Cost-benefit analysis of WSPA's Mwingi Intervention in Kenya.

Report prepared by:
Economists at Large Pty Ltd
Melbourne, Australia
www.ecolarge.com
info@ecolarge.com
Phone: +61 3 9005 0154 | Fax: +61 3 8080 1604
65 Bevan St, Albert Park, VIC 3065, Melbourne, Australia

Citation:
Economists at Large, 2013, *Cost-benefit analysis of WSPA's Mwingi Intervention in Kenya.* A report for The World Society for the Protection of Animals, prepared by Economists at Large, Melbourne, Australia.

Project lead:
Tristan Knowles

BACKGROUND

Beginning in 2011, WSPA and Economists at Large began to investigate the economics of losing livestock in a disaster. We have been working on a framework to estimate the impacts of losing livestock in a disaster on communities and households. Losing livestock in a disaster has real economic consequences as livestock often play a critical role in economic productivity

In 2011, WSPA began an operation in the Mwingi district in Kenya, in response to long-running drought conditions. This analysis presents the preliminary findings of an economic cost-benefit assessment of WSPA's Mwingi operation.

SCOPE OF ANALYSIS

This analysis is based on internal WSPA documents "post-intervention response reports" provided to Economists at Large. These documents were used to assess the number of animals reached and the total cost of WSPA's intervention.

This analysis focuses on the household income impacts to owners of livestock who brought their animals to the Mwingi operation for treatment. It does not consider indirect costs and benefits of the intervention relating to other regions and industries. These issues will be considered in more detailed analysis of future interventions.

Specifically, we aim to assess the economic contribution of the first stated aim of the intervention:

1. *To increase prospects of animals in the drought stricken area of Mwingi district surviving until the next rainy season.*
   (Mutembei, 2011a) (p.6)

GOALS

The goal of this analysis is to help WSPA understand the economic impact its operations are likely to have had on local and regional economies. The nature of this work is such there is considerable uncertainty involved. We acknowledge this uncertainty but recognise that currently no such analysis is undertaken.

METHODOLOGY

This analysis uses cost-benefit analysis as its foundation. The relevance of this methodology to livestock interventions is detailed in our forthcoming report Economists at Large (2013 *forthcoming*).

ASSUMPTIONS

Due to the uncertainty involved in such assessments. We made a number of assumptions in our analysis, these include:

- We assume that conditions will return to normal at some point soon after the intervention. That is, the carrying capacity of the region will return to close to what they were like prior to the drought. If conditions don't return to normal, animals wouldn't return to normal productivity so the 'benefits' of the intervention we've estimated may be overstated.
- We assume that current market prices for livestock do not represent the present value of their future production. Instead of current market prices per animal, we have adopted a value flow approach in estimating production of milk, meat & draft uses.
- That 50 percent of animals were male and 50 percent were female. This is an important ratio as it impacts on assumptions above milk production. In the absence of any data, we have taken the middle ground assumption, which has the effect of resulting in conservative estimates.
- That 50 percent of animals that WSPA treated survived as a result. In other words, if WSPA didn't fund the Mwingi operation, between 7,000 and 10,000 additional animals would have

perished due to lack of care and feed.

- Our analysis didn't include Camels because little data was available on income derived and the number of camels treated was low as a percentage of total, 4 per cent.
- That all of the animals treated during operation 1 were unique individuals. That is, that no animals were treated twice. However, we've assumed that animals treated in operation 2 were being treated for the second time.
- That livestock production is at 20% of regular productivity at time of intervention based on WSPA assessment reports.
- We assume that the same animals were treated in the second operation as the first, adding those costs to the costs of the first operation but not increasing the benefits.
- A discount rate of 25 per cent. This seems high in a developed country context but in lower income countries discount rates can be even higher, see (Yesuf & Bluffstone, 2008) (p.11).

LIMITATIONS & SOURCE OF DATA

The limitations of this study include the assumptions above but also a lack of data about the actual income earned by livestock holders in the regions where WSPA carried out operations.

Data about income and prices of livestock in our estimates are based primarily on the work of Behnke & Muthami (2011) and citations within that report. In addition, we relied on the Kenya intervention reports provided by WSPA, (Mutembei, 2011a) & (Mutembei, 2011b).

RESULTS

The table below provides details of the analysis undertaken on WSPA's Mwingi operation in Kenya.

1. Intervention details

Treatments provided	Number	**36,452**
Animals treated	Individual	**20,707**
Animals saved	USD	**10,354**
Cost of Intervention	USD	**39,968**
Cost per treatment	USD	**1.10**
Cost per animal	USD	**1.93**

2. Estimates and discount rate

Annual Income of Livestock Saved	USD/annum	**136,925**
Discount Rate	%	**25%**

1. Basic intervention details based on WSPA's intervention report documents.

2. Estimates of the annual potential income of the animals saved by the intervention.

3. Net present value estimates over 1, 3 and 5 years.

4. Benefit-cost ratios over 1, 3 and 5 years.

3. Net present value over 1,3 and 5 years			4. Benefit/Cost Ratio
NPV 1 Year	USD	109,540	2.74
NPV 3 Year	USD	267,278	6.69
NPV 5 Year	USD	368,230	9.21

Source: Ecolarge analysis based on Behnke & Muthami (2011), (Mutembei, 2011a) & (Mutembei, 2011b).

DISCUSSION

Based on our analysis, over a one year time period, WSPA's Mwingi intervention generated $2.74 of benefits in the form of avoided losses for every $1 spent. If the time period is extended to 3 years, the benefit-cost ratio increases to $6.69 in benefits for every $1 spent.

CONCLUSIONS

The results above suggest the following:

- The present value depends on the duration over which you attribute income to the intervention and the discount rate. This is typical with cost benefit analysis. Some approaches to this include:
    - Basing duration on average length of ownership for animals. Or expected lifespan based on estimated age at the time of the intervention.
    - Basing the discount rate on available rates of finance to rural communities, through banking, microcredit or informal lending markets.
- The greatest return on investment for WSPA is from cattle, given their high economic contribution.
- Goats are often owned by poor families and so it would be inequitable to just focus on one species. Nor would it be consistent with WSPA's values.

RECOMMENDATIONS

- That WSPA train field workers involved in interventions to obtain consistent data on the following:
    - Number of unique animals treated, not just treatments provided.
    - Data on the health of each animal with a corresponding qualitative description of this assessment. For example, a grading of 1 – 5 with information on what each grade means in terms of the importance of the intervention to the animal's productivity and ultimately, survival.
    - Proxies for health of animals based on production quantities or ability to undertake drought work.
    - Data on economic conditions resulting from disaster including cost of feed & water, market prices of animals and market prices for any outputs (drought, manure, hides, meat, milk).
    - Implications of losing livestock to livelihoods. Qualitative assessment of attitudes towards importance of the intervention.
- Baseline data on areas of interest to WSPA. Current and trends in prices for livestock and economic returns of owning livestock. Other credit availability such as microfinance or informal loans.

REFERENCES

Behnke, R., & Muthami, D. (2011). Contribution of Livestock to the Kenyan Economy. IGAD LPI Working Paper, No. 03-11.

Mutembei, H. (2011a). *WSPA Post-intervention Response Report: Mwingi Operation 1* (pp. 1–25). WSPA, Internal report.

Mutembei, H. (2011b). *WSPA Post-intervention Response Report: Mwingi Operation 2* (pp. 1–19). WSPA, Internal report.

Yesuf, M., & Bluffstone, R. (2008). *Wealth and Time Preference in Rural Ethiopia*. Environment for Development discussion paper series. EfD DP 08-16. Retrieved from http://www.rff.org/RFF/Documents/EfD-DP-08-16.pdf