



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

Training Session on Economic Valuation – Session 2 Subsession 3 „The Repository of Valuation Studies - conducting the benefit transfer, using market prices & summing up”

Training on the systematic integration of economic valuation
of "wet" ecosystem services into the TDA/SAP process





Context

- In the first steps of a tier 1 economic valuation – “setting the scene” – a set of ecosystems and ES is selected for further analysis (presented in Subsession 2).
- The results are recorded in the “checklist for Tier 1” (www.iwlearn.net/learning/manuals/economic-valuation/accompanying-documents-and-training-materials).
- In Subsession 2, we performed these steps, using “Bakul Country” as an example and filled the “checklist for Tier 1” also with information on ecosystem size).
- In this subsession, we will:
 - Look for proper studies for a benefit transfer (in the “Repository of EV studies”: www.iwlearn.net/learning/manuals/economic-valuation-of-wet-ecosystems/the-repository-of-economic-valuation-studies).
 - Perform a short benefit transfer exercise.
 - Discuss the market price valuation approach.
 - Consider the summing up of a tier 1 EV results.





The Repository of EV studies

- The Repository contains information on studies considered directly usable for tier 1 benefit transfers...
- ... is the result of an extensive search, screening hundreds of valuation studies and selecting the few that are directly usable...
- ...and is structured in a way allowing an IW project manager to undertake a benefit transfer by identifying the studies available for the transfer to the project area, selecting the most appropriate ones and performing any adjustments to the values cited that might be necessary.
- Online: <https://www.iwlearn.net/manuals/economic-valuation/the-repository-of-economic-valuation-studies>





The Repository of EV studies

- Search function

Search the repository X

Broad ecosystem type (B) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Specific ecosystem (C) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Services (E) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Valuation methods (F) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>
Monetary unit (H) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Socio-economic characteristic - GDP/capita (J) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Socio-Economic characteristic: area (K) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>	Warm or cold-water (N) <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">- All ▼</div>





The Repository of EV studies

- If you search, for example, for the ES "moderation of extreme events" of "mangrove ecosystems", which were calculated with the "damage cost avoided" approach in "US Dollars", your filled search field should look as such:

Search the repository X

Broad ecosystem type (B)	Specific ecosystem (C)	Services (E)	Valuation methods (F)
- All ▼	mangroves ▼	moderation of extreme events ▼	damage cost avoided ▼
Monetary unit (H)	Socio-economic characteristic - GDP/capita (J)	Socio-Economic characteristic: area (K)	Warm or cold-water (N)
US\$ ▼	- All ▼	- All ▼	- All ▼





The Repository of EV studies

- The result of the search a list of the studies found and a link for exporting the results to Microsoft Excel:





Learning > Manuals > Economic Valuation of "wet" ecosystems > The Repository of Economic Valuation Studies

The Repository of Economic Valuation Studies

- > Economic Valuation of "wet" ecosystems
- > Introduction to the Guidance Documents
- > The Repository of Economic Valuation Studies

The repository of EV studies contains information on studies considered directly usable for tier 1 benefit

Search the repository

Broad ecosystem type (B) - All	Specific ecosystem (C) mangroves	Services (E) moderation of extreme events	Valuation methods (F) damage cost avoided
Monetary unit (H) US\$	Socio-economic characteristic - GDP/capita (J) - All	Socio-Economic characteristic: area (K) - All	Warm or cold-water (N) - All

5 items found - [Reset](#)

[Export to Excel](#)

1 Authors/name of the study/year	2 Marine or freshwater ecosystems	3 Specific ecosystems covered	4 Ecosystem and study area characteristics	5 Ecosystem services covered	6 Valuation Method(s) used	7 Values per area (i.e. per hectare) monetary unit used (year)	8 Monetary unit used, and which year	9 Socio-economic characteristics: population density of the area (low/medium/high)
Koch/ Barbier/ Silliman/ Reed/ Perillo/ Hacker/ Granek/ Primavera/ Muthiga/ Polasky/ Halpern/ Kennedy/ Kappel/ Wolanski (2009): NON-LINEARITY IN ECOSYSTEM SERVICES: TEMPORAL AND SPATIAL VARIABILITY IN COASTAL PROTECTION	Marine	Mangroves	Data collected in Vietnam, where plantations of K candel and Sonneratia sphave been planted as coastal defense against typhoon waves.	Moderation of extreme events (e.g. floods, storms)	Moderation of extreme events: Damage cost avoided	Moderation of extreme events: *For Sonneratia sp (marginal value per km2): 3km2 mangrove area: mid tide- US\$11,972,379 (119,74/ha) high tide - US\$6,098,261 (60.983/ha)	US\$, 1996	High





The Repository of EV studies

- You now have to determine whether the economic values of the ES identified can be transferred to your project area.
→ For the following benefit transfer, the areas in the studies found should be as similar to your project area as possible.
- In order to do this, a set of "criteria" - characteristics and traits of the area/areas which are evaluated in the study/studies taken from the repository - will guide you through the process.





The Repository of EV studies

The criteria are the following (see guidance document for details, and also exercise in Handout 2.3):

- the population density of the site, ranked as high/medium/low;
- per capita income: should not differ by more than 100% (i.e. it should not be less than half and not more than double as high);
- whether it is an urban or a rural area;
- whether the area is economically used, i.e. through agriculture, fisheries etc.;
- the intensity of its use by tourists/visitors, ranked as highly visited/medium/rarely visited; and
- whether it is a warm or cold-water ecosystem.





The Repository of EV studies

- If you found a study that “fits well”, you could directly proceed to the benefit transfer.
- If not (e.g. if too many studies were found), you should refine the search by adding criteria, such as “stricter” GDP/capita levels, same world region etc. to get results that fit better in your project area’s context.
- In case of doubt about a study, it should be checked and assessed - the PDF versions of the original studies are to be found in the first column of the results table (via hyperlink).





Group exercise: The Repository of EV studies

- First, to make things easier, let us select an important ES in Bakul for doing the exercise – do you have one in mind?
- Or we take one of the following ones:
 - Moderation of extreme events of mangrove ecosystems?
 - Tourism/recreation in coral reefs?
- Now, use Handout 2.3 “The Repository of Valuation Studies and Valuation Methods” (pp.5) for further instructions – to search the Repository for existing studies and values that can be used for the benefit transfer!



Source: Neil Palmer/CIAT, 2012¹





Group exercise:

- Try out the repository
 - Find studies for ecosystem-ecosystem service combination, export to xls
 - Assess: which studies/values are best suited for transfer to Bakul, and why?
 - Which ones are not suited, and why?
- For guidance see the list of relevant criteria in your Handout 2.3.

DISCUSSION OF RESULTS





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The Repository of EV studies

Questions?





The benefit transfer

- Via the Repository, a study/a set of values was identified and selected as “fit for purpose” for a transfer to your project area...
- ...now, an adjustment of these value(s) to the socio-economic circumstances in your project area is needed, in order to get current values (net present value - NPV) as well to adjust the values to the differences in the socio-economic background of the original site and your project area.
- Using table C3 of the “Checklist for Tier 1” for note keeping
- For some ES/ES groups, specific considerations should be taken...





The benefit transfer - specifications

Regulating Services

- Carbon Sequestration: market prices of carbon are volatile and dependent on political decisions – better use studies that have avoided damages/replacement costs as basis.
- Moderation of extreme events: often based on damage costs, which can be very local – clearly state if this is the case, or use replacement costs.
- Air quality regulation (e.g. capturing dust, micro climate): very little information available.



Source: Portland Corps, 2014⁵





The benefit transfer - specifications



Source: Neil Palmer (CIAT)⁶

Habitat services

- These often provide the basis for the provision of the two provisioning services "seafood" and "genetic resources".
- Hence: there is a risk of double counting, i.e. of counting the economic benefits of certain ES twice.
- It is recommended to subtract the total values determined for the maintenance of life cycles of migratory species and of genetic diversity, if evaluated, from the total values of the provisioning services "seafood" and "genetic resources".





The benefit transfer - specifications

Cultural services

- These encompass two very different ES: tourism and recreation, which can be evaluated relatively easy with market prices (general revenues from tourism/recreation), and the non-use values "aesthetic information, inspiration, spiritual experience and education".
- Biodiversity is often counted as a separate service...
- ...here, it is understood that important parts of the value of "biodiversity" are included in provisioning (e.g. food), regulating (e.g. carbon sequestration), habitat (e.g. nursery service) and cultural (tourism/recreation) services.
- The intangible existence value of biodiversity is included in the "grouped" service "aesthetic information, inspiration, spiritual experience and education".





The benefit transfer: adjustment

Step 1: Incorporate inflation to adjust the value to present values

- In this first step, the values stated in the selected study are transformed to their current value, i.e. adapting the value to inflation using the appropriate inflation rate (in most cases of the country in which the study was conducted).
- The inflation rate is always stated as a percentage, e.g. "2%".
- Note: Applying an inflation rate to past values in most cases *increases* the figure - i.e. the *result is a higher number* than before.
- Adapting past values for inflation simply increases the value/figure by the inflation rate, for each year separately.





The benefit transfer: adjustment

Step 2: Transfer the adapted value into U\$ of the same year

- In the second step, the present value of the benefit transfer study calculated in step 1 is converted into present-day US Dollars.





The benefit transfer: adjustment

Step 3: Incorporate the difference in price levels

- In this step, the difference in price levels between the benefit transfer site and the project area are accounted for.
- This is done by comparing the gross domestic product (at purchasing power parity) per capita (“GDP PPP”).
- The adjustment is done by calculating the ratio in GDP PPP between the benefit transfer site and your project area, resulting in a factor that will be applied to the current US\$ value calculated in the steps 1 and 2 above.





The benefit transfer: adjustment

Result

- As result of the three steps above, we now have a simplified benefit transfer completed and documented the results in table C3 of the checklist.
- At this point, the results will be in stated as "per hectare per year/annum" values, which need to be upscaled to the size of the ecosystems providing the services (see summary at the end).





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The benefit transfer: specifications & adjustment

Questions?



Market prices approach

- In Subsession 1, the approach for EV based on local market prices was presented.



Source: Van Beukering, 2011²



Market prices approach

- Market prices are relatively easy to obtain, and provide a fairly exact estimate of the value of ES to the local community.
- Suitable for:
 - Food: fish/fishery products (for marine and freshwater ecosystems), any other seafood (shellfish, mollusks; mostly marine ecosystems), and aquaculture products (both marine and freshwater ecosystems).
 - Non-Food and Timber Products: genetic and medicinal resources, fiber, timber and fuel, as well as water for drinking, irrigation and cooling purposes.
 - Tourism/recreation.



Source: Andrea on flickr, 2011³





Market prices approach



Source: Tim Cronin/CIFOR⁴

- General issue: you will need to search in regional, national or international databases for the information.
- Can be difficult, but in many cases, data should be available; if not: estimations (expert judgment)
- In relation to the spatial area, the data will be “absolute” or “relative”:
- Absolute: a "total value" for the specific ES, e.g. "total value of all fish catches in the area“.
- Relative: a figure relative to a single unit of measurement, e.g. "value per ton caught" or "value per m³ harvested“.





Market prices approach

- In the first case, you might want to relate the absolute value to a single hectare or square kilometer.
- You do this by dividing the absolute value through the size of the area (we recommend to use hectare, as most economic values are stated in "value per hectare").
- In the second case, you need to calculate the absolute value by multiplying the value per kg/ton/m³ with the overall amount produced or harvested.





Market prices approach

The sustainability question:

- Fish/fisheries: should only be included in the economic valuation as long as it is provided on a sustainable basis; for example, the Maximum Sustainable Yield (MSY) could be taken as the basis for the valuation as ecosystem service, rather than the total value of all available fish stocks.
- Water: Irrigation water for agriculture should only be included in the EV as long as it is provided on a sustainable basis, i.e. without severely impacting ecosystems or reducing the potential of an ecosystem to provide the full set of ES (i.e. groundwater tables are not lowered by water abstraction, minimum ecological flows for surface waters are sustained and no water-dependent ecosystems - such as wetlands - are negatively impacted).





Market prices: Bakul - discussion

- For which ecosystem services can we use market prices?
- Any difficulties here?





Summing up

- In a tier 1 economic valuation, you will in the end have probably more than “just” one single value...
- ...depending on how many ES were evaluated.
- You have to do some final steps:
- Relating the “per hectare” values to the overall size of the ecosystems.
- Summing up, e.g. adding the values together.
- BUT: be careful, as major assumptions/uncertainties are involved: clearly state them!!!





Discussion: two approaches, many uncertainties...

- Where do you see the major uncertainties involved the overall approach?
- ...and in the benefit transfer and market prices approaches?
- Reflecting the benefit transfer exercise: which were the main assumptions you had to take?
- Any ideas for reducing uncertainties?
- Consequences of the uncertainties and assumptions?

WHAT IS NEEDED: TRANSPARENCY!





List of uncertainties included relate to:

Impacts of a human activity on the provision of ecosystem services, i.e. how a degradation of the quality of the ecosystem affects ecosystem services.

Interlinkages of different ecosystem services and to the various components of ecosystem functioning.

The role of **biodiversity**/biophysical modeling.

"Double counting", i.e. some ecosystem services are not complementary or influence each other (e.g. provision of fish/fisheries and spawning grounds, two values that should not be added).

Metrics: other approaches beyond showing values in US Dollars can be useful, e.g. number of people/households depending upon the service(s), or the number of persons suffering from diseases linked to ecosystem degradation.

The assumption that the **value of ES by one hectare of a certain ecosystem equals** the one of an ES somewhere else (even within the same region).

Changes in size of ES is not "proportional" to the change of ES services provided.

In stated preference methods (e.g Contingent Valuation): assumed that stated preference is similar to revealed preference: **would they actually pay?**

Calculation of the **number of persons benefitting** by a service.

The "proper" **discount rate**.

Market price approach: often difficult to **deduct the costs from the value** (e.g. regarding fishing).

Questions of **marginality**, environmental limits and thresholds, the appropriate consideration of **spatial and temporal issues** and dealing with **possible cumulative effects**.





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Thank you!

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