

Valuation of Watershed Services in the Koshi Basin of Nepal

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Introduction

- ▶ Rural people are on the frontline of climate change
- ▶ Enhancing community resilience to climate change through ecosystem management
- ▶ Focusing on ecosystem services that contribute the most to reduce the vulnerability of local communities to climate change (Colls et al. 2009)
- ▶ Mainstreaming ecosystem management into national development policy (Vingola et al. 2009)
- ▶ Understand how household perceive the need for different services and their trade-offs

Using non market valuation

- ▶ No trade in markets for services – provided by nature
- ▶ Establishing the value to households requires to elicit willingness to pay (WTP)
- ▶ WTP positively associated with respondents' income
- ▶ Hypothesis: WTP depends on the mode of payment (monetary versus in-kind)

Objectives

- ▶ To assess whether WTP depends on the mode of payment
- ▶ To estimate the shadow value of time

Methods

- ▶ Discrete choice experiment to elicit public preferences
- ▶ Identified important ecosystem services through focus group discussions (Figure 1)
- ▶ 600 household interviewed (Upstream & Downstream)
- ▶ Total 20 choice sets – grouped into 5 blocks

Figure 1: Selected attributes and their levels

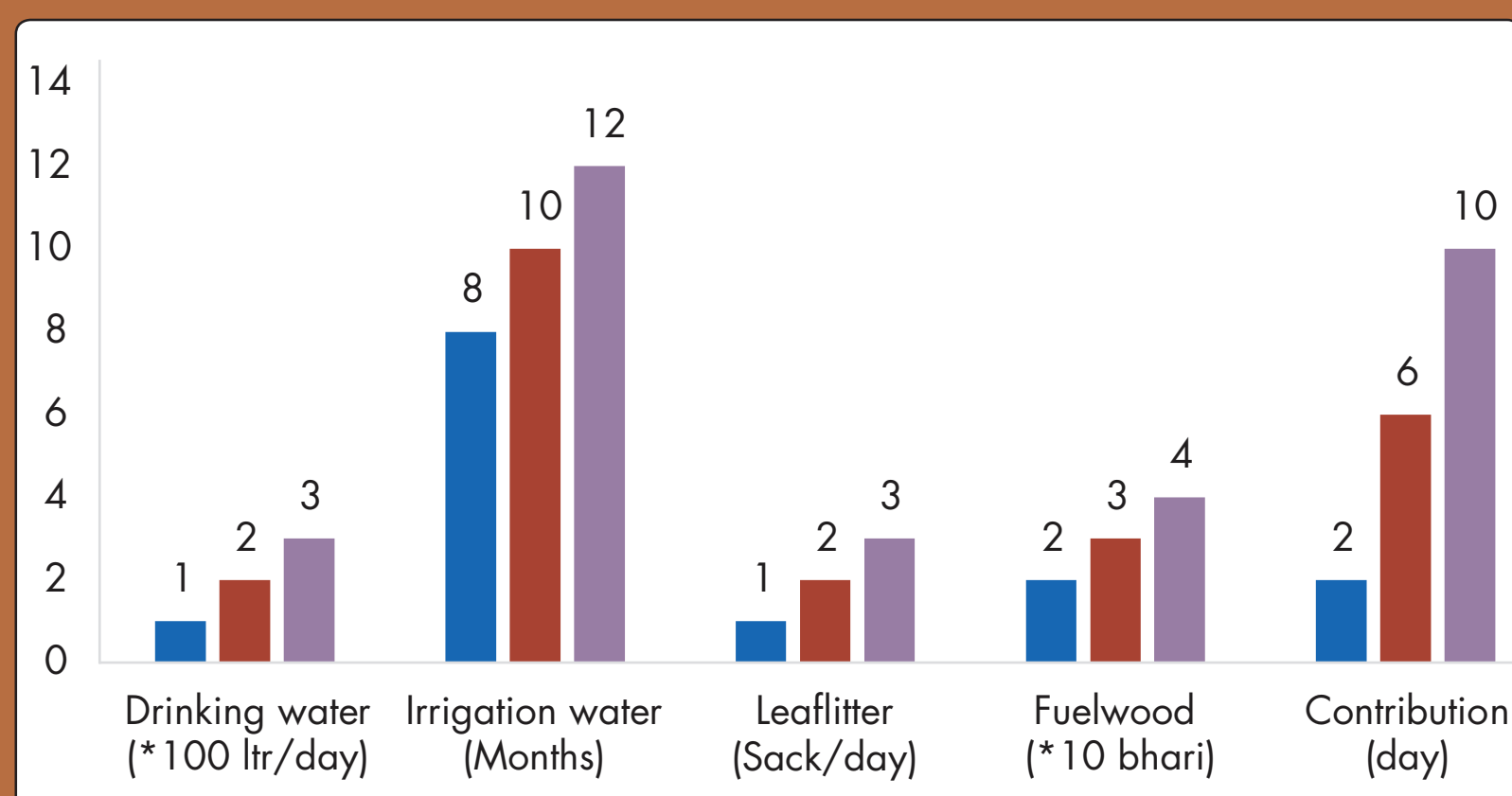


Figure 2: Percentage of respondents

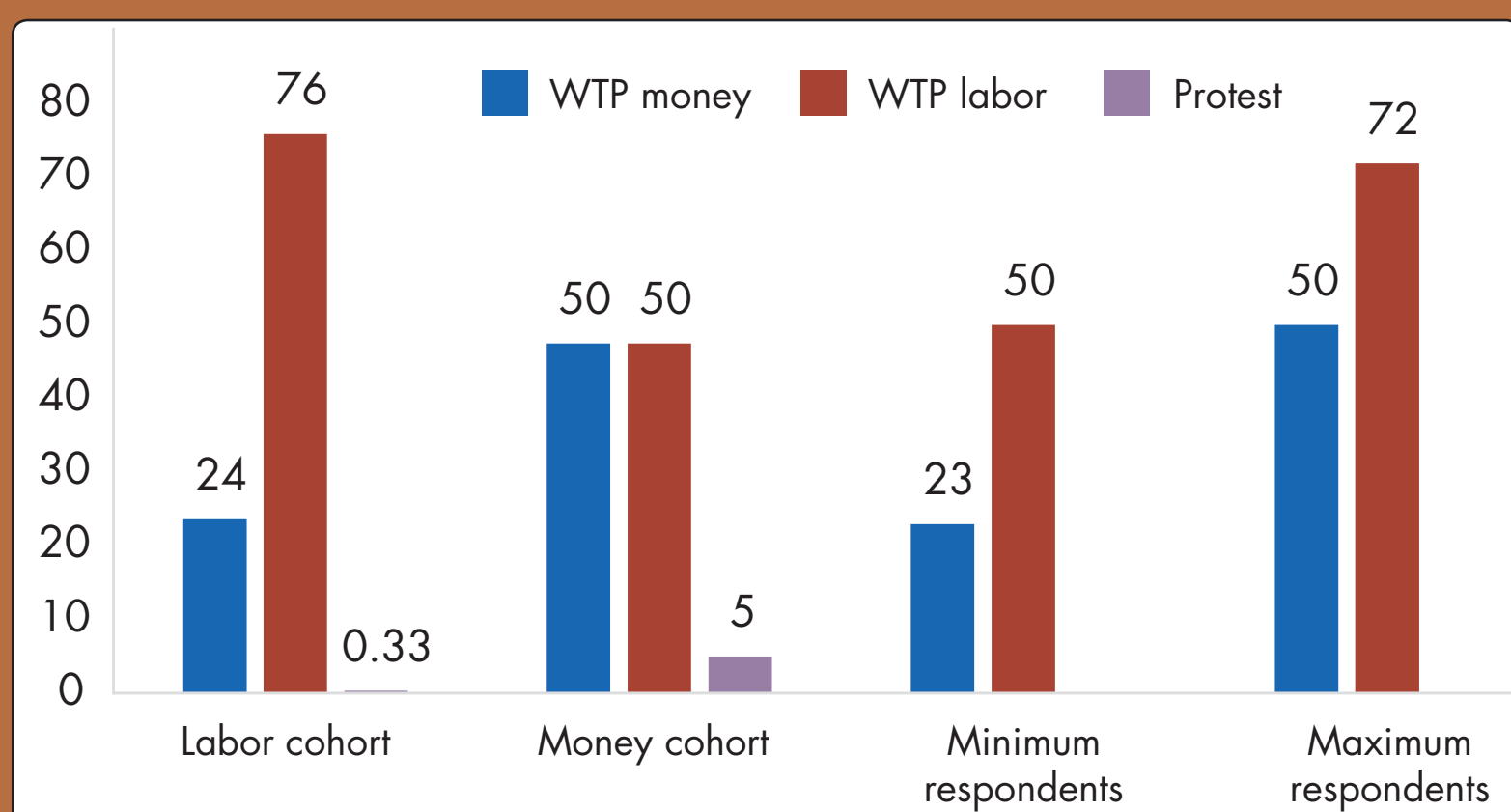


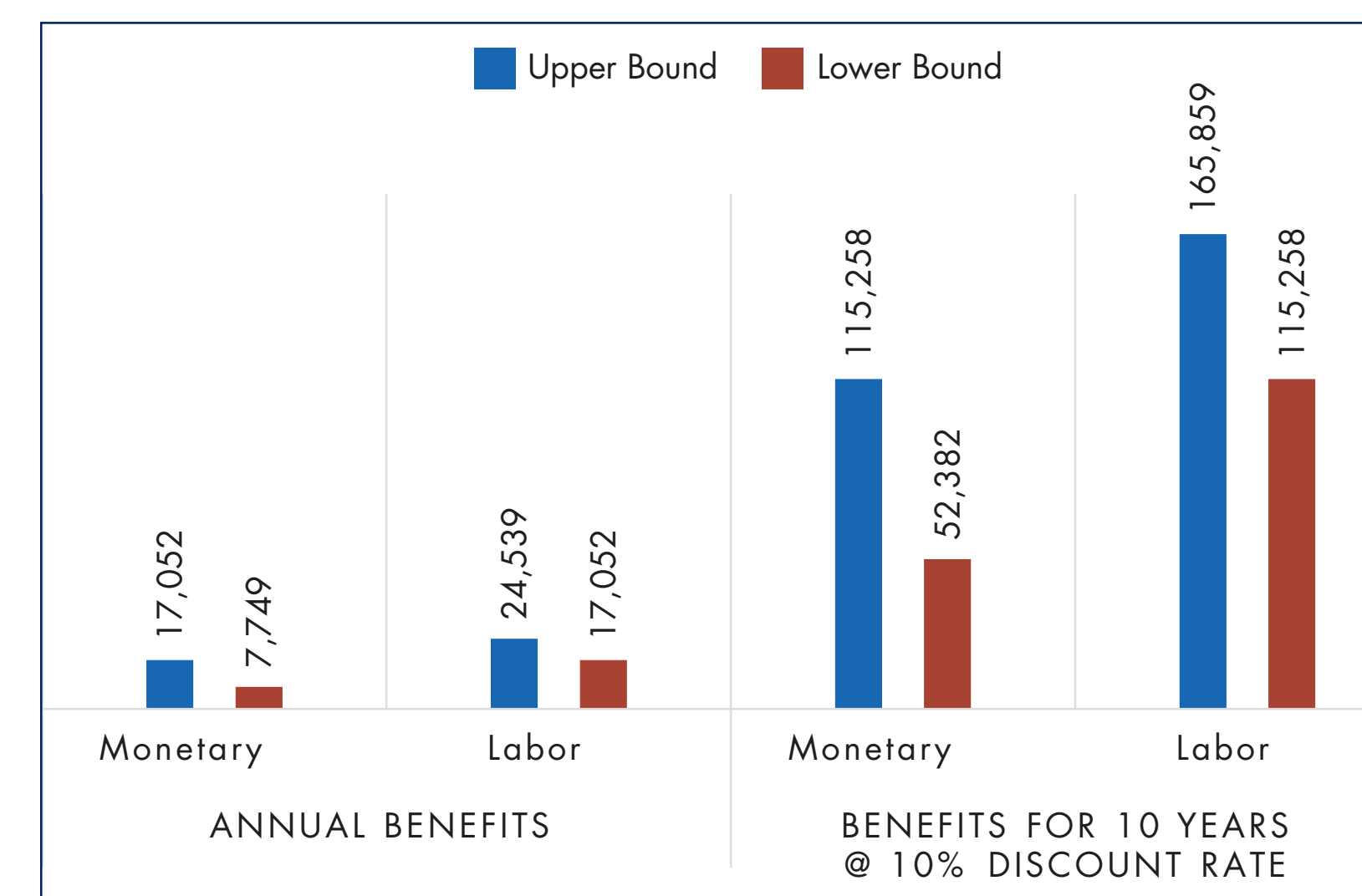
Table 1: Implicit price of each attributes and their confidence intervals at 95%

Attributes	Monetary (NPR)	Labor time (Days)	Monetary value of IP in labor (Col 2 x market wage rate in NPRs)
	1	2	3
Drinking water (litre/day)	29.37	0.11	33
Irrigation water (per month)	1,442.78	5.76	1,728
Leaf litter (Sack/day for a month)	1,283.13	5.77	1,731
Fuelwood	116.75	0.38	114

Estimation of WTP

- ▶ New scenario: Drinking water (Litter per day) +10, Irrigation water +1 month, Leaf litter (Sack/day) +1, Fuelwood +1 bhari.
- ▶ Household WTP Monetary = NPR 3,136
- ▶ Household WTP Labor = 13 days
- ▶ Opportunity cost = NPR 241/day ~ 80% of market wage (NPR 300/day). NPR is Nepalese currency. 1 USD ~ NPR 100.00
















Figure 3: Household WTP and social benefits



Conclusions

- ▶ WTP in labor increases the social benefits between 1.44 and 2.20 times
- ▶ Generating interest of the younger generation in farm activities may increase benefits
- ▶ Increasing forest products availability can benefit rural women
- ▶ Eliciting WTP in labor encourages participation of low-income households in decision-making process

Figure 4: An example of choice set

Attributes	Alternative 1	Alternative 2	Current situation																																																
Drinking water 	200 litres/day 	200 litres/day 	100 litres/day 																																																
Irrigation water <table border="1" data-bbox="1116 1658 1401 1788"> <tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td></tr> <tr><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td></tr> <tr><td>Sept</td><td>Oct</td><td>Nov</td><td>Dec</td></tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	12 months available <table border="1" data-bbox="1422 1658 1670 1788"> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>													8 months available <table border="1" data-bbox="1681 1658 1908 1788"> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>													8 months available <table border="1" data-bbox="1918 1658 2112 1788"> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>												
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Leaf litter collection 	2 sacks/day 	2 sacks/day 	1 sack/day 																																																
Fuelwood collection 	30 bhari (stacks) 	30 bhari (stacks) 	20 bhari (stacks) 																																																
Watershed management fee 	NPR 3,000.00 	NPR 600.00 	No additional fee																																																
Your choice M Please tick (✓) one box																																																			

Acknowledgements

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Note

References will be provided as per request. For further details please contact

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