



Excel Exercises

Cost-Benefit Analysis training workshop - Suva

January 24-27, 2012



PACIFIC ADAPTATION TO CLIMATE CHANGE
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Excel Exercises

- Understanding how to deal with a stream of future benefits and costs is extremely important for these Cost Benefit analyses.
- We'll walk through a few excel exercises that deal with these future benefits and costs and focus on a few important concepts such as: Discounting, Net Present Value, and Uncertainty

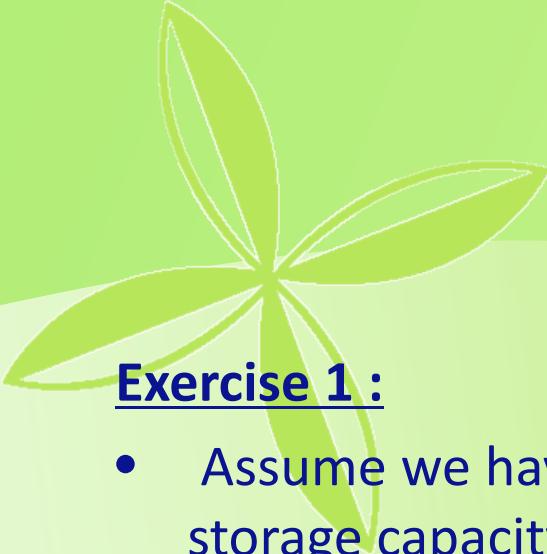




Excel Exercises

- **Exercise 1 and 2:** These exercises will walk you through how to calculate and then discount a stream of future benefits and costs.
- **Exercise 3:** This exercise will walk you through how to calculate net present value.
- **Exercise 4 and 5:** These exercises will address how to deal with uncertainty regarding our cost and benefit estimates.





Excel Exercises

Exercise 1 :

- Assume we have built 1 rainwater storage tank that provides storage capacity of 5m³.
- Assume this tank is filled by rainfall 1 time a year (this assumption is for educational purposes only) .
- **How do we determine the value of 5m³ in each year out to 2020?**
 - Determine the physical benefits of the water tank in each year
 - Apply a market price to the benefits of that water



Excel Exercises

Exercise 2:

- Are benefits tomorrow worth the same to you as benefits today?
- **How do we determine the value of 5m³ in each year out to 2020?**
 - Determine the physical benefits of the water tank in each year
 - Apply a market price to the benefits of that water.
- **How do we discount the value of 5m³ in each year to today?**
- **What is the present value of benefits of the water storage tank?**

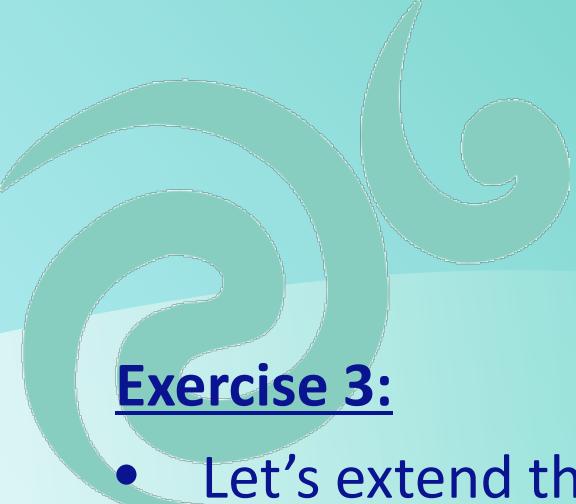
$$\text{Present Value} = \text{Future Value} / ((1+r)^t)$$



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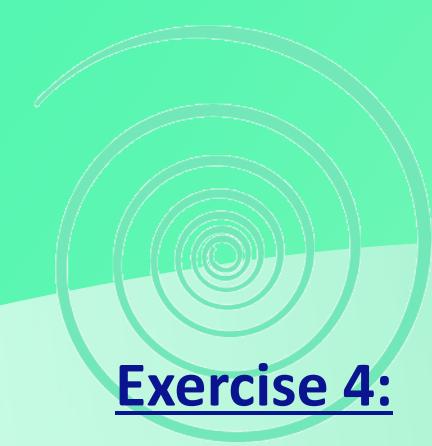


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Exercise 3:

- Let's extend this to a case including costs.
- What is the present value of costs of the water storage tank?
- What is the **net** present value (NPV) of the water storage tank?
 - PV of benefits minus PV of costs





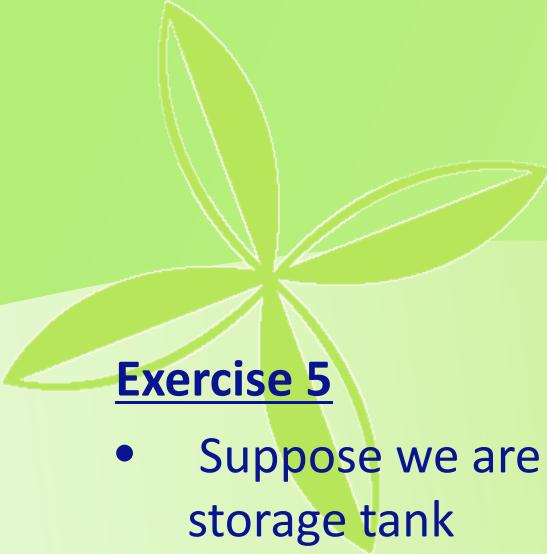
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Exercise 4:

- Suppose we are uncertain about the **value** of drinking water
- We believe it could vary between \$8 and \$18 per m³

- **Is the storage tank still a good idea for this range?**





Excel Exercises

Exercise 5

- Suppose we are **also** uncertain about the **maintenance costs** of the storage tank
- It could involve up to 10 days of work a year
- **Is the storage tank still a good idea for these ranges?**

