



Regional Guidelines on Livestock Identification and Traceability (LITS) in the IGAD Region

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Acronyms

AHC	Animal Health Certification
APFSWG	Animal Production and Food Safety Working Group (OIE)
ASF	African swine fever
AU-IBAR	African Union – Inter African Bureau of Animal Resources
BMC	Botswana Meat Commission
CAC	Codex Alimentarius Commission
CBPP	Contagious bovine Pleuropneumonia
CCFICS	Food Import and Export Inspection and Certification Systems
CCIA	Canadian Cattle Identification Agency
CVO	Chief Veterinary Officer
DVS	Director of Veterinary Services
EU	European Union
FAO	Food and Agriculture Organization
FMD	Foot and Mouth Disease
GHoA	Greater Horn of Africa
ICAR	International Committee for Animal Recording.
ICPALD	IGAD Centre for Pastoral Areas and Livestock Development
IGAD	Intergovernmental Authority on Development
IGAD MS	IGAD Member States
ILRI	International Livestock Research Institute
ISO	International Standards Organization
ISTSDs	Improving animal disease surveillance in support of trade (in

IGAD)

LITS	Livestock Identification and Traceability System
NLIS	National Livestock Identification System
OIE	World Organization for Animal Health
PPR	Pest de Petit Ruminants
RFID	Radio Frequency Identification Device
RVF	Rift Valley Fever
SADAC	Southern African Development Community
SMP-AH	Standard Methods and Procedures in Animal Health
SPS	Sanitary and Phyto-Sanitary System
TADs	Transboundry Animal Diseases
TBT	Technical Barriers for Trade
USDA	United State Department of Agriculture
WTO	World Trade Organization

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Executive summary

In a move to address challenges posed by the inadequate response and interventions to the control of endemic TADs and zoonoses in IGAD region, and to continue to grow the live animal export markets, the AU-IBAR in partnership with IGAD and financial support from the EU has developed a regional project entitled “*improving animal disease surveillance in support of trade (STSDs) in IGAD member states (MS)*”. The overall objective of the STSD project is to reduce the impact of TADs and zoonoses in food security, trade and resilience of livestock farmers. The two result areas of the project include:

- Livestock identification, traceability and animal health certification improved.
- Surveillance systems and disease control strategies at national and regional levels improved.

Under the first result area, the IGAD Center for Pastoral Areas and Livestock Development (ICPALD) is responsible for the development of guidelines on livestock identification and traceability system (LITs) for IGAD MS. While implementing activities under this result area, the project seeks to complement activities carried out by the Standard Methods and Procedures in Animal Health (SMP-AH) project.

While development of the guideline is part of the STSD planned activities, it also addresses the recommendations issued by the three workshops held in Addis Ababa (Ethiopia) in February, April and October 2014, organized jointly by AU-IBAR and IGAD, with active participation from other regional and international organizations and IGAD MS.

Livestock production systems in IGAD MS comprise mainly of three production systems based on the way livestock husbandry and animal management systems are managed:

- Pastoral and agro-pastoral livestock production system
- Settled mixed crop-livestock production system
- Small and large scale fattening and dairy production systems.

Each of the above system has its own peculiarities and features which need to be considered when implementing any identification system.

Livestock identification and traceability system (LITS) provides for the management of herd / flocks, animal health (including zoonoses) programmes and food safety. These tools may improve the effectiveness of activities such as:

- Animal identification
- The management of disease outbreaks and food safety incidents
- Vaccination programs
- Livestock rustling
- Herd/flock husbandry
- Zoning/compartmentalization
- Surveillance, early response and notification systems
- Animal movement control, inspection and certification
- Fair practices in trade
- Control of the use of veterinary drugs and pesticides at farm level.

Many of the IGAD countries are trading livestock across borders, and internationally to mostly Middle Eastern countries. To improve competitiveness, the disease status of animals must be continuously monitored and sanitary standards must be complied with. However, to successfully contain or respond to an outbreak of an infectious animal disease, a system for identifying and tracking animals is a prerequisite.

Recommendations

- To be effective, a LITS requires two basic components, **animal identification** (for example a ISO numbered ear tag) and **movement monitoring** of an animal, or groups of animals, along the value chain to the final destination i.e. a database. It is only when these components are all put together that a LITS becomes functional.

- All countries that implement a LITS should choose one device that can meet the requirements for all production systems.
- The tamperproof tag as a means of identification device is cost effective and has been proven to significantly reduce cattle rustling but requires the animal identification number to be manually imputed onto a paper form and then transferred to an electronic database. The other devices, for example RFID tag or bolus, significantly increase the costs of a LITS but make the management of large numbers of animals easier. At the LITS workshop held in Addis Abba the recommendations for the device to be trialled in order of priority were as follows:
 - 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.
- Implementing and running a LITS system requires a high level of organization within an industry where all actors in the value chain must cooperate to make it work. Whilst the system should be managed by the ministry responsible of livestock, the task is usually given to a smaller **task team** (for example two to three staff members) who are employed by the ministry and/or private sector and who are given the full time responsibility to implement the system. This task team should also ensure that all participants adhere to and support the implementation and assist with the running of the system. All industry participants must be committed to abide by the rules, which must be supported by a legislative framework. This legislative framework must enforce strict penalties to participants who do not comply.

- The livestock Industry and **especially smallholders in developing countries will usually support a LITS system if it can clearly demonstrate that there is a direct benefit to their livelihood.** For example, if it can be demonstrated that a LITS will prevent cattle rustling, and is possibly supported by a vaccination program, the potential added financial value accrued per animal usually allows this sector to become supportive of a LITS.
- Most countries in the IGAD region are in the process of considering or piloting some type of LITS program and there is a clear willingness to follow a regional approach to a LITS implementation. At the same time it must be recognized that each country has its own specific requirements and in some instances unique challenges and specific production systems. However, it is clear that **a general framework and guideline could be developed for the region tailored to the major production systems and the economic status of each country.**
- Feedback from the questionnaires sent to the CVO's provided valuable inputs. IGAD/ICPALD facilitated the consultants meet a number of livestock stakeholders in different regional and international organizations and private consultants stationed in Nairobi (Kenya). At the regional AU-IBAR and IGAD workshop on the coordination of LITS and Animal Health Certification (AHC), held in Addis Abba in April 2014, **a Regional Coordination Forum for LITS and AHC was launched with a unanimous decision and agreement to establish a regional technical advisory committee to support this body.**
- It was clear from the summary of the questionnaire, and the species that were chosen by all countries that have already developed a national LITS system, that **the preferred species for an initial LITS implementation should be cattle** because the-per unit cost, i.e. the cost of the device relative to the carcass, is the most cost effective. The recommendation is to implement a LITS in cattle before moving to other species unless it can be clearly demonstrated that it would be preferable to implement LITS in small stock.

- It is also important to take small and incremental steps when implementing a LITS. The implementation of a LITS starts by **targeting a specific production system** (usually where the most financial value is added in the value chain) and then piloting the device to be used.
- An **Animal Health Certification system** (movement control certification) should be implemented simultaneously but needs to start by providing the basic and essential information.
- A LITS implementation will benefit from a clear **legal framework and an Animal Identification (and Traceability) Act**. The act should provide clear guidelines regarding the devices to be used, that all animals should be identified, all movements recorded and enforced and that it is an offence to remove the device. In most countries that have implemented a LITS, the Animal Identification Act has replaced the older Livestock Branding Act.
- It was also clear from the discussions held in Addis Ababa that the following criteria should be considered when developing a Pilot project:
 - Consider the export trade because this is where the most value is added
 - Consider at least three of the IGAD countries in the pilot
 - Possibly consider countries who do not yet have a pilot study

1 Introduction

The livestock sector in the Intergovernmental Authority on Development (IGAD) region has substantial potential to contribute to food security and general economic viability and will enhance the integration within the Greater Horn of Africa (GHOA). However, the sector is seriously burdened with Trans-boundary Animal Diseases (TADs) which is always a strong rationale for potential livestock importers to impose bans on livestock and livestock products imports originating from the IGAD region.

It is thus important for IGAD to strengthen disease prevention and control TADs in the region to facilitate export market access. However, these attempts at diseases control and prevention are confronted with a lot of constraints. The most important constraint is that the disease status of animals cannot be monitored in any part of the value chain in any of the IGAD countries. To be able to monitor the disease status, an identification system is required.

In a move to address challenges posed by the inadequate response and interventions to the control of endemic TADs and zoonoses in IGAD region, the AU-IBAR in partnership with IGAD and financial support from the EU has developed a regional project entitled “*improving animal disease surveillance in support of trade (STSDs) in IGAD member states (MS)*”. The overall objective of the STSDs project is to reduce the impact of TADs and zoonoses in food security, trade and resilience of livestock farmers. The two project areas include:

- An improved system for animal identification, traceability and disease certification.
- Improved Surveillance systems and disease control strategies at national and regional levels.

Under the first project area, the IGAD Centre for Pastoral Areas and Livestock Development (ICPALD) is responsible for the development of LITs guidelines for IGAD MS. While implementing activities under this project it seeks to complement activities carried out by the Standard Methods and Procedures in Animal Health (SMP-AH) project.

In recent years, the main forces driving the development of traceability systems for animals and their products have been concerns about human and animal health (Hoffmann et al, 2008/9). As a response animal identification and traceability has been addressed by many institutions, particularly health standards setting agencies. These include the OIE, FAO, CAC, WTO, WHO, ISO and ICAR.

Animal identification is the main component of traceability and disease control and the harmonization of standards and procedures among various countries, including the guidelines for a LITS for the benefit of the people of the region, is part of the IGAD mandate.

1.1 Purpose of consultancy

At the February 2014 regional meetings organized by ILRI/SMP each IGAD member country provided feedback on the developments of LITS in their own country and considered proposals of various LITS options. Participants also had to design a LITS system, taking into account the different capacity needs, equipment required, funding options, monitoring and evaluation and policy and legal frameworks. Different options, regarding a primary and secondary form of identification were also evaluated.

At the April 2014 regional meeting and validation workshop of the guideline held in October 2014 organized by AU-IBAR and ICPALD under the STSD project, many recommendations were made that reiterated that a harmonized approach should be taken for implementing a LITS in the IGAD region and guidelines provided. Some of the recommendations from this workshop were:

- An appropriate mechanism needs to be created for collecting, documenting and sharing of LITS and animal health certification (AHC) lessons; practices and experiences that should be implemented.
- There is need for harmonization of LITS and AHC processes and procedures where possible in the IGAD region.
- IGAD should establish and manage an effective and functional hub for collecting, managing and sharing LITS and AHC knowledge and information in the region.

- There is need to learn from the successes and failures of previous interventions and initiatives to harmonize LITS and AHC systems in the region and other regions.

The above principles guided the final report provided by the consultants. However, the specific mandate of the appointed consultants were as follows:

- Review and summarize the specific LITS practices from a LITS situation analysis conducted in IGAD member countries by ILRI through the SMP-AH project as well as the analysis conducted in Sudan through the STSD project.
- Provide a description of LITS being used in other parts of Africa and other continents, study the lessons learnt and different models that could be useful for IGAD member states.
- Develop LITS guidelines in line with OIE guidelines, and taking into account the major production systems in the IGAD region and their applicability and adaptability to the region.
- Provide recommended options of feasible LITS systems and provide guidelines that can be piloted and adopted in the region.

1.2 Background: IGAD Region

The Intergovernmental Authority on Development (IGAD) is a regional organization that is located in the Horn of Africa and accommodates eight countries: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Southern Sudan, Sudan and Uganda (Figure 1)

These countries, although characterized by high rates of human growth and possessing huge numbers of diversified livestock species, are also considered to be some of the poorest countries in Sub-Saharan Africa (Table 1).

Concerning the livestock sector, IGAD is aiming at the promotion of joint development strategies and the harmonization of national policies that affect livestock development (Vivien 2004).

1.3 Overview on livestock and livestock production system in the IGAD region

Vivien (2014) reviewed the livestock status in the IGAD region. The author documented 98 million cattle and 173 million sheep and goats in the IGAD region (Table 2 Distribution of livestock population in different production systems in IGAD MS. This amounts to half of the population of these species of the Sub-Saharan Africa. Pigs are mainly found in Uganda and few in Kenya. However, the statistics for livestock in the IGAD region are not reliable because of the continuous movement across international borders due to the existence of common tribes across the borders, and national and regional conflicts that is usually followed by the displacement of communities. The frequent raiding of livestock is also a factor that affects the unreliable statistics.

With the exception of Ethiopia (Its Central Statistic Authority carried out a census in 2013 sample survey report updating livestock population in the country), census data in other countries were not updated for long periods. For Sudan for example, the last official livestock census was carried out in 1976. Livestock productivity for milk in IGAD countries is known to be low even compared to the standards of other developing countries.

Most of the IGAD region falls in arid and semiarid zones. The area is frequently subjected to drought and a high degree of pastoral-risk (Reid, Serneels and Nyabenge 2005) is experienced. Livestock and its products are mainly used for subsistence and wealth purposes, but this is now changing with many livestock being marketed.

Livestock production in most of IGAD region is faced by many constraints that are documented by many authors. These constraints can be summarized as follows:

- Diseases and animal health problems
- Low production and productivity of the indigenous livestock breeds
- Shortage in feed elements
- Inadequate investment in the livestock sector
- Poor marketing and trade infrastructure and lack of marketing opportunities.

- Inadequate development policies and lack of tools for enforcement of policies, regulations and laws.
- Limited research in livestock.
- Lack of reliable statistical data.

1.3.1 Pastoral livestock production

Pastoral livestock production is the most dominant production system in the IGAD region, and is characterized by a large (over 50%) contribution of livestock or livestock related activities to household gross revenue (Otte 2002).

Vivien (2004), estimated that 53% of the cattle, 71% of sheep and 68% of goats are mostly held in pastoralist and agro-pastoral production system in IGAD countries. There are a lot of differences between IGAD countries in livestock production systems. Close to 100% of the ruminants in Djibouti and Somalia, exist in the pastoralist systems. This is very different in other countries. In Kenya 44 – 70 % of ruminants are found in pastoral and agro-pastoral areas, Eritrea 63 -65%, Uganda 23 – 100%, Sudan 16-82% and in Ethiopia 17 -33%.

In Somalia, nomadic pastoralist systems are the most dominant livestock husbandry system practiced in rural areas. These pastoralist systems involve the movement of people with their animals in search of water and pasture. There are allocated grazing areas, watering points and temporary holding camps for each pastoralist group (Ali-jabra 2014).

Shitaye (2014) described the relationship between pastoralist and agro-pastoralist systems in Ethiopia, that are both characterized by a dry agro-ecology, little or no crop agriculture, and high mobility of animals in search of grazing and water. In this type of production system livestock is kept as the principal pastoral activity by people. Although all species of livestock are maintained in these systems, goats are the dominant species.

In Uganda the pastoralist system is characterized by extensive communal grazing, semi-nomadism and agro-pastoralism systems which accommodate 90% of the cattle population (Benom, 2014).

Elmi (2014) described different patterns of livestock management systems in Djibouti. The pastoral system is characterized by random mobility and depends mostly on rainfall patterns. A Trans humanance form of livestock farming is the practice that occurs in small groups, with fixed movements from the camp and distances do not exceed 150 – 300 km. This form of farming is restricted to cattle and camels.

1.3.2 Settled mixed crop-livestock production system

This is found mostly in the highlands, sub-humid and humid zones within the IGAD countries. A total of 42% of cattle, 29% of sheep and 32% of goats of IGAD region are present in the above mentioned zones. This type of livestock keeping occurs mostly in Ethiopia, Kenya, Uganda, Eritrea and Sudan. Mixed production systems in IGAD countries account for 35% of total beef production, 29% and 30% of sheep and goat meat production and 16% of cattle milk production respectively (Otte 2002).

Ali-Jabra (2014), described similar patterns of livestock keeping in Somalia. He observed that the system is characterized by the maintenance of a permanent home base by families in the farming area. Furthermore, the author added that several different subtypes of this system ranging from farmers owning large herds to small scale-farmers owning only a few animals.

In Ethiopia, this system is found in areas where altitude ranges above 1500 and 3000 meters above sea level. It is characterized by high rainfall and moderate temperatures and is thus also suitable for grain production. The integration of crop and livestock is high in most areas. Cattle are the dominant livestock species and are kept especially as draught animals. Sheep and goats are used to meet immediate cash needs. In this system sheep is the dominant species (Shitaye 2014).

1.3.3 Small scale dairy production system

Small scale dairy production systems are mainly practiced in the Kenyan highlands and to a lesser extent in other East African countries. This type of production system is combined with the crop production system that includes mainly maize, beans and potatoes in addition to the keeping of poultry (Otte 2002).

In Ethiopia, dairy production has different systems, namely: the specialized / commercialized production system. This system represents medium to large scale commercial farms in and around the major cities. This includes mainly dairy farms, feedlots and poultry farms. Due to the interaction of many constraints, including management, marketing and ecological reasons and the productivity is low (Shitaye 2014).

Benon (1994) described different modes of livestock production systems in Uganda. One mode is characterized by practicing intensive commercial systems in order to produce beef and dairy products. There is also an intermediate mode between the extensive and intensive systems that specializes in mainly in the production of improved fodder.

2 Overview of LITS (General Concept)

To successfully contain or respond to an outbreak of an infectious animal disease, a system for identifying and tracking animals is a prerequisite. To be effective a LITS system requires two basic components, an identification system (for example brands, marks or a device) and a system that tracks an animal, or groups of animals, along the value chain to the final destination. It is only when these components are all put together that a LITS system becomes functional (Britt, et al. 2013)

Britt (2013) also described, in detail, the elements required to develop a LITS system. This study was commissioned by the OIE in 2013 and is titled “linking live animals and products”. In this study, they recommended the following elements be adhered to when implementing a LITS:

- The Ministry for livestock should be the authority that manages the system.
- A National database should be implemented to collect all the required identification, ownership information and to track the movements.
- A means of physically identifying individuals needs to be implemented.
- The necessary movement and disease control documents needs to be developed.
- A legal framework is required.
- The implementation must be supported by a program that educates the industry participants.
- A proper monitoring, enforcement and evaluation and audit procedures must be put in place.
- Finally, a query system i.e. if an animal Identification is inputted into the database, must be implemented that uses the database to enable the history and whereabouts of individuals or groups animals to be identified.

Implementing and running a LITS system requires a high level of organization within an industry where all actors in the value chain must cooperate to make

it work. Whilst the system should be managed by the Ministry responsible for livestock, the task is usually given to a smaller task team (for example two to three staff members) who are employed by the ministry and/or private sector and who are given the full time responsibility to implement the system. This task team should also ensure that all participants adhere to and support the implementation of the system and assist with the running of the system. All industry participants must be committed to abide by the rules and the rules must be supported by a legislative framework. This legislative framework must enforce strict penalties to participants who do not comply.

At the same time the ministry responsible for livestock, through the appointed task team, must have the capacity to be able to provide all actors in the chain with a high level of support, especially in the education of the various industry role players, and ensure that all industry participants understand their roles and are on board.

For many importing markets, food safety is a major concern and it is now becoming a prerequisite for countries that import live animals, or animal products. The exporting country has to prove that the animals are free of disease or have been vaccinated and have been monitored throughout a significant part of the value chain. Health Certificate for each animal should be provided. A LITS enables such a certificate to be issued.

The livestock Industry and especially pastoralists in developing countries will usually support a LITS system if it can clearly demonstrate that there is a direct benefit to their livelihood. For example, if it can be demonstrated that a LITS will prevent cattle rustling, and is possibly supported by a vaccination program, the potential added financial value accrued per animal usually allows this sector to become supportive of a LITS.

For the more commercialised sector or smallholder sector of the industry, it must be demonstrated that there is an added financial benefit for supporting a LITS. Many livestock producers in the commercialised sector for example, already identify animals but usually cannot envisage how they can benefit from LITS financially in the short to medium term and look at government to subsidize the system. If these benefits can clearly be demonstrated to the role players, this sector will also become more supportive.

From a ministry of livestock perspective there is thus the challenge of balancing the needs of National Government that requires a LITS to ensure the national interest is met in terms of food safety, the control of exotic and endemic diseases, improved management of animals through the value chain, and market access, with the needs of the industry who are willing to participate.

2.1 Overview of LITS in the world.

Recent reports (Bradfield and Beffa, South Sudan Cattle Program 2013), (Bradfield and Truitt 2014) and (Daborn and El Shiekh Idris 2014) have reviewed various LITS systems in both the developed and developing world, and these reviews includes most African Countries. The reports provided at two workshops held by AU-IBAR in February and April 2014 in Addis Abba, Ethiopia (Ali-jabra 2014), (Kilewe 2014) also detail the various stages of LITS implementation in the IGAD member countries. It is thus not the aim of this report to provide yet another review of LITS in the IGAD region or to review LITS in other countries. This report will rather consider the lessons learned from some of the countries that have successfully implemented a LITS, or run various pilot projects, and use these lessons to form the basis of a strategy for a proposed regional guideline for the development and implementation of a LITS in the IGAD region.

2.2 LITS in some developed countries and lessons learned

2.2.1 Australia.

Australia was one of the first countries to develop a National traceability system in the 1970's. The system, for cattle, began with the registration of all properties and used brands, tail tags and paper based records to track the movement of animals. In 1996, Government, working with industry, decided to implement a “whole life” identification and traceability scheme. The National Livestock Identification System (NLIS) was officially mandated in 2002 by all State Governments and an electronic radio frequency identification device (RFID) system was implemented. The legislated LITS Act specified that a single database be used and RFID tamperproof tags or the bolus be used. The NLIS for sheep and goats was introduced in 2006 but is still essentially a “mob based” system that can identify groups of animals to property of

origin. The sheep industry has been a lot slower to adopt a NLIS because the unit cost (price of the carcass relative to the device) for a small stock animal is a lot higher than cattle and the retention of the identification device is not as good as in cattle. There are however new recommendations to encourage a move towards an individual animal identification system for the small stock industry based on the current NLIS system, also using a standard NLIS approved RFID device.

In Australia the NLIS system must be able to facilitate the trace back of a suspect (i.e. diseased animal) and trace forward all of the companions within 24 hours. This can currently be achieved within two hours.

Lessons learned:

- A LITS system started in the cattle industry because the unit cost (cost of the tag versus income from the carcass) is more favourable, the RFID devices used has a better retention rate (usually over 98%) and it is in practice a lot easier to implement in cattle.
- Because of access to lucrative markets such as, for example, the EU or Japan, the Australian NLIS can demonstrate that the financial benefits accrued to producers outweigh the costs.
- The NLIS system evolved over time and started with a brands register, then an individual Animal Identification system with normal ear and tail tags, and finally a national system with a tamperproof RFID device.
- More than 99% of the devices used are the Tamperproof RFID tags, though producers may choose the reticular bolus.
- The bolus has fallen out of favour as a preferred device for the NLIS, largely because it has been proven to be impractical to use (it is more difficult to insert than a tag), is significantly more expensive than the tamperproof RFID tag and a bolus was also found to be impractical to retrieve in the abattoir.



- In the small stock sector, a “mob based” NLIS system is considered by the industry to be a practical, low cost and effective system. However, most of the vendor (i.e. sale-yard) declarations have recorded significant numbers of errors prompting a move by state governments towards an individual Identification system. This change is happening despite a lot of resistance from the industry because of the significant increase in cost.
- One database system is used across all states. The database is a “real time system” that captures all movements of animals and their individual identification numbers.

2.2.2 Europe

European Union (EU) legislation requires that all large and small stock animals are traced at all stages of the value chain through to retail. Specific and detailed legislation has been implemented for the registration and identification of livestock and animal products and for inter-country EU trade. Animals must also be accompanied by a health status and passport. All animal owners are identified, along with the farmer/producer details on the farm on which the animals are kept. The owner is legally responsible for compliance.



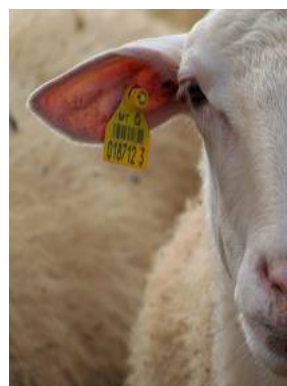
Lessons learned:

- The primary form of identification is either a RFID tag (UK for example), or Bar Coded tag (Macedonia for example).
- In most countries a Primary and secondary tag is used. The primary tag is a usually a pre-printed tag and the secondary tag contains the same identification number but also allows management information to be recorded.
- The database maintains a register of births, deaths and imports of cattle used for animal health purposes.

- The database issues cattle passports and records individual cattle whereabouts.
- Many European countries use an individual passport system for cattle movement. The passport includes details of the animal, details of where it has been throughout its life; and, also details the animal's death.
- The traceability systems in place allows animal's to be traced throughout the value chain, from birth to slaughter and in many instances to the final packaged product.
- The implementation of a LITS in most European countries has usually been subsidized by local governments.

2.2.3 Canada

Similar to Australia, the Canadian beef industry is one of the largest beef exporters in the world and produces 1.5 billion kilograms of beef annually. This is as much as half of their total annual production. The United States is the largest purchaser and imports mostly the high quality cuts.



In 2003, after the US closed its borders to Canadian beef products as a result of some Bovine Spongiform Encephalopathy (BSE) disease infected animals, the Canadian industry dramatically stepped up efforts to provide both traceability and extensive disease surveillance/eradication programs to assure their trade partners of their ability to provide consumers with a safe and wholesome product. The Canadian Cattle Identification Agency (CCIA), an industry led, non-profit organization was created in 2008. The CCIA program started implementing a system where all cattle had to be identified “beyond the herd of origin” with a unique identification number. This implementation was finalised in 2001 and cost the government \$1.5 million with a \$1 million contribution from industry for the infrastructural development. In 1998 the CCIA conducted very comprehensive trials on all the various identification devices. The various tag companies submitted over 30 000 tags. A minimum of a 95% retention was required for tag approval.

Lessons learned:

- Industry pays an administrative livestock fee equivalent to \$0.22 per animal towards the administration and database. Added to this is the tag fee that is also paid for by the industry.
- Canada first implemented a traceability system in cattle. The Sheep traceability system followed later, and is still a visual tamperproof tag though there is a move toward a tamperproof RFID tag.
- The CCIA did extensive research on most of the known identification devices (Table 4) and now exclusively uses tamperproof RFID tags in cattle.
- The initial traceability system was voluntary and visual ear tags were used. The move to RFID progressed over a period of time.
- Government was supported by industry to fund the infrastructure cost to implement a National traceability system.
- Because most of the high value products are exported, the system has become self-funding and proven value addition to the producer can be demonstrated.

2.2.4 United States.

The US beef and dairy industry spends more than \$300 million on animal disease management and control issues—including disease traceability. Each individual Federal state and tribe is responsible for implementing traceability. In 2012, the United States Department of Agriculture (USDA) finalized the rules for improving the traceability of US livestock moving interstate. Each US State or Tribe implements the law independently within the framework established by the federal government.

The federal rules require that livestock moved interstate would have to be officially identified and accompanied by an interstate certificate of veterinary inspection or other documentation, such as owner-shipper statements.



The USDA allows a wide range of products to be considered official devices ranging from a simple metal tag with official numbers to Radio Frequency Identification Device (RFID) tags that are integrated into other production systems.

Lessons learned:

- No subsidy is provided for the purchase of official tags. The USDA does however provide grant money for animal disease management.
- The USDA has allowed each State/Tribe to implement its own Traceability system, with the USDA setting basic guidelines.
- Each State/tribe runs its own database. A federal database to record movement across States is being developed.
- To date, a variety of devices can be used to identify animals. There is still much debate in the industry regarding a mandatory move towards RFID or standardised devices.
- The USDA is currently providing federal guidelines that each state will need to adhere to, to allow across border traceability.
- All state and tribes have initially targeted traceability for cattle and not small stock.

2.3 LITS in some developing countries other than Africa and lessons learned

2.3.1 The Greater Mekong sub region

In a report prepared for the FAO in 2011, Cameron and Ben (2011) gave an overview of traceability systems in the greater Mekong sub region (i.e. Cambodia, Laos, Myanmar, Thailand, Vietnam and Yunnan Province in China) and provided the requirements, prospects and challenges for implementing a system in this region. Like much of the IGAD, the countries in the greater Mekong region are in the early stages of considering how they can implement a regional traceability system on a cost effective basis and also a system that has to consider the different production environments. Many of the challenges for a regional and harmonized approach are discussed in this report.

Lessons Learned:

- The report suggests that the framework for a regional system be provided but countries should be given the flexibility to develop their own systems.
- It costs almost as much to develop a database for a pilot project as it does for a national or regional system, because the requirements are essentially the same.
- A clear statement of regional objectives is required.
- No regional LITS system has been attempted. Even Europe developed independent National systems that can integrate with one another. The authors of the report did concede that it can be more cost effective to develop a database for a regional system and the device costs would also be a lot cheaper if purchased in bulk.
- The authors of the report suggest that the high value species be targeted because the costs of identification and information management is small relative to the value of the animal.
- The Mekong sub region has clearly identified boundaries.
- The authors of the report suggest that a step-wise implementation process be used.
- The Identification device should be life-long and allow the animal to be identified at all times.
- The report documented that the running costs for a LITS can be prohibitively expensive and can cost almost as much as the individual devices.

An animal certification system requires a LITS system.

2.4 LITS in some Southern African countries and lessons learned

2.4.1 Namibia

The Namibian Animal Identification system progressed from a Stock Brands system in the early 20th century, to a voluntary system with normal double sided ear tags, to a system that included all commercial producers with the role out of a tamperproof identification tag where all information was recoded on a central database. This formed the basis of the National NAMLITS system. After successfully using a tamperproof tag for nearly a decade the sector briefly introduced bar-coded tags and then moved to a RFID tamperproof tag. Only cattle were targeted. The system now also incorporates all animals from the 70 000 communal smallholder producers in the North of Namibia.



Lessons Learned:

- The system progressed over time to be an international leader by starting small, targeting one species of animal and targeting specific sectors of the value chain that are of high value.
- The database and infrastructural costs were paid for by the Meat Board, whilst the individual tags are paid for by the producers. Initially the cost of the tags were subsidized as an incentive to get producers to accept the adoption of a LITS.
- The infrastructure and device are covered by a per tag fee (20%) and a per carcass fee charged for exports (80%).
- The bar-coded tagging system was discarded because it was not suitable to Namibia's dry, arid environments.
- Namibia has distinct zones that are free of Foot and Mouth Disease and has access to the lucrative European Union (EU) market. A substantial premium is paid by the EU for the Namibian beef carcass thus justifying the cost for implementing an RFID system.
- Because of the value per carcass relative to the infrastructure costs, only beef cattle are included in the NAMITS scheme.

2.4.2 Botswana

Botswana implemented a national LITS system, using the reticular bolus as identification device, for all its cattle. All producers (mostly smallholder or communal) are included in the program and all animal movements are tracked. Similar to Namibia, Botswana has large areas that are Foot and Mouth disease free zones.



All animals are slaughtered through its centralised abattoir, the Botswana Meat Commission (BMC). Because of the Foot and Mouth disease free status the BMC has negotiated access to export carcasses to the European Union thus receiving a premium price. The reasoning for initially using the bolus was because it can significantly reduce cattle theft and could be recycled, thus initially incurring a once off cost to the government. However, the bolus is not visible on the animal and the over reliance on veterinary officers to manage the system (insert the bolus and track all movements) has meant that the whole Botswana system is now under review and it is likely that it will adopt a system similar to Namibia.

Lessons Learned:

- The use and efficacy of the bolus as an identification device in a National system is under review.
- Recycling the bolus from the abattoir has proven to be difficult and impractical.
- The implementation of the Botswana LITS system was almost wholly funded by the government and the system relied wholly on government employees to administer the bolus and to record movements.
- The database was not “real time” i.e. animals were often slaughtered before their movements could be tracked.

2.5 LITS in the IGAD MS and lessons learned

Table 3, in the Appendix gives an overview of the status of LITS development in the IGAD region, the devices used and trialled, the different pilot programs and the suggested way forward for regional implementation. Details were

provided from the two stakeholder LITS meetings held in February and April 2014 in Addis Abba, Ethiopia and also the questionnaire solicited from each DVS office.

Many countries in the IGAD region are in the process of considering or piloting some type of LITS program and there is a clear willingness to follow a regional approach to a LITS implementation. At the same time it must be recognized that each country has its own specific requirements, and in some instances unique challenges and specific production systems. However, it is clear that a general framework and guideline should be developed for the region that considers the major production systems and the economic status of each country.

Lessons Learned

- All countries require a cost effective LITS system that can address the following concerns.
 - Reduce cattle rustling and improve security
 - Prove ownership
 - Add value to the cattle
 - Facilitate disease surveillance
 - Improve access to markets
 - Monitor productivity of herds in the commercial production system.
- Branding of cattle is still the main form of Identification for most countries.
- Systems trialed have included the RFID Bolus (Kenya and Uganda) and the tamperproof RFID tag (South Sudan and Ethiopia). A major constraint is that RFID equipment requires expensive equipment and a good country infrastructure to manage the system.
- All countries are considering some sort of legal framework for LITS implementation or would like to see one adopted.

- There is a strong need for an umbrella body at Regional (IGAD) level and at National Level. There is also a need for a technical working committee at both the Regional and National level.
- All member states want to see the implementation of some form of LITS nationally but it must be cost effective to implement.

We would like to reiterate suggestions from the meetings of February, April and October 2014 held in Addis Ababa, Ethiopia:

- Identify the segment of the market (value chain) where the most financial value can be added to the product if a LITS is implemented.
- Use a device that is cost effective, visible, easy to implement, and does not require expensive overheads to get started.
- Pick one species, where the unit cost is lowest, use a cost effective device and implement it properly within a specific segment of the value chain.
- Start within a country and get the infrastructure in place.
- The LITS system must be linked to animal health certification.
- Arrange a visit for IGAD members to countries that have successfully implemented a LITS.
- The tamperproof visual ear tag should be the primary form of identification and the other forms of identification the secondary identification method.

2.6 Summary of lessons learned

- Most countries that have implemented national LITS systems have attempted to thoroughly test the efficacy of the Identification device. As mentioned previously in this document, the identification device used forms the backbone of a LITS system and significantly influences the cost of the whole system.
- Most countries in the developed world started with Hot Iron Brands, then moved to normal visual Identification tags. In the Seed stock or pedigree registry sector, tattoos became mandatory. When

National Identification systems were proposed, some countries implemented a tamperproof tag (Namibia and Canada for example) before implementing the RFID tamperproof tag, whilst others moved straight from normal visual tags to RFID tags and the industry and government absorbed the costs. All these countries could justify the costs because they had access to the “high end” markets for meat and meat products.

- Botswana was the only country in the world to use the RFID bolus as a National Identification device. The system was 100% subsidized by the government. Whilst the bolus as a device had a positive effect on reducing cattle rustling, it has proven to be impractical as a national identification device and there is now a move to allow producers themselves to insert a tamperproof RFID Tag similar to that used in Namibia.
- The Tamperproof tag used in the CNFA project in South Sudan’s Bar El Ghazal province significantly reduced cattle rustling and reported a 97% recovery rate when cattle went missing. All animals were logged onto a state database and individual ownership details could be verified against the system by the owner of the cattle.
- The use of the microchip in food producing species such as cattle and shoats must be questioned.
- In most countries that have implemented a LITS the preferred species to start the program have been cattle because of the cost (carcass income relative to the device) and the ease of implementation.
- A LITS system must be supported by a legal framework making it mandatory for animals to be tagged and penalties must be enforced if the device is removed.
- The system must be linked to an Animal Health Certificate.
- A Single, National Database is implemented.
- The financial benefits accrued across the industry should outweigh the costs for the system to be viable in the long term. The challenge is that RFID devices are expensive to implement and maintain. The

alternative is to implement a cheaper device such as a normal ICAR approved ear tag that is also tamperproof but realize that all animal details will need to be written down on paper forms before they are entered into a database.

- National government's implementing a LITS usually subsidizes the device, database and administrative costs to get the system implemented. Thereafter, it needs to be self-sustaining.

3 Trans-boundary Animal Diseases (TADs) in IGAD

IGAD member States (MS) are challenged by the adverse socioeconomic impact of the main TADs prevalent in Africa in general and the region in particular. The table below indicates the most prevalent TADs in IGAD MS as has been prioritized by the Chief Veterinary Officers of MS of the region in a meeting held in Zanzibar (Tanzania) in 24 – 26 August, 2010:

Disease	Spreading areas in IGAD	Control measures	Socioeconomic impact	Epidemiological status
PPR	All IGAD MS	Vaccination & movement control	Adverse with no zoonotic impact	Endemic
ASF	Uganda, Kenya and Tanzania	Isolation of infected and quarantine	Heavy losses in pigs	Endemic in some countries
FMD	Almost in all states	Some countries starting to join FMD PCP	Affects production & acts as a trade barrier	Endemic in most countries of the region
RVF	Kenya, Sudan, Somalia	Vector control, movement restriction	Zoonotic, trade barrier	Seasonal episode
Rabies	All states	Vaccination, control of stray dogs	Zoonotic. Interferes with social relationship	Endemic
Trypanosomiasis	All states	Vector control, treatment	Responsible for deaths and lowering production	Endemic
Brucellosis	All states	Surveillance, vaccination,	Zoonotic, lowers production	Endemic
Sheep and goat pox	All states	Vaccination, isolation	Affects skin's and hide quality	Endemic
Lumpy skin diseases	All countries	Vaccination movement control wound treatment	Affects skins,	Endemic
Vector borne diseases	All countries	Treatment with acaricides and disinfectants	Affects skins and inflict mortality in exotic breeds	Endemic

Data supplemented from www.oie.int

4 Livestock markets and Trade within and from IGAD Region

Livestock and livestock products are primarily used for home consumption. The decision to sell animals by farmers or pastoralist is based on urgent cash requirements. Profit always becomes a motive for sales higher up of the marketing chain (Aklilu, 2002).

4.1 Domestic markets

Halderman (2004) described livestock marketing systems in the IGAD region as follows; It starts with the primary markets in the rural areas, then the secondary markets and finally ends with the terminal markets. Within the primary markets, producers sell their animals to small –scale traders at the market centers in the area. Bigger traders then move the animals to larger secondary markets, probably in larger towns and finally reach terminal markets either through the bigger traders or their agents who are seconded to buy animals from producers.

The market places usually lack watering facilities, feeding areas, shelters for attendants, weighing scales and veterinary inspection. This situation does not encourage producers to bring their animals to these markets, the reason which makes most of the buying and selling transactions occur outside of the vicinity of these markets.

It is known that livestock prices drop during drought seasons. This is attributed to the difficulty and lack of feeds hence producers get rid of a large number of their non-productive herds to be able to secure fodder for the remaining animals.

Aklilu and Catley (2009) observed the inconsistent relationship between the different players in areas of livestock marketing and trade. There are many factors which govern the retail prices of the animals. The producers are always under pressure and need cash. There is also a lack of price information.

Transport also constitutes a major cost factor in livestock trading, and differs between whether animals are trekked or transported in trucks. Trekking is the most common mode of transport from the pastoral areas. However, the

negative attributes of trekking includes weight losses, deterioration of health condition and injuries or even death of animals. Animal attendants usually avoid following the main roads to escape taxes imposed by local authorities.

Transportation using trucks is another option exercised by livestock producers. However, some limitations are encountered with this mode. One of these factors is lack of enough space in the truck for a large number of animals and the cost of maintaining and operating the vehicles.

Local markets in Somaliland exist in both villages and towns. Camels dominate the local markets but considerable numbers of cattle sheep/goats are also sold and brought into markets. The numbers of animals taken to the markets fluctuate on the demand for local consumption and export (Ali-jabra 2014).

In South Sudan the main sources of livestock to local markets are found in the states of Jongeli, Bor and Pibor in Eastern River Nile, Central Equatoria and Eastern Equatoria (Alum Araba, 2014).

In Ethiopia, livestock trade is characterized by three major market systems. These include the domestic, official export markets and also the informal cross border trade market exists. The mixed crop livestock and the pastoral and agro-pastoral production systems are the main source of livestock export. Ninety percent of livestock for the official export market come from the pastoral and agro-pastoral systems. The mixed crop-livestock system contributes only 10% to exports. All livestock routes from rural areas terminate in and around the Addis Ababa market as the final Ethiopian destination. There they are then fattened in cattle fattening facilities and then exported mainly via road to Djibouti for export to the Middle East (Shitaye 2014).

4.2 Exports

One example of cross border livestock trade among IGAD countries is the cattle trade from Ethiopia and Somalia into Kenya. This depends on the competition of prices on either side or the domestic needs in meat products.

Apart from Sudan and Somalia, and to some extent Djibouti, most of the IGAD countries lack access to regional and international livestock markets. The official livestock export market is burdened by lots of regulations, documentations and fees compared to the domestic livestock marketing system (Halderman, 2004).

Livestock from Somaliland are exported to the Arabian Peninsula. Livestock traders are classified based on the number of livestock they export or type of license they have (wholesaler or ordinary exporter). There are two large scale traders, 15 medium size and 10 small scale traders. The average number exported per month is 10 000 head and is dominated by sheep and goats. All animals are exported through Berbera Port (Ali-Jabra, 2014).

For livestock exports from South Sudan, a proper official export channels is not yet established. However, informal exports are always practiced by targeting neighboring countries and these include Sudan, Uganda and Central African Republic (Wani 1994).

Ethiopia exports live animals to different Middle Eastern and African countries. The official livestock export figures are continuously rising, from 163,375 in 2005/2006 to 800 000 in 2010/2011 (Shitaye 2014). At the same time meat exports rose proportionally. This was attributed to success of accessing new markets in the region. The unofficial cross border export was estimated to be two to three times the official export volume (Shitaye 2014).

In Djibouti, which imports livestock from the two neighboring countries, there are three livestock routes for marketing and trade. These routes are Galafi and Galile at the Ethiopian borders and Loyada at the borders with Somalia. Animals from Ethiopia are mainly trucked while those from Somalia are trekked. The country also exports animals to the Gulf countries thus utilizing the existence of a regional quarantine station in its territory. This quarantine station has implemented the sanitary requirements of importing countries. These requirements include vaccination, testing and quarantine for the main TADs RVF, FMD, CBPP, brucellosis, orf, pox and parasite disinfection and disinfestations (Elmi 2014).

5 Linking the LITS program to different uses in the livestock sector

5.1 Animal health and disease control

OIE in the terrestrial animal health standards (OIE 2013) has devoted two chapters for LITS. In the first chapter 4.1., OIE described the general principles of LITS in live animals. OIE considered animal identification and traceability as tools for addressing animal health including zoonoses and food safety issues. The effectiveness of these tools are directed towards strengthening the management of disease outbreaks, vaccination programs, herd/flock husbandry, food safety incidents, zoning/compartmentalization, surveillance and early response and notification systems. Other elements of disease control include: animal movement controls, inspection, certification, fair practices in trade and utilization of veterinary drugs.

Van De Wiele (2009) demonstrated the linkages between animal health information system and traceability. The authors concluded that this information is not only used for establishing the zoo-sanitary status of the country but for a prophylactic approach and to manage any crisis situation.

The importance of animal identification and traceability, emerged after the occurrence of bovine spongiform encephalopathy (BSE) in Europe in the mid-eighties and dioxin contamination in the 1990s. The outbreak of FMD in United Kingdom in 2001 also initiated the necessity of farm animal to be identified to facilitate the epidemiological tracing backwards and forwards.

Rogan (2009) enumerated the benefits gained by the livestock industry from implementing proper animal identification and traceability. Concerning animal health, animal identification can play a significant role in containing single or multiple outbreaks:

- The rapid identification of all animals at risk
- The location of all susceptible species within the geographical region
- The forward and backward tracing of all movements of susceptible into and out of the region

- The implementation of a highly effective animal movement control strategy
- Effective resource deployment

Other authors added the significance of animal identification and traceability and its contribution to other applications of animal health, especially in the field of vaccination, epidemic-surveillance, outbreak investigation and zoning and compartmentalization. OIE has addressed all these issues in the different technical recommendation and standards and these are included in the terrestrial animal health standards (OIE, 2013).

OIE defined animal identification as a combination of the identification and registration of an animal individually with a unique identifier or collectively by its epidemiological unit or group with a unique group identifier. Animal traceability is defined as the ability to follow an animal or group of animals during all stages of its life. The two definitions contribute to the effectiveness of disease control and trade safety.

Daudi (2008) explained that a viable animal identification system benefits all players in the food chain. Secure and reliable systems contribute to food safety and quality assurance and help prevent major disease outbreaks. It also offers long term economic benefits to the livestock industry, securing international trade and eradication of diseases. This was confirmed by Jim Harsdorf (2006) when he mentioned that international trade, disease control and consumer confidence depends on the accountability and traceability that an animal identification system could provide (cited by Daudi, 2008).

LITS in livestock disease control was practiced in Africa during implementation of regional projects: JP-15, PARC and PACE. However, those experiences were not legalized by the African governments. At that time it was known that the numbers of ear notches always indicated the number of vaccinations against Rinderpest or CBPP. Despite the effectiveness of this livestock disease control implementation, the approach was limited to the Rinderpest and occasionally to CBPP, but served indirectly the purpose of control and even eradication of the disease.

5.2 Animal production (general)

The OIE Animal Production and Food Safety Working Group (APFSWG) is the forum for cooperation, collaboration and coordination between the OIE and Codex Alimentarius Commission (CAC). It acts as a steering committee for the OIE works program in development of standards aimed at protecting consumers from food-borne hazards arising from animals at production level of the food chain and to promote cooperation with CAC (Slorach 2006).

Slorach (2006), added that the APFSWG developed a document addressing the issue of identification and traceability of live animals. This document was unanimously endorsed by the OIE general session in 2006. Later those recommendations constituted the basis for developing guidelines for animal identification and traceability for live animals. The OIE member countries are expected to use these guidelines to develop their own standards based on their prevailing conditions.

Animal identification helps producers and institutions that support LITS to manage animals more effectively. This includes implementing herd/flock health programs and to apply more efficient breeding or genetic improvement programs.

5.3 Animal breeding / Productivity monitoring

Most developed and many developing countries (for example Namibia, South Africa and Zimbabwe) have developed a database for registered cattle in which the authorities list all the cattle breeds and herds in the country with a unique breed registry and identification number. The livestock producer is responsible for notifying the registering authority on animal movements (for example birth, sale, purchase, boarding, transhumance, slaughter or death). All this data is recorded in a database which is usually linked to the national animal health database.

5.4 Tribal usage for determining ownership (Prevention of theft)

Animal identification was implemented by the tribal communities in Eastern African countries to determine ownership of animals by tribes or individuals. This type of identification system, is implemented by using hot branding on cattle and camels. The technique succeeded in reducing cattle rustling

in some countries in the IGAD region particularly South Sudan and Uganda (Wani 1994) and (Benon 1994).

5.5 Livestock marketing, certification and trade

The movement of livestock and their products has increased due to globalization of trade. This has facilitated the spread of diseases, increased threats to human health and reduced confidence to animal products (McKean 2001).

Animal identification systems are becoming a prerequisite to international trade. Chapters 4.1 and 4.2 in the OIE terrestrial animal health standards clearly indicate the importance of animal identification and traceability system as a tool to facilitate market access.

The linking of animals at the time they are slaughtered – through the use of identification devices or marks and accompanying movement documentation – with the meat produced from their carcasses, adds further value from the consumer safety perspective (Britt, et al. 2013).

As a general rule, identification and traceability systems are more developed in importing than in exporting countries. From a trade perspective, the requirements of major importers are the most important as they establish the minimum standards that exporters will need to satisfy for having access to their markets. Lack of a proper system of animal identification and traceability may result in loss of competitiveness and access to certain markets (Pavon 2011).

5.6 Food safety

Scannell (2009) stated that the established animal identification and traceability system benefits do not stop at the slaughterhouse but can continue throughout the retail food chain. Labeling of beef cuts in Europe includes reference numbers which identify the slaughterhouse or origin, the animals concerned and the place where they were born, reared and slaughtered. This indicates that there is a bridge between animal health and food safety and confirms the motto of ensuring food safety from farm to table.

5.7 Animal tracking (tracing?)

Lea-Godfrey et al (2009) discussed the role of animal identification and traceability as a successful tool in a tracking system whether used for geographical, animal health and food safety trace back or for market-based application. The main challenges encountered in the tracking system is how to differentiate genetically modified animals from those produced using traditional and conventional methods. This distinction can only be achieved through having reliable animal identification and traceability systems in place.

Effective tracking enables the prompt implementation of preventive measures and may assist in shortening the life of an epidemic, thereby delivering considerable commercial and animal welfare benefits (Britt, et al. 2013).

In many countries traceability of live domestic animals and products of animal origin is requested by governmental authorities to protect public and animal health and give consumers an informed choice about product purchased.

6 LITS international standards and guidelines

In general, LITS in international trade, is expected to target the following:

- Improve the management of the risk related to food safety and animal health issues
- Guarantee the products' authenticity and to give reliable information to consumers
- Improve the products' quality and processes

Accordingly, all the below mentioned international organizations are considering these guidelines when formulating their standards with the objectives to safeguard human, animal and plant health.

6.1 World Trade Organization (WTO)

Traceability is not mentioned explicitly in Sanitary Phytosanitary agreement (SPS) or Technical Barriers to Trade (TBT) of WTO, but requested as part of SPS measures by the importing country. It must then meet the general principles of SPS, including food safety, animal health and plant health. The need for traceability could arise in negotiations about equivalence and zoning/compartimentalization.

Concerning equivalence, the Article 4 of SPS and Article 2 of TBT, the exporting country can suggest the use of traceability as the tool for equivalent measures, enabling it to meet the importing country's requirements.

6.2 LITs and International Standards Organization (ISO)

The International Standards Organization (ISO) in (ISO 8402) defines traceability as “the ability to trace the history, application or location of an entity by means of recorded identifications”. The International Committee for Animal Recording (ICAR). ISO standards 11784 and 11785 ensure compatibility between electronic identifiers and readers. Since 1995 ICAR has established and continuously updated its guidelines on animal identification, methods, performance recording and genetic evaluation particularly in the bovine sector. Quality standards for conventional plastic ear tags were established (Pavon 2011).

6.3 World Organization for Animal Health (OIE) LITs guidelines

The OIE first addressed the issue of LITs in 1998 at the international seminar with the theme “*permanent animal identification system and traceability from farm to fork*”. Later, in 2001 OIE devoted an entire technical review issue for animal traceability. Then in 2005 an ad hoc group was established for this purpose. This ad hoc group recommended guidelines to the terrestrial animal health commission which developed the first series of guidelines in animal identification and traceability which were endorsed by the OIE general session in 2007. An international traceability conference was also held in 2009 in Argentina with the theme “*Animal Identification and traceability, from farm to fork*”. Each OIE country was expected to provide feedback on the traceability system implemented in their country and to provide recommendations to members.

Through a series of developments, LITS was included in the OIE terrestrial animal health standards in separate chapters 4.1 and 4.2 (OIE, 2013). In the first chapter, the document indicates general principles on identification and traceability of live animals. While in the second chapter 4.2, recommendations for designing and implementation of the identification systems were developed with the objective of achieving animal traceability. The OIE does not prescribe the devices that should be used or prescribe how a traceability system should be implemented.

6.4 Food and Agriculture Organization of United Nations (FAO) approach to LITS

FAO and World Health Organization (WHO), both of which are United Nations agencies, in 1961/63 created Codex Alimentarius Commission (CAC) to develop international food standards, guidelines and recommendations in order to protect the health of consumers and to ensure fair practices in food trade (Miyagishima 2009).

Work on traceability/product tracing has been carried out by the Codex Committee on General Principles (CCGP), and in Food Import and Export Inspection and Certification Systems (CCFICS). CCGP has developed the definition included in the Codex Procedural Manual (2004), while the CCFICS guidelines were included in Principles for Traceability/Product Tracing. These

were used as a tool with a Food Inspection and Certification System (CAC/GL 60-2006). These principles assist the competent authorities to use traceability in a food inspection certification process whenever appropriate.

CAC issued the Code of Hygiene Practice for Meat (Code) which indicates that the principle of “meat hygiene” involves animal identification practices that allow trace back to the place of origin. The focus of Code is to develop hygiene provisions for meat from live animal production systems through to retail (Pavon 2011).

The ultimate objective behind this is to protect the consumers against the risk of diseases, particularly food-borne hazards. The work is done through close cooperation, coordination and collaboration with OIE and other international and intergovernmental organizations (Miyagishima 2009).

7 Feedback from stakeholders

The consultants designed two stakeholder questionnaires (attached as Appendix 3.3). A more detailed questionnaire to be answered by the IGAD MS CVOs and a shorter one to be answered by other non-veterinary livestock stakeholders. Feedback was received from Djibouti, Ethiopia, Kenya, Sudan and Uganda. The outcome from these responses from CVOs represent a valuable input to this study. A summary of the responses can be summarized as follows:

- Most countries mentioned FMD, brucellosis and PPR as the most important TADs which deserve control and even eradication.
- Concerning outbreaks which usually result in high casualties, most countries enlisted PPR, FMD, CBPP, rabies and Rift Valley Fever.
- Most of countries regularly report disease outbreaks to OIE and AU-IBAR.
- Some countries received funds for disease control from FAO, IGAD, EU, USAID and AU-IBAR.
- In most IGAD countries 60% of the national herds are in continuous migratory move within the country for pastoral grazing purposes.
- Livestock at the borders of most countries are moving freely from one country to another for grazing and trade purposes.
- Countries which are considered as land locked, have no access to seaports, usually export their animals utilizing the marine exit of a neighbouring country.
- Most countries are exporting live animals instead of carcasses or meat products.
- Most countries have no legislation of their own to regulate a LITS and are only implementing standards developed by OIE, WTO (SPS), ISO and CAC
- All countries mentioned a number of constraints which affect livestock development. Principally they all agreed that TADs, uncontrolled

livestock movement, a lack of ground infrastructures for trade, taxes, livestock rustling (particularly at common borders), lack of regular funding for disease control and development, repeated drought, lack of investment projects, inadequate legislation were the main constraints.

- The **majority** of countries agree on regional and national body for LITS implementation.

IGAD/ICPALD facilitated for the consultants to meet a number of livestock stakeholders from different regional and international organizations and private consultants stationed in Nairobi, Kenya (Table 5). The outcome from these meetings can be summarized as follows:

- There is strong justification for implementing LITS in the countries of the region. Most of the stakeholders were in agreement that LITS can be used in animal health (different disease control patterns), facilitation of trade, proving ownership (security), food safety and in animal production and breeding purposes.
- There are great benefits for the producers and the country as a whole as result of a LITS implementation. LITS is considered as a valuable tool.
- LITS implementation in each country should be built on the existing identification methods practiced. It also depends on the actual country requirements for a LITS implementation. The type of LITS facility selected also depends on the availability of trained staff and the financial and economic status of the country. LITS should be simple to implement and be able to be easily managed by the producers and local authorities.
- There is need for LITS coordination bodies at both national and regional level. The regional level can contribute to the harmonization of national programs.
- A legal framework for LITS is a prerequisite for the implementation of LITS in the country.

Cattle should initially be the main point of focus.

8 Expected Challenges

- Updating of policies not yet done and will take time
- Lack/inaccessible information and standards for updating policy
- Weak enforcement of the policies
- Weak systems between the competent authority and law enforcement agencies (police, immigration agencies, army)
- Fragmentation of the chain of command to lower levels makes enforcement very difficult
- Different countries have different administrative levels (national and subnational)
- Inadequate Funding,
- Porous borders
- Difficulties in animal movement control are also caused by
 - Inadequate of capacity building and training (limited awareness among owners and traders).
 - Inadequate equipment and logistics for monitoring.
- Large livestock populations
- Cultural issues – acceptability by the communities
- Limited regional cooperative and communication for LITS and AHC.
- Limited market access to better paying markets
- Inadequate international standard quarantine stations
- Absence of dedicated transport
- Inadequate harmonized disease surveillance and control
- Inadequate staffing and poor technical capabilities.
- Departments in charge of implementation of LITS are not under one ministry.

9 Proposal for a regional and national LITS framework

9.1 Regional level

At the regional IGAD workshop on the coordination of LITS and Animal Health Certification (AHC), held in Addis Abba in April 2014, it was unanimously decided to create a Regional Coordination Forum for LITS and AHC and also a regional technical advisory committee to support this body. Participants at the meeting included most of the key stakeholders from the livestock sector from the IGAD region. The terms of reference for the Regional Coordination forum were reviewed and the forum was launched.

The Forum agreed on the need for a common regional LITS and AHC vision in line with the acceptable international standards. The vision also had to accommodate the different objectives and priorities of each member state for example, security and trade and disease control.

The vision proposed was defined as follows:

As a common IGAD vision we want the world to be aware that we have a credible, reputable LITS system that adds value to our animals, guarantees disease free exports and supports security of ownership.

The terms of reference proposed for such a coordination forum were summarized as follows:

1. To create an understanding on the existing national and regional activities on LITS and AHC and to share the knowledge and development of various LITS initiatives amongst member countries.
2. To identify gaps and challenges related to capacity building, institutional requirements and policy development and to co-ordinate efforts for the adoption and implementation of LITs and AHC.
3. To exchange information on good practices and lessons learned so that duplication of efforts can be avoided.
4. To propose recommendations to member states at a technical and Ministerial levels;

5. To raise awareness on the importance of LITS and AHC in the IGAD region.

At that meeting it was also proposed that the members of the regional coordination forum should include:

- Member states represented by the directors of veterinary services, animal production and marketing.
- Regional bodies involved in livestock development activities.
- Regional bodies involved in trade.
- Research organizations.
- Private sector representation.

It was agreed that the forum would meet annually to respond to inputs from the technical advisory committee.

9.2 National level

All countries that have successfully implemented a LITS system have a similar structure at the National level to that proposed above. As mentioned previously in this document, Britt and colleagues (2013) proposed that the ministry responsible of livestock should be the “competent authority”. The ministry will normally designate who the main role players should be for a LITS implementation. In Namibia for example, the Namibian Meat Board (NAMMIC) has been designated the task. NAMMIC is an umbrella body on which are representatives of all participants in the livestock industry and it is funded by a statutory levee on every carcass. In Botswana, this role has been designated to the Department of Veterinary Services (DVS). In both instances, a small working group of 3-4 people have been given the task to conduct the necessary pilot studies and to ultimately to implement the LITS system. Whilst input is required from all sectors of the industry to successfully implement a LITS, the actual implementation is done by a small group who are specifically tasked with this mandate.

9.3 Proposed Identification devices

The main devices that are used in an animal identification/traceability system are listed below and the advantages and disadvantages of each are also briefly discussed. Table 4 gives a list of identification devices that were trialled in Canada and provides a recommendation for each device. Unfortunately, no one device will satisfy all identification, animal health and issues with cattle rustling needs in the IGAD region and it is very much a situation of each country or even production system deciding for itself the device that should be used. It is however important to note that there must be commonality. If for example, the RFID tag is chosen as the device for a national system, then all production systems must comply and guidelines and rules put in place regarding compliance for the use of the RFID device.

9.3.1 Hot Iron branding

Hot iron branding remains one of the most cost effective and easy ways to implement and ensure a permanent identification on an animal. A branding iron costs less than \$10 and this is a once off cost.



Branding an animal by region is a cost effective way to prove ownership for a particular region and is also useful for disease control and identification at the county level. All brands should however be registered on a national database.

Branding is one of the oldest and most cost effective ways to permanently identify livestock. Pastoralists in some IGAD countries (for example South Sudan) are adverse to interventions that would be seen to harm the animal. There are often also very limited facilities to restrain the animal and limited veterinary officers or animal health workers who have any experience branding cattle. The major challenge is also that there are often large numbers of pastoralists with small numbers of animals, and with trans-boundary trade and undefined boundaries it will be very difficult to manage the ownership of each brand.

Advantages and disadvantages of hot iron branding

Advantages	Disadvantages	Comment/Outcome
Leaves a permanent mark	Will be difficult to manage if too many livestock owners each have their own brand. This is arguably the biggest challenge for the IGAD region where there are millions of livestock owners.	Branding needs to be implemented to county level as part of a disease control program.
Is a cost effective way of identifying cattle. A branding iron costs less than 10 dollars.	Is invasive and burns the animal for a short period of time. This could be perceived as cruel by cattle owners and animal rights groups.	Livestock producers will need to be sensitised to the effect of branding. The branding process may require an immobilizer.
Individual brands can be registered on a national database.	Individual ownership can still often be disputed if the animal is from a different region.	Brands for individual owners must be registered on a national database.
Can significantly assist disease control	Needs to be linked to a LITS program.	Individual owners should be allowed to brand their animals.
Branding irons are easily obtained from suppliers		Require a public/private partnership to supply the market.

9.3.2 Normal Tamperproof Tag

Tamperproof ear tags allow each animal to be uniquely identified with a pair of cost effective tags that can only be removed if the tag is cut out of the ear with a knife. This would however be a similar intervention to pulling a registration number plate off a car. Like branding or any other method of identification, the insertion and/or removal of tamperproof tags must be backed by a law in the form of an animal identification Act.

The law should require that *all animals* have a tamperproof tag for identification. Tamperproof tags bearing the same number are usually attached to both ears using a special applicator. If one of the tags is accidentally torn out, then the livestock owner must request a new tag that would have the same number from the competent authority.

The first tag is flagged so that the identification of the animal is easily visible whilst the second tag is usually the size of a 25mm coin that is very difficult to remove. Large flag tags are more visible but are also easier to lose if for example, the tag is snagged in a bush whilst an animal is grazing. The retention rate for tags is usually over 99%.



Tags are numbered with an ISO number that will have a country of origin digit. When working with a national database, no tag in the world should be duplicated. Lost tags will have the same number but a smaller subscript number (called a check digit) will identify that the tag has been lost and that it is a duplicate. All animal tag numbers and owner details must be registered on a database.

The LITS system using tamperproof tags will only work if all animal movements and terminations/deaths are properly recorded at the competent authority designated for the task.

Normal tamperproof tags are adequate for systems starting out in identification and are successfully used in countries such as Zimbabwe and South Africa. With cell phone technology individual owner identification could be verified against the National database.

The biggest disadvantage of using a normal tamperproof tag is that it is labour intensive and the recording is prone to errors.

Advantages and disadvantages of using a Non RFID tamperproof ear tag.

Advantages	Disadvantages	Comment/Outcome
Similar to a number plate of a motor car, each animal is individually numbered	If not backed by an animal identification Act the tag can be cut off and removed	Tags are an effective form of identification if backed by legislation
Ownership of each animal is recorded on a central database	Requires administrative input to run the system	Animal ownership is secure if a proper database is in place
The normal tamperproof tag does not require an expensive infrastructure with Internet facilities.	The data capturing is not electronic thus requiring it to be done on paper forms. This process is labour intensive and can cause significant errors.	Tamperproof tag does not require an expensive infrastructure but is labour intensive and can cause errors
Is a cost effective system. A double tag usually costs approximately \$0.70		Is cost effective if administered properly
Movements between owners are recorded		

9.3.3 Bar coded Tamperproof Tags

Bar coded tamperproof tags are commonly used in some European countries, and was in some instances, the precursor to the RFID devices because of a significant saving in cost compared to an RFID device.

It has all the advantages of the Tamperproof tag as explained above. However, it has a bar coded reader that reads the bar code on the tag of each animal and can thus electronically store an animal's details. There is no need to write down the tag numbers making it easier to administer the process and the system is less prone to errors

The bar coded tag requires a good infrastructure to support the system because readers also have a limited battery life and need to be charged. Details of each animal need to be recorded and then uploaded onto the internet at each point in the value chain where animals can be monitored.

The biggest challenge; however, is the readability when large mobs of cattle are being processed under hot, windy and dry conditions. Namibia for example, used the bar coded tags for a short period of time and decided that it was not suitable under their extensive environments. Each animal had to be restrained and the bar code had to be cleaned to obtain a positive read. This proved to be impractical.

Advantages and disadvantages of the bar coded tamper proof tagging.

Advantages	Disadvantages	Comment/Outcome
Each animal is individually numbered with a bar coded tag	The bar coded tag is impractical to use in extensive, dry African conditions	Bar coded Tags can be an effective form of identification if backed by legislation but the readability in dry, dusty conditions is questionable
Ownership of each animal is recorded on a central database	Requires administrative input to run the system	Animal ownership is secure if a proper database is in place
The bar coded tamperproof tag readers are more cost effective than RFID readers.	The data capturing is electronic thus reducing errors.	Bar coded Tamperproof tags require an infrastructure but being electronic errors are eliminated.
Is a cost effective system. A double tag usually costs approximately \$1.00		Is more cost effective than RFID

9.3.4 RFID Tamperproof Ear Tag

RFID tags are similar to the non RFID tamperproof tag but has an implanted Radio Frequency Device that is triggered by a reader. The tags are approximately three times as expensive as the non RFID tags but have the advantage that they can be read electronically. There is thus no need to write down the tag numbers making it easier to administer the process and the system is less prone to errors. The readers are however expensive, have a limited battery life and are required at each point of the value chain where animals can be monitored. At these points in the value chain where

movements or deaths need to be recorded, Internet access to the National database is usually required.

RFID systems are usually used when there are large movements of animals and large scale changes of ownership throughout the value chain are made, for example from producers to growers, then feedlots (cattle fattening facilities) and finally to abattoirs. They are also used where a good infrastructure exists and are used in countries such as Australia, Namibia, Canada, USA and most of Europe.

As with the Tamperproof tag, RFID devices must be supported by the required legislation mandating that all animals must have a tag and that it is unlawful to remove the tag (as would be the case with a car number plate for example).

The LITS system using tamperproof tags will only work if all animal movements and terminations or deaths are properly recorded with the competent authority designated for the task.

Advantages and disadvantages of RFID tamperproof tags

Advantages	Disadvantages	Comment/Outcome
Each animal is individually numbered with a RFID tag that is easily recorded on a reader	If not backed by an animal identification Act the tag can be cut off and removed	RFID tags are an effective form of identification if backed by legislation
Ownership of each animal is recorded on a central database	Requires readers that have a limited battery life and internet at certain access points	Animal ownership is secure if a proper database is in place but the system requires readers and an internet infrastructure at certain access points
Is a system that easily transfers the information from the animal onto a central database.	Is an expensive system to implement (but less expensive than the bolus). A double tag usually costs approximately \$2.00. The readers cost between \$300-\$1000	The cost/benefit needs to be assessed, especially in countries that do not have access to “high end” export markets. Is administratively easier to manage than normal tamperproof tags

9.3.5 RFID Bolus

The RFID bolus has been the system of cattle identification in Botswana for the last 10 years and it is generally acknowledged that this method of identification can significantly reduced cattle rustling and theft. Some reports claim that it has reduced cattle rustling by over 40%. The RFID bolus is inserted into the rumen and cannot be tampered with. In areas where large scale rustling occurs, a radio frequency identification device (RFID) bolus has thus been proven to be effective, especially to reduce cattle rustling.



The RFID bolus as a LITS device however has its challenges. The cost is approximately \$7.00 per bolus (more than double the price of a RFID tamperproof tag) and requires a trained veterinary officer or health worker to insert. The bolus also requires an RFID reader to be able to identify animals that are part of the herd.

The bolus will work well if it is used as a secondary method of identification in conjunction with a tamperproof tag but the cost/benefit is usually prohibitive. Botswana is now trialling the RFID tamperproof tag as an alternative system.



Advantages and disadvantages of the RFID Bolus.

Advantages	Disadvantages	Comment/Outcome
Is an RFID device that lies in the rumen and is tamperproof and can significantly reduce cattle rustling.	Is expensive and costs at least seven time more than a tamperproof tag.	The RFID bolus is a very effective form of identification that is tamperproof and can reduce cattle rustling.
Can be recycled	Is difficult to recycle in practice and does not visually identify the animal thus also requiring a visual tamperproof tag.	It is difficult to recycle and requires a visual tag as a secondary ID

9.3.6 Subcutaneous RFID implantable microchip

When LITS programs were implemented in the early 1990s in many of the developed countries (Europe, Canada and Australia for example), the RFID implantable microchip was suggested as a possible Animal Identification.

The RFID implantable microchip has been successfully used in the companion animals, for example the pet and wildlife industries. It is in fact the preferred method of identification in the companion animals. The microchips used in the early 1990's had serious problems with migration (McAllister, et al. 1999) and the glass capsule housing the microchip proved problematic and a large percentage (often up to 20%) broke within the animal. Some of the problems have been fixed, especially in cattle and sheep.

The use of the microchip in food producing species such as cattle and shoats must however be questioned. The migration of the transponders is still a problem, the potential contamination of meat products, high failure rates, and the difficulty recovering the implant in the slaughterhouse has created a lot of doubt about the efficacy and use of the microchip as an identification device in the Meat Value Chain (McAllister, et al. 1999).

Despite concerns raised by various scientists of the implantable microchip as an Identification device, if used, it is strongly recommended that the microchip be implanted in the base of the left ear on the scutiform cartilage and that the animal also carry an external identifier to indicate that a microchip is present. The microchip must be recovered at slaughter and government guidelines must govern the use of implants.

Advantages and disadvantages of the RFID implantable microchip.

Advantages	Disadvantages	Comment/Outcome
Is an RFID device that is implanted under the skin, normally the base of the year	Is cheaper than the bolus and is to some extent tamperproof. However, questions are raised regarding its use in the Meat Value Chain. It is also prone to migrate and has failure rates if not implemented carefully.	The RFID implant can be an effective form of identification that is tamperproof but serious questions have been raised about its use in the Meat Value Chain.

Can be recycled	Is difficult to recycle in practice and does not visually identify the animal thus also requiring a visual identification tag.	Animal ownership is secure if a proper database is in place
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9.3.7 Summary, lessons learned and recommendations

Together with a database, the choice of identification device is the most important component of a LITS. Whilst the administrative costs and database can be significant, the device used for a National system is the single largest cost. The challenge for developing countries that have Foot and Mouth disease, is that it does not have access to the more lucrative European, USA, Russian or Japanese markets that pay a significant premium for carcasses. Countries such as Namibia or Botswana are able to justify the costs of more expensive devices such as RFID, and the infrastructure required to support the device, by exporting carcasses to the European Union and other high value markets. In Namibia, for example, almost a dollar more is paid per kilogram for carcasses exported to Europe. On a 300kg carcass, there is thus a premium of \$300 and this significant increase in income justifies the cost of implementing the system and the RFID device used.

At the regional workshops held in Addis Abba (Ali-jabra 2014) in February, April and October 2014 and taking into account the costs/benefits of a LITS system, the identified device options in order of priority were listed as follows:

- 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

It is recommended that one device be used for all the production systems and purposes. There should not be one device for each specific production system within a country. All countries that implement a LITS will choose one

device that can meet the requirements for all production systems. The pilot in South Sudan showed that the tamperproof tag can be effective for reducing cattle rustling and Ethiopia is for example trialling the tamperproof tag for its export market.

9.4 Database requirements at regional and national levels

One of the most important components any LITS system is the database. A LITS database for an animal traceability system requires a similar support structure for a National health system or passport control system. The development of a good database is often the most undervalued part of a LITS and is often the cause of failure of a LITS. It often requires a similar database infrastructure for a pilot program as it does for a national and even regional system (Cameron and Ben 2011). The recommendation for running a pilot program is to use a fully functional LITS database, but run it via a web based system. Companies who provide an “off the shelf” database system are usually amenable to assist governments or production groups with a database.

The minimum recommendations for a database provider should be the following criteria (Bradfield and Truitt 2014).

- The system must be capable of meeting the demands of a National LITS system and provide numbers of the number of animals that can be accommodated.
- The user interface and data fields must be customizable without significant cost or development expense. The system should allow for batch entry of animals and the web services interface should utilize more modern software such as a Microsoft .NET Framework.
- The database must be capable of operating with internet access from multiple devices and sources simultaneously.
- User access of the system should be available through all common browsers and mobile devices (smart phone).
- The user interface should be intuitive and user friendly with a minimal amount of training needed to interface with the system.

- The database must be scalable and preferably built on the Microsoft SQL Server or equivalent platform.
- A cloud storage and interface system is required.

The demonstrated capacity to interface with other Biosecurity systems including Surveillance and Epidemiology systems and Emergency Response Management must be shown.

The support for and providing of Audit capabilities to officials overseeing the LITS program must be in place.

Prices vary markedly but a good LITS database should cost between \$100-200 000 with an annual fee that would depend on the numbers of animals recorded.

In general, National Governments prefer to run and manage their own National databases because it allows them to change the database to meet their own market and production system requirements. Security concerns may also be a National Priority because all details of properties, animals, all animal movements and veterinary and disease information is logged onto the database. Because the database should be the backbone of an epidemiological system, a country may also want to keep the database within its own boundaries.

However, for some of the IGAD countries it probably makes sense to consider a regional database as a point of departure. Pilot programs for example can be managed from a single database via a web based browser and resources shared for the setup and maintenance costs. The protocol for operating the database, on a per country basis, could be arranged beforehand with the service provider to ensure that only specific access is allowed to allay security concerns. The challenge for a regional database will probably be internet access and internet speed. Operating a database with a poor and slow internet line between countries is not recommended.

9.5 Animal health certification (AHC)

It is important to take small and incremental steps when implementing a LITS system. The implementation of a LITS starts by targeting a production system (usually where the most financial value is added in the value chain), pilots

the device to be used and also gets Identification numbers of each animal logged onto the database. An Animal Health Certification system (movement control certification) can be implemented simultaneously but needs to start by providing the basic and essential information. In the UK and the rest of Europe, many countries implemented a “Passport” type system for each animal. This was done many years before the database was able to provide a real time, detailed history of the movements and animal health status of each animal. In countries where mobs of animals are moved simultaneously a passport system is not usually recommended (Cameron A and Maden B 2011). For a LITS trial in Ethiopia targeting the export sector, Bradfield M and Truitt J (2014) recommended that details of animals moved from the point of sale are batch recorded on paper sheets in a book (no Internet services or power is available at the Point of Sale). In this way the region or village of origin for cattle can be recorded, and the next movement logged whenever it reaches a destination where it can be inputted into a database.

At the very least, the following needs to be recorded onto an animal health certificate:

- Date
- Market location
- Veterinary Official Initiating the Documentation
- Identification Number on the Tag applied at the time of sale
- Description of Animal (species, gender and other information deemed appropriate)
- Disease status of the animal
- Comment section that describes the current disease status
- Vaccination status and if known, what vaccination the animal has received
- Seller information (identification number or phone number and location/origin source)
- Buyer information
- Transport Information (means of transport and identification)

9.6 LITS legal framework

A LITS implementation will only work if it is underpinned by a strong legal framework and an Animal Identification and Traceability Act that can be enforced. The act should clearly provide guidelines regarding the device to be used, that all animals should be identified, all movements recorded and enforce that it is an offence to remove the device. In many countries that has implemented a LITS, the Animal Identification Act has replaced the older Livestock Branding Act.

From the questionnaire it is clear that Ethiopia is currently busy implementing an Identification Act and that Kenya has developed an Act but that this is not yet implemented. It would make sense, in an IGAD context, to get a consultant to develop a protocol that each country can use as a template and to then develop it later on as necessary. This is certainly the way the SADAC countries have developed many of their Livestock Acts.

It is also important that each Act will recognize the other IGAD countries LITS system and that animals moved from one region (or IGAD country) will be recorded in the next region.

9.7 Capacity Building, training and management

LITS implementation needs the mobilization of the whole livestock sector. To run a traceability system thus requires a complete buy in from all sectors of the livestock industry and positive interaction with the application from the producers. It is important that the cattle owners and industry participants have a level of control in implementing and managing the system. Though some ministries prefer to have “complete control” of the system, the ministry often becomes overburdened by the sheer complexity and volume of work required to implement a LITS. If the private sector is for example able to tag the animals themselves, then a significant component of the work to manage a LITS is overcome. The role of the ministry should be a support and enforcement role and not to run every element of the system. The roles of the government and other stakeholders is given below.

Duty statement	Role
Be the competent authority	Ministry responsible for livestock
Runs the national database	Ministry responsible for livestock
Creates the necessary documents	Ministry responsible for livestock
Develops the required legal framework	Ministry responsible for livestock
Tag the animals	Public and also Private sector
Educates industry participants	Government/private/Development Partner
Capture required information onto forms	Public and Private sector
Capture required information onto database	Public and Private sector
Monitoring and evaluation	Ministry responsible for livestock
Procure and distribution of tags	Ministry responsible for livestock

The training will depend of the production system and the purpose being targeted for the LITS. In general, training should be provided on the devices, a need and advantages of a LITS the way the pilot will be implemented for the following:

- Producers and pastoralists
- Animal attendants and feeders
- Sellers and buyers
- Feedlot owners
- Abattoir owners
- Veterinary Staff
- Ministry of Livestock personnel
- Ministry and/or Security involved in combatting cattle rustling

10 LITS implementation roadmap

10.1 Species

It is clear from the feedback from the questionnaire that the preferred species for an initial LITS implementation should be cattle. Cattle were also the species that was chosen by most countries that developed a national LITS system. The first reason for choosing cattle is that the per unit cost, i.e. the cost of the device relative to the carcass, is the most cost effective. Secondly, it is easier to implement and manage the device in cattle compared sheep and goats. Thirdly, in an IGAD context, cattle are considered to be the high value species that carries the wealth of the community. It is used for dowries, funerals and for high value inter clan trade. In South Sudan, where tamperproof ID devices were implemented, it was clear that the cattle owners placed a very high value on their cattle being recorded on a database. The recommendation is thus to implement a LITS in cattle. However, if the identified production system or market system will add the most value to Smallstock then this sector should be considered.

10.2 Pilot Study

At the regional IGAD workshop on the coordination of LITS and Animal Health Certification (AHC), held in Addis Abba in April 2014 (Ali-jabra 2014), the request was that the consultants involved in developing this report, would make a recommendation on a pilot study for the region. It was also clear from the discussions held in Addis Abba that the following criteria should be considered when developing a Pilot project:

- Consider the export trade because this is where the most value is added
- Consider at least three of the IGAD countries in the pilot
- Possibly consider countries who do not yet have a pilot study

In the questionnaire, and during discussions held at the workshop in Addis Ababa, it is clear that the preference from the IGAD countries (for example Ethiopia, Kenya and Uganda), would be to firstly develop their own within-country systems, before embarking on a regional LITS implementation. All

countries supported the development of regional guidelines, however the first priority should be for each individual country to first get its own house in order before embarking on a regional system.

Once each country has implemented its own LITS program, a regional system can be considered. If animals move from Uganda to Kenya for example, it is important that the animals are firstly recorded onto the Ugandan database (and ownership of each animal recorded). Animals are then transferred to the Kenyan database and the transfer in ownership, and country of origin, should be recorded. In a similar way that most human passport control offices record movements across countries, the database should be able to process the transfer. Once animals are slaughtered they are recorded (“fated”) on the database. Exported animals are recorded as being for export, with the country of origin recorded. The database should be able to have a record of the country of origin and all animal movements.

Ethiopia has implemented a pilot study, funded jointly by the ministry, the private sector and a NGO to test the use of tamper proof tags, to then batch record animals at the point of sale onto paper based forms, and to then load this information onto a database once the animal has reached a feedlot. This program will initially target animals destined for export. The program started in August 2014 (Bradfield and Truitt 2014). It is considered an effective solution because no readers will be used thus requiring no expensive overheads, the tags are affordable (less than 1 dollar) and the data will only be logged onto a database when internet access is available. A fee per tag charged to the feedlot owner will cover the overheads once the program goes into a production phase.

Kenya has implemented various pilot studies to evaluate LITS systems. The largest was in Northern Kenya where over 150 000 bolus devices were used. This pilot program was stopped because of a lack of funding. Kenya is currently considering different alternatives for a LITS implementation. (Elaborate on ILRI developments after the workshop).

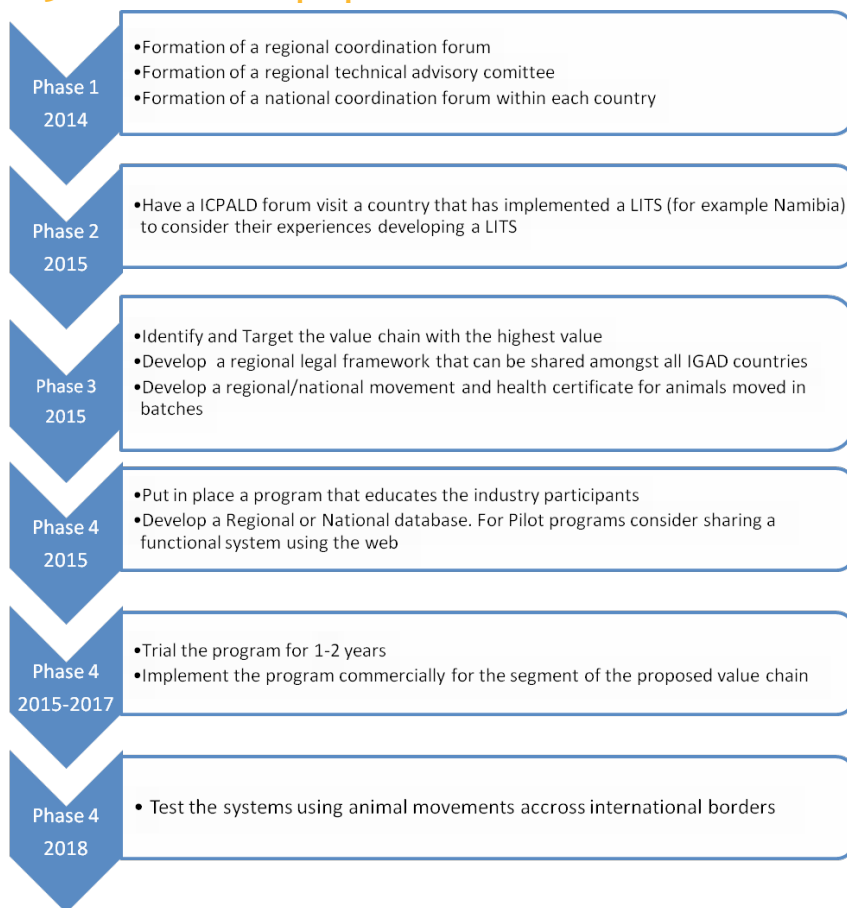
South Sudan, in the Northern Bar el Ghazal province, trialled the use of tamperproof tags. These proved to be cost effective and reduced cattle rusting by over 95%. Tagged animals were logged onto a database and the ownership of each animal could be verified. The ideal would have been to

link the identification program to a vaccination program. The trial stopped because of the civil war. The program was however considered to be successful by the ministry and implementing partners.

The pilot program proposed for Sudan (Daborn and Amar, 2014), is to use a dual system of RFID implants and tamperproof tags. The recommendation is to trial the devices at a research station and thereafter to conduct a field trial. The recommendation is also that animals destined for export should be targeted.

Uganda has trialled the RFID tamperproof tag and the bolus but concerns have been raised regarding the costs of these devices. Somalia and Djibouti have not yet trialled a LITS program but have expressed interest to trial a LITS.

10.3 Schematic of proposed timeframe



11 Funding

A LITS program can only be self-sustaining over the long term if the major cost of running the system is paid for by the industry. However, to get a LITS system up and running will initially require Government and Private Sector (possibly NGO) support.

When starting the LITS system the device should be wholly or partly subsidized and the program should then move into a commercial phase. The database and running costs should initially be paid for by the Ministry. Over the long term however, a fee should be included into the identification device (and slaughtered carcass) to pay for the running costs and database administration.

Namibia for example spent 615 000 Euro's to implement its RFID tag system for approximately 2.5 million cattle. The system costs approximately 685 000 Euro's to administer. The proposal for IGAD MS is to implement a tamperproof tag that costs less than a dollar (0.70c). The administrative costs would depend on the numbers of animals and the sector of the value chain that is targeted. The database would cost approximately \$100 000 to develop and approximately \$50 000 to maintain annually. The administrative costs would require 2-4 staff members who are employed specifically to administer the program. Other significant costs would include developing the health certificates, Internet infrastructure, human resources and training and finally the monitoring and evaluation fee.

12 Monitoring and evaluation

Monitoring animals for disease surveillance will require all sectors of the value chain to be committed to the LITS implementation. It is suggested that for the serious diseases (for example FMD and RVF), it should be required that within 24 hours the ministry will need to be notified of suspected serious veterinary diseased animals at any sector of the value chain. It must be also possible to determine the location(s) where these animals resided concurrently or subsequently on any of the points in the value chain on which a specified animal has resided in the last 30 days.

The staff members working for the LITS should also be part of the monitoring and evaluation team and be tasked with updating the database. The team will also be tasked with putting in place the business rules (for example decide who does the tagging, time lag required for data to enter the database) and ensure that the rules are being enforced.

13 Recommendations, guidelines and conclusions

As mentioned previously in this report, the challenge for the IGAD region is to match the costs of running a LITS with the perceived benefits. The infrastructure required to run a LITS is also a challenge. It is also important when trialling a LITS to target the segment that adds the most value.

The recommendations can be categorized as follows

13.1 General recommendations

- The two regional organizations IGAD and AU-IBAR in collaboration with member countries and other potential partners (for example ILRI and FAO) should work together to implement a LITS pilot project in the member countries based on the Addis Ababa workshops (February, April and October 2014) recommendations.
- Implementation of LITS for any specific purpose should comply with the international standards and norms recommended by recognized international standard setting organization (s).
- LITS recommended for a country should be supported by the National government and technical partners and considered according to the economic, financial and technical capabilities of the country within the agreed frame work of the regional guidelines.
- Capacity building of the staff is the prerequisite for any LITS implementation in a country.
- Countries sharing common international borders should harmonize their LITS to monitor cross border movement of the livestock for trade, security or grazing purposes.
- It is recommended that one device be used for all the production systems and purposes. There should not be one device for each specific production system within a country. All countries that implement a LITS will choose one device that can meet the requirements for all production systems.

- The non RFID Tamperproof tag is arguably the most cost effective system available and can significantly reduce cattle rustling, if supported by a law that makes it mandatory for animals to have a device and also makes it illegal to tamper or remove the device. It could be combined with branding or the bolus in some instances.
- Target the component of the value chain that has the highest value, for example the dairy sector and/or export sector. Start with small steps and grow the implementation over a period of time.
- Create a proper infrastructure to support the implementation. A LITS office should have an adequate number of staff and 3-4 staff members is often adequate.
- Many LITS programs fail at the first step because of a poor database. Put in place a well-designed database that is accepted internationally and has been proven to work. The database should be put out to tender. For a pilot program an Internet enabled system should be used rather than keeping records on spreadsheets or a developing an in-house database.
- Create an umbrella body (within country) that represents all sectors of the industry. This body should meet regularly. Also create a technical working group that provides advice and support to the umbrella body.
- Included in the trials should also be countries which do not yet have a pilot study such as Somalia, Sudan and Djibouti. Animals destined for export should be targeted in these countries.

13.2 Implementation of a LITS

- LITS can be implemented in each individual country, or a harmonized system can be implemented in group of neighbouring countries but this is often difficult to administer.
- Different identification devices have been trialled, or are currently being trialled by different IGAD MS (Table 3).
- At the regional workshop, held in Addis Abba in February 2014, and taking into account the costs/benefits of a LITS system, the identified device options in order of priority were as follows:

- (a) Visual tamperproof ear tags with ISO coding.
- (b) Visual tamperproof ear tags (with ISO coding) plus hot-iron branding in insecure areas.
- (c) RFID ear tags.
- (d) RFID Bolus (for ruminants).
- (e) Microchip implants (for controlled trials) with hot-iron branding to deter theft.

13.3 Database requirements at regional and national level

There will be a need for the establishment of a central database managed by the Ministry. A back-up system needs to be put in place, including the paper forms used in all transactions. The database should also become the Animal health certification System. Countries usually prefer to develop their own database so that the system can meet their own market and production system requirements. Because all Identified animals are recorded on the database, including veterinary and disease information and animal movements, countries usually prefer to keep the database within its own boundaries for security reasons.

13.4 Regional framework

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 needs to be formed. The national policy will also need to be in line with the regional strategy.

13.4.1 At national level

- The Ministry of Agriculture should be the competent authority to manage the system.
- The National regulatory body should conduct research studies to evaluate the feasibility of LITS implementation in the country.
- An organizational body including all stakeholders should be formed to control implementation of LITS in the country.

- The above mentioned body is the statutory body which is capable to identify the most suitable LITS for each country, the production system, and the requirements of the system to be implemented and the capacity building of the staff.

The above mentioned body shall utilize national and regional channels to build linkages and harmonization with the relevant bodies in neighbouring countries.

13.4.2 At regional level

- IGAD, AU-IBAR and other potential donors and stakeholders should formulate a coordination body to assist member countries to implement a LITS. This should include all stakeholders who benefit and who are affected by a LITS implementation.
- The above mentioned body should be responsible for raising funds for the LITS national projects.
- The body should be able to regularly monitor, assess and evaluate LITS national projects and find solutions and remedies for the shortcomings at the initial stages of the project implementation to avoid any industry concerns.
- The regional body is mandated to harmonize different LITS national projects.

The regional body should facilitate visits and study tours by the staff of member countries to the countries who have successfully implemented a LITS.

13.5 Legal framework

- LITS implementation should be governed by a legal framework that regulates the procedures for the selected LITS implementation device, livestock species and production system targeted in addition to enforcement of LITS implementation.
- This legal framework should be endorsed and approved by the highest supreme and legislative body in the country.

- The framework should accommodate in its provisions all the standards recommended by the international standard setting organizations

13.6 Organizational setup

LITS at national and regional levels should be managed and administered by capable organizational bodies in which planners and beneficiaries actively participate in its operation.

13.6.1 At the national level

- A management body should be formed under the concerned supreme body (council of ministers) presided over by the Chief Veterinary Officer and membership of the different livestock stakeholders and beneficiaries involved in LITS implementation.
- A small task team should be devoted to running the LITS. The team should be properly resourced with highly trained staff, and accommodated in a professional premises that is well equipped and furnished. The team should also be properly equipped and transport facilities provided.

13.6.2 At a regional level

- A coordinating body should be accommodated in IGAD MS but be run jointly and in collaboration with AU-IBAR and support from other regional and international organizations engaged in LITS (for example OIE, FAO and ILRI).
- This regional body should be mandated to liaise directly with the national bodies in the member countries.

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15 Annexures

15.1 Annexure of Figure 1

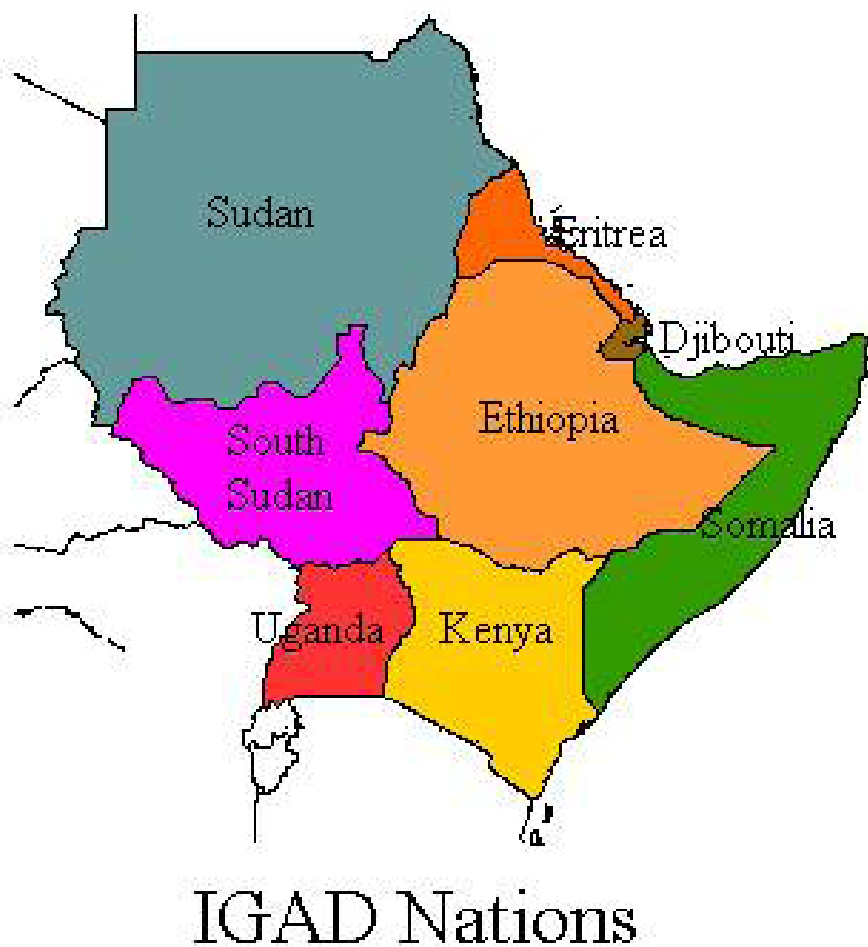


Figure 1 IGAD Member countries (in yellow)

15.2 Annexure of Tables (1-5)

Table 1 Animal Population in IGAD Member States

Country	Animal population (heads)				
	Cattle	Sheep	Goats	Camels	Pigs
Djibouti	40,000	1,000,000		50,000	
Eritrea	1,415,000	1,415,000	906,000		
Ethiopia	53,900,000	25,500,000	24,000,000	900,000	
Kenya	5,165,000	4,252,000	17,855,000		
Somalia	1,524,791	7,516,708	6,836,695	360,110	
South Sudan	11,700,000	12,100,000	12,400,000	Existing	
Sudan	30,570,000	36,539,000	25,596,000		
Uganda	12,841,000	3,842,000	4,012,000		3,584,000

Table 2 Distribution of livestock population in different production systems in IGAD MS

country	Percentage of livestock in different production system											
	Nomadic/pastoralist			Agro-pastoralist			Settled crop-livestock			Small scale Commercial dairy/beef		
	C	S	g	C	S	G	C	S	G	C	S	G
Djibouti	100	100	100	0	0	0	0	0	0	0	0	0
Eritrea	63	65	92	37	35	48	0	0	0	4		
Ethiopia	20	17	33	78	83					2		
Kenya	44	55	70	20						49		
Somalia	100	100	100	0	0	0	0	0	0	0	0	0
South Sudan												
Sudan	81	80	73	20	18	27						
Uganda	20	17	16	69	79	84				62		

C: Cattle, S: Sheep, G: Goats (Vivien 2004)

Table 3 Comparison of different LITS systems being implemented or piloted in the IGAD region

	Kenya		Ethiopia	Sudan	South Sudan	Uganda	Somalia	Djibouti
Traditional Identification Devices/ Methods	Hot Iron Branding		Hot Iron Branding	Branding	Ear Notches	Branding	Hot Iron Branding	Branding
	Plastic ear Tags		Ear Notches	Plastic Tags	Visual		Ear Notches	Plastic Tags (export)
Identification devices that have been trialled	Ear Notches		Painting	Ear Notches			Painting	Ear Notches
	Name animals on colouring		Limited Ear tagging	Visual				
	2003	Branding	Limited Ear tagging (Commercial and Government)		2011-2013 Visual Tamperproof tags on 15 000 animals	RFID Bolus/Tag		
	2008-10	RFID Bolus/ Tag						
	2008-10	Bolus						
	2008-10	Brands						
Identification devices considered for future pilot Studies	2008-10	GPS tracking						
		Subcutaneous transponders	3 year program, Tamperproof tag	RFID Tags and Subcutaneous transponder		Possible RFID	?	Role out of ear tag nationally
		Tamperproof tag	250 000 Animals					
Political Will		Tamperproof RFID	Very strong	Very strong	Reasonable			
		Very strong	Very strong	Very strong		Very Strong		

Legal Framework	Delayed	In process	Being considered	Being considered	Being considered	?	?
Database development	Part of Pilot programs	Being put out for tender					
Species Targeted	Mostly Cattle	Cattle	Cattle and sheep	Cattle	Cattle	All Species	All species
Production System targeted	All systems	Feedlot and Export	Export	Pastoral	Pastoral	All	Mainly export
Main Constraints	Funding	Funding	Funding	Political instability	Funding	Funding	Infrastructure
	Infrastructure Culture/Religion	Infrastructure Inadequate Law enforcement Uncertain Export Environment	Infrastructure	Funding Infrastructure	Infrastructure Inadequate Law enforcement	Infrastructure Inadequate Law enforcement	Nomadic production Lack of equipment
Suggested Way forward for IGAD	Provide guidelines/roadmap	Common Vision				Policy and strategy	Build Capacity
	Implement regional systems Cooperate with private sector	Harmonized Legal Harmonized Health Certificate				Partnership's Legal Framework	Select cost effective options

Table 4 Comparison of identification methods and devices

Comparison of identification methods for cattle and small ruminants

Method	Ease of application	Ease of reading	Success of reading ^(a)	Affordability	Data transfer speed	Protection from fraud	Protection from entry to food chain	Lack of pain/stress to animal
Ear tags								
Plastic dangle	****	***	**	****	*	*	****	****
Plastic bar code	****	*	**	***	** ^(b)	*	****	****
Metal ear clip	****	**	***	****	*	*	****	***
Electronic RFID	****	****	***	**	****	*	****	****
Injectable transponder								
Base of ear	***	****	***	**	****	***	**	***
Axilla	**	****	***	**	****	***	*	***
Other methods								
Rumen bolus	**	****	****	**	****	***	**	***
Hot-iron brand	**	**	****	****	*	***	NA	*
Freeze brand	**	**	**	***	*	***	NA	**
Tattoo	*	**	**	****	*	***	NA	**
Ear notch	**	***	***	****	*	***	NA	**
Photograph/sketch	*	*	***	**	**	***	NA	****
Retinal scanning	**	***	****	*	****	****	NA	****
DNA fingerprinting	***	*	****	*	*	****	NA	****

Table 5 List of stakeholders met during field visit to Nairobi (31/8 – 5/9/2014)*

SN	Name	Organization	e-mail address	Remarks
1	Dr. Ameha Sebisibe	IGAD/ICPALD	ameha.sebsibe@igad.int	
2	Dr. Agol M. Kawi	IGAD/ICPALD	agol.kwal@igad.int	
3	Dr. Patrick Bastiaensen	OIE Representation	srr.eastern-africa@oie.int	
4	Dr. Chris Daborn	Consultant	tv@s@habari.co.tz	Met at AU-IBAR
5	Dr. James Wabacha	AU-IBAR	james.wabacha@au-ibar.org	
6	Dr. Zelalem Tadesse	AU-IBAR	zelalem.tadesse@au-bar.org	
7	Dr. Thomas Njoroge Manga	CVO Kenya	thomasmanaga@yahoo.com	
8	Dr. Tabitha Kimani	FAO Kenya	tabitha.kimani@fao.org	
9	Dr. Paul Mutongi	FAO Kenya	Paul.mutongi@fao.org	
10	Dr. Peter Ithondeka	Consultant	peterithondeka@yahoo.com	Met at AU-IBAR

*IGAD fixed appointments with Bernard Bett of ILRI and Qalicha G. Wario of KLMC but due to logistical constraints the consultants were not able to meet.

15.3 Annexure Questionnaire

Developing Regional Guidelines on Livestock Identification and Traceability (LITS) in the IGAD Region

Stakeholder - Interview Guide

Name of Respondent	
Position of Respondent	
Name of Institution/organization	
Location/Country	
Date of submission	

Introduction

This consultancy is part of the IGAD project aimed at improving animal disease surveillance in support of trade in IGAD Member States (STSD). We have received the within country reports that contains useful details of the activities taking place at a regional IGAD level. One of the consultants also attended the workshops on Livestock Identification and Traceability Systems (LITS) and the Launch of a Regional Coordination Forum on Animal Identification and Traceability and Animal Health Certification (AHC).

This Questionnaire has been designed to solicit the views of each country/ organization representative or livestock stakeholder and to harmonise the information received. Section A of the questionnaire briefly reviews the current situation whilst Section B considers recommended options.

We would like to thank you for taking time to answer this questionnaire. Your input is highly appreciated.

Kindly email the completed questionnaire by the 1st September 2014 to Dr Michael Bradfield michael@agribusa.co.za or Dr Ahmed Ali alihassanahmed48@gmail.com

Note; Circle your options and comment where necessary.

Section A: Current Situation

Part 1: Trans-boundary Animal Diseases (TADs)

1.1 List, by order of importance and species, the five most significant Transboundary Animal Diseases (TADs) affecting your livestock sector:

1)

2)

3)

1.2 Give three examples of serious TADs outbreaks that have occurred over the last five years.

1)

2)

3)

1.3 Can you give an estimate of the **within country** costs, due to animal diseases (provide evidence if available to substantiate your estimates?)

CATTLE

.....

SHEEP

GOATS

.....

CAMELS

.....

OTHER

.....

1.4 Does your country's veterinary service regularly report the outbreaks of animal diseases of socio-economic importance to OIE?

YES

NO

Comments.....

- 1.5. Is your country implementing any disease control program for any of the above mentioned TADs?

Comments.....

- 1.6. Has your country received funding for disease control from any of regional or international funding agency?

Comments.....

Part 2: Livestock Trade and Animal Movements

- 2.1 What percentage (estimate) of your country has clearly defined boundaries?

.....

- 2.2 By species what number of animals are estimated to be continuously moved, for PASTORAL **GRAZING PURPOSES, within country**

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

- 2.3 List, by order of importance, the main routes that animals are moved for pastoral **GRAZING PURPOSES, across borders**. You may also provide a map of the main trade routes.

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

- 2.4 By species, what number of animals are estimated to be continuously moved, for live marketing and slaughtering **purposes, within country** (or provide your annual market and slaughter figures)

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

- 2.5 By species, what number of animals are estimated to be continuously moved, for live **EXPORT purposes, across borders**

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

2.6 By species, what are the main exit points for live animal exports? What are the final destination points?

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

2.7 By species, what numbers of animals and/or meat tonnage of your animals are slaughtered at official slaughter houses (abattoirs) for **DOMESTIC** consumption purposes?

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMELS

.....

OTHER

.....

2.8 By species, what numbers of animals and/or meat tonnage of your animals are slaughtered at official slaughter houses for **EXPORT** purposes? What are the final destination points?

CATTLE

.....

SHEEP

.....

GOATS

.....

CAMEL

.....

OTHER

.....

2.9. What are main livestock trade barriers in your country?

Comments.....

Part 3: Challenges encountered

3.1 What are the main challenges encountered in your country that prohibits the implementation of a LITS system?

Comments.....

3.2 Has the private industry implemented any initiatives of their own for LITS in your country?

YES

NO

Discontinued

Comments.....

3.3 Has your country initiated steps to coordinate work among different stakeholders to develop and implement a LITS System?

Comments.....

Part 4: Existing legislation

4.1 Has your country implemented any legislation to regulate LITS or the implementation of a LITS system?

YES NO Discontinued

If the answer is YES, which of the following international standards you are using as reference?

OIE

WTO (SPS).....

ISO.....

CAC.....

4.1.1 If NO in 6.1, in what timeframe do you consider implementing the required legislation?

1 year 2 years 5 years 10 years 20 years

4.1.2 If NO in 6.1 are you waiting for the AU-IBAR IGAD partnership on LITS (this report) to provide recommendations?

YES NO

4.2 Has your country implemented any Legislation to regulate Animal Health Certification or the implementation of an Animal Health Certification system?

YES NO Discontinued

If the answer yes, which of the following international organizations have you used as a reference:

OIE.....

WTO (SPS).....

CAC.....

4.2.1 If, NO in 6.2, in what timeframe do you consider implementing the required legislation?

1 year 2 years 5 years 10 years 20 years

4.2.2 If, NO in 6.2 are you waiting for the AU-IBAR IGAD partnership to provide recommendations?

YES NO

Part 5: Existing Funding

5.1 Has your ministry a budget for funding a LITS implementation (for example a pilot project)

YES NO

Comments.....

5.2 Does your ministry rely on International Donor Funding for LITS implementation?

YES NO

Comments.....

5.3 If yes, in 7.2, what proportion of the funding can come from:

Donor funding	%
Ministry	%
Industry	%

(Please provide an estimate)

5.4 Has your country/ministry ever done a cost-benefit analyses of a LITS system and considered the cost/benefit of different devices in a LITS system.

YES NO

Comments.....

Part 6: Existing Capacity

6.1 Does your ministry have an office and trained personnel that has the capacity to administer a LITS system?

YES

NO

Comments.....

6.2 Does your ministry have an office and trained personnel that already administers an Animal Health certification system?

YES

NO

Section B: Summary of Recommended Options

Part 1: Options for a Feasible IGAD Identification System

1.1 At the regional workshop in Ethiopia in February 2014, the following vision statement for a harmonized LITS and AHC system was developed.

As a common IGAD vision we want the world to be aware that we have a credible, reputable LITS system that adds value to our animals and guarantees disease free exports

This vision is:

Acceptable,

Should be changed

Comments.....

1.2 Rank the following species in order of expense to implement a LITS system (1 most expensive 3 least expensive):

Cattle,
Other

Shoat,

Camels,

1.3 In which of the following species would your ministry would like to see LITS implemented?

Cattle,
All,

Shoat,

Camels,

1.4 How good is your ministry's understanding of the costs associated with implementing a LITS system (this includes the identification device, database and infrastructure costs)

Very Good	Good	poor	No understanding
10	8	6	4
			2
			0

1.5 Would your ministry be prepared to implement a cheaper device (such as a plastic ear tag), even if it requires more administration, if it could be proven to be a successful system?

YES, NO,

Comments.....

1.5.1 If YES. Is your country planning to involve other stakeholders in the management of a LITS system?

Comments.....

1.5.2 Would your ministry prefer an electronic system such as a RFID tag, bolus or micro-chip, because of the reduced administration and reduced errors despite the potential increase in costs?

YES, NO,

Comments.....

Would your ministry first need to be convinced of the cost/benefit of any system recommended?

YES, NO,

Comments.....

Part 2: Preferred venue for a Pilot Project

2.1 In order of preference (Score your preference out of a 100). a LITS regional pilot project should be implemented in an area that:

Has no current pilot LITS system

Has high volumes of livestock trade across borders

Includes as many countries as possible

A financial contribution can be made by the implementing country

2.2 Please provide detailed comments regarding the area, device application and database and infrastructure requirements, that you feel should be taken into account regarding a proposed LITS IGAD pilot project.

Comments.....

Part 3: Creating an Umbrella Body

3.1 Is it important to create a regional umbrella body that oversees and harmonizes LITS implementation in the IGAD region?

YES,

NO

Comments.....

3.2 Who do you feel in your country should serve on this umbrella body (for example veterinary services, NGO, Private sector nominee)

Comments.....

3.3 If it is one person or ministry department nominated to serve, who should this person or entity be?

Comments.....

Part 4: Providing a Regional or Within Country Database

4.1 Taking account of the movements across borders, and the increased costs if each country had its own database, which of the following options would your ministry most prefer:

One central database that works across all IGAD countries

Own within-country database that integrates with those from other countries

Own within- country database that integrates with a central IGAD database

A cost benefit analyses of each option must be required before making a decision

Comments.....

Part 5: Integrating Animal Health with LITS

5.1 Should IGAD coordinate and fund a central TADs reporting facility and integrate this with LITS?

YES,

NO

Comments.....

5.2 Would your ministry financially support such a facility?

YES,

NO,

Comments.....

5.3 Should the central TADs facility be part of LITS or independently run?

YES,

NO,

Comments.....

Part 6: Funding Mechanism

6.1 Paying for the LITS system (i.e. identification device and maintaining a national database) requires significant funding. Would the livestock sector in your country be able to provide some of the funding in terms of a statutory amount charged per animal?

YES,

NO,

6.2 What would the livestock producer be prepared to pay in dollars as a statutory amount for LITS?

6.3 Do your ministry currently receive funding from a developing partner for a LITS pilot project?

YES,

NO,

Don't know

If YES in 6.3, would your ministry be prepared to give the amount contributed by the developing partner?

Comments.....

Part 7: a Harmonized Legislation

7.1 Taking account of the movements across borders, and the increased costs if each country had to develop its own legislation, which of the following options would your ministry most prefer?

One central piece of legislation that is used across all IGAD countries

Own within-country legislation that is integrated with those from other countries

7.2. Will you encourage neighboring countries to sign bilateral agreements for inclusion of LITS to monitor TADs and livestock movements across the borders?

Comments.....

Part 8: Building Capacity within the IGAD Region

8.1 What are your suggested capacity building needs to implement LITS in the IGAD region?

Comments.....

15.4 Annexure: Response to the groups' discussion reports

NOTE:

The questions below came from the group discussions and appropriate comments were included into the final report. Comments are given in brackets and in some instances explanatory notes are given.

MS=IGAD Members States

Question (1):

Evaluate the proposed guideline (strength and weakness) and make inputs for improvement:

- **The following strengths in the document were identified:**
 - Criteria of selecting the consultants
 - Framework for IGAD MS will help the development of national ones
 - Good coverage of the subjects
 - Participatory approach
 - Strong base i.e. previous experience
 - Wide Range of alternatives and choices
 - Well structured
 - The current existing system in some MS
- **The following weakness were identified in the document:**
 - Time given was not enough
 - Some details are needed on LITS previous experience and the future plans in IGAD MS [done]
 - The protocol should be rectified and signed by MS [Agreed]
 - Implementing procedure not included [Depends on country preparedness]

- In the document experience of Kenya & Uganda is mentioned without given type of devices being used or intended to be used in the future [Table 3 of the document]
- The proposed vision has to be broad even though the mandate is only concerned about trade/export. There are countries that are implementing LITs for the purpose of livestock rustling (like south Sudan).[Included in report]
- Regarding the institutional structure quoting “livestock or agriculture ministry” it’s better to say the “ministry responsible for livestock development” [Done]
- It should propose the best LITS arrangement for the region after discussing the regional and other world LITS implementation practice. [Is comprehensively covered in the report]
- Discuss a system for traceability of other animals eg poultry, donkeys? – Not part of this report, although also not part of TORs. [Is not part of SOW. Recommendation was cattle and shoats if financially more viable]
- Arrangement of regional harmonized system that helps organize the national ones. [Is included in the document]
- The document to be signed by the concern ministers. [For members to decide according to regulations]
- Purpose of LITS guidelines - need for clarity (security, animal health, food safety, breeding, accessing international market, non-descriptive). [Most of these sugestions is in actual report]
- Provide a **menu of options** and/ or combination of options of feasible LITS systems from which IGAD MS can select from. [Is described in advantages and disadvantages]
- IGAD MS should develop and implement their LITS based on their needs.

[Agreed. However, target a specific sector of the production system or for cattle rustling]

- The **Competent authority** for implementing LITS is the veterinary services; governed by the OIE standards. [Should be Ministry responsible for Livestock]
- The role of the other players (Security, animal production, trade) is determined by the objective of the LITS. [Agreed, and is part of production system targeted]
- The finer details of the policy enforcement should be in national policies - A regional policy frame work is at a higher level. [The suggestion is to have a policy document that can be shared amongst IGAD MS]
- Flexibility of the constitution of the **national technical advisory committees** – should take into account both national and subnational administrative units. Consider technical committees at sub national level. [The document talks about the creation of a technical and regional advisory committee].
- **Funding strategy** - Guidelines on funding strategy should consider Stakeholder analyses and an assessment of the distribution of benefits, who is losing, who is gaining most, who is losing more along the value chain. Who should contribute to the system? [In general, the rule is he/she who benefits most, should pay.]
- Pg 22 Lessons Learned - All countries require a cost effective LITS system that can address the following concerns - Add value to cattle – replace with Add value to livestock [done]
- Pg 34 - As a common IGAD vision we want the world to be aware that we have a credible, reputable LITS system that adds value to our animals , guarantees disease free exports and supports security of ownership [done]
- Pg 49 - Create an umbrella body (within country). Also create a technical working group that provides advice and support to the umbrella body- Reword - Every country should provide guidelines for the formation of the national technical advisory committee and

qualifications of the members of the committee. [It is for this group to decide whom should serve on this committee.]

- Pg 50 - IGAD, AU-IBAR and other potential donors and stakeholders should formulate a coordination body to assist member countries to implement a LITS. The regional platform should also include representatives of producers of the different farming systems and value chains as well as regional security institutions. [This should include all stakeholders who benefit and who are affected by a LITS implementation.]
- Pg 45. It is clear that the preference from the IGAD countries would be to firstly develop their own within-country systems, before embarking on a regional LITS implementation - There are inconsistencies between regional and National LITS. At regional level we should have the regional guidelines on LITS implementation and at the national level the actual LITS implementation. [In the questionnaire, and during discussions held at the workshop in Addis Ababa, it is clear that the preference from the IGAD countries (for example Ethiopia, Kenya and Uganda), would be to firstly develop their own within-country systems, before embarking on a regional LITS implementation. All countries supported the development of regional guidelines, however the first priority should be for each individual country to first get its own house in order before embarking on a regional system.]
- Roles of government and private sector about the implementation need to be clearly defined [Has been included into the document with the Table below]

Duty statement	Role
Be the competent authority	Ministry responsible for livestock
Runs the national database	Ministry responsible for livestock
Creates the necessary documents	Ministry responsible for livestock
Develops the required legal framework	Ministry responsible for livestock
Tag the animals	Public and also Private sector
Educates industry participants	Government/private/Development Partner

Capture required information onto forms	Public and Private sector
Capture required information onto database	Public and Private sector
Monitoring and evaluation	Ministry responsible for livestock
Procure and distribution of tags	Ministry responsible for livestock

Question2:

What are the expected challenges for application of the proposed LITS guidelines for disease surveillance and control and enhance compliance with regional and international market requirements

[Done, a chapter has been included into the report that includes the below]

- Updating of policies not yet done and will take time
- Lack/inaccessible information and standards for updating policy
- Weak enforcement of the policies
- Weak systems between the competent authority and law enforcement agencies (police, immigration agencies, army)
- Fragmentation of the chain of command to lower levels makes enforcement very difficult
- Different countries have different administrative levels (national and subnational)
- Inadequate Funding,
- Porous borders
- Difficulties in animal movement control are also caused by
- Inadequate of capacity building and training (limited awareness among owners and traders).
- Inadequate equipment and logistics for monitoring.
- Large livestock populations
- Cultural issues – acceptability by the communities

- Limited regional cooperative and communication for LITS and AHC.
- Limited market access to better paying markets
- Inadequate international standard quarantine stations
- Absence of dedicated transport
- Inadequate harmonized disease surveillance and control
- Inadequate staffing and poor technical capabilities.
- Departments in charge of implementation of LITS are not under one ministry.

Question3:

Please verify and enrich the recommendations and the road map provided

- The two regional organizations IGAD and AU-IBAR in collaboration with member countries and other potential partner partners should be included, such as ILRI and FAO. All should work together to implement a LITS pilot project in the member countries based on the Addis Ababa workshops (February and April 2014) recommendations. Done
- LITS recommended for a country (supported by the national government and by RECS & technical partners) should be considered according to the economic, financial and technical capabilities of the country. Agreed
- Capacity building of the staff is the prerequisite of LITS for any LITS implementation in a country Done
- Countries sharing common international borders should harmonize their LITS to monitor cross border movement of the livestock for either trade (security) or grazing purposes. Done
- The non RFID Tamperproof tag (and branding are) is arguably the most cost effective system(s) available and can significantly reduce cattle rustling, if supported by a law that makes it mandatory for animals to have a device and also makes it illegal to tamper or remove the device. [Include It could be combined with branding or the bolus in some instances.]

- Create a proper infrastructure to support the implementation. (LITS office should have adequate number of staff). Done
- Many LITS programs fail at the first step because of a poor database. Put in place a well-designed database that (Include meets the international standard)
- Included in the trials should also be countries which do not yet have a pilot study such as Somalia,(Sudan) and Djibouti. Animals destined for export should be targeted in these countries. Done
- LITs for region should be considered according to the economic, financial and technical capabilities of the country within the agreed frame work of the regional guidelines. Done
- Countries sharing common international borders should harmonize their LITS to monitor cross border movement of the livestock for either trade or grazing purposes. Harmonization should be based on the countries that have similar purpose and objectives either in trade or grazing purpose. Done
- The non RFID Tamperproof tag is arguably the most cost effective system available and can also significantly reduce cattle rustling, if supported by a law that makes it mandatory for animals to have a device and also makes it illegal to tamper or remove the device. Done
- Create an umbrella body (within country) that represents all sectors of the industry. This body should meet regularly. Done
- Proposed recommendations and guidelines should be merged in the LITS implementation roadmap Done
- Pg 45 - It is clear from the feedback from the questionnaire that the preferred species for an initial LITS implementation should be cattle: [Included: The recommendation is thus to implement a LITS in cattle. However, if the identified production system or market system will add the most value to Small stock then this sector should be considered].
- The LITS should be interoperable i.e. “talk to one another” across the MS. [This will happen automatically because of the internationally accepted ISO Identification number.]

- Development of LITs missing from the road map. [Included into timeframe]
- Develop regional policy framework – first find out if there is existing MS policy and legal framework; if so align it to regional policy framework. [Results from Questionnaire included]
- Research and development into mobile and web based integrated system.

[The proposal recommended is to start simply and cost effectively, however if the necessary infrastructure exists web based applications can be developed at a second phase]

- Formation of a National forum that involves different stakeholders at different governance levels within MS. [Agreed, and has been included in the report]
- Countries should look for appropriate and affordable identification systems for example cell phone/web based integrated systems for sustainability. We need to cost the system and share the information with MS. [A Chapter on funding has been included in report.]

Question4:

Please provide any other propositions you have for proper adoption and implementation of the LITs guideline in the region? DONE

- The region remains open to new and cheaper technology to come.
- The guideline should be based on the purpose orientation
- There must be advocacy and get political buying at higher level

Question5: Develop generic action plan on the rolling out of the guideline at member state level. [All have been included as part of the document]

- Legal framework
- Creation of Extension and awareness campaign
- Training and capacity building for all stakeholders levels

- Choose one of the production system and scale it up
- Mobilization of fund ,expertise from technical organization
- Piloting
- Evaluation
- Harmonization with the regional system
- The generic action plan should follow the purpose (capacity building, awareness creation, legal framework, formation of the authority and using the document as a reference when they under take related activities.
- Develop ideas of implementation, the counties should use the developed guidelines by the region as a reference
- During implementation take other countries experience on LITS guidelines
- Consider multiple species, livestock destined for trade.
- Target LPS that have not been addressed by the current pilot studies
- Need to identify system that has most value and where actors are willing to pay
- Piloting should be built on what is already there - A good synthesis of the outcome of pilot studies and experiences of other countries to inform the pilot study.
- Priority species
- Purpose of the LITS
- Livestock Production Systems
- Countries that show interest– make the process competitive. This will ensure only interested MS will be considered for the pilot and will improve the chances of success. [Need common consensus between countries]
- Countries that did not have a chance to implement the pilot system

should also be considered Agreed

- Phase 2: Replace regional forum with country coordination forum for LITS – Country coordination mechanism rather regional. It will increase chances of acceptability by countries that are already implementing LITS because of the buy in a ICPALD forum?
- Phase 3: develop regional legal framework that can be shared amongst all IGAD countries – remove regional and replace with country framework. Template can be regional
- Phase 4: should read - Test the systems using animal movements across international borders and not across border Done

Question6:Develop the criteria for selecting the LITS pilot countries under the STSD Project. Done and to be discussed by selected committee

- Exporting countries
- Countries not piloting
- Countries that have legal framework
- Countries with fixed production system
- Members country commitment to avail staff, facility and others
- Matching fund
- On-going initiatives in the country
- Purpose /objective to encourage the regional trade
- Countries which have best experience on this sector
- Commitment letter from countries Government
- Current capacity to carry this project