Expert meeting on Ecosystem Valuation in the context of Natural Capital Accounting
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Economic valuation of erosion control/sediment retention of agricultural land and forest in Japan

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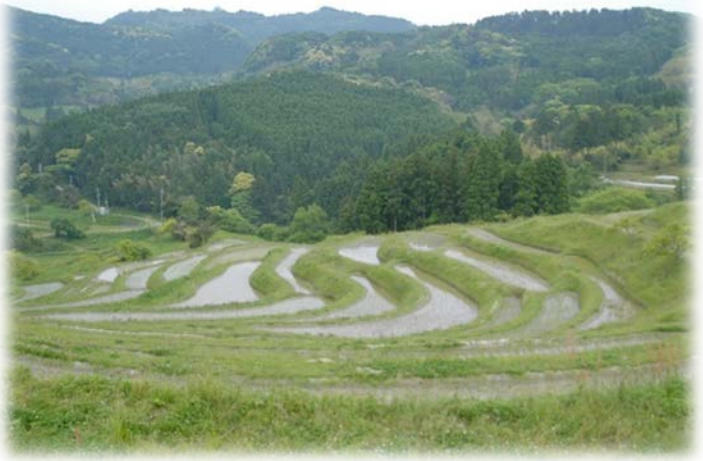
Two major studies for valuation of ecosystem services at national scale

- 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 value of erosion control and soil retention
  - Agricultural land (paddy and arable)
  - Forest
- Valuation techniques
  - Replacement cost (RC):
    - cost of check dam construction or hillside works
  - Avoided damage cost (ADC)
    - Number of soil erosion incidence caused by abundance of farming
    - Average damage cost per incidence



KU 2016 study

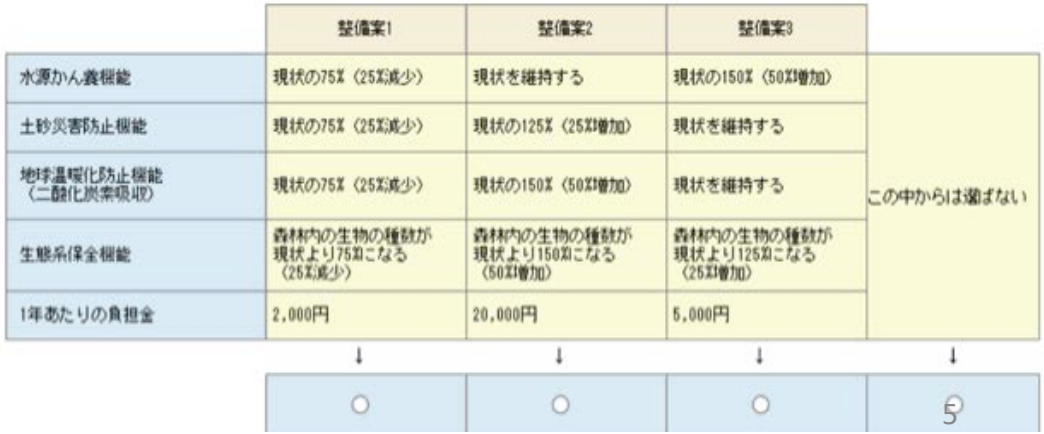
- Assessed economic value of soil retention
  - Forest
- Valuation technique
  - Contingent valuation and Choice experiment (CV+CE)

KU 2016 study

- CV: questionnaire survey conducted in 2015

In order to conserve forest in your county, local government is currently planning to extend 1 hectare of forest conservation area. How much amount of additional payment can be accepted in your household? ( )JPY

- CE: Six ecosystem services using partial profile design
  - Water storage
  - Sediment retention
  - Wildlife habitat
  - Climate change mitigation
  - Recreation
  - Timber production



	整備案1	整備案2	整備案3	
水源かん養機能	現状の75%（25%減少）	現状を維持する	現状の150%（50%増加）	この中からは選ばない
土砂災害防止機能	現状の75%（25%減少）	現状の125%（25%増加）	現状を維持する	
地球温暖化防止機能（二酸化炭素吸収）	現状の75%（25%減少）	現状の150%（50%増加）	現状を維持する	
生態系保全機能	森林内の生物の種数が現状より75%になる（25%減少）	森林内の生物の種数が現状より150%になる（50%増加）	森林内の生物の種数が現状より125%になる（25%増加）	
1年あたりの負担金	2,000円	20,000円	5,000円	
	↓	↓	↓	↓
	○	○	○	○

MAFF 2000 and KU 2016 studies

		MAFF 2000	KU 2016
Ecorion constrol	Agricultural land	✔ (ADC)	
	Forest	✔ (RC: Check dam)	
Sediment retention	Agricultural land	✔ (RC: Check dam)	
	Forest	✔ (RC: Hillside works)	✔ (CV+CE)
Connection with SEEA-EEA			✔

Results

Unit trillion JPY

		MAFF 2000	KU 2016
Ecorion constrol	Agricultural land	0.33 (ADC)	
	Forest	28.3 (RC: Check dam)	
Sediment retention	Agricultural land	0.47 (RC: Check dam)	
	Forest	8.4 (RC: Hillside works)	14236 (CV+CE)

Huge gap!

- Mainly due to number of beneficiary multiplied

Value = JPY/ha/household/year * Number of households in Japan
(Unit value) (No. of Beneficiaries)

- But in the first place, valuation target may be different…

Incorporation into an account

Forest asset account in Japan

Please select coverage area and years

全国
Forest
2007-2012

		Physical value		Monetary value													
				Exchange value							Surplus value						
		Total	Total	Total	Water strage	Sediment retention	Mitigation of climate change	Conservation of ecosystems	Timber production	Recreation	Total	Water strage	Sediment retention	Mitigation of climate change	Conservation of ecosystems	Timber production	Recreation
Unit		Hectare	1000m3	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY	Bil. JPY
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Opening stock of ecosystem assets	1	23,637,376	4,431,737	15,650	0	0	0	0	15,650	0	72,764,545	14,439,353	15,023,336	14,837,998	10,927,735	9,669,056	7,867,068
Addition to stock	2																
Regeneration - natural	3																
Regeneration - human activity	4																
Reclassifications	5																
Reduction in stock	6																
Reduction due to extraction and harvest of resources	7																
Reduction due to ongoing human activity	8																
Catastrophic losses due to human activity	9																
Catastrophic losses due to natural events	10																
Reclassifications	11																
Revaluation	12	－－	－－	0.00	0.00	0.00	0.00	0.00	0.00	1.00	−1,256,125	−252,064	−264,71	−260,900	−183,184	−162,214	−133,050
Net change in stock	13	−19,556	468,774	−12.95	0.00	0.00	0.00	0.00	−12.95	0.00	−3,835,275	−760,881	−787,0	−778,605	−579,410	−511,848	−417,515
Closing stock of ecosystem assets	14	23,617,820	4,900,511	15,637	0	0	0	0	15,637	0	68,929,270	13,678,472	14,236,3	14,059,393	10,348,325	9,157,209	7,449,553

－－: Firgures not recorded on this cell conceptually

Source: Based on SEEA-EEA handbook Table 6.1

- Economic values may be unstable when it is measured by CV…
- Can these figures reliable for visualization and mainstreaming of ecosystem?