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“Improving and Integrating Animal Health Services in the Livestock Value Chain through Public : Private Dialogue in Ethiopia”

MISSION REPORT (Draft)

of

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Table of Contents

Abbreviations and Acronyms	2
Executive Summary	3
I. Background to the assignment	3
II. Situation analysis	4
III. Outputs	5
IV. Recommendations	10

Annexes:

1. Mission Programme
2. List of meetings held
3. Workshop and training on risk analysis and disease control, 15 -21 June 2013; Adama
4. Presentations and handouts of the Workshop and training on risk analysis and disease control, 15 -21 June 2013; Adama; see separate file “Annex 4. workshop ppts.zip”
5. Training in qualitative risk analysis, 11 -16 July 2013; Addis Abeba
6. Training manual: “Risk analysis & qualitative assessment” for the training in qualitative risk analysis, 11 -16 July 2013; Addis Abeba; see separate file “Annex 6. hand out risk analysis.pdf”
7. Evaluation of disease control plans for ten high priority diseases
8. Questionnaire for disease prioritisation
9. Diseases listed in the prioritisation exercise according to categories national & regional economy, farmers’ livelihoods and public health
10. Risk assessment exercises conducted during the “Training in qualitative risk analysis”,
See separate file “Risk assessment exercises.docx”
11. Organisational chart of the Ministry of Agriculture and the veterinary services
12. Outbreak investigation form of the NAHDIC

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Abbreviations and Acronyms

AHA	Animal Health Assistant
AHD	Animal Health Directorate
AHS	African horse sickness
APHRD	Animal and Plant Health Regulatory Directorate
AU-IBAR	African Union – Inter-African Bureau for Animal resources
bTB	Bovine tuberculosis
CBPP	Contagious bovine pleuropneumonia
CCPP	Contagious caprine pleuropneumonia
CPD	Continuous professional development
EHV	Infection with equine herpes virus
EU	European Union
FAO	Food and Agriculture Organization
FMD	Foot-and-mouth disease
HACCP	Hazard Analysis on Critical Control Points
HPAI	Highly pathogenic avian influenza
IGAD	Intergovernmental Authority on Development
LR	Large ruminants
LSD	Lumpy skin disease
LVC-PPD	Improving and integrating animal health services in the Livestock Value Chain through Public Private Dialogue in Ethiopia
MOA	Ministry of Agriculture
NAHDIC	National Animal Health & Disease Investigation Centre
ND	Newcastle disease
NVI	National Vaccine Institute
OI	Outbreak investigations
OIE	World Animal Health Organization
PA	Peasant Association
PE	Programme Estimate
PPR	Peste des petits ruminants
RVF	Rift Valley fever
SGP	Sheep and goat pox
SR	Small ruminants
STE	Short-term expert for Risk Analysis
TAD	Trans-boundary Animal Disease
TBD	Tick borne diseases (anaplasmosis, babesiosis, heartwater)
TL	Team leader of the LVC-PPD project
USAID	United States Agency for International Development
VPH	Veterinary public health
VS	Veterinary services
WB	World Bank

Executive Summary

This Mission Report is presented following the mission of the STE in Risk Analysis in the period 5 – 21 June and 8 – 19 July 2013. During the mission two training workshops were conducted. At the first training on risk analysis for disease and prevention participants from Federal and Regional Veterinary Authorities gained a basic understanding of techniques used in qualitative risk assessment. They can now understand and employ risk assessment techniques to plan targeted disease surveillance, control and vaccination programmes as well as for the revision of national and regional disease prevention and control strategies, especially where resources are limited.

During the (second) training on Import Risk Analysis and qualitative risk assessment participants from the Federal Veterinary Authority were enabled to independently apply scientific risk assessments. The training was based on a comprehensive manual, developed by the STE, to apply risk analyses. Risk assessments can now increasingly be conducted in order to set the necessary sanitary measures for the regulation of import of live animals and animal products. An understanding of Import Risk Analysis techniques also allows those involved with Export Certification to better negotiate bilateral trade agreements as well as having the ability to apply the principles of the SPS Agreement, once Ethiopia becomes a member of the WTO and thus facilitate growing exports for animals and animal products, and in the area of food safety.

It is recommended that a Risk Analysis Working group should be established at the APHRD/AHD.

During the first training exercise, the outcomes of disease prioritisation showed that, while for most TADs and disease relevant for national economy national control plans exist, control and vaccination strategies adapted to regional needs are clearly required. High priority diseases with a public health interest are currently insufficiently covered by prevention and control strategies. While the prevention and control of TADs should clearly be federal responsibility with full financial coverage, disease control with cost sharing between government and livestock owners should include some disease identified as being of high priority for farmers' livelihoods.

Vaccine requirements and programming of distribution were reviewed during the trainings. To allow better resource planning, vaccination strategies should be part of comprehensive annual and multi-annual disease control plans which need to be developed by the Federal and Regional Veterinary Authorities at their respective levels. Only quality vaccines of sufficient potency, which match circulating field strains and which are stored appropriately should be used. The effectiveness of vaccination campaigns should regularly be monitored and the use of vaccines, whether for prevention or control of outbreaks, should be accurately be documented.

To improve the quality of disease surveillance and control, outbreaks based on clinical suspicion should increasingly be followed-up diagnostically. Outbreak investigations are urgently necessary in order to confirm potentially epidemiologically significant events.

Detailed recommendations are included in the report for the following areas: the use of risk analysis; disease surveillance, prevention and control, including risk based/targeted control and surveillance; data and information gathering; organisational and structural issues; communication and awareness.

I. Background to the assignment

Expected outputs (according to the Activity Plan of the STE for Risk Analysis as agreed between the TL and the Director of APHRD):

1. 20 – 30 Veterinary officers from Federal and Regional Veterinary Authorities have a basic understanding of techniques used in Qualitative Risk Assessment.
2. Contingency plans / Emergency Preparedness plans – including Vaccine / Vaccination programme requirements – 10 most important livestock diseases -
3. 5-6 Veterinary Officers from AHD Epidemiology Dept / Quarantine Case Team / NAHDIC have in depth understanding of Qualitative Risk Assessment

4. In depth Qualitative Risk Analysis exercise on 1-2 selected animal disease(s) has been undertaken at Federal level.
5. Final Report – including Vaccine requirements and programming of distribution for 10 most important diseases

Tasks and duties (according to the contract of the STE)

In accomplishing his/her task, but not limited to, the Collaborator will establish and provide on-going support to assist veterinary services in Ethiopia to utilise risk analyses to inform decision making:

- (i) in formulation of cost effective and focussed animal disease prevention and control policies,
- (ii) in management of the export marketing chains and thereby satisfying the requirements of importing countries, and
- (iii) in establishing sanitary requirements for the regulation of importation of livestock and livestock products.

The Collaborator shall work with the selected staff members of APHRD and the regional veterinary services so that informed decision making is promoted at these key decision-making levels.

In accomplishing the tasks the Collaborator shall refer to what is stated in the ToR for all generic issues and to the Workplan detailed in the “Risk Assessment STE Mission V5” for all specific issues.

This report refers to the mission carried out by the STE in risk analysis during the period 5 – 21 June and 8 – 19 July 2013.

II. Situation analysis

It was concluded in the PE No. 1 and 1st 6 Monthly report of the LVC-PPD project, in order to upgrade the national veterinary services mechanisms for emergency preparedness, early warning, outbreak detection, prompt reaction and diseases control strategy (including identification of priority diseases) need to be taken into consideration.

The situation regarding risk based approaches has been described in various LVC-PPD project reports. The following table summarises, for selected institutions and stakeholder levels, what is working well and where there are gaps. The table was discussed and agreed on by workshop participants at the workshop in Adama.

Table 1. The use of risk based approaches in livestock production and health sector

Institution/ stakeholder	What is working well	Gaps
APHRD/AHD	Risk analysis has been conducted for priority diseases (HPAI, RVF, LSD) and for a proposed sanitary certification system (2008); Risk based control for some diseases (PPR, CBPP)	Main focus in relation to disease prevention and control is on outbreak response, not on prevention; lack of dedicated VPH lab services; no real time reporting of notifiable diseases (currently monthly); risk analysis esp. for live animal imports and poultry/products not conducted; national disease control strategies not covering all notifiable disease, if existing, often not enforced; CPD not institutionalized; training and guidance on disease reporting (NAHDSS, ARIS) required
NAHDIC	Risk based surveillance for RVF; HPAI, ECF; Surveys for circulating field strains (FMD, AHS), incl. topotypes and molecular typing; training provided to regional levels	Insufficient flow of info and data between NVI, NAHDIC, Regional Labs, APHRD/AHD and regional / wereda Vet office levels
Regional Agricultural Bureaus	in some regions prevention strategies exist; partial budgetary and technical autonomy to focus on local priorities; good network of clinical health providers	Lack of budget/resources; no risk based application of national disease control plans; main focus on outbreak response vaccination strategy rather than on prevention; insufficient induction training and CPD; no train-the-trainer approach along the hierarchy;

		practical application of centrally provided training not sufficient; links between regional bureaus and labs and central level not sufficient (see Annex 11); no consistent structure of VS at regional level; lacking inter-regional cooperation and information sharing
NVI	Surveys for circulating field strains for vaccine production	Not sufficient vaccine for prophylaxis and outbreak control (esp. FMD); insufficient planning of vaccines to be made available for prophylactic use and outbreak control - Lack of information on Vaccine use – whether for outbreak spread control or prevention of diseases
Vet. Faculty (Debre Zeit)	Risk analysis included in the curriculum	insufficient training/capacity of teaching staff in risk analysis; lacking connection to the VS and applied disease surveillance and control
Food industry	Certification and HACCP partially applied in export abattoirs	Certification, HACCP or risk analysis not applied for the domestic food chain
Farmers	Good knowledge of diseases, economic losses and value of vaccination; Pastoralists: good communication about disease between them and perceived risks, good indigenous disease knowledge; Differing risk aversion strategies between highland farmers and pastoralists	Low willingness to invest in perceived lower priority diseases; Pastoralists: lack of sufficient access to vet. services some places Attitudinal - Dependency on state provided vaccination following disease outbreaks rather than appreciation of using vaccination as a preventive measure.

III. Outputs

1. Trainings/workshops

Two trainings/workshops were held during the mission of the STE.

a) Workshop and training on risk analysis and disease control; 15 -21 June 2013; Adama

The objectives of the training/workshop (see pt. I. Expected outputs):

- I. Participants have a basic understanding of techniques used in qualitative risk analysis.
- II. During the training, main requirements are identified for contingency/emergency preparedness plans and disease control plans, including vaccination programmes for the 10 most important livestock diseases

Workshop methodologies and outputs

- **Main outputs:** Participants from Federal and Regional Veterinary Authorities gained a basic understanding of techniques used in qualitative risk assessment. They can now use risk assessment techniques to formulate targeted disease surveillance, control and vaccination; and revise national and regional disease strategies, especially where resources are limited.
- Presentations by the TL and the STE focussed on the principles and practical applications of risk assessment and risk analysis (see Annex 4).
- Other presentations were given by the case team leaders epidemiology and VPH of the AHD, and by NAHDIC on the use of risk analysis and risk based approaches in their respective areas of work (see Annex 4).
- A disease prioritisation exercise was carried out for the sectors: national economy, regional economy, farmers' livelihoods and public health (see pt. 2. and Annexes 8 & 9).
- The current use of risk based disease control and surveillance was evaluated on various levels of the VS. For ten high priority livestock diseases the epidemiology, surveillance and control were described, the

disease control plans evaluated, and gaps and recommendations for improved and risk based control identified (see table 1 and Annex 7).

- Applied training was delivered in the areas of risk analysis and the HACCP concept, outbreak investigations, monitoring and surveillance. Presentations and handouts were developed and given to the workshop participants on these topics (Annex 4).
- The training consisted of presentations, case studies for group work and discussions, and of videos use. For the *workshop/training agenda* see Annex 5.

b) Training in qualitative risk analysis, 11 -16 July 2013; Addis Abeba

The objectives of the training (see pt. I. Expected outputs):

- I. 5-6 Veterinary Officers from AHD Epidemiology Dept. / Quarantine Case Team / NAHDIC have in depth understanding of Qualitative Risk Assessment
- II. In depth Qualitative Risk Analysis exercise on 1-2 selected animal disease(s) has been undertaken at Federal level. Participants have a basic understanding of techniques used in qualitative risk

Workshop methodology and outputs

- **Main outputs:** Participants from the Federal Veterinary Authority were enabled to independently apply scientific risk assessments which follow international guidelines and are objective, defensible and transparent. The training was based on a comprehensive manual, developed by the STE, to apply risk analyses. Risk assessments can now increasingly be conducted as part of the process for formulation of sanitary measures for the import regulation of live animals and animal products, to facilitate growing exports for animals and products, and in the area of food safety. To ensure the sustainability of the training and fulfil national needs and international requirements, a Risk Analysis Working Group should be established at the APHRD/AHD.
- During the first two days of this four day training, principles of risk analysis and qualitative risk assessment were covered. The training was based on a manual "Risk analysis & qualitative assessment" which was developed by the STE during the mission (Annex 6). The training was mainly based on the guidelines of the OIE on Import Risk Analysis.
- From the end of the second day until the fourth day participants used their newly acquired skills for practical exercises on risk analysis and qualitative risk assessment. Import Risk assessments were conducted for two diseases (RVF, ECF) which have been identified prior to the training by the APHRD/AHD (see Annex 10).
- The two working groups produced risk assessments as outputs of this training. Because of lack of sufficient time, good quality data and technical expertise during this training the risk assessments were only partly finalised. The two training risk assessments were delivered after the end of the training and general comments were provided by the STE.
- The risk assessments were conducted for training purposes and do not reflect the technical position of the APHRD/AHD or the trainer/STE on these diseases and on the requirements of risk assessments.

For the *training agenda* see Annex 5.

2. Disease Prioritisation

Methodology

There are various methods of disease prioritisation available¹. The disease prioritisation during the workshop was based on the FAO methodology "Livestock Consultations" tool (FAO Veterinary Public Health

¹ e.g. Humblet MF. 2012. Multidisciplinary and Evidence-based Method for Prioritizing Diseases of Food-producing Animals and Zoonoses. *Em. Inf. Dis.* 18 (4)

Livestock Consultation Tool: strengthening livestock value chains through national stakeholder engagement). The FAO has developed “Livestock Consultations” at country level aiming at fostering interaction between different stakeholders of a the livestock production chain in developing and transition countries to identify local constraints and priority animal and zoonotic diseases, as well as viable interventions and policy options for diseases management and sustainable development of the production chain. The following stakeholder levels are included in the FAO tool: national economy, farmers’ livelihoods and public health. The questionnaire and methodology were tested during the STE’s fact finding mission with representatives of the stakeholder levels prior to the workshop. Where necessary the methodology was amended, e.g. the stakeholder level “regional economy” was included as fourth stakeholder level. The main focus was on livestock diseases, excluding poultry and fish. Despite this, ND was identified in one out of three prioritisation methods among the top five diseases. In some cases participants mentioned also health conditions; therefore, the term “diseases” below includes diseases as well as health conditions. The three prioritisation methods used are described below. The results of the three methods for the respective categories/ stakeholder levels (national economy, regional economy, farmers’ livelihoods, public health) are expressed in Table 3.

Participants were divided into four groups representing the stakeholder levels national economy, regional economy, farmers’ livelihoods and public health. Firstly, all participants listed the animal diseases which they considered most important for the four stakeholder levels (see Annex 8 “... what are the animal diseases most commonly affecting livestock ...?”; Method 1).

Then each participant copied all diseases she/he listed in the table of her/his respective stakeholder group. For each disease an impact score (0-3, Method 2) was given according to the following impact scores:

- 0 – not important
- 1 – low importance
- 2 – medium importance
- 3 – high importance

The criteria for the disease prioritisation to assess the impact of the diseases for the stakeholder levels are given in table 2.

Table 2. Criteria for the disease prioritisation to assess the impact of the diseases for the stakeholder levels national economy, regional economy, farmers’ livelihoods, public health

Impact on:			
national economy	regional economy	farmers’ livelihood	public health
- Economic direct impact (mortality, morbidity, lethality, transmissibility, production losses) - Draft power loss - Impact on trade and exports - Impact on food safety - Costs for disease control - Economic impact on others sectors (tourism, industry, etc.)	- Direct economic impact (mortality, morbidity, lethality, transmissibility, production losses) - Impact on local & regional trade and exports - Impact on food safety - Costs for disease control - Economic impact on others sectors (tourism, industry, etc.) - Environmental aspects (chemicals/acaricides, animal carcasses)	- Clinical severity, morbidity, lethality - Infertility, miscarriage - Production losses - Impact on growth - Impact on home consumption - Impact on work power - Impact on sales - Cost for disease control	- Severity: clinical signs, lethality - animal/Human to human transmissibility - Availability and cost of treatment - Disabilities, high chance of successful interventions (donor preferences)

FAO. Extrapolate vers. 2.0. Decision support tool. www.fao.org/ag/againfo/programmes/en/pplpi/dsextra.html

Giltsdorf and Krause G. 2011. Prioritisation of infectious diseases in public health: feedback on the prioritisation methodology. *Eurosurveillance*, 16 (18)

Krause G. 2008. How can infectious diseases be prioritized in public health? A standardized prioritization scheme for discussion. *EMBO Rep.* 2008 July; 9(Suppl 1): 22–27

Humblet MF. 2012. Multidisciplinary and Evidence-based Method for Prioritizing Diseases of Food-producing Animals and Zoonoses. *Em. Inf. Dis.* 18 (4)

Discontools (Disease Control Tools). www.discontools.eu

FAO. Extrapolate vers. 2.0. Decision support tool. www.fao.org/ag/againfo/programmes/en/pplpi/dsextra.html

Then all listed diseases were ranked according to their priority for the respective stakeholder level (starting from ranking score 1-highest rank; Method 3).

The outputs for each method were calculated in the following way (see Table 3):

Method 1 (Diseases most commonly affecting livestock by category in %): percentage of perceived frequency (frequency of individual diseases listed divided by all diseases listed per stakeholder level, presented in %); see also Annex 9), the 5 diseases with the highest percentages are presented in Table 3.

Method 2 (Impact score): the average impact score was calculated per disease, diseases with <3 respondents were excluded, the 5 diseases (-7 diseases in case of equal scores) with the highest scores are presented in Table 3.

Method 3: (Ranking score): the average ranking score was calculated per disease, diseases with <3 respondents were excluded, the 5 diseases (-7 diseases in case of equal scores) with the lowest scores are presented in Table 3.

Results

The priority diseases for each method and stakeholder level are shown in Table 3.

Table 3. Outcomes of the disease prioritisation

Stakeholder level	Ranking order	Method 1		Method 2		Method 3	
		Disease or condition	Most affecting diseases for category (%)	Disease or condition	Impact score	Disease or condition	Ranking score
National economy	1	FMD	86.2%	CBPP	2.9	FMD	1.3
	2	PPR	58.6%	PPR	2.8	PPR	3.4
	3	CBPP	55.2%	Trypanosomiasis	2.8	LSD	4.2
	4	LSD	48.3%	FMD	2.7	CBPP	5.1
	5	CCPP	44.8%	LSD	2.5	CCPP	6.8
	6			ND	2.5	AHS	6.8
	7			CCPP	2.5	bTB	6.8
Regional economy	1	FMD	72.4%	PPR	2.8	Black leg	4.3
	2	Anthrax	58.6%	Trypanosomiasis	2.7	Anthrax	4.7
	3	Ectoparasites	58.6%	LSD	2.6	LSD	4.7
	4	CBPP	51.7%	CCPP	2.6	SGP	4.7
	5	Black leg	51.7%	Anthrax	2.5	Trypanosomiasis	4.7
	6			Black leg	2.5		
Farmers' livelihoods	1	FMD	65.5%	CBPP	3.0	FMD	3.4
	2	Anthrax	65.5%	Anthrax	2.8	Anthrax	3.5
	3	Black leg	65.5%	Black leg	2.8	Black leg	3.6
	4	PPR	58.6%	FMD	2.4	CBPP	4.7
	5	Mastitis	55.2%	Brucellosis	2.3	Ectoparasites	5.2
Public health	1	Brucellosis	86.2%	Rabies	2.7	Rabies	3.4
	2	Anthrax	82.8%	Brucellosis	2.4	bTB	5.3
	3	Rabies	79.3%	Anthrax	2.3	Brucellosis	5.7
	4	bTB	75.9%	FMD	1.8	Anthrax	5.8
	5	Taeniosis	27.6%	Taeniosis	1.6	Taeniosis	5.8
No. of respondents		n=29		n=29		n=26	

Legend:

- agreement between all 3 methods
- agreement between 2 of the 3 methods

The diseases marked in dark brown are listed and show agreement for all three methods, the diseases in light brown are the same for two of the three methods. Most priority diseases show good agreement between the methods, thus validating the methods used. Especially for “national economy” there is good agreement between the participants and the methods in identifying the highest priority diseases (FMD, PPR, CBPP, CCPP, LSD). The highest variation between the methods is found in the stakeholder category “regional economy”. This highlights the fact that the disease priorities vary considerably between the different regions and thus control strategies need to be adapted to the regional requirements instead of only following general national plans. Also for “farmers livelihoods” only three diseases are equivalent in terms of perceived risk between the three methods. Reasons for this probably include regional differences in disease prioritisation as well as the fact that no farmers actually participated in this exercise and veterinarians played the role of farmers.

The diseases least covered by national control strategies, surveillance and stakeholders awareness are those listed for “public health” (brucellosis, anthrax, rabies, bTB and taeniosis). Three of these diseases (bTB, anthrax, rabies) were therefore also included in the evaluation of disease control plans for ten high priority diseases (see Annex 7 b).

3. Evaluation of disease control plans for ten high priority diseases

For the ten high priority livestock diseases identified, the epidemiology, surveillance and control were described, the disease control plans evaluated, and gaps and recommendations for improved and risk based control identified. For the outcomes of the evaluation and disease specific recommendations for improved and risk based control and vaccination see Annex 7. Recommendations which are valid for more or all diseases are presented in pt. IV. Recommendations.

The first five priority diseases were identified by the APHRD/AHD and during stakeholder discussions in preparation of the workshop, based on the fact finding missions of the STE and the TAT; these were FMD, LSD, ND, CBPP and PPR (see Annex 7 a). All these diseases were selected because of high national importance for control and the existing large scale national vaccination programmes. Except for ND, all diseases were identified also in the prioritisation exercise among the top five priority diseases for national economy. The focus of the prioritisation was not on poultry diseases; nevertheless, ND was identified in one out of three prioritisation methods among the top five diseases.

The second set of five priority diseases was identified from the high priority diseases of the prioritisation exercise and agreed by the workshop participants; these were bTB, anthrax, black leg, rabies and trypanosomiasis (see Annex 7 b).

4. Evaluation of the current outbreak investigation methodology and forms

In the first training one module was on outbreak investigations (OI) in which the current system of OI and the data reporting forms used were evaluated.

There is currently no system of regular OI including the identification and investigations of epidemiologically significant diseases/events (s. OIE Terrestrial Animal Health Code, Art. 1.1.3.) and NAHDIC is the only institution at the central level of VS to conduct OI.

The current OI scheme conducted by NAHDIC covers the areas of confirmation of clinical suspicion and disease, sample collection and diagnostics reasonably well. In the NAHDIC “Check-List for Disease Outbreak Investigation” instructions are given on the preparation of the OI team and the methodology for the collection of specimens, data and information. The OI form for data recoding is attached in Annex 12.

However, there is no clear distinction between diagnostic investigations and OI for epidemiologically significant diseases/events.

The NAHDIC diagnostic and OI form was reviewed by the workshop participants. Recommendations for additions to the current form to be used in investigations for epidemiologically significant diseases/events include:

- name and contact details of the owner of the sick animals, representative of the PA and the local veterinarian/AHA
- descriptions of the epidemiological unit incl. type of unit (PA, individual farm, market, slaughterhouse, etc.), animal number per species and age groups, production systems, number of PA inhabitants, biosecurity
- reason for the outbreak investigation
- detailed description and major features influencing the epidemiology of the event, incl. mapping
- involved species and (sub-) populations and clinical signs in the population
- description, history and seasonality of relevant:
 - health interventions (e.g. treatments, vaccinations),
 - husbandry events (e.g. seasonal migration, behavioural or cultural practices, climatic influences)
 - disease occurrence, usual and recent patterns
- epidemic curve, attack rate, mortality rate and case-fatality rate; public health relevance
- timeline of events, e.g. movements of animal, major vectors and contacts, health interventions, start and progression of clinical signs in index case and other parts of the population, starting 14 d before the first signs for fast progressing events, longer if required
- record of all animals contacts, movement of people, vehicles, machinery and other vectors onto (backward tracing) and off (forward tracing) the epidemiological unit by date, type of contact, also record contact details (name, phone no. etc)
- prioritisation of the contacts (e.g. very high, high and low risk)
- likely tentative diagnosis of the cause of the disease/event, probable differential diagnoses

IV. Recommendations

1. On vaccine requirements and programming of distribution

- Develop annual and multi-annual disease control and vaccination strategies. Existing national disease control plans should be amended if necessary (CBPP 2010, FMD 2006, ND 2010, PPR 2012), and developed for other high-priority diseases and legally endorsed.
- The vaccination strategy should be part of a comprehensive disease control strategy.
- Extend the current annual planning meeting between NVI, APHRD/AHD and regional agricultural bureaus to a “disease control committee” which allows timely planning and transparent and realistic allocation of vaccine and resources. A clear distinction between vaccines used for prophylactic and outbreak response should be made in the planning.
- Only vaccines should be selected for use which match the circulating field strains, and for which suitable quality and potency of vaccine strains can be demonstrated. This is especially important for FMD vaccine, which is expensive and not sufficiently available (see FMD in Annex 7).
- Vaccination calendars should be developed on regional and sub-regional levels to allow planning of campaigns. The purpose and timing of vaccination campaigns should be communicated to the veterinary services at wereda and kebele levels and to animal owners.
- The effectiveness of vaccination campaigns should be monitored regularly to detect gaps and take corrective actions. This be done by independent bodies and could include sero-surveys, checking the documentation of veterinarians, recording of returned empty vials, and contacting farmers to receive their verification.
- Each vaccination should be entered into a vaccination certificate of the animal owners. This improves quality checks and follow-up of vaccinations, and increase accountability, traceability and disease awareness.
- The cold chain needs improvement on all levels. Capacities should be increased on regional and sub-regional level to allow rapid dispatch of vaccine from decentralised storage and to reduce the current expected loss in vaccine efficiency due to inadequate storage, esp. for bacterial vaccines. Vaccinators and extension staff should be clearly instructed on the use of cool boxes and ice packs.

2. On risk assessments and risk analysis

- Federal and Regional Veterinary Authorities should use Risk analysis techniques to formulate targeted disease surveillance, control and vaccination strategies, and revise national and regional disease strategies, especially where resources are limited.
- Federal Veterinary Authorities should increasingly conduct risk analyses as part of the process for formulation of sanitary measures for the regulation of import of live animals and animal products, to facilitate growing exports for animals and products and in the area of food safety. For this, a Risk Analysis Working Group should be established at the APHRD/AHD.
- The risk analyses should follow the international guidelines and be objective, defensible and transparent.

3. On surveillance and control in general

- A clear distinction should be made between surveillance data based on unconfirmed clinical suspicion and data derived from confirmed disease (based on diagnostic laboratory confirmation). Clinical cases should be increasingly diagnosed using laboratory tests to improve reporting quality, as laboratory and extension resources are limited this should be risk-based. Syndromic disease reporting might be considered to improve passive surveillance.
- The identification, reporting and investigation of epidemiologically significant events need stronger emphasis. Investigations of epidemiologically significant diseases/events (s. OIE Terrestrial Animal Health Code, Art. 1.1.3.) should be investigated jointly between NAHDIC and the Epidemiological case team of the AHD and the regional authorities. The recommendations for outbreak investigations should be taken into consideration.
- Regional laboratories need stronger diagnostic mandate to confirm suspected disease occurrences from field reports. To implement this, they need improved capacities/training, funds, equipment and reagents.
- The disease control planning should account for increased reporting of certain diseases which is expected when the quality of the surveillance increases.
- Disease control strategies must include economic, public health, socio economic/livelihood aspects; the latter two criteria do not currently receive sufficient emphasis.
- Prioritise disease control according to national and regional economics, livelihood and public health importance. The cost effectiveness of the control and the likely success of a disease control strategy should be considered in the prioritisation (e.g. PPR, LSD).
- Disease control should clearly distinguish between diseases for which there is full financial coverage for disease control (controlled disease) and diseases control with cost sharing between government and owner (animal disease control scheme). (According to the distinction now made in the Draft Animal Health, Welfare and VPH Proclamation).
- The prevention and control of TADs should clearly be federal responsibility.
- The surveillance, prevention and control of poultry diseases should be strengthened because of their importance for livelihoods of rural populations, especially the poor.
- The current focus of disease control is mainly on the control of spread of outbreaks. Some disease outbreak measures esp. ring vaccination need to be reconsidered (e.g. for FMD, anthrax, black leg; see Annex). Prevention is not given sufficient attention and targeted preventive vaccination on high risk or economic valuable animals should be increased.
- The concept of disease-free zones not feasible in the near future. Reasons for this include the current capacities and recourses of the VS, the low level of intensification of animal husbandry, endemic occurrence of most diseases in the wider region.
- Para-professionals should be increasingly used to overcome the current insufficient outreach of the veterinary services for surveillance, disease control and clinical services.

4. On risk based surveillance and control

- Risk based/targeted control and surveillance:
 - should be used according to the workshop outcomes to revise the current disease surveillance and control schemes on national and regional level;

- should be improved (e.g. for CBPP, PPR) by implementing regular and timely surveillance;
 - should especially be used for high value sub-populations (e.g. dairy cattle, draft oxen, animals for export), high risk populations (e.g. migrating herds) and cost-intensive disease control programs;
 - should increasingly be based on laboratory confirmation rather than suspected disease;
 - needs to be based on recent livestock demographic figures; especially on wereda level figures are outdated.
- The outcomes of this workshop should be used by the participants to extend their training to colleagues lower in the hierarchy in their respective professional areas.
 - The use of the HACCP concept and gap analysis should be expanded from export slaughterhouses to establishments for domestic food processing.
 - Explore the feasibility for commodity-based trade in the medium term, using risk analysis techniques.

5. On data and information gathering and sharing

- There should be a communication framework which allows regular updates on disease outbreaks, control, surveillance and early warning between APHRD/AHD and regional agricultural bureaus and laboratories. The ARIS 2 (Animal resource information system 2) should be implemented and utilised on central and regional level without delay as soon as it becomes available. A system of feedback to the wereda level needs to be implemented (meetings, bulletins, etc.) to better integrate and motivate field level service providers to provide disease data / information.
- All collected data should be analysed and utilised on national and regional levels, based on clear planning and organisational structures.
- The results of disease surveillance and control must be made available to all stakeholders in sufficient detail including to veterinary staff at the sub-regional level and to animal owners.

6. On organisational and structure

- Streamlined and direct line of technical communication is necessary from the federal to the grassroots levels.
- Inter-institutional cooperation and human resource development urgently need strengthening.
- Duplication and redundancy of epidemiological and other competencies should be avoided. Clear tasks and mandates need to be attributed for the Epidemiology Case team at the AHD, the NAHDIC, regional laboratories and the NVI.
- The independent and transparent veterinary inspection of slaughterhouses under municipality authority should be strengthened to improve public health, and disease control and surveillance (reporting of pathological conditions / diseases detected at meat inspection).
- Revolving funds for vaccine and drugs (based upon phased-in approach towards full cost recovery in the case of non-TADs/Zoonoses), on regional and sub-regional level should be supported and expanded.
- The privatisation of clinical services and contracting out (under Sanitary mandate) of certain governmental tasks should be initiated as recommended by LVC-PPD project outputs; a manpower - resource survey is needed (already planned) to focus on improved quality of VS.

7. On communication and awareness

- Develop a communication and awareness strategy including all stakeholders. Main stakeholders include: the VS on all levels, policy makers, processors and exporters, animal owners and consumers.
- This strategy should include:
 - National, regional and sub-regional disease distribution and control,
 - Disease awareness and reporting,
 - Vaccination and disease prevention,
 - Cold chain and vaccination quality,
 - Public health issues and
 - Animal welfare.

Annexes

Annex 1. Mission Programme

Date	Activities
5.6.2013	Briefing by TL, familiarizing with the project and the situation, mission planning, meeting with heads of Case Teams
6.6.	Meeting with heads of Case Teams and at NAHDIC Sebeta, planning of workshop/training
7.6.	Meeting at Oromyia Regional Livestock Agency and Pastoralist Development Commission, travel to Debre Zeit
8.6.	Meeting at National Vaccine Institute and Faculty of Vet. Science, travel to Awassa
10.6.	Meeting with personnel of the Regional Agric. Bureau, Zonal Vet Dept. in Awassa and Dale wereda clinic of Awassa region
11.6.	Meeting with personnel of Halaba wereda clinic; Shashamene; travel to Adama
12.-14.6.	Preparation of the workshop and training on risk analysis and disease control
15. & 17.- 21.6.	Workshop and training on risk analysis and disease control
8.-10.7.	Preparation of the training on import risk analysis
11.-12. & 15.& 16.7.	Training on import risk analysis
17.-19.7.	Preparation of draft final report
19.7.2013	Submission of draft final report, debriefing

Annex 2. List of meetings held

Date	Meeting with/event	Outcomes
5.6. 2013	Drs. John Woodford, TL, and Darsema Gulima Dr. Bewket, Director APHRD	Briefing on the situation, drafting mission plan Briefing on mission and training planning
5. & 6.7.	Case team heads, AHD: Drs. Yismashewa Wogayehu (Epidemiology), Elias Walelign (VPH), Lemlem (Import/export certification), Teshome (Quarantine & Export Live animals)	Collection of existing information on animal disease prevention and control programmes and how these have been formulated/planned, identification of gaps. Discussion on disease notification, outbreak investigation & disease information management
6.6	NAHDIC Sebeta, Dr. Mesfin Sahle Forsa, Director, Dr. Getachew	Collection of information on how outbreak investigations are planned and conducted – what outbreak investigations have been carried out, how the information derived from these activities has been used to influence disease prevention and control planning, lab capabilities and future expectations at federal and regional levels
7.6.	Drs. Asmamau & Negusi, Oromyia Regional Livestock Agency	Collection of information on regional level animal disease prevention, control planning and animal disease surveillance planning
	Pastoralist Development Commission	Involvement of the Commission in formulation of disease prevention and control activities in pastoralist areas
8.6.	Dr. Kenenet, National Vaccine Institute	Collection of information on vaccine production, procurement and distribution planning, use of vaccine for prophylaxis and outbreak control, national planning of vaccine use
	Dr. Fufa, Faculty of Vet. Science	Discussion on how curriculum addresses the topics of “risk assessment” as applied to planning disease prevention and control and disease surveillance
10.6.	Regional Agric. Bureau/Livestock resource Development Bureau personnel and Zonal Vet Dept of Sidama personnel; Awassa Dale wereda clinic; Awassa region	Collection of information on disease prevention and control strategies, animal populations, stock routes, disease surveillance activities
11.6.	Halaba wereda clinic; Shashamene	Discussion on disease prevention and control strategies, animal populations, disease surveillance activities
8.- 9.7.	Drs. John Woodford, TL; Darsema Gulima & Yismashewa Wogayehu	Preparation of the training on import risk analysis
17.7.	Drs. Yismashewa Wogayehu & Elias Walelign	Final discussion on and completion of the risk assessment exercises
18.7.	Lorenzo Grazioli (Director), Giulio Bucci; Agriconsulting Europe SA	Discussion of mission outputs
19.7.	Dr. Bewket Siraw Dr. John Woodford, TL	Debriefing and discussion of outputs Debriefing

Annex 3. Workshop and training on risk analysis and disease control, 15 -21 June 2013; Adama

a) Agenda

Improving and Integrating Animal Health Services in the Livestock Value Chain through Public Private Dialogue in Ethiopia (LVC-PPD)



EU Funded Project
(EuropeAid/130753/D/SER/ET)



Workshop and training on risk analysis and disease control 15 -21 June 2013; Adama

Objectives

- 1 Participants have a basic understanding of techniques used in qualitative Risk
- 2 During the training, main requirements are identified for contingency/emergency preparedness plans and disease control plans, including vaccination programmes for the 10 most important livestock diseases

Agenda

Workshop

Time	Topic	Lead
15 June		
9.00-9.30	Opening and introduction	APHRD, TAT
	Risk analysis	
9.30-10.00	Principles of the OIE risk analysis	TAT
10.00-10.30	The risk of introduction of African swine fever into the European Union – an example of risk analysis	TAT
11.00- 12.30	Collection, analysis, dissemination of data and disease reports, and the use of RA in the case teams of the AHD: <ul style="list-style-type: none"> • epidemiology • public health • NAHDIC 	APHRD
13.30-14.00	Risk based approaches in the APHRD - What works well and where are gaps in the current system	Discussion, TAT
	Disease prioritisation	
14.00-15.00	Working groups on disease prioritisation	group facilitators
15.30-17.00	Presentations of WG on disease prioritisation and discussion	group facilitators

Training

Time	Topic	Lead
17 June		
	HACCP – practical application of risk analysis	
	Principles of HACCP	TAT
	Practical application of HACCP at an export slaughterhouse	APHRD
	Risk based disease control	
	Summary of the disease prioritisation exercise	
	Working groups on the first five selected priority diseases: epidemiology	group facilitators
	Presentations of working groups and discussion	group facilitators
18 June		
	Working groups on the first five selected priority diseases: prevention and control	group facilitators
	Presentations of working groups and discussion	group facilitators
	Does the national production of animal vaccines meet the demand?	NVI
	Working groups on the remaining priority diseases: epidemiology, prevention	group facilitators

	and control	
	Presentations of working groups and discussion	group facilitators
	Monitoring and surveillance	
	Principles of Monitoring and surveillance	TAT
	Epidemiological surveys – planning, implementation, data gathering and analysis	TAT
19 June		
	Working groups: Case studies on monitoring and surveillance	group facilitators
	Presentations of working groups and discussion	group facilitators
	Working groups: Surveillance and data collection for the priority diseases	
	Presentations of working groups and discussion	group facilitators
	Outbreak investigation	
	Principles of outbreak investigation	TAT
	Working groups: Case studies on outbreak investigation	group facilitators
	Presentations of working groups and discussion	group facilitators
	Information gathering and use of questionnaires	TAT
	Outbreak investigations for the priority diseases	Discussion
	Contingency plans(optional)	
	Working groups: Review of the contingency plans on HPAI, RP and RVF	group facilitators
20 June		
	Disease control plans and legislation	
	Veterinary legislation – current situation and future developments	TAT
	Working groups: Review of the current disease control plans	group facilitators
	Presentations of working groups and discussion	group facilitators
	Gaps in the current system and priorities for national disease control on regional and national level	discussion, TAT
21 June		
	Working groups: Key issues for disease control plans and vaccination programmes for the 10 priority diseases	group facilitators
	Presentations of the working groups and discussions	group facilitators
	Summary of main aspects of control plans and vaccination programmes for priority diseases	TAT
	Conclusions and closing of the training	AHD, TAT

Abbreviations

APHRD Animal and Plant Health Regulatory Directorate

HACCP Hazard Analysis on Critical Control Points

TAT Technical assistance team of the LVC-PPD project

b) List of participants

Name of Participant	Regional State	Institute	Position
Abreha G/medhin	Tigray	BoHRD	Expert
Abay Eneyew	Gambella	BoA	Officer
Adamu Asegidew	A.A	MoA	Driver
Aregash Timerga	A.A	MoA	Accountant
Asmamaw Aki (Dr.)	B/G	Association Vet Lab	Coordinator
Biruk Alemu	Sebeta	NAHDIC	Driver
Carsten Potzsch			Consultant
Darsema Guilma	Federal	MoA	Epidemiologist
Daniel Desalegn	Federal	MoA	Driver
Daniel Gizaw	Oromia	NAHDIC	Microbiologist
Dereje Alemu	NTTICC	NTTICC	Director
Derara Huka	Diredawa	Agri office	Epidemiologist
Diriba Lemma	Oromia	ARVL	Expert
Etsegenet Tekeba	Oromia	Bedele Reg lab	Staff
Elias Walelign	A.A	MoA	Expert
Fasil Akililu	NAHDIC	NAHDIC	Microbiologist
Fufa Abunna	AAU	AAU	Asso. Prof
Getachew Gutema (Dr.)	OPADC	OPADC	Expert

Getachew Giari	MoA	NAHDIC	Epidemiologist
Gebru Legesse (Dr.)	Tigray	BoHRD	Expert
G/meskel Yalew	Gambella	Bu.Agri	Officer
Getnet Gezahng	Bedele	NTTICC	Driver
Girma Zeleke (Dr.)	A/A	EVA	G/Manager
Gurara Megerssa (Dr.)	Oromia	Yabello	Epidemiologist
Ismail Warsame	Diredawa	Agri office	Epidemiologist
John Woodford	A.A	LVC-PPD, MoA	Team Leader
Kassahun Tafese	A.A	U. Agriculture	Head of Lab
Kassaye Erkihun	MoA	APHRD	Quarantine expert
Kenenet Atnafu (Dr.)	Oromia	NVI	Q.C
Lemelem Tesfaye	A.A	MoA	Inspector
Mahlet Andargie	A.A	MoA	Cashier
Meseret Admassu (Dr.)	Amhara	ARLRDPA	Expert
Mesfin Getachew	Amhara	Kombolcha lab	Expert
Melese Gashe (Dr.)	SNNPR	BoA	Expert
Mohammed Redwan (DR.)	Harari	BoA	R.V.D
Negusie Regassa	Oromia	Agency	Expert
Samuel Mulat	A.A	MoA	Quarantine expert
Seid Ahmed (DR.)	Afar	APADB	Senior Vet.
Senait Abate	A.A	MoA	D/encoder
Shimeles Dejenie (Dr.)	SNNPR	Sodo Regional lab	DVM
Tadlo Mazengia	Amhara	BADRDL	Lab. Techn
Tadesse Kebede	A/A	U. Agriculture	Officer
Takele Ayanaw	Amhara	BDU	Instructor
Tsegaye Gebre	SNNPR	Mizan Lab	Officer
Wondwossen Getachew	Federal	MoA	Facilitator
Yismashewa Wogayehu	A/A	MoA	Expert

Annex 4. Presentations and handouts of the Workshop and training on risk analysis and disease control, 15 -21 June 2013; Adama;
see separate file “Annex 4. workshop ppts.zip”

Annex 5. Training in qualitative risk analysis, 11 -16 July 2013; Addis Abeba

a) Agenda

Date	Topic
11 July	Risk Analysis - Introduction and application
12 July	cont. Risk Analysis - Introduction and application Risk assessment exercise for ECF and RVF: identification of risk questions
15 July	Risk assessment exercise for ECF and RVF
16 July	Risk assessment exercise for ECF and RVF Conclusions and closing

b) List of participants

Name of Participant	Institute	Position	Notes
Daniel Gizaw	NAHDIC	Microbiologist	2 days participation
Elias Walelign	AHD	Case Team leader Public Health	
Getachew Giari	NAHDIC	Epidemiologist	
Kassaye Erkihun	APHRD	Quarantine expert	3 days participation
Samuel Mulat	MoA	Quarantine expert	
Yismashewa Wogayehu	AHD	Case Team leader Epidemiology	
Fasil Akililu	NAHDIC	NAHDIC	

Annex 6. Handout/Training manual: “Risk analysis & qualitative assessment” . Training in qualitative risk analysis, 11 -16 July 2013; Addis Abeba
see separate file “Annex 6. hand out risk analysis.pdf”

Annex 7. Evaluation of disease control plans for ten high priority diseases

a) Priority diseases identified by the APHRD/AHD and during stakeholder discussions in preparation of the workshop

	FMD	CBPP	PPR	LSD	ND
Most affected populations	Cattle, young stock, high yielding, pastoral herd (migrating, during dry season because of frequent animal contacts)	Bovine all age groups, pastoral populations	SR (especially: goats, young stock, in lowlands)	Bovine	backyard poultry (chicken)
Main epidemiological characteristics	Serotypes A & O – endemic, SAT 1 & 2 - epidemic, serotypes without cross-immunity; limited outbreak control options as highly contagious & fast spreading, livestock movements important for transmission, exports have increased in recent years despite endemic distribution, TAD	Endemic occurrence in all regions, highest prevalence in Benishangul/Gumuz, W & S Oromia, Gambela, S SNNP, NO Somali and S Tigray regions, except Harari	Migration important for transmission, seasonality: end of rainy season/kidding season, TAD	Animal movements important for transmission, higher no. of vectors during and after rainy season, highest prevalence in low- and midlands (50-64%), highlands (26%, 2009-10)	Spread during holiday season and movements, seasonality: high prevalence in post rainy, distribution in all areas but poultry density higher in highlands
Current surveillance	Poor surveillance (serotypes, distribution), limited diagnostics (Ag, Ab & 3ABC ELISA), no pen side tests, 329 outbreaks reported in 2011-12, CFR=3.2% (8215/254514), in 2012-13: 8353 sera and virological samples tested at NAHDIC	PS from disease outbreak reports, AS plan by NAHDIC but not implemented, 103 outbreaks reported in 2011-12, CFR=14.2% (597/4187) Usually no laboratory confirmations, no OI	Current risk areas for control & surveillance were established in 1999 serosurveillance (0-15% seroprevalence in highlands and 5-55% in lowlands), no AS since then, 342 outbreaks reported in 2011-12, CFR=25.9% (3898/15054), largely underreported esp. in pastoral areas (reporting rate: ca. 20% from pastoral areas VS & ca. 60% from highland areas VS), 2012 vacc. campaign: pre and post vacc monitoring of sero conversion, increase of herd immunity by ca. 10% post vacc.	no vaccination surveillance	195 outbreak reported in 2011-12, CFR=41.6% (6884/16540) no other surveillance results available
Current control and vaccine characteristics	Management of endemic disease, ring vaccinations but often not timely and insufficient numbers, vacc. not free of charge, available vacc.: NVI: A,O, SAT 2, imported vacc. from India: A,O; Kenya: A,O,SAT 2 vacc. matching studies at the WRL/UK, international assistance from FAO FMD PCP	Management of endemic disease, vacc. in endemic zones (categorization in endemic, surveillance, at-risk zones, based on surveillance > 10 yrs ago), outbreak control with ring vacc., sufficient amount of vaccine available, annual vacc. (2011: 3.43 M, 2012 4.35 M) vacc. free of charge	Management of endemic disease, vacc. results in long lasting immunity (3 yrs), problems with vacc. availability, no problems with owners acceptance, targeted vaccination, >50% seroconversion in high risk zones (Afar and Somali regions)	Management of endemic disease, vacc. induced immunity lasting 2 yrs, sufficient vaccine available, vaccine use for prophylaxis and outbreak control unclear, treatment of cases	Vaccination resource intensive, eye drop vacc. every 4-6 month, thermo-tolerant vaccine available
Gaps in surveillance and control	PS reasonable, as signs are clear, capacities and capabilities of the VS, vacc. used only 1x/yr, targeted in some	Underreporting as difficult to diagnose, last serosurveillance > 10 yrs ago (on which results the current	Regional labs do not have reagents for diagnosis, logistical problems in vacc/control (cold	No comprehensive disease control strategy, no risk based control	No surveillance, confusion with AI possible

	FMD	CBPP	PPR	LSD	ND
	areas but generally not sufficient # of doses, not sufficient vaccine produced at NVI, large amounts of imports necessary, highest cost of all vaccines (ca.1 USD), mass vaccination logistically difficult, esp. in pastoralist settings, cold chain often not maintained, unrestricted animal movements (local & long distance), no pen-side tests available, molecular strain typing needed, no transnational cooperation	risk-based control is based), NAHDIC is the only national lab for diagnosis	chain, timeliness of measures), PS and AS data scanty, vacc. plan is not based on the real population size and disease occurrence, disease free areas not managed		
Disease priority*	among 5 highest priority diseases for national economy and livelihood	among 5 highest priority diseases for national economy and livelihood (2/3)	among 5 highest priority diseases for national economy	among 5 highest priority diseases for national economy	Identified as highest priority poultry disease prior to the workshop
Recommendations for improved and risk based control	High priority: for control: high yielding animals, feedlots, dairy, draft oxen, export Medium priority: migrating animals & along migration routes, marketed animals, cattle Use of rapid tests molecular characterisation of field strains prophylactic vacc. Should be 2x p. year, The current use of ring vaccination should be reconsidered - before ring vacc. is applied the feasibility (resources, time etc.) should be proven, only vacc. with high potency (min. 6 PD50) should be used (because poor vaccine matching studies, low cold chain provisions, long vacc. intervals), wider use of vaccine matching between field and vacc. strains necessary. The target should be achieving FAO/OIE PCP stage 2 in the mid-term future	abattoir surveillance needs to be increasingly used, greater emphasis on planned vaccination in high risk areas surveillance is needed to demonstrate the distribution, and presence of formerly thought to be disease-free zones	With assistance of AU-IBAR, IGAD, FAO a transnational eradication program is planned, funding from EU, WB & USAID	Outbreak response: movement control and ring vaccinations, prophylactic vacc. of animals going to feedlots and around feedlots regardless of season, preventive vaccination targeted on basis of outbreak reports, more data & information needed about the distribution of LSD and the role of vectors for future control planning	Strategy needed for backyard and intensive production sector, strong focus on backyard needed, Follow-up the plan by NVI to produce in smaller doses/vial formulations (30-50 doses = suitable for vacc. in backyard poultry)

b) Priority diseases identified during the workshop through disease prioritisation exercises and verified by the workshop participants

	TB	Anthrax	Black leg	Rabies	Trypanosomiasis
Most affected populations	Bovine, intensively managed – Dairy Dairy camels	Bovine, etc all except birds. Goats less likely to be infected. Rare in Camels – Carnivores less susceptible – prevalence in lowlands slightly higher – drought related - 1 st flush of grass	Cattle and sheep More or less equally prevalent across all farming/agro-ecological systems	Any warm blooded mammal – Carnivores more affected. Stray dogs represent a high risk sub-pop. – More common in big cities	Cattle, Camels, dogs , horses, (humans) Northwest, west and south western & southern regions - 220,000 kmsq tsetse infested
Main	In extensive production 1-10%	Aftermath following Tef harvest-	Spore former – soil contaminant	Spread by bite from infected	Between 15 -20 M cattle at risk

	TB	Anthrax	Black leg	Rabies	Trypanosomiasis
epidemiological characteristics	prevalence; up to 50% in intensive production (comp. skin test results from 2007-10 - 4-5% (meat inspection) in slaughterhouses ...close contact, faecal excretion, environmental contamination- Outbreaks sporadic and don't spread far from source, usually.	Hot spots exist – Environmental contamination important spread factor	– Sporadic outbreaks -	animal Wildlife do play a role acting as a reservoir Threat to survival of endemic spp (Simien Fox)	in W & SW lowlands - Different tsetse spp involved - Widespread drug resistance both prophylactic & curative. Tsetse spreading up to 1800m - Higher incidence during/ after rains – wildlife reservoir hosts play an important role Mechanical transmission biting flies possible -
Current surveillance	No structured surveillance One study - human TB due to M.bovis: 10-15% of all TB cases in population (2010), 29% of TB +ve cases among dairy workers (1998) (similar results 2005 study),	Farmers usually report – Passive disease reporting fairly reliable - Endemic (340 outbreaks in cattle reported to OIE in 2011) – Very little outbreak investigation	Limited to sporadic passive reports	OIE 2011: 34 new outbreaks in wildlife & domestic animals, Reported in 2011 in wildlife 2001-09 - 386 human cases reported, of 2172 positive brains 90% dogs, 5% cats, 3% cattle, 2% other spp (2002), 95% of human cases from dog bites - Passive reporting tends to be good	No outbreak reports to OIE in 2011 Not notifiable
Current control and vaccine characteristics	No control strategy and no disease management	Management of endemic disease, vacc. in 2011: Prophylactic: 557,337 bovine Ring vacc.; 790,440 (192535 bovine, 526614 ovine, 71291 equine)	Management of endemic disease Emphasis on response to outbreak rather than prophylaxis	No control strategy and no disease management, no vaccination as outbreak control, voluntary vacc. for domestic dogs (no free of charge),CNVR in Addis - City municipality campaigns - vacc. of stray dogs some big cities	Management of endemic disease, Pour-on, insecticides, impregnated traps / targets, large scale aerial spraying - Increasing drug resistance - 10-year eradication program using sterile males started 2005 – GI pallidipes
Gaps in surveillance and control	No structured surveillance and control strategy	More outbreak investigation needed	Probably more prevalent than being reported -		
Disease priority*	among 5 highest priority diseases for public health (2/3 scores)	among 5 highest priority diseases regional economy, livelihood & PH	among 5 highest priority diseases for reg economy and livelihood	among 5 highest priority diseases for public health	among 5 highest priority diseases for regional economy (2/3 scores)
Recommendations for improved and risk based control	Promote milk pasteurisation, Public awareness, Structured surveillance, and possibly a voluntary eradication programme	Reconsider current ring vacc policy - Annual prophylactic vacc in dry seasons, anthrax risk mapping, diagnosis can be done on wereda level (stained smears)	Annual prophylactic vacc just before dry seasons,	Increase awareness, use of World Rabies Day for awareness and vaccination campaigns, Initiate studies on stray dog ecology, responsible dog ownership and knowledge-attitude-practices and utilise the results (see Yimer et al, 2012)	Vector control/traps, targets/ pour-on insecticides – Chemotherapy - - greater regulation on the use of prescription only medicines

* according to the prioritisation exercise conducted during this workshop

Abbreviations: AS active surveillance, PS passive surveillance, vacc.: vaccination/vaccine

Annex 9. Diseases listed in the prioritisation exercise according to categories national & regional economy, farmers' livelihoods and public health; number of mentioning and in % of all mentioning

	Categories	Farmers' livelihoods		Regional economy		National economy		Public health	
		Disease	total	%	total	%	total	%	total
1	Anthrax	19	65.5%	17	58.6%	10	34.5%	24	82.8%
2	Black leg	19	65.5%	15	51.7%	4	13.8%	0	0.0%
3	Brucellosis	12	41.4%	8	27.6%	6	20.7%	25	86.2%
4	Pasteurellosis, bovine	13	44.8%	7	24.1%	4	13.8%	0	0.0%
5	Pasteurellosis, ovine.	11	37.9%	5	17.2%	1	3.4%	0	0.0%
6	bTB	6	20.7%	5	17.2%	5	17.2%	22	75.9%
7	Botulism	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8	Listeriosis	0	0.0%	0	0.0%	0	0.0%	2	6.9%
9	Salmonellosis	1	3.4%	1	3.4%	1	3.4%	4	13.8%
10	Campylobacter	0	0.0%	0	0.0%	0	0.0%	1	3.4%
11	E.coli	0	0.0%	0	0.0%	0	0.0%	1	3.4%
12	FMD	19	65.5%	21	72.4%	25	86.2%	0	0.0%
13	AHS	11	37.9%	8	27.6%	10	34.5%	0	0.0%
14	LSD	13	44.8%	10	34.5%	14	48.3%	0	0.0%
15	CBPP	13	44.8%	15	51.7%	16	55.2%	0	0.0%
16	CCPP	12	41.4%	14	48.3%	13	44.8%	0	0.0%
17	PPR	17	58.6%	14	48.3%	17	58.6%	0	0.0%
18	Rabies	3	10.3%	3	10.3%	2	6.9%	23	79.3%
19	SGP	7	24.1%	7	24.1%	6	20.7%	0	0.0%
20	HPAI	1	3.4%	0	0.0%	1	3.4%	2	6.9%
21	RVF	1	3.4%	1	3.4%	1	3.4%	1	3.4%
22	Camel pox	1	3.4%	1	3.4%	0	0.0%	0	0.0%
23	EHV	1	3.4%	1	3.4%	0	0.0%	0	0.0%
24	Ectoparasites	12	41.4%	17	58.6%	10	34.5%	0	0.0%
25	Endoparasites	13	44.8%	9	31.0%	3	10.3%	2	6.9%
26	Taeniosis, incl. coenurosis	2	6.9%	1	3.4%	0	0.0%	8	27.6%
27	Hydatidosis/Echinococc.	1	3.4%	0	0.0%	0	0.0%	5	17.2%
28	Ascariidiosis	0	0.0%	0	0.0%	0	0.0%	1	3.4%
29	Fasciolosis	1	3.4%	2	6.9%	0	0.0%	0	0.0%
30	Shistosomiasis	1	3.4%	0	0.0%	0	0.0%	0	0.0%
31	Trypanosomiasis	10	34.5%	11	37.9%	9	31.0%	0	0.0%
32	Coccidiosis	1	3.4%	2	6.9%	1	3.4%	0	0.0%
33	Toxoplasmosis (HIV)	1	3.4%	0	0.0%	0	0.0%	3	10.3%
34	TBD	3	10.3%	3	10.3%	0	0.0%	0	0.0%
35	Tick infest.	3	10.3%	1	3.4%	0	0.0%	0	0.0%
36	Epizootic lymphangitis	2	6.9%	0	0.0%	1	3.4%	0	0.0%
37	Mastitis	16	55.2%	6	20.7%	3	10.3%	1	3.4%
38	ND	9	31.0%	9	31.0%	7	24.1%	0	0.0%
39	Gumboro	2	6.9%	3	10.3%	1	3.4%	0	0.0%
40	Fowl typhoid	1	3.4%	0	0.0%	0	0.0%	0	0.0%
41	Mareck's disease	0	0.0%	1	3.4%	1	3.4%	0	0.0%
42	Pneumonia	0	0.0%	1	3.4%	0	0.0%	0	0.0%
43	Bloat	1	3.4%	0	0.0%	0	0.0%	0	0.0%
44	Dystochia	1	3.4%	0	0.0%	0	0.0%	0	0.0%
45	Lameness	1	3.4%	0	0.0%	0	0.0%	0	0.0%
46	Sore back	1	3.4%	0	0.0%	0	0.0%	0	0.0%
47	Unknown camel disease	0	0.0%	1	3.4%	0	0.0%	0	0.0%

Annex 10. Risk assessment exercises conducted during the “Training in qualitative risk analysis”, 11 -16 July 2013

See separate file “Risk assessment exercises.docx”

Annex 11. Organisational chart of the Ministry of Agriculture and the veterinary services (source: LVC-PPD project; Programme estimation 2 report)



