Cost-Benefits Analysis for Baringo El-Nino Animal Disaster Response October 2015

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BACKGROUND

An El Nino event hit the greater Horn of Africa from October to December 2015. World Animal Protection partnered with the Directorate of Veterinary Services (DVS) and the University of Nairobi faculty of Veterinary Medicine (UoN) to activate the veterinary emergency response unit (VERU) based at the UoN. The DVS also activated the national rift valley fever (RVF) task force, which comprises of both the ministries of health and the directorate of veterinary services. The floods in 2006/7 the zoonosis rift valley fever (RVF) caused 158 human deaths and economic losses of 4 billion Kenyan shillings (US$ 4 million). As a result, an elaborate RVF contingency plan, complete with a RVF risk map and livestock data was developed. According to the risk map, the RVF hot spot areas are within Tana River Delta, Baringo, Turkana, Isiolo, Marsabit and Bundalangi.

Under the RVF task force, World Animal Protection and University of Nairobi were requested to cover Baringo County which was one of the worst affected county during the 2006/7 RVF outbreak. In line with the RVF contingency plan, which aligns with the OiE standards, a RVF vaccination should cover at least 80% of cattle, sheep and goats. Alongside, the RVF vaccination, the VERU also vaccinated against rabies, treated sick animals and passed on flood preparedness messages.

On 4th October 2015, a total of 62 veterinary personnel (30 VERU plus 32 Baringo veterinary officers|) were trained on the incident command systems (ICS) used by VERU. The vaccination campaign was divided into two phases, the first utilising the UoN VERU plus county staff, and the second with only county staff. For phase one, four teams with 8 officers joining the VERU were constituted to undertake 3 day vaccinations from 5th to 7th October. In phase two, these eight officers became the team leaders for the ICS managing 32 Baringo county veterinary officers. They then continued the vaccination for another 11 days, ending on 19th October.

The objective of the response was to prevent the RVF animal disease disaster from occurring and should an outbreak still happen to reduce its impact. The secondary objective was to demonstrate the effectiveness of utilizing a VERU system to deliver animal disaster response.

Both phase one and two were undertaken as a multi-sectoral intervention involving veterinary sector, with support from health sector plus the public administration. The county government catered for the costs of all their officers, provided four 4-wheel drive vehicles and one ambulance with two nurses to support teams. World Animal Protection covered the logistics costs of the VERU and communication team, and bought the RVF vaccines, veterinary drugs and supplies, branded t-shirts, caps and personnel protective equipment (PPE). Kenya Veterinary Association and DVS donated 3,000 doses of rabies.

Prior to this vaccination event, the Baringo County highest vaccination achievements was 50,000 animals over a span of 60 days. This was to be the first time they were to receive training on veterinary emergency disaster response plus work within a coordinated multisectoral and multiagency field response team, that is, Min. of health, public security and min. of agriculture, veterinary department.

A total of **263,321** animals belonging to **7,831** households were directly vaccinated or treated. The first phase of mitigation took 15 days.

SCOPE OF ANALYSIS

This analysis is based on investigating the economics of saving livestock in a disaster. It is a framework to estimate the potential 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.

Post-intervention response reports provided data used to assess the number of animals reached and the total cost of intervention.

This analysis focuses on the household income impacts to owners of livestock who brought their animals to the Baringo operation for treatment. However. it does not consider indirect costs and benefits of the intervention relating to other regions and industries.

Specifically, the aim is to assess the economic contribution of the below stated aim of the intervention:
To increase survival prospects of animals in the el-Nino stricken area of Baringo County.

GOAL

The analysis can help better understand the economic impact on VERU operations are likely to have on local and regional economies. We acknowledge this analysis has uncertainty but recognize that this analysis is the only one of its kind in Kenya.

METHODOLOGY

This analysis uses cost-benefit analysis as its foundation.

ASSUMPTIONS

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

• 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 over 50 percent of animals that were treated survived as a result. In other words, if the intervention didn't take place the animals would have died.

RESULTS

We compare the results of the VERU system of delivery with the control which is not utilizing VERU and undertaking a similar vaccination using the County Baringo veterinary teams.

Table 1: VERU System response

1. Intervention details		
Treatments provided	Number	310,000
Animals treated	Individual	263,321
Animals saved	USD	131,667
Cost of Intervention	USD	163,488
Cost per treatment	USD	0.53
Cost per animal	USD	0.62
2. Estimates and discount rate		
Annual Income of Livestock Saved	USD/annum	1,741,209.7
Discount Rate	%	25%
3. Net present value over 1,3 and 5 years		4. Benefit/Cost Ratio
NPV 1 Year	USD 1,392,967.7	8.5
NPV 3 Year	USD 3,394,846.3	20.8
NPV 5 Year	USD 4,682,604.5	28.8

Key: (1). Basic intervention details based on VERU post-intervention reports
(2). Estimates of the potential income of the animals saved by the intervention
(3). Net present value (NPV) estimates over 1, 3 and 5 years
(4). Benefit-cost ratios over 1, 3 and 5 years

Table 2: Control: System without VERU training

1. Intervention details		
Treatments provided	Number	310,000
Animals treated	Individual	50,000
Animals saved	USD	25,000
Cost of Intervention	USD	163,488
Cost per treatment	USD	0.53
Cost per animal	USD	3.27
2. Estimates and discount rate		
Annual Income of Livestock Saved	USD/annum	330,625.90
Discount Rate	%	25%
3. Net present value over 1,3 and 5 years		4. Benefit/Cost Ratio
NPV 1 Year	USD 264,499.9	1.6
NPV 3 Year	USD 645,380.8	3.9
NPV 5 Year	USD 889,143.8	5.4

Key: (1). Basic intervention details based on information provided by Baringo County DVS – 50,000 animals over 60 days
(2). Estimates of the potential income of the animals saved by the intervention
(3). Net present value (NPV) estimates over 1, 3 and 5 years
(4). Benefit-cost ratios over 1, 3 and 5 years

INTERPRETATIONS OF RESULTS

The VERU response intervention activity in Baringo generated great benefits. Depending on duration, the present value of the intervention generated benefits of $8.5, $20.8 and $28.8 over 1, 3 and 5 years, respectively for every 1$ spent. In comparison, when VERU was not utilised the benefit was 80% lower than utilising the VERU.

Although it is the veterinary profession's duty to respond to disasters involving animals (Nusbaum et al., 2007), these demonstrates benefits of the strategy to include VERU training for disaster preparedness,

response and recovery activities to improve on efficiency and enhance livelihoods of livestock-dependent communities during disasters. Thus, VERU should viewed not only as an integral part of disaster recovery but ultimately as a supporting component of humanitarian relief work, and should be included as part of planning for disasters from the start (Buchanan, 2000; Nusbaum et al., 2007).

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 operations took place.

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.

REFERENCES

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