

REGULATORY IMPACT STATEMENT (RIS)

**ANIMAL DISEASES (ANIMAL IDENTIFICATION AND TRACEABILITY) RULES,
2021**

January, 2021

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Introduction

The Regulatory Impact Statement for the proposed **Animal Diseases (Animal Identification and Traceability) Rules, 2020** is prepared in accordance with the provisions of sections 6 and 7 (1) and (2) of the Statutory Instruments Act, 2013. Section 6 of the Statutory Instruments Act, 2013 requires the Regulation Making Authority to prepare a Regulatory Impact Statement (RIS) for the proposed regulations indicating the costs and benefits of the proposed regulations on the public and stakeholders. Section 7(1) and (2) of the Act set out the contents of a Regulatory Impact Statement for the proposed regulations as follows:

1.0 A Statement of the Objectives and Reasons for the Proposed Rules

The overarching objective and reasons for these Rules is to provide for a framework for the management of information on animal identification, registration, and traceability as prescribed under **section 9 of the Animal Diseases Act 364; revised in 2012**. Traceability of animals is a critical aspect of animal disease control. Benefits of the proposed identification and traceability system have for the most part potential benefits that rest on largely unknown probabilities of disease occurrence and reactions by domestic and foreign markets. The primary benefit of the proposed rules would be the enhanced ability of Kenya to respond to animal health and public health issues more quickly thus minimizing losses (animal productivity and product value chains) and enabling reestablishment of foreign and domestic market access with minimum delay in the wake of an animal disease event which is an obligation for conforming to international standards and guidelines. In addition to high prevalence of animal diseases across the farming systems and the response through treatment of clinical cases with antimicrobials raises risk for development of antimicrobial resistance (AMR). AMR is a global concern for both public health and agriculture sectors and it increases morbidity, mortality, health care costs, threatening health security, food security with negative impacts on trade and economies. It is projected that by 2050, health consequences and economic costs of AMR will be about 10 million human fatalities annually and a decline of between 2 and 3.5 % in global Gross Domestic Product (GoK, 2017). Having an identification and traceability system in place would allow the country to trace animal disease more quickly and efficiently, thereby minimizing not only the spread of disease but also the trade impacts an outbreak may have. The rules shall be applicable to all animals born in and imported to Kenya

1. The object of these Rules is to provide for—
 - (a) the management of information on animal identification, registration, traceability and tracking for purposes of—
 - (i) animal health, animal welfare, animal production and security of animals;
 - (ii) providing for an improved animal productivity, breeding, genetic exchange, animal market access, export certification and other trading requirements;
 - (iii) rapid and accurate information on an animal from farm to table; and
 - (b) Safety of foods of animal origin.

2.0 Statement on the Effect of the Proposed Rules

2.1 Effects on the Public Sector

The proposed Rules will affect the public sector in the following ways:

- i. **The Government shall establish a National Information Animal Management System** for management of information on animal identification and traceability. The System shall be centrally supervised under the oversight of the Director of Veterinary Services with County Registers kept by the County Director of Veterinary Services. The System shall provide ease in supporting identification and tracking of animals for disease control purposes and as an added advantage to further aid in tracing stolen and lost animals occasioned by rustling and other related crimes. The system will hold very specific current and historical details of the animals including attached tracing devices and shall be a reference point for specific identification of animals. The Rules mandate the Director of Veterinary Services to determine ownership (of an animal) using prescribed methods. Despite the cost of establishing the system, the benefits outweigh the overhead costs.
- ii. The Rules places responsibilities at both National and County Government level which in essence streamlines collaboration and coordination between the two levels for better national planning and linkage to trading internationally. Tracing of animal products through the value chain is facilitated. This in essence promotes adoption of food safety, hygiene and produce quality standards thus contributing to reduced public health provision costs.
- iii. The proposed system has user accounts operated by authorised users comprising both public and private sector practitioners. The information stored in the Management System comprises personal information which is in the custody the Registrar who is the Systems Administrator. With these provisions, identification of animals and subsequent tracing will be managed from a consolidated point thus making government planning and decisions in the area better structured.
- iv. The proposed rules will support resource allocation for the sector and also enhance revenue collection for the county governments through livestock markets
- v. The country as stands currently lacks a centralised database for animal tracing for both breeding, disease control and other trade related purposes. As best practice, especially for trade, and to match global standards, the system will aid in establishing a more harmonized approach in identification and traceability of animals as part of the wider global system. The country will gain confidence in the global sphere in respect to requirements for animal health and subsequently become a more trusted trading partner.
- vi. Electronic animal identification and traceability is a new concept in the country and thus subjecting it to a regulatory framework to enable uniformity of the concept for all stakeholders will allow better compliance, monitoring and effective enforcement of the management system.

- vii. The improved identification and traceability of animals will provide reliable real time data and other important details on the actual animal situation including ownership, location, movement, health and numbers for better planning and decision making on national food security and saving the country foreign exchange used on food imports. This data base will serve as a fallback position in times of emergencies experienced during drought to avoid losses and will aid in planning for government projects that include livestock offtake programs, control in disease outbreak amongst others.
- viii. The animal identification and traceability system has the benefit of enabling reduction diseases outbreak and insecurity due to rustling which subsequently leads to increased volumes of production from the sub sector which has a correlation to better living standards for communities.
- ix. LITs will provide information that support restocking of herds and flocks and the proper management of the environment.

2.2 Effects on the Private Sector

The proposed Regulations will potentially affect the private sector in the following ways:

- i. The private sector actors will benefit from introduction of a well-structured, organized and regulated animal identification and traceability system, to support management of ownership of animals and animal health records.
- ii. The Rules for animal identification and traceability for cattle is profitable at individual farm level based on input variables used in the economic analysis undertaken by the Department.
- iii. The Rules are key in animal tracing which has the potential impact on identification and traceability on animal parentage which currently poses substantial challenges with reference to poor breeding which has affected marketed products through low market weights, smaller hides and skins and longer periods to maturation.
- iv. Provision of insurance cover and credit access for livestock is considered risky by financial services practitioners due to uncertainty occasioned by animal diseases and other risks including theft of animals. With a registration, identification and traceability capacity in place, farmers are able to have contractual agreement with financiers for purposes of improved and proper management of animals. This ultimately offers farmers better opportunities in accessing both insurance covers and credit for expanding their trade. Alternatively, even though animal producers and keepers may forgo insurance claims, this new system is a good a security and its uptake for the farmer will translate to improvement of quality of animal and animal products for enhanced incomes.
- v. The country and by extension animal farmers, and related animal enterprises will experience enhanced foreign exchange earnings from export of animal and animal products from Kenya, reduction on costs from the number of deaths due to disease and other incidentals including injuries from rustling.

- vi. With the identification, registration and traceable management system in place, private sector actors may incur costs in ear tags, disposal of ear tags for slaughtered cattle, costs of tag application, extra cost of production (extra feeds, veterinary drugs, herdsman, facilities) depend on production system) and record keeping for animals.
- vii. With the identification, registration and traceable management system in place, there will free flow of information and hence a potential reduction in seasonal fluctuations of animal products supply in the market and therefore stabilize prices and incomes for the different actors especially the farmers who are victims of intermediaries. This will lead to better market predictability and value addition management as animal products will be readily available.
- viii. Implementation of the rules will create employment opportunities subsequent to the predictability of markets for animal products and auxiliary services, thus improving livelihoods of many households across the sub-sector.

2.3 Effects on Fundamental Rights and Freedoms

The registration, identification and traceability rules provide for establishment of a functional system that will hold personal stakeholder information. Article 31 of the Constitution provides for the right to privacy which includes the right not to have one's person, home or property searched, possessions arbitrarily seized, information relating to family or private affairs unnecessarily revealed or privacy of communications exposed. The Rules may constitute an infringement on right to privacy of animal owners, but personal information will be held confidentially as highlighted subject to the relevant legislation. Alternatively, The Rules also seek to promote right to access to information under article 35 of the Constitution. Article 35(1) guarantees every citizen the right of access to information held by State or by persons' other person and required for the exercise or protection of any right. This provision is promoted as it forms the substance of the Rules, with various authorized users having access to the Animal Information Management System established under the rules.

Rule 23(4)(b) provides for the disposal of a retrieved electronic devise in accordance with the relevant legislation on protection of the environment. This is subject to Article 42 of the Constitution that provides for the protection of the environment viz: "Every person has the right to a clean and healthy environment, which includes right to have the environment protected for the benefit of present and future generations ... and to have obligations relating to environment fulfilled under Article 70" which speaks to Judicial Action.

The proposed rules recognizes fundamental rights and freedoms of individuals. The rules support improved household incomes and enhanced capacity to afford adequate standards of living as envisaged under article 43 of the Constitution which provides for the economic and social rights. With enhanced standard of living, relevant communities are able to access adequate housing, food of acceptable quality and clean and safe water. The State has an obligation to allocate and provide resources for the progressive realization of these rights.

Rule 5(4) mandates the Director of veterinary Services to determine the identification of an animal using prescribed methods. Article 40 of the Constitution provides for protection of

right to property. Sub Article (2) is specific on Parliament not enacting legislation that permits the State or any person ... “to arbitrarily deprive a person of property of any description or of any interest ...” It is anticipated that the, Director, in making determination, the outcome will be informed by a fair process that is devoid of injustice or deprivation of individual rights.

3.0 Statement on Regulatory & Non-Regulatory Options

3.1 Option 1: Maintaining the Status Quo

Before considering new interventions, it is important to consider whether the problem could be resolved by making changes to practices within the existing regulatory framework, thus maintaining the status quo. Examples of this are:

- i. Making use of existing laws, regulation and/or guidelines
- ii. Simplifying or clarifying existing regulation;
- iii. Improving enforcement of existing regulation; or
- iv. Making legal remedies more accessible or cheaper.

These rules will operationalize the electronic identification, registration and tracking of animals and for connected purposes. However, traditional animal identification systems through branding will still be in use. It is noted that the branding act has deficiencies which has hampered its use for operationalizing traceability of animals and their products.

3.2 Option 2: Passing the Rules

Government can achieve its policy objectives by using taxpayer’s money or through a range of non-spending interventions, including regulation. The object of these Rules is to provide for—

- (a) the management of information on animal identification, registration, traceability and tracking for purposes of—
 - (iv) animal health, animal welfare, animal production and security of animals;
 - (v) providing for an improved animal productivity, breeding, genetic exchange, animal market access, export certification and other trading requirements;
 - (vi) rapid and accurate information on an animal from farm to table; and
- (b) Safety of foods of animal origin.

Preventing and controlling animal disease is the cornerstone of protecting animal even as ranchers and farmers work hard to protect their animals and their livelihoods. There is never a guarantee that animals will be spared from disease, but to support farmers’ efforts, the Department of Livestock proposes to promulgate Rules to prevent, control, and eradicate disease through a registration, identification and traceability system. The system does not

prevent disease, but knowing where diseased and at-risk animals are, where they have been, and when, is indispensable in emergency response and in ongoing disease control and eradication programs. The country does not currently have an overarching animal disease traceability program integrated to meet the needs, this being the overarching aim for setting these Rules to protect and benefit people, businesses and the environment, stabilizing markets and addressing market failures to support economic growth. In Piloting a livestock identification and traceability system in the northern Tanzania–Narok–Nairobi trade routes a group of researchers observed that it is possible to trace animals back to their villages or epidemiological units or origin even when tagging is at primary markets (Mutua *et al.*, 2017).

The above notwithstanding, it is noted that these Rules could create costs for businesses, and the public sectors. These could also, if overused, poorly designed or implemented, stifle competitiveness and growth of the livestock sub-sector. Despite the apparent benefits of an animal tracking system, achieving full participation of individual producers and keepers may require extra effort. Therefore, this calls for a system that has incentives and compatible for individual participation and cooperation of animal producers.

Going forward, the adoption and operationalization of the proposed Rules will enhance growth in the following areas:

Animal health and disease control

- Improved animal disease control and quantification of potential benefits for the control of key notifiable diseases (Foot-and-mouth disease, Rabies, Rift valley fever, Brucellosis) in the farming systems.
- Reduce rustling and its impacts such as animal disease outbreaks, loss of property and livelihoods, loss of lives and physical/mental/social injuries.
- Facilitate establishment of a functional animal information management system for the purpose of trade, research and policy change
- Support animal census within the country
- Enable and support animal disease surveillance and monitoring activities across the animal production systems in Kenya
- Traceability will enhance awareness of animal welfare along the supply chains

Food safety issues

- Enables traceability of food animals and animal products along the animal value chains
- Increase the awareness on occurrence of diseases transmitted between animals and humans
- Awareness creation on antimicrobial resistance (AMR) and drug residue risks along the animal food value chains, through records on types of antibiotics used for treatment of animal ailments across the different production systems.

Consequence on trade

- Traceability of animal and animal products in disease control and food safety will support local and international trade.
- The potential impact of identification and traceability (animal parentage tracing) on genetics improvement and breeding which currently poses substantial challenges with reference to low market weights, smaller hides and skins and longer periods for maturation;
- Increased access by animal producers to insurance and financial services while using the animal as security to obtain credit
- Enhanced contribution of improved food safety through animal identification and traceability on hotel and hospitality industry, employment creation and business opportunities in related animal enterprises;

3.3 Option 3: Other Practical Options

Alternatives to regulation include information and education, market-based structures, self-regulation (business as usual) and co-regulation. In addition, existing policies can be improved, without further regulation, using techniques such as behavioral insight or changing enforcement practices to improve compliance. However, for an improved animal industry that is futuristic, these alternatives would not be practical.

1. Alternatives to regulation include:

i. Information and education;

Information and education can be used to empower animal industry players including animal producers and traders on benefits of the system in improvement on their areas of interest. Sensitization of market actors about the roles they ought to play in determining the sources of the animals they purchase or sell would ensure that reliable information on the sources of animals tagged is collected. The type of data to be collected could be limited to those required for traceability purposes, i.e., animal identification number, owner or trader identities, and the premises they passed through. It may also not be straightforward to assess how people will react or change their behaviour in response to the information provided. It will also increase costs for government and businesses that will be providing the information and education required. However, provision of information and education alone will not help achieve the objective of traceability.

ii. Incentive/market-based structures;

The government can use economic instruments, such as taxes, subsidies, quotas and permits, vouchers etc. as initiatives to realize the desired objectives. These systems may be used to encourage farmers and other animal keepers to adopt the identification system in return for tax breaks or subsidies for farmers who have up taken the identification and traceability technology. These initiatives however are only practically possible in a well-coordinated,

transparent and cost effective tracking system where users relate with one another based on trust. Furthermore, without proper identification and traceability systems, ownership of these animal is not guaranteed, and application of the system may result in despites because the farms are currently not registered either.

2. Alternatives models of regulation:

i. Self-regulation;

Self-regulation entails industry players developing a framework to self-regulate a sector. This could be done through the use of codes of conduct, customer charters, standards or accreditation. In many cases rules and codes of conduct will be formulated by the industry representatives or organizations under their own initiative. In absence of well-developed and all-inclusive industry organizations as in the warehouse receipt system, self-regulation currently cannot be effectively possible since all animal producers are currently practicing all manners of animal identification which cannot help with the objective of the LITs programme.

ii. Co-regulation.

Co-regulation is an intermediate step between law and self-regulation that involves some degree of explicit government involvement where industry may work with government to develop a code of practice whose enforcement would be by the industry or a professional organization and accredited by government. Even with well-developed and all-inclusive industry organizations, effective co-regulation may still be difficult to achieve arising due to conflict of interest where players have different objectives.

4.0 Costs-Benefit Analysis (CBA)

The LITs technology will reduce the prevalence of animal diseases which are rampant within these production systems (e.g FMD, RVF, and Brucellosis) which may arise from rustling and uncontrolled and movement of animals. The average cattle herd sizes in the pastoralist areas in Kenya has been documented to be 100 within pastoral areas (Onono *et al.*, 2013). For example, within the cattle rustling prone regions of west Pokot, Baringo, Laikipia, Marsabit, and Elgeyo Marakwet all holding about 4,300,000 head of cattle according to the latest population census report (KNBS, 2019), the estimated number of pastoralist households keeping cattle would be about 43,000, with reports that all pastoralist households in the affected areas having experienced rustling events (Schilling *et al.*, 2012). The projected potential savings from reduction in losses from rustling due to uptake of the LITs technology would be 3.44 KSH billion annually, while in the smallholder dairy system where the cattle herd sizes averages about 1- 4 cows per farm (Omoro *et al.*, 1998), and about 4,000,000 dairy cattle raised within the Country, the projected savings from adoption of the LITs technology from the approximately 1 million smallholder dairy cattle farming community is estimated at 21 KSH billion annually. This level of costs avoided through reduction in risk of rustling, reduced prevalence of animal diseases and increase in the quality and value of milk and other

animal products can be reallocated to other livestock development and improvement investments in the country to support economic growth.

4.1 Economic, Environmental and Social Impact

The Kenya Markets Trust portends growth in the animal sector has potential to help Kenya achieve some of the SDG goals (KMT, 2019). The KMT state that Kenya's meat production is predominately through pastoralists and that the sector contributes 10 to 13 % of GDP, employing upto 50 % of the agricultural sector labour force. The strategy for animal identification and traceability for animals (i.e in cattle) therefore appears to be profitable at individual farm level based on the input variables used for the economic analysis undertaken. However, the level of net benefits across the production systems included in analysis may vary based on levels of risks inherent in these input parameters and production systems.

4.1.1 The Economic Impact of the Rules

Generally, the economic contribution of animal identification to disease surveillance and food safety can only be realized through initiatives linked to traceability. Identification, registration and traceability systems allow for animals and their products to be followed through market channels all the way back to the farms of origins. These are critical interventions that are best targeted to areas that are identified to be sources of diseases and even pathogens or chemical hazard that may have grave impact on economies directly due to loss of animal or as a public health concern, through such animal products in the value chain being detrimental to human.

Globally, these tools are more important as consumers are more informed to demand safe and wholesome sources foods that are not only unique, but are tamper proof and linked to an official registration system (COMESA 2009) (Corporale et al 2001). This being a requirement to international animal trade, LITS is as good as mandatory to have considering that animal production in the country is mostly practiced by pastoral communities. Specifically, the following economic benefits of proposed Rules are:

- i. In pastoralist system, avoided revenue loss from reduced cattle rustling accounted for about 80% of new revenue amounting to 80,000 KSH per herd while milk yield accounted for 8% of new revenue annually.
- ii. The new costs from application of the technology accounted for up to 95.45 % of the total costs of application with an estimate of 67,200 KSH, while forgone revenue from insurance claims accounted for 4.55 % of the total costs annually.
- iii. For the small-scale dairy system, new revenue from the perceived improvement in the quality of milk accounted for 66.46 % with estimates of 23,853 KSH per herd annually.
- iv. The averted loss from human deaths and injuries for youth within the cattle rustling prone areas was estimated at 1,985.6 DALYs (Disability-Adjustment Life Year).
- v. New revenue from the strategy are higher within the pastoralist's production systems and small-scale dairy systems.

- vi. However, the additional returns are marginal for the subsistence cattle production system which may present a bottle neck for the implementation of the strategy in these farms.

Other economic benefits but which are difficult to quantify with the available data and information are:

- i. Increased foreign exchange earnings from regional trading and export of animal due to global trade having more confidence in the animal and attendant products derived from traceability of the products.
- ii. Effective management of animal disease outbreak saves money for keepers and traders alike which leads to increased savings and investment by the different actors within the relevant livestock value chain.
- iii. Traceability of animals could be used to prevent theft or loss of animals
- iv. Enhance records keeping would facilitate the identification of superior genetics in terms of productivity.

Economic costs of the proposed regulation

- i. Effective implementation of the Rules will require increased investment in establishing LITS and further training the stakeholders on its operations. This is a cost that will be borne by both state and non-state actors at both levels of government.
- ii. Producers and stakeholders within the animal sub-sector will incur additional costs associated with implementing an animal traceability system. These include equipment as well as records keeping and maintenance costs.

4.1.2 The Social Impact of the Regulations

The social impacts will comprise of benefits (positive impacts) and costs (negative impacts)

4.1.2.1 The social benefits of proposed Rules are:

- i. Reduction of prevalence of diseases in herds will result in more animals surviving which can be used as support cultural value of animal
- ii. With reduction in incidences for rustling, the youths will now redirect their efforts towards other social activities in the community, besides most of the youth who are currently faced with premature deaths and injuries because of rustling will have improved quality of life.
- iii. Improved disease surveillance leads to healthier herds and flocks, with better production hence improved quality of life for animal producers.
- iv. Improved food safety due to enhanced disease monitoring and control
- v. Increased incomes for smallholder farm households from the increased production.
- vi. Improved general population health status from improved food safety and security thus reducing nutrition related health complications.
- vii. Improved education levels and reduced illiteracy in the societies due to improved incomes and thus improved social wellbeing of the rural communities.

viii. Reduced tide of rural urban migration in search of employment opportunities.

4.1.2.2 Social costs of the proposed regulation

The social costs of proposed Regulations are:

- i. Loss of cultural habits brought about by change
- ii. Change is a process that is difficult to take up. This will require persistent awareness programs
- iii. Producers and other value chain stakeholders could be uncomfortable with the possibility of data becoming available to other state agencies like KRA or information in the system used to assign liability to them for things that may not go right with their animals.

4.1.3 The Environmental Impacts of the Regulations

The environmental benefits of proposed Regulations are:

- i. Better animal husbandry practices will result in proper environmental management and hence reduction of impacts on climate variables
- ii. Reduced environmental degradation and better management of animals as implementation of the traceability system come with extension services (e.g advice on the right carrying capacity, proper waste management in slaughter houses).

Environmental costs of the proposed regulation

With proper and effective implementation of these Rules and other relevant regulation in respect to environmental conservation and protection, negative environmental impacts can be significantly mitigated and impacts reduced.

- i. If the regulation on disposal is not followed, and hence improper disposal of used identification equipment's these may pollute the environment.

4.2 Administration and Compliance Cost

The RIA notes that resources will be required for operationalization of the Rules, including human resource. Operational costs for enforcement of the Rules and other resources geared towards providing awareness and public education will be required for success in implementation of the system. Considering that providing technical support to county governments is a function of national government, there is need to budget for the same to enable a sustainable uptake of the animal identification and traceability system. Agriculture being a devolved function, it is assumed that county governments shall set aside adequate resources for the implementation of the Rules. The roles of all parties in operationalizing these Rules are contained in Annex 2 of this report.

4.3 Assessment of Return on Investment (Benefit)

The approval and operationalization of the proposed Rules is critical in facilitating the establishment and development of the animal identification and traceability system in Kenya.

This will significantly transform the livestock sub-sector and relevant value chains most of which are currently poorly structured, promote the production and consumption of standardized high quality, hygienic, food products, enhance credit access especially for small animal producers and traders due to better identification and traceability of animal. Operationalization of the traceability system will enhance trade for the country on the global market as animal products traded in international markets can be traced back to their origin. This will have multiplier effects in line with the SDGs (reduction of hunger, poverty reduction, quality healthcare, decent work and economic growth, climate action, responsible consumption and production and partnerships for goals) (DESA, 2016) and in supporting achievement of the economic pillar of the country's Vision 2030 (GoK, 2007), Agricultural Sector Transformation and Growth strategy and other development strategies that Kenya has in place for the betterment of lives for citizens. The country is also able to stall animal disease spread as information in the system will aid in quickly establishing interventions for disease control thus mitigating on losses and hence provision of adequate food for the citizenry (Constitution of Kenya, 2010). The Rules will also promote increased animal production and trade thus improving and attendant better lives through employment opportunities and better nutrition for communities.

4.4 Quantification of the Benefit

Introduction and effective widespread use of the animal identification and traceability system in monitoring of disease and tracing of animal products for trade purposes will contribute towards better earning and a stable environment for both traders and customers. The data base will also facilitate the improvement of herds and enable better planning. Based on the available data and the case study discussed above some of these benefits can be extrapolated as follows:

- i. This Rules would results in savings through reduction of impact of animal diseases which currently are prevalent in our farming systems. For example, it is estimated that the impact of contagious caprine pleuropneumonia (CCPP) in small ruminants in Kenya is 6.2 billion KSH annually.
- ii. Currently we are exporting meat to the Middle East worth 53 billion annually and with enactment of this rules we can enhance this level of exports which would earn the country additional foreign exchange.
- iii. A minimum of 1,985.6 DALYs saved (from premature deaths and injuries including loss of limbs from the raiders) due to reduced cattle raid events in the cattle rustling prone areas.
- iv. Enhanced control of animal diseases and zoonoses which will directly have a positive impact on international trade in animal products from Kenya, and therefore supporting foreign exchange earnings for the country.
- v. Annual savings of Ksh 3.44 billion in pastoral areas from avoided cattle rustling, and Ksh 21 billion from the increase in value and quality of milk from smallholder dairy cattle systems, which can be reallocated to other development efforts in the animal sector.

6.0 Conclusion

The proposed Rules if effectively implemented will support the management of information on animal identification, registration and traceability system in the country and this will transform and improve traceability of animal and food animal products along the various animal production systems and their associated value chains. These objectives will be achieved without incurring huge costs to the society and they will contribute to animal disease control, animal welfare and food safety which ultimately will result to enhanced foreign exchange earnings for the country and a healthier nation.

7.0 Recommendation

From the Regulatory Impact Assessment approval and operationalization of the proposed Rules is recommended.

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ANNEX 1: REGULATORY IMPACT ASSESSMENT FOR DRAFT ANIMAL DISEASE (ANIMAL IDENTIFICATION AND TRACEABILITY) RULES 2020

SUMMARY

Objective: The object of these Rules is to provide for a framework for the management of information on animal registration, identification and traceability.

Methods: Use of secondary data on input prices, levels of outputs, production parameters in livestock systems. The analysis done using a bio-economic model that has incorporated the production and other input parameters from the different cattle systems.

Results:

- In pastoralist system, avoided revenue loss from reduced cattle rustling accounted for about 80% of new revenue amounting to 80,000 KSH while milk yield only accounted for 8% of new revenue annually.
- The new costs from application of the technology accounted for up to 95.45 % of the total costs of application with an estimate of 67,200 KSH, while forgone revenue from insurance claims accounted for 4.55 % of the total costs annually.
- For the small-scale diary system, new revenue from increased income from milk accounted for 92.12 %) with estimates of 93,528 Ksh per herd annually.
- The averted loss from human deaths and injuries for an adult youth aged 34 years was estimated at 1,985.6 DALYs.
- New revenue from the strategy appears to be higher within the pastoralist's production systems and small-scale dairy systems. However, additional revenue would be marginal for the small-scale dairy and meat systems.
- However, the additional returns are marginal for the subsistence cattle production system which may present a bottle neck for the implementation of the strategy in these farms.

Conclusions:

The strategy for animal identification and traceability for cattle appears to be profitable at individual farm level based on the input variables that were used for this economic analysis. However, the level of net benefits across the production systems included in analysis may vary based on levels of risks inherent in these input parameters and production systems.

METHODOLOGY

The analysis applied a partial budget framework for identification of new costs associated with the technology for identification and traceability of livestock (electronic ear tags); forgone revenue associated with practices which are implemented by livestock farmers before the application of the new technology; new revenue which would accrue from

implementation of the new technology and costs saved by farms which have acquired new technology and not practising old methods for identification or adverse consequences of the old technology. The additional costs are obtained by summing the new costs and the forgone revenue and the resultant value was subtracted from the additional benefits which were obtained by summing the new revenue and costs saved where applicable. The result is the net benefit per herd of livestock due to the implementation of the technology for identification and traceability of livestock. The analysis has been done at the level of the individual farmer, since the additional benefits are private income to the animal owner, but other costs associated with this strategy would be borne by the state, for example costs of purchase of readers which cannot be expensed to the individual farmer, setting up data servers in government officers and their maintenance and costs of supervision which for the most part will be performed by state officers during their normal daily duties and routines. The estimated values of input parameters used for this analysis were obtained through a desk review of published literature sources and key informant interviews (Table 1).

The partial budgeting technique only considers those components of enterprise income and costs that are likely to be influenced by the proposed technology. In general, fixed costs (e.g. taxes) are largely ignored. Partial farm budget analysis is usually reserved for assessment of small changes that do not affect total farm management. Therefore a partial farm budget describes the economic consequences of a change in farm procedure. To achieve this, budget items are categorized as:

- a. Additional monetary returns received due to adoption of the proposed control procedure (e.g. increased yield of product at possibly higher prices).
- b. Foregone returns (e.g. reduced number of culled animals or a benefit that is lost from old practices)
- c. New costs incurred due to the control procedure (e.g. new technology, expenditure on drugs & management procedures).
- d. Costs no longer incurred if the program is implemented (e.g. salvage treatment procedures).

In addition, cattle rustling results in death and injuries for the livestock owners based on a recent review by Risk Analysis Services (2020). For this analysis, we have assumed that most of the injuries were associated with loss of two upper limbs with a weight of 0.123 based on the DALYs provided by WHO standards (WHO, 2020). And the life expectancy in Kenya was taken as 65 years (<https://www.macrotrends.net/countries/KEN/kenya/life-expectancy>). The values of other parameters which were used for this analysis are shown in Table 2. The economic analysis for both cases was performed using a bio-economic model developed using Microsoft excel software.

Table 1: Partial budgeting framework for analysis of LITs project

COSTS	BENEFITS
<p>NEW COSTS</p> <ol style="list-style-type: none"> 1. Ear tags 2. Disposal of ear tags for slaughtered cattle 3. Costs of tag application 4. Extra cost of production (extra feeds, veterinary drugs, herdsman, facilities) depend on production system) 5. Record keeping for cattle /animals 6. Environmental degradation (KSH?; WTP study?) 	<p>COSTS SAVED</p> <p>Reduction in number of deaths and injuries from cattle raids/ rustling</p>
<p>REVENUE FORGONE</p> <ol style="list-style-type: none"> 1. Insurance claims 	<p>NEW REVENUE</p> <ol style="list-style-type: none"> 1. Extra cows from reduced raids 2. Extra incomes from milk per litre 3. Extra income from meat per kg 4. Awareness on AMR and drug residues

Table 2: Estimates of cattle production parameters, input prices, and outputs in three selected production systems in Kenya

Description of parameters in cattle herds	Pastoral	Small-scale dairy	Small-scale subsistence	Source of data
1. Herd sizes	100	4	10	Onono et al., 2013
2. Percentage reduction in rustlings	12	1	1	Current study
3. Market price for cattle KSH	20,000	200,000	20,000	Current study
4. Price per ear tag KSH	300	300	300	Current study
5. Service charge per ear tag applied on an animal KSH	254	254	254	Current study
6. Cost of record keeping KSH	100	100	100	Current study
7. Cost of production per year (KSH)	1,050	3,730	1,050	Onono et al., 2013
8. Percentage breeding females	33.9	50	33.9	Onono et al., 2013
9. Average market price for whole milk KSH	38.97	38.97	38.97	KNBS,2018
10. Percentage rise in price of milk	5	20	20	Current study
11. Milk yield per cow per lactation (kg)	305	6,000	600	Onono et al., 2013
12. Insurance claims (percentage of value of livestock)	4	4	4	Current study

Table 3: Estimated parameter values used for the calculation of DALYs from cattle rustling

Description of variables	Estimated parameter value	Source of data
Life expectancy (Japanese woman)	82.5 years	WHO,2020
maximum age of those at risk	34 years	NCPD,2017
minimum age of those at risk	18 years	NCPD,2017
Weight for death	1	WHO,2020
Life expectancy in Kenya	65 years	macrorends.net ¹
Weight for living with disability (lost two upper limbs)	0.123	WHO, 2020
Weight for perfect health	0	WHO,2020
Number of people killed	26	Risk Analysis Services, 2020
Number of people injured during rustling	34	Risk Analysis Services, 2020

¹ <https://www.macrorends.net/countries/KEN/kenya/life-expectancy>

Notes on inputs parameters used for the LITs regulatory impact assessment

1. The average herd sizes and structures in different production systems (pastoralists, small-scale dairy and small-scale dairy and meat systems) were obtained from published literature sources which have document these measures (Onono et al., 2013; 2014).
2. The impact of cattle rustling to reduction in herd sizes in the pastoralists system was based on the previous work by Risk Analysis Services, and this was estimated at 12%. For the other production systems, a level of risk for rustling was estimated at 1% since there was no published estimate for cattle rustling and raids in these systems, however the event could not be entirely ruled out in these production systems.
3. average market prices for cattle in the markets across the systems was estimated for Ksh 20,000 based on the estimate from risk analysis services for the pastoralist systems and small-scale diary and meat, while the estimate for the small-scale diary system was estimated at Ksh 200,000.
4. The purchase price per ear tag was estimated at Ksh 300 each based on estimates from risk analysis services.
5. The cost of application of the ear tag on animals by a qualified veterinarian or expert was estimated at Ksh 254 based on the estimates from risk analysis services.
6. It is estimated that farmer or owner of the animal will need to keep some formal records of their livestock at a cost of Ksh 100 per herd.
7. The cost of production (feeds, herdsman, veterinary medicines, and facilities) of livestock in the three livestock production systems was estimated based on previous published reports. For the pastoralist and small-scale dairy and meat system this was estimated at Ksh 1,050, while for the small-scale diary system this was estimated at Ksh 3,730 annually (Onono et al., 2013).
8. The average market price for whole mil was estimated at Ksh 38.79 based on the current report from the statistical abstract (KNBS, 2018).
9. The percentage rise in price of milk following the introduction of the identification and traceability system was estimated to range between 5 and 20 percent based on the production system. For the pastoral system, the rise was estimated at 5% because of the low human population densities in the ASAL areas hence low demand for milk, while for the small-scale dairy and meat and the small-scale diary system this was estimated at 20% based on the estimates provided by the risk analysis services.
10. The lactation yield per cow in the production systems was estimated at 305 litres for the pastoralists systems, 600 litres for the small-scale diary and meat system and 6,000 for the small-scale dairy system (Onono et al., 2013).
11. The insurance claims for lost cattle was estimated at a rate of 4% based on the prevailing market rates across all the livestock production systems. The estimates provided by risk analysis services was considered not reliable since the current compensations were based reduction of vegetation index for climate related disasters in the ASAL areas.
12. Costs of quality of life lost from death of people during rustling events and raids was calculated based on years of life lost (YLL) and years people live with disabilities (YLD). According to risk analysis services, about 26 people are killed each year and another 34 are injured. The best quality of life was that for Japanese woman estimated at 82.5

years, weight for death = 1, weight for perfect health = 0, weight for loss of both upper forelimbs = 0.123 (WHO, 2020), life expectancy in Kenya = 65 years, maximum age for a youth at risk of death and injuries from rustling = 34 years.

Table 4: Partial budgeting analysis for introduction of animal identification and traceability in three cattle production systems in Kenya

BUDGET ITEM	CATTLE PRODUCTION SYSTEM		
	Pastoral system	Dairy system	Subsistence livestock system
NEW COSTS			
• Ear tags	30,000 (47.58%)	1,200 (40.88%)	3,000 (50.21%)
• Service charge for ear tagging by a veterinarian	25,400 (40.29%)	1,016 (34.61%)	2,540 (42.51%)
• Extra cost of production (feeds, herdsman, veterinary medicines, facilities)	4,200 (6.66%)	149.2 (5.08%)	105 (1.76%)
• Record keeping	100 (0.16%)	100 (3.41%)	100 (1.67%)
• Transaction cost for tag replacement	150 (0.24%)	150 (5.11%)	150 (2.51%)
Sub-total	59,850	2,615.2	5,895
FORGONE REVENUE			
• Insurance claims	3,200 (5.08 %)	320 (10.90%)	80 (1.34%)
Sub-total	3,200	320	80
Total Costs	63,050	2,935.2	5,975
COSTS SAVED			
• DALYs averted- see DALYs			
NEW REVENUE			
• Extra cows not stolen	80,000 (79.88 %)	8,000 (25.49%)	2,000 (29.50%)
• Extra income from milk	20,147 (20.12 %)	23,382 (74.51%)	4757 (70.40%)
Sub-total	100,147	31,382	6756
Total Revenue	100,147	31,382	6756
Strategy net benefit (Ksh) per herd	29,747	28,447	781

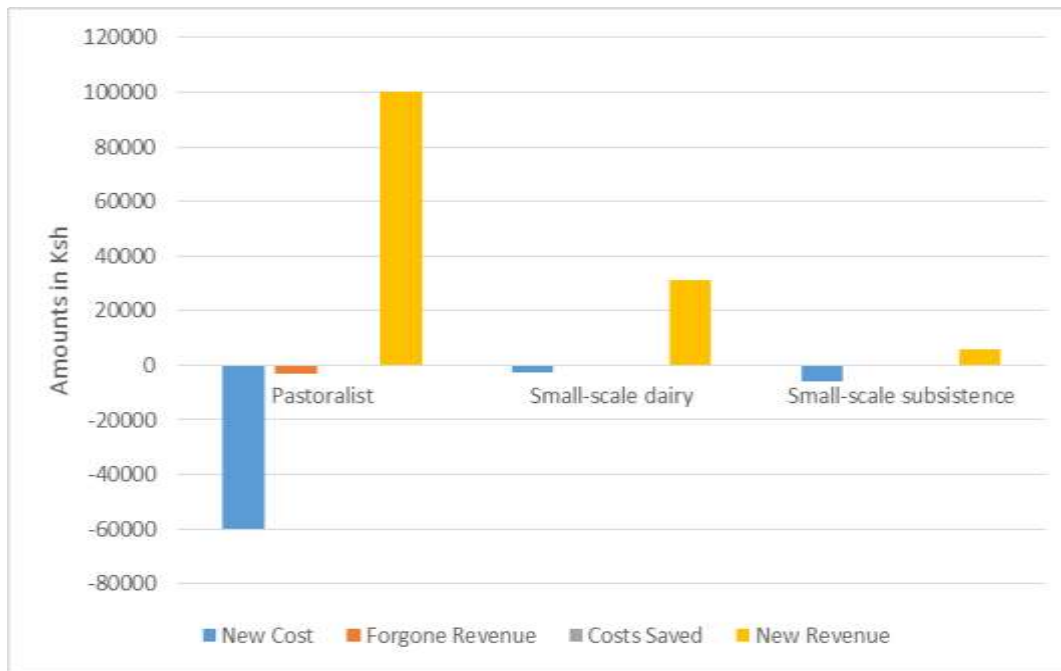


Figure 1: Economic analysis using partial budgeting framework for introduction of animal identification and traceability in three cattle production systems in Kenya: pastoralist, small scale dairy and small-scale subsistence

Key findings from economic analysis

1. In pastoralist system, avoided revenue loss from reduced cattle rustling accounted for about 92% of new revenue amounting to Ksh 240,000 while milk yield only accounted for 8% of new revenue annually.
2. The new costs from application of the technology accounted for up to 71.3 % of the total costs of application with an estimate of Ksh 55,400, while forgone revenue from insurance claims accounted for 12.4% of the total costs annually.
3. For the small-scale dairy system, new revenue from increased income from milk accounted for 92.12 %) with estimates of Ksh 93,528 per herd annually.
4. In the small-scale dairy and meat system, milk sales accounted for about 88.8 % of the new revenue estimated at Ksh 8,085 per herd.
5. The estimated strategy net benefit was higher in the pastoralists systems, and lowest in the small-scale dairy and meat system.
6. The averted loss from human deaths and injuries for a mature youth aged 34 years was estimated at 1,985.6 DALYs.
7. New revenue from the strategy appear to be higher within the pastoralist's production systems and small-scale dairy production systems. However, the additional revenue would be marginal for the small-scale subsistence cattle system.
8. The additional costs for implementing the strategy in all the cattle production systems analysed appear to be lower than the additional benefits, and therefore the strategy would be considered profitable. However, variations inherent in production systems may influence these levels of benefits to the farmers and society.

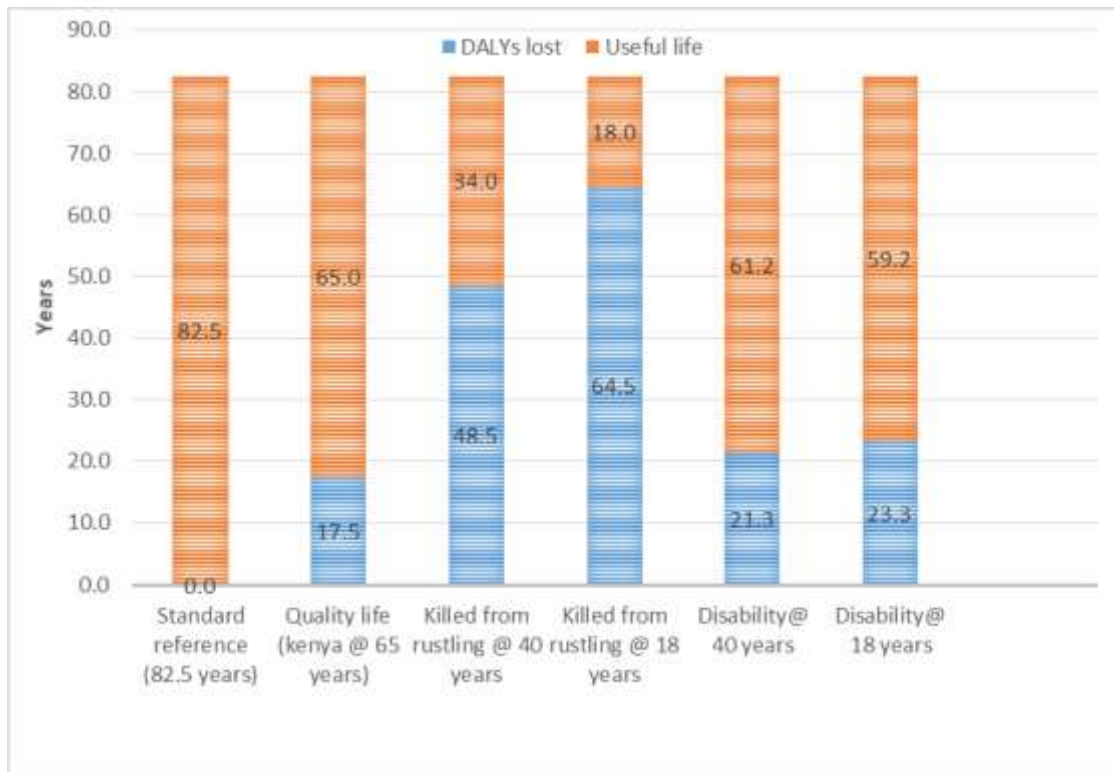


Figure 2: Comparison of DALYS lost and useful life for various category of people: Standard Japanese woman with a life expectancy of 82.5 years, average Kenyan with a life expectancy at 65 years and youths who are either killed or injured during the rustling events within the pastoral areas in Kenya

1. According to a report by the risk analysis services, 26 people are killed annually from cattle rustling events and additional 34 people are injured. Based on this, it was estimated that the years of life lost (YLL) from this insecurity challenges was 1,261; and therefore reducing this rustling events would prevent this level of loss. Additionally, 725 quality of life would be lost for those people who are injured and have to live with the disabilities of losing upper forelimbs.
2. Therefore, the total DALYS averted when these rustling events are reduced will be (DALYS = YLL + YLD) 1,986 DALYS.
3. DALYS lost for those people who are killed from rustling events accounts for up to 64% of the total DALYS lost in the pastoral areas for those who are aged 34 years, and 68% for the youths who are aged 18 years.
4. Those who are killed at 34 years would loss up to 48.5 of their useful years of life, while for those killed at the age of 18 years would end up losing up to 64.5 of their useful life.

Table 5: Summary values for DALYs for a Kenyan youth who either loses life or is injured during cattle rustling events within the pastoral areas

Age of youths	DALYS per person	DALYS lost for those youths who are killed	DALYS lost for those youths who are living with injuries	Total DALYs lost
Maximum age of 34 years	21.31	1,261	724.6	1,985.6
Minimum age of 18 years	23.28	1,677	791.6	2,468.6

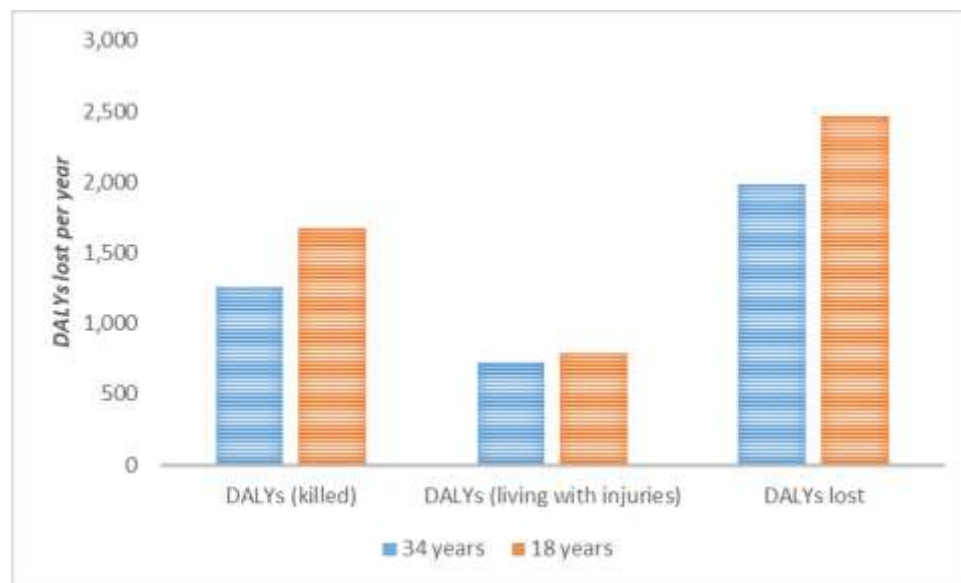


Figure 3: Comparison of DALYs lost from injuries and death for Kenyan youths resulting from cattle rustling events in pastoral areas

List of intangible benefits for animal identification and traceability system in Kenya

1. Enabler and support for animal disease surveillance and monitoring activities across the livestock production systems in Kenya
2. Increased awareness on occurrence of zoonoses, AMR and drug residue risks (provide narrative explanations), i.e levels of tetracycline's were found to be low for cattle tracked along the marketing systems from Narok (Mutua *et al.*, 2017).
3. Increased access by livestock producers to insurance and financial services
4. Enhanced contribution of improved livestock identification and traceability on hotel and hospitality industry, employment creation and business opportunities
5. Improved animal disease control and quantification of the potential benefits of control of key notifiable diseases (FMD, Rabies, RVF, Brucellosis) in the farming systems
6. The potential impact of identification and traceability on animal genetics and breeding which currently pose substantial challenges with reference to low market weights, smaller hides and skins and longer periods to maturation.
7. Benefits would also accrue from improved food safety, reduction in incidence of food borne diseases and zoonoses
8. Reduced impacts of cattle rustling events which also contributes to livestock disease control and reduction in loss of lives and limb for cattle owners.
9. Enhanced foreign exchange earnings from export of livestock and livestock products from Kenya due to an established system of traceability
10. In southern Turkana, 96% of the people interviewed felt insecure or highly insecure. when asked about the reason for the insecurity, the interviewees in both communities gave these replies: raids, conflicts or the enemy. About 20 homesteads were reported to be looted and destroyed between 2008 and 2011 in and around Kaptur alone. In October 2011, the village of Nauyapong was found abandoned due to insecurity caused by Turkana raiders. Loss of human lives: The most direct effect of raiding on human well-being is the loss of lives and injuries caused during the raids. In Turkana alone, TUPADO recorded 592 raid-related deaths. For Turkana and Pokot County combined, reports on number of conflict-related deaths were 640 in the year 2009 alone. Turkana and Pokot experienced a net loss of livestock of more than 90,000 animals due to raids between 2006 and 2009. This number has to be treated with caution as raided communities tend to report higher numbers hoping to receive higher compensations (Schilling *et al.* 2012).

List of intangible costs for animal identification and traceability system in Kenya

1. The regulations may constitute an infringement of on rights and freedoms of cattle owners. But, personal information will be held confidentially as highlighted on the regulation.

2. Adverse impact of regulatory ban on export of animals and products without identification and traceability to destinations that do not require identification and traceability. It is noted that selective implementation of the regulations would be inimical to the requirement to demonstrate that they apply uniformly across the whole country and across all sectors.
3. Potential costs of notification of the WTO and arising probable objections upon the regulations coming into force.

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Annex 2: Public-sector costs associated with the implementation of LITs programme

Description of items	Who is responsible	Units required	Cost to national/county government(Ksh)	Cost to counties (Ksh)	Notes for the public-sector costs for LITs
Animal identification	Private				
Animal identification devises	Private				
Animals presented to slaughterhouses to bear identification devices.	Private				
Appointment of inspectors	National				
Approval of animal identification and tracking device.	National				
Awareness creation to general public	County		100,000,000		Vernacular radio stations, public consultations (refer to AMR communication strategy) for five years
CDVS (Registrar of LITs)	County				
Cost of readers and equipment's (tag applicators)	County	940	30,080,000		To be issued to secondary livestock markets, abattoirs, police check points
County register	County				
Declaration of animal identification areas and animals to be identified.	National				
Disposal of identification devices					
Identification cards	National				
Identification of imported animals	Private				
Information relating to the animals	Private				
Information security.	National				
Loss of an identification	Private				

device					
Mid-term evaluation of the project	National		5,000,000		To be done on the whole country
National register/central database	National				
Register of animals in farms	Private				
Registrar of LITs	National		12,000,000		Personnel rearrangement from DVS and DLP (4 staff from each unit)
Reporting loss of an identification device					
Disposal of (identification device) tags	County	2.5% of 17.5 million head of cattle		127,500,000	Administrative costs for retrieval and disposal of tags (Assuming 2.5% natural mortality rate of cattle in herds); cost of retrieval at 15 km per retrieval and a cots 20 Ksh per kilometer
Retrieval of an identification device.	Private				
Sale and acquisition of animals	Private				
Supervision and enforcement costs	County		25,000,000	25,000,000	ICT and field workers per year
System acquisition	National	1	20,000,000		
System maintenance	National		2,000,000		Annual cost
System security	National/ county				
Traceability system	National				
Training of technical personnel	National/county		5,000,000		Scanner of tags in the field,
Transmitting data through the system	County			56,400,000	Installing and updating registers by CDVS of animals, holdings and establishments. This is based on the assumption that each reader is assigned a budget for transmitting data to the national servers charged at the prevailing rates of Safaricom Ltd data prices with 50% general rise in prices.