

Expert meeting on Ecosystem Valuation in  
the context of Natural Capital Accounting  
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# Economic valuation of flood control/water flow regulation of agricultural land and forest in Japan

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# Two major studies for valuation of ecosystem services at national scale

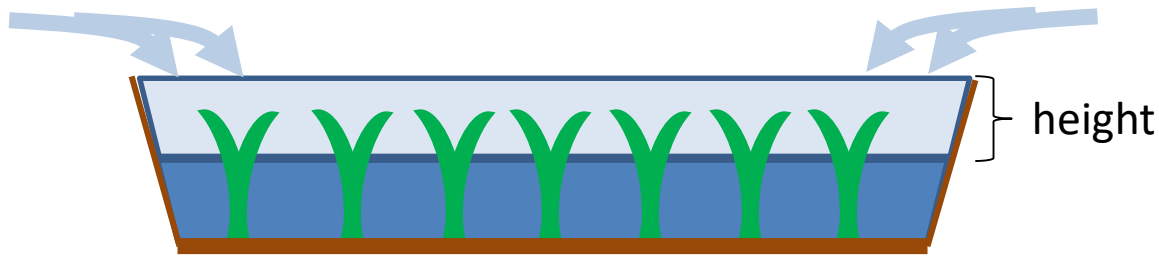
- Conducted by the Ministry of Agriculture, Forestry and Fisheries (MAFF) in around 2000
  - To assess the value of multifunctionality of agricultural land and forest
- A research project led by Kobe University (KU) during in around 2016
  - To estimate economic value of ecosystems (mainly forest and wetland) for SEEA-EEA

# MAFF 2000 study

- Assessed economic values of flood control and water flow regulation
  - Agricultural land (paddy and arable)
  - Forest
- Valuation techniques
  - Replacement cost (RC):
    - Construction cost of flood control dam
    - Construction cost of water utilization dam

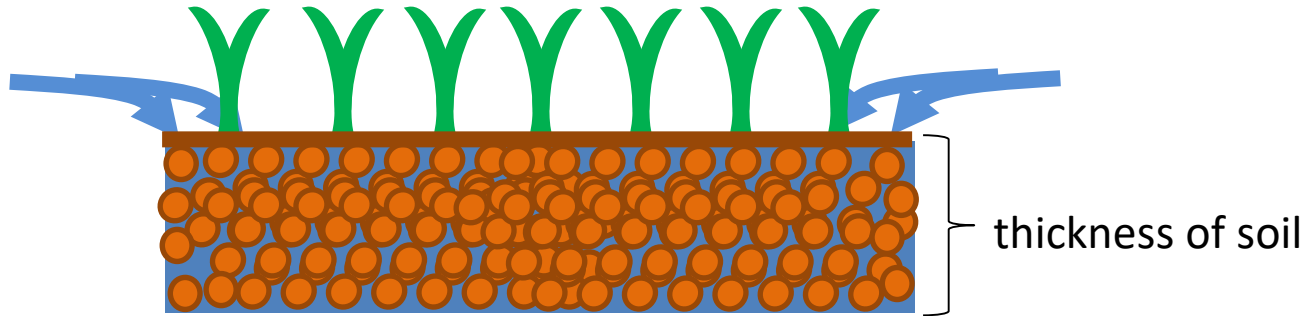
# Valuation technique of flood control

- Flood control of paddy field
  - Amount of water stored in paddy = additional height to store water \* area of paddy



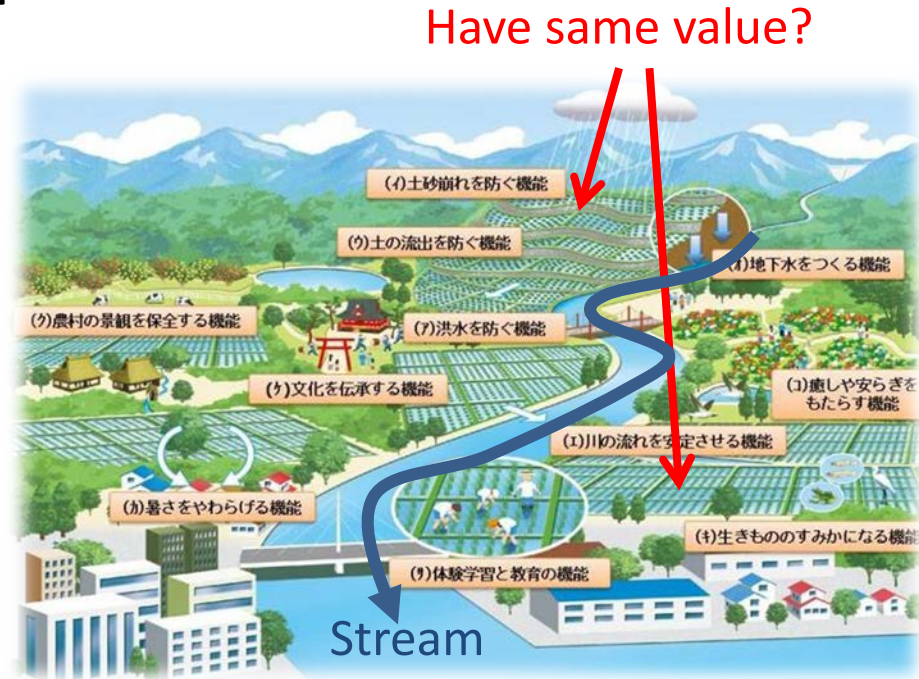
# Valuation technique of flood control

- Flood control of arable land
  - Amount of water stored in paddy = thickness of soil \* porosity \* area



# Valuation technique of flood control

- Land in the upper stream
  - Large number of beneficiaries
- Land in the lower stream
  - Small number of beneficiaries



# Valuation technique of flood control

- Paddies are grouped into two
  - Standard area location
    - Assume all paddies have beneficiaries
  - Lower stream area location
    - Assume 25% of paddy has no beneficiaries
      - Share of paddies which have beneficiaries in all paddies: 0.75
    - Amount of water stored paddy in lower stream area = additional height to store water \* area of paddy \* 0.75
- For arable land, location is ignored

# Valuation technique of flood control

- Price per hectare
  - Construction cost of flood control dam per storage capacity (JPY/m<sup>3</sup>)
    - Legal durable period: 80 years
    - Legal interest rate: 5%
    - 2.34JPY/m<sup>3</sup> (≒0.02 USD/m<sup>3</sup>)



# Results

		Unit trillion JPY	
		MAFF 2000	KU 2016
Flood control	Agricultural land (RC: Flood control dam)	3.5	
	Forest (RC: Flood control dam)	6.5	
Water flow regulation (Water strage)	Agricultural land (RC: Water utilization dam)	1.5	
	Forest (RC: Water utilization dam)	8.7	13678

But more detailed identification of beneficiaries is needed