Cost-Benefit Analysis study

Zambia Red Cross Society food security and livelihoods recovery intervention

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Acknowledgements

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Table of contents

List of tables

List of figures

List of abbreviations and acronyms

BCR	Benefit-cost ratio
BEC	Branch Executive Committees
CBA	Cost-benefit analysis
CHF	Swiss franc
DRR	Disaster risk reduction
ECHO	European Commission - Humanitarian Aid and Civil Protection
IFRC	International Federation of Red Cross and Red Crescent Societies
SAPRCS	Southern Africa Partnership for Red Cross Societies
SARO	Southern Africa Regional Office
ZMK	Zambia kwacha
ZRBI	Zambezi River Basin Initiative

Summary

The Zambezi River is an important direct source of livelihood and economic activity for the inhabitants of southern Africa who reside along its river basin. The river basin, however, is threatened by the negative impact of climate change and the incidence of natural disasters in this area is projected to increase as a result. The recurrence of floods and drought disasters, combined with the lack of developed social infrastructure on the southern Africa sub-region, unfavourably affects the communities living along the river basin.

In support of mitigation and adaptation strategies, the IFRC established the Zambezi River Basin Initiative (ZRBI) in 2009. This initiative presents a shared vision that is aimed at strengthening the synergies while maximizing the impact of its interventions in an integrated and holistic manner for the seven countries whose communities reside and derive livelihoods from the Zambezi River.

A cost-benefit analysis (CBA) study was undertaken to assess the costs and benefits of investment in the initiative in Zambia. This study is the second such review under the ZBRI CBA assignment. The overall aim of the study was to quantify the economic value and benefits of the ZRBI food security and disaster preparedness interventions for Zambia's selected communities in Sesheke and Kazungula districts. The study deployed qualitative and quantitative tools using a CBA model and participatory community and individual interviews to measure the impact of activities undertaken by beneficiary communities.

A benefit-cost ratio (BCR) of 4.9 was achieved for the period 2010 to 2015, which demonstrates a positive net impact of resources invested in the ZRBI in the country. The study noted the importance of CBA as a complementary decision-making tool for investment which should be integrated in developmental programming.

Project background

Droughts, floods and cyclones are the main disasters affecting southern Africa. Research has confirmed the increased negative impact and relationship of climate change with the high incidence of disasters in southern Africa; however, the level of infrastructure development and institutional capacity gaps to deal with the adversities has remained a limitation. Notably, poor and limited healthcare facilities, road networks, sanitation facilities, water reticulation and drainage systems are made worse by unplanned human settlement and migration. The absence, deterioration and poor quality of these social structures compounds the communities' vulnerability and increases the magnitude of damage caused during times of disasters.

Climate change experts have expressed concerns over the impact climate change will have on the Zambezi river basin, especially in regard to increased incidence of flooding, drought and levels of disease (International Rivers, 2012). This would further threaten the already vulnerable lives and livelihoods of communities domiciled along the river basin. Poor communities, women, children, as well as the elderly, sick and disabled remain vulnerable to the unexpected nature of disasters.

Hydro-meteorological hazards like floods, drought, cyclones and storms as well as disease, in particular epidemics such as HIV/AIDS, cholera outbreaks and malaria, continue to threaten the southern Africa sub-region. Natural disasters and epidemics inevitably affect agricultural production and pose food security constraints while also frustrating development efforts. Given the sub-region's exposure, the Red Cross has in the past undertaken regional relief operations in flooded Zambezi river basin regions in Angola, Botswana, Malawi, Mozambique, Namibia, Zambia and Zimbabwe.

Against this background, the Zambezi River Basin Initiative (ZRBI) was born out of the need to respond to disasters and build community resilience among communities along the river basin. The initiative is driven by the IFRC and seven National Societies in the affected areas. The ZRBI represents a shared vision amongst southern Africa Red Cross National Societies. The programme was initiated at the Southern African Partnership of Red Cross Societies (SAPRCS) to strengthen the synergies and maximize the impact of Red Cross interventions in an integrated and holistic manner.

Since the launch of the ZBRI in 2009, no quantitative assessment of the programme interventions and resource efficiency has been undertaken. It is against this background that the cost-benefit analysis (CBA) studies were commissioned. Out of the seven ZRBI participating countries, the Zambia food security CBA study constitutes the second of such studies after Namibia. The study specifically focuses on the livelihoods intervention component of the programme while also documenting the evolution of the intervention, approach to planning and implementation, as well as sustainability aspects. The study further identifies the key elements and outputs of the programme that have contributed towards sustainable outcomes, which have led to the enhanced awareness and resilience of communities' livelihoods programme and its vital link to the disaster response operations undertaken by the Zambia Red Cross National Society.

A participatory community CBA of the food security and livelihoods programme, was commissioned by the IFRC. The study focused on Zambia's Sesheke and Kazungula districts which form part of the Zambezi river basin. The study relied on two approaches of 'with' and 'without' ZRBI interventions which are based on beneficiary case studies and the CBA model.

Facilitated by the IFRC 's Southern Africa Regional Office (SARO), the initiative has four components, namely: disaster risk management, food security, health and organizational development. It was launched with a budget of 8.6 million Swiss francs (CHF); however, just 19 per cent of the pledged support was catered for until 2011, and spending was recorded to be CHF 1.02 million (IFRC, 2013).

A participatory community CBA is a useful planning and decision-making tool which can be used to measure benefits, value and return from developmental interventions. It complements financial analysis and it is meant to internalize and account for non-market benefits and costs in more detail and takes into consideration such variables as environmental costs, biodiversity preservation, disaster preparedness, informal activities (with economic value), social opportunity cost of labour, and opportunity cost of investment.

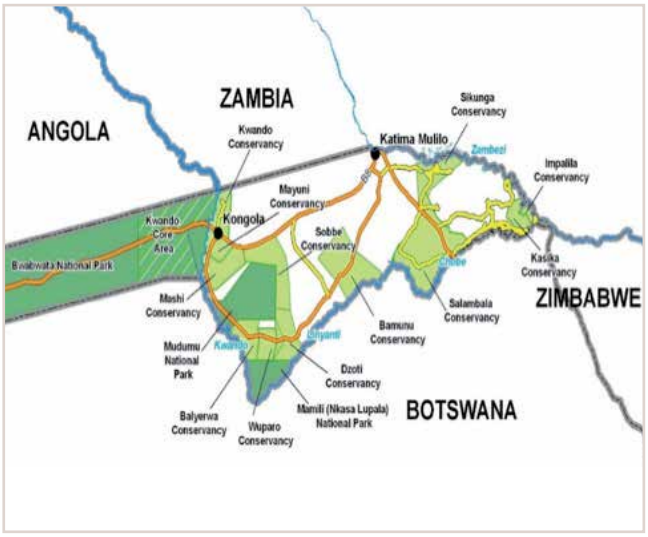
CBA is an evidence-based quantitative tool which is useful for identifying future resource allocation and deployment by potential donors and other relevant stakeholders to help them assess the extent of impact of interventions and resources deployed.

General context

The Zambezi River, which stretches over 2,500 kilometres across Angola, Botswana, Malawi, Mozambique, Namibia, Zambia and Zimbabwe, has a flood plain extending over 1,388 square kilometres with 38 million inhabitants. The river benefits the southern Africa region in terms of transport, power generation and tourism, while communities depend on it for their livelihoods through varied economic activities such as agriculture and fishing. Mozambique, Namibia, Zambia and Zimbabwe consume more than 70 per cent of their freshwater resources for agriculture from the river (Life & Peace Institute, 2012).

The overall goal of the ZRBI is to reduce the impact of challenges facing communities along the Zambezi river basin, and improve the quality of their lives and livelihoods. The three key components of the ZRBI are DRR, food security and health. Organizational development, viewed as a cross-cutting intervention, seeks to increase the capacity to implement disaster preparedness, response and recovery operations, understanding and identifying the good practices, skills development, tools and methods, and sharing of experiences in DRR initiatives to enhance integrated community-based programming and knowledge management.

Figure 1: Zambezi river basin



Source: Google.com

At least five severe drought seasons were experienced between 2000 and 2007 along the Zambezi river basin. These reportedly affected between 300,000 and 700,000 people in all 13 regions. The cost and destruction of such disasters are immense as floods in particular destroy crops, land and infrastructure, and they threaten human life.

Zambia overview

With an estimated population of 13 million, Zambia experiences recurring drought and flood disasters along the Zambezi river basin, making communities living in the area very vulnerable. Prolonged droughts and floods negatively impact on agricultural production causing food insecurity. Sesheke and Kazungula, which are two of the most affected districts, have limited healthcare facilities and poor road infrastructure and this situation hinders disaster response interventions during times of emergencies. Long-term sustainable interventions are crucial to ensure community resilience and access.

Zambia effectively commenced project implementation under the ZRBI during the fourth quarter of 2010 with the establishment of the Branch Executive Committees (BECs) structures in the districts of Sesheke and Kazungula. (The Siavonga district joined at a much later stage.)

The main focus of the ZRBI in Zambia is around food security (livelihoods recovery intervention). Lead and follower farmers have been recruited and trained in the various aspects of crop production (horticultural and field crops, identification of pests and diseases as well as their control), conservation agriculture, and livestock management. Horticultural and field crop seeds were procured and distributed, together with livestock and equipment which included treadle pumps, motorized pumps and sprayers among other items of equipment.

The Zambia Red Cross National Society was allocated CHF 10,640 for the launch of the ZRBI and an additional CHF 23,510 for organizational development activities (Zambia ZRBI Annual Report, 2011). Implementation started in Sesheke first (Lusu East and Maondo/Katongo) in 2010, followed by Kazungula (Mambova and Sikaunzwe).

Cost-Benefit Analysis (CBA) study

The food security and livelihoods component of the ZRBI was the main driver of the CBA study. However, due to the interconnectedness of the components, the study naturally included the preparedness and mitigation as well as the health components of the initiative as secondary social activities and the trickle-down positive effects of food security and livelihoods.

The key issues for consideration when investing in community-based developmental interventions tend to centre on the net benefits: whether they outweigh the costs associated with not having the investment or the costs of undertaking the intervention in relation to the benefits. In instances where a CBA is carried out as a forecast for future investment, it serves as a comparative basis for the selection and prioritization of projects or programme interventions.

CBA is applied in social/community investment planning as a major decision-making tool used mostly for estimating the efficiency of projects and application of resources. It seeks to demonstrate the costs and benefits and natural trade-offs of investment in community and public projects and programmes. Although the rationale of CBA is based on the business concept of appraisal of the rate of return on financial investment against the profitability of commercial projects, the concept is extended to estimate the profit of programme interventions to society.

This tool measures the costs and benefits associated with undertaking projects and programmes. CBA complements financial analysis and it is meant to internalize and account for non-market benefits and costs in more detail by taking into consideration such components as environmental costs, biodiversity preservation, disaster preparedness, shadow prices, informal activities (with economic value), social opportunity cost of labour, and opportunity cost of investment, among other aspects.

A CBA is a useful method to enable current and potential donors, government, and programme developers/officers, among other stakeholders, to assess whether or not the interventions supported have produced positive results. Also, it provides information as to whether further assistance is required or if other stimulus interventions need to be deployed to improve the impacts and social returns on investment.

Figure 2: Objectives of participatory CBA

Objectives of participatory community cost-benefit analysis (CBA)

- To quantify the economic value and benefits of the food security and disaster preparedness interventions for Zambia's ZRBI activities
- To inform future programming interventions and deployment of resources
- To quantitatively demonstrate the economic viability and multiplier effect of financial investment made in a way that can inform further investment

Methodology

The approach adopted in this study was that of an annualized retrospective CBA as it sought to evaluate the value added from the food security and livelihoods recovery intervention in Sesheke and Kazungula. This method varies from the one that would be undertaken during the planning stage of a project.

The aim of the CBA was to assess the value and economic return of different programmatic food security interventions in relation to livelihoods recovery interventions. As a result of considerable data limitations associated with poor record-keeping among communities, assessment was limited to annualized composite benefit-cost ratios (BCR) instead of intervention-specific benefit-cost outcomes. However, it is important to note that the benefits and development outcomes of spending on such an initiative as the ZRBI are not always clear and easily quantifiable.

To assess the value of benefits and costs over time, a social discount factor of 10 per cent was applied to measure the equivalent benefits and costs decrease in the future in comparison to the present value. The underlying rationale was the consideration of two scenarios: 'with' and 'without' interventions since

the inception of the programme. The latter case tries to demonstrate the status of communities without the ZRBI, while the former attempts to measure the economic impact and efficiencies realized as a result of the interventions.

The 'with' scenario specifically measures the avoided direct and indirect macroeconomic as well as socio-economic benefit and cost impacts of interventions without which the cost to communities could be devastating. In order for the food security interventions under the ZRBI to be considered beneficial and value adding to the communities, the decision rule of BCR greater than one (BCR >1) should remain viable. The net benefit derived from the programme should more or less outweigh the combined costs associated with the operation of the programme as well as those costs from not having the interventions in place.

Data collection

Fieldwork was conducted among communities in Sesheke and Kazungula over a two-day period and it targeted beneficiaries under the ZRBI. Data on programme costs and benefits as well as case studies based on beneficiaries' testimonies on the impact of the project were compiled. Community participants and National Society staff were selected for the interviews.

Data collection was preceded by training of the National Society team. The training was intended to give the National Society an understanding and appreciation of the objectives of the CBA study and how it would be beneficial to their programming activities. It was also to familiarize them with the tools and the process of data collection and conducting the CBA.

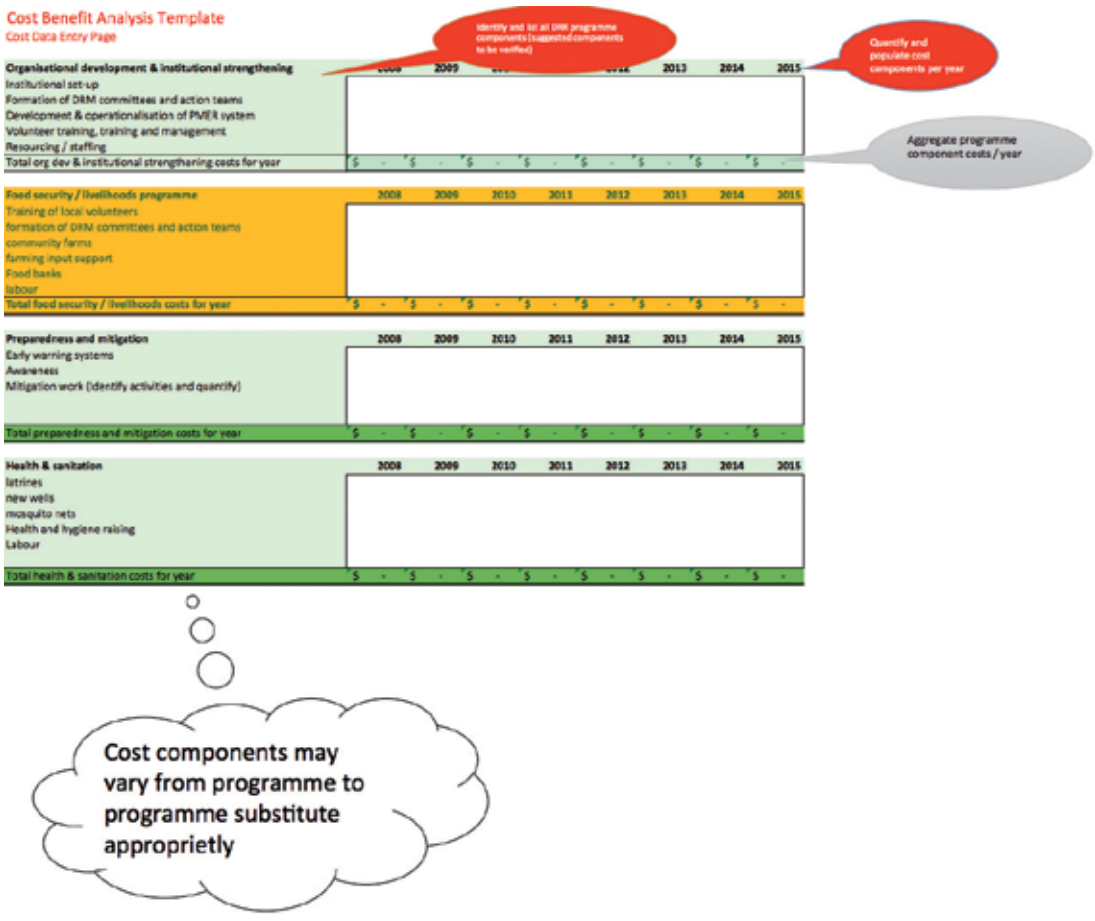
Tools

The tools used for the CBA included an Excel-based model questionnaire and a data collection sheet that were used for collecting the required and relevant information for the study.

Questionnaire

A questionnaire and data collection sheet were developed and used for focus group participatory meetings and individual interviews (see Annexure 1). Questionnaires were issued to individual community

Figure 3: Illustrative CBA model template



members who were taken through the interview process and the completion of the questionnaire. The data and information were subsequently consolidated into the costs and benefits (income) components of the CBA model. In addition to the information that was collected through focus groups and individual interviews, data sheets were also issued to community members to enter details of their incomes and the production costs of the different interventions they were involved in since 2009, when the ZRBI was first launched.

CBA model

An interactive Excel-based CBA model template was developed to assist the National Society with data entry on the programme investment (disbursement to communities) and associated institutional and programme operational costs (see Annexure 2).

Costs were compiled at National Society level as well as from participating beneficiary communities. Relevant costs for food security and livelihoods recovery interventions were identified and measured over the duration of the ZRBI. The costs identified included institutional and programme establishment and operational costs by the National Society as well as operational costs incurred at a community level for the different programme activities.

Findings

There were positive economic and social benefits and impacts from the investment channelled into the food security and livelihoods recovery intervention. The impacts of the ZRBI interventions were noted through asset creation and accumulation, improved food security and nutrition, entrepreneurship, market development and linkages, and skills training among the participating households.

There was evidence of an increase in food security and diversity as a result of the ZRBI. Various groups have even reported a significant reduction in malnutrition. For most participating farmer households, there had been some marked increase in the food security status of communities whereby adequate food stocks had been achieved even during drought and flash floods, unlike in the past before the introduction of the initiative. Communities reported a marked improvement in food security where they now had readily available fresh vegetables, and drought and flood-resistant grains were being grown. Also notable was the knowledge and skills acquired, which has led farmers to practise farming activities all year round. An increasing number of farmers had started considering farming as a business more seriously and cash crops and horticultural produce were being introduced. Replication and transfer of practices was observed among farmers outside the participating communities, which shows a positive spin-off effect from the interventions.

A farmer selling vegetables

Disaster Risk Management and Early Warning

For centuries, communities along the river basin have lived a sedentary life with disasters. Their responses have been based on traditional ties of shifting from the flooded plains to higher land or from drought-affected areas or swampy land, depending on the kind of disaster that has affected them. In recent years, communities have faced an increase in the frequency and intensity of disasters like flood and drought because of climate change.

Trainings such as the community contingency planning process, early warning and early action and climate change, basic disaster risk management and vulnerability capacity assessment, among others, have helped the communities to better prepare and predict the weather patterns. Communities have been seen to use disaster risk management and early-warning tools as needed.

Therefore, the ZRBI implemented in Sesheke and Kazungula is an example of how the Zambia Red Cross Society's DRR and early-warning activities have been helping communities. Through the communities' lead farmers, beneficiaries have been trained on how to use seasonal calendars to facilitate early planting of seeds, and to forecast weather patterns

Case study 1: **Benefits of detecting early-warning signs**

Jane Sampondo is a 49-year-old married woman with six children and she lives in Sinyendende village in Kazungula district. She was taught ways to detect early-warning signs of drought and ways to remain resilient to such disasters. She states that before becoming a beneficiary of the ZRBI she was a constant victim of drought as she would lose crops due to lack of water.

Over the past year, she was able to predict the weather patterns and this helped her to take measures to mitigate hunger for her family. She embarked on gardening, an activity she could manage even during periods of drought.

"For me, when I noticed signs of drought at the onset of this rainy season, I immediately decided to embark on vegetable gardening near the river because I could easily water my vegetables using the river water. It was easy for me to notice some signs that rain would be a problem this season. I started gardening with the assistance of the seed packs and from the knowledge provided by the Zambia Red Cross Society," said Jane.

Gister Kampamba spraying his crops with chemicals to prevent damage by pests and diseases - photo by Bruce Mulenga

Case study 2: **demonstration field and linking to farmers**

Gister Kampamba, an Agriculture Extension Officer in Kazungula district, acknowledges that before the ZRBI, farmers were having difficulties in producing crops because they had limited knowledge of growing crops and vegetables.

Gister said: *"This programme has helped me to be linked to the farmers. I formed a demonstration field in this community where farmers can come together to learn about crop and soil management. I monitor their preparation of fields until they harvest. I am glad that most farmers I have trained have learnt improved ways to grow their crops. The government department of Agriculture has recognized that this model can help farmers. Therefore, about 150 government staff and about 400 farmers have visited this demonstration field and learnt from it."*

Before he began growing vegetables, Gister's regular meal consisted of Nshima (maize porridge) and fish caught from the Zambezi River, and he was limited to one meal a day on average. Today, Gister boasts about food security and balanced nutrition as his family can now have three meals a day because he has access to freshly harvested vegetables from his garden.

"As you can see, my children are now able to have three meals a day," he said.

With gardening, Gister is able to enhance his household meals with vitamins and minerals from the vegetables. So, his family is now enjoying well-balanced meals. *"I am able to sell extra vegetables to earn income. I harvest twice a month on average. I earn 700 Zambia kwacha per harvest. I use the money to buy other foods to balance our household's diet. My children are healthy and no longer get sick easily. My two-year-old child weighs 13.5 kilograms. According to the nurses at our local clinic, my child is growing healthily," boasted Gister. "I also use the money to support my children at school and this has made me a happy man,"* he added.

Table 1: Impact of interventions with and without scenario

Intervention	Without intervention	With intervention
Disaster risk management and early warning	Inability to predict weather patterns and constant victims of starvation	Early-warning signs detection and ability to predict disasters, building more resilience and preparedness
Food security and livelihood self-sufficiency	Limited crop production skills, poor nutrition and food insecurity, limited market linkages, poor school attendance by children, dependence on relief food, low morale	Wealth creation and asset accumulation, improved standard of living, entrepreneurship, horticultural and animal husbandry training, employment creation, improved livelihoods and high morale All-year-round crop production and horticulture, food security and improved nutrition resulting in better health Farmer training and demonstration Market linkages in Sesheke, Kazungula and in neighbouring Namibia Improved school attendance by children Investment in higher education by some community members

which can lead to droughts or floods. The trainings have helped increase awareness and prediction of the looming dry spells (drought) or floods and have enabled the readiness to adopt drought-coping strategies. In addition, growing crops in swampy areas was promoted, depending on seasonal factors. Beneficiaries have become more knowledgeable about DRR and disaster preparedness.

So, most beneficiaries were now able to predict the dry spells and the types of crops to grow in anticipation of these dry periods. This activity has assisted many farmers along the river basin to build their community's resilience towards disasters and ultimately improve food security in the long term.

Food Security and Livelihood Self-sufficiency

A total of about 22,000 beneficiaries in Sesheke, Kazungula and Siavonga districts received seeds, along with insecticides and herbicides. They received training on conservation farming techniques. Best practice for cultivation was taught to ensure optimal upper-land crop and vegetable growth. Because of practising conservation farming, the quality of soil on the beneficiary farmers' plots has improved and this in turn has helped farmers to increase their yields as the fertility of the soil has been organically replenished.

Beneficiaries were trained in using animal droppings for the production of compost manure for use in their fields. This was more evident in areas where beneficiaries were rearing small stock such as goats

Jane Sampondo watering her garden with the aid of a water pump – photo by Bruce Mulenga

and chickens. Farmers were discouraged from using chemical fertilizers as they are expensive and cause environmental harm to the natural fertility of the soil. Most beneficiaries adopted the use of organic manure to improve their soil and enhance its fertility. As a result, their crops grew well and their yields increased considerably.

Through the provision of the seed packs, knowledge of managing soil fertility and of predicting weather patterns, together with the supply of animal starter packs, communities were encouraged to engage in needs and resource-based food-security activities.

Several households engaged in growing vegetables. Their gardens have flourished owing to the knowledge and skills acquired through the use of demonstration fields and from the frequent monitoring of follower farmers by the lead farmers.

Case 3: **Demonstration field and linking to farmers**

Gister stated: *"This programme has helped me to be linked to the farmers. I formed a demonstration field in this community where farmers come together to learn about crop and soil management. I monitor their preparation of fields until they harvest. I am glad that most farmers I have trained have learnt improved ways to grow their crops. The government department of Agriculture has recognized that this model can help farmers. Therefore, about 150 government staff and about 400 farmers have visited this demonstration field and learnt from it."*

This has resulted in increased household crop harvests, food security and self-sufficiency, and better nutrition. Because the diet of most beneficiaries along the Zambezi River consists of *Nshima* (maize porridge) and fish, vegetables and meat from goats and chickens has provided them with additional nutrition. This, therefore, has given the majority of farmers and their households a more balanced and diversified diet. Excess produce is sold to generate income to enable some to purchase other household needs and to pay for their children's school fees.

Other beneficiaries have engaged in the rearing of small animals. They also use their improved knowledge and skills in animal husbandry obtained from trainings and receive ongoing veterinary assistance from community extension officers and lead farmers.

Sydney Mwiinga feeding his chickens at his home – photo by Bruce Mulenga

This has helped beneficiaries maintain and grow their livestock despite the occurrence of diseases and other problems. As a result, the livestock population of goats and chickens has multiplied substantially over three-year period. This has provided beneficiaries with protein from meat consumption. Excess animals are sold to raise funds to enable them to afford other household needs and to send their children to school.

CBA results

The impacts outlined above have been measured quantitatively through the CBA study from 2009 to 2015. The number of positive impacts over the years was derived from the gross benefit during the period from which the associated costs were offset to calculate the net present value (NPV) of benefits. A discount factor of 10 per cent was applied to adjust costs and benefits to present-value terms using 2009 as the base year. The results are presented below.

The total present value of costs for all the interventions amounted to Zambia kwacha (ZMK) 2,932,682 against ZMK 14,476,350 worth of benefits, discounted at 10 per cent to derive the present values. An overall BCR of 4.9 was achieved between 2009 and 2015.

The BCR for 2011 is below the minimum acceptable threshold of 1.0. This can be attributed to the start-up phase of the interventions and the late commencement of the ZRBI project in Sesheke and Kazungula districts where the programme started in 2010 and 2011 respectively. This therefore resulted in a delay in benefit realization. From then on, the BCR improves significantly with project implementation and maturity of the activities.

The ratio of 4.9 shows that there was net benefit and positive impact from the funds invested into the food security and disaster preparedness interventions. For every Zambia kwacha invested in the initiative, ZMK 4.90 was generated in benefits.

The overall BCR demonstrates a range of cost-effective interventions and the ability of the resources deployed to accrue incremental positive benefits and improvements in the well-being of communities. The quantitative results support the impact of improved quality of life, food security and enhanced sustainable socio-economic development. The interventions put in place uplifted target beneficiaries' lives, and it was evident that there was significant value and merit in working with integrated and aligned multi-

Table 2: ZRBI Cost-benefit Analysis 2008 – 2015[1]

	Cost Stream			
Year	Year #	Total costs	Discount Factor 10%	Present Worth Costs 10%
2009	1	1 015 457	0,91	923 050
2010	2	496 936	0,83	410 469
2011	3	505 365	0,75	379 529
2012	4	299 005	0,68	204 220
2013	5	480 473	0,62	298 374
2014	6	712 093	0,56	401 620
2015	7	614 852	0,51	315 419
Total Present Worth Costs				2 932 682

	Benefit Stream					
Year	Gross Benefit	Production Costs	Net Value of Production (Net benefit)	Discount Factor 10%	Present Worth Benefits 10%	BCR
2009	-	-	-	0,91	-	
2010	-	-	-	0,83	-	
2011	211 230	73 931	137 300	0,75	103 112	0,3
2012	2 997 090	1 048 982	1 948 109	0,68	1 330 558	6,5
2013	11 035 230	3 862 331	7 172 900	0,62	4 454 371	14,9
2014	14 357 790	5 025 227	9 332 564	0,56	5 263 566	13,1
2015	9 970 740	3 489 759	6 480 981	0,51	3 324 743	10,5
Total Present Worth Benefits					14 476 350	4,9

1. *The results shown for 2015 are for only a four-month period (January to April), and the projected BCR for the full year could reach 21.1.*

donor programmes. The results show that the utilization and allocation of scarce capital resources has been maximized to safeguard the socio-economic welfare of the communities involved.

The BCR trend confirms that the investment made was worth the monetary and non-monetary resources invested in the programme and the return on investment per Zambia kwacha invested was growing. The BCR was expected to increase further in the medium to long term.

Challenges

Those involved in implementing the interventions experienced challenges owing to the late commencement of the ZRBI project in 2010 for Sesheke and 2011 for Kazungula, and this caused delayed and low benefit and impact in the earlier years of the intervention. Moderate staff turnover in the two operational districts of Sesheke and Kazungula were reported. Institutional availability issues at National Society level impacted negatively on the capacity of head office to supervise operational staff at the district level. Coupled with inadequate and delayed funding, this has resulted in the inability to expand activities to other needy and affected communities along the Zambezi river basin and its nearby tributaries.

The general poor practice of record keeping was noted during the fieldwork, and to some extent this may have had an impact on the BCR outcomes of the project. This shortcoming also presented some methodological limitation as some of the costs and resulting benefits could not be quantified in full.

Recommendations

An economic evaluation methodology for quantifying economic value added and benefits of the ZRBI food security and disaster preparedness interventions should be prioritized as a key tool for future developmental planning to complement financial analysis towards deepening and strengthening resilience within affected communities.

The quantification of economic value added and benefits accruing should further be used to consolidate investment from donors as well as to enable informed decision-making for the optimal and efficient allocation of resources.

There should be provision for regular review of economic analyses of resilience interventions undertaken by communities. Therefore, record-keeping and information management are vital to achieving accurate economic assessment. Such assessments could be driven by the lead farmers, who should assume the responsibility of record-keeping on behalf of the follower farmers; this was found to be effective in one community in Sesheke district where farmers' literacy levels are limited.

Participatory community economic analysis which involves the quantification of benefits accruing to communities should be applied and used for mapping practical and bankable resilient instruments and initiatives that are not only acceptable to the communities but also attract the interest of potential donors.

Environmental degradation is a cost. As more communities become more involved in farming, sustainable land use and farming practices should be adopted. The use of chemicals should gradually be replaced by organic fertilizers and pesticides that are environmentally friendly and consistent with the overall climate-change objectives.

Conclusions

The BCR is a useful economic planning and decision-making tool that can be used to assess the financial and economic impacts generated by investment of resources in resilience interventions related to food security and disaster preparedness. This tool should be used to enable decision-making and deployment of resources by donors and other relevant stakeholders in future programming interventions.

Economic analyses should be used as part of an integrated planning and resource mobilization framework and in decision-making processes towards resilience building and strengthening. However, it must not be used in isolation, but as a complementary tool.

Community buy-in, acceptance and ownership of the interventions proved to be critical success factors driving the disaster-resilience interventions. Community-focused processes are equally important during the planning and implementation of relevant inter-

ventions. Effective and consistent record-keeping has a positive bearing on CBA studies as this could result in more accurate BCR outcomes.

The ZRBI preparedness interventions contributed to social inclusion and participatory approaches which created and strengthened sustainable community development. Multi-donor and stakeholder partnerships developed synergies that benefited the various interventions and their subsequent impact. An integrated holistic approach to the implementation and execution of interventions was seen to result in multiple community-related benefits.

The results achieved under the CBA study were an indication of the benefits generated by the investment and could be adopted as a sound basis for further investment into the programme. The benefits associated with investment in food security and disaster preparedness were significant and had an ongoing economic effect across communities.

It is no longer optional to ignore the mainstreaming of disaster preparedness as a sustainable development strategy and overall development plan. This is because the avoided cost of disasters often results in quantifiable and unquantifiable benefits for the communities.

References

International Bank for Reconstruction and Development/The World Bank, 2013. *Building Resilience: Integrating Climate and Disaster Risk into Development.*

International Federation of Red Cross and Red Crescent Societies, Southern Africa Region *The Zambezi River Basin Initiative Project Document, 2009.*

International Federation of Red Cross and Red Crescent Societies, *SAR Annual Reports, 2009 - 2014.*

International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland, 2013. *A guide to mainstreaming disaster risk reduction and climate change adaptation.*

International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland, 2013. *Review of Phase I of the Zambezi River Basin Initiative (ZRBI).*

EM-DAT. *The International Disaster Database Centre for Research on Epidemiology of Disasters,* CRED. 2015.

Annexure 1: ZRBI field questionnaire

Zambezi River Basin Initiative cost-benefit analysis fieldwork questions

1. How long have you been involved in the Zambezi River Basin Initiative (ZBRI) by the Red Cross?

.....

2. How many family members are involved?

.....

3. Which aspect(s) of the programme are you involved in?

.....

4. What resources/materials have been distributed to you for use? (Indicate monetary value.)

No.	Resource/material distributed	Monetary value	Year of distribution

5. How much time do you and each of the family members involved spend on project activities (training, meetings)?

.....

6. What would you normally do with your time if you were not attending to project activities (fishing, hunting, carpentry, harvest forest products, blacksmith, resting etc.)?

No.	Activity	Monetary value

7. What are the main positive and negative impacts that the project has had on you and your family?
Positive impacts:

.....

Negative impacts:

.....

8. Did the project sink a borehole in your community? ☐ Yes / ☐ No

9. Do you use the borehole? ☐ Yes / ☐ No

10. Were any latrines built in your community? ☐ Yes / ☐ No

11. Do you use the latrines for the intended purpose? ☐ Yes / ☐ No

12. How has the well-being of the community changed as a result of having a borehole and/or latrine, particularly on production?

13. Do you grow any drought/flood-resilient crop varieties? ☐ Yes / ☐ No

14. Name the drought/flood-resilient crop varieties you grow

.....

.....

15. Are there individual/community seed banks and storage facilities? ☐ Yes / ☐ No

16. How many seed banks and grain storage facilities are in your community?

.....

17. Are there any families that have been resettled to higher ground by the project? ☐ Yes / ☐ No

18. How many families have been resettled to higher ground by the project?

.....

19. What land improvement activities have you undertaken?

.....

.....

20. Have you benefited from any form of training by the project? ☐ Yes / ☐ No.....

21. If Yes, how have you used the knowledge/skills acquired from the training by the project?

.....

.....

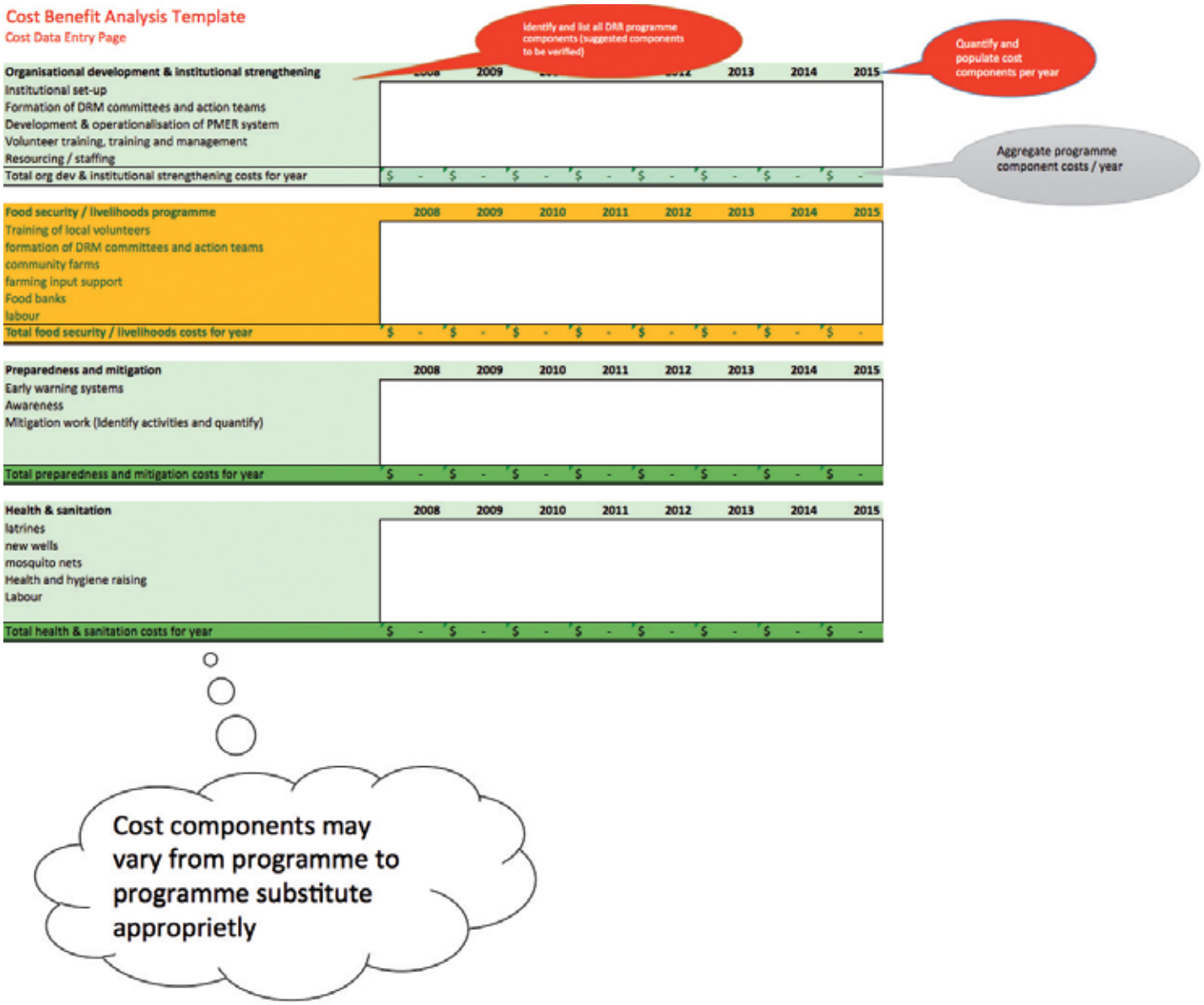
22. Is there any evidence of community members acquiring assets? ☐ Yes / ☐ No
(If Yes, name some of the assets – e.g., TV, solar panels, house iron sheets, bought livestock, grocery/shop.)

.....

.....

The list of questions above is only a guide to some of the questions that may be asked of communities.

Annexure 2:
illustrative excel cost-benefit analysis model



The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples.

Impartiality It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality In order to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide.

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