


# International Livestock Research Institute


Livestock identification and traceability systems in the  
Intergovernmental Authority on Development (IGAD) region:  
Proceedings of a regional workshop, Addis Ababa, Ethiopia,  
4-5 February 2014






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#### Citation

ILRI (International Livestock Research Institute). 2014. *Livestock identification and traceability systems in the Intergovernmental Authority on Development (IGAD) region: Proceedings of a regional workshop, Addis Ababa, Ethiopia, 4-5 February 2014*. Nairobi, Kenya: ILRI.

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## Abbreviations and acronyms

AGP-LMD	Agricultural Growth Program – Livestock Market Development
AIMS	animal identification and traceability system(s)
ASALs	arid and semi-arid lands
AU-IBAR	African Union-Interafrican Bureau for Animal Resources
CVO	chief veterinary officer
DVS	Department of Veterinary Services
EAC	East African Community
ECOWAS	Economic Community of West African States
ECTAD	Emergency Centre for Transboundary Animal Diseases
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
ICPALD	IGAD Centre for Pastoral Areas and Livestock Development
IGAD	Intergovernmental Authority on Development
ILRI	International Livestock Research Institute
ISO	International Organization for Standardization
LGAs	local government authorities
LIT	livestock identification and traceability
LITS	livestock identification and traceability system(s)
MARF	Ministry of Animal Resources and Fisheries
MLFD	Ministry of Livestock and Fisheries Development
NGO	non-governmental organization
OIE	World Organization for Animal Health
RFID	radio frequency identification
SMP-AH	Standard, Methods and Procedures in Animal Health
SSCP	South Sudan Cattle Project
SPS	sanitary and phytosanitary
TADs	transboundary animal diseases
TANLITS	Tanzania livestock identification and traceability system
USAID	United States Agency for International Development
USD	United States dollars

## 1 Executive summary

### 1.1 Background

Livestock identification and traceability systems (LITS) enhance livestock production and trade by enabling improved surveillance and management of infectious diseases, control of livestock movement and effective delineation of production systems through zoning and compartmentalization and improved access to information along market chains. LITS have also been used to deter stock theft in areas that are prone to cattle rustling (cattle theft). In a meeting held in Argentina in March 2009, the World Organization for Animal Health (OIE) and its members resolved to progressively implement LITS as per the Terrestrial Animal Health Code for fairer and broader international trade of animals and animal products.

Anecdotal information suggests that producers and traders in the member states of the Intergovernmental Authority on Development (IGAD) employ various traditional animal identification methods, some of which have not been registered by their state veterinary departments. The member states are also at various stages of institutionalizing these systems. For example, the Republic of Tanzania is thought to have set up most of the required LITS institutions while the Republic of South Sudan is currently enacting the required legal instruments. The ongoing Standard Methods and Procedures in Animal Health (SMP-AH) project seeks to promote the development and implementation of harmonized animal health procedures in the Greater Horn of Africa region in line with the OIE guidelines. With regards to LITS, the project supports a pilot study that aims to develop a LITS framework that aligns with the region's livestock production and marketing systems. It is against this background that a two-day regional workshop on LITS was held on 4-5 February 2014 at the International Livestock Research Institute (ILRI), Addis Ababa.

### 1.2 Workshop purpose and expected outputs

The purpose of this regional workshop was to review and discuss alternative systems and make recommendations on the most practical options and approaches for use in the development of a LITS framework in the IGAD region. The expected outputs that were necessary and sufficient to deliver the purpose were:

1. Reports on the situational analysis of LITS in the IGAD member states **presented, discussed and understood.**
2. Lessons learned from LITS implementation in other regions **presented, discussed and understood.**
3. Practical options and approaches for use in the development of a LITS framework in the IGAD region **identified, discussed and the way forward agreed upon.**

The workshop was attended by a total of 35 participants drawn from the African Union–Interafrican Bureau for Animal Resources (AU-IBAR), Agricultural Growth Program – Livestock Market Development (AGP-LMD) livestock traceability study Ethiopia, the Centre for International Security Studies, chief veterinary officers (CVOs) from IGAD member countries, CNFA South Sudan Cattle Program (SSCP), the East African Community (EAC) animal health desk, the Food and Agriculture Organization of the United Nations (FAO) regional office and the Emergency Centre for Transboundary Animal Diseases (ECTAD), the IGAD Centre for Pastoral Areas and Livestock

Development (ICPALD), ILRI, the Kenya Livestock Marketing Council, the North East Africa Livestock Council and LITS national experts from IGAD member countries.

### **1.3 Situational analysis of LITS in the IGAD region**

Presentations were made on the status of the livestock industry in the region, the SMP-AH project and the status of LITS in the respective countries in the IGAD region. In addition, experiences and lessons learned in the development and management of LITS in other countries and regions were shared.

The presentation on the status of the livestock industry in the region indicated that (i) there is growing demand for livestock and livestock products in Africa and the Middle East, (ii) improving access to animal health services is essential to improve the health and productivity of livestock in the region, (iii) regional harmonization of LITS is essential based on international standards and leveraging existing traditional animal identification systems, (iv) there is need for increased support for compliance, (v) there is need for increased investment in livestock development and (vi) there is need for enhanced coordination among livestock stakeholders.

It was indicated that the SMP-AH project, coordinated by AU-IBAR and IGAD with financial support from the United States Agency for International Development (USAID) East Africa regional office, supports harmonization and coordination of disease surveillance and prevention and control of trade-related transboundary animal diseases (TADs) in the Greater Horn of Africa. The project covers Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda and Tanzania. The goal of the project is to contribute to the reduction of poverty and enhance regional economic growth and integration through improved access of live animals and animal products to regional and International markets. The purpose of the project is to develop and implement harmonized animal health approaches in the Greater Horn of Africa region. The project expects to deliver on this purpose through the attainment of the following results: (i) a framework for surveillance and control of trade-related TADs established, (ii) laboratory testing procedures for the priority diseases harmonized in the region, (iii) standards for regional quarantine stations established and (iv) technical and coordination capacity of participating countries and IGAD enhanced.

The status of LITS in the respective countries in the IGAD region was presented from seven countries: Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Uganda and Tanzania. The presentations covered the current livestock identification and traceability (LIT) activities in the country, the LITS that the country requires as an improvement of the existing one, the foreseen challenges or problems in the implementation of the proposed system and the steps that can be taken to harmonize the LITS in the IGAD region.

### **1.4 Status review of LITS in other regions**

The review of LITS activities in other countries in Africa covered global outlook, Africa continental and regional initiatives and approaches, status of LITS development in Africa, key components and drivers, system architecture, geographical coverage, species, production systems, identification technologies in use, registration functionality (premises, actors and identification systems); information technology solutions and traceability functionality (entry and exits), funding and



sustainability, incentive packages and factors contributing to success and failure. The overview concluded by outlining several lessons learned.

The overview of the LITS in the United States of America indicated that for a LITS to work in the IGAD region, there is need for cooperative design with livestock owners, traders, marketers and departments of veterinary services and careful assessment of costs so that the design of the LITS fits financial resources and is sustainable. Additionally, there is need for assurance that information management, databases and communications are sufficient and in place and pilot tested thoroughly before implementation on a larger scale.

The overview went on to indicate some suggestions for consideration in the design of a LITS. These include: starting small with pilot testing and growing from there, offering livestock owners a program of ownership identification that they can do themselves so as to get ownership identification going at very low expense to the LITS program, for program purposes, beginning the LITS with disease control traceability in market livestock for export trade (both live animals and commodity animals), combining with One Health later for zoonotic diseases and learning from the above and expanding as is needed and doable.

### **1.5 Understanding perceptions and positions on LITS by different stakeholders**

Given that LITS have been used for ownership identification and theft prevention, disease control traceability, quality control traceability, premises and location identification and livestock management issues, the workshop deliberated on the understanding, perceptions and positions on LITS by different stakeholders. The discussion was guided by the following questions:

- What should be the priority focus for a regional LITS and for national systems?
- What are the expected challenges in the design and implementation of a sustainable regional LITS?
- What should be done to make LITS work in terms of expected level of acceptance by different stakeholder categories, promotion of the LITS, required incentives to promote adoption and harmonization of LITS in the region?
- What steps should be taken to ensure sustainability of a LITS?

There was consensus on the purposes of LITS including theft prevention, disease control, premises and location identification, quality control traceability/access to markets/export certification, ownership and livestock management issues, breed improvement and to capture the true value of the livestock. In this regard, the priority focus for LITS at the regional level should be to support trade, disease control, traceability, ownership identification and theft prevention. All these should be guided by an appropriate IGAD regional policy framework for animal health and trade. On the other hand, priorities for national LITS should be for conflict/theft management, control of production and diseases and quality control for those countries focussing on commodity trade, certification, residues and adulteration.

In the design and implementation of a sustainable regional LITS, the anticipated challenges that were identified included low capacity to design and implement LITS, member states are at different levels of implementation and have different priorities, funding constraints, how to demonstrate the



economic benefits of LITS, lack of incentives, the initiative may be mistaken for tax opportunities, lack of legal frameworks that is closely tied with political will, a database that can communicate regionally and the cultural differences between countries.

With regard to the level of acceptance, it was noted that this would be highest among the producers especially if the service is offered free. The initiative would also be highly accepted by governments/veterinarians, processors and service providers. Traders, especially illegal ones, would be sceptical for fear of taxation. To promote the adoption of LITS, there will be need to create public awareness and sensitization, clearly articulate the benefits and costs, build on the traditional systems, combine LITS activities with other government projects, initiate pilot systems in small geographical areas and involve all stakeholders in developing policies to operationalize the system. A wide range of incentives as well as steps for harmonization of LITS within the IGAD region were suggested.

With regard to sustainability, it was noted that it will be important to design a LITS that is easy to use, affordable and cost effective. Most important would be to ensure stakeholder buy-in and participation in the development of the system. The developed LITS should be part of the legal framework and only those animals that are identifiable should be marketed. Identification of new markets will be crucial to ensure benefits are continuous.

### **1.6 Design and implementation of a regional LITS**

Based on the plenary presentations, discussions and agreements, the workshop identified the LITS currently being used in the region. This was followed by the identification of LIT options that can be used in the design of a regional LITS. For each of the identified priority LITS options, the workshop discussed and agreed on their design and implementation. The identified LIT options in order of priority included the following:

- Visual tamperproof ear tags with International Organization for Standardization (ISO) coding
- Visual tamperproof ear tags (with ISO coding) plus hot-iron branding in insecure areas
- Radio frequency identification (RFID) ear tags
- RFID bolus (for ruminants)
- Microchip implants (for controlled trials) with hot-iron branding to deter theft

The workshop agreed that visual tamperproof ear tags and visual tamperproof ear tags combined with hot-iron branding can be used both for individual animals and groups of animals. In insecure areas, a combination of visual tamperproof ear tags and hot-iron branding would be most preferable. RFID ear tags can be used on all species of animals, while RFID bolus is suitable for ruminants only. Microchip implants and hot-iron branding can also be done for individual animals but branding can be for groups of animals and is species specific. In most cases, both primary and secondary identification would be necessary. All the options identified can provide a trace-back in the entire value chain to the primary markets, villages and farms. For all options, there is need for capacity development of all stakeholders to appreciate and manage the systems. Incentives range from subsidies, subsidized cost/free ear tags/equipment, links to market, improved disease control, combining identification with routine disease control programs (vaccination) and improved security to encourage investment in the systems. It will be essential to develop a communication strategy to promote LITS nationally and in the region.

For all the identified LIT options, various equipment and facilities will be required. In addition, there will be need to set up a central database (recording system/manual or electronic) managed by the government (administrator) who would give rights for data entry and access at different levels. A back-up system has to be in place, including the paper forms used in all transactions. There has to be a national government law to implement the program which can be cascaded to all levels of administration. A specialized division under the CVO or Department of Veterinary Services (DVS) will need to be formed. The national policy needs to be in line with the regional strategy. IGAD will need to come up very early with a regional LIT policy and strategy for reference and to guide member states. Political goodwill from all member states will be essential for the system to work.

With regard to financing, start-up funds may need to be provided by the government but for sustainability there is need for co-financing between the government and beneficiaries. Cost sharing should be done according to the benefits accrued. On system maintenance, the suggestion was that this should be the responsibility of the governments since it was a public good. Monitoring and evaluation would be both internal and external and at both levels of government.

### **1.7 General recommendations and way forward**

Given the presentations, discussions and consensus reached, the workshop came up with the following general recommendations:

- Develop a pilot project on LITS for the IGAD region (including Tanzania) based on set criteria and the already ongoing initiatives
- Develop an IGAD umbrella body that would oversee the implementation of LITS in the region
- Develop guidelines, procedures and regional coordination mechanisms by the umbrella body in conjunction with states that have current and proposed LIT activities
- Encourage international/regional organizations such as FAO, AU-IBAR, OIE to hasten the development, finalization and dissemination of guidelines on LITS to assist the developing countries
- Encourage the member states to establish and strengthen their LITS as an important tool for trade and disease control
- AU-IBAR and IGAD should organize exposure visits to areas with reasonably advanced LITS

Given the outcome of this regional workshop on LITS in the IGAD region, ILRI was encouraged to move the process further in terms of:

- Consolidation and synthesis of the consultants' reports from the various IGAD member states. This would provide the position of LITS in the region;
- Evaluation of what is ongoing worldwide to learn from the experiences of what has succeeded and challenges encountered;
- Design of a pilot project using the methods/options identified for traceability taking into account cost effectiveness, ease of implementation and sustainability. The aim is to come up with data based on objective evaluation of the systems to identify which systems could be viable.

## 2 Introduction

### 2.1 Background

LITS enhance livestock production and trade by enabling improved surveillance and management of infectious diseases, control of livestock movement and effective delineation of production systems through zoning and compartmentalization and improved access to information along market chains. LITS have also been used to deter stock theft in areas that are prone to cattle rustling (cattle theft). In a meeting held in Argentina in March 2009, OIE and its members resolved to progressively implement LITS as per the Terrestrial Animal Health Code for fairer and broader international trade of animals and animal products.

Anecdotal information suggests that producers and traders in IGAD member states employ various traditional animal identification methods, some of which have not been registered by their state veterinary departments. The member states are also at various stages of institutionalizing these systems. For example, the Republic of Tanzania is thought to have set up most of the required LITS institutions while the Republic of South Sudan is currently enacting the required legal instruments.

The SMP-AH project seeks to promote the development and implementation of harmonized animal health procedures in the Greater Horn of Africa region in line with OIE guidelines. With regards to LITS, the project supports a pilot study that aims to develop a LITS framework that aligns with the region's livestock production and marketing systems. The study plans to implement a number of activities towards this goal including (i) development of a situation analysis report through a review of the existing LITS activities in the region, (ii) implementation of field surveys along the beef and small ruminant value chains and (iii) organizing stakeholder workshops to review the project activities and provide input to the subsequent stages of the study. The study anticipates developing a LITS framework that comprises:

- Primary animal identification procedures differentiated by administrative location, community and country. Countries have effective policies for implementing these procedures (such as animal branding) although in many places, animal identification has not been done or sustained.
- Secondary animal identification systems along market chains that would be important for traceability purposes. These might include back tags, paint marks and ear tags. Transaction records, animal movement permits and animal entry and exit registration sheets could also be used to support traceability of market livestock.
- A database for storing information on producers and premises, traders and other value chain actors, identification methods and programs for running queries for trace-backs as well as for identifying animals that might have come into direct contact with those being traced.

It is against the background outlined above that a two-day regional workshop on LITS was held on 4-5 February 2014 at the ILRI Addis Ababa campus. The workshop reviewed the current practices on LITS and explored the opportunities for improving the existing systems and ways of harmonizing LITS practices across the IGAD member states so as to minimize the inconsistencies that would limit animal traceability and hence the management of TADs.

## 2.2 Workshop purpose

The purpose of this regional workshop was to review and discuss alternative systems and make recommendations on the most practical options and approaches for use in the development of a LITS framework in the IGAD region. The recommendations are expected to guide the design of the pilot studies that are planned to be implemented under the SMP-AH project.

## 2.3 Workshop expected outputs

The expected outputs that were necessary and sufficient to deliver on the purpose were:

- Reports on the situational analysis of LITS in the IGAD member states **presented, discussed and understood.**
- Lessons learned from LITS implementation in other regions **presented, discussed and understood.**
- Practical options and approaches for use in the development of a LITS framework in the IGAD region **identified, discussed and the way forward agreed upon.**

## 2.4 Workshop participants and approach

The workshop was attended by a total of 35 participants (Annex 1.1) drawn from AU-IBAR, AGP-LMD livestock traceability study, Ethiopia, the Centre for International Security Studies, CVOs from IGAD member countries, CNFA SSCP, the EAC animal health desk, the FAO regional office and ECTAD, ICPALD, ILRI, the Kenya Livestock Marketing Council, the North East Africa Livestock Council and LITS national experts from IGAD member countries.

The workshop was designed as a hands-on activity with a logical combination of plenary presentation and discussion sessions, discussion group sessions and group feedback sessions. Each discussion group session had clear terms of reference. The feedback sessions were used to present each group's report and were done in a plenary set-up. This set-up facilitated consensus building and agreement on the issues under discussion by all the participants. The workshop was facilitated by Dr Antony M. Kilewe of Topridas Consultancy Services assisted by Ms Violet O. Kirigua. The workshop deliberations were guided by the rolling workshop program shown in Annex 1.2.

## 2.5 Welcome and opening remarks

### 2.5.1 Welcome remarks

The workshop facilitator called the workshop to order and led the participants on self-introduction before calling on Dr Bernard Bett from ILRI to formally welcome the participants to the workshop and invite the guest of honour. Dr Bett started his remarks by welcoming the participants to the workshop and went on to say that he was grateful the participants found time to attend the workshop to discuss this LITS project being undertaken by ILRI. He said the project was funded by USAID and they were presenting this activity on LITS for consultations. Dr Bett said ILRI was working closely with AU-IBAR under the broader framework of the SMP-AH project. The other collaborator in this project is ICPALD. Dr Bett went on to say that the workshop had invited participants from the veterinary departments from the IGAD region to review ongoing LIT activities in the different member states, share lessons learned from other systems, build on the experiences of AU-IBAR in southern and West Africa in establishing LITS and develop some suggestions on LITS options. The

aim is to see how LITS can be implemented in the IGAD region. Dr Bett concluded his welcome remarks by wishing all a fruitful deliberation and then called on Dr Iain Wright, Animal Science for Sustainable Productivity program leader at ILRI and the Director General's representative in Ethiopia, to officially open the LITS workshop.

### **2.5.2 Workshop opening remarks**

Dr Wright gave the workshop opening remarks. He started by saying that ILRI was pleased to host this workshop on LITS. He said livestock are very important for the socio-economic development of the IGAD member countries, currently estimated to contribute about 60% of the combined gross domestic product (GDP) and are an important source of livelihood for about 40 million people. In this regard, taking a regional approach to putting in place a harmonized LITS is bound to boost the livelihood of the majority of the poor people in the region. He said the workshop was one of the activities of the LITS study that ILRI and AU-IBAR are implementing and falls under the SMP-AH project funded by USAID. The activity builds on the LITS interventions that have been done in the past, focusing more on finding ways of harmonizing systems across the countries to facilitate management of TADs and trade.

Dr Wright went on to say that OIE has been encouraging member states to progressively implement LITS in their countries until they attain the standards set out in the Terrestrial Animal Health Code for fairer trade of animals and animal products. He said Botswana and Namibia in southern Africa were good examples where good progress has been made and they have seen the benefits. The IGAD region could, therefore, use some of their experiences and lessons in developing systems that can be applied locally. Dr Wright said that LITS can also be used to enhance food safety and food quality because some of the TADs that impair livestock productivity are zoonotic and, therefore, impact on human health. Some of these diseases cannot be easily identified using standard surveillance systems as they do not capture noticeable mortalities or ill health in livestock populations. Therefore, information captured from routine screening in quarantine stations is vital as it can be used for risk surveillance, especially if there are effective LITS available for traceability purposes.

To achieve this, Dr Wright said there is need for good cooperation between the different actors in the livestock value chain. In this regard, the workshop organizers had invited a range of stakeholders interested in this agenda and were delighted at the excellent response. Dr Wright went on to recognize the presence of CVOs from the IGAD region, experts and consultants on LITS, representatives of value chain actors, partner institutions that included AU-IBAR, FAO, EAC, project managers and coordinators of LITS projects in the region, non-governmental organizations (NGOs) and USAID to whom livestock movement and traceability is important. He said their participation would be important for achieving the workshop objectives set out in the concept note.

He said that the two-day workshop was just the beginning of the dialogue on this important subject, and at a later date ILRI would invite the stakeholders to assess the progress on implementation of the activities. He added that the livestock sector has been neglected by international community for a long time and there is need to interest development partners on the potential of livestock. Africa has over one billion livestock and there are opportunities for value addition which can contribute positively to the development of human health. We need to advocate for investment in livestock.

Fortunately, there are many positive signals from stakeholders and increasing cooperation among countries and partners to improve the livestock sector.

### **2.5.3 Further remarks**

#### **Remarks from AU-IBAR**

On behalf of the director of AU-IBAR, Prof James Wabacha welcomed the participants and said this was an important exercise to support food safety and traceability. He wished all well in their deliberations and looked forward to the outcome of the workshop.

#### **Remarks from the host country**

Remarks from the host country were given by Dr Bewket Siraw, CVO in Ethiopia, who started by welcoming the participants and thanking the organizers for choosing Ethiopia to host the workshop. He said identification of animals using different techniques is a very ancient practice in Ethiopia and other IGAD member states and was done to prove ownership and prevent theft. Today, he said, animal identification is motivated mainly by animal health and food safety requirements.

Dr Siraw went on to say that many countries that participate in international trade in livestock and animal products have put in place some form of animal identification and traceability system (AITS). As a result, these countries have expanded their international market share. Animal identification and traceability is not only an animal health and food safety management tool, but a market access requirement as well. Dr Siraw said Ethiopia exports meat and live animals to different countries and plans to expand further. Therefore, the country sees the importance of putting this system in place. In view of this, the country was in the process of developing a LITS that would be piloted in the next few months.

Dr Siraw said that the workshop theme, *LITS in the IGAD region*, was very timely and was sure that it would provide participants with opportunities to enrich the LITS under development. He said he was confident that the workshop would create productive and insightful discussions and contribute towards developing and implementing a harmonized LITS in the IGAD region. With these remarks he wished the participants fruitful deliberations.

#### **Remarks from ICPALD**

On behalf of Dr Solomon Munyua, the acting director of ICPALD, Dr Ameha Sebsibe said the IGAD region is rich in livestock resources and the demand for livestock products in the region, as well as in other regions of Africa and in the Middle East, was on the increase. The demand for live animals to the Middle East continues to increase annually and in 2012 the region exported 8.6 million live ruminants. He said the region needs to maintain and improve this trade, including giving adequate attention to value addition and meat exports. Dr Sebsibe said the region cannot afford to have another ban from the international markets and there is also need to diversify its market destinations. As region member states and partners, we need to work together.

Animals are crossing borders to reach regional markets on transit to the Middle East market. Therefore, he noted that it was essential for all actors and partners at the national and regional levels to work in harmony through a coordinated effort in disease surveillance and control to enhance livestock and meat trade and minimize cattle rustling that result in conflicts and loss of life

and assets of communities involved. An important priority intervention for ICPLAD is the LITS as it has a great role in disease control, security and trade enhancement. The purpose of this regional workshop, therefore, was to review the existing situations and discuss the alternative systems and make recommendations on the most practical options and approaches for use in the development of a harmonized LITS framework in the IGAD region. The study by ILRI is supported under the SMP-AH project implemented by AU-IBAR and ICPALD in the IGAD region including Tanzania, and both institutions will use the inputs from this workshop for follow-up of related regional activities such as a project on surveillance for trade-sensitive diseases funded by the European Union and other World Bank projects that have LITS components. Dr Sebsibe reaffirmed ICPALD's commitment to take forward the deliberations of the workshop in collaboration with member states and partners. Dr Sebsibe concluded his remarks by thanking USAID for financing the SMP-AH project and ILRI for the study and for organizing the regional workshop. With these remarks he wished the participants productive workshop deliberations.

### **3 Overview of the livestock industry in the IGAD region**

During this session, presentations on livestock production and trade in the region and the ongoing SMP-AH project were made and discussed as outlined below.

#### **3.1 Presentation on livestock production and trade in the IGAD region (by Dr Ameha Sebsibe, ICPALD)**

The presentation indicated that ICPALD was established in July 2012 at the 45<sup>th</sup> meeting of the IGAD Council of Ministers. The mission of ICPALD is to complement efforts of IGAD member states in enhancing sustainable economic growth in arid and semi-arid areas in IGAD member states, while its overall objective is to promote and facilitate people-centred and gender-responsive sustainable development in drylands and livestock in the IGAD region. ICPALD's core functions include policy review and support with respect to harmonization in the region, promoting and facilitating knowledge management, supporting and facilitating capacity building of all actors in drylands and livestock sectors, supporting diversification of livelihoods, coordinating relations with relevant technical institutions in the region and undertaking regular studies of relevant international standards and recommending appropriate steps to achieve compliance.

With regard to back ground information on livestock production in the region, the presentation indicated that the region is home to about 336 million ruminants. The sector is important for the livelihoods of millions and earns respective countries substantial foreign currency, despite 80% of the region falling under arid and semi-arid lands (ASALs). The livestock production systems include (i) pastoral and agropastoral livestock production in the arid and semi-arid lowlands, (ii) settled mixed crop-livestock production in the highlands, humid and subhumid areas and (iii) small-scale dairy production in the East African highlands. Livestock trade in the IGAD region caters for domestic, regional and international markets. Live animal exports from the IGAD region to the Middle East and North Africa in 2012 were estimated at 8,613,581 animals while meat exports from stood at 27,419 tonnes.

The major challenges to livestock production and trade include drought and floods, animal disease outbreaks and TADs, inconsistent and inadequate supply of marketable animals, under-investment in livestock and infrastructure in pastoral and agropastoral areas, inadequate policy, legislative and



regulatory framework, resource-related conflicts, multiple taxation, limited capacity of value chain actors, poor market orientation among the majority of the producers and fragmented and weak efforts in enhancing LITS in the region.

Currently, there is a growing demand for livestock and livestock products in Africa and the Middle East. Therefore, improving access to animal health services is essential in order to improve the health and productivity of livestock in the region. Regional harmonization of LITS based on international standards and leveraging existing traditional animal identification systems is, therefore, crucial. There is also need for increased investment in and coordination of livestock development in order to enhance compliance with international and market standards.

### **3.2 Overview of the SMP-AH project (by Prof James Wabacha, SMP-AH project coordinator, AU-IBAR)**

The presentation indicated that livestock resources in the Greater Horn of Africa contribute significantly to the agricultural GDP of the region's member states. Other contributions of livestock include food security, employment and nutrition, besides driving the microeconomy at village level. The IGAD region is the leading exporter of live animals in Africa, contributing 42% of the exports, while the Economic Community of West African States (ECOWAS) region's share is 35%. The region is a net exporter of live animals and animal products. The major importers are the Middle East and Saudi Arabia. The challenges facing export of animals and animal products to the Gulf Region are the recurrent bans due to concerns over TADs, seasonality of supply and demand, inadequate livestock marketing infrastructure, poor meat quality due to poor processing and handling infrastructure and stiff competition from Australia, Brazil, India, New Zealand and Pakistan. In addition, challenges to intra-regional trade include unregulated cross-border trade, poor vertical integration of stakeholder organizations along value chains, lack of market information and intelligence, inadequate regional integration, non-tariff barriers affecting the business environment, inadequate capacity for implementation of sanitary and phytosanitary (SPS) measures for TADs; low public and private investments in the livestock sector and conflicts in pastoral areas.

To address these challenges, the SMP-AH project was initiated with financial support from the USAID regional office for eastern Africa. The SMP-AH project is coordinated by AU-IBAR and IGAD. The goal of the project is to contribute to the reduction of poverty and enhance regional economic growth and integration through improved access of live animals and animal products to regional and international markets. The objectives are to (i) support harmonization and coordination of disease surveillance; (ii) prevent and control trade-related TADs in the Greater Horn of Africa in order to ease movement of livestock across national borders for trade, (iii) reduce livestock export bans by trading partners and (iv) enhance trade within and between regional economic communities. The expected results are (i) framework for surveillance and control of trade-related animal diseases established, (ii) laboratory testing procedures for the priority diseases harmonized in the region, (iii) standards for regional quarantine stations established and (iv) technical and coordination capacity of participating countries and IGAD enhanced.

The key outputs from the Project include development of 10 draft standard methods and procedures for adoption in the region; initiation of research on AITS in participating countries, production of a field manual of animal disease by syndrome, capacity development of veterinary staff in key areas

and for ICPALD and capacity building for surveillance, disease control and vaccine production. One-week exposure visits have been made to Oregon in the Pacific Northwest and Texas in the southern part of the United States of America. ILRI is undertaking a research study to provide data and evidence for suitable LITS options in the region. It has been noted that functional AITS for the region is critical for disease surveillance and control, laboratory testing and diagnosis, certification for trade and livestock management.

### **3.3 Discussion on the presentations on the overview of the livestock industry in the IGAD region**

#### **Question**

- There is conflict between farmers and cattle keepers particularly in the countries. What is the given approach to address this? Many countries have tried and succeeded whereas others have failed. What is the given approach?

#### **Response**

- This issue is related to crop-livestock conflict. Mobility is useful but has also a problem with regard to security and animal diseases. To address this issue, ICPALD organized a mission for policymakers to West Africa to understand how the mobility policy has been implemented and enforced and how it has benefited the people. Currently there is a transboundary protocol in the region. However, we are drafting the regional transboundary mobility policy which will be subjected to stakeholder consultation prior to its adoption. Hopefully this will establish a corridor for movement of livestock. Once the policy is adopted, mobility will be respected.

#### **Comments/questions**

- The assumption is that all animal movements come from all the areas in the region moving towards the Middle East especially through the Red Sea. In my opinion, this movement is only of cattle and small ruminants. There is one key movement for camels from northeastern Kenya to Addis Ababa. Most of the camels consumed in Somalia also emerge from Kenya. Therefore, the presentation mainly focused on the movement of cattle and small ruminants to the Middle East.
- Despite the fact that livestock contribute significantly to the GDP of countries in the IGAD region, the livestock sector has been neglected in the past and the situation is same to date. This is due to the fact that some areas where livestock do very well, and are used by pastoralists are being transformed into irrigation schemes or used for other purposes. All this is because the policymakers do not give due attention to livestock. How can we, as researchers, come up with evidence that can highlight the contribution of livestock to national GDP for lobbying for more support to the sector?
- The IGAD region has the largest population of animals and produces the most meat yet we do not consume much compared to countries in the ECOWAS region which also export more. Who consumes the meat we produce? Are we under-reporting?

#### **Response**

- What was presented is the volumes expected rather what we consume locally. You can see from the statistics we are also exporting a lot of high-value meat. This is because we are near a market that demands high-value products and that explains the statistics. However, there is

room for improvement in terms of meat exports. In terms of meat consumption, we are not doing very well.

#### **Question**

- Do we get more profit if we export rather than consume locally and have we met the local demand? Which is more lucrative?

#### **Responses**

- If you look at the consumption patterns, what is happening is that there has been an oversupply of meat and, as a result, meat prices have stagnated for a long time. Therefore, we need to encourage exports to create the demand.
- We can run parallel strategies as the target markets could vary. For example, if you take beef in the Ethiopian market, in Addis the domestic market has preference for highland animals. Equally, there is preference for small ruminants from the highlands. In addition, pastoral and agropastoral animals are preferred in the Middle East but highland animals can also be exported. The major constraint in meat exports is the cold chain (lack of standard facilities, compliance/requirements and capacity building). With these in place, we can target any market.

#### **Comment**

- In Sudan, the consumption of meat locally has increased. This stands at 17 million head of different animal species consumed locally. This is now among the sectors that has contributed to economic development and has encouraged other sub-sectors such as poultry to develop and improve. One of the reasons is that the cost of inputs for cattle production is high, whereas poultry can be produced with relatively cheaper inputs. In addition, the traditional cultural habits are changing and people are now consuming more poultry. This has provided an opportunity to enhance livelihoods.

#### **Question**

- Commenting on the figures, last year Sudan earned 675 million United States dollars (USD) from exports of live animals and meat. The figures shown are very low.

#### **Response**

- The figures in the presentation represent those for live animals. The figures are low because there is a lot of informal cross-border trade that is not captured.

#### **Question**

- Given that the figures show the importance of livestock, why have policymakers not taken this seriously in the policy documents? Are we not communicating adequately?

#### **Responses/comments**

- As a follow-up and tying to the remarks made by the representative from the Kenya Livestock Marketing Association and what Dr Sebsibe presented, we may have underestimated the value of livestock. In Kenya, for example, it was found to be under-valued. But if you look at the economic survey reports after that, estimates for livestock values still remained low. This is because we used a production approach in our evaluation while GDP is estimated using the

commodity approach. So at the end of the day, we are using a different method and we cannot use these official statistics to lobby for investment in the livestock sector. IGAD and its partners need to engage the national bureaus of statistics, the institutions charged with coming up with GDP estimates, to find out where the problem lies. We also need to improve the way we collect data as the GDP depends on the data we give from the livestock sectors. Any investment or national policy planning done is based on the contribution to GDP. We still lack the correct figures to work with and that is where the problem lies.

- Part of the problem in the livestock sector has been the informality of the trade, because informal traders do not want to be regulated and would rather smuggle animals than engage in legal trade. Therefore, only official data get into official communication systems. The other problem is that most of these areas are in the ASALs and policymakers rarely visit them. These policymakers can only be engaged at the capitals or in the urban centres. I am aware that the livestock department in Kenya for a long time had never met the Treasury officials who were doing the budgetary allocation but would indicate lack of a budgetary allocation for their activities. They never had any representation in the process of negotiations and this has contributed to the low support to the sector.
- There are several reasons for the downward trend in support for the livestock sector. One could be that governments in the region focus on ensuring that people have enough access to calories and these traditionally come from the major staple food crops. These food crops vary from region to region and country to country. So there is an understandable reason for the focus on food crops. This is also being reinforced by the experience and lessons from research and development and going back to the Green Revolution which had a huge impact, particularly in Asia. People's perceptions and decisions are influenced by these considerations. In term of data and methodologies, there are weaknesses in data availability, quality and standards and so many methodologies. There is also little recognition of the fact that food security is not just about ensuring enough calories but also facilitating access to proteins, vitamins, minerals among others. We have not been able to work out the connection between agricultural development and nutrition and where there is disconnection. Many countries focus on food security as opposed to nutrition security. But the livestock sector is important in making this happen because it is not about calories but availing proteins.
- Livestock exports from Kenya are very low. To address this, the country has a deliberate policy on value addition. There is a scramble for raw materials by importing countries and Kenya does not get any value by exporting live animals. In this regard, Kenya has made a deliberate effort and has formed a disease-free zone where animals will be held under strict quarantine, slaughtered locally and products exported. In this way, the country will also be able to add value to the byproducts contributing a lot to the economy.
- To clarify the statement regarding budgeting process in Kenya, I wish to state that this is program based and there are budget ceilings and, therefore, more is being directed towards livestock because the sector has a lot of potential and the government has realized this potential. As we move forward with the concept of disease-free zones, this will be increased and as the concept is scaled up there will be more investments in identification and preparation for trade.
- Based on the Maputo Declaration, AU member countries committed to contributing 10% of the national budget to agriculture. Out of this, the African leaders proposed that 3% should be allocated to the livestock sector. We are not sure how many member states have complied with

this despite the significant contribution of the livestock sector to many of the economies of African countries. A study has been planned to identify the appropriate allocation of resources to the livestock sector. The study will also incorporate the private-sector investments. Hopefully the finding from these studies will enable IGAD formulate appropriate advocacy messages on resource allocation to lobby the leaders in the region.

- There is growing investment in the ASALs by political leaders. For example, in 2011 there was a severe drought and many animals died. Consequently, IGAD and the East African countries agreed to have a regional initiative to address drought emergency. In this regard, the IGAD regional disaster emergency initiative was created. Under this initiative, Ethiopia, Kenya and Uganda have each committed USD 75 million to investments in the ASALs. This is an opportunity which could be capitalized on.
- Regarding the underestimation of the contribution of livestock sectors, the performance criteria that have been used over time is inappropriate. Studies are ongoing in Uganda, Tanzania and Senegal on valuation of the livestock sectors and hopefully the findings will rectify this situation thus enabling a more realistic quantification of the contribution of the livestock sectors in the respective countries.

#### **4 Situation analysis of LITS in the IGAD countries**

The status of LITS in the respective countries in the IGAD region was presented from seven countries: Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Uganda and Tanzania. The status presentations covered the current LIT activities in the country, the LITS that the country requires as an improvement of the existing one, the foreseen challenges/problems in the implementation of the proposed system and the steps that can be taken to harmonize the LITS in the IGAD region.

##### **4.1 Tanzania LITS situation analysis report – by Mohammed M Bahari**

The presentation indicated that the Tanzania LITS (TANLITS) had adopted two systems: (i) the basic LITS based on group identification using hot-iron branding in the traditional non-commercial motivated production system and (ii) the contemporary LITS based on combo RFID ear tags in compulsory LIT declared areas. The basic LITS is centrally designed and coordinated through local government authorities (LGAs) village brand code allocation and register on a pilot basis using paper based registration – village livestock and livestock owners' register. Districts in the Lake Zone Regions that include Kagera, Mwanza, Mara and Shinyanga responded well with close to one million identified and registered cattle. Other districts in other regions and zones responded poorly mainly due to financial constraints.

In the contemporary systems, the combo ear tags technology to be used was selected and equipment purchased. This is targeted for cattle, sheep and goats for commercial production and livestock destined for export markets and boluses for areas prone to theft of cattle. However, these have yet to be put onto the animals, pending the completion of information technology solution development. On the traceability system, a country customized AITS and LITS information technology solution satellite-based tracking system is envisaged and being developed through FAO support. TANLITS will cover all species of livestock (cattle, sheep, goats and pigs) but will start with cattle and cover all areas on a gradual basis. The basic system will cover the whole country while the contemporary system shall only be for compulsory declared areas based on market and trade

participation incentive. In all the cases, identification and registration is on the farm at birth or acquisition of the animal.

Central Government Ministry of Livestock and Fisheries Development (MLFD) and LGAs shall be the main players in the development and implementation of TANLITS. A special unit under the Directorate of Research, Training and Extension and within the extension unit (Extension and Registration) has been charged with overseeing the development of the program. A principal law (Cap 184) with six parts and 25 sections has been enacted and comprehensive set of regulations have been made (Government Notice No. 362). The success of the program is based on the progressive and graduated approach that incorporates stakeholders' dialogues and consultation. At the national level, the program is supported by the highest offices.

The challenges experienced include provision of adequate financial resources for development, implementation and sustainability of LITS at central and LGAs, capacity building and deployment of LITS experts to both central and LGA level, maintenance of a degree of permanence and legibility of the LIT technology adopted in view of the rapidly evolving and changing technologies, winning total support and adoption by the majority of livestock producers and pastoralists to finance and practise the system; accessing lucrative markets of Europe and Far East Asian countries that offer higher prices to provide incentives for the implementation of the system; LITS quality assurance system, independent auditing, improvements and linkages to animal production efficiency as per FAO and International Committee for Animal Recording guidelines for AITS and maintenance of a large database able to trace and retrieve individual animals to the herd of origin.

With regard to harmonization of LITS in the region, the presentation indicated that there will be need to harmonize identification technologies (numbering system), information technology solution cross reading, training and exchange study visits and basic identification and brand coding harmonization (one or two ISO Country Code Prefix agreement as with vehicle registration)

#### **4.2 Uganda LITS situation analysis report – by Benon Kyokwijuka**

The presentation indicated that various LITS have been used in the country. Initially the hot-iron branding method was used which involved applying a simple brand coding system based on letters of the alphabet for a few selected districts. However, the system collapsed during the political unrest. The identification was done by the district veterinary services but later taken over by the Uganda Police Defence Force. The initiative was fairly successful as a good number of animals were branded and this partially reduced cattle rustling. However, hot-iron branding frequently disfigured the animals and was often interfered with and, therefore, was not the best choice for Karamoja. Electronic identification was adopted in Karamoja region for security purposes. It was a better alternative despite the high cost.

To support the implementation of LITS, various laws and policies exist such as the Breeding Act (2001), the Animal Diseases Act (1964); the Prevention of Cruelty to Animals Act (1957), the Food and Drugs Act, the Cattle Traders' Act, the Straying Animals Act (1964); the Grazing Act, the Uganda Bureau of Statistics Act, the Markets Act and the Meat Policy (2003). However, implementation has not been successful due to an unclear legal framework, poor regulation and organization of livestock production and marketing systems, cattle rustling in ASALs, defacing of brands and 'over-branding'.

The challenges faced in the implementation of LITS in Uganda include lack of policy and effective legal framework, low levels awareness of LITS by livestock owners, high costs of LITS, illegal livestock movement across borders, lack of adequate resources (funding and manpower) for enforcement; limited infrastructure (roads, dips, crushes, recording and database system) and lack of rapid alerts. For Uganda, the government envisages putting in place a functional LITS that ensures identification and traceability of animals and animal products. The country hopes to develop and implement modern LITS using electronic identification devices. The bottlenecks that such a system would face include poor organization and regulation of livestock marketing systems, high costs of LITS programs, social and cultural issues towards animal identification, possible political opposition and inadequate institutions and personnel to enforce a LITS policy.

Regarding harmonization of LITS in the IGAD region, the steps that need to be taken include developing a workable LITS regional policy and strategy, mainstreaming LITS in all livestock activity plans nationally (breeding, marketing and vaccinations), carrying out extensive consultations with all stakeholders to determine how to best strengthen the functioning of all agencies in the livestock sector; increasing awareness of the benefits of LITS; increasing public-private partnerships and putting in place infrastructure to enforce LITS.

#### **4.3 Kenya LITS situation analysis report – by Kimutai Maritim, George Matete and Manga Njoroge**

The presentation indicated that the main drivers for livestock identification are the need to ascertain origin and ownership of livestock and to discourage stock theft and thus livestock-related insecurities; support disease surveillance and minimise the spread of TADs, and improve external market access through exports. Livestock identification methods currently in use include hot-iron branding (Branding of Stock Act, Cap 357 of 1907), plastic ear tags that are widely used for dairy cattle, goats and sheep (Kenya Livestock Breeders' Organization), ear notching, RFID chip, radio tracking and naming of animals.

Kenya has undertaken traceability trials, the first in 2003 through the 'Dumisha Amani I' initiative using hot-iron branding to address security concerns in 15 districts, namely, Trans Nzoia, Turkana, Trans Mara, Mount Elgon, Baringo, West Pokot, Marakwet, Marsabit, Moyale, Isiolo, Samburu, Tana River, Laikipia, Kuria and Keiyo where over two million livestock (cattle, camels and donkeys) were branded. Pilot studies on RFID-based LITS (2007–08) were also done between 2008 and 2010 by the Department of Veterinary Services in collaboration with Terra Nuova to track cattle to the market end. Under the 'Dumisha Amani II' program, a second pilot field trial on RFID bolus and hot-iron branding was carried out in counties where cattle theft is common. One hundred and thirty thousand head of cattle were identified using ruminal bolus and over 2.5 million livestock were branded. In addition, spatial and temporal tracking using global positioning system tracking technology to map cattle trade routes from Garissa market to Taita ranches has been undertaken.

LITS has received support from the current government whose manifesto mentions electronic animal identification. Apart from the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Interior has an interest due to security concerns. The challenges of implementing LITS include human and financial capacity limitations, high cost of implementation, inadequate infrastructure and



support services, lack of coordination among different players, farmers' perceived intrusion and non-confidentiality of information and culture and religion. Implementation of LITS has been successful and with the current political will, this shall be scaled out.

#### **4.4 Ethiopia LITS situation analysis report – by Edmealem Shitaye**

The presentation indicated that agriculture is mainstay of the national economy and accounts for 45% of GDP. Livestock contributes 15–17% of total GDP, 45% of agricultural GDP and 18–19% foreign earnings supports 70–80% of rural households. Agricultural production systems include crop-livestock, pastoral and agropastoral and commercial systems. Animal identification systems in Ethiopia are the traditional system dominantly practised in pastoral systems and the conventional practices which came with the modernization of livestock development interventions and include ear notching and ear tagging done by commercial farms, research and academic institutions.

Ethiopia is in the process of developing a five-year national pilot LITS program whose goal is to enable the country retain its traditional markets and explore new ones through building confidence in Ethiopia's SPS certification systems. The objectives of the proposed LITS are to enhance market access and the capacity of the veterinary services to detect and respond quickly to animal disease outbreaks. The country intends to increase the number and value of live animal exports and the quantity and value of meat exports. It is anticipated that 111,000 tonnes of meat and 2.35 million heads of animals worth one billion USD will be exported by the end of the planning period. Within five years, all cattle and products destined for export will bear an official Ethiopian identification and be traceable to the origin in 48 hours. At the end of the fifth year of the pilot program, 250,000 cattle destined for export per year will be identified and traceable to source. The program will adopt a stepwise approach with an incremental trend.

Elements of the LITS include premises identification, animal identification and movement control and trace back. There is currently no legal framework although one is being developed. The proclamation 267/2002 exists and it includes some movement control provisions and thus will be used for piloting the program. To enhance its uptake, the country will develop a communication strategy to create awareness among the relevant stakeholders. Stakeholders will be trained and provided with field-level technical support especially at the beginning of the program.

The challenges that may be encountered include limited budget; limited capacity in implementing institutions; delay in endorsement of a legal framework and inadequate enforcement of laws; apathy from pertinent stakeholders due to lack of awareness on benefits from the system; and long term commitment by the government and stakeholders to implement LITS.

The measures that can be taken to harmonize LITS in the IGAD region include the establishment of a common vision and objective, harmonization of surveillance, a legal framework and information system and development of region-wide infrastructure (trade routes, diagnostic facilities and a regional knowledge management system).

#### **4.5 Somalia LITS situation analysis report – by Mahmud Hassan Ali Jabra**

The presentation indicated that the LITS currently being used are hot-iron branding, paint and permanent markers, ear notching and plastic and metal ear tags. This is done on cattle, camel,

sheep, goats, horses and donkeys by the veterinary services in all pastoral areas, livestock entry and exit ports, livestock markets and slaughterhouses. The supporting institutions are the Ministry of Livestock and the veterinary department at entry and exit ports and the municipality at livestock markets. Currently, there is no identification and traceability policy or national infrastructure in place to facilitate livestock identification, traceability and tracking. The challenges encountered include reluctance to accept ear tagging and ear notching, suspicion of new innovations and technology introduced, cost and expenses for new identification and tracking systems and lack of a policy, law enforcement, infrastructure and national body for identification, registration, traceability and tracking of livestock.

Hot-iron branding in pastoral areas has been successful against stock theft but not in tracing back to the farmer. Ear tagging, notching and painting and markers have been successful in livestock disease surveillance and control, screening against TADs and for tax collections at livestock markets and entry and exit ports. With regard to LITS required by the country, since hot-iron branding is widely practised and appreciated by many pastoralist communities in Somalia, an effectual identification system needs to build on this as a basis from which to anchor any other component of the system, especially electronic identification. Primary identification can be done by making it mandatory for all livestock in the country to have a unique registered brand that can be traced to a particular farm, individual, family or community. Thereafter, the state could provide a secondary electronic identification system in the form of rumen bolus which not only identifies but also confers traceability attributes to the animal.

Key problems foreseen in the implementation of the proposed system include resistance to new innovations and technology, particularly by nomadic pastoralists, due to lack of awareness on technological advancement in livestock identification, traceability, registration and tracking; lack of policy, law enforcement, infrastructure and a national body for identification, registration, traceability and tracking and lack of resources. For harmonized LITS in the IGAD region, there is need take into account the variations and different levels of development of the livestock industry and LITS in the member states to facilitate joint regional initiatives on identification, marketing and disease control. National advocacy campaigns would also be important and a pilot scheme in one of the sub-regions will be necessary to learn lessons and streamline the program. The establishment of basic institutional, legal and policy frameworks will be critical.

#### **4.6 Republic of South Sudan LITS situation analysis report – by Jada Rombe Wani**

The presentation from the Republic of South Sudan indicated that the country has a population of approximately 8-12 million people. Ninety per cent of the population are rural residents of whom 45.5 % are agro-pastoralists. According to the 2008 census, the livestock population stands at 11.7 million cattle, 12.1 million sheep and 12.4 million goats. Traditionally, each community has unique ways of animal identification and traceability. The communities trace and identify their animals by naming the bull or cow, composing songs to praise the colour and the horn style until the animal is familiar with the sound and rhythm. This is done by the men, while the women or girls or boys help in pulling the animal during praising time. Writing on the animal's body using paint for identification is done specifically for those that are to be sold in the market. Other means of identification include tying a rope on the animal's neck with or without a bell, branding or tattooing livestock on the hoof or horn (not a common practice these days), decorating the ears of animals with a special mark for

the clan or household, massaging the animal in the morning and evening with cow dung ash and standing at the kraal to see and count the animals as they go to and come back from grazing site.

Official identification programs have been implemented through government initiatives. Ear tagging has been done on the exotic breeds introduced by MAFAO between 1978 and 1983. Between 1980 and 1990, Yambio Agriculture Institute introduced trypanosomiasis-tolerant cattle from Nigeria and used ear tags for identification. Among the pastoralists, the rinderpest eradication project in the Republic of South Sudan introduced plastic ear tags for local cattle. This enabled the traceability of positive cases of antibodies of the rinderpest virus. For disease control, a mass vaccination program against rinderpest used clover or V-shape ear notches to identify vaccinated animals from unvaccinated ones.

There is a new project on LIT in the Republic of South Sudan covering the Northern Bahr el Ghazal State in the north of the country. It is a two-year pilot project funded by the United States Department of State in close collaboration with the Ministry of Animal Resources and Fisheries (MARF) and the Government of Northern Bahr el Ghazal State. The target species is cattle. South Sudan has yet to enact all the bills covering the livestock industry. The challenges faced include the cost of the different programs; possible political opposition; absence of legislation to regulate animal traceability and identification; and lack of or inadequate framework, institutions, and personnel to enforce a livestock identification policy. A LITS in the country would require training of field staffs to assist pastoralist in identifying and tracing animals; construction of a border check point within and without; establishment of quarantine centres; passing bills and laws by the Assembly; and coordination and collaboration with stakeholders. Anticipated problems include lack of funds for implementation and law enforcement.

In designing a LIT pilot project, it will be necessary to involve all relevant stakeholders to buy in to the idea, consider good traditional LIT practices as the starting point or key entry point for introducing modern system, consider plastic or metal ear tags that are easy to use, low cost and durable, start in agropastoralist systems with few livestock rustling record and high offtake and share the benefits of using LIT with stakeholders in other countries or within the country.

#### **4.7 Djibouti LITS situation analysis report – by Abdi Mahamoud Elmi**

The presentation indicated that the country has no official livestock registration methods for record keeping at the national level. However, traditional animal identification methods such as hot-iron branding have been used by pastoral owners. Some sedentary agropastoralists use ear tags to identify their animals. For export, all animals must be identified by ear tags before or after entering the quarantine centre. The documents accompanying the livestock export allow for verification of numbers in the consignment, especially those from Ethiopia. Traceability is based on documents accompanying livestock including health certificates, ear labels or neck chains, name and address of the sender and country of origin.

The LITS the country requires is the existing ear tag system. The capacity for management of this system already exists and so the focus will be to improve the identification system to cover the whole country. Advantages of this system are that it easy to tag on the ear of animal and the tag is difficult to take off or tamper with. The tags are kept on the animal for a long time and can be read

from a distance. Tags are available in different colours, sizes and shapes depending on the species of animal; this enables differentiation of customers by the colour of the ear tag.

The unstructured and unorganized system of animal identification and traceability is one of the key challenges being experienced. Other challenges include the high mobility of livestock crossing borders in all areas, poor record keeping system in the country, inadequate training and capacity, low levels of literacy among pastoralist communities, inadequate equipment and logistics to improve LITS, lack of funding and lack of regional cooperation and communication for LITS.

To harmonize the LITS in the IGAD region, there will be need to build capacity on the different methods of LIT, select the best, most cost effective and practical system and develop a standardized record-keeping system for the region. This will be essential for the successful operation of AIT.

#### **4.8 Discussion on presentations on the situation analysis of LITS in the IGAD countries**

After the country presentations on the situation analysis of LITS in the IGAD region, the comments, questions and responses outlined below were raised.

- All speakers have mentioned the need for a harmonized approach to be adopted in the region. There will be need for a harmonized policy and legal framework to be put in place. How do they envisage this will be achieved?
- A couple of the presentations have mentioned the need for policy commitment. The question is: where is the policy framework in terms of committing themselves? Institutions and policies may exist but where are the resources? On the one hand, there are policy commitments but on the other, there are no resources to implement the policy. Therefore, all LITS projects come and go with donor resources. This could be a point for the discussion: policy commitments versus availability of resources and how the policymakers allocate resources.
- From the presentations, three purposes for traceability are identified: (i) ownership, (ii) security and (iii) animal health, trade, food safety and disease control. All three will influence the policy and legal framework that will be needed. This will require a lot of engagement with the relevant stakeholders and especially funders. Therefore, there is need to look at the distribution of the benefits in the market and who is going to pay because this affects the policy. Many times we have engaged the regulatory framework for enforcement, but we should rather focus on a policy that provides incentives for all these purposes and, where necessary, enforcement.
- Sudan has been missed in these presentations. This is an important livestock exporting country. However, plans are underway through an upcoming project to work with the Government of Sudan and a consultant to undertake a review of the LITS in the country. Hopefully, this will give the whole regional picture with no deficiencies in harmonization of LITS in the region.
- All presentations agree on the need to have a regional approach to policy, financing and capacity building. Kenya and Tanzania have good practice and could other countries in identifying the best options. With regard to South Sudan, security is a major problem. Could the presenter highlight the successes from the USAID-funded project and collaboration with

the ministry? Did Kenya have a program with the private sector on bolus reuse as this would impact on the cost of the whole exercise?

## Responses

- In Kenya, the LITS exercise was based on budgets from the government in order to establish a sustainable system. Yes, the private sector was engaged in the first pilot project and in this case we contacted the marketing agents who were pleased to be involved. Reactions from the private sector have been positive. For example, the insurance sector developed products tailored for this. On the issues of recovering bolus, we had a program for this. However, we had challenges where animals were stolen and there were litigation issues with regard to ownership and recovery of the type of boluses used. This was settled and eventually had a positive effect of building confidence among those who adopted this program as we were able to recover the animals. For us this was a positive step which we could build on.
- Tanzania is still in the planning phase but we have received a positive response from the private sector especially with regard to those who fabricate and supply the tags. There is also interest in information technology solutions from the private sector.
- Costs are very crucial in livestock identification systems. From the presentations, the feeling is that the identification systems in the USA are positively primitive. In this system, there is a clear separation between identification and traceability. Identification is the responsibility of the owner of the livestock and any costs associated with traceability for identification are borne by the owner. On the other hand, traceability is a government program to monitor the disease. Therefore, the tools (ear tagging, ear notching and tattooing) used are for identification and are the owners' responsibility. Farmers have the responsibility to identify their animals and, therefore, the government will not be held responsible in case of theft. Any system that is adopted should be cost effective and affordable. If it is costly to do, then it needs to be simplified. There is need to incorporate issues of sustainability into the whole system. Projects are transient but sustainability is for the long term.
- A lot of consideration has been put into the cost-benefit analysis of the different systems and one of the things we need to consider in the region is the cost of introducing such systems in areas with insecurity. For example, in Karamoja there is a heavy military presence for inspection and surveillance against cattle rustling. In such a case, the cost of a standing army is a factor to consider when setting up a system. In addition, there is need to address aspects of animal transboundary movement. At this point one needs to identify from the basket of options what is the most appropriate system. The problem is to load the cost of the whole system to the farmers. Apportioning the costs to all those involved will lessen the farmers' burden and will go a long way in making the system more sustainable. Such a system should be simple and traceability information should be easily available.
- The need for LITS in the region is apparent and the principal issues to be addressed include conflict, disease control and market access. Listening to the presentations, we have tried to address these issues from a supply side perspective. For example, veterinary officers supply what is most appropriate. Going forward, we need to work with consumers of the services we want to supply. Probably one or two combinations are most ideal. In some communities, tampering with the traditional identification system may not be taken kindly and, in this case, another system may need to be adopted. In this regard it is critical to consider the customer perspective and in all cases work with the targeted consumers.

- Different member states have different objectives and motives for implementing the livestock identification systems. This has an effect on the policies that will be put in place and the resources allocated to these objectives. With these different objectives, how can we harmonize the identification and traceability systems regionally? Probably a first step would be to identify the common areas to enable the process of harmonizing to begin. In addition, having common objectives is critical to moving the process forward.
- Presenters have given a good overview of LITS in the respective countries and we had hoped we could get a map to show what countries are doing. However, speakers mentioned specific activities in their countries. Most of the presentations are heavy on identification as opposed to traceability except the case of Kenya where boluses were found much further away from original trial sites. There is still need to see the extent to which some of the identification systems have been used for traceability purposes. Some of these identification systems may not be amenable to being used for traceability but there could be experiences that people have on this. For example, perhaps there is a way that paint markings can be used for traceability. The presentation from Tanzania showed us a form that can be used for such a purpose and that from Ethiopia gave an example of steps towards a harmonized approach by developing a common vision. This workshop could be the first step towards achieving a common vision and approach for LITS for the region.

## **5 Lessons learned from implementation of LITS in other regions**

### **5.1 Review of LITS activities in other African countries – by Mohammed M Bahari, James Wabacha, Joseph Magona and Bernard Bett**

The review of LITS activities in other countries in Africa covered the global outlook in terms of future demands for livestock and meat products, key drivers and components of AITS, continental and regional LITS initiatives and approaches, overall status of development and implementation of LITS in Africa, system architecture (geographical coverage, species and production systems), identification technologies in use, registration functionality (premises, actors and identification systems), information technology solutions and traceability functionality (entry and exits), funding and sustainability, incentive packages and factors associated with success and failure. The overview concluded by indicating some of the lessons learned:

- Most African countries are at different stages of designing, developing and implementing LITS.
- Some countries like Botswana and Namibia are well advanced and are updating their systems by dumping expensive and highly specialized systems in favour of easily available technologies.
- It is important to engage and consult extensively with stakeholders, with the possible option of the beneficiaries meeting some of the operational costs.
- Wholesale adoption of LITS developed in other countries might, in the long run, prove expensive. Therefore, countries should avoid such costly mistakes in their endeavours to develop and implement LITS.
- Combining LITS with other public sector led initiatives such as vaccination programs, artificial insemination, subsidy management and livestock insurance can lead to significant improvement in the rate of pastoralists' uptake of contemporary AITS.
- For the AITS to be vibrant and up to date, the government and public sector must support the design and development of LITS, enact conducive legislation to ensure confidentiality of the data and compliance to AITS rigorous demands of tagging, registering, recording and reporting as well as curb all illegal bush slaughter and unauthorized and unreported movement of livestock and livestock products.
- AITS changes should be done after extensive consultations and agreement with stakeholders.

### **5.2 CNFA experiences in SSCP – by Robert Mullen**

This presentation gave an overview of the SSCP which is a two-year pilot project focused on cattle only and is the first LITS program in South Sudan. The project is funded by the United States Department of State as violence mitigation effort, and operates in Northern Bahr el Ghazal State in three of the five counties. The program involves the use of non-RFID tags and aims to tag 150,000 cattle and register them in the LITS database. The project will be undertaken in three phases: (i) consultant report, (ii) implementation (tagging and registration) and (iii) handover to MARF. The project is expected to impact the livelihoods of 60,000 people and reduce cattle theft by 25%. Challenges the program has faced include lack of infrastructure, cattle theft, cultural acceptance of the program, very low rates of literacy and numeracy, limited communication externally and very



little capacity in government. Additionally, the country was at war for almost 30 years hence there is minimal development, low government budget and risk aversion by the populace.

Despite the challenges, progress has been made. Phase 1 of the project is complete while Phase 2 is in progress. The project has incredibly motivated local staff and the development of the database has been completed. Over 13,000 cattle have been tagged since September 2013 and currently there is a cordial working relationship between MARF and CNFA. Local FM radio stations have been working with owners towards the recovery of lost or stolen animals. In future, the project will continue to develop capacity of MARF (Phase 3), enhance relationships with the police and the army, continue community awareness effort and registration, develop relationships with other stakeholders, synchronize tagging with vaccination efforts, showcase the successes and grow the pilot phase into a larger project.

The presentation outlined some recommendations for IGAD as it develops a regional LITS program. It should start with a pilot program and, if possible, avoid readers and high technological options. Be ambitious but cautious in the roll-out phase of the program. Finally, if NGOs are involved they must understand the local culture.

### **5.3 Development and implementation of an AITS for Ethiopia – by Michael Bradfield, Jay Truitt, Wondwesen Assfaw and Girma Kassa**

The presentation gave an overview of CNFA's experience in LIT internationally and in sub-Saharan Africa countries of Namibia, Botswana and Zimbabwe. Of the African countries, Namibia has evolved to be the leader in LITS. All cattle are identified and the system is 100% a user pay system. Over three million animals have been identified and can be tracked. In Botswana, all cattle are identified in zones and over 80% are owned by smallholders. The bolus system that was introduced failed and the country is now switching to visual ear tags and adopting a user pay system. In Zimbabwe, commercial cattle have been identified using tamperproof visual tags. The system is also a user pay system and all movement of animals can be tracked.

Most African countries are implementing some form of LITS. For those who intend to engage in export trade in the future, LITS will be a prerequisite. An important aspect in this regard is to integrate LITS with a disease surveillance program. Based on demands of exporters and importers, there is need for a basic livestock identification and trace-back system which should also help to eliminate cattle theft and illegal trade. In all countries there is a ministry that oversees the program. Traceability systems are effective when they are part of a disease surveillance system and add value to every sector of the value chain.

CNFA is in the process of developing a proposal for Ethiopia. The vision is “within five years, all cattle and beef products will bear an official Ethiopian identification device and be traceable to region of origin to enhance exports and control animal diseases”. The proposal targets the 250,000 cattle destined for export. This initial proposal is practical and manageable and will enable Ethiopia to make the claim it has implemented traceability. It will also create a ‘brand’ for exports of live animals and meat products and allow farmers to produce for a market as requirements change. The project will adopt plastic tamperproof tags which are cost effective and do not rely on the internet or expensive readers.

The database should be customizable and scalable to the national system, have an internet interface for users, be cloud compatible, be currently commercially available and tested, have the capacity to handle movement data and be interoperable with health certificate and biosecurity systems and emergency response management.

#### **5.4 Overview of the LITS in the United States of America – by Andrew Clark**

The presentation covered various LITS and technologies that have been used in the United States of America and how these could be adapted by the countries in the IGAD region. Of importance, it is necessary to differentiate between identification and traceability and their purposes. Whereas identification is a foundational issue for surveillance, disease control and certification for trade, traceability is about getting back to the source herd. The issue of concern is that good disease control requires ability to trace, therefore, the need to design and operationalize a tracing system. There are several basic identification systems using different devices for different purposes including:

- Ownership brands and marks: Hot brands, freeze brands, ear marks and flesh marks
- Plastic dangle tags: Individual animal identification, typically used by livestock owners for management purposes
- RFID ear tags, rumen bolus and implants: Ownership or feedlot management records
- Tattoos: Ownership and disease control
- Clip-type ear tags: Recording disease control events
- Back-tags: Recording and tracing sales and movement

The presentation indicated that for a LITS to work in the IGAD region, there is need for cooperative design with livestock owners, traders, marketers and departments of veterinary services, careful assessment of costs so that design of the LITS fits financial resources and is sustainable, assurance that information management, databases and communications are sufficient and in place and pilot tested thoroughly before larger-scale implementation. The overview went on to indicate some suggestions for consideration in the design of a LITS that include starting small with pilot testing and growing from there and offering livestock owners a program of ownership identification that they can do themselves so as to get ownership identification going at very low expense to the LITS program. For program purposes, begin the LITS with disease control traceability in market livestock for the export trade of both live animals and commodity animals, combine with One Health later for zoonotic diseases and learn from the prior interventions and expand as is needed and doable.

#### **5.5 Discussion on presentations on lessons learned from implementation of LITS in other regions**

After the presentations on lessons learned from implementation of LITS in other regions, the comments, questions and responses outlined below were raised.

##### **Comments**

- The SSCP is progressing well but there is concern about the coordination with regard to the involvement of MARF. The project is coordinated by a different department with whom

there are no links and we are not even receiving reports. In the next implementation project it will be important that the relevant livestock departments are involved.

- Presenters have stated varying figures for the livestock population in South Sudan: 11 million versus 13 million. Which is the correct figure?

#### **Responses**

- No livestock census has been done in South Sudan so the figures provided are estimates.
- Most African countries have not undertaken livestock censuses and, therefore, most figures are estimates.
- Official statistics on livestock populations can be obtained from the National Bureaus of Statistics. They have the mandate for generating official data and have the best official data that can be used.

#### **Question**

- South Sudan's LITS is anchored on security issues. Given the small size of the population versus the large livestock numbers, what are the strategies for improving their livelihoods?

#### **Responses**

- The program that we have built in South Sudan is for livestock traceability. Right now it is to mitigate cattle theft. However, with the foundation we have built it can easily accommodate animal health, marketing and genetics.
- Anything that points to stability and supports livestock trade makes stabilization a goal. If we are doing that, then we are raising the profile of the livestock industry and everybody gains. In turn, national and household economies gain.

#### **Question**

- Can the back tags be used for regulatory purposes and are they tamperproof? What happens when the animals cross into another country?

#### **Response**

- For animals that get killed the back tag is taken off and traceability is achieved. However, in Africa there are 56 sub-divisions with eastern Africa having nine national sub-divisions. So if the animal originates from Ethiopia, and moves to Djibouti then to Somali and back to Djibouti and is positive it is still possible to trace back.
- With regard to the tags they indicate 'Do not remove' and, therefore, should not be tampered with. However, like any other identification tool, they can be removed. The point is to ensure that people understand the purpose and the need for identifying the animals and to have a legal framework that is enforced.

#### **Comments**

- We need to appreciate in the IGAD region that livestock movement is constant and, therefore, tags can be easily removed. In addition if you have a tag that reads Uganda and the animal, out of necessity, has to move to another country, then there is bound to be

some resistance. What we need is a system that regulates the movement of animals across the boundaries.

- Low-cost identification devices like ear tags have been identified for use in South Sudan. Could they suggest the system they would adopt if they are faced with cattle rustling? The use of ear tags for trade is understandable. But in cases of cattle rustling these can be tampered with.

#### **Response**

- There is no silver bullet to address the challenges hence the reason for this discussion. Every circumstance is different. If the animal has a short process then you use a single approach, but if the process is long, then a secondary identification may be needed. In South Sudan we had every thousandth animal inserted with bolus in addition to tamperproof ear tag. Therefore, in case of theft it would be possible to trace the animals because of the one with the bolus. In such a system it would be difficult to get rid of the ear tags from the animals. There are certain criteria that need to be adopted in identification. But each country needs to adopt some system.
- One of the secondary identification tools that could be used is tattooing. Tattoos can be hidden on certain parts of the animals only known to the owner, and they are very difficult to tamper with.

#### **Comment**

- There are claims that the RFID chip can enter the food chain, thus having health implications. The cost of the RFID chip is up to five times less than that of the other technologies. For most of the cattle owned, it could be inserted into the horn making it less harmful. If it is the question of costs of the system, this is an aspect that could be considered.

### **6 Understanding perceptions and positions on LITS by different stakeholders**

Based on the above presentations and discussions, most countries have used the LITS for ownership identification, theft prevention, disease control traceability, quality control traceability, premises and location identification and livestock management. To gain further insight on the understanding, perceptions and positions on LITS by different stakeholders, group discussions were held. During this discussion group session, the participants were divided into three groups based on occupation or profession. The three groups comprised chief veterinary officers, livestock value chain actors (farmers, traders, quarantine workers, transporters and meat processors such as the Kenya Meat Commission) and national experts/consultants. The rest of the participants who did not fall in any of these groups were evenly distributed across the three groups.

In carrying out their respective assignments, the groups were expected to review the plenary presentations and discussions, any other relevant documents as well as draw on their collective knowledge and experience and then discuss and respond to the guiding questions. The questions that guided the discussions in the three groups were the following:

- What should be the priority focus for a regional LITS and what should be the priorities for national systems?

- What are the expected challenges in the design and implementation of a sustainable regional LITS?
- What should be done to make LITS work in terms of expected level of acceptance by different stakeholder categories, promotion of the LITS, required incentives to promote adoption and steps that should be taken to harmonize LITS in the region?
- What steps should be taken to ensure sustainability of the LITS?

### **6.1 Harmonized discussion group report**

After fruitful deliberations, the three groups' reports were presented and discussed in plenary. Since the three groups responded to the same guiding questions, their reports were then harmonized into one report that incorporates the plenary feedback as outlined below.

In general, purposes of LITS were identified as: theft prevention, disease control, premises and location identification, quality control traceability/access to markets/export certification, ownership and livestock management issues, breed improvement and to capture the true value of the livestock. In this regard, the priority focus for LITS at the regional level should be to support trade, disease control, traceability, ownership and theft prevention. All these should be guided by an appropriate IGAD regional policy framework for animal health and trade. Based on this list, the key priorities of LITS at national level were identified as: (i) conflict and theft management, (ii) control of production and diseases and (iii) quality control for those countries focussing on commodity trade, certification, residues and adulteration.

In the design and implementation of a sustainable regional LITS, the anticipated challenges that were identified include low capacity to design and implement LITS, member states are at different levels of implementation and have different priorities, funding constraints, how to demonstrate the economic benefits of LITS, lack of incentives, the initiative may be mistaken for tax opportunities, lack of legal frameworks that (closely tied with political will), a database that can communicate regionally and the cultural differences between countries.

With regard to the level of acceptance, it was noted that this would be highest among the producers especially if the service is offered free. The initiative would also be highly accepted by governments, veterinarians, processors and service providers. Traders, especially illegal traders, would be sceptical for fear of taxation. To promote the adoption of LITS, there will be need to create public awareness and sensitization, clearly articulate the benefits and costs, build on the traditional systems, combine LITS activities with other government projects, initiate small pilots in limited geographical areas and involve all stakeholders in developing policies to operationalize the system. A wide range of incentives were suggested including:

- Stratification of the market especially among pastoralists so that those who have adopted LITS can access better markets.
- Access to high-value markets with larger volumes by exporters.
- Provision of free ear tags and vaccinations.
- Exposure visits for implementing agencies to countries with working LITS.
- Performance rewards (for example, for law enforcers) on agreed targets for those that participate.

- Training of traders through workshops to ensure that they are well informed to make decision.
- Capacity building of all value chain actors (farmers, traders, abattoir owners, processors and consumers) to demonstrate the value of improved production and on LITS.
- Linking groups to high-value markets.

Regarding the harmonization of LITS within the IGAD region, the following steps were suggested:

- Understanding what is happening on the ground.
- Development of a common vision and purpose and, consequently, a policy and legal framework to facilitate the establishment of LITS.
- Lobbying political leaders and the private sector. IGAD to take the lead as the regional authority. At the national level there should also be an authority to lead.
- A regional coordination body needs to be put in place to help countries in the design and implementation of national LITS. The body should be able to highlight what the importing countries require.
- Databases should be interoperable at regional level.
- Standardization of LIT processes at border points based on OIE guidelines.
- Facilitation of the implementation guidelines among the member states.
- Establishment of common protocols and standard operating procedures but with flexibility to implement individually.

With regard to sustainability, it was noted that it will be important to design a LITS that is easy to use, affordable, and cost effective. Most important would be to ensure stakeholder buy-in and participation in the development of the system. The developed LITS should be part of the legal framework and only those animals that are identifiable should be marketed. Identification of new markets will be crucial to ensure benefits are continuous.

## **7 Design and implementation of a regional LITS**

The design process of a regional LITS was carried out in discussion group setup. During this discussion group session, new groups were formulated by mixing the participants to create three multidisciplinary groups. The main focus of this discussion was to develop LIT options that can be piloted in the region. In order to achieve this in a sequential manner, this discussion group session was delivered in two parts. Part one dealt with the identification and ranking of LITS currently being used in the region. To do this the groups were expected to (i) identify LITS currently being used in the region and (ii) identify and rank regional LITS options that can be used to meet the objectives identified in the previous sessions of the workshop. The outcome of the first part of the discussion was then presented to the plenary for agreement and consensus building before proceeding to part two.

Following plenary agreement and consensus on the outcome of part one, the second part of the discussion group session dealt with the design and implementation of LITS options for the IGAD region. During this part, each group was assigned one or two of the top priority LITS options identified in part one and was then expected to review, discuss and agree on their design and implementation guided by the (i) scope – individual and/or group identification, (ii) extent of the

trace-back system to farm, village and market, (iii) capacity needs – who does what, compliance, (iv) incentives and promotion, (v) equipment needed, (vi) information system (databases) – collection, storage and access, (vii) policy and legal framework, institutions and institutional arrangements, (viii) coordination across institutions and countries, (ix) sustainable financing, (x) system maintenance, (xi) monitoring and evaluation and (xii) any other concerns that should be addressed in the design and implementation of a regional LITS.

### **7.1 Plenary discussion and feedback on group reports**

After fruitful deliberations, the three groups report were presented and discussed in plenary. The proposed designs for the priority options as discussed and presented in plenary by the groups were as indicated in Tables 1–3.



**Table 1: Visual tamperproof ear tags with ISO coding/Visual tamperproof ear tags (with ISO coding) plus hot-iron branding in insecure areas**

Question/criterion	Visual tamperproof ear tags	Visual tamperproof ear tags plus hot-iron branding
Scope (species, geographical coverage)	Individual livestock – (cattle, camels, sheep, goats, pigs)	Individual and group
Extent of trace-back system to farm, village, market etc.	<ul style="list-style-type: none"> <li>• Market: Animals for feedlot/export market except those for immediate slaughter</li> <li>• Farm level: Dairy (phased approach, starting with markets with a view to expanding this later to specific areas)</li> </ul>	<ul style="list-style-type: none"> <li>• Village: Djibouti/ Sudan/TZ /Somalia</li> <li>• Payam: South Sudan</li> <li>• Location: Kenya</li> <li>• <i>Kebele</i>: Ethiopia</li> <li>• Sub-county: Uganda (need for traceback to the source herd)</li> </ul>
Capacity need (who does what, compliance)	Veterinary frontline technical staff responsible to CVO <ul style="list-style-type: none"> <li>• Traders</li> <li>• Livestock owners</li> <li>• Market managers</li> <li>• Enforcement agents</li> </ul>	Veterinary frontline tech. staff responsible to CVO <ul style="list-style-type: none"> <li>• Traders</li> <li>• Livestock owners</li> <li>• Market managers</li> <li>• Enforcement agents</li> </ul>
Incentives and promotion	<ul style="list-style-type: none"> <li>• Communication strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Communication strategy</li> </ul>
Equipment needed	<ul style="list-style-type: none"> <li>• Ear tags: coded</li> <li>• Ear tag applicator</li> <li>• Hardware and software</li> <li>• Crushes</li> <li>• Computers/printers</li> </ul>	<ul style="list-style-type: none"> <li>• Ear tags: coded</li> <li>• Ear tag applicator</li> <li>• Hot-iron brands</li> <li>• Hardware and software</li> <li>• Crushes</li> <li>• Computers/printers</li> </ul>
Information system(databases): collection, storage and access	<ul style="list-style-type: none"> <li>• Recording system (manual or electronic)</li> <li>• Internet connection</li> <li>• Database and operating platform</li> </ul>	<ul style="list-style-type: none"> <li>• Recording system (manual or electronic)</li> <li>• Internet connection</li> <li>• Database and operating platform</li> </ul>
Policy and legal framework, institutions and institutional arrangements	<ul style="list-style-type: none"> <li>• Legal statutes</li> <li>• IGAD regional LIT policy and strategy</li> <li>• Political goodwill</li> <li>• Specialized division under the CVO/DVS</li> </ul>	<ul style="list-style-type: none"> <li>• Legal statutes</li> <li>• IGAD regional LIT policy and strategy</li> <li>• Political goodwill</li> <li>• Division under the CVO/DVS</li> </ul>
Coordination across institutions and countries	<ul style="list-style-type: none"> <li>• Regional coordination unit at IGAD level</li> <li>• National coordination DVS/CVOs</li> <li>• Cascade to lower administrative units</li> </ul>	<ul style="list-style-type: none"> <li>• Regional coordination unit at IGAD level</li> <li>• National coordination DVS/CVOs</li> <li>• Cascade to lower administrative units</li> </ul>

Question/criterion	Visual tamperproof ear tags	Visual tamperproof ear tags plus hot-iron branding
Sustainable financing	<ul style="list-style-type: none"> <li>• Cost sharing according to the benefits (private-public partnership)</li> </ul>	<ul style="list-style-type: none"> <li>• Cost sharing according to the benefits (private-public partnership)</li> </ul>
System maintenance	<ul style="list-style-type: none"> <li>• National and local governments</li> </ul>	<ul style="list-style-type: none"> <li>• National and local governments</li> </ul>
Monitoring and evaluation	<ul style="list-style-type: none"> <li>• Internal and external</li> <li>• All levels of government</li> </ul>	<ul style="list-style-type: none"> <li>• Internal and external</li> <li>• All level of government</li> </ul>
Any other concerns	<ul style="list-style-type: none"> <li>• Trace back – one step back from the market but more to be done as the system evolves</li> </ul>	<ul style="list-style-type: none"> <li>• Trace back – one step back</li> </ul>

**Table 2: RFID ear tags and hot-iron branding/RFID bolus and hot-iron branding**

Question/criterion	RFID ear tags	Hot-iron branding	RFID bolus
Scope	• All species (after 6 months)	• Large animals (camel and cattle)	• Only ruminants (after 6 months)
	• Individual	• Group	• Individual
	• Targeted areas (trade stock)	• Can be all areas	• Can target high theft areas • Target commercial systems
Extent of trace-back	• Farm level	• Village	• Farm level
Capacity needs	<ul style="list-style-type: none"> <li>• Central government for design and database</li> <li>• Implementation is by local government</li> <li>• Tagging done by vet services or public-private partnership</li> <li>• Farmers can also do tagging</li> <li>• Farmers have to learn to take ownership</li> </ul>	<ul style="list-style-type: none"> <li>• Central government for design, brands and database</li> <li>• Implementation is by local government</li> <li>• Farmers can also do branding but needs to be supervised</li> </ul>	<ul style="list-style-type: none"> <li>• Central government for design and database</li> <li>• Implementation is by local government</li> <li>• Needs to be done by a veterinary officer or public-private partnership</li> </ul>
Training needs	• Lots of training, veterinary officers	• Less training	• Training (animal health workers)
Incentives	<ul style="list-style-type: none"> <li>• Initially provide it at subsidized cost or free</li> <li>• Link to market</li> <li>• Improved disease control</li> <li>• Combine with vaccination</li> <li>• Improved security</li> </ul>	<ul style="list-style-type: none"> <li>• Improved security</li> <li>• Give incentives for vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Improved security</li> <li>• Give incentives for vaccination</li> </ul>
Promotion	<ul style="list-style-type: none"> <li>• Better market opportunities</li> <li>• Extensive communication and consultation</li> </ul>	<ul style="list-style-type: none"> <li>• Better market opportunities</li> <li>• Extensive communication</li> <li>• Consultation</li> </ul>	<ul style="list-style-type: none"> <li>• Better market opportunities</li> <li>• Extensive communication</li> <li>• Consultation</li> </ul>
Equipment	<ul style="list-style-type: none"> <li>• Applicator, reader and tags</li> <li>• Readers at all checkpoints</li> <li>• Readers need to be charged</li> <li>• Need crushes</li> <li>• Need field data capture systems</li> </ul>	<ul style="list-style-type: none"> <li>• Crush</li> <li>• Branding equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Applicator, reader and tags</li> <li>• Readers at all checkpoints</li> <li>• Readers need to be charged</li> <li>• Need crushes</li> <li>• Need field data capture systems</li> </ul>

Question/criterion	RFID ear tags	Hot-iron branding	RFID bolus
Database	<ul style="list-style-type: none"> <li>Needs to be a central database</li> <li>Electronic, can be custom or off the shelf</li> </ul>	<ul style="list-style-type: none"> <li>Needs to be a central database</li> <li>Can be both electronic and paper</li> </ul>	<ul style="list-style-type: none"> <li>Needs to be a central database</li> <li>Electronic, can be custom or off-the-shelf</li> </ul>
Collection	<ul style="list-style-type: none"> <li>Phones or forms</li> </ul>	<ul style="list-style-type: none"> <li>Forms or electronic</li> </ul>	<ul style="list-style-type: none"> <li>Reader, phones or forms</li> </ul>
Storage	<ul style="list-style-type: none"> <li>Reader or database</li> </ul>	<ul style="list-style-type: none"> <li>Forms or electronic</li> </ul>	<ul style="list-style-type: none"> <li>Reader</li> </ul>
	<ul style="list-style-type: none"> <li>Need to add value to the product to offset the cost of the tag and running the system.</li> </ul>	<ul style="list-style-type: none"> <li>Need to add value to the product to offset the cost of the tag and running the system</li> </ul>	<ul style="list-style-type: none"> <li>Need to add value to the product to offset the cost of the tag and running the system.</li> </ul>
Startup funding	<ul style="list-style-type: none"> <li>Government and livestock industry and development partners</li> </ul>	<ul style="list-style-type: none"> <li>Government and livestock industry and development partners</li> </ul>	<ul style="list-style-type: none"> <li>Government and livestock industry and development partners</li> </ul>
Operational financing	<ul style="list-style-type: none"> <li>Co-financed between government and beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>Co-financed between government and beneficiaries</li> </ul>	<ul style="list-style-type: none"> <li>Co-financed between government and beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>Create demand for systems (e.g. in South Sudan)</li> </ul>	<ul style="list-style-type: none"> <li>Create demand (e.g. in South Sudan)</li> </ul>	<ul style="list-style-type: none"> <li>Create demand (e.g. in South Sudan)</li> </ul>

**Table 3: Microchip (for controlled trials) and hot-iron branding/tamperproof ear tags and branding**

Question/criterion	Microchip and hot-iron branding	Tamperproof ear tags and branding
Scope	<ul style="list-style-type: none"> <li>Is for individual animals but branding can be for the group and is species-specific</li> </ul>	<ul style="list-style-type: none"> <li>Both individual animals and groups</li> </ul>
Extent of trace-back system	<ul style="list-style-type: none"> <li>To the farm or owner level, given this is a huge investment and appropriate for tracing up to market and owners</li> </ul>	<ul style="list-style-type: none"> <li>Entire chain from the producer to slaughter; can be to fork if barcodes are added</li> </ul>
Capacity needs (who does what?)	<ul style="list-style-type: none"> <li>Applications of microchips by the CVOs or government agencies</li> <li>Branding by the owner, based on national state register</li> <li>Database: managed by government agencies</li> <li>Maintenance of national brands and microchip registry by the governments</li> <li>Trained personnel: by government and collaborators</li> <li>Availability and costs: are they readily available in quantities needed in the region?</li> </ul>	<ul style="list-style-type: none"> <li>Branding by the owner</li> <li>Ear tags by the responsible government agents</li> </ul>
Incentives and promotion	<ul style="list-style-type: none"> <li>Awareness and sensitization on the need for identification and traceability</li> <li>The initial application for the herd to be free but cost for subsequent additions or offspring to be borne by the owner</li> <li>Initial application combined with routine disease control programs (vaccination)</li> </ul>	<ul style="list-style-type: none"> <li>Awareness and sensitization on the need for identification and traceability</li> <li>The initial application for the herd to be free but subsequent additions or offspring borne by the owner</li> <li>Initial application combined with routine disease control programs (vaccination)</li> </ul>
Equipment needed	<ul style="list-style-type: none"> <li>Crush: To contain large animals for vaccination, implanting the microchip and branding</li> <li>Microchip applicator and reader, computer software (online) and hardware</li> <li>Hot-iron branding tool: Branding only during the dry seasons when there are fewer less flies</li> <li>Firewood or propane</li> <li>Syringes</li> <li>Vaccines</li> <li>Shears for sheep</li> </ul>	<ul style="list-style-type: none"> <li>Tamperproof ear tags (serialized)</li> <li>Application pliers/ear tagger</li> <li>Branding: the brands have to be standardized and country-specific in line with regional framework (symbol for area specific with primary and secondary numbering; primary- K for Kenya, U for Uganda)</li> <li>Hot-iron branding tool</li> <li>Firewood or propane</li> </ul>
Information system	<ul style="list-style-type: none"> <li>Managed by the government (administrator) who gives rights for data entry and access at different levels</li> </ul>	<ul style="list-style-type: none"> <li>Managed by the government (administrator) who gives rights for data entry and access at different levels</li> </ul>

Question/criterion	Microchip and hot-iron branding	Tamperproof ear tags and branding
	<ul style="list-style-type: none"> <li>Back-up system has to be in place including the paper forms used in all transactions</li> <li>Collection of data: Can use mobile systems</li> <li>System to be run/regulated by the government</li> </ul>	<ul style="list-style-type: none"> <li>Back-up system has to be in place including the paper forms used in all transactions</li> <li>Collection of data: Can use mobile systems to capture data</li> <li>System to be run/regulated by the government</li> </ul>
Policy and legal framework	<ul style="list-style-type: none"> <li>There has to be a national government law to implement the program which can be cascaded to all levels of administration</li> <li>The policy needs to be in line with the regional strategy. IGAD policy/guide needs to be developed very early for reference</li> <li>OIE, World Trade Organization</li> </ul>	<ul style="list-style-type: none"> <li>There has to be a national government law to implement the program which can be cascaded to all levels of administration</li> <li>The policy needs to be in line with the regional strategy</li> <li>IGAD policy/guide needs to be developed very early for reference</li> </ul>
Coordination across institutions and countries	<ul style="list-style-type: none"> <li>Across the institutions: Inter-ministerial sharing among the ministries of agriculture, livestock and security</li> <li>Countries: Refer to the regional guidelines to see the IGAD regional plan</li> <li>The IGAD framework needs to be in line with the AU-IBAR framework</li> </ul>	<ul style="list-style-type: none"> <li>Across the institutions: Inter-ministerial sharing among the ministries of agriculture, livestock and security</li> <li>Countries: Refer to the regional guidelines to see the IGAD regional plan</li> <li>The IGAD framework needs to be in line with the AU-IBAR framework</li> </ul>
Sustainable financing	<ul style="list-style-type: none"> <li>To be budgeted for by the governments</li> <li>Cost sharing with the industry parties: To sustain there is a need for cost sharing</li> </ul>	<ul style="list-style-type: none"> <li>To be budgeted for by the governments</li> <li>Cost sharing with the industry parties: To sustain there is a need for cost sharing</li> </ul>
System maintenance	<ul style="list-style-type: none"> <li>The government; it is a public good</li> </ul>	<ul style="list-style-type: none"> <li>The government; it is a public good</li> </ul>
Monitoring and evaluation	<ul style="list-style-type: none"> <li>The government</li> </ul>	<ul style="list-style-type: none"> <li>The government</li> </ul>
Other concerns	<ul style="list-style-type: none"> <li>Information technology capacity</li> <li>Logistical capacity: electricity, computers, data sending to the server</li> </ul>	

Outlined below is a harmonized summary of the group reports that incorporates the plenary feedback. Based on the plenary presentations and discussions, the workshop identified the LITS currently being used in the region. This was followed by the identification of LIT options that can be used in the design of a regional LITS. The identified LIT options in order of priority were the following:

- Visual tamperproof ear tags with ISO coding
- Visual tamperproof ear tags (with ISO coding) plus hot-iron branding in insecure areas
- RFID ear tags
- RFID bolus (for ruminants)
- Microchip implants (for controlled trials) with hot-iron branding to deter theft

Visual tamperproof ear tags and visual tamperproof ear tags combined with hot-iron branding can be used both for individual animals and groups of animals. In insecure areas, a combination of visual tamperproof ear tags and hot-iron branding would be most preferable. RFID ear tags can be used on all species of animals, while RFID bolus is suitable for ruminants only. Microchip and hot-iron branding can also be done for individual animals but branding can be for the group and is species specific. In most cases, both primary and secondary identification would be necessary. All the options identified can provide a trace-back in the entire value chain from the farm, village to markets. For all options, there is need for capacity development of all stakeholders to appreciate and manage the systems. Incentives range from subsidies, subsidized cost or free ear tags and equipment, links to market, improved disease control, combining identification with routine disease control programs (vaccination) and improved security to encourage investment in the systems. It will be essential to develop a communication strategy to promote LITS nationally and in the region.

For all the options, various equipment and facilities will be required. In addition, there will be need to set up a central database (manual or electronic recording system) managed by the government (administrator) who would give rights for data entry and access at different levels. A back-up system has to be in place including the paper forms used in all transactions. There has to be a national government law to implement the program which can be cascaded to all levels of administration. A specialized division under the CVO/DVS will need to be formed. The national policy need to be in line with the regional strategy. IGAD will need to come up very early with a regional LIT policy and strategy for reference and to guide member states. Political goodwill from all member states will be essential for the system to work.

With regard to financing, start-up funds may need to be provided by the government but for sustainability there is need for co-financing between the government and beneficiaries. Cost sharing should be done according to the benefits accrued. On system maintenance, the suggestion was that this should be the responsibility of the governments since it was a public good. Monitoring and evaluation would be both internal and external and at both levels of government.

### **Controlling concepts of development work and field manual – by Andrew Clark**

Dr Clark distributed a field manual to the participants titled *A field manual of livestock diseases by syndromes – with emphasis on transboundary animal diseases*. The manual presents TADs in a basic pictorial format (Figure 1). He hoped that it would help everyone associated with animals to

recognize these diseases so that they could participate in the system of reporting them. Dr Clark concluded his presentation by illustrating how to use the field manual in the identification of TADs using the ‘surveillance pincers’ illustrated in Figure 1.

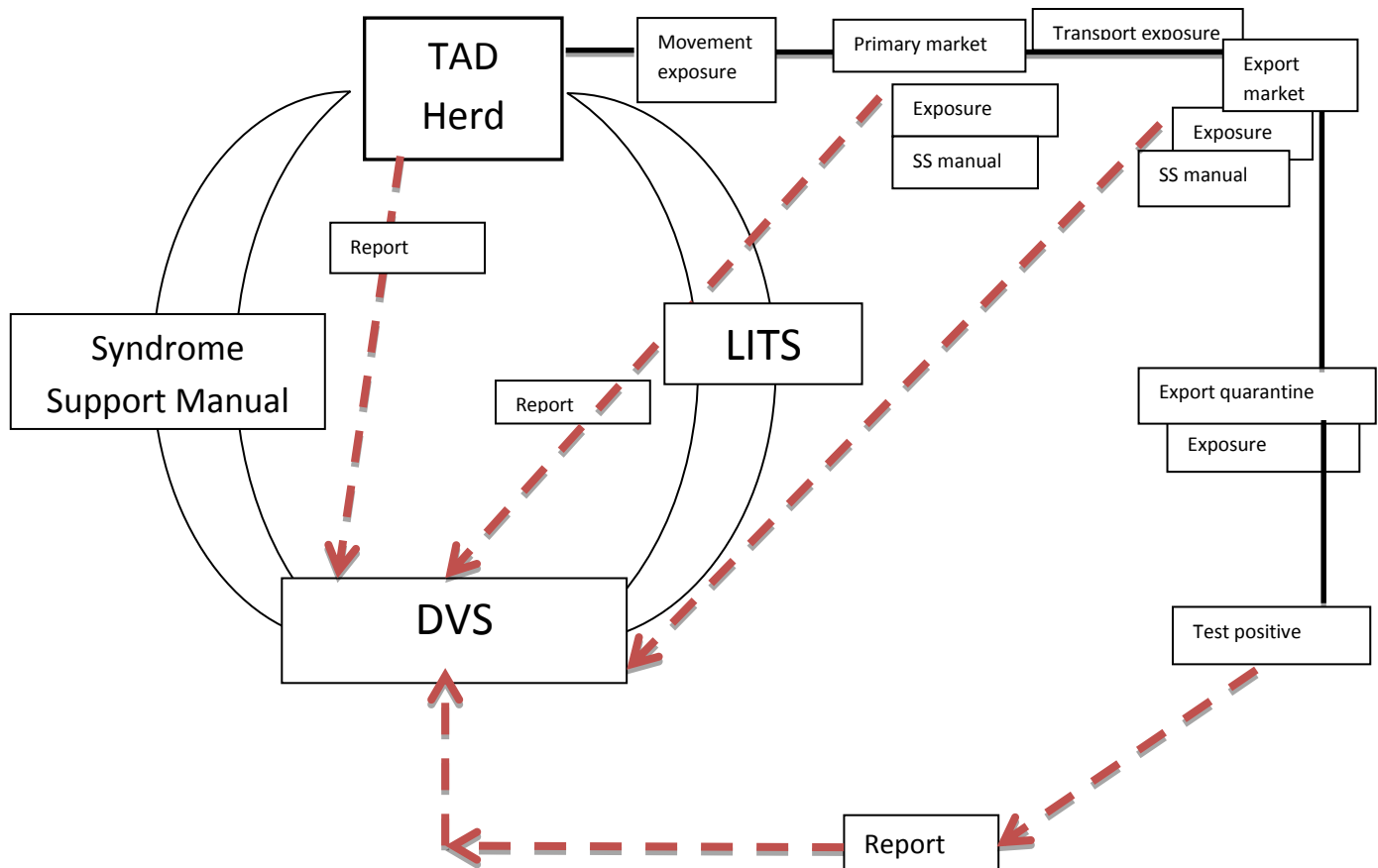


Figure 1: Surveillance pincers.

## 8 General recommendations, way forward and closing remarks

### 8.1 General recommendations and way forward

Given the presentations, discussions and consensus reached, the workshop came up with the following general recommendations:

1. Development of a pilot project on LITS for the IGAD region (including Tanzania) based on the following criteria:
  - Areas with identified target market and export facilities (quarantine and abattoirs among others)
  - Areas with confirmed security concerns
  - Areas with cross border movement
  - Areas with fairly advanced LITS
  - Areas with confirmed animal health concerns



- Areas with major livestock trade routes

In this regard, ILRI was encouraged to work closely with the already ongoing initiatives for the design and implementation of the pilot study.

2. Development of an IGAD umbrella body that would oversee the implementation of LITS in the region.
3. Development of guidelines, procedures and regional coordination mechanisms by the umbrella body in conjunction with states that have current and proposed LIT activities.
4. Encourage international and regional organizations such as FAO, AU-IBAR and OIE to speed up the development, finalization and dissemination of guidelines on LITS to assist the developing countries.
5. Encourage the member states to establish/strengthen their LITS as an important tool for trade and disease control.
6. AU-IBAR and IGAD should organize exposure visits to areas with reasonably advanced LITS.

Given the outcome of this regional workshop on LITS in the IGAD region, ILRI was encouraged to move the process further in terms of:

1. Consolidation and synthesis of the consultants' reports from the various IGAD member states. This would provide the position of LITS in the region;
2. Evaluate what is ongoing worldwide to learn from the experiences on what has succeeded and challenges encountered;
3. Development of frameworks for LITS for the region and;
4. Designing of a small pilot project using the methods/options identified for traceability taking into account cost effectiveness, ease of implementation and sustainability. The aim is to come up with data based on objective evaluation of the systems to identify which systems could be viable.

## 8.2 Workshop closing remarks

In his closing remarks, Dr Antony M. Kilewe said that the facilitators had enjoyed very much facilitating the workshop and hoped that the workshop had delivered on the expected outputs against the limited time allowed. He hoped that the facilitators' performance had met both the participants' and the organizers' expectations. In this regard, Dr Kilewe went on to express special thanks to the ILRI management for giving the facilitators an opportunity to facilitate the workshop; Dr Bernard Bett for his valuable guidance, advice and encouragement in preparing and conducting the workshop that contributed enormously to the achievement of the expected outputs as well as overall success of the workshop; the participants for their dedication and commitment that enabled the workshop to achieve its purpose besides making the facilitation task quite easy and enjoyable; Ms Rosekellen Njiru, Dr Florence Mutua and the rest of the organizing team for the excellent handling of all the logistics before and during the workshop and the ILRI management for providing excellent facilities and services. Dr Kilewe concluded his remarks by wishing everybody safe journey to their respective destinations and looked forward to continued cooperation and collaboration in similar activities in future. He then invited Dr Bett to proceed with the remaining part of the workshop closing protocol.

In his closing remarks, Dr Bett recognized and appreciated the participation and contribution of all towards the success of the workshop. He said that he was very happy that the workshop was able to achieve its purpose through the attainment of the three expected outputs. He said the information gathered would go a long way in the design of the pilot project using the methods and options identified for LIT taking into account cost effectiveness, ease of implementation and sustainability. He went on to recognize the contribution of Dr Ameha Sebsibe in the organization of the workshop and concluded by calling upon Prof James Wabacha to give his remarks.

In his remarks, Prof Wabacha said that he was happy that the workshop had gone on very well and thanked the participants, organizers and workshop facilitators for a job well done. He reminded the participants that Dr Clark had indicated that he would be getting back to them with regard to who should receive the field manuals to support what he had explained on surveillance and traceability and how they should be distributed. Prof Wabacha concluded by saying that he looked forward to receiving the workshop proceedings as this would enhance their confidence as they engaged with the CVOs on how to get the job done.

In the final closing remarks, Dr Ameha Sebsibe thanked ILRI, the participants, workshop organizers, SMP-AH project and the facilitators for the successful and productive workshop. He said the workshop had brought together ILRI, project members and all partners to move forward with the discussions on LIT in the IGAD region and was happy that the deliberations had been actualized. He thanked the participants once again and said he hoped they would all meet again soon.

### **8.3 Workshop evaluation**

At the end of the workshop, the participants were requested to evaluate the workshop by completing a simple evaluation form. The information provided will be used to improve on the planning, organization and management of future workshops. A total of 22 participants completed and returned the evaluation forms. The analysis of the responses indicated that the workshop was quite successful with an overall rating of 53% very good, 45% good and 2% average.

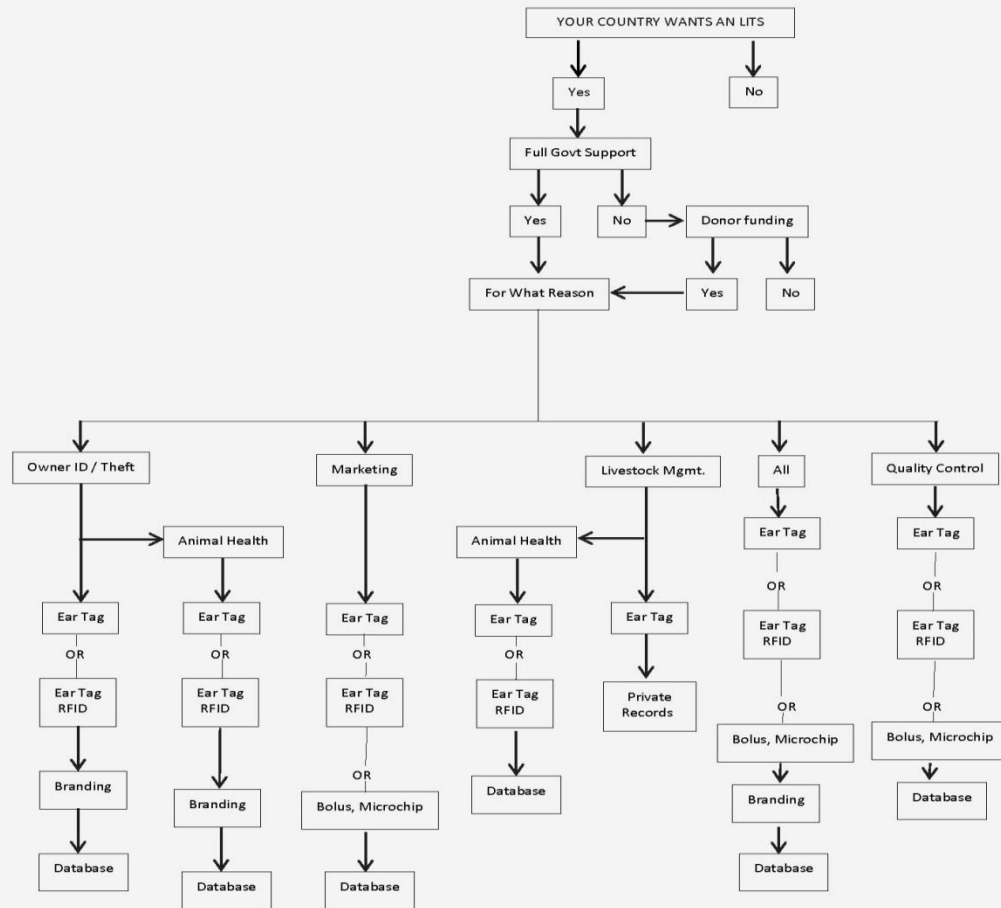
The most mentioned aspects of the workshop that the participants thought went well were as follows:

- The diversity in the composition of the participants which enriched the workshop discussions both in plenary and in the discussion groups.
- The good workshop organization, approach/methodology and plenary presentations and discussions.
- The excellent workshop facilitation and good time management that contributed to the attainment of the workshop expected outputs.
- The good discussion sessions with clear terms of reference that provided excellent opportunity for in depth interactions and networking.
- The open interaction among the participants, excellent level of engagement and respect for individual views.

The most mentioned aspects that the participants thought needed improvement were as follows:

- The need to allocate enough time for the presentations, discussions and group work.
- The need to ensure adequate representation of the farmers/traders as well as the private sector right from the start of the design process for sustainability and acceptance.
- The logistic support/very small per diem and the need to give the participant a chance to have a look at the town.
- The accommodation, especially the tiny beds in Block D while other rooms had big beds, and poor availability of dinner.

The following decision tree for analysing a country's need for LITS and options was prepared by Robert Mullen but was not presented and discussed during the workshop due to time constraints and is, therefore, included in this report as food for thought.



### Annex 1.1: List of workshop participants

Name	Institution and contact
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Violet O. Kirigua (workshop facilitator)	Topridas Consultancy Services, P.O. Box 66748-00800, Nairobi, Kenya violetkirigua@yahoo.com

## Annex 1.2: Workshop program

Day One: Tuesday 4 February 2014

Time	Activity	Responsible
0800–0830	Registration and review of documents	ILRI/facilitators
<b>Session 1</b>	<b>Workshop opening and scene setting</b>	
0830–0840	Introductions and workshop approach	Facilitators
0840–0850	Welcome remarks and workshop expected outputs	Bernard Bett
0850–0910	Workshop Opening Remarks	Iain Wright
0910–0920	Remarks from Ethiopia/AU-IBAR/ICPALD	CVO Ethiopia; James Wabacha; Ameha Sebsibe
0920–0930	Livestock production and trade in the IGAD region	Ameha Sebsibe
0930–0940	Overview of the SMP-AH project	James Wabacha
0940–1000	Comments and points of clarification	Facilitators
1000–1030	Health break and group photograph	
<b>Session 2</b>	<b>Plenary presentation and discussion of the LITS situational analysis reports</b>	
1030–1045	LITS report – Tanzania	Bahari
1045–1100	LITS report – Uganda	Benon
1100–1115	LITS report – Kenya	Maritim
1115–1130	LITS report – Ethiopia	Shitaye
1130–1145	LITS report – South Sudan	Jada
1145–1200	LITS report – Somalia	Hassan
1200–1215	LITS report – Djibouti	Abdi
1215–1300	Plenary discussion limited to feedback on the reports	Facilitators
<b>1300–1400</b>	<b>Lunch break</b>	
<b>Session 3</b>	<b>Lessons learned from LITS implementation in other regions</b>	
1400–1500	Review of LITS activities in other countries	Bahari/Joseph/ Andrew
1500–1515	CNFA experiences in South Sudan	Robert Mullen
1515–1540	Comments and points of clarification	Facilitators
<b>Session 4</b>	<b>Group work to understand perceptions and positions on LITS by different stakeholders</b>	
1540-1600	Discussion groups formation, terms of reference and task assignment	Facilitators
<b>1600</b>	<b>Health break</b>	
1630-1730	Group-based discussions as per the terms of reference	Group chairpersons and facilitators
1730-1830	Plenary presentation, discussion and consensus building on group reports	Group chairpersons and facilitators
1930	Cocktail	All

## Day Two: Wednesday 5 February 2014

<b>Session 5</b>	<b>Group work to design LITS options for the IGAD region</b>	
0830–0840	Recap on day one and emerging issues	Facilitators
0840–0850	Discussion groups formation, terms of reference and task assignment	Facilitators
0850–0950	Group-based discussions as per the terms of reference	Group chairpersons and facilitators
0950–1020	Plenary presentation, discussion and consensus building on group reports	Group rapporteurs and facilitators
102–1030	Discussion groups terms of reference and task assignment	Facilitators
<b>1030–1100</b>	<b>Health break</b>	
1100–1300	Group-based discussions as per the terms of reference	Group chairpersons/facilitators
<b>1300–1400</b>	<b>Lunch break</b>	
1400–1440	“Continued” Group-based discussions as per the terms of reference	Group chairpersons and facilitators
1440–1545	Plenary presentation, discussion and consensus building on group reports	Group rapporteurs and facilitators
<b>1545–1615</b>	<b>Health break</b>	
1615–1700	“Continued” Plenary presentation, discussion and consensus building on group reports	Group rapporteurs and facilitators
1700–1715	15 controlling concepts of development work and field manual	Andrew Clark
1715–1745	General workshop recommendations and the way forward	Facilitators/Bernard Bett
1745–1815	Workshop closing	ILRI/facilitators