2.4.11 SUB-MODULE 11- ANIMAL HEALTH

The provision of veterinary services during drought and other disasters is an important strategy for ensuring pastoralists are protected from loss of their livestock and that the benefits of livestock ownership are sustained. In pastoral communities where livestock are regarded highly as a capital asset and wealth, veterinary care can help to prevent sudden loss of livestock due to acute diseases which cause high mortality. In situations where high livestock mortality occurs, it can take many years for communities to rebuild their livestock assets. Veterinary care can also reduce the impact of chronic diseases which may affect benefits such as milk production, fertility or the use of livestock as pack animals. In general, veterinary vaccines and medicines are inexpensive items relative to the economic value of livestock.

In pastoral areas of Kenya the trend in recent years has been towards the privatisation of clinical veterinary services, with increasing use of private veterinary suppliers to support primary-level workers such as community-based animal health workers (CAHWs).The emergence of these approaches in Pastoral areas demonstrates the willingness and capacity of pastoralists to pay for basic veterinary services.
Therefore, there are two main types of veterinary interventions during drought and other calamities as follows:

- Support to the private sector for primary clinical veterinary care – the prevention and treatment of livestock diseases which cause high mortality or substantial production losses.
- Support to government veterinary services, particularly for disease surveillance, disease control, veterinary public health, and other functions as needed.

Intervention strategy

If drought becomes very prolonged the need to support core public sector veterinary functions should be considered.

Coordination

The MoALFC is responsible for coordination at National level and the County Veterinary Departments ensure veterinary programs are implemented at County level, during drought or other disasters. This coordinating bodies for Veterinary inputs should be viewed as complementary to other forms of drought assistance, such as supplementary feeding, and good coordination should ensure that appropriate combinations of different interventions are used.

Some of specific functions of coordination as they relate to veterinary interventions are as follows:

Initial assessment – ensuring timely and accurate assessment of veterinary needs, encouraging joint assessment with all key actors working together, and making information available to assessment teams.

Funding mechanisms – coordination and preparation of funding proposals, with assignment of operational areas and technical roles to agencies with relevant experience and technical expertise.

Design of interventions - harmonisation of primary veterinary service design and implementation strategies among agencies working in a disaster-affected population, and between affected and adjacent unaffected populations as needed; ensuring that interventions fall within government policy and that any training inputs use existing government standards and guidelines; ensuring that interventions fall within international standards and guidelines.

Monitoring and evaluation – coordination should include monitoring of the overall intervention and real time adjustment of strategies and activities as needed. The use of standardised monitoring forms assists the collation of monitoring data on a programme-wide basis. This is particularly important for veterinary interventions because relatively limited information is available on the impact of veterinary inputs on livestock production and mortality, and any associated benefits to pastoralist communities.

Guidance on disease surveillance

In pastoral areas of Kenya, international trade in livestock or livestock products is an important aspect of livelihoods. This trade is influenced by international animal health standards and the use of disease information to determine the risk of Kenya exporting livestock diseases to trading partners. The major source of disease information is the Directorate of Veterinary Services and livestock disease surveillance system and therefore, disease control activities need to be designed in collaboration with the Directorate.

Routine monitoring - the monitoring of clinical activities of para-veterinary workers such as CAHWs can contribute to a livestock disease surveillance system. Routine monitoring can include the recording of livestock disease events, in addition to the treatment or control measures used. Such data is most useful if livestock morbidity and mortality by species and disease is recorded in relation to the population at risk - treatment or vaccination figures per se have limited value unless related to specific populations of different livestock species. For CAHWs, pictorial monitoring forms have been used successfully in Kenya and are particularly useful for CAHWs with low levels of literacy. Monitoring tasks should be designed in collaboration with government veterinary services.

Veterinary investigation – There are several regional Veterinary investigation Laboratories in the country which have capacity to conduct investigations of disease outbreaks including post mortem examination and laboratory diagnosis The laboratories carry out regular reporting of disease outbreaks and strategies for control and quarantine can then be implemented.

Reporting - in protracted crises, all agencies should submit regular disease surveillance reports to the Veterinary Services Authority, which in turn, should compile and share information with relevant partners.

Veterinary public health

Veterinary public health covers the prevention or control of animal diseases which are transmissible to humans either through food or by contact between animals and people; it is a key public sector function. These zoonotic diseases include anthrax, salmonellosis,

tuberculosis, brucellosis, manage and Rift Valley fever. Drought or other disasters can result in abnormal livestock movements or use of grazing areas, high livestock mortality followed by scavenging of carcasses by wild or domestic carnivores, crowding of livestock, or close contact between livestock and people. These conditions can increase the risk of zoonotic diseases in livestock and humans. The disease control method depends on the disease in question and in some cases, collaboration between veterinary and human health services is justified.

Examples of veterinary public health activities during drought or other crises include public education campaigns to control Rift valley fever, tuberculosis , brucellosis etc e.g. through hygiene and consumption of boiled milk, or public awareness and mobilisation to collect and bury or burn animal carcasses.

Assessment - rapid participatory assessment conducted under the provision of primary-level clinical veterinary services should include a rapid assessment of zoonotic diseases, in terms of actual cases or potential risk of disease occurrence. In emergencies, anthrax may be associated with abnormal movement of livestock to grazing areas which are normally avoided; rabies may be associated with local populations of wild or domestic predators, possibly attracted to carcasses or garbage; other zoonotic diseases may be associated with close contact between animals and people, or unhygienic conditions arising from the crowding of people and animals in camps, or the breakdown of water supplies.

Zoonotic disease control - the control method will vary according to the zoonotic disease(s) in question. For some diseases, information to livestock keepers might be transferred verbally or using leaflets delivered by paraveterinary workers as an addition to their routine clinical work. Where private veterinary workers are used on a short-term basis, payment for their services by an aid agency will usually be required. Zoonotic disease control efforts between agencies and between areas should be harmonised as part of the coordination effort. Collaboration with human health agencies and programmes is beneficial to harmonise approaches and for sharing of resources.

Euthanasia and disposal - disasters may result in large numbers of injured or terminally sick animals, which require euthanasia and disposal. Animals dying as a direct result of disaster injuries also require disposal. Animal carcasses may spread disease, are unsightly, produce noxious odours and attract predators and scavengers such as packs of dogs, hyenas or jackals. Animal euthanasia should follow humane standards and practices. Depending on the sickness, injury and method of slaughter, some livestock carcasses can be fit for human consumption.

Slaughter facilities and meat inspection – in emergency interventions in pastoral areas of Kenya, attention to slaughter facilities and meat inspection is particularly relevant to slaughter destocking. In camps for displaced pastoralists it may be appropriate to construct slaughter slabs to encourage the humane slaughter of animals by trained workers, the hygienic handling of meat, and meat inspection. In all cases, consultation with local livestock workers or butchers will help to determine the correct locations for slaughter slabs, and their design. Meat inspection procedures are generally well known. Safe disposal of offal from slaughtered livestock should be ensured.

Clinical veterinary care: General approaches and principles

Preventive and curative veterinary interventions during drought fall into two broad categories: the examination and treatment of individual animals or herds, and tactical and strategic treatment or vaccination programs.

The principle of choice, in which livestock keepers are able to select the type of preventive or curative service they require for all diseases other than those covered by official disease control policies. In common with primary medical services, veterinary services should be accessible, available, afford- able, acceptable and of sufficient quality. In drought in pastoral areas of Kenya two of these characteristics of service provision are particularly important.

Accessibility - in remote areas with poor infrastructure and communications, veterinary service delivery is a challenge even in normal periods. Access to communities might only be achieved on foot and in general, the more remote a community, the more vulnerable it is during a disaster. Para-veterinary workers such as CAHWs are usually the most appropriate service providers in these situations because they are able to travel and function in these environments. Therefore, supervised and well-trained CAHWs should always be considered as potential veterinary service providers.

Affordability and payment for services - experiences in pastoral areas of Kenya show that when private clinical services are based on simple community-based approaches with low transaction costs, even the poorest livestock keepers will use these services. In drought or other disasters, the issue of affordability is a particular challenge for agencies aiming to provide rapid, equitable and effective clinical veterinary care, while also trying to support local, private service providers who require an income. Approaches such as sub-contracting local private veterinary workers or the use of voucher schemes warrant wider use and assessment. These schemes can reach poorer and more vulnerable livestock users, while also helping to maintain private facilities during disasters. In contrast, there is little evidence to show that the provision of free veterinary care on a large scale and delivered directly by aid agencies or government during disasters overcomes equity problems or provides significant livelihoods impact.

When designing the provision of primary clinical veterinary services during drought or other disasters the trade-offs between the free provision of services and some form of payment by livestock keepers need to be considered.

Free service delivery - if delivered free-of-charge, the coverage of a veterinary service will depend on the availability of funding by external agencies or government due to disparity between the level of funds available and the size of the population to be reached. In some cases, only a small proportion of a drought-affected population will be accessed. The decisions about which types of livestock and diseases to treat, and the method of treatment, are based on the objectives of specific agencies and the clinical judgments of veterinary workers on the ground. If clinical services are delivered by aid agency staff in isolation of local veterinary services providers, there is a risk of undermining local services. Furthermore, unless closely supervised there is a risk that free services are not actually delivered and users are charged at the

point of delivery. Alternative systems of clinical veterinary service delivery aim to use existing veterinary workers where they exist, or, conduct rapid selection and training of para-veterinarians. These approaches help to strengthen local capacity and support systems which can be improved over time and as the drought wanes. Again, if services are provided free-of-charge, service accessibility and availability will depend on the level of funding available.

Payment for services - if payment for services is used, accessibility and availability can improve, although the issue of affordability becomes important. A third approach involves the gradual introduction of payment for services, with free provision during the acute stage of an emergency and payment for services in later stages and as livestock markets begin to function. In Kenya, veterinary services are in a state of transition from government to private sector delivery of clinical veterinary care. Therefore, an important aspect of the provision of clinical veterinary services during disasters is to work with private sector veterinary facilities and workers wherever possible. Such service providers can comprise the main source of quality veterinary care after drought. During a drought they can be subcontracted to deliver veterinary services, or can provide services through mechanisms such as voucher schemes. In general in Kenya, most veterinarians are located in major cities and towns. In remote, rural or marginalised areas veterinary care is provided by para- veterinary workers. The categories of para-veterinary workers include veterinary assistants, animal health technicians and CAHWs. Different strategies for emergency veterinary care are needed according to the pre-existence or not of local veterinary workers in the disaster-affected area.

Agencies considering the provision of clinical veterinary care have to understand the trade-offs between these different approaches. In terms of the principles of livelihoods-based programming, there is very limited evidence to show that the free provision of clinical veterinary care to individual animals provides significant livelihood benefits to disaster affected populations, or is cost-effective or equitable. Relatively more evidence of livelihoods benefits is available for para-veterinary systems based on some level of payment for services, particularly in protracted crises, where studies show reduced livestock mortality and improvements in service accessibility, availability and acceptance at a population level.

Guidance on the Timing of Veterinary Interventions

Veterinary interventions can be appropriate at all stages of a calamity, but should be combined with other forms of assistance. Support to basic clinical veterinary services will help to ensure that sick animals are treated promptly.

It should be noted that livestock vaccination should be completed before drought occurs. Of the various diseases prevented by vaccination, only anthrax is particularly associated with drought as animals may move to anthraxinfected areas due to limited grazing elsewhere. During other crises all possible veterinary interventions could be considered.

Guidance on supporting basic services for the examination and treatment of individual animals or herds through the services of supervised CAHWs, emergency veterinary interventions during drought and other calamities can aim to provide a clinical service to

pastoralists and treat sick livestock. Such services can provide immediate benefits to those users who can access the service.

Assessing needs of vulnerable groups

The design of equitable and effective primary veterinary service delivery requires an understanding of livestock ownership or use by different socio-economic groups within a population. In particular, the assessment should include an understanding of the following:

- Livestock owned or used by women - vulnerable groups such as female-headed households may own specific types of livestock such as poultry, small ruminants or donkeys, and therefore it is important to consider the main health problems affecting these animals. Women and girls may be responsible for small and/or young stock, including the diagnosis and treatment of livestock diseases and hence may have significant ethno-veterinary knowledge which should be taken into account in planning. Women are also commonly more vulnerable in emergencies to food insecurity and other threats. Therefore, they should be involved in animal health interventions, including specific targeting of particular activities and the recruitment of women CAHWs where possible and appropriate.
- People living with HIV/AIDS – for people with HIV/AIDS the prevention of zoonotic disease is particularly important. In addition, livestock products can provide substantial nutritional benefits to people living with HIV/AIDS. Increasing the productivity of livestock through animal health interventions can therefore also have a positive impact on these groups in particular.

Context analysis

In addition to the particular needs of certain subpopulations within communities, the assessment should take account of security and environmental issues.

Security factors - the security implications of any animal health intervention should be considered. For example, CAHWs carrying cash and/or medicines may be at increased personal risk of robbery or attack. Insecurity can also have animal health implications: animals stolen from a neighbouring group or area can bring disease.

Policy and legal factors - the assessment should include a rapid review of government agency and do- nor policies, rules or procedures which relate to implementation options. There may be restrictions on the use of certain types of veterinary products by certain levels of veterinary workers. The use of funds from some donors to buy veterinary input is governed by bureaucratic donor requirements which pre- vent rapid and appropriate procurement in emergency contexts.

Approaches and methods for rapid participatory assessment

General approach and timing - during drought or other disasters the assessment of veterinary capacities and needs should be conducted rapidly and use participatory approaches and methods. The initial animal health assessment should be carried out

during the alert phase of a calamity. Best practice for rapid participatory assessment of veterinary capacities and needs include:

Stakeholders -the assessment should involve all relevant sub-groups within a drought or disaster-affected population and should be conducted in partnership with local veterinary authorities and service providers, and/or with other groups as relevant.

Skills and experience of assessment team - the assessment should be conducted by veterinarians who have been trained in participatory approaches and methods, and who are experienced users of these methods in pastoral areas of the country.

Methods for assessing veterinary services - The assessment of existing veterinary services and possible gaps in service provision should be based on the use of five key indicators viz. accessibility, availability, affordability, acceptance and quality; useful participatory methods to measure these indicators are also listed below. Participatory mapping is particularly useful as a rapid assessment method. It can quickly show existing service providers such as veterinarians and all types of para-veterinary workers working in the public and private sectors, and for NGOs or UN agencies. Understanding the activities and coverage of these workers will assist agencies to define a strategy for service delivery, including ways to fill gaps in terms of coverage or access to vulnerable groups.

Information derived from participatory methods should be cross-checked against secondary data when available. Secondary data includes government disease surveillance reports, disease studies from local research institutes and published data. Cross-checking (triangulation) of information in this way helps to ensure that the overall analysis is as rigorous as possible within the time available. Formal livestock disease surveys involving questionnaires and laboratory diagnosis are rarely feasible in disaster con- texts, and the modest added value of the disease information obtained is rarely justified in relation to the additional time and cost required, and the need for rapid action.

Guidance on the design and implementation of clinical veterinary services

Following the common principle of community participation pastoralists, including vulnerable groups, should actively participate in the design of emergency veterinary interventions during drought or other crises. They include:

Type of intervention - the veterinary intervention during an emergency could generally be curative, preventive and supportive treatments based on the initial assessment results. Vaccination of livestock during peak emergency situations is discouraged and avoided unless and otherwise it is strongly suggested as an outcome of the initial assessment process. Livestock vaccination should be conducted in a strategic way and based on epidemiological findings during normal, alert and/or recovery stages of the drought management cycle.

Payment for services - the animal health intervention should be based on the principle of partial or full payment at all times. When the results of a rapid participatory assessment justify that livestock owners are unable to pay for the inputs and services, partial or total cost will be borne by aid agencies and/ or other actors including the government. Such a subsidised operation must last only for a short duration of time and has to be decided prior to the implementation of interventions.

Voucher or coupon systems could be implemented for effective service delivery and to discourage misuses. Animal health interventions during emergencies must support local private actors and could involve CAHWs, private practitioners and drug vendors. Good coordination is needed to define the roles and responsibilities of private sector actors, government and NGOs.

Focus on important diseases – the service design should aim to address the prioritised livestock health problems which are identified during the initial assessment. It is rarely feasible or appropriate for an emergency, primary-level veterinary service to address all livestock health problems and in most cases, a limited range of veterinary vaccines and medicines can be used to prevent or treat the most important diseases in a given area. The focus of the service on prioritised livestock diseases needs to be understood and agreed by all actors, including livestock keepers. Similarly the appropriate timing for interventions particularly vaccination should be discussed and agreed with all stakeholders.

Vulnerable groups - service design should take account of the types of livestock owned or used by vulnerable groups, and should aim to address the main health problems in these livestock. Vulnerability in terms of primary veterinary service delivery also requires special attention to accessibility and affordability issues. Accessibility to more remote areas with limited infrastructure by conventional means requires considerable cost and therefore limited coverage, or the use of para-veterinary workers who are able to travel on foot or local transport. In some cases, programmes may need to provide or support local modes of transportation for veterinary workers.

The strategy for payment for services needs to take account of the need for rapid and equitable delivery, while also supporting private sector veterinary workers where possible. For more vulnerable groups, private veterinary workers can be subcontracted by agencies to deliver a service for a specified, short time period. Voucher schemes are a variation of this approach, in which selected livestock users are provided with a voucher which allows them to access private veterinary care up to a specified value. The private veterinary workers then exchange the vouchers for cash from the aid agency. In areas where a private veterinary sector is active or where government charges for clinical veterinary care, the continuation of normal pricing policies should be followed, other than for targeted vulnerable groups. To avoid confusion, community participation and agreement with community representatives is needed.

Procurement and storage of veterinary medicines - there is considerable variation in the quality of veterinary vaccines and medicines sourced from different suppliers, either locally or internationally. Suppliers also vary in their capacity to supply large volumes of drugs with appropriate expiry dates, and according to agreed delivery times. Procurement can be further complicated by the range of diseases in different livestock species, and the wide range of products available to prevent or treat a particular disease. When using veterinary vaccines, some vaccines require the isolation of local field strains of disease pathogens to ensure adequate protection and therefore the exact composition of these vaccines needs to be verified. Agencies with limited experience of veterinary drug procurement should seek expert advice. Local importers, mostly based in Nairobi, can be a source of readily available drugs

in reasonable quantities. However, the quality, expiry date and prior storage of these drugs need to be checked. At field level, most veterinary vaccines and some drugs require cold storage. They should not be purchased or used unless adequate cold storage facilities are in place. Cold storage facilities of human health services can sometimes be shared.

Training inputs - in situations where some veterinary workers are already present and where rapid delivery of services is required, training should be limited to short refresher courses focusing on the clinical diagnosis of the prioritised diseases, and the correct use of veterinary vaccines or drugs. The need for such refresher training is determined by the existing capacity of local personnel. If para-veterinary workers such as CAHWs need to be selected and trained from scratch, guidelines are available for CAHW systems in Kenya although these guidelines refer to development rather than emergency programmes. In emergency situations where rapid delivery of services is required, it may be necessary to streamline and shorten some of the best-practice principles related to CAHW selection and training. However, as emergencies become protracted or end, further training to enhance CAHW knowledge and skills is recommended.

Social and cultural norms - the design of veterinary services needs to take account of local social and cultural norms, particularly related to the roles of men and women as service providers. In some com- munities it is difficult for women to move freely or travel alone to more remote areas where livestock might be present. However, even in very conservative communities it is often possible to select and train female CAHWs to provide a service to women, who are often among the most vulnerable groups.

Security issues - service design should take account of the possible exposure of veterinary personnel to violence, abduction or theft. Livestock are often grazed away from more secure settlements, and some- times have to be moved long distances to grazing areas and water points. In conflict situations, veterinary workers travelling to such areas may be at risk. In part, the use of local para-veterinary workers can be appropriate in these situations because these workers know the local area and the relevant armed groups or security forces, and are able to negotiate access. In areas where livestock are very important to local economies and livelihoods, veterinary drugs are highly prized and as small volume and high value items are easy to loot and re-sell.

Roles and responsibilities - many of the problems which arise during emergency veterinary service provision are associated with misunderstandings about the roles and responsibilities of different actors, false expectations regarding the aims and coverage of the service, or confusion over pricing arrangements or selection of beneficiaries. Many of these problems can be avoided by a commitment to community participation and where possible, close collaboration with local authorities and private sector actors. Roles and responsibilities should be documented in Memoranda of Understanding or similar agreements. Such agreements act as a very useful point of reference in the event of disputes.

Mass treatment and vaccination programmes

This section summarises some key technical aspects affecting the impact of vaccination and advises veterinarians and livestock programme managers to consult OIE guidelines. Although the design of vaccination programmes varies according to the epidemiology and impact of different diseases, veterinary professionals are advised that:

Disease diagnosis - failure to diagnose disease(s) according to recognised international diagnostic standards increases the risk of inappropriate vaccination e.g. through the use of the wrong vaccine.

Vaccine composition - for some diseases, vaccine efficacy is highly dependent on the identification of local field isolates and the inclusion of these isolates in the vaccine. This is a particular issue in the case of vaccines for hemorrhagic septicemia and the various forms of bovine and ovine pasteurellosis. Agencies conducting vaccination should check with vaccine suppliers that the composition of vaccines is relevant to the diseases and specific pathogens in their geographical areas of operation.

Vaccine efficacy - although some vaccine producers may cite results of their own laboratory-based vaccine efficacy trials, such trials require large sample sizes, relevant livestock species and a capacity to reproduce natural infection in laboratory settings. For these reasons, reference to peer-reviewed literature and/or the guidelines provided by OIE and FAO is advised.

Vaccination protocols - when using vaccines, the level and duration of immunity varies according to the vaccine, number of doses and timing of doses.

Foot and mouth disease (FMD) is a severe, highly contagious viral disease of livestock that has significant economic impact. The disease affects cattle, swine, sheep, goats and other cloven-hoofed ruminants. The organism which causes FMD is an aphthovirus of the family Picornaviridae. There are six strains (A, O, C, SAT1, SAT2 and SAT3) which are endemic in different countries. Each strain requires a specific vaccine to provide immunity to vaccinated animals. Vaccination is the common control method designed to achieve mass coverage or targeted to specific animal subpopulations or zones. It is important to use inactivated virus vaccines, as inactivated viruses do not have the ability to multiply in vaccinated animals. The use of live virus vaccines is not acceptable due to the danger of reversion to virulence.

Timing of vaccination in the face of outbreaks of FMD, anthrax, hemorrhagic septicemia, pasteurellosis and blackleg, vaccination of affected herds is unlikely to reduce mortality unless it is conducted before mortality peaks in a given herds. If vaccination is conducted after peak mortality has occurred, it is unlikely to affect mortality. Furthermore, delayed vaccination using only a single dose of inactivated vaccine tends to produce immunity of short duration or no immunity (depending on the vaccine type). Therefore, such vaccination may not prevent future disease outbreaks.

In many pastoral areas, outbreaks of FMD, anthrax, hemorrhagic septicaemia, pasteurellosis and blackleg are predictable because the diseases are either location-specific (e.g. anthrax) and/or seasonal. Failure to complete a full vaccination course for these diseases before periods of high risk, and/or failure to cover a high proportion of animals in a given herd, reduces the impact of vaccination.

Cold storage - many vaccines require cold storage. Failure to comply with manufacturer's recommendations for cold storage increases the risk of ineffective vaccination. In hot pastoral areas, particular care is needed to ensure correct storage of vaccines.

Disease control policy - in the case of contagious bovine pleuropneumonia, contagious caprine pleuro pneumonia and Peste des petis ruminants, the design of vaccination programmes should be the subject of national disease control programmes and strategies.

Monitoring of veterinary service provision

Clinical veterinary services in droughts and other crises should be monitored systematically and with sufficient frequency to enable rapid detection and correction of problems, either by the county veterinary Department or the agencies on the ground.

Monitoring approach and timing – following the common principle of community participation, the monitoring system should include regular consultation with community representatives, community members, vulnerable groups and other relevant stakeholders including CAHWs, private practitioners, NGOs and local authorities. Each of the five main monitoring indicators for veterinary service provision can be measured using participatory methods.

Monitoring should occur at least once a month. The monitoring system should include the monthly submission of monitoring reports by veterinary workers to the aid agency and/or County Veterinary Department. These reports should detail the activities of workers in tabulated form, and should complement measurement of the five main indicators of service provision detailed below.

The outputs from monitoring exercises should be timely communicated to all relevant stakeholders including the local veterinary services authorities.

Indicators for monitoring service provision - there are no internationally-recognised standard indicators for measuring primary veterinary services. Indicators for primary human health services can be applied to veterinary services, and five useful indicators are accessibility, availability, affordability, acceptance and quality. The methods used to assess these indicators during an initial assessment can also be used to monitor progress over time. Given the need to reach vulnerable groups, each indicator should not only measure service provision in the population as a whole, but also service provision for specific vulnerable groups. Accessibility, availability and affordability can be measured quantitatively, whereas acceptance and quality can be measured quantitatively and/or qualitatively.

Indicators for measuring livestock diseases - monitoring systems for clinical veterinary services should contribute to official disease surveillance systems. Therefore, monitoring should include the collection of information on livestock disease incidents, and use indicators such as the proportion of animals affected by disease and livestock species, and mortality by disease and livestock species. For preventable diseases, this process assists the project to assess whether veterinary service provision is reducing diseases according to the prioritised list of diseases identified during the initial assessment, and whether other or new diseases should be addressed. The monitoring system should also track outbreaks of particularly important livestock diseases and inform responses as necessary as shown below.

Process indicators		Impact indicators
Designing the system	Completion of participatory survey and analysis	Identification of the ten most important animal health problems in the community according to different wealth and gender groups
	Number of meetings with community/ community representatives	Analysis of options for improving animal health Agreement on action to be taken
	Number of meetings between private veterinary workers and agency	Agreement between parties Number of para-veterinarians linked to private veterinary drug supplier or agency
	Number of workers trained Number and type of animal health	Improved veterinary knowledge and skills among trainees
	problems covered in training course Geographical location of workers Cost of training	Livestock mortality over time
Links to drug outlets	Number of starter kits supplied to veterinary workers	Geographical coverage of veterinary workers Proportion of livestock-rearing house- holds serviced by veterinary workers
	Cost of starter kits supplied Quantities and types of medicines supplied to veterinary workers Cost of medicines supplied to veterinary workers	Proportion or number of workers functioning after training
Rapid veterinary training	Number of treatments per disease per livestock type per worker per month Number of vaccinations per dis- ease per livestock type per worker per month	Drugs and vaccines resupplied to CAHWs based on revenue collection
Veterinary worker activities	Income received by veterinary workers Number of monitoring forms sub-mitted by veterinary workers	Action taken according to disease outbreak reports
	Number of disease outbreaks reported by veterinary workers	Food consumption in community related to improved animal health and according to wealth and gender groups
		Income in community related to improved animal health and according to wealth and gender groups
		Influence on policy

Policy implications

The policies for veterinary care in pastoral areas during drought or other emergencies relate to policy on veterinary service provision and policies on disease control.

Policy on veterinary service provision – the MoAD recognises the economic and production benefits of mobile livestock rearing systems in pastoral areas of the country and consequently, supports veterinary service delivery which best meets the needs of mobile communities and their herds. To date, the most effective means of service delivery has been private CAHW systems which are properly designed and maintained with appropriate supervision from veterinarians. These systems fall within international standards set by the World Animal Health Organisation. All agencies are advised to follow the Directorate of Veterinary services National Minimum Standards and Guidelines for the Design and Establishment of Community-based Animal Health Worker Systems, and conduct proper monitoring and evaluation of these systems.

Policies on disease control – the development of disease control policies for specific livestock diseases in pastoral areas has been hindered by the limited information available on the epidemiology and economics of diseases in these areas. During normal periods, between droughts or other crises, all actors involved in veterinary services in pastoral areas are encouraged to conduct studies on livestock diseases and as far as possible, work with the Directorate of Veterinary Services to design disease control strategies to be implemented by the private sector, or as public-private partnerships. Participatory epidemiology approaches and methods are well suited to pastoral areas and require further use by government services, research institutes and NGOs.

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