

ITM SCALING UP IN TANZANIA

Scoping Study of East Coast Fever Vaccination

Godfrey G. Bwana

www.livestockfish.cgiar.org

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ilri.org
better lives through livestock
ILRI is a member of the CGIAR Consortium

Box 30709, Nairobi 00100, Kenya
Phone: +254 20 422 3000
Fax: +254 20 422 3001
Email: ILRI-Kenya@cgiar.org

Box 5689, Addis Ababa, Ethiopia
Phone: +251 11 617 2000
Fax: +251 11 617 2001
Email: ILRI-Ethiopia@cgiar.org

1. Introduction

Cattle are prime resource for the people and government of Tanzania. The country is the second largest cattle keeping in Africa, with estimated population at 21.3 million heads. Small ruminants mainly goats and sheep represents the second largest component of mixed farming system (URT, 2013). The country is leading in SADC Region in having large number of livestock units followed South Africa, Namibia, Angola, Botswana and Zambia. The majority of these livestock in Tanzania are indigenous species breed and are very vital in component of the mixed farming system where they are used as draft animals for ploughing and providing milk and meat.

The regional distribution of the livestock is uneven, about 74% Of all indigenous cattle is kept in the six regions of Arusha, Singida, Tabora, Shinyanga, Mwanza, and Mara (MLFD, 2008). This signifies the importance of need to vaccinate.

Several constraints exists for increasing animal output products, but the mains constraint are tick-borne diseases (TBD). Major tick-borne diseases are East Coast Fever (ECF), Anaplasomosis, Babesiosis, and Erlichiosis, all transmitted by different species of ticks. The tick diseases contribute up to 72% of annual livestock mortalities in the country, and ECF cause 43% of annual cattle mortalities in Tanzania, this make the disease single most important animal disease that limit cattle productivity in the country (MLFD, 2013)

ECF immunisation in Tanzania started in early 1990s and it is estimated up to now that about 700'000 cattle have been immunised, and majority of these are the indigenous cattle. The country has done a number of interventions in the control of Tick and Tick Borne Diseases, these includes compulsory dipping programme (Cap.106), mapping of tick distribution in 1967 and 1998, dip construction and rehabilitation, free dipping programme, training of dip attendants, controlled movement of livestock (establishment of stock routes for dipping and vaccination with holding grounds), monitoring of dip washes, construction of veterinary centres or Livestock Development Centres (LDCs)

2. Objective

The overall objective of this assignment was to identify the geographical spread of the current ITM vaccination by existing distributors and vaccinators, find out how distributors are identified and registered, also to identify and recruit, trained, registered and monitored, and also collate number of vaccine by area, livestock system and distribution mechanism.

The study was to look at and characterise the current distribution mechanisms, what are the constraints faced (financial; human resources etc.) and the opportunities identified to scale up the technology, both on distributor and vaccinator level. This will also include a comparison of demand in the existing ITM areas, also considering the prices paid and the growth in vaccination numbers over the period since it was introduced.

3. Methodology

In order to realize the objective mentioned above, reviews of existing literature, reports and publication on ECF and ITM vaccination was done and this was complimented with interviews with various actors involved in the ITM vaccines supply chain.

4. Current Status

4.1. Regulatory Environment

4.1.1. Policies and Strategies

The regulatory environment is examined at two levels, i.e., (i) Policies and strategies, and (ii) legal framework. Tanzania has a conducive policy and legal requirement in governing and controlling **tick and tick borne diseases**, the policies and legislations can be used to significantly reduce tick and tick borne diseases.

The legal environment is supportive conducive and may help during scaling of ECF vaccination. The legal and policy support exists for facilitating scale up of ECF vaccination. Some of existing policies and legislations are highlighted below.

i. The National Livestock Policy, 2006

This policy which guides the livestock industry in Tanzania. The policy in general aims at stimulating development in the livestock industry in order to exploit the available resources with due concern of conservation of environment. This policy emphasize on **competitive markets; commercialize livestock industry**, value addition in livestock products and sustainable development

ii. Tanzania Development Vision, 2025

Tanzania has set up its vision document named Tanzania Development Vision 2025 (TDV2025). All national plans and initiatives are geared to attain the goals of TDV 2025. This vision provide guidance on national long term strategic goals for social and economic development highlights, it provides for change in approach and mind-set in order to make Tanzania a middle income country by 2025 in terms of human development. Therefore existence of this vision complements what need to be done in the livestock industry; with over 21m cattle, a significant portion of the population will be involved in it and hence intervention to reduce mortality of cattle will have significant economic benefit to the country.

iii. The Rural Development Strategy, 2001

This strategy focuses on stimulating economic growth and reducing poverty in the rural areas.

iv. Agriculture Sector Development Strategy, 2001

This was designed to create enabling environment and conducive environment for improving profitability of Agriculture sector as basis for improved farm income and rural poverty reduction in the medium term- this has been accomplished successfully and now ASDP II is under way.

v. The Tanzania Livestock Sector Development Strategy, 2010

The National Livestock Development Strategy has been developed as first step towards operationalization of the Nation Livestock Policy (NLP). The policy identifies issues that impacts the livestock industry. Issues such as livestock identification and traceability, biotechnology and biosafety etc., are addressed in this policy. NLP has policy statements that provides for achieving the policy objectives.

The strategy is the operational tool that spells out actionable interventions required to meet livestock sector vision and mission.

vi. The Animal Health Strategic Plan, 1998

This strategy is very key in helping operationalization of ECF, it defines the public sector, private sector, and shared public/private sector roles in delivery of animal health in the country

vii. Strategic Plan for Control of Tick & Tick Borne Diseases in Tanzania Mainland, 2012/13- 2017/18

This strategy has been developed based on TDV 2025, the strategy wishes that by 2025 there shall be a livestock sector which by large extent shall be run commercially, and which is sustainable. The strategy has geared itself for a modern and sustainable livestock industry. The strategy has a number of strategic objectives. These strategic objectives can be used as opportunities for the upscaling of the ECF vaccination

4.1.2. Legal Environment

Examining the legal framework in the whole livestock industry shows that there is an established framework which together with the policy framework are likely to be very supportive on scaling up of the ECF vaccination in the country.

ECF cannot be dealt with in isolation with other T & TBD therefore the existing of legal framework the scaling up of ECF vaccination in Tanzania.

In general, there is sufficient legal environment, only what is needed is proper enforcement and each institution responsible to play its role properly. A number of law/regulations exists, and these include

- i. The Land Act No. 4 of 1999
- ii. The Village Land Act No. 5 of 1999
- iii. The Food, Drugs & Cosmetics Act No. 1 of 2003
- iv. The Veterinary Act No. 16 of 2003
- v. The Animal Diseases Act No. 17 of 2003
- vi. The Local Government (District Authorities) Act No. 17 of 1982
- vii. The Local Authorities Finance Act No. 8 of 1982
- viii. The Meat Industry Act No. 10 of 2006
- ix. The Dairy Industry Act No. 8 of 2004
- x. The Hides, Skins & Leather Act Trade No. 18 of 2008
- xi. Tanzania Livestock Research Institute Act No.4 of 2012
- xii. Livestock Registration, Identification & Traceability Act No. 12 of 2010

4.2. Business Environment and Actors

Business environment is the sum of all external and internal factors that influence business. These includes employees' management supply and demand, business regulations,

competitions, sanctions etc. ECF vaccination as any other business is no exception. The business is taking place in existing business environment. Any business will be successful if the business environ is friendly and supportive to flourish. Internal and external factors are all important for a business to transact successful

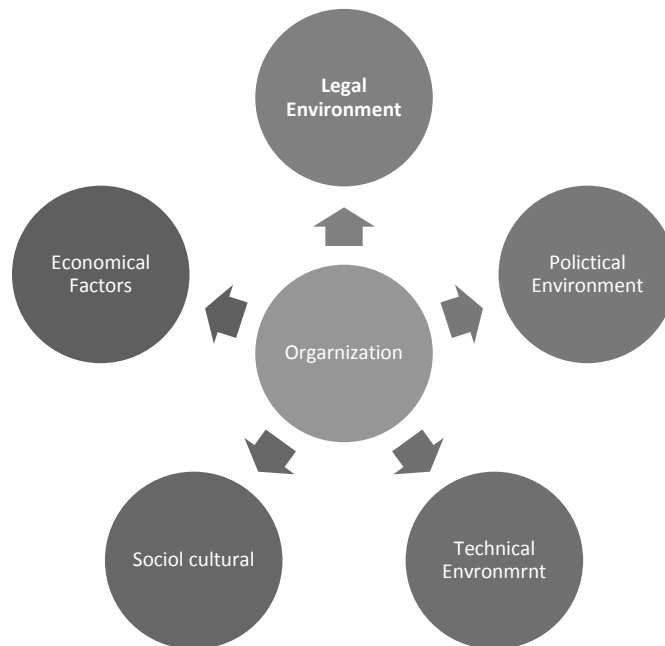


Fig. 1: Business Environment

The business environment of the ECF vaccination has several actors and factors, like any other business. Internal factors remains among the actor’s themselves. These includes employees, internal processes etc. External to the distributors there are customers, rules and regulation, economic factors, political factors, social economic factors etc. These need to be looked and identify which ones need to be looked and addressed if they pose challenges in conducting the vaccination business



Fig.2: Simple ECF Supply Chain

4.2.1. Business Model

ECF vaccination is business like any other business. This is a service business with long term impact. The research product which is ILRI work need to reach the intended users (livestock

keepers). This brings in business transactions, and this will start from the manufacturer (CTTBD), then to Distributors (appointed by Manufacturer) then to Vaccinator, then to Farmers. Exchange takes place at every stage on this simplified business model. As it is the business model works well, no significant challenges have been encountered, with growth in the business the model needs to open especially to allow actors to enter and leave.

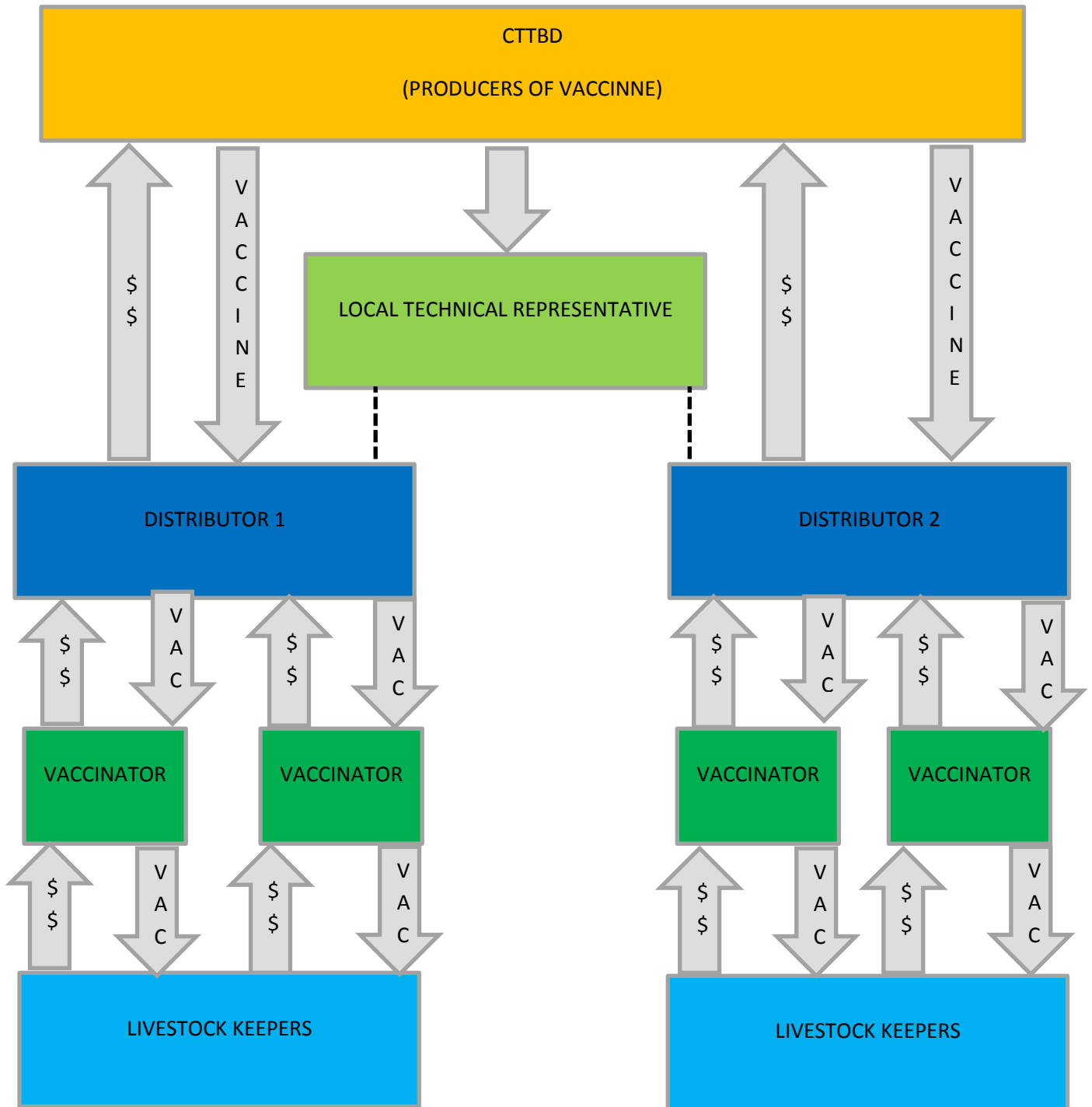


Fig. 3: Current ECM Business Flow

4.2.2. Business Actors

About seven different categories of actors exist in the ECF vaccine supply chain, the key actors are distributors, vaccinators and livestock keepers. Service providers like Liquid Nitrogen suppliers, and other drug suppliers exist as service providers, also government and government agents are actors supporting the supply chain.

Assessing the current situation reveals that ECF vaccination is inevitable in Tanzania, if the country has to eliminate the disease. It has been observed in the areas where vaccination has taken place that the vaccine is very effective and the farmers are more than ready to pay for the service.

Mr. James Paroli is a farmer from Chakwale, he keeps reasonably large herds of indigenous cattle. He started using the ECF vaccination for the calves since 2013. He is very happy since then, he accepts that the mortality rate has significantly dropped. For example he recalls on a group of about 100 calves which were vaccinated two years ago (2013) about 20 died but he says that those which died, did not die from ECF but another disease, since he knows the symptoms of ECF, he confidently concludes they were not dying from ECF.. "The calves were losing weight for about a month before they die, and this is not a symptom for ECF, if it were ECF these calves would not have survived for a week" Insisted Mr. Paroli.

From his experience he explained that these deaths which are not ECF caused sends wrong message for livestock keeper who has little knowledge and they end up linking it with the vaccine, and hence some hesitate to continue vaccinating. He therefore suggests more awareness campaigns to livestock keepers especially the pastoralists.

On his side he has committed not to stop vaccinating as he has already reaped the benefits, and quick increase of his cattle compared to the time before starting vaccinating the calves.

To Mr. Paroli price is not an obstacle at all, because he has already seen how effective the vaccines are, and how the benefits from vaccine have accrued to him. He only insists on increased awareness among the livestock keeper.

Business competition exists among the distributors, and also among the vaccinators; this is a good indicator for potential and sustainable business in the vaccination process.

The friction among the importers/distributors indicates that competition exists, this kind of competition is common place in many successive business endeavours.

Distributors

Only two distributors exist, this market condition is known as duopoly. Where only two firms' control the market for selling a certain product. This situation has the same impact like monopoly if the two sellers will decide to collude, however this has not happened on the

ECF vaccine business, thanks to the existing competition which has made the importers failing to collude.

Distributors were identified by the government, this happened during the end of the pilot project, and ever since the two distributors continued with business. Need for additional distributors have emerged as the need for vaccination continued raise.

There is no set up mechanism for new distributors to join the market, the existing distributors are the one who are recommending additional distributor. This need to be well looked in future as it may threaten competition in the market and create a cartel.

The distributors work very closely with government (MLFD – Veterinary Service Division), hence monitoring some of their activities, especially importation of the vaccine and training of the vaccinators.

The two distributors have supplied vaccine drugs in Dar is Salaam, Arusha, Kilimanjaro, Manyara, Tanga, Coast, Lindi, Mtwara, Iringa, Mbeya, Rukwa, Singida, Mara and a bit in Mwanza.

Ronheam International as one example alone have managed to distribute about 55'000 doses in a period of 18 months (which is good indicator for market potential), and since end of the project i.e. June, 2013, Ronheam has distributed up to 90'000 doses and vaccination is ongoing

The need for distributors has been echoed by actors to increase availability of the vaccine to the vaccinators, a more transparent way in selecting the distributors.

The question of misconduct in vaccination is recurring now and then. This complaint has been observed in almost every report, or record of meetings held preciously, and it has emerged in almost every interview I managed to have with distributors and vaccinators. (Arusha, Morogoro, Manyara, Tanga and Mbeya) The complaint is persistence

A quick analysis of this problems lead to a conclusions that it's caused by business competition among the actors.

There is business potential in this process, hence unscrupulous business people take this opportunity to make super profits at the expense of the vaccine and this may risk destroying all good work done by actors in eliminating ECF

It si recommended that during the scaling up project this factor should be critically looked at and come up with means to curb this cheating.

Vaccinators

Vaccinators are the key actors in the ECF vaccination supply chain. They are the ones who delivers the service to the final customers. The perform the critical task of vaccination, Delicate as the ECF vaccination is, these vaccinators need to be well trained and licenced to do the job.

About 160 vaccinators are available in Tanzania currently. Training of vaccinators is done by the distributors using the distributors designed curriculum as accredited by the Veterinary Council of Tanzania.

All of the existing vaccinators have been recruited and trained by the distributors. These to the large extend were recruited and trained during the vaccine piloting and other were trained during year 2013 when the commercial operation on vaccination started.

There is no laid down procedure where an independent vaccinator who want to enter into business can be recruited and trained in ECF vaccination

Monitoring of vaccinators also is not well coordinated, current situation shows that mostly the vaccinators work in trust with the distributors, there is little monitoring of the ECF vaccination activities. This has led to unscrupulous vaccinators to try to do vaccination.

Vaccinators- Business Actors

This is another group of actors who are very important in completing the ECF supply chain. These are actually down on the ground performing the actual task. They are the ones who can make the vaccine successful or fail.

They need to be people of high professional integrity and adhere to the ethics of their professional and avoid the business aspect to override the professional integrity.

These are charged with multiple roles which are:

- *Doing the actual vaccination*
- *Store the vaccine (some of them)*
- *Educate the farmers*
- *Monitoring the effectiveness of vaccination (feedback loop)*

Other Actors

Government

The government is the key actor in the ECF vaccination. Its main responsibility is to oversee and coordinate other actors to make sure that TDV 2015 is achieved through contribution and efforts from other actors in the livestock industry.

Tanzania Veterinary Laboratory Agency – (TVLA) - Regulatory

This an Executive Agency of the Ministry of Livestock and Fisheries Development. The agency has been established under the Executive Agency Act Cap 245 (R.E 2009) and gazetted on the GN number 74 of March 2012.

The Agency is mandated to meet the following objectives:-

- i. Developing and marketing appropriate technological package

- ii. Institutionalize Management Systems
- iii. Undertaking and Strengthening Surveillance and Diagnostic Services
- iv. Improving Infrastructure and Facilities'
- v. Strengthening Financial and Human Resource Management Systems
- vi. Strengthening Institutional Arrangements
- vii. Addressing Crosscutting issues

TVLA has its headquarter in Dar Es Salaam with multiple sites in the country in terms of Zonal offices, laboratories, research centres and research farms.

Examining the role of TVLA at the current set up of the ECF supply chain, it has been noted that TVLA has a very important role of verification if the vaccine is effective, i.e. it yield the expected results. This is done by checking if there is a difference between vaccinated animal and those which have not been vaccinated. For this to happen, TVLA need to be in constant loop with the vaccinators

TVLA did tried to apply for distributorship of the ECF vaccine, unfortunately they could not get that opportunity. Since executive agencies operates in a more or less like private sector actors, the agency is still interested to work as distributors in the ECF value chain, as they can use their experience and facilities to be effective distributors..

TVLA categorically agree that farmers in most parts where the vaccine has been used do appreciate that the vaccine is effective and have helped reduce mortality significantly.

TVLA put it clearly that ECF vaccine cannot completely replace the dip washes, as ticks still carry other diseases and hence dip washes are still necessary.

Therefore there are some oppotunities for TVLA to be part of this scaling up project in several aspects:-

- Supervisory role (quality and effectiveness- this can be done in collaboration with the Local Technical Representative for the Vaccine)
- Advisory Role (tapping their expertise and technical capacity)
- Verification role (when it comes to disputes on the effectives of the vaccine)
- Creating awareness (especially to end users- this also will be tapping their experience and technical capacity in dealing with other vaccines and veterinary drugs)

Veterinary Council of Tanzania. - VCT - Regulatory

The Veterinary Council of Tanzania (VCT) is a body corporate which is under Ministry of Livestock and Fisheries Development, VCT is independent from the Department of

Veterinary Services. VCT was established following enactments of Veterinary Service Act No. 16, 2003(Cap 319).

VCT wishes to become an effective institution that ensures the provision of accessible and sustainable quality veterinary services for improved quality livestock and livestock products.

That ambition will be achieved through regulating the veterinary profession in order to contribute fully to food security and poverty eradication. And also through increased quality livestock and livestock products without causing any harm to the environment.

The council is mandated with the following functions:-

- i. Register Veterinarians, Veterinary specialists and Veterinary Practice Facilities, enrol Paraprofessionals and enlist Paraprofessional Assistants
- ii. Advise and recommend to the Minister responsible for the profession on any matter related to Veterinary Practice
- iii. Regulate Veterinary Practice
- iv. Recognize qualifications, training facilities, training Institution and Colleges
- v. Collaborate with other relevant Institution or bodies in accrediting courses of training curriculum which provide qualifications for Veterinarians, Veterinary Specialist, enrolment of Paraprofessionals and enlistment of Paraprofessional Assistants
- vi. Determine minimum standards for:-
 - a. Veterinary Practice Facilities
 - b. Conduct scope of Practice activities by Veterinarians, Veterinary specialist, Paraprofessionals and Paraprofessional Assistants
 - c. Training proficiency required for the degree, diploma, certificate or any other award entitling the holders thereof to practice
- vii. Exercise effective disciplinary control over the professional ethics and conduct of veterinary practice
- viii. Promote and encourage educational advancement with regard to the practice of the veterinary profession
- ix. Provide information and education as regard to the veterinary profession
- x. Facilitate collaboration among persons and organisations relating to veterinary practice in order to enhance dignity and integrity of the veterinary profession
- xi. Initiate and provide advice to the body for the time being responsible for regulating the use of veterinary pharmaceuticals drugs and poisons
- xii. Arrange and conduct qualifying examinations to establish competence in veterinary education and practice.
- xiii. Perform such functions as may be required under the Veterinary Act.

Looking at the its role in the ECF supply chain, but recognises its specialized handling and the way it has to be administered, and therefore knows the importance for the vaccination specific training and those trained need to be registered and recognized.

VCT does not train vaccinators but certify the curriculum, and also certifies the trained veterinarians who are trained as ECF vaccinators.

The council maintained a database of all trained vaccinators and where they are located. The register of all Veterinary experts is under the custody of the registrar. At the moment there over 3'000 registered veterinary experts. These have been registered in three categories, Degree holders, Diploma holders, and certificate holders.

Among these there over 100 veterinary experts who has been trained as ECF vaccinators. The training curriculum has been developed by the distributors and collaboration with the council

VCT have experienced some challenges in relation to ECF vaccination. This was dealing with a complaint raised after unscrupulous vaccinators who started to vaccinate for ECF, when the complaint was lodged, VCT investigated and realized that the vaccinators were not registered, and using unregistered tags. VCT investigation realized that these were not representing any distributors among the two registered distributors.

VCT are very critical actors in the ECF supply chain with the role of registration of vaccinators, accrediting the curriculum and supervision of ethical and professional conduct of the vaccinators.

Tanzania Food, and Drug Authority (TDFA)

Tanzania Food, and Drug Authority is established by the Tanzania Food, Drugs and Cosmetics Act, 2003. This act has established TDFA and set up its node of operation. The aim of the act is set an efficient and comprehensive regulation of food, drugs and medicinal devices and herbal drugs

The act under section 5 mandates TDFA among many other things to regulate all matters relating to quality and safety of food, drugs herbal drugs, medicinal devices, poison, and cosmetics.

TDFA also is mandated to: "Regulate in accordance with the act the importation, manufacturing, labelling, marking, or identification, storage promotion, sell and distribution of food, drugs, and cosmetics. And also mandated to "Condemn and order destruction or disposal in any way any products regulated by the act which will be found to be of unfit for its intended use.

In the ECF supply chain, TDFA plays it legal role to make sure the imported drug, meet the legal requirement, and has no consequences which can affect the livestock industry

Specifically, TFDA does the following:-

- Controls the registration of the drug in the country

- Regulate the vaccine in the market (making what has been registered is what is being administered. TFDA works closely with the Local Technical Representative of the manufacturer. The law requires that if a drug is not produced in Tanzania, the manufacture need to appoint a Local Technical Representative (LTR). TFDA recognizes the LTR and will work with the LTR in case of any complaints, of if the drug does not perform to the expectation.
- Control every importation of the vaccine. Each time distributors imports the drug, LTR will inform how many doses have been imported

In general the role of TFDA is continuous on this supply chain, it creates the feedback loop which need to be enhanced.

4.2.3. Pricing

In simple terms, pricing is the process where an entrepreneur or a business person use to determine at what value his product of service will be paid for in exchange, while price is the value which is put on a product or service and is results of sometimes simple or complex computations and calculations. While computations are done, other factors are considered like research on many factors in the market, understanding and risk taking ability. The pricing strategy takes into account segments, ability to pay, market conditions, competitors' actions, and trade margin and output costs. Normally pricing is targeted at defined customers and against competitors.

However there is no one right way to calculate or determine the price for product. Four ways are available for calculating or determining the price of product; these are,

- **Cost-Plus Pricing-** This sets the price by including cost of goods plus fixed costs at volume of production plus a certain profit margin
- **Target Pricing-** This method sets the price in order to achieve the Return On Investment (ROI)
- **Value Based Pricing-** Here the product is priced based on value it will create for the customer. This is usually the most profitable if it can be attained
- **Psychological pricing-** this approach considers the customers perception

Looking at the ECF supply chain, vaccinators apply the simple method of recovering the costs and add a profit margin. The size of profit margin differs from one vaccinators. The study has noted that for ECF vaccination price ranges from TZS 8'500 – 15'000.

Availability of Liquid Nitrogen (for him he need to get it from Arusha, where its more reliable, than Dodoma where its closer); therefore bring in the need for travelling, so if he has to travel these are the costs incurred (Fare TZS 32'000; Accommodation TZS 60'000; Price of LN (20lts) + 5% TZS 150'000; transport of the cylinder TZS 30'000; and town

commuting TZS 20'000. To him availability is not the challenge but the costs involved to obtain it makes it a challenge

Spoke of intruding vaccinator who vaccinate at a lower price; this distorts the market, and was asking himself a question how is it possible for one to charge a low price. The conclusion he gets is either its sabotage, or fake vaccine. Another risk is that these intruders are not trained

The intruders vaccinate up to TZS 7'000 which bring in a lot of questions, and suggests either if the vaccines are genuine, the there is a leakage in control among the distributors, hence unfaithful people can access them , and sell at a lower price.

5. Challenges and Opportunities faced by actors

Different challenges and opportunities exist in the ECF supply chain, these are important some of them are highlighted here.

Government and Government agents

The study reveals that dealing with controlling T&TBD is a challenge, the use of chemicals which are expensive and need specialized handling after treatment (waste management). These challenges are numerous and a few will be raised here for the attention of the stakeholders.

- Inadequate financial resources which hinders proper surveillance and reporting of T& TBD, infrastructure and institutional efficiency
- Weak monitoring system on effectiveness of the therapeutic drugs and acaricide in the field due to inadequate resources.
- In most cases treatment and mixing of acaricide is done by farmers- this brings in the risk of under or over concentration of dip wash and therapeutic medicinal products.
- Legal obstacles such as conditions set by the articles of the Animal Diseases Act, no. 17 which requires formation of advisory committee on the use of animal pesticides in the country, this reduces the pace of T& TBD control.
- Interference from Institutional set up in implementing T &TBD activities has led to conflicts of interest and lack of understanding on the responsibilities on controls among the authorities (MLFD, PMO-RALG, LGAs & Farmers)
- Unregulated livestock movement also constraints the T & TBD controls, animal's moves for several reasons such as family exchange, pastoralism, & commercial stock etc.
- All these challenges reduces and stifles the fight on T & TBD which ECF is one of them, and since ECF contributes over 42% of T& TBD calamities (mortality), then there is a need to enhance an efficient way to deal with ECF, and since ITM

methodology has been scientifically been proved a success scaling up of the vaccine remains the best option to eradicate ECFE

Distributors

For distributors some of the challenges faced are as below

According to Ronheam International a number of challenges exists for distributions of the vaccine, to maintain the cold chain the following are the requirements and also all of them has their own challenges:

- Reliable power supply – In local case power has been unstable for some times now in Tanzania, this pose a challenge. Distributor might need to have a standby generator which automatically will add the holding/storage costs
- Storage- The vaccine need to be stored in controlled temperature, the straw need to be maintained at -1980 C and the diluent need to be stored at -1200 C
- Antibiotics
- Access to Liquid Nitrogen is a challenge, currently LN can be obtained in Arusha, Mbeya, Mwanza, Dar es Salaam, Iringa, Dodoma, and Kilimanjaro. All these plants are not reliable and the price per litre continues to rise. At Tanzania Oxygen Limited the price is TZS 10'000 and at the government plats it can obtained at TZS 6'000 per litre. At the distributor level , there is a need to consider possibility of a small LN Plant

Vaccinators

Vaccinators' faces a number of challenges some are specific to the area, and some are similar. Most vaccinators accept that the vaccine is very successful, but challenges exists as farmers have accepted it, the still face many challenges and some of them are:-

- Vaccination kits- some vaccinators do not have these kits, they need to be made available and accessible (cost wise)
- Availability of Liquid Nitrogen (if they have to keep stocks of the vaccine)- this increase costs as they form part of storage costs
- Vaccinators who come from other area, and charge low price – which suggests cheating and this brings the risk of losing confidence with the vaccine
- A critical mass is needed for the vaccination to be economically sustainable; the critical mass can be attained through awareness campaigns
- Availability of Liquid Nitrogen (for him he need to get it from Arusha, where its more reliable, than Dodoma where its closer); therefore bring in the need for travelling, so if he has to travel these are the costs incurred (*Fare TZS 32'000; Accommodation TZS 60'000; Price of LN (20lts) + 5% TZS 150'000; transport of the cylinder TZS 30'000; and town commuting TZS 20'000. To him availability is not the challenge but the costs involved to obtain it makes it a challenge*)
- Stability on cost price from the distributors (as only two distributors exist now) but one sells a straw at TZS 350'000 and the other sells at TZS 300'000

- Need for the farmers to understand more about the vaccine, although some have understood. Therefore need for capacity building to farmers.
- Capacity building at the level of LGA officials (politicians – councillors) not to interfere the vaccination process. There were some feeling that LGA should collect some fees during vaccination, i.e. they need to put a certain flat rate amount to be collected on each head vaccinated, this will increase price for farmers and they may avoid to vaccinate.
- Mobility, this vaccination is not done closer to where the vaccinator is based, and nature of livestock keeping which involves bringing in the need for vaccinators to have suitable transport to reach their clients
- Access and availability of Containers- to maintain quality and efficacy of the vaccine, special equipment' are needed, these should be made affordable, option of solar refrigerators
- Price is the challenge for those who are not aware of the vaccine, they feel it is too high. As for now in this region vaccinators charge between TZS 12'000 – 15'000
- Unethical practices, some vaccinators especially those who are new, do not practice ethically therefore risk tarnishing the good performance of the vaccine- this brings the need to screen the vaccinators, and also have close supervision during vaccination
- Actors are not well coordinated, this causes some greedy vaccinators to come in and vaccinate- It is important for the relevant authorities to know what is happening in certain areas. A good surveillance system

Opportunities.

In any business environment where there are challenges, opportunities also exist, the study has noted some opportunities which if well capitalized will help in scaling up of the ECF vaccination initiative.

Despite the challenges, farmers are already aware of the effectiveness of ECF vaccination (especially those who have already vaccinated) therefore avoid using the vaccinators who they don't know. Need to use the experienced vaccinator to be trainers (ToT)

The farmers in the southern highlands are highly motivated and would demand even to vaccinate cows over 400kgs, and demand for vaccination is keeping on increasing at the time when the vaccine availability is decreasing, this is an opportunity to be capitalized.

Market potential exists, especially when targeting the indigenous cattle, over 21.3 million cattle while it's only a fraction that has been reached.

The government on its side understands very well the importance of the ECF vaccination and it is boasting of the existing business environment for ECF vaccination. This has been echoed by then Ag. Permanent Secretary MLFD when opening ECF Vaccine Importers and Distributors meeting on January 10th, 2014. He said, *"The National livestock policy of 2008 clearly stipulates that the government will strengthen technical support services on tick & tick borne diseases control and that collaboration with other stakeholders will encourage and promote investment in production and provision of acaricide, anti-protozoans drugs and other livestock inputs. It is here actually the issue of ECF vaccine*

provision falls in”, he insisted that “ECF distribution in the country is the responsibility of the private sector, with government principally assuming regulatory role” This is an opportunity which also can be capitalized during scaling up.

The commitment by to pilot in the lake zone is good opportunity for scaling up, the lake zone is an area where there is a large stock of cattle; therefore piloting in the area has great potential to promote use of this vaccine and may lead to attract distributors to extend their services

Existence of the Strategic Plan for Control of ECF in Tanzania is an opportunity which can be seized for scaling up of ECF vaccination. The scaling up strategy should try to align with the 7 strategic objectives of the strategic plan

Willingness by the government to introduce the vaccine to new area, namely Rukwa, Katavi, and Njombe, and proposal to introduce new distributors set another opportunity for scaling up.

6. Conclusion and Recommendation

ITM Vaccine has reduced death on calves and helps improve livelihood of the livestock keepers, as this has been testified by vaccinators and the livestock keepers

There is big business potential in ITM Vaccination (high demand for the vaccine), and existence of high population of cattle’s in Tanzania

Potential for scaling up is very high due successful in pilot and trend shown since 2013. Number of cattle in Tanzania (21m and the number is increasing)

Recommendations

- Increase awareness for livestock keeper, and LGAs on economic benefits of vaccination
- Liberalize more the distribution and vaccination (increase the number of distributors on competitive manner
- Streamline training of vaccinators (can be trained by vaccinator in collaboration with accredited institution, or the accrediting institution should be issuing certificates)- this will make it more liberal and my attract more vaccinator
- Facilitation of mobility to vaccinators due to nature of work, and livestock keeping style
- Subsidization of the Liquid Nitrogen Equipment to make them accessible by the vaccinators
- Training to livestock keeper to do this activity on commercial basis (as the number of herd of cattle are now increasing very fast, and this contributes to conflicts between farmers and livestock keepers

- Need for ToT so that the trained and experienced vaccinators can be retrained and become trainers of trainers, this will help increase number of vaccinators while reducing training costs
- Streamline certification to come from one institution, e.g. VCT
- Allow trainers train in their areas

The important issue to look at here is how distributors are appointed, despite the fact that the business is specialized business; need for a transparent process of appointing the distributors is needed, if the business is private sector initiative. It is important for interested distributors to be given equal chance to participate in the business. (Meaning the appointing procedure should be participative and transparent) (Recommendation)

On training to vaccinators it is recommended that

At the moment this vaccinators are identified by the distributors and trained by the distributors. Most of the current vaccinators were those who were involved with the pilot project, and therefore were easy to identify and work with. Many are still government employee who does this as part time employment and some have retired and continue to work as private businessmen.

Considering the vaccinators in the upscaling it will be important first to recognize them as key stakeholders, then bring them together show them the business potential, those who will be interested invited for training, with possibility of the interested one contribute for their training (this will help bring in serious entrepreneurs who see the business potential. The up scaling project should minimize as much as possible footing the training cost for vaccinators, distributors also should avoid this, even when the distributors will consider subsidizing this should be at the minimum. This approach will help set up a sustainable business model which will survive past the project life time.

Recommended that training to more vaccinators and increase of awareness to livestock keeper are necessary efforts to make this vaccine more successful, and this may be a good ingredient during the scaling up period. The methodology for awareness will differ from one area to another, and this can be agreed with the respective local authority

Recommended that Ministry of Livestock and Fisheries Development should take its position it should be firm on its decisions and supervise this business well

Some vaccinators recommended that Distributors need to be restricted on areas to serve

The scaling up intervention should try to liaise with the MLFD and see how the 5 strategic objectives in the strategic plan can be linked with the scaling up project planned to start soon.

7. Annexes
8. References