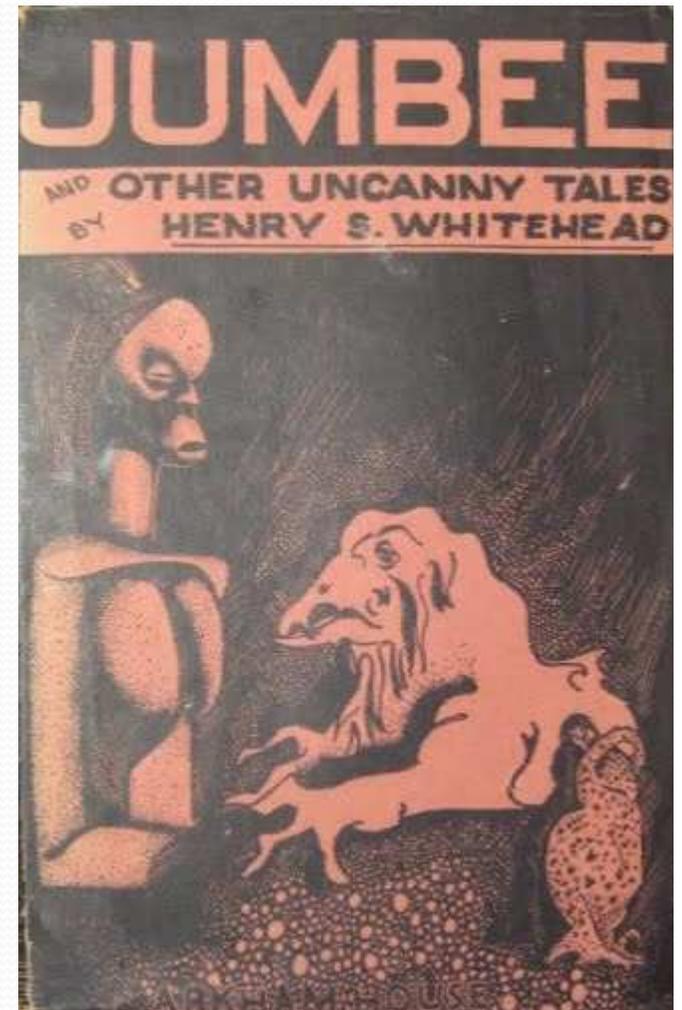


# Steps in conducting a CBA

# Invasive Jumbees

- Jumbees are ghosts that causes havoc after dark.
- Jumbees usually take the form of dogs, pigs, or cats.
- Frequent damages include broken furniture, plates, and glasses. People have a hard time sleeping when jumbees are present in the house, and jumbees have been known to cause psychological stress.
- Jumbees cannot cross water, so one way to avoid having jumbees follow one home is to cross a river when travelling back to the house.
- Leaving shoes outside the door has proven to be effective in distracting jumbees from entering the house because while jumbees love shoes, they do not have feet, so they spend a lot of time trying to wear them.
- Jumbees love to count, so some people have found that leaving heaps of rice outside the door prevents jumbees – who feel compelled to count every grain – from entering the house.



# Steps in conducting a CBA

1. Determine the objectives of the Cost-Benefit Analysis



2. Identify costs and benefits



3. Value costs and benefits



4. Aggregate costs and benefits



5. Perform sensitivity analysis



6. Consider distributional impacts



7. Prepare recommendations

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
  - What is the problem, i.e., what are we trying to prevent by controlling of jumbees?
  - What are the options?



# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
  - What is the problem, i.e., what are we trying to prevent by controlling of jumbees?
  - What are the options?
    1. Do nothing
    2. Diversion channels to bring water in front of all doors
    3. Leave shoes outside the door
    4. Leave heaps of rice outside the door



# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
  - **Total Costs** = Direct Costs + Indirect Costs
    - (Alternatively, Explicit Costs + Implicit Costs)
  - **Total Benefits** = Direct Benefits + Indirect Benefits
    - (Consider market costs + non-market costs)



# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*

<b>Costs of management</b>	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*

<b>Costs of management</b>	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice
R&D		Civil engineer	Market research firm	
Fixed Capital		Concrete		
Annual Supplies			Shoes	Rice
Labour		Contractors		
Maintenance		Maintenance engineer	Compliance officer	Compliance officer

## Benefits of management:

- Avoided costs: less damage to furniture, plates, and glasses
- Economic/health outcomes: better sleep → higher productivity at work
- Psychological outcomes: People are less afraid

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*

Costs of management	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice
R&D	fixed cost →	\$750,000	\$350,000	
Fixed Capital	fixed cost →	\$135,000		
Annual Supplies	variable cost →		\$200,000 / year	\$50,000 / year
Labour	fixed cost →	\$600,000		
Maintenance	variable cost →	\$400,000 / year	\$80,000 / year	\$80,000 / year

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*

<b>Benefits of management</b>	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice
Avoided costs	0	\$200,000 avoided damages / year	\$140,000 avoided damages / year	\$40,000 avoided damages / year
Economic/health	0	\$400,000 labour productivity / year	\$280,000 labour productivity / year	\$80,000 labour productivity / year
Psychological	0	?	?	?

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*
- [4] *Aggregate costs and benefits*

	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice
Cost over 20 years	\$0	$\$750,000$ $+ \$135,000$ $+ \$600,000$ $+ \$400,000 \times 20 \text{ yrs}$ $= \mathbf{\$9,485,000}$	$\$350,000$ $+ \$200,000 \times 20 \text{ yrs}$ $+ \$80,000 \times 20 \text{ yrs}$ $= \mathbf{\$5,950,000}$	$\$50,000 \times 20 \text{ yrs} +$ $\$80,000 \times 20 \text{ yrs}$ $= \mathbf{\$2,600,000}$
Benefit over 20 years	\$0	$\mathbf{\$12,000,000 + ?}$	$\mathbf{\$8,400,000 + ?}$	$\mathbf{\$2,400,000 + ?}$

# Steps in conducting a CBA

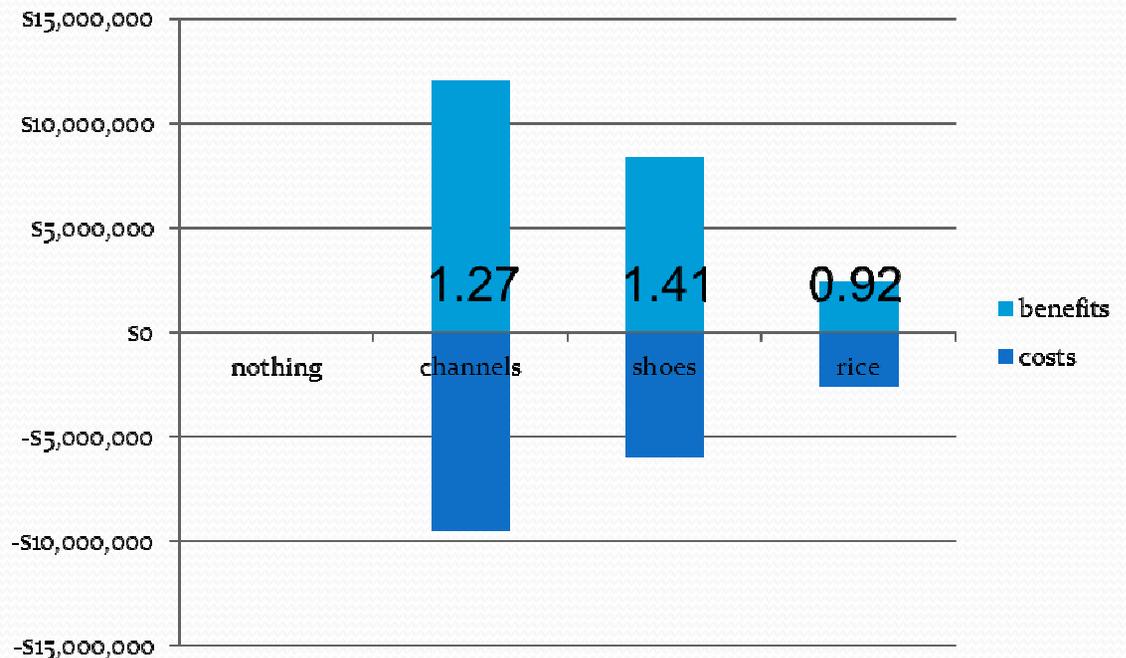
- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*
- [4] *Aggregate costs and benefits*
  - Calculate the **Benefit / Cost Ratio** and/or **Net Benefit**



	Do nothing	Diversion channels	Shoes outside the door	Heaps of rice
Cost over 20 years	\$0	<b>\$9,485,000</b>	<b>\$5,950,000</b>	<b>\$2,600,000</b>
Benefit over 20 years	\$0	<b>\$12,000,000 + ?</b>	<b>\$8,400,000 + ?</b>	<b>\$2,400,000 + ?</b>

# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*
- [4] *Aggregate costs and benefits*
  - Calculate the Benefit / Cost Ratio and/or Net Benefit
  - If you wish to draw figures, place benefits above the X axis and costs below



# Steps in conducting a CBA

- [1] *Determine the objectives of the cost-benefit analysis*
- [2] *Identify costs and benefits of managing the invasive*
- [3] *Value costs and benefits*
- [4] *Aggregate costs and benefits*
- [7] *Report results and prepare recommendations*
  - Present the problem in a way that funders, politicians, and managers can understand
  - Demonstrating the benefits in “dollar values” to policy makers can make projects easier to evaluate
  - Avoid highlighting short-term impacts over long-term changes

