



ITM2 SCALE PROJECT IN TANZANIA

Vaccinator meetings proceedings

DRAFT REPORT

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Acronyms

CBO	Community Based Organizations
DRT	Director of Research and Training
DVO	District Veterinary Officer
DVS	Director of Veterinary Services
ECF	East Coast Fever
FBO	Faith Based Organizations
ILRI	International Livestock Research Institute
ITM	Infect and Treatment Method
LGA	Local Government Authority
LN	Liquid Nitrogen
LTR	Local Technical Representative
NGO	Non-Governmental Organization
PMO	Prime Minister's Office
RVO	Regional Veterinary Officer
TAVEPA	
TBS	Tanzania Bureau of Standards
TFDA	Tanzania Food and Drugs Authority
VCT	Veterinary Council of Tanzania
ZBC	

1. Introduction

This is a report of the proceedings of three ECF vaccinators meetings held in Mwanza, Arusha, and Dar es Salaam on 3rd, 5th and 7th December 2015 respectively. The aim of the meetings was to engage with vaccinators who will ultimately be able to participate in the scaling up project of the Infection and Treatment Method (ITM) of immunization against East Coast fever in Tanzania. The meetings targeted ECF vaccinators who have been training and active or not active in ECF vaccination. The meetings also intended to collect baseline information which will help setting verifiable indicators during the implementation of the project.

ITM Scaling up in Tanzania is a 2-year USAID-funded project aimed at increasing the availability of ITM vaccine to more livestock keepers. This project aims to facilitate the expansion of the distribution networks. This will involve recruitment of additional distributors and expanding the network of distributor agents for new and existing distributors; also the project intends to train, equip and link vaccinators to cattle keepers through innovative linkage mechanisms.

Three meeting in three zones of Tanzania were organized in Mwanza, Arusha and Dar es Salaam. The Mwanza meeting brought together vaccinators around the lake zone; these were from Mwanza, Mara, Shinyanga, Simiyu, Kagera, Geita and Kigoma regions. The second meeting held in Arusha had participants from Arusha, Manyara, Tanga and Kilimanjaro regions. The last meeting held in Dar Es Salaam had participants from Dar Es Salaam, Coast, Mbeya, Iringa, and Njombe Regions

The meeting objectives were;

- To introduce the vaccinators to the project
- To gain vaccinator buy-in for strengthening ITM dissemination
- To elicit vaccinators' perceptions on critical issues to be addressed by the project

The three meetings were attended by existing ECF vaccinators and would be ECF vaccinators from around the country. Representative from Government (DVS) also attended the meetings.

2. Vaccinators Meeting- Mwanza 3rd December, 2015

This meeting was held at the Gold Crest hotel in Mwanza. The meeting was attended by 72 participants from Mara, Mwanza, Kagera, Simiyu, Geita, Shinyanga, and Kigoma Regions.

2.1. Opening

This meeting was formally opened by Dr. Genchwere@@@ on behalf of the DVS. Dr. Genchwere welcomed all the participants to Mwanza, and wished them a warm stay in Mwanza with good deliberations during the meeting.

The meeting started by a round of introduction of all participants and their affiliation organisations. During introduction participants were asked if they have been trained on ECF vaccination or they are

vaccinating currently. It was immediately realised that most of the participants have not been trained on ECF vaccination only 11 out of 72 participants were trained.

2.2. Participants were informed that the objective of the meeting was twofold, first was to introduce the ITM scale up project to the participants. The project is funded by USAID and will be implemented in Tanzania for a period of two years. Secondly, was to obtain baseline information on vaccinators and obtain the experience of the vaccinators during the actual vaccination activities. The participants were then given an overview of the one days program.

2.3. Project Overview and Rationale

Dr. Henry Kiara presented an overview of the project, and the rationale for scale up. He emphasised the importance of ECF vaccination.. ECF is one of major constraints in livestock productivity and hence lead to economic losses to farmers. Different studies have proven, smallholders farmers losses are up to \$ 4.4million (MacLeod and Kristian 1999), pastoral and agro-pastoralist faces economic losses of up to \$ 129.5 million (Minjau and Macleod 2003)

These economic losses are enormous and this justifies the efforts to scale up ECF immunization. ECF immunization has more advantages than other existing alternatives such as use of acaricides which leads to resistances and it is also difficult to manage, the chemotherapy option is expensive and zero grazing is not absolute and is not feasible in some areas. So vaccinators and would be vaccinators were informed that, ECF which has proved successful need to be up scaled. Hence, ILRI is implementing *ITM2Scale* project in Tanzania for 2 years.

The challenges which faces ECF immunization were pointed out, these includes but not limited to; i) inadequate coverage by existing distributors, ii.) Existence of trained distributors but who lack equipment and financing mechanism, and iii.) Limited cold chain infrastructure – LN, vaccinators also lack business orientation.

To address the above challenges the objectives of *ITM2Scale* project were mentioned as follows; i) to expand distribution reach of the vaccine, ii) to sensitize and create awareness to farmers and other actors, and iii) to improve vaccine delivery by involving other animal health actors.

2.4. Discussions

Participants in Mwanza discussed various aspects of ECF vaccination, mainly from their knowledge of the disease and because also they are professional in the veterinary field. A few of them have participated in the vaccination of ECF using the ITM method. Those who have the knowledge are those who participated in the 1990s.

It was noted that awareness is still low along the lake zone. The level of awareness is both low from the farmers as well as the vaccinators. Business orientation also was not much higher, as most of the participants who participated were from public, and those who vaccinated were mostly those who did through public. Some participants were still insisting on the public approach. However after the presentation, the vaccinators were able to start change their orientation and start to understand, how this is a business and not a service. They also started to understand how they can participate in the supply chain of the business. The spirits were high among the participants, and this has been backed by willingness to contribute for ECF training.

The observation suggests that the upscale in lake zone would need a well-tailored awareness to address the farmers, (address the belief that that the decease is not in existence in the area, also to address the vaccinators to change their orientation and take ECF vaccination as a serious business.

2.5. Session II: Responding to the Questionnaire

The second session of this meeting was to respond to the questionnaire designed to collect important baseline information for the project. Before responding, vaccinators consent was sought. A consent form was introduced and read to the participants, each section of the form was elaborated. All participants agreed and signed the consent form.

The two page questionnaire had six sections. The first section was identification, the second section covered ITM history and successes, the third section covered questions on monitoring and evaluation. Section four covered business links & services, section five covered ITM training and section six covered outlook for ITM business.

The questionnaire was displayed over the projector and each section was elaborated while filling each section. This was done to help vaccinators have same level of understanding on questions. Elaboration was made whenever a vaccinator could not understand the question.

2.6. Session III: Group work

The third objective of these vaccinators meetings was to elicit vaccinators' perceptions on critical issues to be addressed by the project. The pre-determined areas where the project wanted the perception were: training, quality control and certification, business and government collaborations, and Monitoring and Evaluation.

Five questions were asked for each area of focus as shown in **table 1** below. Participants were grouped into four groups. It was necessary to set the groups such that participants from same district were not in the same group.

Therefore RVO, and DVOs who were present were distributed in each group, and also vaccinators who have been trained were also distributed in each group, and again all vaccinators who have vaccinated were also distributed in each group and finally the remaining were equally distributed in each group. The participant were given one hour for this assignment and were required to present their work in plenary. However the group work took longer than anticipated. The table below shows results from the group work.

Table 1: Group Questions

1. Training	2. Quality Control & Certification	3. Business and Government Collaboration	4. Monitoring and Evaluation
Who are the key actors interacting with vaccinators in relation to Training on ECF immunisation?	Who are the key actors interacting with vaccinators in relation to Quality control & certification in ECF immunisation?	Who are the key actors interacting with vaccinators in relation to Business development & government collaboration in relation to ECF immunisation?	Who are the key actors interacting with vaccinators in relation to Monitoring and Evaluation in relation to ECF immunisation?
What are the key roles of these actors	What are the key roles of these actors	What are the key roles of these actors	What are the key roles of these actors
What are the main challenges faced by these actors in fulfilling their obligations	What are the main challenges faced by these actors in fulfilling their obligations	What are the main challenges faced by these actors in fulfilling their obligations	What are the main challenges faced by these actors in fulfilling their obligations
How can these challenges be addressed in the next two years	How can these challenges be addressed in the next two years	How can these challenges be addressed in the next two years	How can these challenges be addressed in the next two years
Who is best placed to address these challenges?	Who is best placed to address these challenges?	Who is best placed to address these challenges?	Who is best placed to address these challenges?

One hour was allocated for this exercise. The outcome of group works were presented in plenary as summarized from table 2 below.

Table 2: Training

Actors	Key Roles	Main Challenges	How to control	Who is best to do it
DISTRIBUTORS	Training of Vaccinators and supply of Vaccines	Few distributors Poor cold chain Lack of awareness low demand due to high cost	Subsidize cold chain = LN Request GOV to recruit technicians to maintain LN plants Encourage more distributors to participate	DVS
LGA	Finances Trainees Source of Trainees Monitoring of Trainees	Low priority to training activities few livestock Extension officers	DED to prioritize training and recruitment of more Ext. staff	LGA
DVS/DRT	Source of Trainers, Financing Trainees Policy formulation and regulation	Lobbying and advocacy Coordination breakdown between LGA and MLDF	DVS and DRT encouraged to lobby more funds from GOV DVS to create mechanism for better coordination with LGA's	DVS
FBO, CBO AND NGO	Source of Trainees and Finances	Limited coverage of services	Identify more CBO, FBO and NGO's and create awareness	LGA, Project, DVS
Private Practitioners	Trainers of Vaccinators and finances their training costs	Availability of other control alternatives Limited interest	To dialogue with them not to fear ECF vaccine not threat to their business To increase demand by creating awareness among farmers	Project
Farmers	Adoption of the vaccine	Only Farmers with improved breeds are willing to vaccinate Low awareness	Sensitization and awareness creation of the technology Promote keeping of improved breeds	LGA's

Table 3: Quality Control and Certification

Actors	Key Roles	Main Challenges	How to control	Who is best to do it
Distributors	<p>Import vaccine from manufactures</p> <p>Supply vaccine to vaccinators</p> <p>Support vaccinators with equipments</p> <p>Offer other support services to vaccinators</p>	<p>Delays in receiving the order (import permit process)</p> <p>Unreliable sources of Liquid Nitrogen</p>	<p>Expedite the process to register the vaccine in Tanzania</p> <p>Find a best way to operate the existing LN plants</p>	<p>LTR</p> <p>Distributors</p> <p>Ministry of Livestock</p> <p>TFDA</p>
Vaccinators	<p>Vaccinate the animals</p> <p>Keep record of vaccinations</p> <p>Report on vaccination activities</p>	<p>Limited number of distributors</p> <p>Lack of awareness on ECF vaccination</p> <p>Very limited vaccination at the moment</p>	<p>Licence more distributors</p> <p>Train vaccinators on record keeping and reporting</p>	<p>MLFD (DVS)</p> <p>TFDA</p> <p>CTTBD</p> <p>Training Institutes</p>
TFDA, TBS	<p>Responsible with quality of vaccine</p> <p>Responsible with quality and standard of equipments</p>	<p>Existance of some poor equipment (LN tanks)</p>	<p>Institute measure to curb importation of poor quality equipments</p>	<p>TFDA</p> <p>TBS</p>
Service Providers	<p>Selling of other antibiotics</p> <p>Supply of Liquid Nitrogen</p>	<p>Challenge in running of the LN plants</p>	<p>Think of joint venture operation of the LN plants with private sector</p>	
DVS,DVO	<p>Supervisory and administrative role on the vaccination process</p>	<p>Poor reporting of the ECF activities</p>	<p>Coordinate the vaccination exercises</p>	<p>DVO</p> <p>DVS</p> <p>Vaccinators</p>
Farmer/ Animal Keeper	<p>Keeping the animal for vaccination</p> <p>Willingness to pay for vaccination</p>	<p>Lack of awareness on ECF vaccination</p> <p>Price is high</p>	<p>Increase awareness on ECF vaccination to farmers.</p>	<p>DVO</p> <p>Vaccinators</p>

Table 4: Business and Government Collaboration

Key Actors	Roles	Challenges	Solution to Challenges	Additional Actors	Who is best to do it
Distributor	<p>To source vaccine from the manufacturer</p> <p>To distribute vaccine to the agents and vaccinators</p> <p>To ensure proper storage and handling of vaccine</p> <p>To provide appropriate training to agents and vaccinators</p> <p>To create awareness on ECF vaccination</p> <p>To receive feedback from the field</p> <p>To maintain database on ECF vaccination</p> <p>To appoint qualified agents</p>	<p>Difficulty in monitoring widely located vaccinators</p> <p>Difficulty in finding capable and reliable agents</p> <p>Difficulty in obtaining quality feedback from the field</p>			
Agent	<p>To ensure availability of vaccine to the qualified vaccinator</p> <p>To ensure proper storage and handling of vaccines</p> <p>To receive feedback from the vaccinators and relay to the distributor</p>	<p>Low demand for vaccine in some areas</p>			
Vaccinator	<p>To ensure proper vaccination of cattle</p>	<p>Few customers</p>	<p>Sensitization</p>	<p>To improve</p>	

	<p>Monitoring post vaccination reactions and provide appropriate intervention</p> <p>To generate vaccination reports and give feedback to supplier and DVO</p> <p>To identify vaccinated animals</p>	<p>Negative information from farmers</p> <p>High cost</p> <p>Regular refresher training</p> <p>High cost of transport</p>	<p>Work with farmers groups and networks to increase number of livestock</p> <p>Cost subsidy</p> <p>Increase number of vaccinators</p> <p>Collaboration with local authority</p> <p>Train vaccinators on entrepreneurship skills</p>	<p>PPP with large farms available</p> <p>Where possible, local research centres</p> <p>Local government for creating conducive environment</p>	
Livestock Keeper	<p>Ability to pay for the service</p> <p>Willingness to vaccinate</p> <p>To conduct monitoring and evaluation of vaccinated animals</p> <p>To provide proper information of the health status of animals</p>	<p>High cost of vaccine</p> <p>Unreliable and inadequate information</p>			

Monitoring and Evaluation

The group work from this group was presented in a different format and it is attached as annex ###

3. Vaccinators Meeting- Arusha 5th December, 2015- Kibo Palace Hotel

This meeting was held at Kibo Place Hotel in Arusha, and was attended by **54** participants who came from Arusha, Manyara, Kilimanjaro, and Tanga Regions.

Introduction of the participants was the first item of the meeting, a similar question as was in Mwanza was asked to get to know how many participants have actually been trained and also vaccinated. Out of the 54 participants 28 had been trained, and 26 had vaccinated or participated in the vaccination activities. In this zone most of the participants had extensive knowledge on ECF vaccination.

3.1. Project Overview and Rationale- Dr. Henry Kiara

An overview of the project was presented together with the rationale for scaling up. Highlights of why vaccination for ECF is very important were presented. ECF is one of major constraints in livestock productivity and hence lead to economic losses to farmers. Smallholders farmers losses are up to \$ 4.4million (MacLeod and Kristian 1999), pastoral and agro-pastoralist faces economic losses of up to \$ 129.5 million (Minjau and Macleod 2003)

These economic losses bring the need to upscale ECF vaccination. It was emphasized that ITM immunization has more advantages than other existing alternatives to combat ECF such as use of acaricides which leads to resistances and it is also difficult to manage, the chemotherapy option is expensive and zero grazing is not absolute and is not feasible in some areas. ITM vaccination has been scientifically proved to eliminate ECF hence ILRI is implementing *ITM2Scale* project in Tanzania to upscale ECF vaccination to other parts of the country.

It was pointed out that currently a number of challenges exist in relation to delivery of ITM vaccine and these includes;

1. limited coverage by existing distributors
2. Existence of trained distributors but who lack equipment and financing mechanism,
3. Limited cold chain infrastructure – LN
4. Vaccinators also lack business orientation.

Participants were therefore informed that objective of *ITM2Scale* project are three fold, i) to expand distribution reach of the vaccine, ii) to sensitize and create awareness to farmers and other actors, and iii) to improve vaccine delivery by involving other animal health actors.

3.2. Discussions

The participants in Arusha had more experience and exposure on ECF vaccination compared to the participants in Mwanza.

The discussion in Arusha focused on the main challenges they face which are actually mainly on the delivery of the vaccine.

Issue of a few distributors was of great concern; to them depending on only two distributors was a challenge. They also raised the size of the dose was discussed (40 dose package is a challenge) as sometime it is difficult to aggregate the order so that a vaccinator has a good number of calves.

Another challenge was in the availability of storage tanks and liquid nitrogen (LN) available plants are not reliable and sometime vaccinators need to source LN from Iringa. This was one of the serious challenges and took time to be discussed.

Participants raised the challenge on lack of capital to some of vaccinators, which prompted the need to link the vaccinators with financial institutes. There was a unique challenges of geographical coverage which was discussed, first this was referred to only having two distributors who cover the country, but on another dimension was on the quality of the vaccine. Participants face this challenge when out in the field. One could manage to organize the farmers for vaccination but these might be sparsely distributed and sometime risks to compromise the quality of the vaccine (the six hours' time limit after reconstituting the vaccine)

Participants discussed also the package challenge, they believe if there could be the package of say 10 doses it could be convenient for the vaccinators to reach clients with small herds of cattle's, or even those with large cattle but are dispersed

Farmers need to be educated on the effectiveness of the vaccine, since some are still not aware of the vaccine and hence hesitate to vaccinate.

3.3. Session II: Responding to the Questionnaire

The second session of this meeting was to respond to a questionnaire which was designed to collect important baseline information for the project. Before this exercise, the consent of the vaccinators was sought, this was done by introducing the consent form which was read and elaborated on each section. Vaccinators gave their consent by signing the form.

The two page questionnaire has six sections. The first section is identification, the second section covered ITM history and successes, the third section covered questions on monitoring and evaluation. Section four covers business links & services, section five covers ITM training and section six covers outlook for ITM business.

The questionnaire was displayed over the projector and each section was elaborated while vaccinators were filling each section. This was done to help vaccinators have same level of understanding the questions. Elaboration was made whenever a vaccinator could not understand the question or needed.

3.4. Session III: Group work

The third objective of these vaccinators meetings was to elicit vaccinators' perceptions on critical issues to be addressed by the project. The pre-determined areas where the project wanted the perception were: training, quality control and certification, business and government collaborations, and Monitoring and Evaluation.

Five questions were asked for each area of focus as shown in table 1 Above. Participants were grouped into four groups. For Arusha groping was easy as most of the participants have been trained on ECF vaccination, and others who has not been trained has participated in the vaccination process, but it was necessary to balance the groups and at the same time making sure that participants from same district

Actors	Roles	Challenges	Solutions	By who and resources
Distributors (Ronheam,VetAgro)	They offer train	Very few to cover the whole country	To authorize other distributors	DVS/VCT
	Financing	Hire very few personnel	To engage other stakeholders to train additional vaccinators	DVS, ILRI, GALVmed and others
	Selection of trainees	Inability to train enough vaccinators Might be biased in selection of trainees		
LGAs	Selection of trainees	Low budget	Create awareness on the importance of the economy of LGAs	Livestock department: Resource: Funds
	Offer train	Low priority to livestock		
	Monitor trainees	Very few personnel		
Private animal health providers	Potential trainees	Very few personnel	Create awareness on the availability of business opportunity in the rural areas	DVS, LGAs, ILRI, GALVmed and others
	Trainers	Lack of business orientation The few personnel available are centred at big cities	Training on entrepreneurship	
NGOs (HPI, Brac,SHILDA,Oxfarm, IRLDO,MAWAKI)	Financing (Trainees and trainers)	Very limited areas of operation	Discussion with relevant NGOs	DVS, LGAs, ILRI, GALVmed and others
	Selection of trainees	Very few to cover the whole country Lack of technical consultation with technical people Funding is very restricted		

MINISTRY (DVS)	Financing Select trainees Offer train Monitor performance of train Authorise distributors Making Policies	Financial constraints Low priority of ECF control	Solicit funds from different sources To review the priority diseases	DVS
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6: Quality control and Certification

Actors	Key Roles	Main Challenges	How to control	Who is best to do it
Distributors	Vaccine importation To maintain quality of the vaccine To identify demand To identify qualified Agents Training vaccinators Recording	To obtain accurate data to match with demand Availability of storage facilities e.g electricity, liquid Nitrogen. Lack of established distribution chain.	A good communication between distributors, agent and vaccinator Establishment of small plants which produce Liquid Nitrogen and stand by automatic generators DVS and VCT to provide guideline to establish distribution chain	-Distributor -Distributor & ILRI -DVS & VCT
Agents	To maintain quality of vaccine To identify vaccinators To bring closer the service to the community Backstopping	Limited fund Availability of storage facilities e.g electricity, liquid Nitrogen. lack of transport	To acquire loan through Financial institution Local arrangement between agent and distributor TBS have to ensure the standard quality of equipment eg Nitrogen	Agents and loan institutions Agents and Distributors

	Recording		Containers	TBS
Vaccinators	To maintain quality of vaccine, To maintain immunization procedures To identify demand Recording	Lack of transport Geographical location of farmer Package and Price Availability of Liquid Nitrogen in certain areas. Handling of vaccine	To acquire loan through Financial Institution Should have appropriate transport and quality equipment for handling vaccine and liquid Nitrogen should have small package (we recommend 10 dose) and Government subside	Vaccinators and Loan Institutions Vaccinator MANUFACTURER & DISTRIBUTOR & GOVERNMENT
Farmer	To inform exactly number of the health animal to be vaccinated To pay for all services Cooperation during and after vaccination.	Lack of education/knowledge Mobility	All stakeholder should be involved in sensitization	<ul style="list-style-type: none"> All stakeholders
Regulatory bodies TFDA VCT DVO	To insure quality and registration of the vaccine To identify and register the qualified vaccinators To supervise and inspect all standard procedures in District	To control quality of vaccine to distributor and agent Most of vaccinators are not registered and recognized Lack of Transport and fund for supervision Poor communication between DVO and Vaccinators	Through the established vaccination chain To identify vaccinators and register them Ministry through ZBC in collaboration with PMO, TAMISEMI should give directives to all LGAs to assist DVOs to perform their duties on ECF vaccination DVOs to ensure close supervision to vaccinators.	TFDA VCT DVO

Table 7: Business & Government Collaboration

Key Actors	Roles	Challenges	Solution to Challenges	Additional Actors	Who is best to do it
Distributor	<p>Procurement of vaccine package</p> <p>Vaccine storage and handling</p> <p>Vaccinator/agent price setting</p>	<p>Delayed payment for delivery of vaccine package</p> <p>Few distributors vs large cattle population & coverage area</p>	<p>Enhance the sale agreement</p> <p>Identify and increase # of distributors in Tanzania</p>	<p>Identify and upgrade vaccinators to become agents</p>	Vaccinators/government/credit institutions
Distributor agent	<p>Vaccine storage and handling</p> <p>Vaccinator/agent price setting</p>				
Vaccinator	<p>Procurement of vaccine package</p> <p>Create awareness among farmers</p> <p>Procure liquid nitrogen</p> <p>Receive and document farmer feedback</p> <p>Ensure proper handling and</p>		<p>Develop cooperation between vaccinator and distributor to ensure reliable access to LN</p> <p>Back up liquid nitrogen tank for individuals or network of vaccinators</p> <p>Vaccinator organize for OTC back-up</p> <p>Set by-laws forbidding distributor involvement in direct</p>	<p>Credit institution</p> <p>Vaccinators /regulatory authority</p>	Vaccinator/distributors/regulatory authority

	<p>delivery of vaccine to farmers</p> <p>Capture and report vaccination records to distributors and DVS</p> <p>Organize vaccination program</p>	<p>Direct vaccination by distributors creating unhealthy competition</p>	<p>vaccination</p> <p>Initiate formation of vaccinator association</p> <p>Manufacturer should ensure smaller packages</p> <p>Charge higher for smaller stock to cater for damaged vaccines</p> <p>Use producer organization to organize sufficient number of cattle</p> <p>Vaccinator to receive business training and linkage to financial institution</p>		
Cattle keeper	<p>Willingness to vaccinate</p> <p>To cooperate with vaccinator and prepare appropriate environment for vaccination</p> <p>Communicate with vaccinator regarding demand/need for vaccination</p>	<p>Unfaithfulness of vaccinator</p> <p>Lack of knowledge or awareness</p>			

Monitoring and evaluation.

The group work from Monitoring and Evaluation was presented in a different format, the whole presentation is attached as Annex @@@@

4. Vaccinators Meeting- Dar Es Salaam 7th December, 2015 – Blue Pearl Hotel

The meeting in Dar es Salaam was attended by 30 vaccinators coming from Dar Es Salaam, Coast, Iringa, Mbeya, and Njombe Regions. Twenty one (21) vaccinators have been trained and the rest 9 had no ECF vaccination training. The protocol for this meeting was not different from the previous two. Basically the same presentation on background and rationale for the project was presented (Annex @@).

4.1. Discussion

The first echo after the presentation was need to increase awareness, especially to farmers, it was mentioned that it take time for the farmers to understand how this vaccine work and how important it is for their animal and their business as well.

4.2. Group Work

The participants were also divided into four groups to discuss who are the actor, what are their roles and what are the challenges faced and how the challenge can be addressed. The discussions were to focus into the four aspects of training, certification and quality control, business and government collaboration, and lastly monitoring and evaluation.

The outcome of group work was presented in the plenary as summarized in the tables below

Table 8: Training (This table to be completed, I couldn't get the summary of this work for Dar meeting)

Actors	Key Roles	Main Challenges	How to control	Who is best to do it

Table 9: Quality Control and Certification

Actors	Key Roles	Main Challenges	How to control	Who is best to do it
TFDA	Certification, registration and quality control Issue import permit	Delay issuing import permit	Shorten period of issuing import permit	TFDA-Managing Director
TBS	Certification, quality control of vaccination equipment	Presence of uncertified vaccination equipment	Certify and quality control Regular inspection of	TBS-Managing Director

		Poor quality of the equipment in the market	the equipment	
Distributor	<p>Importation and storage of the vaccines</p> <p>Maintenance of the cold chain</p> <p>Distribution of the vaccine to vaccinators</p> <p>Training of the vaccinators</p> <p>Awareness creation and promotion to the stakeholders</p> <p>Training of business skills</p>	<p>Maintenance of cold chain</p> <p>Constant supply of vaccine</p> <p>Delay of import permit</p> <p>Its need large capital e.g Importation and advertising materials</p> <p>Poor supply of electric power</p>	<p>Reliable source of Liquid Nitrogen plant</p> <p>Alternative source of power (Generator)</p> <p>Access loans from financial institutions</p> <p>Importing permit should be prompt</p> <p>Increase awareness creation to stakeholders through mass media</p> <p>Farmers group discussion</p> <p>Increase number of trained vaccinators</p>	<p>Distributors</p> <p>TFDA</p> <p>Livestock Training Institutes</p>
Vaccinator	<p>Awareness creation to the farmers</p> <p>Conducting vaccination</p> <p>Keep vaccination records and reporting</p> <p>Maintain cold chain</p> <p>Monitoring and evaluation</p>	<p>High costs of vaccination equipment</p> <p>Unfaithfulness of the vaccinators to vaccinate more animals compares to the number animals require e.g 60 instead of 40</p> <p>Size of the dose per straw</p> <p>Antibiotic supplied by the distributors is not enough</p> <p>Farmers are very</p>	<p>Government to subsidize costs of equipment</p> <p>Vaccinators should be enlisted/registered by VCT</p> <p>Vaccinators to report to DVO</p> <p>Small size of the doses per straw e.g 10,20 and 40</p>	<p>Manufactures</p> <p>VCT/TAVEPA</p> <p>Vaccinators</p>

		scattered and need time to reach them while the vaccine has been constitute. Transportation Cold chain supply- LN container, refrigerator, cool boxes		
Government	To control quality Issue licence to the vaccinators Participating in awareness creation Subsidize vaccination cost	Inadequate number of staff Poor feedback from vaccinator No subsid funds of ECF vaccination program	Employ extension staff Improve feedback mechanism Subsid funds for ECF Immunization	VCT DVO DVS
Liquid Nitrogen Suppliers	Constant production of LN Maintenance of production plants	Inadequate supply of LN Few plants High cost of LN	Increase LN plants- private sector Rehabilitate LN plants(Government)	Liquid Nitrogen Suppliers Ministry of Livestock and fishers
Agrovets	Supply of antibiotics and vaccination inputs Record keeping	Quality of veterinary equipment Need large capital	Access loan from finance institution.	Agrovets DVO TBS TFDA
Farmers	Accept vaccine Participate in awareness creation To pay for extension services	Low adoption rate High price of service Awareness creation	Advertisement Subsidy fund	Farmers Government Distributors

Table 10: Business and Government Collaboration

Key Actors	Roles	Challenges	Solution to Challenges	Additional Actors	Who is best to do it
Distributor	<p>To procure vaccine from manufacturer</p> <p>Distribute vaccine to agents and vaccinator</p> <p>To ensure proper storage and handling of vaccine</p> <p>To receive and document vaccination record and feedback from vaccinators and agents</p>	<p>Large area to distribute the vaccine</p> <p>Unreliable access to liquid nitrogen</p>	<p>Increase number of distributor</p> <p>Increase number of distributor agents</p> <p>Distributors to acquire large back-up tank for storage liquid nitrogen</p> <p>Enhance capacity of distributor to produce or support production of liquid nitrogen</p> <p>Integrate liquid nitrogen as part of vaccine supply package</p>	<p>More distributor</p> <p>Large government farm; large private farms; district councils</p> <p>Other private and public producers of liquid nitrogen</p>	<p>Ministry of Livestock, DVS GALvmed</p> <p>Distributors/project/ Ministry of Livestock</p> <p>Distributor</p> <p>Distributors/project/ private & public producers</p> <p>Distributor</p>
Distributor agent	Same as Distributer	Same as Distributer	Same as Distributer		
Vaccinator	<p>To ensure proper handling and delivery of vaccine to farmers</p> <p>To mobilize - sensitization and awareness creation</p> <p>To record and communicate</p>	<p>Distance from vaccinator to distributor/agents</p> <p>Unreliable access to capital for acquiring equipment</p> <p>Lack of awareness/limited knowledge among farmers</p> <p>Fewer vaccinators vs area to be</p>	<p>Increase number agents in remote places</p> <p>To enhance business orientation</p> <p>To link vaccinators to credit institutions</p> <p>Provide more education to farmers</p> <p>Make use of mass media (e.g., shamba shape up style) to</p>	<p>Other non-business institutions with potential to become agents places easily accessible to vaccinators</p> <p>Business development trainers</p> <p>Credit institutions/DV</p>	

	vaccination reports	covered Misinformation from other services providers and other veterinary drug sellers Large package vs small scale production system Unreliable or insecure system for reporting	create awareness To train more vaccinators Create more awareness among service providers and input suppliers Reach farmers through groups Plan vaccination program Organize farmers through input suppliers Organize farmers through extension agents Develop an online/ICT-based system for recording that is accessible to all actors	Extension service providers, input suppliers (acaricide suppliers); distributor Media houses Extension service providers, input suppliers (acaricide suppliers); distributor Group leaders Input suppliers Extension agents Project	
Cattle Keeper/ Farmer	Willing to vaccinate his/her cattle Cooperate with vaccinator Provide accurate information about his/her cattle	Lack of financial resources to vaccinate Low awareness leading to improper valuation of cattle Distance from service providers Geographical distribution (scattered) in smallholder dairy systems	More education to farmers to understand cost vaccination vs value of cattle and treatment Increase the number of vaccinators Establish vaccination centres (crushes, individual farmers, LDCs, cattle dips)	Extension field officers Training institutions Cattle dip committees	Vaccinators/extension officers/distributors Ministry of Livestock/project/distributors Vaccinators/farmers

Monitoring and Evaluation

The group work from the M & E group was presented in a different format, and therefore the whole presentation is attached as annex @@@

5. Annexes

- Presentations
- Participants Lists
- Program