



**Southern Africa Newcastle
Disease Control Project
SANDCP**

July 2002 – October 2005

Independent Completion Report

to

AusAID

26 June 2006

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1. Schedule for the SANDCP ICR
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Glossary

ACIAR	Australian Centre for International Agricultural Research
ACR	Activity Completion Report
ADRI	Animal Disease Research Institute, Tanzania
AMC	Australian Managing Consultant
ATL	Australian Team Leader
AUD	Australian Dollar
AusAID	Australian Agency for International Development
CC	Country Coordinator
CCC	Country Coordinating Committee
CVL	Central Veterinary Laboratory, Malawi
DANIDA	Danish International Development Agency
Dira	Vision
DTL	Deputy Team Leader
FAO	Food and Agricultural Organisation of the United Nations
GRM	GRM International Pty Ltd
HIV	Human Immunodeficiency Virus
I-2	Thermostable, live, avirulent ND vaccine available for local production
ICR	Independent Completion Report
INIVE	National Veterinary Research Institute, Mozambique
LTA	Long-Term Adviser, SANDCP
M&E	Monitoring and Evaluation
MDF	Minimum disease flock
MoU	Memorandum of Understanding
Mw	Malawi
Mz	Mozambique
ND	Newcastle Disease
V4	Thermostable, live, avirulent ND vaccine
NGO	Non-governmental Organisation
OIE	World Organisation for Animal Health
PCC	Project Coordinating Committee
SADC	Southern Africa Development Community
SANDCP	Southern Africa Newcastle Disease Control Project
SOP	Standard Operating Procedure
Tsh	Tanzanian shilling
Tz	Tanzania
VIC	Veterinary Investigation Centre, Tanzania

Executive Summary

The participants in this project can be justifiably proud of its achievements. SANDCP made significant achievements in capacity building, community development and poverty alleviation through developing and implementing a model for ND control that should be sustainable. As a result Mozambique, Malawi and Tanzania are now world leaders in the control of ND in village chickens and are continuing to produce and use increasing amounts of vaccine. On several occasions during this review, village leaders expressed their appreciation and thanks for the project and the benefits that it had brought to their communities.

Factors that contributed to the success of SANDCP included:

- A proven technology in thermotolerant I-2 vaccine and the delivery mechanism.
- An organised campaign approach to vaccination of chicken populations.
- Significant and demonstrable benefits to users that were realised under operational conditions.
- Committed leadership with previous local experience in use of the technology.
- Collaborative management at project and national levels.
- Community consultation and participation.
- Careful training and extension to maintain quality control in the field.
- Quality control of vaccine production and distribution.
- Comprehensive and easily understood documentation of procedures.
- Budgetary control

Having been undertaken six months after the completion of the project, this review was able to investigate the short term sustainability of the SANDCP model. The report focuses on lessons learnt and particularly addresses issues related to the medium- to long-term sustainability of this model for successful ND control.

The SANDCP model has continued to be applied in the project villages since the end of the project and has been successfully adopted in many other communities. There is considerable potential for wider implementation within the three project countries and similar countries where improved health and production of village chickens does or can play an important role in addressing communities' needs and desires. Aspects of the SANDCP model could also be adapted where the control of other diseases by

vaccination or treatment would have a direct and demonstrable impact on the survival or productivity of villagers' and smallholders' animals.

It is very likely that the demand for vaccine will continue to increase as more communities are informed of the benefits. Inability to satisfy this demand or to maintain high levels of quality control in production, distribution and administration of vaccine threaten the sustainability of ND control. The partial cost-recovery systems that have been established in each country will have to be improved to ensure that all elements of the model are financially and technically sustainable, including procuring and maintaining laboratory equipment and consumables, timely delivery of vaccine to the field, training of extension staff and community vaccinators. In the near future additional laboratory and vaccine production staff will have to be trained not only to expand production but to maintain the required core knowledge and skill set.

It is recommended that AusAID:

1. Maintain an interest in the extension, adaptation and application of this successful model for ND control.
2. Engage interested regional groupings, governments and NGOs in applying the model in other countries, with input from ACIAR.
3. Assist the SANDCP partner countries integrate written ND control strategies into their national animal health programs
4. Assist the SANDCP partner countries develop sound business models for long-term sustainable ND vaccine production, distribution and administration.
5. Support training of laboratory scientists from these countries in virological methods and vaccine production.
6. Identify and secure partner government funds for specific activities in any future projects.
7. Consider increased full time management/coordination capacity in partner countries/regions in any future projects.

Acknowledgements

I would like to thank Ms Anita Menete of AusAID Pretoria and Dr Mahomed Harun (the former Deputy Team Leader) who were both frank advisers and good company during this review. Thanks also to the former Country Coordinators (CCs) who organised the visits and accompanied us in each country: Dr Anabela Cambaza, Dr Richard Mgomezulu and Dr Halifa Msami and to their respective drivers, Mr Armando Romao, Mr David Chimbwanda and Mr Adam Chale. Thanks also to Mr Augustino Kibaya who organised and accompanied us on the Dodoma visits. Finally, I would like to express my appreciation to the numerous people (listed at Attachment 2) who welcomed us and shared their views about SANDCP and ND control.

Background

Village chicken production has been recognised as an important means of alleviating poverty in Africa where outbreaks of Newcastle disease are the most serious constraint on chicken production (Kitalyi 1998). The goal of the Southern Africa Newcastle Disease Control Project (SANDCP) was to contribute to poverty reduction and increased food security in three countries of southern and eastern Africa. The project aimed to alleviate poverty in the short and long-term by providing assistance to all stakeholders to improve their ability to increase chicken and egg production through a decrease in Newcastle disease occurrence. This was to be achieved by an organised, coordinated and comprehensive vaccination program using the live thermotolerant vaccine, I-2, that had been developed by the University of Queensland and ACIAR to control ND among scavenging village chickens. ACIAR projects had successfully trialled I-2 vaccine, and its predecessor V4, in several countries in Asia and Africa during the 1990's. Although V4 or I-2 was used by some progressive individuals in some countries, broad and sustainable population level control of ND was not achieved.

AusAID implemented the 3-year SANDCP in partnership with the Governments of Mozambique (Mz), Malawi (Mw) and Tanzania (Tz) with the Australian Managing Contractor, GRM International and Uniquist. Project activities commenced in Mz and Tz on 1st July 2002 and in Mw in March 2003. A four-month extension to the end of October 2005 was approved to allow the implementation of activities aimed at ensuring the sustainability of the project outcomes.

This review was undertaken by by AusVet Animal Health Services Pty Ltd for AusAID with the following objectives:

1. To independently assess the relevance, efficiency, impact and sustainability of the SANDCP, in order to compile an Independent Completion Report (ICR) in accordance with the AusGuidelines
2. To validate the performance data and assessment ratings provided in the Activity Completion Report for the SANDCP.

AusAID provided the seventh draft of the GRM ACR as the basis of the review. The review was undertaken by David Kennedy, who visited the three project countries with AusAID and former GRM staff between 23 April and 6 May 2006. The schedule for the visits is at Attachment 1 and the people consulted is at Attachment 2.

An advantage of conducting the review six months after the end of the project was the short-term sustainability of the model could be investigated. This report focuses on lessons learned and particularly addresses issues related to the medium- to long-term sustainability of this model for successful ND control.

Review of Implementation Performance

Management and contracting arrangements

The design of the management arrangements contract was satisfactory	ACR	ICR
	Agree	Agree

The project had a strong GRM management team based in Mozambique which met biannually with the Program Coordinating Committee (PCC). At the national level, the three Country Coordinators (CC) worked closely with the team leaders and with Country Coordinating Committees (CCC) of various stakeholders, that met quarterly. The support from the management team and communication within and among countries was effective and greatly appreciated as it helped countries learn from one another and identify and solve issues more quickly than if they had to manage alone.

Country leadership

The Australian Team Leader (ATL) felt that the appointment of only one Deputy Team Leader (DTL) and the absence of DTLs in Mw and Tz was a deficiency in the project design. Locating the DTL in Tz or Mw, rather than in Mz with the ATL, may have partly overcome this deficiency as did the appointment of a Long Term Adviser (LTA) in Tz in 2004.

CCs were critical leaders in each country. Although they were meant to be only part-time appointments (50%) they had to commit far more time and energy as ND program activities expanded and this conflicted with their other duties. This occurred notably in Mw, where coordination of field activities was left to the Department and CC when the proposed partner, DANIDA, unexpectedly abandoned its village poultry program. More in-country support would have been appropriate to deal with the impact of this loss. Full time country coordinators would have facilitated implementation.

Budgetary control

The project budget was provided by AusAID through GRM and was managed carefully by the ATL. MoUs with partner governments listed activities that the governments would undertake but did not include budgets for those activities nor an undertaking that the governments should identify and set aside funds for the purpose. This appears to have been the result of two factors: not budgeting these activities in the project plan and the partners' national budgets having been approved before the SANDCP budget was finalised. As a result, from time to time governments could not fund some of the activities that they had agreed to undertake and sought financial assistance from GRM/AusAID.

The Australian funds were not transferred to the partners to manage. CCCs developed their own plans within the project plan and then sought approval to spend against this plan. While this allowed tight control of spending and prevented project funds being diverted to other activities, partners in each country raised the issue that they felt a certain lack of ownership and control. Having partner governments identify and commit funds to project accounts and providing more training in financial

management at the national level may have enabled increased delegation for spending at that level with confidence that project funds would be managed appropriately.

Activity objectives

The objectives of the activity were satisfactory	ACR	ICR
	Agree	Agree
The achievements of the activity were satisfactory	ACR	ICR
	Strongly Agree	Strongly Agree

The components of the project that were originally to be emphasised in the three countries as follows:

Components	Mw	Mz	Tz	Objectives
1 - Community		+	+	To develop effective and sustainable community participation and ownership of a Newcastle disease control program
2 - Vaccine	+	+		To provide the technical inputs required to support the development of an effective and sustainable Newcastle disease control program
3 - Extension		+	+	To provide effective training, education and awareness raising of relevant community members, NGOs, and vaccinators/village livestock workers in relation to Newcastle disease control and poultry husbandry.
4 – Project Management		+	+	To manage the project efficiently and effectively, meeting both the generalised standards outlined in AusGuidelines and complying with the specific requirements of the Contract between the Commonwealth of Australia and the Contractor.

As circumstances unfolded, all components were addressed to a significant extent in the three countries with Mw having to pick up field activities from DANIDA and Tz enhancing its vaccine production from 2004 following appointment of the LTA in Dar es Salaam. This and the uptake of vaccination and expansion of the SANDCP model to non-project villages and areas put stresses on staff and vaccine production that had not been anticipated. However these should be seen as indicators of the success of the project rather than shortcomings. Vaccine production and use had expanded since the end of SANDCP although drought conditions have reduced chicken numbers and demand in some areas this year. In the Dodoma district virtually no vaccination was undertaken in the first round in January.

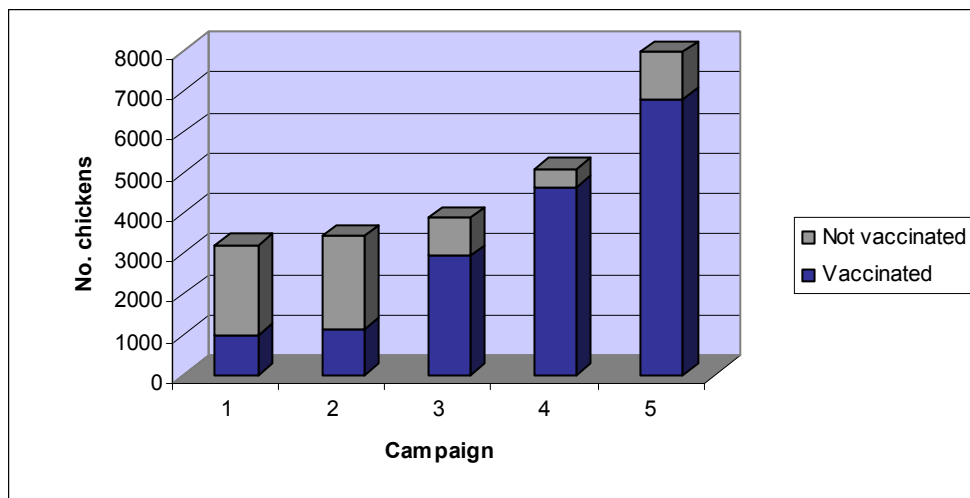
In Mz, INIVE produces wet I-2 vaccine in three periods to satisfy the demand for the three vaccination campaigns in the five project provinces. INIVE produced 1.86 million doses of wet I-2 vaccine in 2004 and 2.21 million doses in 2005. Another 0.76 million doses were produced in the first seven of eight batches produced for the

first campaign this year. The numbers of chickens vaccinated increased steadily from 90,000 in March 2003 to 414,000 in July 2005 and baseline surveys found that proportions of farmers vaccinating increased from 16 to 73% in that time.

Vaccine is produced virtually year round in Tz to satisfy the demand from non-campaign areas where vaccine is supplied direct to farmers. The number of doses of wet I-2 vaccine produced more than doubled from 3.34 million doses in July 03-March 04 to 7.3 and 6.9 million doses in the two years ending March 05 and 06. In the five project villages in the Dodoma districts, the numbers of chickens vaccinated fell by about a half from 21,000 after the first round in May 2003 (see Sustainability) but increased to 19,000 and 23,000 in May and September 2005.

In Mw, low volume vaccine production commenced for trials in mid-2004 and has gradually increased although the latest production data was not available. Monitoring and Evaluation data had not been collected and collated fully in Mw but in Kamuana village as an example, vaccination coverage increased from 28% of the 3,200 registered chickens in round 1 in August 2004 to 85% of the approx 8,000 chickens registered in the last round in December 2005 (Figure 1).

Figure 1. The numbers of chickens vaccinated over five campaigns to December 2005, Kamuana village, Malawi.



Drought and the need to sell chickens to buy food have reduced chicken numbers and vaccination activities in Mw and in Dodoma in Tz in 2006.

Development impact

The Activity will probably have a satisfactory overall impact	ACR	ICR
	Agree	Strongly Agree

Training and extension and the increased survival of chickens as a result of SANDCP has had an impact on development. There is now an understanding of infectious disease and population immunity and of the potential to manage some infectious diseases by vaccination. The visible benefits of vaccinating have increased confidence in technology and in investing in better housing and management and marketing of chickens, such as that undertaken by small poultry production groups in Mvumi Makulu and Nhinhi and the DIRA womens group in Chalinze in the Dodoma districts.)

The income derived from chickens has also enabled some farmers to invest in larger livestock.

Poverty Reduction

The impact of the activity upon poverty was satisfactory	ACR	ICR
	Agree	Strongly Agree

The impact on reducing poverty was highlighted in project reports. During the review, people typically told of having increased their chicken numbers from around 0-5 to 20-40 through control of ND. Reduced chicken losses has led to improved nutrition through increased consumption (for home use, celebrations, guests, etc) and/or sales of chickens for cash, thus increasing buying power and options.

There is a preference for village chicken meat over commercial broiler meat in large cities that results in a price premium. During recent droughts, chicken prices have also appreciated allowing villagers to keep pace with inflating food prices. During the review we were told that the ability to sell chickens to buy food saved some people during recent famine in Mw and Tz.

In more normal times, people have used the proceeds of chicken sales to support education, to buy clothes, housing materials and medicines and to upgrade to larger livestock.

Opportunities may also be developing for further marketing of vaccinated chickens to replace birds in villages wishing to expand chicken production or where numbers have been decimated by drought. The people of Mvumi Makula were pleased to have sold young vaccinated chickens to other villages for TSh 2000. The Nala community in Dodoma said that members recently received price premiums of 30% to 50% respectively for vaccinated cockerels and hens because they were in better health and of superior weight and quality.

Cross-Sectoral impact

Environmental impact

The impact of the activity upon the environment was satisfactory	ACR	ICR
	Agree	Agree

No data on environmental impact was identified but, as most village chickens are scavengers, it is unlikely that increasing numbers will have a significant environmental impact. Unlike cattle, the benefits of having increased numbers of chickens is in being able to consume or sell them and there is little prestige in keeping increasing numbers of chickens as visible assets.

Gender impact

The differential gender impacts of the activity and gender components were satisfactory	ACR	ICR
	Strongly Agree	Strongly Agree

SANDCP empowered women as community vaccinators and as income providers, especially where the men are mainly interested in cattle or where they are away working (eg in the mining industry). In Chalinze in Dodoma, the control of ND has allowed the DIRA womens group to pursue further development of their village poultry enterprises.

Health and wellbeing

The increased nutrition from consumption of eggs and chickens should have a positive effect on health including people's capacity to deal with HIV infection. Improved buying power improves access to medicines. Better clothes and housing would also be expected to contribute to improved health.

Education

During the review many women said that they spent their extra income on their children's school fees and on exercise books. Combined with improved nutrition, these investments could result in improved learning and literacy.

Cost-Benefit Analysis

The activity's benefits as compared to costs are satisfactory	ACR	ICR
	Agree	Agree

The project cost AUD 6.1 million. Formal cost-benefit analysis has not been provided but the ACR calculated the direct cost of annual losses that could be avoided as AUD 60 million if ND was substantially prevented in the three countries. This was not a project objective and has not yet been realised, however it could be achieved in the future. The potential medium to long-term benefits however extend beyond reduced chicken deaths as has been discussed above. SANDCP has established and implemented a disease control model that has the potential to provide substantial benefits not only in the three project countries but in others as well. For the farmers and vaccinators, participation in vaccination programs has clear financial benefits.

Value for Money

The activity's value for money is satisfactory	ACR	ICR
	Strongly Agree	Agree

This is a rather subjective assessment that suggests comparison with alternative investments that are not available in this review. Having said that, the management of the project, the commitment of the project personnel and the impact on poor people's lives suggests that AusAID did get good value for its investment.

Monitoring of activity

The monitoring of the activity was satisfactory:	ACR	ICR
	Agree	Agree

As well as undertaking comprehensive baseline surveys, the project developed a simple but informative ongoing M&E system to collect data on vaccination coverage at the village level and to collate data at the regional and national levels (M&E data, summarised at village level, is the basis for Figure 1). This was completed for Mw and Tz and some data was summarised in the ACR. However data from Mw is still to be collated and reported. This was partly affected by the DTL's illness and surgery last year but he has now taken steps with the CC in Mw to finalise this reporting.

Data collection is being facilitated by preprinting of simple registers in Mw and Mz with the data columns that are set out to record vaccination coverage for each household over the three campaigns in each year. Data on the numbers of households newly vaccinating, revaccinating and not vaccinating has not been supplied consistently, nor have reports when three or more households in a village experience chicken deaths.

Particular attention should be paid in all areas to ongoing collecting, collating and reporting of this data. Not only does it monitor the activity but provides valuable data to support investment in ND control by government and NGOs and aid organisations.

Further publication and dissemination of data collated at the different levels will be useful information for extension, promoting further uptake and for regional/district authorities considering ongoing support and funding. The impact of this data will be enhanced by presentation in graphical format.

Technical assistance, training and capacity building

The technical assistance provided under the activity was satisfactory	ACR	ICR
	Strongly Agree	Strongly Agree

The success of ND control in the project areas and the ACR attachment on Capacity Building are evidence of the significant achievement in training and technical

assistance. This was also reflected by the confidence about the future of ND control and about village chicken production among many people with whom we met during the review.

As well as the training courses and ongoing advice, the careful documentation of procedures in extension manuals and laboratory standard operating procedures represent valuable resources for the further expansion of ND control using the SANDCP model.

Procurement

The design of the management arrangements contract was satisfactory	ACR	ICR
	Agree	Agree

In general, procurement appeared to be well managed with tight budgetary control. Care was taken by the ATL to procure assets and consumables cost effectively, although this occasionally contributed to delays in procuring some items. The supply and servicing of some equipment however was not satisfactory.

In Mw, two important pieces of laboratory equipment that were ordered by SANDCP, a minus 86°C freezer for storing master seed virus and an analytical balance, had still not been delivered by the Tanzanian supplier by late April 2006. A bench balance has also been delivered, but not installed, by the same company. In Tz, this company was used as a preferred supplier for some laboratory equipment including a laminar flow cabinet. It was delivered and installed although the frame on which it was installed was of low quality. The company had agreed to replace it but this had not occurred at the time of the review. The purchases from the company in Tz did not follow standard tendering processes. Instead of obtaining three pro-forma invoices, as was project policy, a less formal assessment of potential products and suppliers was conducted by the LTA. Although enquiries have been made through the former DTL to the AMC, the reasons for this approach have not been clarified at the time of finalising the report.

In Mz, concern was expressed that the partner agency did not support and had argued against some actions taken by the management team, particularly in relation to the publishing of extension materials. For example, the 2006 ND control calendar was printed with the former SANDCP contact details (which are no longer valid), despite the partner agency's advice to the management team to use the contact details for the government agency that now manages ND control .

While procurement of specialised equipment from single source or preferred suppliers is desirable where the product and service quality and price have been demonstrated to be superior, favouring a single supplier has resulted in some unsatisfactory outcomes. On the other hand, government purchasing rules that require five pro-forma invoices in Tz are obstructing the timely procurement of the standard eye droppers that have been adopted for I-2 vaccination from the agreed South African supplier (which was originally selected after a formal selection process).

Risk management

Risk Management for the activity was satisfactory	ACR	ICR
	Agree	Agree

SANDCP was an ambitious project that involved numerous people in management, vaccine production, training and extension and vaccination delivery over wide and relatively undeveloped areas in three countries. The risks were many and high. That the project has been so successful indicates that they were generally managed well by the committed management team with the PCC and by CCs and their CCCs.

Activity management

The performances of the Joint Management Committee, Partner Governments, Implementing Agencies, AusAID and AMC were satisfactory.	ACR	ICR
	Agree	Strongly Agree

The management structure and contribution at all levels was impressive and generally functioned well. Strong leadership combined with a consultative structure from the PCC to village participation contributed greatly to the success of the project. The procurement issues that were noted previously were not consistent with this high standard of management and should not detract from the overall satisfactory rating of management.

Management may have been enhanced by having full time CCs and by the DTL being located in a different country to the ATL.

The involvement of recipients/beneficiaries in the activity was satisfactory.	ACR	ICR
	Agree	Strongly Agree

Discussions with village leaders, community vaccinators and chicken farmers during the review indicated a high level of ownership of ND control, indicating an appropriate involvement in SANDCP. While communities sought further financial assistance, for instance in expanding vaccination coverage, suggestions for improvement were usually constructive and recognised that many of them were in the communities' own interests and within their capacity (for instance, buying a bike from vaccinators profits).

Sustainability

The long term impact of the project and its contribution to alleviating poverty will depend on the SANDCP model or effective derivatives being effectively applied in the project areas and adopted elsewhere. While the SANDCP model is sustainable, improvements will be needed to ensure sustainability in the respective countries.

The following sections cover the major issues under the same headings as the ACR.

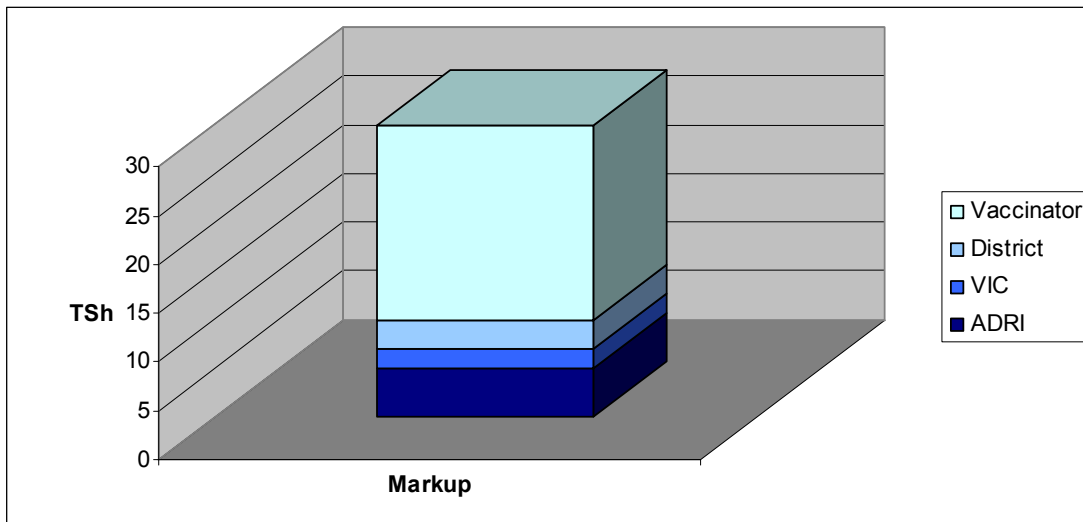
Financial sustainability

The activity is financially sustainable.	ACR	ICR
	Neither Agree nor Disagree	Disagree

The current cost recovery systems that have been established in all countries do not meet the full costs of vaccine production, distribution and administration. Mw is setting up a separate account within the Department’s Trust Fund Account from which vaccine production costs can be drawn. Tz is also hoping to establish a separate account. Medium to long term sustainability requires near full cost recovery for all stages of the process.

Laboratory costs are only a small proportion of the the current vaccine price to villagers however the current inability to cover costs at the laboratory in Tz, is threatening sustainability and the required increases in vaccine production. An increase in price from 2 to 5 TSh would allow staff to be paid overtime allowances, purchase of additional incubation capacity and the more timely purchase of the standard eyedroppers (without having to resort to government tendering procedures). For instance in Tz, the components of the proposed pricing structure that is expected to be approved, now that the vaccine has provisional registration, are presented in Figure 2.

Figure 2. Proposed pricing structure for wet I-2 vaccine in Tanzania assuming a price to the farmer of TSh 30.



Given the high level of demand for the vaccine among farmers, that village chickens sell for 100 times the cost of the vaccine (about TSh 3,000), that there are very few other production costs and that production and distribution margins account for only a third of the final price, there is probably an opportunity to increase the price to farmers and fund other components of the vaccination program from within the cost recovery system. Sound business models in each country could also provide funds for training and extension.

Strategic AusAID support

Support of the Kyeema Foundation to help sustain the program in Mw this year should prove to be effective. CCs have identified other areas where marginal assistance could be expected to have a significant pay-off. The sustainability of ND control in these countries and initiation of the SANDCP model in others will be facilitated by strategically directed, short term and modest investments by AusAID.

Technical sustainability

The activity is technically sustainable	ACR	ICR
	Agree	Agree

The technical components that will sustain the activity and its benefits have been clearly identified during the project and have been implemented successfully. These are also well understood by the stakeholders in each country and are have been applied since the end of the project. To ensure that sustainability and expansion of the impacts are achieved in the longer term, there will continue to be ongoing issues that will need to be managed.

Training and extension

Comprehensive training and extension was a vital component of SANDCP that differentiated it from former attempts to apply thermotolerant ND vaccines. This will need to be sustained and the opportunity exists to enhance the model by extending the lessons and improvements from some of the more successful communities. For instance, in Dodoma, Nala village is organising the purchase of a bicycle by the community to enable greater mobility and coverage by their community vaccinators and the Chalinze womens groups have improved their poultry rearing, housing and feeding and are now moving to improve the marketing of their chickens.

Ability to produce vaccine

The increasing demand for vaccine places a demand on the vaccine production capacity within the short time frames permitted by the wet I-2 vaccine’s shelf life. The inability to satisfy demand and maintain quality control represents a major threat to sustainability. The estimated chicken populations of the three countries are 8 million birds in Mw, 26 million in Mz and 27 million in Tz. Taking the most successful vaccine producer as an example, national coverage with I-2 in Tz would require 80 million doses annually. In the past three years, production has increased to 7 million doses per annum; that is, less than 10% of the current potential market, that itself would probably increase with by the successful control of ND.

Some of the resources required are in limited supply in each country. These include trained staff who are skilled in virological methods, adequate supply of eggs from low risk (MDF) flocks and adequate incubator, packaging capacity and cold storage capacity.

In Mw, the government has purchased a new larger incubator to supplement two small incubators provided by SANDCP to the CVL but this is still considered to be insufficient capacity to produce vaccine and to undertake the thermostability tests

required for registration. The virology laboratory staff have other duties and has also lost two of its three staff who had been trained in I-2 vaccine production.

The issue of installing and maintaining sophisticated equipment (see Procurement) is a threat to the continued manufacture of vaccine. As well as the examples in Mw, INIVE in Mz has a freeze dryer, funded by another donor, that had still not been installed six months after delivery. The relatively small markets for sophisticated laboratory equipment in the three project countries leaves them susceptible to poor installation, training and servicing by the suppliers.

There is also a need to maintain adequate supplies of eggs from chickens that satisfy the appropriate health requirements (currently MDF). Mw has had difficulty procuring reagents from its South African supplier to conduct three-monthly monitoring of its flock for mycoplasmosis and White Bacillary Diarrhea (Salmonella). An inability to routinely monitor the status of the flock may compromise achieving and maintenance of vaccine registration in Mw. Commercial suppliers have been used in Mz and INIVE is developing its own flock of 400 birds that should supply approximately 1200 eggs per week from 2007. Although an alternative supplier was to have been identified in Mw during the project, this has not yet occurred. Tz is in a better position, having the option of at least two large commercial egg suppliers.

The possibility of central manufacture of vaccine, and distribution to other countries, has been considered previously and may be more attractive once registration is achieved and mutually recognised. This option would be more attractive for a freeze-dried vaccine with its longer shelf life.

Timing of Vaccination Campaigns

One of the successes of the SANDCP model was the strategically timed vaccination campaigns every four months. However these short campaigns put considerable stresses on the production and distribution systems because of the relatively short shelf life of the wet I-2 vaccine. In each country this timing has been standardised but in the larger countries like Mz and Tz, different climatic patterns may allow campaigns to be staggered across the country to smooth-out the demand for vaccine. In any case, it is timing the first round of vaccinating so that it precedes the seasonal peak in ND that is really critical. If high vaccination coverage and population immunity is achieved and maintained at regular intervals, the seasonal timing of subsequent rounds is less important. Analysis of surveillance data on the reported incidence of ND may identify the appropriate start months in different climatic regions.

Distribution of vaccine

Highly sustainable distribution technology was developed by SANDCP. Kerosene/paraffin or electrical (including solar powered) refrigeration is becoming increasingly available at district offices and in some communities at health clinics and hospitals. Vacuum flasks and woven baskets with damp cloths provide sufficient cooling to protect the vaccine once collected by the community vaccinators.

The major cost that needs to be covered is in actually transporting the vaccine speedily from the laboratory refrigerated store to the district office or NGO field

office. This usually requires a personal trip by vehicle as public buses are not considered sufficiently reliable. For distant locations in Mz, air freight is used.

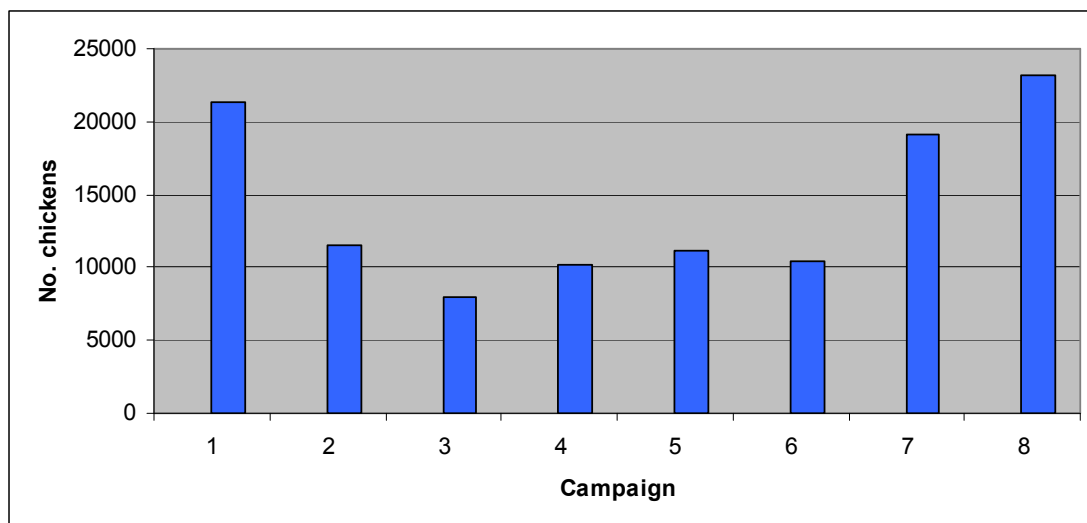
Wastage of vaccine

It has been estimated that in Mz, only 55% of the 3.3 million doses of distributed vaccine was used between March 2003 and July 2005. This however improved from about 30% to 70% over the course of that period as community vaccinators became better organised. Training vaccinators in better organising their rounds and different pricing structures may be appropriate to further encourage efficiency.

Community ownership and confidence in vaccination

The visible outcomes of vaccinating, individual’s paying for vaccine, having trained community-based vaccinators and the pre- and post- vaccination extension and consultation all contribute to achieving and maintaining a high level of community ownership and commitment to ND control. Experience has shown however that a major threat to community confidence has been outbreaks of ND and other diseases such as fowl pox and coryza and a misunderstanding about the role of ND vaccine in preventing other diseases. Outbreaks of ND at the time of vaccinating in some Dodoma villages in 2003 resulted in incubating birds being vaccinated and subsequently dying. This shattered confidence and vaccination coverage has only recovered recently (See Figure 3).

Figure 3. Numbers of chickens vaccinated in five project villages in the Dodoma district over eight ND vaccination campaigns from May 2003 to September 2005.



High levels of extension, quality control of vaccine handling and administration need to be maintained. Poultry disease outbreaks need to be investigated and reported and the relevant community must be informed of outcomes of these investigations.

Complementary vaccines

There is interest among users and there appears to be a legitimate place for complementary ND vaccines that overcome this weakness of wet vaccine while maintaining many of the advantages of I-2, notably its thermostability. Rather than using other vaccines that rely heavily on the cold chain or have to delivered by

injection with the risk of needle stick injuries (a disadvantage in areas where HIV is endemic), using freeze-dried I-2 strategically appears to be the most appropriate solution.

Successfully using freeze-dried vaccine will require new skills among community vaccinators but appropriate selection and training should enable high standards to be achieved. The risk of excessive dilution of the reconstituted vaccine with water could be partly addressed by diluting the vaccine at district offices before it is given to vaccinators, increasing the virus titre and/or colouring the diluent.

The true prices of wet and freeze dried I-2 vaccines has been investigated during the project. In Mz, freeze-dried vaccine in vials was estimated to be about twice the cost of the wet vaccine supplied in droppers. Options for the use of freeze-dried vaccine, probably complementing and possibly being cross-subsidised by wet vaccine, should be included in business models for sustainable ND vaccination.

Institutional sustainability

The activity is institutionally sustainable	ACR	ICR
	Agree	Agree

Institutional ownership, capacity and structures were developed in each country during the project that should sustain successful ND control and deliver ongoing benefits. The following comments however identify areas that deserve to be managed carefully to ensure long term sustainability.

Government commitment

Governments have indicated that they are committed to maintaining and expanding ND vaccination programs and the demand from new farmers and districts for access to I-2 vaccine is likely to maintain political pressure. Tz published a draft national strategy in October 2004. In Mw, ND control has been integrated into the draft national animal health budget for 2006-07, although allocations had not been notified at the time of the visit. In Mz, the government is also using elements of the SANDCP model for vaccination programs in five other provinces that currently use *ItaNew* vaccine.

However high level decision makers in government will need continued reminders of the success of ND control and the need to provide structures and staff to support ongoing control. This may be facilitated by integrating succinct reporting of vaccination uptake and of the incidence of ND by region and over time into national surveillance programs. Graphs and maps would be useful means of communication to busy managers and politicians.

Role of NGOs

NGOs interested in ND control have a sound model in SANDCP. Those with a strong commitment to poultry production and food security for villagers are key players in supporting government agencies in ongoing training, extension and implementation of the vaccination programs. These include the Kyeema Foundation, Inter Aide and Concern Worldwide in Mw and World Vision in the Dodoma District in Tz. Heifer International is planning a collaborative approach with Kyeema in new areas.

Some NGOs however are not charging for vaccine. It is important that NGOs also develop the community cost-recovery mechanisms that are considered important for ownership and sustainability.

A salient lesson in Mw was that the NGOs approached by the CC to participate have been disappointing partners while others that sought to be involved have been actively implementing training, extension and vaccination programs. Involving NGOs in planning programs would help identify and commit partners early and enable the design to describe their responsibilities and requirements.

Registration of vaccine

All three countries are planning to register the I-2 vaccine to better guarantee its quality and effectiveness to users and potentially expanded sales networks within country and new markets in neighbouring countries. Only Tz has achieved provisional registration at this stage. In Mz, the registration authority is new and the I-2 submission from INIVE is the first it has considered. The authority had demanded a “increasing virulence test” be undertaken to OIE standards but is now planning to seek advice from other countries using the vaccine on any evidence of virulence. Mw is yet to conduct the recommended thermostability test.

There is an opportunity for collation and circulation of material on virulence and from the varous countries using I-2 as a resource for others seeking assurance or registration.

Extension to other African countries

The initial concept and design for this project was to include other SADC countries over a five year period. When the design and budget was contracted to three countries over the three years, other SADC countries apparently lost contact and interest. Extension of the model to these countries may require concerted input.

Phase-Out/Exit Strategy

The activity phase-out strategy is satisfactory	ACR	ICR
	Agree	Neither Agree nor Disagree

All three countries have indicated an ongoing commitment to application of the SANDCP model and presented draft strategies to the 5th PCC meeting in 2005. Tz has a draft national strategy but Mz and Mw do not have written program plans. The Mz government is however maintaining training and operational activities and Mw is incorporating ongoing ND control into its national animal health program and will continue to support NGOs.

There has not been a clear-cut exit in Mz and government officers raised concerns about assets. This was immediately taken up with AusAID in Pretoria and with GRM. Their main issue was that some significant assets (including vehicles) had still not been transferred by April 2006, six months after the end of the project. An audit and acqittal statement of the fate of assets may be appropriate.

Lessons Learnt

Factors that contributed to the success of SANDCP included:

- Proven technology in thermotolerant I-2 vaccine and the delivery mechanism.
- An organised campaign approach to vaccination of scavenging chicken populations.
- Significant and demonstrable benefits to users that were realised under operational conditions.
- Committed leadership with previous local experience in use of the technology.
- Collaborative management at project and national levels.
- Community consultation and participation.
- Careful training and extension to maintain quality control in the field.
- Quality control of vaccine production and distribution.
- Comprehensive and easily understood documentation of procedures.
- Budgetary control

Improvements could have been made in

- Additional full time project management/coordination.
- Procurement, installation and servicing of some laboratory equipment.

Conclusions and Recommendations

SANDCP successfully addressed AusAID's goals of poverty alleviation and capacity building not only in the project areas but in other areas that have taken up this model for ND control. It has also increased Australia's standing among the people who have participated in and benefited from the project.

Poverty among village families has been alleviated by improved food security and nutrition and increased income. The prevention of large scale losses previously caused by ND is also allowing villagers to look to other improvements in chicken production that should have further impacts on poverty and empowerment. As one woman in Dodoma said during the review, it has made the people feel good about themselves.

Even though some consider the three year term of the project to have been too short, SANDCP did meet its objectives and accomplished most of its planned activities. Extensive training has been undertaken and valuable training methods and aids developed. Vaccine is being successfully produced in three laboratories, delivered and administered effectively so that ND has been largely prevented and chicken numbers and offtake increased substantially.

It is very likely that the demand for vaccine that has persisted since the end of the project will continue to increase as more communities are informed of the benefits. Inability to satisfy the demand for vaccine or to maintain high levels of quality control in production, distribution and administration of vaccine threaten the sustainability of ND control. The partial cost-recovery systems that have been established in each country will have to be improved to ensure that all elements of the model are financially and technically sustainable, including procuring and maintaining laboratory equipment and consumables, timely delivery of vaccine, training of extension staff and community vaccinators. In the near future additional laboratory and vaccine production staff will have to be trained not only to expand production but to maintain the required core knowledge and skill set.

It is recommended that AusAID:

8. Maintain an interest in the extension, adaptation and application of this successful model for ND control.
9. Engage interested regional groupings, governments and NGOs in applying the model in other countries, with input from ACIAR.
10. Assist the SANDCP partner countries integrate written ND control strategies into their national animal health programs
11. Assist the SANDCP partner countries develop sound business models for long-term sustainable ND vaccine production, distribution and administration.
12. Support training of laboratory scientists from these countries in virological methods and vaccine production.

13. Identify and secure partner government funds for specific activities in any future projects.
14. Consider increased full time management/coordination capacity in partner countries/regions in any future projects.

Reference

Kityali AJ. 1998. Village chicken production systems in rural Africa – household food security and gender issues. FAO Animal Health and Production Paper 142. Rome 1998. 81pp

Attachments

1. Schedule for the SANDCP ICR
2. People consulted

Attachment 1

Schedule for the SANDCP ICR

Day	Time	Activity
23rd April	Am	Arrival at Johannesburg airport – day room at Holiday Inn.
Sun	Pm	Meeting with AusAID; Travel by air to Maputo – JHB /MPM -flight TM 318 19:40 – 20:40 - Cardoso Hotel.
24 th April	Am	Meet former team leaders, Drs Alders and Harun
Mon	Pm	Travel to Xai Xai, Gaza province
25th April	Am	Meet provincial and district staff.
Tue	Pm	Meet Coca Missave and Riguane communities Return to Maputo - Cardoso Hotel
26 th April	Am	Meet INIVE staff
Wed	Pm	Meet Ministry of Agriculture Staff
27 th April	Am	Travel by air to Lilongwe MPM/JHB TM 301 07:00 – 08:00 / JHB/LIW flight SA 170 10:20 – 12:45 – Hotel Korean Garden
Thu	Pm	Meet Malawi Country Coordinator and Coordinating Committee members
28th April	Am	Meet Lilongwe Agricultural Development District. Visit Kamuana village
Fri	Pm	Meeting staff Inter Aide NGO, Nkhoma and community vaccinators
29 th April	Am	Meet CC and inspect CVL
Sat	Pm	Report Writing
30 April		Travel by air to Tanzania - Hotel Peacock Dar Es Salaam
Sun		
1 st May	Am	Travel to Dodoma by road – Hotel Dodoma
Mon	Pm	Meet Country Coordinator and Dodoma district poultry specialists
2 nd May	Am	Meet DALDO managers and Nala community
Tue	Pm	Meet World Vision ADP, Cipanga
3 rd May		Meet Mvumi Makulu, Nhinhi and Chibelela communities
Wed		
4 th May	Am	Meet Vikonje and Chalinze communities.
Thu	Pm	Return to Dar es Salaam – Hotel Peacock.
5 th May	Am	Meet Livestock ministry managers and vaccine laboratory staff at ADRI
Fri	Pm	Review project with former DTL
6 th May		Travel by air to Johannesburg DAR/JHB SA 7166 09:30-12:10 (for Mr Kennedy)
Sat		

Attachment 2

People Consulted

Australia	
Dr Peter Spradbrow	International Rural Poultry Centre

Mozambique	
Dr Robyn Alders	Kyeema Foundation. Former ATL
Dr Mavale, Dr Libombo, Dr Florencia Cipriano	Ministry of Agriculture – Animal Health & Rural Extension.
Dr Anabela Cambaza	Country Coordinator
Dr Zacarias Massicane, Dr Constantino Banze, Eng Azaiel Macuacua, Eng Paulo Mumembue, Sr Acacio	Office of Provincial Director – Livestock Services & Rural Extension, Gaza Province
Mr Huberto	Oikos (NGO)
Extension staff, vaccinators and approx. 50 people	Renguane (Macia District) and Coca Missava (Chabuto District)
Dr Paula Dias, Dr Belmira Mata, Dr Amilear da Silva	INIVE, Maputo

Malawi	
Dr WG Lipita	Steering Ctee and Directorate of Animal Health and Livestock Development
Dr Richard Mgomozulu	Country Coordinator
Mr Timothy Zedi Chunga, Mr Banda, Mr Hwana	Lilongwe ADD
Mr Luka Tumbwe, Ms Alice Marive, Mr Chikanga	Poultry Specialists, Livestock officer, Kamuana
Village chairman, community vaccinators and approx 70 people	Kamuana Village
Mr H Ganizini, Mr Hezekia Goliati, Mr Mazantso Thawale	Inter Aide Agricultural and Health Education Unit, Nkhoma

Tanzania	
Dr Halifa Msami	Country Coordinator
Dr Samson Muniko, Mr Hamisi Mgalula	Dodoma Region
Mrs Susan Bidya	Dodoma Rural District Executive Director
Mr Roble Notary, Dr Stewart Msengi, Mr Augustino Kibaya	Dodoma Rural District, Agricultural and Livestock Development
Mr Emmanuel Omuyanje	Dodoma Municipal District Coordinator
Ms Daina Mwiwanga, Dr Boniphace Tibatduka, Mr Kawedi Mlawe	Dodoma Municipal District, Agricultural and Livestock Development
Mrs Paskalia Elias	Extension Officer, Nala Ward

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Village chairman, 3 community vaccinators and approx 20 people	Nala Village
Mr Hilmar Mtega and Mr Kenneth Mbatu	World Vision, Cipanga ADP, Dodoma
Mr Aron Chomola	Mvumi Makulu Divisional Councillor
Ms Theresia Mkufya	Extension Officer, Mvumi Makulu
Village chairman, 2 community vaccinators and 5 farmers	Mvumi Makulu
Mr Maulidi Matunda	Extension Officer, Nhinhi
Village chairman, 4 community vaccinators and 7 farmers of	Nhinhi
Mr Mpanda	Principal Livestock Field Officer, Chibeleda
Village chairman, 2 community vaccinators and 6 farmers	Chibeleda
Mr Yahaya Kimolo	Extension Officer, Vikonje
Village chairman, 4 community vaccinators and 3 farmers	Vikonje
Mr Antoni Sahali	Extension Officer, Chalinze
Village chairman, 4 community vaccinators and approx 20 farmer members of the DIRA women's group	Chalinze
Dr S Das	Director, ADRI, Dar es Salaam
Dr AM Kapaga	ADRI Pathology Section
Dr P Njau	Assistant Director, Animal Health Services
Dr J Mollel	Acting Director of Veterinary Services
Dr SB Mena	Acting Director, Livestock Research & Training
Mr G Joshua, Ms P Makaroma & Ms A Mella and Dr G Shirima	Manager and staff, ND vaccine laboratory, ADRI