3.6.0

SERIES 3
Building Resilience

PARTICIPATORY COST-BENEFIT ANALYSIS

CLIMATE RESILIENCE FRAMEWORK
ISET-INTERNATIONAL

Contents of Set

Participatory cost-benefit analysis differs from a traditional cost-benefit analysis by not requiring as much technical knowledge and allowing input from many different community groups. Participatory cost-benefit analysis (CBA) uses participatory research appraisal (PRA) methods to ensure that financial, social and environmental benefits and costs of an activity are identified. As a result, the participatory cost-benefit analysis both captures information that is often unavailable from traditional data sources or is unincorporated in traditional analyses, and is relatively quick and inexpensive to implement. Participatory cost-benefit analyses are particularly effective with diverse groups of stakeholders and can be facilitated via shared learning dialogues at virtually any level (community, city, state, national). Because they capture different information, a participatory CBA should be completed even when a quantitative cost-benefit analysis is also completed.

IN THIS SET YOU WILL:

- ✓ Learn how to use participatory cost-benefit analysis to identifying whether your proposed climate resilience projects are feasible.

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Overview

As discussed in Set 3.5: Introduction to Cost-Benefit Analysis, participatory cost-benefit analysis is always useful for delivering an initial evaluation of a project.

- It can be implemented relatively quickly and inexpensively with the information and people on hand;
- There is little or no need to assemble outside technical expertise; and
- The results will incorporate a broad spectrum of non-monetary input (social and environmental concerns, community input, information on the distribution of benefits and harm from the project, etc.) that a more formal analysis will likely miss.

Implementing a participatory CBA can be broken down into seven steps. If you have been systematically working through the CRF:TM steps one through three will have already been completed. If not, we suggest you complete steps one through three with guidance from Series 2 and Series 3 (3.2 and 3.3).

FIGURE 3.6.1: PARTICIPATORY CBA STEPS
Steps 1–3 will have been completed in Series 2, Set 3.2 and 3.3.

STEP 1

GATHER NECESSARY BACKGROUND INFORMATION

If possible, background information should be collected concerning potential resilience strategies or actions and the costs and benefits associated with them. Background information could include climate information, hazard impact information, socio-economic data, or other data directly related to assessing the costs or benefits of the proposed action. Assembling data in advance generally allows for a somewhat more quantitative assessment. However, assembling data in advance is not critical. Background information can be filled in later as needed, though a second meeting of the group may be needed if the background information contradicts assumptions made in the first meeting.

STEP 2

CONDUCT COMMUNITY BASED VULNERABILITY ASSESSMENT

Series 2 of these training materials describes options for conducting a climate change vulnerability assessment. You will use this assessment now to identify who might be impacted, positively or negatively, by your proposed activities, and who will be left out of possible benefits. You will want to include representatives of all these groups in your discussion group conducting the cost-benefit analysis.

STEP 3

IDENTIFYING ADAPTATION/RESILIENCE ACTIONS

In Sets 3.2 and 3.3 you explored ways to identify potential adaptation and resilience actions. Ideally, you will focus in on 2 or 3 of these actions for your participatory cost-benefit analysis. If you have more than two or three actions to evaluate, it is probably better to conduct a series of cost-benefit analyses. If more than three or four options are evaluated at one time, the time and complexity of the review rapidly increases.

STEP 4

IDENTIFYING THE COSTS AND BENEFITS

Your stakeholder group will meet, through either an SLD or group discussions, and identify the economic, social, and environmental costs and benefits of each strategy. The costs and benefit should be described qualitatively at this point, not

quantitatively. It is important to initially explore the costs and benefits without assigning value to them to avoid steering the discussion in one direction or another, and to ensure that you include all the costs and benefits. These costs and benefits will be quantified, relative to one another, in the next step.

The economic costs of most projects are the upfront implementation costs. There may also be social and environmental costs, such as relocation of people or inability to use land for certain other productive purposes. The benefits of adaptation interventions are both economical—the cost that are prevented by the adoption of the proposed intervention (i.e. value of the damages or losses that might occur in absence of the intervention)—and social and environmental. Some of the social and environmental benefits may be associated with building resilience, such as improving forest health and developing forest products that locals can sell to diversify household income. However, many of the social and environmental benefits may not be associated with resilience building. These benefits are referred to as "co-benefits", such as a storm shelter that can also be used to house a school or dispensary when there is no storm.

In Da Nang, Vietnam, the SLD included members from:

- Da Nang's People's Committee
- Da Nang's Women's Union
- Ward Households

STEP 5

VALUATION AND BENEFIT COST RATIO

In the valuation stage the group scores each cost and benefit from one to five according to perceived cost and benefits. The lowest costs are scored as 1, the highest costs as 5. The lowest benefits are scored as 1, and the highest benefits as 5. For example, promotion of minimum tillage might have no environmental cost because it's improving the environment therefore ranking a 4. Economic costs associated with training and/or potential future output of the land might be significant and therefore rank a 2. If an issue is particularly contentious, or the group is for any reason having trouble scoring a cost or benefit, the team can use participatory rural appraisal ranking methods. After ranking each option from one to five, it is necessary to compare the costs and benefits and determine the benefit cost ratio by dividing the cost into

the benefit. This is done by simply summing the economic, social and environmental costs as well as the economic, social and environmental benefits. Once these are summed, total benefits are divided by the total costs to obtain the cost-benefit ratio.

STEP 6

DISTRIBUTIONAL CONCERNS

When you aggregate results to obtain the cost-benefit ratio, distributional concerns —information about who benefits, who is negatively impacted, and who is left out—may be lost. For example, large losses in a few wealthy households may have higher monetary value than smaller losses amongst a larger number of poor families. Yet, it may be preferable to choose strategies that are focused on the poorer families and larger number of households. One way to recapture this information is to review your vulnerability analysis and identify which households may be targeted or excluded by the proposed actions. If distribution issues do appear, multi-criteria analysis can be used to weight these factors in a final ranking of proposed actions. This is addressed in Set 3.8: Multi-criteria Analysis.

STEP 7

FINDINGS

In presenting the cost-benefit analysis results, results for each of the steps above should be presented, and how and why different options are ranked the way they are should be reviewed. If actions were removed from consideration as a result of the analysis, why they have been removed from consideration should be clearly explained. Similarly, if the analysis clearly identified either the most appropriate resilience action for a given situation or information gaps that must be addressed before a decision can be made, this information should be presented and discussed (Khan et al., 2012).

To Think About

A participatory cost-benefit analysis can be conducted with several smaller groups rather than one large group if it is necessary to ensure that participants can participate freely and equally. However, advance thought and planning will be needed if you then want to combine the costs and benefits rankings from each sub-group. In some cases, it may not be appropriate to combine the priorities of one group with another. Social and environmental costs and benefits

vary from one location or context to another, and in some situations, aggregated figures may be meaningless. A careful review of disaggregated results should be made before results are aggregated, and final rankings should be verified against individual concerns, vulnerabilities, and distributional issues presented in earlier discussions.

Resilience Principles: In Set 1.4 you identified the key principles that inform your resilience planning process. These principles should be reviewed along with your vulnerability assessment, and used to inform your cost-benefit analysis. For example, if equity is a core principle, actions that increase equity should rank higher than those that increase inequity.

Distributional affects of an action can strongly impact how it is ranked. If an action will cost a large number of people even a small amount, but will deliver benefits only to a select few, it is unlikely that those that do not benefit will be interested in supporting it. This also means that if people can not see how they will benefit from an action, they may reject its implementation, even if, in fact, they would benefit. If benefits of a proposed action are not clear to the communities they will affect, it will be necessary to educate those impacted before including them in your participatory cost-benefit analysis meetings.

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Mr. Fawad Khan, senior economist based in Islamabad, has been collaborating with ISET-International on a number of projects since 2006. Mr. Fawad Khan has extensive experience working on the economics of major policy and implementation projects from his period as a staff member with the World Bank. Along with partners at IIASA he has also played a lead role in the methodology design and implementation of ISET-International's prior research on the costs and benefits of climate related disaster risk reduction interventions for the Risk to Resilience project. Formalities to establish ISET-Pakistan as an independent, sister organization to ISET, are ongoing. ISET's office in Islamabad can be found on the very preliminary website, still under construction: www.isetpk.org

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This document is an output from a project funded by the UK Department for International Development (DFID) and the Netherlands Directorate-General for International Cooperation (DGIS) for the benefit of developing countries. However, the views expressed and information contained in it are not necessarily those of or endorsed by DFID, DGIS or the entities managing the delivery of the Climate and Development Knowledge Network*, which can accept no responsibility or liability for such views, completeness or accuracy of the information or for any reliance placed on them.

3.6.1

SERIES 3
Building Resilience

CLIMATE RESILIENCE FRAMEWORK
ISET-INTERNATIONAL

Implementing a Simplified Participatory Cost-Benefit Analysis

Activity 3.6.1

In this activity, you will select 3 to 4 of your proposed resilience actions and conduct a simplified participatory cost-benefit analysis for these actions.

IN THIS ACTIVITY YOU WILL:

- ✓ Select 3 or 4 of your proposed resilience actions;
- ✓ Identify the costs and benefits of each action;
- ✓ Score each cost and benefit and use these to calculate the cost-benefit ratio of each action;
- ✓ Consider distributional concerns (who benefits, who doesn't benefit, and who, if anyone, is harmed) for each of the resilience action, and based on distributional concerns, reassess your assigned cost-benefit ratios; and,
- ✓ Discuss the process of completing a Participatory Cost-Benefit Analysis. Did it change your assessment of any of the proposed resilience actions you assessed?

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ACTIVITY 3.6.1: IMPLEMENTING A SIMPLIFIED PARTICIPATORY COST-BENEFIT ANALYSIS

INSTRUCTIONS

In this activity you will conduct a simplified participatory cost-benefit analysis of several of your proposed resilience actions. Assuming that Steps 1–3 have been completed, the activities will take you through Step 4: identifying the costs and benefits, Step 5: valuing those costs and benefits, Step 6: integrating distributional concerns, and finally Step 7: determining how to present the findings.

In Step 4, *Identifying the Costs and Benefits* you will identify the economic, social, and environmental costs and benefits of several of your proposed resilience actions. As you do this, keep in mind that at this initial stage, the costs and benefits should simply be described; they do not have a quantitative value placed on them yet. Benefits might include assets saved or damages avoided. When describing costs and benefits consider both the infrastructure elements and impact on livelihoods. For example, participants may have lost sewing machines during annual flooding. To ensure that losses are accurately represented, you would include both the cost of replacing the sewing machine and the income lost during the time that a working sewing machine was unavailable.

In Step 5, *Valuation and Benefit Cost Ratio* you will score each cost and benefit for each resilience action. Costs and benefits should be scored using a simple scale, such as one to five. The lower the number, the lower the cost is to the group or the lower the benefit is to the group. For example, the group scores the strategy 'the promotion of tillage' a 1. This means that the group overall thinks the cost of implementing tillage is low. Be aware that the economic, social and environmental costs and benefits should stay proportioned to one another; try not to exaggerate one type of benefit over another. After valuing each cost and benefit, the costs and benefits are summed for each action, and a benefit-cost ratio for the action is derived. When you aggregated your costs and benefits into a cost-benefit ratio, information about who benefits or is harmed by the action is often lost.

In Step 6, *Distributional Concerns* we will consider these "distributional concerns" directly. For example, large losses in few wealthier households may have higher monetary costs than smaller losses amongst more numerous poor families. However, considering the number of livelihoods impacted, it may be preferable to choose strategies that are focused on the larger number of families.
This activity is conducted as an introduction to Participatory Cost-Benefit Analysis. It introduces the steps involved in performing a full Participatory Cost-Benefit Analysis, but, because it is designed as a training, is probably missing many of the stakeholders that should be included in a full analysis.

In Step 7, *Findings* you will consider how PCBA can be used to support your resilience planning process, who should be included, and how the results should be presented.

Step 4: Identifying Costs and Benefits

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1. Select 3 or 4 of your identified resilience actions. These can be related to one another, e.g. actions that all address capacity building, or water, or they can be very different. For each action, write the action name and a brief description at the top of a piece of flip chart paper. Place the flip chart papers on the walls around the room.
2. Identify costs and benefits for each action; these can be written on separate slips of paper and stuck to the flip-chart pages, or written directly on the flip charts. However, use one color for costs and a different color (pen or paper slips) for benefits.
3. Once everyone has contributed, review the flip charts as a large group to determine if there are any obvious costs or benefits that have been overlooked.

TRIPLE BOTTOM LINE COSTS & BENEFITS TABLE

4. Organize the feedback on each of the flip charts into economic, social and environmental costs and benefits. Have one person record all the responses in a pair of large tables drawn on a blank sheet of flip-chart paper. Table 1, below, is an example of a costs table; a similar table should be made for benefits.
5. For each Resilience strategy ensure that there are costs and/or benefits identified in each category, or that you have considered that category and there is nothing to record there.

EXAMPLE COSTS

Resilience Action	Economic	Social	Environmental
1. Promotion of minimum tillage operations	Trainings Demonstration Plots	Disruption of grazing	none
2. Plantation in the degraded and eroded land	Cost of raising saplings Labor Protection of land for 3 to five years	Disruption of grazing and walking routes	none
3. Construction of check dams	Labor Construction Material	Fetch water from a different stream	Disruption in spring water

(Source: Khan 2011)

Step 5: Valuation of Benefit Cost Ratio

Decide, as a group, how you will score costs and benefits. From 0 to 5? From 1 to 10? The lower the number, the lower the cost is or the lower the benefit is. You will use this scale for each cost and each benefit of every resilience action you assess. Once you have selected a scoring system, complete the following steps:

1. Select a resilience action. Discuss each benefit listed for that resilience action:
    - What benefit has the largest monetary value?
    - Which benefit does the group value most for non-monetary reasons?
    - How can you compare the highest monetary value with the highest non-monetary value? Which benefit would you rank the highest overall?
2. Score each benefit in relation to the highest benefit. These scores can be written next to your costs and benefits in the tables you prepared in Part 1. For example, the group decides that promotion of tillage has the highest benefit. Not only does it have significant monetary benefit, but it has ecological benefits as well. All other benefits are then compared to promotion of tillage and ranked somewhere below tillage in their benefit. Note, this step is highly subjective; how you rank benefits will be dependent on the values of the group. If you get stuck on a particular benefit (or cost), for the purposes of this activity you may want to omit it, but make a note that this is something that requires further discussion.
3. Now, discuss each cost listed for your resilience action:
    - What cost has the largest monetary value?
    - What cost does the group rank as largest for non-monetary reasons?
    - How can you compare the highest monetary cost with the highest non-monetary cost? Which cost do you rank as highest overall?
4. Score each cost in relation to the highest cost. Again, write your scores next to your costs and benefits in the tables you prepared in Part 1.
5. Repeat this for each of your 3 or 4 resilience actions.
6. Now, construct a scoring table for your resilience actions. See Table 2, below, for an example.
7. Sum the total costs and sum the total benefits for each resilience action.
8. Divide total benefits by total costs for each action. The result is your final benefit cost ratio (shown in the column labeled "B/C" below) for that action.

TABLE 2: EXAMPLE SCORING TABLE

Source: Unpublished data collected by Li-Bird through the CADP project under ISET's direction. Method design by ISET.

	COST (0-5)				BENEFIT (0-5)				
ACTIVITIES	**ENV**	**ECON**	**SOC**	**TOTAL**	**ENV**	**ECON**	**SOC**	**TOTAL**	B/C
Promotion of minimum tillage operation	0	2	1	= 3	5	4	4	= 13	4.33
Plantation in the degraded and eroded land	0	3	1	= 4	5	5	5	= 15	3.75
Construction of check-dams	1	5	3	= 8	5	4	4	= 13	1.62
Protection of water sources	0	4	3	= 7	5	5	5	= 15	2.14

Step 6: Distributional Concerns

"Distributional concerns" are information about who benefits or is harmed by an action. To ensure that distributional concerns are identified and addressed directly, discuss the following questions for each resilience action:

- Are there people or groups that do not benefit from this action? Are they intentionally left out? Is there some way the project could be modified to benefit them?
- Are there people or groups that may be negatively affected by this action? How will they be impacted? Has this already been considered in the costs of the action?
- Are there people or groups that will benefit more from this action than from actions? If so, who will benefit more? Are these the people you think most need the extra benefit? Who will benefit less? Are those who will benefit less often the people who benefit less? Is it okay that they are going to benefit less?
- Consider the cost-benefit score you assigned to this action. Based on your answers to the questions above, is the cost-benefit score you have assigned to this resilience action appropriate? Does this action positively address distributional concerns in ways that you didn't address in the original scoring? If so, do you want to raise the score? Or, does this action have negative distributional concerns not previously addressed? If so, do you need to lower the cost-benefit score?

TO THINK ABOUT

This may be a challenging discussion. Often, distributional concerns are strongly influenced by politics, social expectations and cultural dynamics. Your vulnerability assessment may provide supporting evidence for issues that are raised here, and may therefore provide a way to open the discussion.

Step 7: Findings

In this activity you have completed an initial participatory cost-benefit analysis. The steps you have worked through are exactly those that you want to walk your full stakeholder group through; the only reason this assessment is initial rather than final is that, presumably, there are other

stakeholders who should be included in the discussions about the actions you assessed.

Discuss the process of completing this assessment:

- Did it change your assessment of any of the proposed resilience actions you assessed?
- Did any of the results surprise you? Were there costs or benefits identified that you hadn't considered?
- Were there any new issues raised in the discussion of distributional concerns?
- Would this activity be different, or achieve different results with a different group of participants?
- Who should be invited to review the activities you assessed today?

When you conduct a full participatory cost-benefit analysis, including representatives of all those impacted by the proposed actions, you will need to present your results to the larger stakeholder group, including the decision-makers who will ultimately determine which actions are implemented. At this presentation, you should review your findings by showing results of the each of the steps above (Parts 1–3) and how and why different options were scored the way they were. This should include:

- What were the qualitative costs and benefits?
- How were the costs and benefits scored?
- What were the reasons for assigning those scores?
- What cost-benefit ratios did this result in?
- Were the cost-benefit ratios further modified based on distributional concerns? If so, what were those concerns, and how were they used to modify the final scores?
- What does the final scoring indicate? What actions should be pursued?

Be sure to include the discussion on final options. In addition, report on whether this exercise gave you clear answers to what the most appropriate resilience plan would be, what questions remain, and what further analysis may be needed to come up with the answers.

References

Khan et al. (2011). [Local Adaptation Plans for Action LAPA Manual.] Unpublished Raw Manual.