Payments for Ecosystem Services (PES)

and

Alternate Land Use Services (ALUS)

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Presentation overview

- General Ideas of PES
- Compare ALUS with PES
- Provide key knowledge on ecosystem services
- Effectiveness and Efficiency of ALUS
- Recommendation for ALUS

What is PES ?

Transaction between provider and beneficiaries of ecosystem services

A PES scheme is :

1. a voluntary transaction in which;
2. a well-defined ecosystem service, or a form of land use likely to secure that service;
3. is bought by at least one ES buyer;
4. from a minimum of one ES provider;
5. if the provider continues to supply that services.

Source: UNEP, 2008

What Constitutes a PES Transaction ?

The payment causes the ES and benefit of ES to occur where it would not have otherwise

Types of PES

1. **Public payment schemes:**
   E.g., the state allocate funds to municipalities to protect forested watershed on private land

2. **Formal markets:**
   Open trading between buyers and sellers of ecosystem services. E.g., International carbon market

3. **Self-organized private deals:**
   Individual beneficiaries of ecosystem services contract directly with providers of those services. E.g., ALUS

Source: UNEP,2008

What is ALUS ?

ALUS:

- Is a stakeholder financed incentive program where farmers are provided incentive to produce ecosystem services;
- Does not rely upon a formal market;
- Relies upon a continual series of payments to farmers who agree to steward ecosystem services;
- Ontario launched in 2007; and
- Stakeholders are MNR, OMAFRA and Conservation Organizations

The Logic of ALUS

Socio-economic impacts

Benefits to Farmers

Costs to Population

Farmer's Land Use Decision
Convert Wetland into Agricultural Land

Public ecosystem services
- Wetland value for Flood control
- Water quality
- Biodiversity (fish, waterfowl)

Low Cost Way

Payments

Pay farmers to conserve wetland for ecosystem services

Public Benefit

ALUS Characteristics

Condition:

- **Retirement up to 20% Land for conservation of ES**
- **EFP Certificate;**
- **Conservation Plan with Best Management Practices; or**
- **Agree to complete conservation plan before contract ending date**

Contract Length:

- **2/3 years with farmers**

Payment Structure:

- **$ 150 per acre based on average land rental rent**

Funding Agency:

- **MNR, OMAFRA and 16 different conservation organizations**

Identification of ES by ALUS

WETLAND	GRASSLAND	POLLINATOR HABITAT	AFFORESTED PROPERTY
Habitat and breeding ground for waterfowl	Habitat and Breeding Ground	Habitat for Pollinator Species and Wildlife	Soil Stabilization
Increased Biodiversity	Soil Stabilization	Increased Biodiversity	Erosion Control
Flood Control	Erosion Control	Soil Stabilization	Increased Biodiversity
Water Storage	Carbon sequestration	Wind Erosion Control	Forrest Corridors
Ground Water Recharge and Discharge	Biomass Production	Enhance Native plant Reproduction	Carbon Sequestration
Water Purification	Increased Soil Fertility		Wildlife Habitat
Landowner Enjoyment	Land Owner Enjoyment		
	Habitat Corridors		

Source: ALUS Project Coordinator

ES of Wetland for Discussion

Flood Control ; Water Storage

Water Purification ; Landowner Enjoyment - e.g., Fishing:

Habitat and Breeding Ground for Waterfowl

ES of Wetland for Discussion

Flood Control : Benefit of Wetland (Final Component of Ecosystem)

Water Storage : Ecosystem Function (Supporting Services) :-- - Quality Water (End Product of Ecosystem)

Water Purification : Ecosystem Function (Regulating Service) :--- Quality Water (End Product of Ecosystem)

Wetland value for flood control benefit = The construction cost for local disturbances (dam, dykes, levees) and water regulation facility per unit storage volume × Water storage capacity of Wetland

The value from water supply = the price of qualified water × the amount of qualified water × the Water storage capacity of wetland

Landowner Enjoyment - e.g., Fishing:

Fishing : Benefit

Input: Ecological Goods and services (Water body + Fish population + Conventional Goods and Services (Tackle + Boat+ Time Allocation + Fishing Licence)

Measuring Criteria: ?

Water body? Fish? Tackle? Boat? Time allocation? Access? What portion of the value of fishing would be allocated to every input.

Key knowledge on Ecosystem Services

	Definitions of Ecosystem services	Characteristics:	Example
Directly used	Component of Ecosystem	Ecological in nature, visible easily classified, quantify and value, avoid double counting, people care	
Indirectly used	Functions of ecosystem	Ecological in nature Non visible quantification and valuation problematic, People does not care	
Direct + Indirect	Benefits from Ecosystem	Conventional & Ecological in Nature Proxy quantification and valuation	

Source: Boyd, 2007 and Morling, 2009

Ecosystem Service Classification

Ecosystem

Wetland

Intermediate services

Habitat of species

Water Storage

Nutrient Cycling

Final Services

Surface water Quality

Clean Water

Soil Quality

Wetland

Benefit

Bird Watching

Canoeing

Drinking Water

Crop Production

Flood control

Source: Boyd, 2007

Ecosystem Service Approach to Valuation

Ecosystem-Wetland

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Ecosystem Service Provider (ESP)- Soil Biota- Earthworm

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Service providing unit (SPU): 1 Tonne earthworm form 1000 kg of soil per ha/year

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Measuring Criteria: Ecological Indicator

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Relationship with Ecosystem Function— Soil Formation

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Ecosystem service: Fertile soil

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Benefit: Agricultural production

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Economic information: Market price of Topsoil

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Beneficiaries: Farmers

VALUATION

- Units of ES
- Quantities
- Aggregation of quantities
- Economic information
- Valuation Method

Ecosystem Service Approach to Valuation Cont.

Ecosystem-Wetland

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Ecosystem Service Provider - Wetland

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Service Providing Unit: The area of Wetland

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Relationship with Ecosystem Function — Damage regulation

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Ecosystem service: Wetland

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Benefit: Flood Control

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Economic information: Cost of Dyke, Dam

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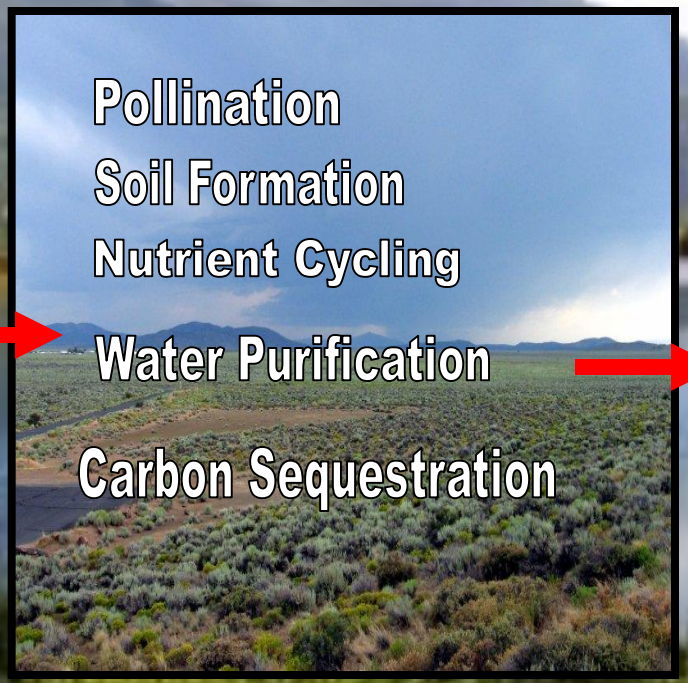
Beneficiaries: Government, Local People

Final Note on Ecosystem Services

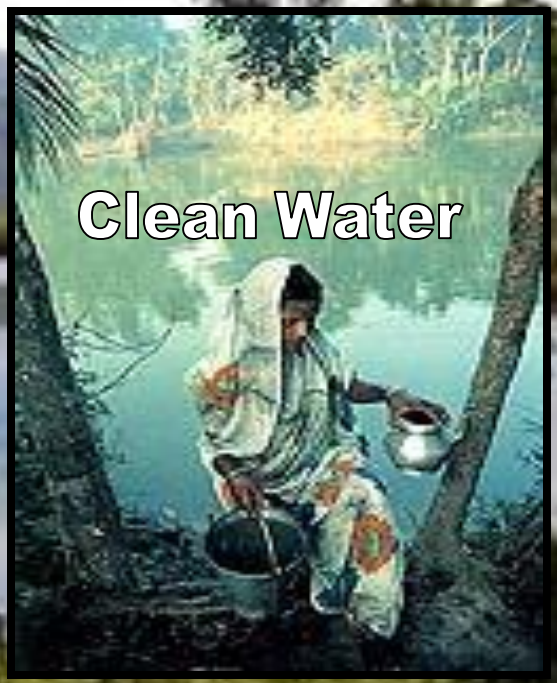
Logic of Considering Final Ecosystem Services

Empty World

Full of Ecosystem Functions



Ecosystem Services



Knowledge comes with a responsibility to act for ES

Effectiveness of ALUS in Providing ES

Three Assessment Criteria:

- **Provision of Ecosystem services (ES);**
- **Conservation practices to ensure that services; and**
- **Measurable outcome**

Assessment criteria	Responses	Comment	Future Implication
Ecosystem services	Identified ES	Mixed up intermediate services, final services and benefit	Problem with Valuation and targeting beneficiaries
Conservation practices	EFP-No linkages with ES	No guarantee for specific ES flow	No guarantee to Sustain conservation
Measurable outcome	Not really	Not generating land use change outcomes	No opportunity to Continue funding

ALUS Management Practices

- Environmental Farm Plan-
- Beneficial Plant: native trees
- Wetland creation
- Not focusing specific ES

Ontario Nature: In-kind Support for habitat creation of Badger, Waterfowl

MNR: SAR Stewardship Fund

Waterfowl Nest Upto One Kilometre

Waterfowl Breeding Ground

3 Management Practices for Wetland:

Hydrological; Chemical; Biological.

No Practices for maintaining water level

Efficiency of ALUS

Theory:

Payments = Opportunity cost + Transaction

If Payment ≥ opportunity cost + transaction cost, farmers have incentive

Payment< Opportunity cost+ Transaction Cost farmers do not have incentive

Four Assessment Criteria:

- **Whether the farmer's participation increase**
- **Whether the program cover opportunity and transaction cost**
- **Whether the payment is continuous or long-term**
- **Whether there is demand for ecosystem services or willingness to pay for services (proxy of buyers)**

Efficiency Cont.

Assessment criteria	Responses	Comment	Future Implication
Farmer's participation	23-34 farm families	Match with EFP And Less Opportunity Cost	No guarantee to continue w/o Payment
Opportunity and Transaction cost	Not covered	May be high opportunity cost landholders are not participating	This may reduce the efficiency of this program
Payment length	2-3 years contract	Not enough for ES Production	Farmers may revert to previous activity w/o payment
Demand and Willingness to Pay	MNR,OMAFRA and Conservation Organizations No measurable value or WTP for ES.	No opportunity to generate new revenue	It may affect funding commitment.

Efficiency Cont.

Additional Gain:

- ALUS provide mechanism to set up trading platform for ecosystem services
- Creation of fund for ecosystem services
- Creation of strong farm community to steward with ecosystem services program
- Awareness of farmers about the consequences of their activities to the ecosystem
- Recognition of ecosystem services by farmers
- Creation of information and knowledge that would be used for the future implementation of incentive program

Recommendations to Operationalize ALUS:

- Narrow down ecosystem service definition;
- Collaborate with stakeholders to classify ecosystem services that people care;
- Identify conservation practices which directly relate to ecosystem services
- Distinguish landholders who really need payment and whose activities threat ecosystem at risk
- Identify potential beneficiaries who are willing to pay for services
- Payment should cover opportunity and transaction cost
- ALUS require some level of economics capacity including sufficient funding and ecological economics expertise who can provide useful assistance in support of implementation

Government Role to Operationalize ALUS

- Identify policy gap and reform legislation and policy to get the ES laws working;
- Government can subsidize transaction cost, research, monitoring, supervision and valuation;
- Government can tax beneficiaries or generate demand through regulation to generate PES fund;
- Government can fund for public ecosystem services;
- Government can define public ecosystem service units through regulation (the “currency” of each ES).

A Framework For Ecosystem Service Index

Wetland based on Management	ES index	Beneficiaries
Newly created wetlands	Waterfowl Fish for subsistence	Local people Farmers, Conservation organization
Recovery and protection of the damaged wetlands	Wetland for flood control	Local People Government
Maintenance of whole wetland ecosystem functions	All final ecosystem services	Company (Wetland credit) Conservation organization (Biodiversity credit)

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Thanks For Kind Attention
Q & A