Cost-Benefit Analysis for Forecast-Based Financing

Cost-Benefit Analysis (CBA) is a tool used to compare the benefits and costs of a project, program or action. The conclusions drawn from a CBA are in terms of the Benefit/Cost (B/C) ratios, which allows the determination of the economic benefits obtained for each dollar invested in the project.

In the humanitarian context, a CBA is commonly used to consider what happens if a disaster occurs *with* vs. *without* an intervention in place. This analysis allows the comparison of the cost and benefits of different types of actions, which serves as criteria to choose the best action to be implemented.

There are three different approaches to conduct a CBA in the humanitarian sector:

a) Hypothetical approach: backward-looking (action was already implemented) or forward-looking (action has not been implemented yet).
b) Comparative approach: between two similar communities (intervention vs. control group).
c) Before-and-After approach: same community before and after an intervention takes place.

Considering that Forecast-based Financing actions had not been implemented yet, first, a hypothetical forward-looking approach can be done. Then, as soon as the Standard Operational Procedures are triggered, when it is feasible a comparative approach using intervention vs. comparison (control) communities may also be implemented.

Objectives of Cost-Benefit Analysis for Forecast-based Financing

a) To understand which actions are more beneficial than others for the same costs
b) To use the qualitative list of costs and benefits and cost of acting in vain to determine at what forecast probability we are willing to act
c) To show the effectiveness of the intervention action after the event happens
d) To build evidence about the effectiveness of the Forecast-based Financing mechanism

SWOT Analysis for CBA in FbF

Analysis conducted during the 3rd FbF Dialogue Platform.

e) Strengths:
- Guides programming and priorities
- Allows to screen FbF actions, ex-post and ex-ante, for effectiveness
- Guides the preparation and concept phase
- Relates the trigger probability to the action selection

f) Weaknesses:
- New approach – will need investment and capacity building
- Expensive and time consuming to do every single time
- We may not cover all aspects of costs and benefits
- Over technical and over complicated
- Difficult for some actions to calculate returns (social return on investment)

g) Opportunities
- Make the case for FbF interventions – an advocacy tool
- Attract funding
- Serve as the basis of learning – are early actions valuable?
- Identify which actions are most cost-effective
- Support the design of FbF interventions
- Promotes the efficient use of funds and leverage
- Has the potential to increase access by private sector

h) Threats:
- Local actors don't understand it
- Demonstrate the cost of actions via non-governmental organizations
- May be difficult to maintain quality standards
- Risk of undervaluing some critical response actions
- CBA concludes that you should always act
- Misses quantitative data
- Poorly done CBAs overstate results

Step-by-Step Process

This proposed step by step process is a general guide of possible ways of conducting a CBA, it is important to take into account that a CBA will be conducted in different ways according to the context and the expertise of the research team.

STEP 1: Understand the current situation of the target communities

Context and background information such as type of hazard and disaster risks, scale of the disaster impact and kinds of actions that would make sense to implement (See FbF guides No. 1 and 2). A field visit and focus group discussions with both the community and experts at all levels could serve this end.

STEP 2: Identification of costs and benefits

Costs are associated with the necessary investments to conduct the early actions or post-disaster interventions. They are usually under the management of the government/organization, but can be also endured by the community or other actors.

Benefits are considered mainly in terms of the prevention/reduction of economic losses (i.e. losses experienced by the community during past disasters such as loss of crops, infrastructures, lives) or the avoidance of otherwise necessary humanitarian assistance.

Most of the costs and benefits can be quantitatively monetized, and the following steps focus on this type of information. However, there may also be other intangible costs and benefits that cannot be easily converted to money. Although they are not part of this quantitative analysis, they need to be considered in the overall analysis of Forecast-based Financing impacts before and after any given intervention. The qualitative list of costs and benefits is a useful output in its own right, even without quantification, and can be used to guide decision making.

STEP 3: Build up scenarios

Costs: a comparison between the costs incurred to implement an action *before* an event vs. executing this same action *after* the disaster.

Benefits: identification of the potential losses for at risk households under three different scenarios: (i) receiving the prevention/mitigation/preparedness (action) *before* the event, (ii) receiving relief *after* the disaster and (iii) no relief.

At this stage, the costs (monetary and non-monetary) of acting in vain are also identified and analyzed.

STEP 4: Monetization of costs and benefits

To assign monetary values to the costs and benefits, where possible, two kinds of data can be used:

1. Secondary data: if no own data has been collected from the communities of study, then it is necessary to rely on other informational sources from civil society organizations, local/national government, NGOs, UN agencies, private sector, research institutions etc.
2. Primary data: corresponds to own data collected directly from the population of study. This is ideal because it gives the most accurate reflection of the situation of the community of interest. The data can be collected at two stages:
   a. Before implementing the action with baseline survey: This case corresponds to the *hypothetical forward-looking approach*. The idea is to ask the community about past losses (experienced during a disaster of similar magnitude as the potential disaster), and how they hypothesize the planned action would have decreased or prevented those losses.
   b. After implementing the action with post-disaster survey: If both intervention and comparison groups have been chosen for the survey, it is possible to apply a *comparative approach* between the two groups by comparing the losses of receiving vs. not receiving an action, or between receiving the action before vs. after the disaster, according to the aim of the study.

STEP 5: Computation of B/C ratio

With all the information collected, it is possible to compute the B/C ratio of performing an action before an event. The benefits are computed as the potential avoided losses between the scenarios: after vs. before [(ii)-(i)], or no relief vs. before [(iii)-(i)]. The costs will correspond to the scenario of implementing the action before an event.

As forecasts are not perfect, the analysis with the CBA can also account for the times that an action is made in vain by considering the costs (without benefits) for the times in which an action is implemented and the forecast was wrong. For example, if an action is triggered 10 times by forecasts, but 3 out of these 10 forecasts are wrong, the total B/C ratio would be computed as: (Benefits x 7)/(Costs x 10).

If the total B/C ratio is still higher than one, then the benefits of doing the
action before the event (even if sometimes we may act in vain) are higher than the incurred costs.

STEP 6: Sensitivity analysis

The objective is to perturb assumptions and factors considered during data collection, moving them up and down by a certain percentage to see how these changes would affect the results (costs, benefits, B/C ratio). In particular, this analysis can help identify the most critical assumptions and a general range for the B/C ratio found in step 5.

STEP 7: Applying the analysis

After having quantified the B/C ratio and range, it is possible to make comparisons between different preparedness actions and understand which ones bring more benefits to the communities. In addition, when including the costs of acting in vain into the analysis, the B/C ratio can help determine the level of forecast probability at which we are willing to trigger an action.

At a more general level, this cost-benefit analysis can help build evidence about the effectiveness of the Forecast-based Financing mechanism, opening the doors for more interest and discussions among different stakeholders.

Examples of Cost-Benefit Analysis

1. Preliminary analysis of cash transfer programme based on forecast in Bangladesh: An ongoing FbF initiative, implemented by the Bangladesh Red Crescent Society with funding from the German Red Cross and technical support from the Red Cross Red Crescent Climate Centre, will cover approximately 2.800 households (14.000 people) in 4 vulnerable villages, where households are at risk every two to three years due to cyclones. Preliminary cost-benefit analysis of the pilot has found that every dollar invested in the program targeting flood-prone areas would save 3 dollars in beneficiary losses, representing a reduction in losses of about 30% for the vulnerable population.
2. CBA Presentation : CBA methodology for Forecast-based Financing