishers on sluice gate operation to minimize rice-fish trade-off
- Approach uses participatory photo stories. Stakeholders are active partners in change
- Potential to apply elsewhere and scale up
- Outputs: sluice gate operation model & practice note



*In partnership with WorldFish*



# Influencing at scale

## 3. Influence at scale

- INGOs and NGOs that share a commitment towards inclusive growth and sustainable development
- Combine evidence in support of integrated planning
- Target key forums and planning process with potential to significantly shape/re-shape agro-ecological conditions
- Identify and work with networks as dissemination pathways



# Influencing at scale

Converting surface water maps into applications at scale

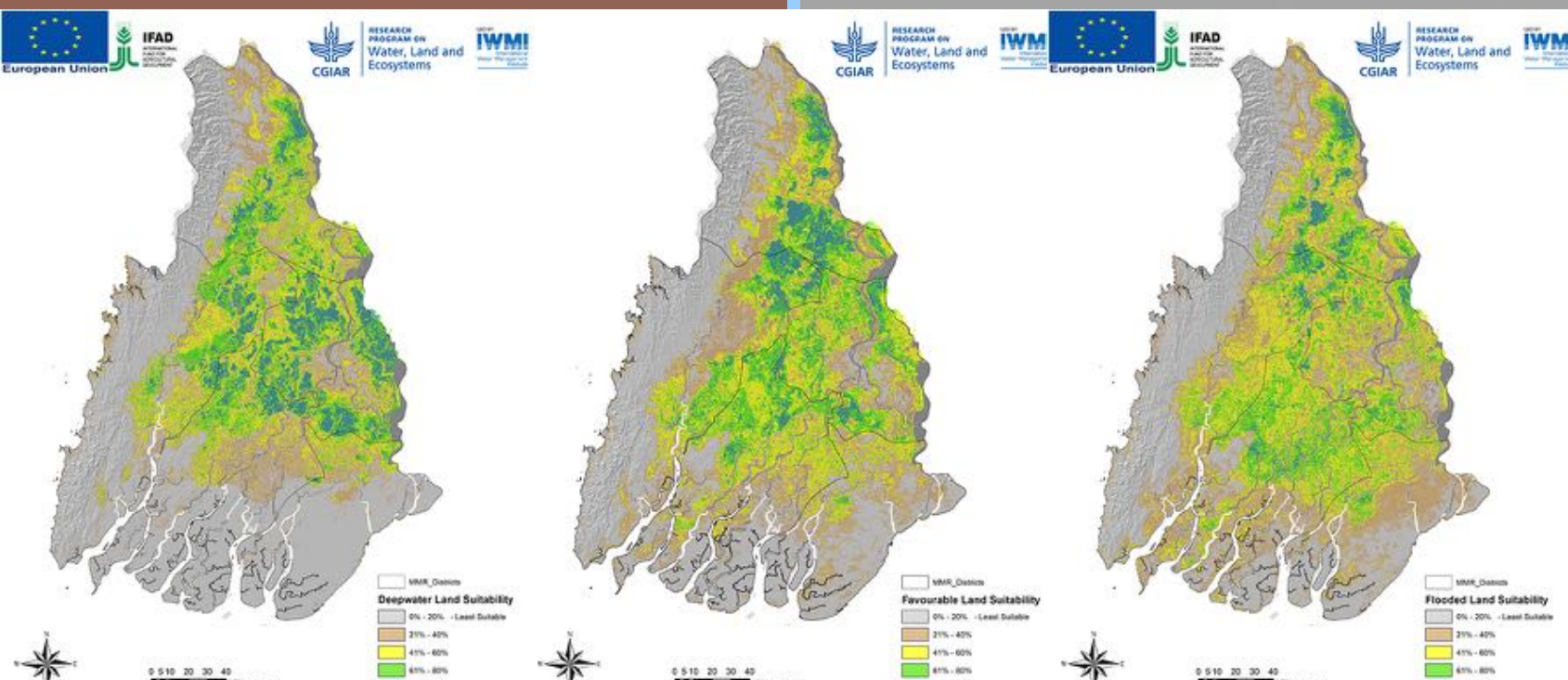
## Rice suitability maps

Based on demand from DoA, to mitigate risks from altered flood patterns

- 3 maps: deep water, flooded and favorable to modern varieties
- Combines cropping calendar with:
  - Remote sensing geospatial datasets (land use, soils, salinity, elevation, water occurrence, soil quality, vegetation indices...)
  - Data from 300 field data points from 15 townships (2018)

## Trends

- 3%, 5% and 7% of the delta is most suitable for flooded, favorable and deepwater rice production respectively



## Next Steps:

Agree with DoA on dissemination and application (e.g. training, soft copies available at district level, training to gov't on spatial analysis)

# Influencing at scale

Converting surface water maps into practical applications at scale

## Rice-Fish suitability map

Responds to high level interest in DoF to further trial rice-fish combinations in marginal rice areas

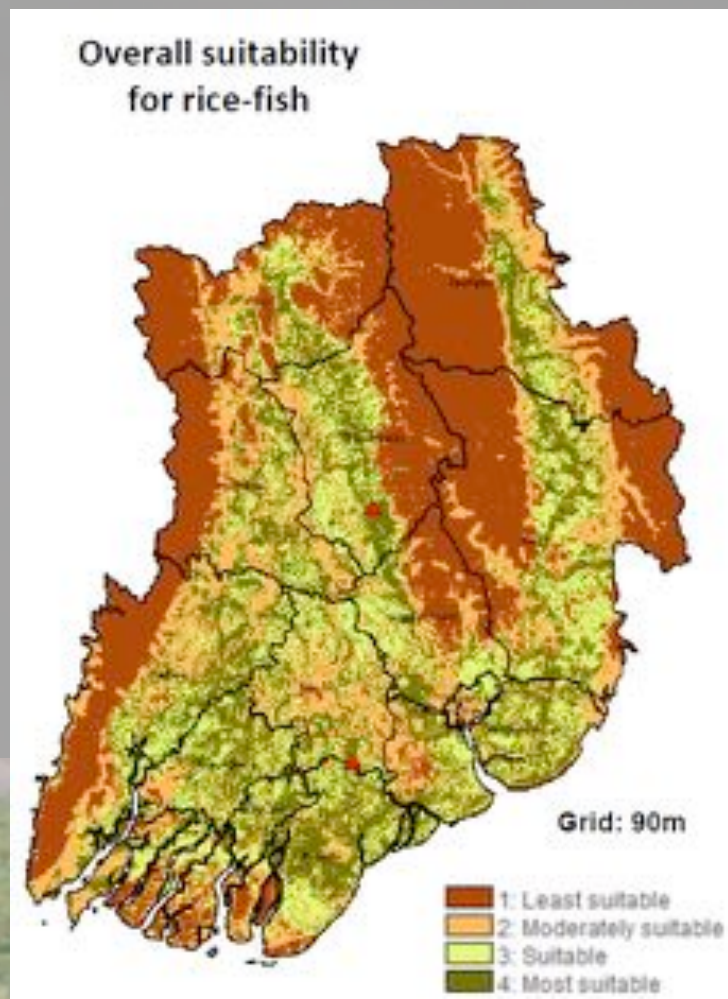
Builds on rice suitability maps

Developed by WorldFish (part of ongoing partnership)

### Next Steps:

Agree with DoF on dissemination and application.

Could be basis of longer term partnership with DoF





# Influencing at scale

Building coalitions and  
networks

## Building coalitions to influence policy and planning

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### WorldFish

- Common concern for impacts of infrastructure development on surface water flows and capture fisheries
- Exploring rice-fish opportunities in marginal rice areas
- Brings additional funding from inside and outside of CGIAR

### WWF

- Impacts of hydropower development on surface water flows

### Online platforms

- Myanmar Information Management Unit (MIMU)
- Myanmar Water Portal



# Influencing at scale

Building coalitions and  
networks

## Exercising collective Influence

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Partnerships and entry point resources (e.g. suitability maps) to support key planning processes in the Delta, e.g:

- Myanmar Water Resources Management Committee
- World Bank's Ayeyarwady Integrated River Basin Management Project (AIRBM)
- ADB flood management investments
- Netherlands funded Delta Strategy





Thank you



## Reference slides

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# What's next: where to invest?

## Potential areas for future investment

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- Rice-Fish mapping. Consider trade-offs in more detail, quantify
- Rice-Fish trial, depending on discussion with DoF.
- Mapping physical structures in the Delta: inventories water regulating/blocking infrastructure, impacts and tradeoffs
- Effects of land use change on other sectors
- Sluice gate management at local level - upscaling





# Understanding contexts at multiple scales

Understanding the water environment as an entry point into key planning processes and forums

## Definitions of Surface water maps

**Occurance:** Degree of surface water occurrence between 1984 and 2015

**Recurrance:** Frequency with which water returns each year, and gives a measure of the inter-annual variability

**Extent:** All areas that have ever been under water over 30 years

**Change in intensity:** Areas of increase, decrease or little change in water occurrence intensity over time

**Seasonality:** Areas under water over different months of a year

### **Transitions:**

- Unchanging permanent water surfaces
- New permanent water surfaces (conversion of land into permanent water)
- Lost permanent water surfaces (conversion of permanent water into land)
- Unchanging seasonal water surfaces
- New seasonal water surfaces (conversion of land into seasonal water)
- Lost seasonal water surfaces (conversion of a seasonal water into land)
- Conversion of permanent water into seasonal water
- Conversion of seasonal water into permanent water

