



SEEA: THE INTERNATIONAL STANDARD FOR ENVIRONMENTAL- ECONOMIC ACCOUNTING

COMPLETING THE PICTURE: BRINGING ECOSYSTEM SERVICES INTO MFP

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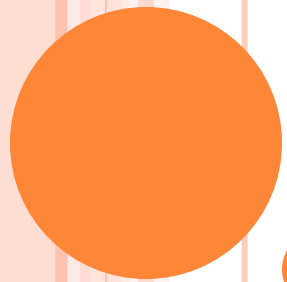
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CONTENTS

- Background and current status of the SEEA
- Ecosystem services and the ecosystem accounting model
- Incorporating ecosystem services in growth accounting
- Next steps





1. BACKGROUND

DEVELOPMENT OF THE SEEA





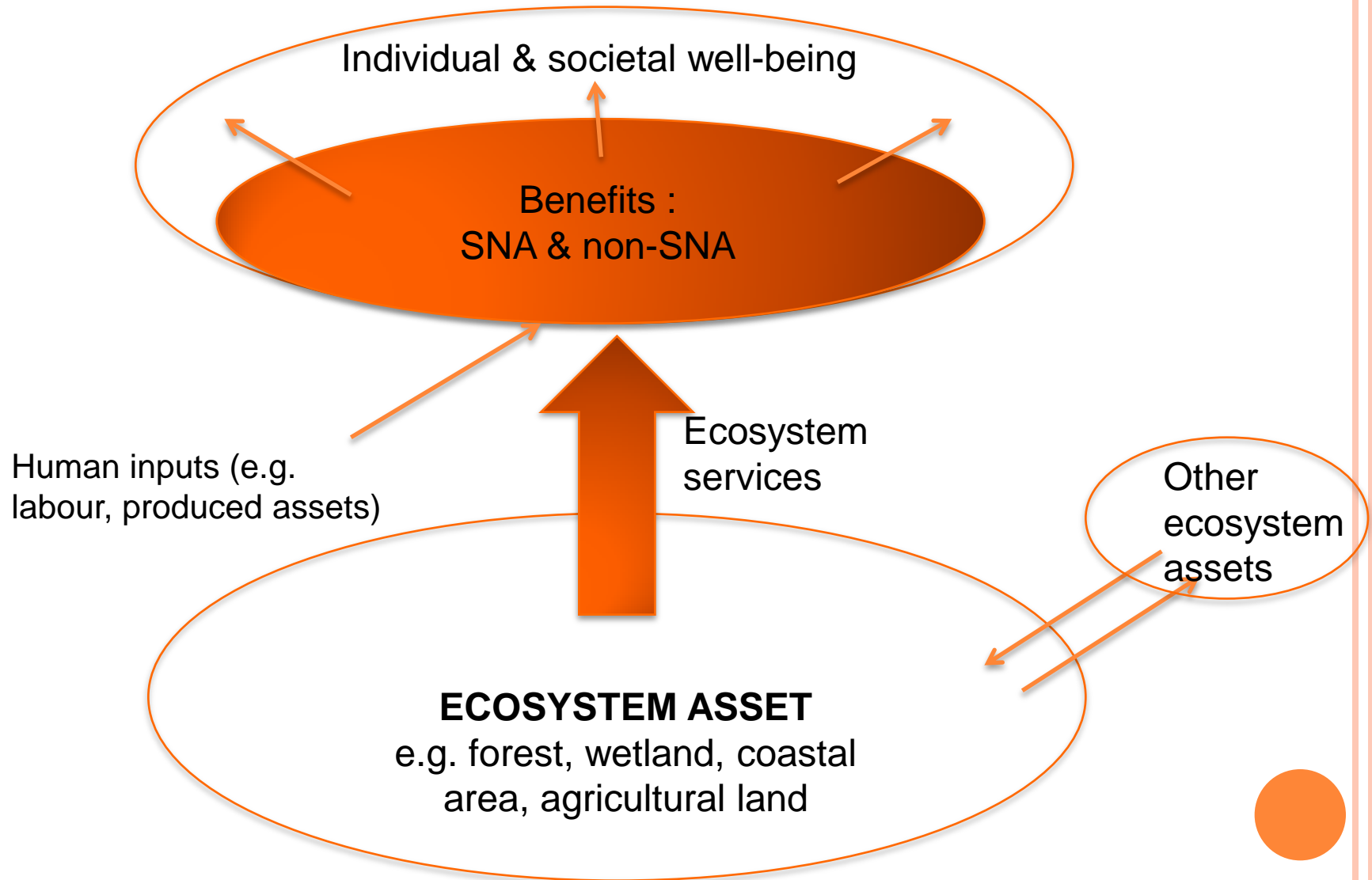
2. ECOSYSTEM SERVICES AND THE ECOSYSTEM ACCOUNTING MODEL

ECOSYSTEMS AS PART OF ENVIRONMENTAL ASSETS

- Dual perspective of the bio-physical environment: individual resources & ecosystem assets



CORE ECOSYSTEM ACCOUNTING MODEL

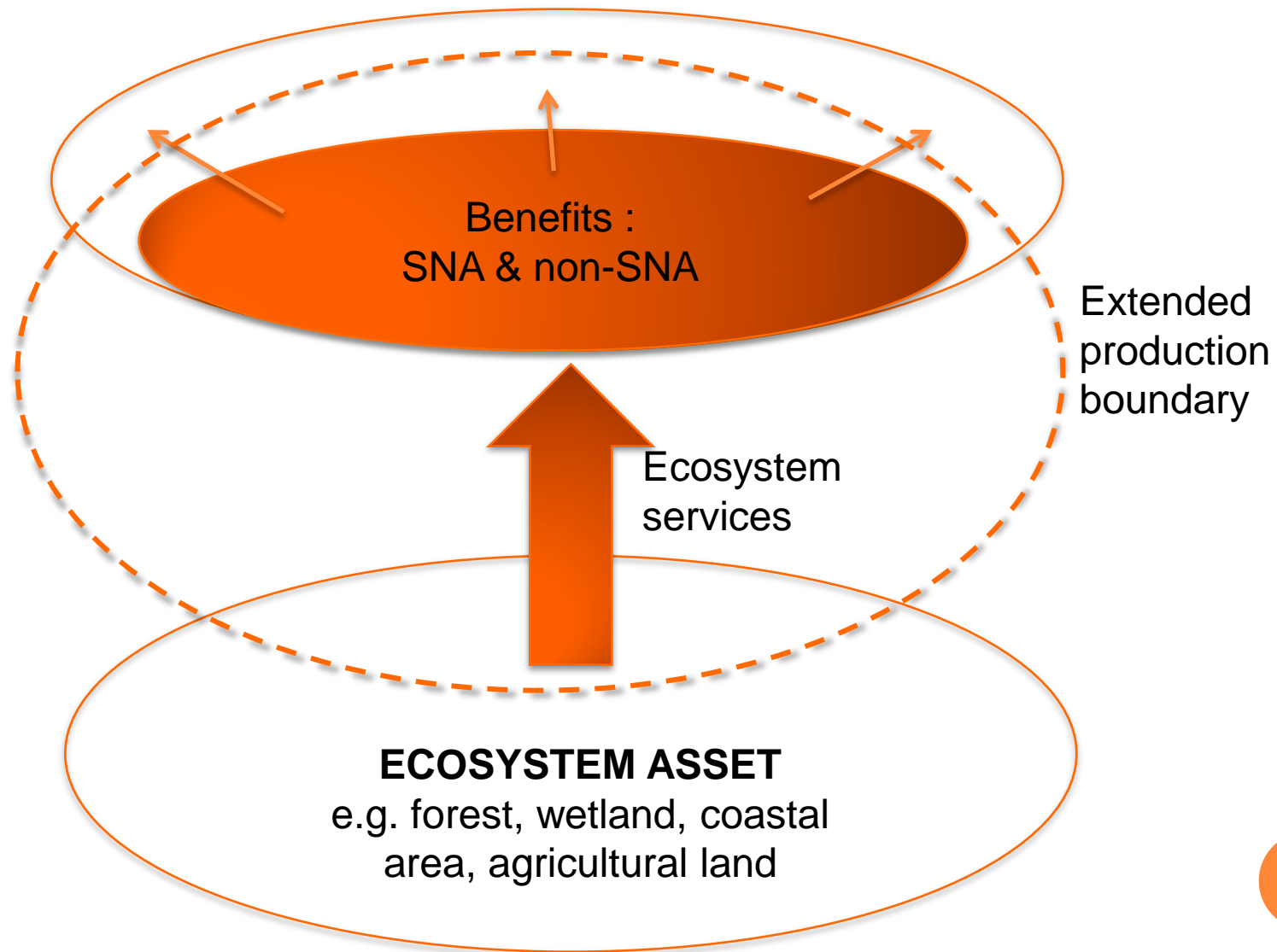


THE PRODUCTION BOUNDARY

- “Production is an activity carried out ... by an institutional unit that uses inputs of labour, capital and goods and services to produce outputs of goods and services” (2008 SNA, 6.24)
- In practice:
 - Exclude household production of services for itself
 - Except rent of owner-occupiers & wages of domestic staff
 - Include household production of goods for itself
 - Agricultural products, fishing, fuelwood, clothes, furniture, water, energy
 - Include concealed and illegal activity
 - **Exclude “things” produced by natural processes**



CORE ECOSYSTEM ACCOUNTING MODEL



ACCOUNTING IMPLICATIONS OF INCLUDING ECOSYSTEM SERVICES AND NON-SNA BENEFITS

- Measures of output, consumption and income larger
- Potential value of environmental assets increases
- Cost of capital – degradation – must take into account loss of future income from non-extractive activity; if asset declines in condition
- Recognise multiple users and income streams from a single asset
- **Potential to extend measures of MFP**





3. IMPLICATIONS AND CHALLENGES FOR MEASURING MFP

LIMITED CASE OF NON-RENEWABLE RESOURCES

- Consider first only private benefits – provisioning services
- Physical flows (e.g. tonnes of coal) represent the capital service flows (see Brandt, Schreyer, Zipperer, 2013; Schreyer and Obst, 2015)
- Given assumptions on extraction rates and quantity of stock can estimate extraction profile and asset lives
- Use standard approaches to estimating resource rent to partition gross operating surplus between produced and non-produced assets to establish cost share



CASE OF RENEWABLE RESOURCES (TIMBER, FISH, BIOLOGICAL RESOURCES)

- Consider first only private benefits – provisioning services
- Physical flows (e.g. m³ timber) represent the capital service flows
- If extraction > regeneration; then given assumptions on extraction rates and quantity of stock can estimate extraction profile and asset lives
- Use standard approaches to estimating resource rent to partition gross operating surplus between produced and non-produced assets to establish cost share



CASE OF RENEWABLE RESOURCES (TIMBER, FISH, BIOLOGICAL RESOURCES)

- However, if extraction = regeneration - i.e. sustainable use; then
 - Asset life infinite
 - No depletion of stock
 - User cost equal to opportunity cost of capital?
- Are there parallels to cite or issues to be resolved?
 - Problem of zero or negative resource rent – under sustainable use does exchange value of the ecosystem service tend to zero?
 - Others?




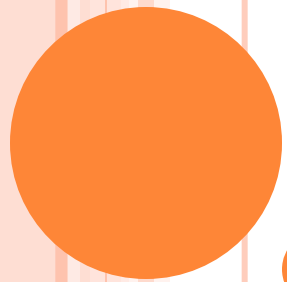
EXTENSION TO OTHER ECOSYSTEM SERVICES

- Going beyond private / provisioning services leads to
 - Expansion in the measure of output/GDP
 - Extending the set of natural capital inputs
- Need to
 - incorporate additional valuation techniques for the measurement of non-market outputs
 - recognise multiple owners/beneficiaries and multiple types of capital services from single asset
 - understand changes in the condition of ecosystems such that degradation of ecosystems can be assessed, valued and allocated



OECD ENVIRONMENTALLY ADJUSTED MFP

- Brandt, Schreyer and Zipperer (2014)
 - Distinguishes environmental inputs (natural resources) and environmental outputs (air pollution)
 - Inputs treated similarly to description above
 - Outputs considered as bads => pollution adjusted GDP
 - Adjustment to GDP based on pollution flows and private cost of environmental regulation
 - Comments
 - Pollution is not an ecosystem service; accounting step unclear
 - Actual private costs already in GDP estimation
 - No direct link between environmental impact of pollution and production function for a country
- 



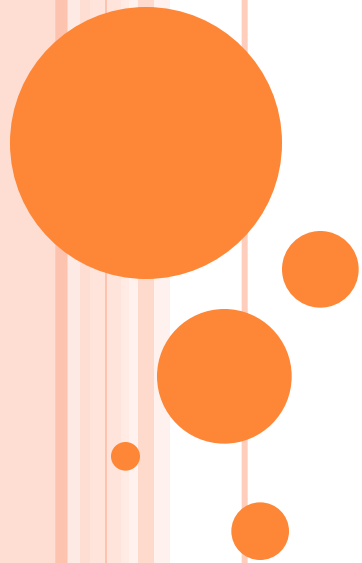
4. WHERE TO?

POSSIBLE NEXT STEPS

- Consider further the mathematics of extended growth accounting to natural capital and the flows of ecosystem services
- Consider the potential non-market valuation approaches that would be consistent with price and quantity decompositions of standard capital accounting
- Advance project to examine the development of Agriculture MFP using extended growth accounting



THANK YOU



LINKS

- **SEEA Central Framework**

http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf

- **SEEA Experimental Ecosystem Accounting**

http://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf

