



A Cost-Benefit Analysis of Practical Action's Livelihood-Centred Disaster Risk Reduction Project in Nepal

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Abstract

This study provides a systematic cost-benefit analysis of a community-based disaster risk management project led by Practical Action in two districts of Nepal over the period 2007 to 2010. Under cautious assumptions about the long-term impacts of the project initiatives, the overall benefit-cost ratio ranges from 1.13 to 1.45, while under moderately optimistic assumptions the estimated benefit-cost ratio is up to 2.04. The internal rate of return of the project is between 22.2 and 26.3 percent. These findings indicate that the livelihood-centred approach to disaster risk reduction adopted in this project has resulted in a significant net contribution to the economic welfare of the target communities and delivered value for money.

Table of Contents

Executive Summary	2
Glossary	5
1. Introduction	6
1.1. Background	6
1.2. Purpose of the Present Study	6
1.3. Outline.....	6
2. Project Overview	7
3. Methodology of the Cost-Benefit Assessment	9
4. Outline of Community-Based Project Initiatives and Their Benefits	10
4.1. Investment in irrigation facilities to reduce drought sensitivity	10
4.2. Electrical fencing to reduce wildlife intrusion risks	11
4.3. Flood risk reduction investments	12
4.4. Crop farming skill enhancement and capacity building initiatives.....	13
4.5. Investment and training in livestock husbandry	14
4.6. Other livelihood diversification measures: off-farm income generation	14
4.7. Support for Community Saving Schemes	14
5. Cost-Benefit Analysis	15
6. Conclusions and Recommendations	19
References	20
Appendix	21

Executive Summary

This study provides a systematic cost-benefit analysis of a community-based disaster risk management project led by Practical Action in two districts of Nepal over the period 2007 to 2010. The objectives of the project are (i) to improve the socio-economic status of communities vulnerable to natural disasters, and (ii) to enhance the capacity of stakeholders at different levels to adopt a livelihood centred approach to disaster risk reduction.

In operational terms, the Nepal project has two main components:

- (i) Community level activities which reduce the impact of particular hazards by increasing livelihood opportunities, increasing resilience, and reducing vulnerability, while fostering preparedness to deal with the hazard and its aftermath.
- (ii) Advocacy and capacity building to link community based experiences with district and national level institutions. Community based experiences and best practices are documented and used to demonstrate the validity of the

livelihoods approach to disaster management to government institutions.

The project sites directly targeted by the community-based project activities belong to five village development committees (VDCs) in the districts of Chitwan and Nawalparasi. The directly targeted population includes 718 families with around 3500 members. In both areas, most of the people are dependent on agriculture and livestock farming. The main hazards the communities in these sites are faced with have been identified through participatory vulnerability analysis and include floods, droughts, landslides and wildlife intrusion.

The assessment takes the form of a systematic quantitative analysis of the economic costs and benefits associated with the community-based project activities and applies the established analytic framework of economic social cost-benefit analysis. Benefits due to the project are measured in terms of the present value of real income gains compared to a “without-project” baseline. The assessment does not only take account of



benefits already observable during the 2007–10 project implementation period but also includes expected future gains beyond 2010. The costs incurred to achieve these benefits include the direct project costs as well as the opportunity costs of additional human and material resources contributed by the target households and other local stakeholders. In order to allow a meaningful comparison of present and expected future benefits, the stream of costs and expected future gains is discounted backward to the starting point of the project in 2007.

The main community-based project initiatives included in the assessment comprise structural investments in irrigation facilities to reduce drought sensitivity, the installation of electrical fencing to reduce wildlife intrusion hazards, dam construction to reduce flood hazards, various activities to improve skills and productivity in crop farming and livestock husbandry, and a range of off-farm livelihood diversification measures.

The Summary Table below compares the total project costs with the overall benefits and summarises the results of the cost-benefit analysis. The present value of benefits exceeds the present value of the total costs of the project activities in all cases. For the central social discount rate of 10 percent, the benefit-cost ratio ranges from 1.27 to 1.50, i.e. the economic benefits exceed the economic costs by a significant margin and it can safely be concluded that the project made a significant net contribution to the economic

welfare of the target communities and delivered value for money. The internal rate of return – that is the discount rate at which the total cost would just be equal to total benefits in present value terms – ranges from 22.2% to 26.3% and is significantly higher than the discount rates commonly used in cost-benefit analysis. For any discount rate below this level, the net welfare gain attributable to the community-based project initiatives is positive.

These results lend support to the view that the LCDDR approach delivers value for money and deserves further funding. To the extent that the baseline “without project” situation in the project sites is comparable to the conditions in other districts of the country, a scaling-up of the LCDDR in terms of geographic coverage deserves serious consideration.

This assessment is based on a cautious and conservative evidence-based evaluation of the project benefits and excludes a range of potential ancillary gains for which the project documentation provides anecdotal evidence. Such unaccounted additional benefits include the reduction of losses from landslides and environmental improvements associated with tree plantation measures and other measures aimed at the reduction of slash-and-burn agriculture, as well as the health impact associated with the improvements in food security and the diversification of diets.

Summary Table: Main Results of the Cost-Benefit Analysis

(Figures in £ unless indicated otherwise)

	r = 5%	r = 10%	r = 15%
10-Year Horizon			
Present Value of Benefits	383,764	306,287	250,831
Present Value of Costs	265,253	241,527	221,657
Net Present Value	118,511	64,760	29,174
Benefit-Cost Ratio	1.45	1.27	1.13
Internal Rate of Return	22.2%		
20-Year Horizon			
Present Value of Benefits	611,774	393,484	310,501
Present Value of Costs	300,235	261,717	233,688
Net Present Value	311,539	131,767	76,812
Benefit-Cost Ratio	2.04	1.50	1.33
Internal Rate of Return	26.3%		

In addition to the community-based initiatives, the project has supported the District Development Committees (DDCs) of Nawalparasi and Chitwan to prepare VDC-level disaster management plans. Both, the VDCs and the respective districts have endorsed the plans in their councils. In Nawalparasi all 28 VDCs have formed Disaster Management Committees (DMCs) to implement their plans while in Chitwan 16 VDCs have formed DMCs. Thus, there has been considerable formal progress in mainstreaming DRR into development planning at VDC and district level.

The main practical recommendation for future LCDRR projects emerging from the assessment is that Practical Action should give serious consideration to making cost-benefit analysis an integral accompanying component of future LCDRR projects from the project planning and inception phases onwards. While a backward-looking cost-benefit assessment at the end of a project is certainly commendable, the CBA approach is potentially most powerful, when it is used as a forward-looking planning and decision support tool to assist in channelling scarce project resources into activities with the highest expected net benefits.



Source: Sahamati

Kritipur farmers selling vegetables

Abbreviations

CHF	Conflict and Humanitarian Fund
DDC	District Development Committee
DfID	Department for International Development
DMC	Disaster Management Committee
DRR	Disaster risk reduction
ha	hectare
HH	Household(s)
kg	Kilogram
km	Kilometre
LCDRR	Livelihood-Centred Disaster Risk Reduction
NGO	Non-governmental organisation
NPR	Nepalese Rupees
£	Pound Sterling
r	Social discount rate
SCBA	Social cost benefit analysis
VDC	Village Development Committee

Glossary

Benefit-cost ratio The ratio of the present value of the economic benefits to the present value of the economic costs of a project each discounted at the economic opportunity cost of capital. If the ratio is greater than 1, the project makes a positive net contribution to welfare.

Expected value The weighted average of all possible values of a variable, where the weights are the probabilities.

Internal rate of return The discount rate that would give a project a net present value of zero.

Net present value The difference between the discounted value of a stream of benefits and a discounted stream of costs.

Opportunity cost The value of a resource in its best alternative use.

Present value The value today of a future payment, or payments, discounted at an appropriate interest (discount) rate. For example, at an annual interest rate of 10 percent ($r=0.1$), a payment of £ 110 next year has a present value of £ 100 = £ 110/(1+r).

Shadow wage The return to labour in its best alternative use.

Social discount rate The discount rate used to calculate the present value of costs and benefits in a social cost-benefit analysis. In conception, the social discount rate should reflect the social opportunity cost of capital, i.e. the rate of return to capital in its best alternative use. The higher the social discount rate used, the lower is the weight effectively given to future benefits or costs compared to present benefits or costs.

Willingness to pay The amount that someone is willing to give up or pay to acquire a good or service

1. Introduction

1.1. Background

In January 2006, Practical Action was awarded a grant of £ 1.9 million from the Department for International Development (DfID) Conflict and Humanitarian Fund to implement the five-year project “Mainstreaming Livelihood-Centred Approaches to Disaster Management” in selected countries of South Asia, Africa and Latin America. The project “focuses on the roles and linkages between vulnerable communities, district and national level government institutions and humanitarian agencies in regards to disaster preparedness and mitigation. It examines how these agencies can be made more responsive to the needs of poor people by adopting a livelihood-centred approach to disaster management.”¹

The main purpose is to make national and local development and disaster plans more responsive and effective in enabling poor communities to reduce disaster risks that threaten their livelihoods.

The specific objectives of the project are (i) to improve the socio-economic status of communities vulnerable to natural disasters, and (ii) to enhance the capacity of stakeholders at different levels to adopt a livelihood centred approach to disaster risk reduction.

Preparatory activities for the implementation of the project in Nepal as part of this wider project commenced towards the end of 2006 and field activities in two districts of Nepal were initiated in January 2007 by the Practical Action Nepal Office in collaboration with two local NGOs.

In operational terms, the Nepal project has two main components:

(i) Community level activities which reduce the impact of particular hazards by increasing livelihood opportunities, increasing resilience, and reducing vulnerability, while fostering preparedness to deal with the hazard and its aftermath.

(ii) Advocacy and capacity building to link community based experiences with district and national level institutions. Community based experiences and best practices are documented and used to demonstrate the validity of the

livelihoods approach to disaster management to government institutions.²

1.2. Purpose of the Present Study

The purpose of this study is to gather evidence on the cost-effectiveness of the Livelihoods Centred Disaster Risk Reduction (LCDRR) approach adopted by Practical Action Nepal for this project. The assessment takes the form of a systematic quantitative analysis of the economic costs and benefits associated with the project activities. The cost-benefit study aims to provide donors and partners with evidence-based information to show whether the LCDRR approach provides a cost-effective approach to disaster risk reduction (DRR) and deserves further support.

Practical Action Nepal believes that if this approach proved efficient and cost-effective, the governing bodies at different levels (from district to national) will also be motivated to incorporate this alternative perspective in their disaster management and development planning.

A further motivation for commissioning this study is the need for more evidence-based research on the costs and benefits of DRR in a food security/ livelihoods context, and within a framework of a changing climate, particularly to feed into wider international discussions and research that is taking place as part of the Global Assessment Report on Disaster Risk Reduction.

The analysis also addresses the challenge of attributing benefits to institutional development of DRR structures and policies, as well as challenges of quantifying long-term impacts in the context of a changing climate and building adaptive capacity and ends with recommendations for future implementation of the LCDRR framework in Nepal.

1.3. Outline

The following section provides a concise overview of the project. Section 3 outlines the methodology adopted in this study. Section 4 describes the various project initiatives included in the cost-benefit assessment along with relevant key data on project inputs and outcomes. Section 5 presents the overall results of the cost-benefit analysis. Section 6 draws conclusions including a number of recommendations for future LCDRR projects.

¹ Practical Action (2005) Project Proposal to DFID CHE.

² Practical Action (2010) Understanding Disaster Management in Practice: with reference to Nepal. Kathmandu: Practical Action.



Repairing flood-damaged irrigation inlet

2. Project Overview

Preparatory activities for the Implementation of the “Mainstreaming Livelihood-Centred Approaches to Disaster Risk Reduction” project in Nepal commenced in October 2006. Field activities in two districts, Chitwan and Nawalparasi, were initiated in January 2007 in collaboration with two local NGOs.

The project sites directly targeted by the community-based project activities belong to five village development committees (VDCs) – Patihani and Megghauli in Chitwan and Pragatinagar, Dibyapuri, and Devchuli in Nawalparasi – and the directly targeted population includes 718 families with around 3500 members. However, some of the project initiatives generate beneficial effects for a wider range of households.

The project sites in Chitwan are located adjacent to the Chitwan National Park on the banks of the rivers Rapti and Narayani. The sites in Nawalparasi are located within the watershed of Baulaha Khola river. In both areas, most of the people are dependent on agriculture and livestock farming. The main hazards the communities in these sites are faced with have been identified through participatory vulnerability analysis and include floods (in the form of river bank cutting,

inundation, and debris flow and deposition), drought (lack of water for timely irrigation), landslide and wildlife intrusion.³

The main objectives of the project were to improve the socio-economic status of the communities and to enhance the capacity of stakeholders at different levels to adopt livelihood centred approaches to disaster risk reduction. To achieve the objectives, the project activities focused on (i) community-level activities which increase livelihood opportunities and reduce vulnerability, and (ii) advocacy and capacity building aimed at linking community-based experiences with District and National level institutions.

The original proposal and logical framework for the project distinguishes four types of expected outputs.

1. Testing and establishing successful examples of livelihood centred disaster risk reduction with communities and stakeholders at local level.
2. Publishing resource materials useful to communities, practitioners and policy makers at local, national, regional and international level, based on the learning in the field.

³ Practical Action (2007).

3. Sharing publications and lessons learned with relevant audiences in order to encourage replication of best practices in other contexts.
4. Influencing policy makers to adopt livelihood centred approaches to disaster risk reduction (DRR) which can be mainstreamed into development planning and practice.

In line with the purpose of this study, the quantitative cost-benefit appraisal will focus on the community-level project activities (output 1). Outputs of type 2 and 3 include the publication of several reports and manuals on practical approaches to CBDM planning, the preparation of a training module on CBDM orientation as well as presentations, meetings, visits and training events to stakeholders outside the project areas. With respect to type-4 outputs, the project has supported the District Development Committees (DDCs) of Nawalparasi and Chitwan to prepare VDC-level disaster management plans. Both, the VDCs and the respective districts have endorsed the plans in their councils. In Nawalparasi all 28 VDCs have formed Disaster Management Committees (DMCs) to implement their plans while in Chitwan 16 VDCs have formed DMCs. Thus, there has been considerable formal progress in mainstreaming DRR into development planning at VDC and district level.

An internal project report suggests that

“(T)he initiatives of the DDCs in preparing these plans have influenced approaches to disaster management in the country. Other agencies working in the field of DRR have initiated similar practices in other districts. The Ministry of Local Development is in the process of formulating guidelines for the development of similar plans and the integration of DRR into local development planning. ... This project initiative has potentially changed the national approach to DRR; resulting in the recognition that DRR is an integral component of development.”⁴

The indirect long-term gains that may materialise in the future in part as a result of these influencing activities could be potentially large. However, at present these disaster management plans remain under-resourced and any attempt at estimating the magnitude of potential indirect long-run gains would be highly speculative – leaving aside methodological problems of attribution. Moreover, as explained further in the following section, it would be conceptually flawed to conflate the direct gains from CBDM measures in the project sites with potential indirect gains from outputs 2 to 4, given that the cost-benefit assessment aims to analyse whether the LCDRR approach should be scaled up in geographical coverage.

⁴ Practical Action (2010) Local Governments Taking Up Leadership in DRR. Internal Project Document.



Practical Action – Nepal

Installing shallow tube well in Meghauri

3. Methodology of the Cost-Benefit Assessment

The study applies the established analytic framework of economic social cost-benefit analysis (SCBA)⁵, which is firmly grounded in economic theory, ensures transparency and internal consistency, and facilitates the cross-examination of results by experts in project appraisal as well as the communication of findings to existing and prospective donors.

The proposed approach provides a quantitative monetary estimate of the overall net welfare benefits attributable to the LCDRR-Nepal project as well as an estimate of the economic benefit-cost ratio of the project.

In conception, benefits due to the project are measured in terms of the present value of real income gains compared to a “no-project” baseline. The evaluation of benefits takes account of the whole expected future stream of real income gains relative to this baseline. Thus, the assessment does not only take account of benefits already observable during the 2007–10 project implementation period as documented in the various project reports, but also includes expected future gains beyond 2010. In order to allow a meaningful comparison of present and expected future benefits, the stream of costs and expected future gains is discounted backward to the starting point of the project in 2007.⁶

In line with the SCBA approach, the costs incurred to achieve these benefits include the direct project costs as well as the opportunity costs of additional human and material resources contributed by the

target households and other local stakeholders. The expected stream of benefits is quantified by assessing the monetary value of the productivity gains due to water resource management investments, farming skill training, introduction of improved livestock breeds and crop seeds, as well as the avoided losses from wildlife intrusion and the additional income attributable to the various livelihood diversification measures. The valuation of physical input and output quantities follows established SCBA principles. The required data are collected through a systematic review of the various project documents⁷ and are supplemented and triangulated with a range of extraneous data sources (including data on life of asset, flood damage functions, FAOSTAT price statistics for agricultural commodities and labour market statistics for the determination of shadow wages).

As noted in the previous section, the quantitative cost-benefit appraisal will focus on the community-level project activities, and will not include estimates of potential indirect long-term gains that might arise from the dissemination and policy influencing activities. Correspondingly, as far as possible the costs directly attributable to these latter activities will be deducted from the total project cost. Although it is recognised that these activities are a core component of the project, it would obviously be a fallacy of circular reasoning to inflate the benefits by including the gains from a wider adoption of the LCDRR approach, and then use the results to argue that the approach should be more widely adopted.

⁵ For canonical expositions of the approach and its theoretical underpinnings see Squire and van der Tak (1975) and Brent (2006). For the mandatory use of the approach in public project appraisal in the UK, see HM Treasury (2003). For guidelines and recommendations on its use in a disaster risk management context, see Mechler (2005).

⁶ The choice of the appropriate social discount rate remains a controversial issue – see Willenbockel (2008) As results will necessarily be sensitive to the discount rate used, we will report results for low and high rates, as well as the internal rate of return for the project (i.e. the discount rate that would just equate overall benefits and costs).

⁷ Data gaps in the project documentation – in particular with respect to local community resource inputs to project activities – have been identified during the first stage of the work and further information has been sought from and provided by the Practical Action Nepal Office.

4. Outline of Community-Based Project Initiatives and Their Benefits

This section provides descriptive qualitative and quantitative information on the range of community-based project activities, their rationale, observable benefits and local contributions to the costs, which will be included in the formal cost-benefit analysis in section 5.

For purposes of the systematic cost-benefit assessment, it is useful to group the various community-based project initiatives under the following headings.

4.1. Investment in irrigation facilities to reduce drought sensitivity

The community-level assessments identified droughts – regarded as periods when water is not available for irrigation – as a common recurring hazard for farmers. Agricultural activity is affected by water deficiency during the dry season between November and May, when surface water sources run low, but also includes protracted periods between rainfalls during the rainy season, since this puts existing crops under stress. Water shortages cause many land parcels to be left fallow for more than six months each year.

The project initiated discussions with community groups concerning issues of drought and its impacts together with possible solutions which led to the adoption of the following irrigation investment measures from 2008 onwards:

Nawalparasi district: In Kirtipur village, 720 metres of plastic pipe have been provided to overcome porosity problems with an existing irrigation channel. The resulting additional water supply allows additional crop and vegetable production during dry season and provides water for domestic use when village water supplies run low. In Gaidi village, a conventional, 1260 metre irrigation canal has been upgraded with cement lining and concrete base to provide additional water supply for irrigation during the dry season. In Kadampur, the project provided similar partial support to upgrading of conventional canal through cement lining. With the improvement, the water drawn from the canal has provided irrigation for additional nursery and vegetable production. Further measures to cope with irrigation water shortages during the dry season in the Nawalparasi district include the installation of a shallow tube well in Bote Tol and the provision

Table 1: Small-Scale Irrigation Schemes Supported by the Project

Measure	Location (VDC – Village)	Area Coverage (ha)	Beneficiaries [No of HH]	Local Cost Contribution (NPR)
Chitwan District				
12 Shallow tube wells and water pump	Meghauri	61.1	163	96,000
2 Shallow tube wells	Patihani – Simalgairi			
1 lake and irrigation channel improvement	Patihani – Simalgairi	13.0	47	16,000
Nawalparasi District				
1 Shallow tube well	Pragatinagar – Bote Tol	2.0	44	8,000
Irrigation channel improvement	Pragatinagar – Gaidi	113.0	160	1,165,325
Electric Motor pump for existing well	Divyapuri – Keureni	8.0	33	
Irrigation channel improvement	Divyapuri – Kadampur	178.0	267	369,477
Irrigation channel improvement	Devchuli – Kirtipur	43.3	78	797,062
Total		418.4	792	

of a motor pump for an existing dug well in Keurini village.

Chitwan district: 2 shallow tube wells have been installed in Patihani and a further 11 in Meghauli (of which two have not been operational by May 2009 due to electricity supply problems). Table 1 provides summary information on the land area benefiting from additional irrigation and the number of households directly benefiting from the various small-scale irrigation schemes. In each case, the project provided support for components and materials that were not locally available and technical guidance during construction, while the community contributed labour services for the installations as well as locally available materials. In some cases, the investment schemes also received financial support from other stakeholders including VDCs, District Development Committees (DDCs) and District Agriculture Development Offices. The local contributions including financial contributions from these other stakeholders to the investment costs are reported in the last column of Table 1. Maintenance and running costs for the tube wells are covered by a fee of 20 NPR per hour of operation.

Overall, the main direct economic benefits from the improvements in irrigation arise in the form of additional net income from extended production possibilities during the dry season but also from increased yields per ha during the wet season. To some extent, the irrigation measures are a complementary pre-requisite for other income-enhancing measures such as the use of new crops and improved seeds. Therefore the benefits from these complementary measures are analytically not strictly separable from each other and are evaluated jointly in the quantitative cost-benefit analysis below.

4.2. Electrical fencing to reduce wildlife intrusion risks

The participatory vulnerability analysis carried out at the start of the project identified wildlife intrusion as a high-frequency hazard for communities living adjacent to the Chitwan National Park. These communities include Meghauli and Patihani in the Chitwan district as well as Pragatinagar and Divyapuri in the Nawalparasi district. Wild animals intrude into the community habitat to feed and present a hazard to the community by destroying crops, attacking livestock, and causing occasional injury to humans.

Traditionally people used to drive away animals by beating drums and lighting torches. They erected

watch towers in the fields and guarded crops day and night from the sowing of seeds till harvest. Earlier efforts to erect barbed wire fencing and install trenches around the village border turned out to be unsuccessful. The threat from wildlife restricted village people from moving around after dark. The damage caused by animals had discouraged farmers from intensifying and diversifying crops, livestock breeds and other income generating enterprises such as bee keeping, fishery and vegetables.

The national park and other stakeholders have previously explored solutions and experiments introducing low voltage electric fencing in smaller areas had been successful. These electric fences do not significantly harm animals beyond causing temporary pain, but are sufficient to discourage wildlife from trying to penetrate the barrier.

The project facilitated the installation of electric fencing by providing support for the purchase of electric wire in Meghauli in Chitwan, an electric inverter and battery in Divyapuri and electric wire in Pragatinagar in Nawalparasi and took responsibility for the mobilisation of resources, documentation, maintaining transparency of inputs and outputs and coordination between different stakeholders. 10.7 km of fencing has been installed in Meghauli, benefiting 1754 households and protecting 619 ha of land, while 4.1 km of fencing has been installed in the Nawalparasi district sites, protecting a further 1238 households. Local contributions to the investment costs in cash, kind and labour services including contributions from VDCs, buffer zone and forest user groups amount to NPR 797,700 in Chitwan and NPR 202,550 in Nawalparasi. A fund has been set up to which each household contributes NRS100 per annum to pay for watchmen and on-going minor repairs and maintenance.

Prior to the fencing installations, reported average annual crop losses due to wildlife intrusion have been 40% to 50% for farmers closer to the park border and 25% to 30% for farmers farther from the park border. Maximum losses amounting to 75% of crops have been reported by farmers directly adjacent to the park boundaries. In addition, there has been unquantified anecdotal evidence of livestock losses and destruction of stored grains and seeds.

According to the Project Mid-Term Evaluation Report, crop losses due to wildlife intrusion have been reduced close to zero after the installation of the fences. People are now able to leave their

homes in the evenings and feel encouraged to grow a greater variety of crops. Thus, there are synergies with other project-related measures targeted at agricultural productivity improvements. In the quantitative cost-benefit analysis, the real income gains from avoided losses due to wildlife intrusion are part of the observed income gains from all project-related initiatives with impacts on agricultural output.

However, an illustrative stylised cost-effectiveness analysis of the Megghauli fencing project viewed in isolation from other project impacts suggests a very high benefit-cost ratio for this investment even under conservative assumptions and in the absence of any other changes to agricultural incomes: Let us assume that only 486 ha⁸ of the total protected area of 619 ha is used for agricultural production and that only rice is produced. Baseline rice yields in Megghauli are 1627 kg/ha (Practical Action, 2007) and the producer price of paddy rice in Nepal in 2008 was around NPR 12 /kg. Taking the lower limit of the reported avoided crop losses (25% per annum) and assuming only one crop harvest per year, the market value of avoided crop losses amounts to NPR 2,372,166 per year. Assuming further a fence life of 10 years in the presence of regular maintenance, a social discount rate of 10 percent and annual operation costs of NPR 200,000 including maintenance costs, the present value of the benefits of the fence investment (net of recurrent operation and maintenance costs) amounts to NPR 14,681,722 (£ 124,421) at constant prices and in the absence of any yield growth over time. This amount needs to be set into relation to the total capital cost of the fence investment including local contributions, which is NPR 927,700 (£ 7,862). The resulting benefit-cost ratio is an impressive 15.8, i.e. even under the stated cautious and conservative assumptions, the present value of expected benefits from the investment is more than 15 times higher than the initial investment costs.

4.3. Flood risk reduction investments

In early 2008 both banks of the Baulaha Khola

river have been raised with 1.5 km long, 3 m high and 2.5 m wide earthen dams, and in 2009 a 500 m long spillway has been excavated to improve drainage. To strengthen the dams, gabion boxes have been laid at strategic positions, and bamboos, broom grass and stylo have been planted on the sides. The dam protects more than 100 ha of agricultural land shared by more than 200 households from flood and bank undercutting. The total cost NRs 528,000 was shared by the *Baulaha Khola* Conservation Committee, VDCs and DDC, with the project contributing NPR 220,000. In 2009 the river damaged approximately 80 metres of the dam on the Pragatinagar side. The VDC invested a further NPR 54000 to rehabilitate the damaged area.

According to the baseline vulnerability assessment, severe flood inundation that results in crop damage takes place every 8 to 10 years. Thus, using a flood probability of 0.1 and assuming – in line with crop flood damage functions used in the recent World Bank (2010) Economics of Adaptation to Climate Change study – a crop loss of 8 percent⁹ in the event of a 10-year flood in the absence of the dam protection, the annual expected value of avoided crop losses due to the dam is 0.008 times the value of annual crop production on the protected land area. Baseline rice yields for Pragatinagar are 136 kg/kattha¹⁰, that is 4024 kg/ha. Valued at a producer price of 12 NPR/kg, the expected annual benefit for the area of 100 ha is thus NPR 38,630. The present value of this probabilistic benefit stream over a 20 year period is NPR 328,879 at a discount rate of 10 percent or NPR 481,415 at a discount rate of 5 percent, which is well below the initial investment cost of NPR 528,000. The internal rate of return on this investment is only 3.9 percent, even though annual maintenance costs and the mentioned rehabilitation costs have not been taken into account.

That is, if households can achieve a return on savings (or alternative investments) higher than this rate, they would be better off without the dam investment. If one includes

⁸ This figure is obtained by multiplying average land holdings per household in Megghauli (8.2 kattha = 0.27716 ha) with the number of benefiting households (1754).

⁹ Additional data provided by the Practical Action Nepal Office suggest that flooding damages on land directly adjacent to the river (covering an area of 8.9 ha) are on the order of 25 percent while more distant plots are far less affected by a severe flood. The assumed average damage of 8 percent for the whole area of 100 ha is consistent with this 25 percent figure under the assumption that the average damage on the other 91.1 ha is on the order of 6.5 percent.

¹⁰ Practical Action (2007), Table 13. Note that observed baseline rice yields in this site are considerably higher than in other project sites

Table 2: Additional Income from New and Improved Seeds

	Seed (kg)	Area (ha)	Yield (kg/ha)	Base Yield (kg/ha)	Price (NPR/kg)	Additional Income (NPR)
2008						1,400,336
Maize	500	46.5	817	442	11.81	206,049
Rice*	105	2.3	2500	0	11.58	66,585
Rice**	300	20.0	2980	0	11.58	690,168
Groundnut	50	0.4	0	0	-	-
Ginger	172	0.0	0	0	-	-
Potato	584	1.5	12000	0	21.92	394,560
Mustard	100	9.7	0	0	47.51	-
Wheat	185	NA		-	14.68	17,616
Lentil	100	5.5	374	296	58.94	25,358
2009						186,614
Lentil	68	9.3	373.8	296	58.94	42,645
Mustard	55	9.7	312.4	0	47.51	143,969

Sources: Internal project documents and producer price data from the FAOSTAT PriceSTAT database.

Hardinath* and *Mathila* varieties; *Ram* variety.

a realistic allowance for annual maintenance and rehabilitation costs, the internal rate of return is likely to be negative, unless there are significant additional expected flood damages in the absence of the dam that are not included in the above calculation. In short, under the stated assumptions, the cost effectiveness of this dam investment appears questionable. However, this tentative assessment might have to be revised in the future if climate change will lead to an increase in the frequency of extreme flooding events.

4.4. Crop farming skill enhancement and capacity building initiatives

The project provided training in the form of workshops, field-based orientations and demonstrations to improve farming skills and knowledge with an emphasis on the introduction of improved crop varieties and new crops to diversify existing cropping patterns.

Tested and certified improved varieties of seed were provided for farmers to try out in order to encourage regular adoption. Seeds supplied included improved varieties of traditionally grown crops as well as new crops. Table 2 lists the seed input quantities provided to farmers in Chitwan district, the land areas to which these seeds were applied compares the resulting observed yields per ha with the baseline yields of previously used

conventional varieties where applicable.¹¹ The final column reports the market values of the observed output increments at producer prices.

Training in the selection and storing of seed was provided. Almost all the farmers who received this training stored seeds for the next season.

The project adopted a range of strategies to encourage farmers to grow vegetables, including training sessions, practical demonstration, and technical advice on marketing of the products. In both districts, community facilitators frequently visited farmers' fields to observe any problems which might need expert advice.

In Nawalparasi, the project provided seeds for the demonstration plots in 2007. Afterwards, farmers purchased their own. In Chitwan, the project provided 100% support for seeds and other inputs in 2007 and a 50% subsidy in 2008. For some farmers, support was given in 2009. Material support ceased in the final year of the project. Essential items of equipment such as watering cans and sprayers were provided to all group members.

¹¹ In cases where the "Base Yield" value is zero, the whole output is additional relative to the no-project baseline, because the land used would have remained idle in the absence of the complementary irrigation measures initiated by the project. In economic terms, the opportunity cost of the land used to plant the improved or new seeds is zero in these cases.

A total of 140 community members participated in 12-week “farmers’ field schools” in 3 locations in Nawalparasi, where farmers learned about various aspects of vegetable farming while practicing in groups and individually on their personal farms.

As a result, vegetable farming is expanding and farmers are scaling up their farming area as well as their variety of crops. 68 households are reported to sell vegetables and more grow vegetables for home consumption. In 2009, the reported annual cash income of 35 families in Nawalparasi was NPR 360,000 while in Chitwan 20 families from Chitwan earned NPR 264,750 in 2009.

As a result of the measures outlined under headings 1, 2 and 4 above, for 30% of vulnerable households in the project area, food security situation has increased by 6 to 9 months, and for a further 30% food security has increased by 3 to 6 months according to the Mid-Term Evaluation Report of May 2009. More than 70% families are now food secure for the whole year and the quality of food has improved due to the additional availability of green vegetables.¹²

4.5. Investment and training in livestock husbandry

Livestock rearing is an integral component of subsistence agriculture in the project sites. Goats and pigs are sold for meat, cattle raised for milk and bulls for draught power in ploughing and pulling carts. Traditional rearing practices – particularly in upstream communities in Nawalparasi – limit growth and productivity. Small over-crowded pens and lack of proper feed result in poor growth rates, diseases and high livestock mortality.

Project initiatives in the area of livestock husbandry include the introduction of improved breeds of pigs and goats to mate with existing livestock, support for the improvement of goat sheds and pig pens, training in livestock management, and the organisation of livestock health camps.

In particular, the project provided full funding for 12 improved breeding bucks and 50 percent funding for a further 6 bucks, distributed 34 piglets of an improved breed, financed the cement inputs for the upgrading of 26 goat sheds and 58 pig sheds (with local contributions to the construction costs amounting to NPR 735,300), and provided 35 days of veterinary training to

3 persons among other training events.

Measurable benefits attributable to this set of initiatives can already be observed. Shed improvements in combination with the other measures have made a significant difference to the health and growth of livestock. Farmers have reported that the live weight gains of pigs and goats have increased by up to 50%. The number of siblings per birth has increased. Miscarriages and early mortality rates have decreased in both goats and pigs. This success has encouraged other households to improve their goat and pig sheds on their own. Overall, beneficiaries’ household income from livestock rearing has increased significantly, and with it the ability to cope with existing and future hazards, shocks and stresses.

4.6. Other livelihood diversification measures: off-farm income generation

Bee keeping

The project supported enhanced bee-keeping practices through the provision of modern hives and related training activities. In 2007, each of the 17 participants of a bee-keeping skills training workshop were provided with an improved hive. Following requests for additional bee-keeping training by other farmers, in 2008 a further 20 hives were provided to new participants of another training event with 50% local cost contribution and a further 11 hives were bought by trainees using entirely their own funds.

Each hive is estimated to provide a net income between NPR 7200 and NPR 10,800 per year as compared to a net income of NPR 3000 to 5000 from traditional log hives.

Other off-farm income diversification initiatives

Other off-farm income diversification initiatives mentioned in the project documentation include support for a sculpturing business, generating additional income of NPR 300 per day, as well as training in candle making, house-wiring and stool fabrication.

4.7. Support for Community Saving Schemes

The project provided training and start-up funding for the formation of local saving funds at community group level, to which members contribute a certain monthly amount. The allocation of funds to members requesting a loan to finance productive activities is decided collectively. In 2008/2009 the total saving and investment

¹² Adhikari (2009).

volume of these funds amounted to around NPR 111,000 in Nawalparasi and NPR 137,000 in Chitwan. Conceptually, these savings – whether additional to the saving volumes in the absence of the project or not – are postponed consumption. The amount saved in any given period is a form of use of the income generated in that period and must in itself not be counted as an economic project benefit. However, the saving schemes generate real value added by providing a financial

intermediation service in a setting of limited or lacking access to commercial banks. The value of this service per Rupee invested is commonly measured by the interest rate differential between lending and borrowing rates. Assuming an interest rate differential of 2 percent, the annual real value added on a saving volume of NPR 248,000 is only NPR 4,960 and the economic net gain appears negligible, once the opportunity cost of time spent in group meetings is factored in.

5. Cost-Benefit Analysis

The last section indicated that the various community-based project initiatives have undoubtedly led to numerous observable improvements for households in the project sites, and this certainly made target households better off to some extent. However, this does not answer the core question whether the project has actually been worthwhile. After all, the funder DfID could have distributed the funds allocated to this project directly to the target households instead, be it in the form of a single lump-sum payment or in the form of monthly or annual income subsidy payments, and this would also have made target households better off to some extent. In order to make a positive contribution to economic welfare, the expected economic benefits attributable to the project must exceed the total economic costs of the resources used in the course of the project, including the cost of the human and material resources provided by Practical Action and its local NGO partners as well as the opportunity costs of the human and material resources contributed by local households and other stakeholders.

Table 3 shows the present value of the costs of Practical Action's resource contributions to the project from January 2007 to March 2011, while Table 4 shows the estimated value of local resource contributions to the project. In order to be able to add up the costs incurred at different points in time, all cost figures are discounted back to the effective starting point of the project, that is January 2007. The Asian Development Bank (1997/2011) recommends a discount rate of 10 to 12 percent for the appraisal of projects in its member states including Nepal. In line with this recommendation and widespread practice, we use a central discount rate of 10 percent for the cost-

benefit assessment, but also report results for the alternative discount rates of 5 and 15 percent as part of the sensitivity analysis.

The cost figures in Table 3 are based on the internal annual project budget accounts and include the costs of Practical Action Nepal Office staff time devoted to the project, other administration costs, support for the partner NGOs involved in the project and the resource costs of the various CBDM activities. The full time profile of the costs is shown in Appendix Table A-1. Since the benefit assessment does not attempt to estimate the wider potential future benefits attributable to the project sharing and dissemination activities, the costs of these activities are deducted from the overall costs for the purposes of the cost-benefit analysis.

To evaluate the local resource contributions, the cost estimates reported in section 4 have been converted from Nepalese Rupees into Pound Sterling using average annual market exchange rates (2007: 128.1 NPR/£, 2008: 118.2 NPR/£, 2009: 114.2 NPR/£, 2010ff: 113.3). The opportunity costs of local labour time inputs diverted to project activities are valued using a shadow wage rate of NPR 250 per day.

Table 5 summarises the total economic project costs. The resource contributions of local households, VDCs, DDCs and other local stakeholders accounts for around 24 percent of the estimated total costs.

Table 6 summarises the economic evaluation of the expected benefits attributable to the CBDM activities initiated by the project using two alternative cut-off points for the projection of expected future benefit flows.

Table 3: Direct Project Costs (Practical Action Contribution to Total Cost)*(Figures in £)*

Cost Category	Sum		Present Value	
	r = 0%	r = 5%	r = 10%	r = 15%
Project Staff Cost	109,715	97,101	86,684	77,990
Project Office	13,981	13,256	12,632	12,092
Travel / Transport	11,497	10,643	9,936	9,344
Support for Partner Logistics	7,451	6,620	5,933	5,359
CBDM Project Activities, of which	81,838	74,630	68,455	63,121
Preparatory activities	3,058	2,920	2,805	2,707
Study and documentation	1,919	1,727	1,564	1,426
Capacity Building	22,364	20,304	18,549	17,039
Income generation support activities and DM	31,576	29,112	26,972	25,099
Social mobilization	8,912	8,039	7,297	6,660
Management and monitoring support from central office	2,309	2,085	1,894	1,730
Training materials and guidelines preparation	11,701	10,443	9,375	8,461
Project sharing and dissemination, of which	7,939	7,175	6,526	5,970
Awareness raising and dissemination	2,209	2,039	1,891	1,762
Meetings and workshops	2,610	2,332	2,098	1,900
Policy influence	2,069	1,864	1,689	1,540
Management meetings, monitoring and evaluation	1,051	940	847	768
Total Practical Action Contribution to Cost	232,421	209,426	190,168	173,876
Total Net of Project Sharing and Dissemination	224,482	202,250	183,641	167,907

The benefits arising from the various measures to raise crop yields capture the joint impact of the irrigation infrastructure investments, farming skill training activities, introduction of new or improved crop varieties and changes to cropping patterns. The projections for crops are based on the observed yield increases and price data reported in Table 2 and are net of recurrent seed input costs. The projections of additional real net income from vegetable production are likewise based on observed figures for 2008 and 2009 compiled from internal project documents. The projections for a ten-year horizon assume a physical asset life of 10 years for the structural irrigation installations and no replacement investment at the end of the period, while the alternative projections for a twenty-year horizon are based on the more optimistic assumption that a local community-financed replacement investment takes place towards 2019.

The evaluation of the benefits from electrical fencing and flood protection measures is based on

the estimates of avoided economic losses outlined in sections 4.2 and 4.3 above. Again, the two alternative projections assume an asset life of 10 years under normal maintenance arrangements without and with locally financed replacement investments after 10 years.

The benefits from livestock husbandry initiatives comprise the real income gains due to skill training, provision of improved breeds, improved animal health care and investments in goat and pig sheds and are based on forward projections of the observed additional income from livestock production reported in the internal project documentation for 2008 and 2009. The 20-year projection assumes a major renovation of sheds after 10 years.

The benefits from project support measures for other income-generating activities including bee-keeping skill training and provision of improved hives, as well as support for the start-up of a sculpturing business project the observed net

Table 4: Costs of Local Community and Government Contributions*(Figures in £)*

Cost Item	Present Value		
	r = 5%	r = 10%	r = 15%
Capital Costs	50,403	47,872	45,580
Irrigation schemes	24,911	23,779	22,745
Electrical fencing	8,073	7,706	7,371
Pig and goat sheds	11,058	10,333	9,690
Flood protection	2,901	2,751	2,616
Pineapple planting	387	369	353
Bee Hives	188	180	172
Fodder and fruit tree seedling plantation	1,209	1,154	1,104
Bio-gas plants	1,676	1,600	1,530
Operating and Maintenance Costs	12,600	10,015	8,170
Irrigation schemes	2,439	1,938	1,581
Electrical fencing	10,161	8,076	6,589
Total Cost Contribution of Local HHs and Government	63,003	57,886	53,750

Table 5: Present Value of Total Costs*(Figures in £ unless indicated otherwise)*

	Present Value		
	r = 5%	r = 10%	r = 15%
Total Cost Contribution by Practical Action	202,250	183,641	167,907
Total Cost Contribution of Local HHs and Government	63,003	57,886	53,750
Total Cost	265,253	241,527	221,657
<i>Share of Local HH and Government Contributions</i>	<i>23.8%</i>	<i>24.0%</i>	<i>24.2%</i>

income gains (see section 4.6) are conservatively assumed to flow for a period of five years.¹³

Finally, the benefits from other project initiatives recorded in Table 6 are evaluated using the willingness-to-pay principle – i.e. the benefits are set equal to the value of the resources the local communities volunteered to contribute to these activities – since no market valuations are available for the outcomes in these cases.

Table 7 compares the total project costs with the overall benefits and summarises the results of the cost-benefit analysis. The present value of benefits exceeds the present value of the total costs of the CBDM measures in all cases. For the central

social discount rate of 10 percent, the benefit-cost ratio ranges from 1.27 to 1.50, i.e. the economic benefits exceed the economic costs by a significant margin and it can safely be concluded that the project made a significant net contribution to the economic welfare of the target communities and delivered value for money. The internal rate of return – that is the discount rate at which the total cost would just be equal to total benefits in present value terms – ranges from 22.2% to 26.3% and is significantly higher than the discount rates commonly used in cost-benefit analysis. For any discount rate below this level, the net welfare gain attributable to the community-based project initiatives is positive.

These results lend support to the view that the LCDDR approach delivers value for money and deserves further funding. To the extent that the

¹³ The project documentation provides no information about the scale of the stool fabrication and candle making initiatives mentioned earlier.

Table 6: Present Value of Benefits from Community-Based Project Initiatives

(Figures in £)

	Present Value of Benefits					
	10-Year Horizon			20-Year Horizon		
	r=5%	r=10%	r=15%	r=5%	r=10%	r=15%
Initiatives to Raise Crop Yields	144,381	114,577	93,319	234,203	149,054	116,825
Vegetables	42,840	34,133	27,916	68,979	44,160	34,756
Potato	24,840	19,808	16,213	39,902	25,583	20,154
Maize	13,343	10,619	8,674	21,533	13,761	10,817
Rice	49,454	39,059	31,657	80,958	51,163	39,901
Wheat	1,411	1,126	923	2,264	1,453	1,146
Oilseeds	8,790	6,861	5,492	14,699	9,136	7,039
Lentils	3,704	2,971	2,445	5,866	3,798	3,011
Wildlife Intrusion Risk Reduction	147,146	116,955	95,414	238,029	151,833	119,198
Flood Risk Reduction	2,617	2,080	1,697	4,233	2,700	2,120
Livestock Husbandry Initiatives	74,941	59,719	48,850	120,630	77,245	60,806
Goats	54,193	43,074	35,140	87,665	55,919	43,900
Pigs	19,780	15,722	12,826	31,998	20,411	16,023
Buffalo	967	923	883	967	915	883
Livelihood Diversification Initiatives	9,910	8,493	7,361	9,910	8,246	7,361
Bee Keeping	7,075	6,013	5,170	7,075	5,829	5,170
Other	2,835	2,480	2,191	2,835	2,418	2,191
Other Initiatives	4,769	4,463	4,191	4,769	4,406	4,191
Bio-gas	2,065	1,881	1,721	2,065	1,848	1,721
Fodder and Fruit Tree Plantation	2,705	2,582	2,469	2,705	2,558	2,469
Total Present Value of Benefits	383,764	306,287	250,831	611,774	393,484	310,501

Table 7: Cost-Benefit Analysis – Summary of Results

	r = 5%	r = 10%	r = 15%
	10-Year Horizon		
Present Value of Benefits	383,764	306,287	250,831
Present Value of Costs	265,253	241,527	221,657
Net Present Value	118,511	64,760	29,174
Benefit-Cost Ratio	1.45	1.27	1.13
Internal Rate of Return	22.2%		
	20-Year Horizon		
Present Value of Benefits	611,774	393,484	310,501
Present Value of Costs	300,235	261,717	233,688
Net Present Value	311,539	131,767	76,812
Benefit-Cost Ratio	2.04	1.50	1.33
Internal Rate of Return	26.3%		

baseline “without project” situation in the project sites is comparable to the conditions in other districts of the country, a scaling-up of the LCDDR in terms of geographic coverage deserves serious consideration.

It is worth re-emphasising that this assessment is based on a very cautious and conservative evidence-based evaluation of the project benefits and excludes a range of potential ancillary gains for which the project documentation provides anecdotal evidence but no hard data for quantification. Such unaccounted additional

benefits include the reduction of losses from landslides and environmental improvements associated with tree plantation measures and other measures aimed at the reduction of slash-and-burn agriculture, as well as the health impact associated with the improvements in food security and the diversification of diets. Moreover, as explained earlier, deliberately no attempt is made to assess the prospective indirect long-term gains from the wider dissemination and policy influencing activities that are part of the project activities.

6. Conclusions and Recommendations

The main conclusion of this study is that the community-based initiatives triggered by the LCDDR Nepal project make a significant net contribution to the economic welfare of the target communities. Under cautious assumptions about the long-term impacts of the project initiatives, the overall benefit-cost ratio ranges from 1.13 to 1.45. Under moderately more optimistic assumptions about the longevity of observed project impacts the estimated benefit-cost ratio is up to 2.04.

How robust is this conclusion? The internal rate of return for the project is between 22.2 and 26.3 percent. This means that our main conclusion remains valid unless the social rate of return on the best alternative use of the funds invested in this project are higher than these rates.

Among the various project initiatives, the measures aimed at raising agricultural productivity in crop farming and livestock husbandry account for nearly 57 percent of the total estimated benefits, and the measures to reduce wildlife intrusion risks account for another 38 percent. Thus, these initiatives account for 95 percent of the total gains while the flood risk reduction investments and off-farm livelihood diversification measures contribute only five percent.

For two of the CBDM initiatives – namely electrical fencing to reduce wildlife intrusion hazards and dam building to reduce flood hazard – the nature of these measures and the available data allow us to estimate activity-specific benefit-cost ratios.

As shown in section 4, even if one uses avoided crop damage figures at the lower limit of the

range reported by households, the present value of expected benefits from the fencing investments is nearly 16 times higher than the initial investment costs. However, as the wildlife intrusion risks are related to the peculiar location of project sites adjacent to a National Park, the realisation of net benefits of this order might not be replicable in other prospective sites, and this fact needs to be taken into account when the results of this study are used to advocate an extension of the LCDDR approach to other regions.

In contrast to the fencing initiative, the estimated benefit-cost ratio for the dam investments is lower than unity even if a low social discount rate of five percent is used. This result suggests that the cost effectiveness of this particular project initiative is doubtful. However, the baseline assessment does not provide sufficient information for the determination of a complete probability distribution that maps the observed frequency of floods of different intensity to observed damages, which would be required for a proper assessment of the expected value of avoided damages due to dam investments.

Moreover, none of the estimates take into account that the frequency of extreme weather events in the form of both droughts and floods is expected to increase in the course of climate change, and that correspondingly the benefits of investments in irrigation and flood protection infrastructure are likely to increase. Given the current state of climate science, projections of the impact of climate change on precipitation patterns, flood and drought risks at local scales remain highly uncertain. In the presence of this uncertainty

a focus on “no-regret” measures that foster the resilience of communities under any future climate is advisable.¹⁴ The LCDRR approach with its emphasis on community-level activities which increase livelihood opportunities and reduce vulnerability appears very appropriate in this respect.

These observations suggest a number of practical recommendations for future implementations of the LCDRR approach:

- While commissioning a backward-looking cost-benefit assessment at the end of a project is certainly commendable, the CBA approach is potentially most powerful, when it is used as a forward-looking planning and decision support tool to assist in channelling scarce project resources into activities with the highest expected net benefits. Practical Action should give serious consideration to the idea to make CBA an integral accompanying component of future LCDRR projects from the project planning and inception phases onwards.
- It also appears advisable to involve an expert with knowledge in CBA methods in the participatory baseline vulnerability assessment at the start of a new LCDRR project who would assist in eliciting and recording information on past disaster frequencies and associated damages in the form required for a full probabilistic cost-benefit assessment. As noted earlier, the lack of information on flood probabilities and historical damages has been one of the most glaring data gaps for purposes of the present study.¹⁵
- A further practical recommendation is the need for a more systematic and organised recording of both project inputs and observed outputs in a way that allows a clear allocation of the CBDM-related project expenses and community contribution to the various project activities and a clear conceptual separation between outputs that are genuinely attributable to the project and outcomes that would have occurred anyway. For the present study, information had to be assembled in a time-consuming iterative process from a host of

scattered and occasionally undated internal project documents with varying attention to detail. A commendable example of good record keeping is the documentation of input and outputs from new and improved seed varieties.

- The design of household survey questionnaires should be tailored more closely to the information requirements of the end-of-project CBA and would thus benefit from the involvement of a CBA expert.
- Finally, it would be interesting and informative to conduct a follow-up study in the same project sites in a number of years to examine the longer-run impacts of the measures initiated by the project.

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¹⁴ See World Bank (2010) and Robinson and Willenbockel for further discussion.

¹⁵ Of course, it is appreciated eliciting reliable information of this kind from the memories of community members in the absence of written historical records is a common problem for DRR CBAs in low-income countries. See however Mechler (2005) for some successful examples.

Appendix

Table A-1: Direct Project Accounting Costs (£)

	2006/07	2007/08	2008/09	2009/10	2010/11	Total
Project Staff Cost	3985.25	19986.25	25878.61	32997.00	26868.00	109715.11
Project Office	5250.87	3642.68	3937.2	450.00	700.00	13980.75
Travel / Transport	3783.07	2519.75	1194.33	2100.00	1900.00	11497.15
Support for Partner Logistics	0.00	2306.68	1467.66	1645.30	2031.00	7450.64
CBDM Project Activities, of which	1764.00	27418.80	29333.45	23322.16	0.00	81838.41
Preparatory activities	1764.00	432.38	0.00	862.00	0.00	3058.38
Study and documentation	0.00	668.42	224.80	1026.00	0.00	1919.22
Capacity Building	0.00	8514.39	5365.20	8484.00	0.00	22363.59
Income generation support activities and DM	0.00	14784.73	12191.79	4599.13	0.00	31575.65
Social mobilisation	0.00	2257.71	3265.86	3388.00	0.00	8911.57
Manag. and monitoring support from central office	0.00	537.81	988.35	782.60	0.00	2308.76
Training materials and guidelines preparation	0.00	223.36	7297.45	4180.43	0.00	11701.24
Project sharing and dissemination, of which	0.00	2531.64	2157.61	3249.83	0.00	7939.08
Awareness raising and dissemination	0	1143.61	680.59	385.00	0.00	2209.20
Meetings and workshops	0	627.74	510.68	1471.74	0.00	2610.16
Policy influence	0	519.11	699.17	850.91	0.00	2069.19
Management meetings, monitoring and evaluation	0	241.18	267.17	542.17	0.00	1050.52
Total Project	14783.19	58405.81	63968.86	63764.29	31499.00	232421.15

For financial years from April 1 to March 31 – Compiled from project accounts.

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Practical Action is an international development agency working with poor communities to help them choose and use technology to improve their lives for today and generations to come. Our work in Africa, Asia and Latin America is in partnership with poor people and their communities, using technology to challenge poverty. We work with poor people to build their capabilities, improve their access to technical options and knowledge and help them to influence the social economic and institutional systems for the use of technology.