Livestock Feed Resources in Ethiopia: *Challenges, Opportunities and the Need for Transformation*

Main issues, Conclusions and Recommendations

By

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List of Abbreviations and Acronyms

ASAL	Arid and semi-arid lands
ATA	Agricultural Transformation agency
BoA	(Regional) Bureau of Agriculture
CIs	Customary institutions
DM	Dry matter
EAFIA	Ethiopian Animal Feed Industry Association
EIAR	Ethiopian Institute of Agricultural Research
EMDTI	Ethiopian Meat and Dairy Technology Institute
ESAP	Ethiopian Society of Animal Production
ESGPIP	Ethiopia Sheep and Goats Productivity Improvement Program
EVA	Ethiopian Veterinary Association
FAO	Food and Agriculture Organization (of the United Nations)
FTCs	Farmers Training Centers
IGAD	Inter-governmental Authority on Development
MNB	Multi-nutrient block
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MoI	Ministry of Industry
MoT	Ministry of Trade
NARS	National Agricultural Research System
NGDHP	Non-governmental Developmental and Humanitarian Partners
NGO	Non-governmental organization
NRM	Natural Resources Management
PLC	Private Limited Company
RPDBs	Regional Pastoral Development Bureaus
SPS-LMM	Ethiopia Sanitary & Phytosanitary Standards and Livestock & Meat Marketing Program
TMR	Total mixed ration

Preface

This publication presents the status, trend, constraints, challenges, and opportunities for feed resources development in different livestock production systems prevailing in the country. It also describes issues related to feed marketing and quality and portrays institutional and policy support schemes needed to ensure feed security. This was based on reviewing documents, using secondary data, questionnaire survey, and focused group discussions. The method used depended upon the type of information needed for different chapters of the paper.

Many institutions and individuals have contributed to the success of the work. The Ethiopia Sanitary and Phytosanitary Standards and Livestock and Meat Marketing Program (SPS-LMM), Ethiopia Sheep and Goats Productivity Improvement Program (ESGPIP), Food and Agriculture Organization (FAO), and Ethiopian Institute of Agricultural Research (EIAR) are duly acknowledged for allowing their respective staff member(s) to take part in the preparation of this publication.

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While preparing this publication we have referred to various published and unpublished sources of information and benefited from the comments of

different individuals on the draft document. In this regard, we have benefited from the useful comments of Dr Carl Birkelo, Mr. Yacob Aklilu, Mr. Beruk Yemane, Mr. Abate Tedla, Mr. Abraham Hailemichael, and Dr William Thorpe. We thank them all for their very helpful comments.

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Introduction

Ethiopia has huge livestock resources and diverse agro-ecologies suitable for different kinds of livestock production. Livestock resources have significant economic and social importance at household level and makes significant contributions to the national economy and foreign currency earnings of the country through export of live animals, meat as well as hides, skins and leather products. However, the productivity and economic contribution of the livestock sector is much below the potential due to various technical and non-technical constraints. Inadequate feed supply and the rising price of purchased feeds are among the main constraints hindering the exploitation of the full potential of the livestock resources of the country. The shortage and escalating price of feeds have adverse effects on productivity and profitability of commercial livestock operations as feed cost accounts for about 60-70% of the total cost of livestock production. The situation also affects the profitability of feed industries due to irregularity and frequent disruption of their operations because of shortage and escalating price of feed ingredients, which raises their cost of production beyond what the livestock producers can afford to pay. Drought induced shortage of feed in the pastoral areas exacerbates the problem in the highlands when large quantities of feeds are channeled to the drought affected pastoral areas for emergency feeding.

The chronic problem of inadequate feed supply was discussed in a consultative meeting organized by the Ethiopian Animal Feed Industry Association (EAFIA) on June 25, 2008 at the Ministry of Agriculture and Rural Development (MoARD) in Addis Ababa. The preparation of this paper was initiated based on the recommendation of the consultative meeting. Accordingly, a task force composed of professionals drawn from governmental, non-governmental, and private institutions was formed to accomplish the task. The objectives were to review available information on livestock feeds and feeding in Ethiopia, identify trends, constraints, challenges and opportunities in feed resources development and recommend actions to be taken by the concerned parties. The document was prepared based on review of available information, use of secondary data, questionnaire survey, and focused group discussions. In the remaining sections of this executive summary, aspects of feed resource availability and their quality; drought induced feed crisis and related emergency responses;

and the status and challenges of compound feed processing industries are highlighted. Moreover, issues related to feed marketing and quality; and institutional and policy support schemes required to ease the prevailing feed related problems were presented followed by recommendations for the way forward.

Feed Resources Availability and Quality

Different types of feed resources are available in Ethiopia. These are broadly grouped into concentrates and roughage feeds.

Concentrates

The main sources of concentrate feeds are agro-industrial by-products, grain, and grain screenings. Agro-industrial by-products include by-products of flourmills, oil-processing plants, breweries, and sugar factories. Wheat bran is the main by-product of flour mills used as animal feed in Ethiopia. Other by-products of the flourmill industry include wheat middlings, wheat short, rice bran, bean bran, bean hull, lentil bran and lentil hull. These by-products have substantial contribution to the livestock feed supply, particularly in the urban and peri-urban areas. The by-products of the oil processing plants are oilseed cakes, which include cottonseed cake, noug cake, linseed cake, sunflower cake, sesame cake, and rapeseed cake. Cottonseed hull is another by-product produced during oil extraction from cottonseed. Because of its high fiber content, it is mainly used as a roughage source. The main by-product of the sugar factories is molasses although bagasse and sugar cane tops are also other by-products that can be used as roughage sources. Molasses is a source of readily available energy to enhance microbial fermentation in the reticulo-rumen of ruminant animals. It is also a good source of minerals such as calcium, potassium, sulphur, and trace minerals, but deficient in nitrogen and phosphorus. However, there are competing alternative uses such as ethanol and other alcohol production, significantly reducing availability of molasses for use as animal feed. Breweries and distilleries produce brewers' grains and distillers' grains, respectively, as by-products. Barley screenings and barley germ are produced as by-products of malt factory.

However, the contribution of agro-industrial by-products to the livestock feed supply is negligible (0.8%) and mostly limited to commercial livestock operations and smallholder livestock producers

in urban and peri-urban areas. Annual production of the different agro-industrial by-products cannot satisfy the increasing demand for these products for inclusion in the diet of farm animals. Annual production of wheat milling by-products and oilseed cakes is estimated to be 269,238 and 102,225 tons, respectively. The flourmills and oil processing plants are operating at less than 50% of their capacities due to shortage and high price of raw materials and non-competitiveness of the products, particularly oil, in the market. The supply and price of oilseeds is affected by competition from other uses such as export and direct use of the seeds locally.

Depending upon availability and price, cereal grains and grains damaged during processing could be used as sources of high-energy feeds. Substantial amount of screenings and damaged grains are produced during grain processing and seed cleaning. Grain represents a concentrated feed resource, which can be transported over a long distance with relatively less cost. Cereal grains are usually highly digestible (80-85%), rich in energy and have a protein content of about 8-12% of DM. Maize grain has a high potential in this respect because of its high energy content, relative abundance and reasonable price most of the time.

Roughages

The main sources of roughage feeds are natural pastures, cultivated forages and pastures, crop residues, forages conserved in the form of hay or silage and other feeds derived from the cropping systems such as leaf strippings of maize and sorghum, sweet potato vines, *enset* leaves and foliage and pods from trees and shrubs.

Livestock grazing is the predominant form of land use in pastoral areas, whereas in the densely populated highland and mid-altitude areas the better soils are used for cropping and only the hilly and seasonally water logged areas are allocated for grazing. Pastoral areas or rangelands account for over 60% of Ethiopia's land cover. The northeastern, eastern, and southern arid and semi-arid lands (ASAL) of the country harbor the largest share of the rangelands, which exhibit considerable temporal and spatial variability. Most of the rangelands are badly degraded showing serious ecological decline and cannot produce sufficient forage to meet the physiological requirements of the livestock population for most part of the year. The most important causes of rangeland degradation include prolonged and excessive rangeland use, recurrent drought, inefficient use of locally available resources, restricted livestock mobility,

encroachment of invasive species, land use change, weakening of customary institutions, and lack of sustained investment in rangeland improvement. Most of these challenges are associated with the management of the rangelands and hence possibilities exist to correct them although the solution may not be simple. Moreover, fodder conservation is not a common practice in many parts of Ethiopia with the exception of the central highlands around Addis Ababa. The native grass hay produced in Sululta area is an important source of roughage feed for many commercial livestock operations.

Crop residues (cereal straws or stovers and grain legume haulms) are becoming increasingly important as sources of roughage feeds for ruminants. The actual quantities of crop residues available for livestock feeding depends on costs of collection, transport, storage and processing, seasonal availability, other alternative uses and wastage. The nutritive value of crop residues is variable depending, among others, on the species and variety of the crops, time of harvest, handling and storage conditions and other factors. Cereal straws and stovers generally have relatively low nutrient content, high fiber content, low digestibility, and low voluntary intake. Most cereal straws and stovers have lower nutritive value than the haulms from grain legumes and/or vines from root crops such as sweet potato. Thus, without supplementation, crop residues cannot satisfy even maintenance requirements of animals primarily because of low N and high cell wall contents and slow digestion.

Improved forages and pastures could play multiple roles of supplying high quality forage to farm animals, improving soil fertility through biological nitrogen fixation or mulching, prevention of soil erosion and controlling weeds, and pests and diseases. Thousands of forage species and accessions have been tested and recommended for wider adoption in different agro-ecologies and production systems during the last five decades. Moreover, various forge development strategies have been developed for different agro-ecologies and production systems of the country. The strategies include integration of food and forage crop production on smallholder farms through production of forage crops on soil conservation structures and as alley crops or hedgerows along the boundary of crop fields. High yielding and good quality forage crops are suitable for production in intensive production systems through application of better production inputs and intensive management. Forage research and development endeavours in the past focussed mainly on agronomic practices, adaptability, herbage productivity and feeding values of the forage

crops without due consideration to forage seed production and institutional issues necessary for adoption of the technology. Because of such limitations in the forage development approaches, adoption of improved forages by smallholder farmers and livestock producers has been very low in spite of critical feed shortage and over four decades of efforts in forage research and development. Ineffective agricultural extension system, lack of adequate awareness of productive agricultural technologies, and lack of private or public forage seed production have negatively affected adoption of improved forage production.

Thinning, leaf stripping and topping from maize and sorghum; sweet potato vines and tuber; banana and enset plants and by-products; and foliage and pods from naturally growing trees and shrubs are other important sources of feed in smallholder livestock production systems.

Nationally, cereal crop residues have the highest contribution to the total feed supply at country level. At national level, cereal and pulse crop residues contribute about 50% of the total feed supply followed by grazing (44%), whereas the balance is supplied by other agricultural and agro-industrial by-products of which *enset* contributes about 3%.

Feed Resources *versus* Animal Productivity

Despite its potential in terms of livestock population, Ethiopia has one of the lowest livestock productivity levels even when compared to sub-Saharan African standards. Average meat yields per animal slaughtered are estimated to be 110 kg of beef and 10 kg of mutton. Similarly, the average milk production of cows is about 1.5 liters per cow per day over a lactation period of about 6 months and that of crossbred cows is much below their potential (around 4-6 liters of milk under smallholder farmer's management and about 8-12 liters in intensive production systems). In general, livestock productivity is low for all classes of animals. The growth rate of growing animals is very slow and the overall production and reproduction performance is sub-optimal. The relatively late age at sexual maturity, the long parturition intervals and the low production performance of the animals reflect an environment in which animals are subjected to long periods of nutritional stress. Nutritional problems also lead to low

overall lifetime productivity. Moreover, in poorly fed animals, feed resources utilization is highly inefficient. In Ethiopian smallholder livestock production system, about 85% of the feed intake is used to meet maintenance requirement of the animal and only 15% is used for production. In such a system, there appears to be a tremendous potential for improvement. Ethiopia produces a broad range of potential livestock feeds that together supply the macro and micronutrients. Thus, there is a need for adoption of the use of balanced "best cost" rations for more efficient and effective utilization of the available feed resources to attain the desired level of productivity.

Feed Crises and Emergency Responses

In the past, drought induced feed crisis was the challenges of the arid and semi-arid lands (ASALs) of the country. With the degradation and shrinking of the communal grazing areas, the temperate, humid, and per-humid environments of the country have also become increasingly vulnerable to livestock asset depleting feed crisis. The severe feed shortage of 2008 drought, for instance, has caused huge ruminant livestock mortalities transcending across all agro-ecologies. This particular feed crisis was so deep and widespread with its negative impacts causing serious disruptions among livestock keepers, consumers, livestock traders and the market oriented livestock enterprises. The severe feed deficits not only arrested livestock production and reproduction but also caused massive livestock mortality. Starved animals that consume pasture rootstocks and excessive lopping of browses combined with the drought have also contributed to the depletion of soil seed bank of the most desirable forage species and their eventual disappearance. In pastoral areas, the desperate livestock mobility resulted in fierce competition over grazing resources, culminating in loss of human life and damage to properties. In the highlands, lactating cows ceased producing milk and oxen become unable to pull the plough. The feed crisis has caused economic damage to emerging small-scale dairying and feedlots leading to substantial decline in productivity and heavy financial loss. Some dairy farmers who were unable to cope up with the soaring feed prices disposed the dairy breeding stock that built at great cost and quitted the business altogether. In response to the rising feed prices, milk price rose by about 65% and become an expensive commodity to most households. This has caused malnutrition in children, and pregnant and lactating women. The lack of milk in the diets of children has long lasting negative impact on the country's

human capital that determines its future. Furthermore, the shortage and sharp price rise of feed have become disincentives for live animal exporters and export abattoirs by increasing the finishing cost of animals intended for the export market.

In areas experiencing frequent feed crisis, various strategies have been employed by the livestock keeping communities, government, and humanitarian agencies to minimize population of livestock dying of starvation. These strategies mainly constitute migration of livestock to places of relatively better forage and water availability, use of bought-in feed to save the lives of core-breeding stock, and disposing of the extremely weakened animals through slaughter-destocking as the last option.

The complex and ever growing challenge of livestock feed insecurity can hardly have all-fit single solution. Containing it would require implementing hosts of area specific feed response, preparedness, and development activities in organized and sustainable manner. Where the grass-roots communities assumes full-ownership and take the leading role, these integrated actions could bring lasting solution to the chronic livestock feed problem. Though limited in scope, encouraging community-led successful grazing land restoration initiatives are going-on in drought-prone woredas of Tigray and Borena zone of Oromia region. In the pastoral areas, if duly recognized and empowered, customary institutions can play a decisive role in minimizing resource use conflicts and in sound management of the rangelands. Supports of donors, humanitarian and development partners are equally vital to build the capability and capacity of grass roots communities and customary institutions, and establish strong disaster risk management.

Feed Processing Industries

The productivity and profitability of livestock and poultry are dependent on the production efficiency and capability of the feed milling industry. The high cost of compound feeds is one of the main reasons for the slow growth of intensive livestock production in Ethiopia. Mixed feed prices have gone up very fast during the past few years largely due to the increase in feed ingredient prices and transport costs. Shortage and high cost of feed ingredients; wastage of slaughter by-products; high import cost of vitamins, amino acids macro and micro-minerals; multiple taxation at different stages of animal feed processing; high transport costs; insufficient storage

capacity and lack of market information. The price of ingredients and manufactured feeds has been increasing to such an extent that many farms have gone bankrupt and out of production. Currently, most feed mills are operating at about 25% of their annual capacity

Low consideration and awareness for high quality feed is another problem. Poor quality of ingredients is due mainly to adulteration, deterioration in feed quality during storage, poor efficiency in processing of raw materials and slow growth of intensive livestock production systems that use compound feeds. Many feed mills do not include or use the essential imported ingredients such as premixes, amino acids, vitamins at below recommended levels due to the high cost. Problems related to lack of expertise in formulation of best cost rations, power interruptions, and lack of spare parts for the ageing feed mills, inadequate extension support services to the feed milling industry, inadequate research information, and lack of appropriate credit facilities also contribute. Quality standards for industrial compound feeds and feed ingredients are in place since 2001. These standards are, however, only "voluntary" which means quality control is left to the feed industry to monitor itself. This has made it impossible to monitor feed quality particularly that from the smaller feed mills, feed ingredient manufacturers, distributors, suppliers, dealers, retailers, and importers. The chances of adulteration and quality degradation of feeds are high at any of these handling stages. The Animal and Plant Health Regulatory Directorate of the Federal Ministry of Agriculture has recently come up with a legislation to put a regulatory mechanism in place. This legislation was approved by the Council of Ministers and the House of Peoples Representatives recently and has come into effect.

There are opportunities of marked increase in demand in the near future as a result of increasing trend of intensification of livestock production, increased consumer demands due to forecasted increase in income/purchasing power of the population, potentially high export of compound feeds to neighboring countries, increases in yield and acreage of maize and soybeans (major ingredients in compound feeds).

The problems facing the compound feed industry are multifaceted and thus require commensurate solutions by the different actors. Provision of incentives, speeding up enforcement of feed legislation, accreditation of laboratories to increase chemical analysis, awards and recognition for consistent compliance to quality standards, rules and

regulations, avoidance of multiple taxation/considering tax exemption for feed ingredients and compound feeds, and provision of support to EAFIA are measures that should be taken by the government to assure adequate feed supplies and reliable quality of raw materials and finished feeds at affordable prices.

The EAFIA should work to strengthen the capacity of producers through training and information exchange. Awareness creation and enhanced knowledge in feed formulation, quality, and maintenance of equipment deserve significant attention. The association should also think of having a regularly published bulletin that documents analytical results and market information on feed for use by compound feed producers. It is also important that the feed industries seek and use professional advisory services on a regular basis.
To improve the availability of by-products, it is important that their utilization efficiency be enhanced. The opportunity costs of exporting raw oil seeds versus enhancement of their value addition through processing them locally need to be critically assessed. Collection and processing of slaughterhouse and slaughter slab by-products, particularly bone meal for inclusion in the diet of monogastric animals should also be given due consideration in the future. Collection and processing of fish offal that is largely wasted and research effort on the use of non-conventional feeds for preparation of compound feeds should also be strengthened. Promotion of the local production of soybeans, maize and premixes and protein concentrates are also some of the measures that help to increase availability of feed ingredients.

Feed Marketing and Quality Issues

Feed has become a marketable commodity in different parts of the country. The increasing number of commercial livestock producers and decreased availability of alternative feeds have increased the incidence of feed marketing triggering price increases for most feed commodities and compound feeds. However, the lack of quality control and assurance mechanism for any feed sold by feed processing plants or retail shops has created mistrust among actors in the industry further thinning the compound feed market.

In urban and peri urban areas, where there is semi-intensive livestock production such as dairying, fattening, and poultry production, there is considerable market for compound feeds, agro-industrial by-products as well as for fodders mainly baled hay and straw. In rural

areas where there is a mixed crop-livestock production system, the majority of livestock producers use feeds from own farm. On the other hand, in the pastoral production system, the source of feed is mainly free grazing of natural pastures without any feed marketing practices except during prolonged dry seasons or drought when feed markets emerge in some pastoral communities.

The markets for the different compound feeds are concentrated along the Addis Ababa-Adama corridor, where the feed processing enterprises and modern livestock farms (poultry, dairy, pig, and cattle fattening) are found. The current markets for compound feeds are characterized by (i) direct sale to individual purchasers, who normally buy small quantities ranging from one to 5 quintals per purchase, (ii) participation in auctions to deliver to modern livestock farms and for relief purposes, and (iii) supplying compound feed based on orders, which is commonly practiced by NGOs that promote livestock production.

The agro-industrial by-products, mainly from flourmills and oil processing plants, are directly marketed to users or through traders, who buy in large quantities for the purpose of retailing and making available in small quantities for urban and peri-urban livestock producers. The customers are mainly dairy farmers, feedlot operators; commercial poultry producers, urban and peri-urban smallholder livestock producers, and urban equine owners (cart horse and donkey owners).

In recent years, the market for roughages is also booming due to continuous reduction of grazing areas and expansion of commercial farms mainly in urban and peri-urban areas. The main roughages marketed are cereal straws and baled hay. The trade for baled hay and straw is mainly dominated by commercial livestock farms. Recent trends show that tef straw is marketed in the urban centers both in the open market and by small feed retail shops. In rural and peri-urban areas, the straw is commonly traded in heaps.

There has been a gradual increase in prices of feed ingredients, compound feeds and roughage feeds since 2003 with huge price increases in 2007/08 and more recently since March 2011. The increasing trend is associated with the overall price increase in agricultural products and increased demand for these by-products following the expansion of commercial livestock farming mainly in urban and peri-urban areas. The price of molasses at Wonji-Shewa

Sugar Factory has increased from 5.6 Birr/quintal in 2004 to 7.0 Birr/quintal in 2007, which has increased to about 47 Birr/quintal in 2011. Taking into consideration the use of molasses as a feedstock for production of biofuel, the demand is expected to increase, which will result in even in more price increase.

Institutional and Policy Support

The institutional and policy support to the feed sector in Ethiopia has been mainly the responsibility of the Ministry of Agriculture. The institutional and policy support is part of the economy-wide support, the agriculture sector based support or the feed sector specific support. The support to the sector so far has not led to desirable impact due to lack of focus and emphasis. The need and urgency for better support is justified from the perspectives of the challenge the livestock industry in general and the feed industry in particular are currently facing. The basis for reconfiguring institutional and policy support in the feed sector is not only from the nutrition and health aspect of the current generation but also from the mental cognition of children, which is the basis of future generation. Realizing the need for facilitating efficient delivery of services for sustainable and prosperous livestock sector and with the vision to maintain global competence, appropriate institution, and policy reforms need to be put in place to promote, regulate, and facilitate livestock production for socio-economic development and industrialization. Key intervention areas with respect to better institutional and policy support include creating national capacity to guide and support the industry, promoting the private sector involvement in the feed industry, enforcing the existing feed ingredient quality standards and development of standards for compound feeds. Moreover, creating favorable environment for market oriented livestock operations, creating economic incentives for all actors in the feed sector especially through evaluation of the taxation system mainly to avoid double taxation, designing and implementing differentiated feed sector development targeting various production systems (crop-livestock, pastoral system, urban or intensive) must be given due consideration.

Conclusions and Recommendations

Ethiopian agriculture is characterized by an ever-declining per capita landholding. Traditionally, livestock feeding is based on grazing of natural pastures and fallow lands augmented with crop residues and stubble grazing. However, due to rapidly increasing human population there is expansion of cropping into traditional grazing areas causing a decrease in area of natural pastures and disappearance of fallow lands in most of the densely populated and intensively cultivated areas of the country.

Consequently, crop residues are becoming increasingly important as sources of roughage feeds for ruminants. However, cereal crop residues are generally characterized by low nutrient content, high fiber content, low digestibility, and low voluntary intake. Hence, they cannot satisfy even the maintenance requirements of animals without proper supplementation. This rationalizes future efforts for improving the quality of crop residues.

So far, substantial research efforts into improved forages have been made to resolve the feed shortage problem mainly in the highlands, aiming at improving feed availability and livestock productivity. However, the impact was so little that animals are still subjected to long periods of nutritional stress in these areas. The adoption of improved forage technologies by farmers has been constrained by lack of follow up and technical backstopping. In view of the high demand for livestock development in Ethiopia, it is imperative that improved forage production through integration into the prevailing production systems be promoted mainly under the smallholder setting.

Adoption of improved forages depends on availability of forage seeds or planting materials and attractiveness of the investment, which in turn depends on market orientation of the livestock production system. Availability of credit services would also be vital for improving smallholder livestock production. Thus, agricultural research and development organizations should give due consideration to the development of appropriate technologies and mechanisms to enhance forage seed production and commercialization of feed production. Under the arid and semiarid settings, there are pervasive and severe degradation of the rangelands, causing feed insecurity with negative impacts on the livelihood and survival of pastoral communities.

Similarly, the production and supply of most agro-industrial by-products is uneven and localized around the main urban centers. Most agro-industries are operating below their capacity due to inadequate supply and high price of raw materials. Although the sugar factories are producing a substantial amount of molasses, nearly all the factories are planning to use the molasses for other purposes that will make it unavailable for animal feeding. Hence, the supply of agro-industrial by-products is not consistent all year round and is not adequate to boost productivity of livestock. Thus, there is a need to enhance efficient and effective utilization of locally available feed resources, which includes minimizing wastages and conserving fodders such as forage biomass during times of plenty, processing and treatment of crop residues and production and use of multi-nutrient blocks from agro-industrial by-products.

The foregoing assertions largely imply the need for more comprehensive, participatory and concerted long-term national feed sub sector development initiatives for enhancing the contribution of the livestock sector to the national economy and household food security. This requires sustained policy, institutional and technological support, and strong participation of all relevant stakeholders.

The most important intervention options to address the different constraints are given below separately for the mixed crop livestock system, the pastoral system and the mixed feed Industry.

Mixed crop livestock system

Constraints	Reasons behind constraint	Needed interventions	Responsibility
1. Shortage of feed supply	Inadequate feed production	Increase area coverage of forage production	MoA and BoA
		Give serious consideration to high yield and nutritive value of residues in crop variety development	Research Institutions, Colleges/Universities
		Increase production of raw materials for mixed feed production e.g. maize, soybean in terms of yield per unit area and acreage	MoA, BoA/Livestock Agency, Research Institutions, Colleges/Universities, NGOs
		Promote contract out-grower schemes of feed production through motivation and support to farmers to specialize in feed production.	Farmers, Compound feed manufacturers, EAFIA, MoA, BoALivestock Agency, NGOs
		Promote the production of protein concentrates by feed industries to foster home mixing of compound feeds by incorporating farm produced grains like maize	Animal feed manufacturers, EAFIA, MoA, BoA/Livestock Agency , Investment agency
		Strengthen the economic incentives for increased investment in feed production • Making land available for the production of feed ingredients and establishment of feed processing plants • Specific loans for feed production/processing • Provision of investment incentives (as is, for example, the case for the flower/horticultural industry) • Consider tax exemption/tax holidays for feed	MoA/BoA/Livestock Agency in conjunction with other concerned bodies (MoT, investment agency, finance institutions)
		Promotion of forage based feeding for dairy production to spare concentrates for manufacture of mixed feed for poultry	MoA, BoA/Livestock Agency, research Institutions,, Universities, NGOs
		Encourage and support feed manufacturers to produce their own ingredients like maize and soybean by making incentives like credit and land available	MoA, BoA/Livestock Agency, Investment agency, MoI, MoT
	Dependence on limited	Expand the utilizable feed resource base by fostering applied research on utilization	Research Institutions,

Constraints	Reasons behind constraint	Needed interventions	Responsibility
	number of feed ingredient sources	of alternative sources of feed ingredients (especially energy and protein sources)	Colleges/Universities
		Establish suitable animal production enterprises to utilize large quantities of by-products generated in specific locations like vicinities of sugar factories to utilize unutilized/underutilized feed resources like sugar cane tops	Sugar factories, entrepreneurs, investment agencies, MoI, MoA
	Exports without value addition	Give priority to local use than exports (e.g. oilseeds)	MoT, MoI
		Promote value addition before export: • Promotion of oil extraction and flour milling factories so that more by-products are made available for use as feed • The advantages and disadvantages of exporting oilseeds without value adding vs. processing locally into oil and oilseed cakes/meals needs to be critically assessed	MoA in conjunction with other concerned bodies
		Policy decision to spare a portion of the molasses currently utilized for ethanol production for use as feed. A small quantity of molasses can render large quantities of otherwise unusable by-products into productive feed. It also has a sparing effect on the quantity of grains used for animal feeding	MoA, MoI in conjunction with other concerned bodies (MoI etc.)
	Wastage of feed	Decrease wastage during harvest, transport, storage and use	MoA, BoA/livestock agency, farmers
		Encourage and enforce the slaughter of animals in abattoirs to save and process slaughterhouse by-products as animal feed ingredients. These are currently largely wasted due to the prevalence of informal animal slaughter	MoA, BoA/Livestock agency, Municipalities, Wereda agricultural offices
		Increase utilization of underutilized feed resources e.g. • Improve collection and small-scale processing of fish offal that is largely wasted • Increase research effort on the utilization of non-conventional feeds.	Research institutes, Universities, BoA/Livestock agency, Producers, NGOs
		Adoption of the use of balanced "best cost" rations for more efficient and effective utilization of the available feed resources and attain the desired level of productivity. • Training on simple ration balancing/mixing and awareness on the increase in efficiency of feed utilization/reduced wastage through feeding animals based on need and efficiency of use (life cycle feeding);	Farming community, pastoralists, feedlots, dairy farms, poultry farmers, MoA, BoA/Livestock agency, NGOs, Research Institutes,

Constraints	Reasons behind constraint	Needed interventions	Responsibility
1. Shortage of feed supply (Cont'd…)	Poor efficiency of utilization of available feed resources	• Adoption of feeding management practices so that livestock are fed according to their requirements to optimize feed utilization efficiency by animals that have special needs like pregnant females and young stock are treated differently. Implementation of targeted allocation of feed to the most responsive class of livestock	Colleges Colleges/ Universities
		Improve the nutritive value and palatability of poor quality feed resources through: • Supplementary feeding using different agro-industrial by-products, horticultural crop wastes and occasional surplus grain • Promote use of simple technologies like physical treatment and/or urea treatment of residues to increase efficient utilization	MoA, BoA/Livestock agency, NGOs, Research Institutes, Colleges/Universities
		Use high moisture roughages that are seasonally produced fresh when and where they are available and conserved (hay or silage) for subsequent use.	MoA, BoA/Livestock Agency, NARS, Farmers
		Consider alternative fuel sources for sugar factories that spares the bagasse that can be used as a roughage source along with molasses and protein supplements	Sugar corporation, Universities, MoI
		Reduce wastage through: • Promotion of proper feed storage • appropriate transport • Proper formulation of rations to reduce wastage through increased efficiency of utilization by the target animal • Promote use of appropriate feeders that reduce wastage during feeding	Animal feed manufacturers, MoA, BoA, traders, livestock producers, feedlot operators
		Conservation of available feed resources such as forage biomass during times of plenty	MoA, BoA/Livestock Agency, NGOs, farmers
		Foster animal production enterprises in the vicinity of high production of feeds e.g. near sugar plantations where high value feeds like cane tops are wasted	MoA, BoA/livestock agency, Sugar factories, Investment agency, Farmers/pastoralists, private feedlots
		Manufacture MNB from agro-industrial by-products and use as supplements.	Feed industries, farmers
		Policy support for sustained supply of agro-industrial by-products such as molasses for use as livestock feed	MoA, MoT, Sugar corporation

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Skill enhancement training on efficient use of agro-industrial by-products	MoA, BoA/livestock agency, Research Institutions, Colleges/Universities
		Avail appropriate technologies and formulating agro-industrial products as supplemental or alternative complete rations	Research Institutions, Colleges/Universities
		Production and use of total mixed ration (TMR) or multi nutrient blocks (MNB)s or compound rations as production or survival ration or as supplements	Farming community, pastoralists, feedlots, dairy farms, MoA, BoA, NGOs
		Promote use of upgraded crop residues, sugarcane tops and wastes from cannery/ vegetable markets for market oriented livestock production	Farming community, feedlots, dairy farmers, MoA, BoARD, NGOs
		An improvement in animal health would enable livestock to make better use of the limited feed resources available. The aim should, therefore, be to improve the health status of livestock to achieve the maximum benefits from better animal nutrition. E.g. the case of parasites	Farming community, pastoralists, feedlots, dairy farmers, MoA, BoA, NGOs
1. Shortage of	Low production and use of improved forages	Identification and strengthening of proper entry points and strategies to ensure sustainable production, management, and utilization of improved forage crops in the farming system. • Identify appropriate strategies and entry points for forage development targeting specific situations • Integrate forage development into the farming system	MoA , BoA/livestock agency, NARS, NGOs
		• Promotion of forage species suitable for under-sowing, inter-cropping, and relay cropping will help address the land shortage for feed production.	MoA , BoA/Livestock agency, farmers, NGOs
		• Complement efforts with adequately prepared extension services to raise farmers' awareness about the importance of cultivated fodder and about their utilization methods through: • training ; • Establishment of demonstration plots at farmer training centers (FTCs). This will provide visiting farmer trainees with maximum exposure;	MoA , BoA/livestock agency, research institutes, NGOs

Constraints	Reasons behind constraint	Needed interventions	Responsibility
feed supply (Cont'd…)		• Complement with field days at exemplary farmer field sites;	
		Widening and strengthening the source base of hay production in the country, which currently is dependent on natural pasture alone coming from specific locations like the *Selale* plain • Raising awareness about the wider use of improved forages with better nutritional value than natural pasture, as silage or hay, for increased animal productivity, should be the focus of extension activities • Explore the comparative advantage of converting additional areas for hay production instead of unproductive crop production efforts • Improving the species composition of available hay production fields by oversowing adaptable nutritious species	MoA, BoA, Livestock Agency, Pastoral Area Development Commission/Bureau
		Application of stock manure from corrals and sheds. The use of animal dung as fertilizer is generally constrained by its alternative use as fuel. This can only be alleviated with the establishment of more fuel wood stands and introduction of other forms of appropriate energy sources to spare manure for fertilization	MoA, BoA/livestock agency, Ministry of water and energy
		• Promote research effort in forage and pasture by focusing, among others, on: o Making thorough assessment of low cost establishment techniques; o Provision of microbiology support facility to produce inoculants for rhizobia specific legumes. The potential yields of many forage legume species used in a development program may not otherwise be realized. o Research effort towards the screening of forage species for low fertility and degraded areas to link forage development with NRM	NARS
		Enhance forage seed production • Develop appropriate technologies and mechanisms to enhance forage seed production • Encourage business oriented forage planting material production and marketing at small-scale level; • Provide appropriate incentives for forage seed production • Make arrangements for contractual forage seed production schemes	NARS, MoA, public and private forage seed producers BoA/livestock agency, financial institutions and Investment Agency

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		• Linking up forage seed producers with many farmers in their vicinities in an out grower production scheme;	
		Create viable market oriented forage development programs	MoA, BoA/Livestock agency
		• Basic technical skills necessary for growing, processing, preserving, and utilizing cultivated forage	MoA, BoA/livestock agency
		• Create economic incentives for forage growers to have interest and take the task more seriously	MoA
		• Support in terms of start-up capital and credit access	MoA, Investment Agency
		• Organize farmers who aspire to produce forage for market	MoA, BoA, Cooperative Promotion Agency
		• Strengthening the linkage between animal producer cooperatives with feed markets	MoA, BoA/livestock agency, Coop agency
		Raising public awareness on proper animal husbandry and efficient pasture management and use	MoA, BoA, Livestock Agencies
		Promotion of food-feed crops to increase the quality and quantity of available biomass without compromising food yield or additional inputs of land and water, which are also required to produce food for people.	MoA, BoA/Livestock agency, NARS
		Reducing stock numbers (destocking): • Determine the carrying capacities of available grazing • Destock and reduce numbers to a level that can be handled in a productive manner o limit the household herd size preferably replacing the less productive animals with fewer more productive animals especially in medium and high altitude areas o numbers of oxen breeding females and followers to be reduced through:	MoA, BoA/Livestock Agencies, farmers, Forage seed producers, Financial Institutions, abattoirs, Investment Agency, Ministry of Transport

Constraints	Reasons behind constraint	Needed interventions	Responsibility
1. Shortage of feed supply (Cont'd…)	Overgrazing/Overstocking/shrinkage of grazing land	▪ Promote the use of female cattle for draft as a medium to long-term measure to reduce cattle numbers in favor of a larger ratio of females in the herd. ▪ More efficient crop production technologies; ▪ Utilize a large number of low land oxen into the farming areas, use for traction, fatten, and dispose. The number of breeding cattle and followers required to produce and maintain the required number of oxen can be reduced as a consequence ▪ Wherever the size of land holding makes it worthwhile, a shift to the use of four-wheeled or two-wheeled tractors would help to reduce the number of relatively unproductive livestock maintained. o Reduce small ruminant numbers through increasing off take by establishing good and reliable livestock markets accompanied by other programs to increase family cash income o Equine numbers to be reduced through improvement in infrastructure and more efficient rural transport services;	
		Planned effort in pasture improvement; • Foster, empower and capacitate customary user organizations that formulate and enforce improved management and utilization guidelines of communal grazing o Give due recognition and support to customary institutions and make effective use of them o Farmer organizations should be effectively used by the extension system. Communal control of grazing areas with well structured farmer groups may afford advantages with a possibility of effective controls over stock access;	MoA, BoA/Livestock Agency
		• Identify and map restoration & utilization measures	MoA, BoA/livestock agency, NARS

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		• Delineation of areas for hay making, grazing reserves and restoration o Stock exclusion areas for vegetation rehabilitation and utilization of forage through " cut and carry " feeding	MoA, BoA/livestock agency, farmers
		• Implementation of pasture improvement measures o Identification of species suited to various agro-climatic zones and over sowing large areas of grazing land with higher producing species of both grasses and legumes; o Make arrangements for production of seed for over sowing, pastures, forage crops and inter-row cropping o Establishment of pastures on communal grazing areas etc o Reseeding by oversowing legumes in the medium to low altitude areas where native legumes are often deficient. This could be done with relatively minimum cost and if successful could upgrade a vast area and benefit a large number of producers	NARS, MoA, BoA/Livestock Agency
		• Promote controlled or zero grazing of pastureland combined with " cut-and-carry " system of feeding. o The more intensive feeding like that in the Hararghe highlands where fattening bulls and oxen are tethered and fed crop residues, fresh cut grass, weeds from crop areas and crop thinnings/strips is good practice that should be expanded to similar areas by the extension system; • Foster development of private fodder production to reduce pressure on communal grazing areas: o Growing and proper utilization of productive and nutritious forages in association with food crops. o Promote planting and intensive use of fodder trees and backyard forage	Local government, NGOs & grassroots community ; Offices of Agriculture
		Improving productivity per hectare for both crop and livestock productions helps to reduce the pressure	MoA, BoA/Livestock Agencies, farmers
		Mobilizing the surplus human population into non-agricultural means of survival	
	Shortage of feed supply	Implement the measures suggested for increasing feed supply above. This will help	Animal feed manufacturers,

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		reduce prices	MoA, Investment agency, Ministry of industry, farmers, BoA/livestock agency
	High transport cost	Promote simple methods like box baling to reduce bulk of roughages to reduce the volume to be transported and thus cost	MoA, BoA/livestock agency, farmers
		Consider dehydration of wet feeds like Brewers grains and production of dried molasses	Feed Industries, Sugar Corporation, feed manufacturers
		Formation of producer groups, which could transport feeds from long distances in bulk and store for the next seasons.	EAFIA, MoA, BoA, Livestock Agency
2. Soaring feed prices	Poor market orientation of feed production	Commercialization of feed production (seed and/or feed as a marketable commodity)	
		• Enhancing business orientation training and support	EAFIA, MoA, EMDTI, MoT, MoI, Coop agency, NGOs
		• Increase awareness of farmers regarding the importance of agro-industrial by-products and manufactured feed	MoA, BoA/Livestock agency, NARS, NGOs
		• train rural farmers in the vicinity of towns on how to make silage using less sophisticated procedure and material and specialized as feed producers	MoA, BoA, Livestock Agency, NARS, NGOs
		• Cereal crop producing areas could also improve the poor quality of crop residues through urea treatment as a marketable commodity.	MoA, BoA/Livestock Agency, farmers
		Upgrade storage capacity so that feed can be purchased and stored at times when it is available at lower cost	Animal feed manufacturers, Financial institutions
		• Boosting commercialization and intensification of livestock production	MoA, BoA/livestock agency, NGOs, Investment Agency and entrepreneurs
		• Foster supply of feed processing and mixing equipment locally by encouraging small-scale production of such equipment by small-scale and micro-enterprises	EAFIA, MoA, EMDTI, MoT, MoI, Coop agency

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Boosting commercialization and intensification of livestock production	MoA, financial institutions and Investment Agency
		Foster feed marketing: • Develop market places for feeds an important step in the improvement of the operation of the feed market • Formation of vertical and horizontal linkages of feed producers to input suppliers, animal producers, cooperatives etc. • Encourage cooperative marketing to help reduce the impact of transportation and handling costs o Motivate and support the suburb farmers surrounding the towns to specialize in supplying dry season roughage to urban/periurban farms o Formation of producer groups, which could transport feeds from long distances and store for the next seasons.	Animal feed producers, MoA, Cooperative agency, BoA/livestock agency, NGOs, EAFIA members etc.
	Multiple taxation	Avoid multiple taxation that escalates the cost of especially agro-industrial by-products	MoA, Ministry of trade, Revenue authority
	Technical/infrastructural problems of the feed industry	Availing facilities to determine the quality of ingredients within the time required by management to make feed formulation decisions based on "best" choice of ingredients based on a combination of price and nutritional value.	MoA, BoA/Livestock Agency, Feed industries NARS
		equip feed mills with equipment/facilities necessary to add molasses to mixed feed	Feed industries, Enterpreneurs
		Encourage/support feed mills to produce pelleted feed – some advantages of in using pelleted feed, one of which is that it reduces wastage when given to livestock. It also increases efficiency of utilization	MoA, BoA/livestock agency
3. Seasonal		Promote feed conservation practices like hay making, silage making and residue treatment to reduce seasonal variability • Grass cut for conservation is usually excessively mature. The extension service should aggressively train and assist farmers to determine the optimum stage of cutting for optimum use of the resources	MoA, BoA/livestock agency
		Enhance storage capacity to purchase during times of plenty for use during periods	Feed industries

Constraints	Reasons behind constraint	Needed interventions	Responsibility
variability in feed quality and quantity		of shortage	
		Form producer groups which could transport feed (especially concentrates, from long distances and store for periods of shortage	MoA, BoA/livestock agencies
		Motivate and support the suburb farmers surrounding towns to specialize in supplying feed to urban/peri-urban farms	MoA, BoA, Livestock agencies
		Inter-row cropping with legumes in areas of higher rainfall to improve dry-season grazing,	MoA, BoA/livestock agency, farmers
		Promote production of fodder trees and backyard forage legumes that can be used as supplements during the dry season	MoA, BoA/livestock agencies, farmers
		Promote seasonal calving/lambing/kidding to avoid births during times of feed shortage and its impacts	MoA, BoA, Livestock agencies, farmers
		Encourage business ventures like UMB and Multinutrient block manufacture as a business venture and also serve as a source of supplement during periods of poor feed supply	MoA, BoA/ Livestock agencies, NGOs
4. Low intake, digestibility and nutritional value (especially protein content) of crop residues		Skill enhancement training of farmers on improving crop residue intake, digestibility and nutritive value by physical and chemical treatment	MoA, BoA/livestock agency, Research Institutions, Colleges/ Universities, NGOs
		Development and promotion of affordable and easy to use tools and machinery for physical treatment of crop residues	MoA, BoA/livestock agency, Research Institutions, Colleges/Universities, NGOs
		Consider supply of urea at farmers level also for residue treatment like that for crop fertilization	MoA, BoA/livestock agency, NGOs, Coops
		Growing fodder legumes and using them as supplement to crop residue based diets • Improved utilization of crop residues by feeding with: o Foliage from fodder trees, e.g. Leucaena; o High quality conserved legume hay	MoA, BoA/Livestock agency, Research Institutions, NGOs

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Promote urea treatment of crop residues	MoA, BoA/Livestock agency, NGOs, farmers
		Promote feed conservation (hay, silage)	MoA, BoA/Livestock agency, NGOs, farmers
		Use of strategic supplementation of residue based diets	Farmers, BoA/Livestock agency, NGOs,
		Promote wastage reduction measures	Farmers, BoA/Livestock agency, NGOs,
5.Lack of knowledge and skills		There is lack of experience and training in the more applied aspects of livestock and forage development and management that needs to be upgraded through practical training of field staff;	MOA, BoA/livestock Agency, NGOs
		Developing knowledge in Animal nutrition, feed formulation adapted to local conditions of animal production and feed milling technology	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops and others
		upgrading the technological skill of feed mill operators to manufacture quality compound feeds and maintain equipment,	MoA, EAFIA, EMDTI, producers associations, coops and others
		Awareness of feed manufacturers that quality pays and customers of manufactured feeds (animal producers) that "cheap is not always economical." This is key in the enforcement of quality assurance and ultimately development of the feed milling industry and the livestock sector	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops , Colleges/Universities and others
		Equipping extension officers with appropriate skills in: • Feed supplementation packages to help increase the awareness of producers served by the extension agents on the use of compound feeds and consequently increase demand. • Provision of extension services to empower producers to demand for quality feeds	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops , Colleges/Universities and others

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Provide training on physical tests and judgement of ingredient and mixed feed quality to feed millers, feed buyers etc.	MoA, EAFIA, EMDTI, producers associations,
		Promote use of appropriate technologies by strengthening advisory services	Extension service, private sector, NGOs
		Extension service to come up with recommended alternative formulae based on different ingredients for various classes of livestock to encourage home mixing of compound feeds	MoA, Research institutions, EAFIA, EMDTI
		Reduce the time livestock and forage extension staff spend in activities other than livestock/forage extension to increase the amount of time spent on livestock/forage development	MoA, BoA/Livestock Agency
		Morale among extension staff especially those engaged in livestock extension is often low. Consider incentives to boost moral	MoA, BoA/livestock agency
		The EAFIA come up with an "Animal Feed Service Bulletin" published regularly (quarterly, 6-monthly etc.) that contains results of the analysis and market information on feeds	EAFIA
		Organize professional advisory service e.g. on ration formulation and manufacture to give support to the industry	EAFIA, Private sector, EMDTI, MoA, BoA/Livestock agency
	Inadequate institutional support services	Facilitate availability and accessibility of credit, land etc. especially to small feed producers and input suppliers	Financial institutions, local governments
		Increase research support to the feed industry. • Increase capacity of the public research sector to generate information on the feeding value of locally available resources through laboratory and field trials and make it available to the industry • Explore technology generation through contract research arrangements between the public and private sector (e.g. the feed milling industry)	Research institutions, Universities/Colleges feed manufacturers
		Strengthen input supply for feed production	
		Increase extension support to the feed industry in terms of providing training and technical advisory services	MoA, EAFIA, EMDTI, MoT, MoI

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Enforce the quality control legislation and organize provision of quality inspection service	Drug and feed regulatory authority, MoA, BoA/livestock agency
Weak or no producer organizations		Strengthening the Ethiopian Animal Feed Industry Association (EAFIA) to: • Serve as the mouthpiece of members to help solve their problems by bringing the same to the attention of relevant bodies • Set up an agreed vision and mission of the feed industry and help members to work towards that goal • Conduct of dialogue, public hearings, workshops to increase level of awareness, improve feedback mechanism and encourage private sector involvement in policy formulation; • Facilitate and make arrangements for experience sharing visits by members in the feed industry in a developed country and/or locally • Foster linkages with local and international government and non-government organizations for information networking and support to the sector	MoA, Cooperative agency, BoA/livestock agency, NGOs, EAFIA members etc.
Weak national capacity to oversee the progress of the livestock and consequently the feed sector	Limited integration of the different aspects of the livestock sector	Creating favorable legal frame work for the sustainable development of the livestock industry	MoA, EAFIA, ATA
		Creating integrated approach for livestock sector development by considering the aspects of (i) livestock husbandry (agriculture), (ii) industrial support related with its linkage with industries (industry), (iii) role in urban economy (urban policy), and (iv) natural resource and environment (land use policy)	MoA, Agriculture Transformation Agency (ATA)
		Strengthening the capacity of institutions engaged in extension, research/education and regulatory aspects of the feed sector	MoA, BoA, EAFIA, producers associations, exporters' associations, coops and others
		Provide support services that increase productivity, value addition, and market access for livestock products (meat, milk, eggs etc.)	MoA, EAFIA, producers associations, exporters' associations, coops and others

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Formation of a lobby group aimed at inducing private-sector participation in the development of the livestock industry is essential. The functions of such a group could include: • Identifying flaws in livestock policies and taking steps to bring them to he attention of policy makers; • Forging working relations among trading communities, development organizations and policymakers; and • Creating forums whereby policy dialogue can take place with relevant bodies on all issues related to improving the participation of the private sector in the livestock industry development process	ESAP, EAFIA, EVA, MoA, BoA/Livestock Agency

Pastoral production system

Constraints	Reasons behind constraint	Interventions required to address constraints	Responsibility
Shortage of feed supply	Rangeland degradation	Identify and map rangelands requiring restorative work	National Agricultural Research Systems (NARS), Ministry of Agriculture (MoA) , Regional Pastoral Development Bureaus (RPDBs), Non-governmental Developmental and Humanitarian Partners (NGDHP), Customary Institutions (CIs) & Grassroots Communities
		Promote participatory landscape planning and allocation of rangelands to their agro-ecological potential	NARS, RPDBs, NGDHP, CIs and Grassroots Communities
		Identify and scale-up appropriate rangeland rehabilitation and management measures	NARS, RPDBs, NGDHP, CIs and Grassroots Communities
		Managing the spread of invasive species	RPDBs, NGDHP, CIs , Grassroots Communities, and Pastoral Development Projects
		Strengthening and expanding community-based rangeland enclosures and ex-situ seed banks	RPDBs, NGDHP, CIs and Grassroots Communities
		Reseeding extremely degraded rangelands with productive and drought tolerant indigenous and introduced forage species	RPDBs, NGDHP, CIs and Grassroots Communities, and Pastoral Development Projects
	Loss of key grazing resources	Protect key drought-time fallback grazing areas and prevent their conversion into unsustainable land use systems (e.g. crop farming)	MoA, RPDBs, Local Administration, CIs and Grassroots
		Avoid haphazard human settlement patterns and water scheme development	RPDBs, Local Administration, CIs and Grassroots Communities
		Encourage seasonal mobility of livestock to/from fallback grazing areas by maintaining traditional livestock migration routes	RPDBs, Local Administration, CIs and Grassroots Communities
		Use of fire as a management tool for brush control to shift the balance, back towards grassland and reduce land lost to bush encroachment.	RPDBs, Local Administration, CIs and Grassroots Communities
	Weakening of customary institutions	Recognize the vital role customary institutions play in the sustainable management of rangeland resources	MoA, RPDBs, Local Administration, CIs and Grassroots Communities
		Empower and capacitate customary institutions	MoA, RPDBs, Local Administration, CIs and Pastoral Development Projects
		Encourage the effective use of indigenous knowledge and practice in resource management	MoA, RPDBs, Local Administration, CIs , Grassroots Communities and Pastoral Development Projects
	Conflict over access and use of	Strengthen community-led peace-building initiatives that paves a way for equitable and	RPDBs, Local Administration, CIs and

Constraints	Reasons behind constraint	Interventions required to address constraints	Responsibility
Shortage of feed supply (Cont'd…)	grazing resources	efficient utilization of buffer zones	Grassroots Communities
		Foster broad-based resource use conflict management efforts transcending regional states and national borders	IGAD, MoA, RPDBs, NGDHP, Local Administration, CIs and Grassroots Communities
	Inefficient management and utilization of locally available feeds	Scale up technologies that minimize wastage and improve feeding value of local feed resources such as the urea-molasses treatment of crop residues and production of multi-nutrient blocks from agro-industrial by-products and forages	MoA, RPDBs, NARS, NGDHP, Grassroots Communities and Pastoral Development Projects
		Increase the efficient use of grazing reserves and browses through well regulated seasonal grazing and hay making practices	RPDBs, CIs, Grassroots Communities and Pastoral Development Projects
		Facilitate reciprocal arrangement between pastoral communities across buffer grazing lands as well as pastoralists and agro-pastoralists/farmers on the use of forage and water resources	RPDBs, Local Administration, CIs and Grassroots Communities
	Limited cultivated forage production and marketing culture	Identify and map areas suitable for community-based forage production under irrigation in the low lands	MoA, NARS, RPDBs, NGDHP, Local Administration, and CIs
		Support market oriented (feed, planting material and livestock-product marketing) irrigation-based forage production by agro-pastoralists through technical backstopping, revolving fund & micro-credit	MoA, RPDBs, NGDHP, Grassroots Communities and Pastoral Development Projects
		Establish system of contractual agreements with agro-pastoral households along perennial rivers to produce and supply fodder at times of drought	MoA, RPDBs, NGDHP, Grassroots Communities and Pastoral Development Projects
	Under utilization of pockets of range resources due to unavailability of water and bush encroachment	• Water development: o Extension of wet season grazing by provision of ephemeral ponds (about 5000 m^3 capacity) to relieve pressure on dry season grazing areas, which are often overgrazed; o Provision of additional permanent waters (large capacity ponds or bores) in areas not currently commanded by water. The spacing of water points is a key factor. About 25 km apart seems appropriate for permanent waters, but ephemeral ponds could be spaced 5km apart. o Use of fire as a management tool: For brush control to use fire in a cheap and positive, way to shift the balance, back towards grassland.	RPDB, Local government, NGOs & grassroots community
	Drought	• Development of Fodder banks: o The national or regional stockpiling of fodder against a drought situation; o Establishment of reserve areas in which fodder is grown and held for use in drought. • Stop encroachment by settled farmers on drought refuges and other incursions into the rangelands	MoA, BoA/Livestock Agency, NGOs, Regional and local administrations
		Raising public awareness on proper animal husbandry and efficient range management and use	RPDBs, Local Administration , Grassroots Communities and Pastoral Development Projects
		Reducing stock numbers (destocking):	RPDBs, NGDHP, Local Administration , CIs,

Constraints	Reasons behind constraint	Interventions required to address constraints	Responsibility
Shortage of feed supply (Cont'd…)	Overgrazing/Overstocking/shrinkage of grazing land	• Determine the carrying capacities of available rangeland resources • Destock and reduce numbers to a level that can be handled in a productive manner o limit the household herd size by increasing offtake o Utilize a large number of low land oxen into the farming areas, use for traction, fatten, and dispose. o Reduce small ruminant numbers through increasing off take by establishing good and reliable livestock markets accompanied by other programs to increase family cash income and providing advisory service to pastoralists on the productive use of money	Grassroots Communities and Pastoral Development Projects, NGOs
		Planned effort in pasture improvement; • Foster, empower and capacitate customary user organizations that formulate and enforce improved management and utilization guidelines of communal grazing o Give due recognition and support to customary institutions and make effective use of them o Pastoral organizations should be effectively used by the extension system. Communal control of grazing areas with well structured pastoral groups may afford advantages with a possibility of effective controls over stock access;	RPDBs, NGDHP, Local Administration , CIs, Grassroots Communities and Pastoral Development Projects, NGOs
		• **Identify and map restoration & utilization measures**	RPDBs, NGDHP, Local Administration , CIs, Grassroots Communities and Pastoral Development Projects, NGOs
		• **Delineation of areas for haymaking, grazing reserves and restoration** o Stock exclusion areas for vegetation rehabilitation and utilization	RPDBs, NGDHP, Local Administration , CIs, Grassroots Communities and Pastoral Development Projects, NGOs
		• **Implementation of Range improvement measures** o Identification of species suited to the different pastoral agro-climatic zones and over sowing large areas of rangeland with higher producing species; o Make arrangements for production of seed for over sowing/reseeding;	RPDBs, NGDHP, Local Administration , CIs, Grassroots Communities and Pastoral Development Projects, NGOs
		• **Foster development of fodder production in areas where there is relatively better water supply:** o Water diversion and water retention for fodder or forage production o Growing and conservation of adapted species o Promote feed marketing in association with production • Use supplements for dry- season grazing: The prospects for feeding energy and nitrogen supplements (e.g. Urea Molasses Blocks) to pastoralist herds and flocks need to be explored	RPDB, Local government, NGOs & grassroots community
	Lack of timely and accurate livestock early warning information	Create capacity to predict, analyze and package timely livestock early warning information	MoA, RPDBs, NGDHP, CIs, Grassroots Communities and Pastoral Development

Constraints	Reasons behind constraint	Interventions required to address constraints	Responsibility
Lack of knowledge and skills			Projects
		Disseminate accurate and timely livestock early warning information using local languages	RPDBs, NGDHP, Local Administration , CIs, Grassroots Communities and Pastoral Development Projects
	Inadequate preparedness and ineffective response to drought	Promote community-based group enclosures and fodder banks	RPDBs, NGDHP, CIs, Grassroots Communities and Pastoral Development Projects
		Establish feed depots at strategic locations in drought prone environments	MoA, RPDBs and Pastoral Development Projects
		Promote the timely stockpiling of locally available feeds (e.g. grass hay, crop residues, leaves and pods of browse, etc) and create local capacity readily triggered to manufacture and market survival feeds (e.g. MNBs) at times of drought	RPDBs, NGDHP, CIs and Grassroots
		Establishing drought insurance scheme	MoA, RPDBs, NGDHP, Grassroots Communities and Pastoral Development Projects
		Link producers (pastoralists) with traders and consumers including marketing cooperatives in big towns, higher learning institutions, military bases	MoA, RPDBs, CIs, Grassroots Communities
		There is lack of experience and training in the more applied aspects of livestock and Range development and management that needs to be upgraded through practical training of field staff;	MOA, RPDB, NGOs
Inadequate Institutional support services	**Absence or weak advisory service provision**	Reduce the time livestock and range extension staff spend in activities other than livestock/range extension to increase the amount of time spent on livestock/range development	RPDBs, Local Administration , MoA
		Transport communications and other infrastructure (gov't services)	RPDBs, Local Administration , MoA
		Morale among extension staff especially those engaged in livestock extension is often low. Consider incentives to boost moral	MoA, RPDB,
		Organize professional advisory service e.g. on rangeland development and utilization to give support to the pastoral community, staff working with extension staff and the government	RPDB, EMDTI, MoA
	Inadequate institutional support services	Range resource development requires targeted effort in the form of development projects like the 2nd livestock development project to counteract the ever increasing resource degradation and effective utilization problems	RPDB, EMDTI, MoA
		Facilitate availability and accessibility of credit, etc. especially to small feed producers and input suppliers	Financial institutions, local governments
		Increase research support to the Pastoral system. • Increase capacity of the public research sector to generate information on range resources management and development • Explore technology generation through contract research arrangements between the public and private sector (e.g. the feed milling industry)	Research institutions, Universities/Colleges feed manufacturers, RPDB, MoA
		Strengthen input supply for Range improvement	RPDB, NGOs, MoA

Constraints	Reasons behind constraint	Interventions required to address constraints	Responsibility
		Increase extension support to the pastoral livestock system in terms of providing training and technical advisory services	RPDB, NGOs, MoA
		Empower customary institutions and promote participatory management of grasslands	MoA, BoA, professional societies, NGOs and pastoral forums
		Support actions that promote the protection of key grazing resources and encourage the observance of ecologically suitable land uses	MoA, BoA, professional societies, NGOs and pastoral forums

Mixed feed production

Constraints	Reasons behind constraint	Needed interventions	Responsibility
1. Shortage of ingredient supply	Inadequate production	Increase production of raw materials for mixed feed production e.g. Maize, Soybean in terms of yield per unit area and acreage	MoA, BoA/Livestock agency, Research Institutions, Colleges/Universities, NGOs
		Promote contract out-grower schemes of feed production through motivation and support farmers to specialize in feed production.	Farmers, Compound feed manufacturers
		Promote the production of protein concentrates by feed industries to foster home mixing of compound feeds by incorporating farm produced grains like maize	Animal feed manufacturers, MoA, Investment agency, EAFIA
		Strengthen the economic incentives for increased investment in feed production • Making land available for the production of feed ingredients and establishment of feed processing plants • specific loans for feed production/processing • Provision of investment incentives (as is, for example, the case for the flower/horticultural industry) • Consider tax exemption/tax holidays for mixed feed production	MoA/BoA/Livestock agency in conjunction with other concerned bodies (MoT, investment agency, finance institutions
		Promotion of forage based feeding for dairy production to spare concentrates for manufacture of mixed feed for poultry	MoA, BoA/Livestock Agency, NGOs
		Encourage and support feed manufacturers to produce their own ingredients like maize and soybean by making incentives like credit and land available	MoA, BoA/livestock agency, Investment agency , MoI
	Dependence on limited feed ingredient sources	Expand the utilizable feed resource base by fostering applied research on utilization of alternative sources of feed ingredients (especially energy and protein sources)	Research Institutions, Colleges/Universities
	Exports without value addition	Give priority to local use than exports	MoT, MoI, MoA
		Promote value addition before export: • promotion of oil extraction and flour milling factories so that more by-products are made available for use as feed • The advantages and disadvantages of exporting oilseeds without value adding vs. processing locally into oil and oilseed cakes/meals needs to be critically assessed	MoA in conjunction with other concerned bodies (MoT, MoI), research institutions
		Policy decision to spare a proportion of the molasses currently utilized for ethanol production for use as feed. A small quantity of molasses can render large quantities of otherwise unusable by-products into productive feed. It also has a sparing effect on the quantity of grains used for animal feeding	MoA in conjunction with other concerned bodies (MoI etc.)
	Wastage of feed	Decrease wastage during harvest, transport, storage and use	MoA, BoA/livestock agency
		Encourage and enforce the slaughter of animals in abattoirs to save and process slaughterhouse by-products as animal feed ingredients. These are currently largely wasted due to the prevalence of informal animal slaughter	MoA, BoA/livestock agency, Municipalities, Wereda agr. offices
		Increase utilization of underutilized feed resources e.g. • Improve collection and small-scale processing of fish offal that is largely wasted	Research institutes, Universities,

Constraints	Reasons behind constraint	Needed interventions	Responsibility
1. Shortage of ingredient supply (Cont'd…)	Poor efficiency of utilization of available feed resources	• Increase research effort on the utilization of non-conventional feeds.	BoA/livestock agency, Producers, NGOs
		Adoption of the use of balanced "best cost" rations for more efficient and effective utilization of the available feed resources and attain the desired level of productivity. • Training on simple ration balancing/mixing and awareness on the increase in efficiency of feed utilization/reduced wastage through feeding animals based on need and efficiency of use (life cycle feeding); • Adoption of feeding management practices so that livestock are fed according to their requirements to optimize feed utilization efficiency by animals that have special needs like pregnant females and young stock are treated differently. Implementation of targeted allocation of mixed feed to the most responsive livestock	Farming community, pastoralists, feedlots, dairy farms, poultry farmers, MoA, BoA/livestock agency, NGOs, Research Institutes, Colleges/ Universities
		Reduce wastage through: • Promotion of proper feed storage • Appropriate transport • Proper formulation of rations to reduce wastage through increased efficiency of utilization by the target animal • Promote use of appropriate feeders that reduce wastage during feeding	Animal feed manufacturers, MoA, BoA/livestock agency, traders, producers
		Policy support for sustained supply of agro-industrial by-products such as molasses for use as livestock feed	MoA, MoI
		Generate technologies and formulating agro-industrial by-products as supplemental or alternative complete rations	Research Institutions,
		Production and use of total mixed ration (TMR) or multi nutrient blocks (MNB)s or compound rations as production or survival ration or as supplements	Farming community, pastoralists, feedlots, dairy farms, MoA, BoA/livestock agency, NGOs
		An improvement in animal health would enable livestock to make better use of the limited feed resources available. The aim should, therefore, be to improve the health status of livestock to achieve the maximum benefits from better animal nutrition. E.g. the case of parasites	Farming community, pastoralists, feedlots, dairy farmers, MoA, BoA/livestock agency, NGOs
	Shortage of feed ingredient supply	Implement the measures suggested for increasing feed supply above. This will help reduce prices	Animal feed manufacturers, MoA, Investment agency, MoI, farmers, BoA/Livestock agency
	High transport cost	Consider dehydration of wet feeds like Brewers grains and production of dried molasses	Breweries, Sugar factories, MoI, Sugar corporation
		Formation of producer groups, which could transport feeds from long distances in bulk and store for the next seasons.	EAFIA, Feed processors, MoA, BoA/Livestock Agency, NGOs
		Promote bulk transport and storage	EAFIA, MoI, Feed mills
		Commercialization /Promotion of feed production	
		• Enhancing business orientation training and support	EAFIA, MoA, EMDTI, MoT, MoI, Coop agency, NGOs

Constraints	Reasons behind constraint	Needed interventions	Responsibility
2. Soaring feed prices	Poor market orientation of feed production	• Increase awareness of farmers regarding the importance of manufactured feed in improving animal productivity and profitability	MoA, BoA/livestock agency, Feed manufacturers, EAFIA, EMDTI NGOs
		• Improve feed marketing channels e.g. creation of a system of encouragement and incentives to foster the use of commercial compound feeds by animal producers, e.g. organizing a possibility for dairy producers to collect compound feeds from milk collection sites, etc.	Feed manufacturers, EAFIA, MoA, EMDTI, producer cooperatives
		• Introduce different marketing strategies like mini packaging of compound feeds, demonstration of the use and value of compound feeds to small-scale producers, etc. should be promoted	Feed manufacturers, EAFIA
		• Investment promotion in animal feed like organizing exhibitions etc. for increased competition in the feed markets	Feed manufacturers, EAFIA, MoA, EMDTI, MoT
		• Trust building measures like institution of quality assurance to reduce the prevailing mistrust between buyers and sellers of compound feeds	Feed manufacturers, EAFIA, MoA, EMDTI, MoT, Drug and feed regulatory authority
		• Organizing promotional events like exhibitions for public awareness and competitive spirit	Feed manufacturers, EAFIA, MoA, EMDTI
		Upgrade storage capacity so that feed can be purchased and stored at times when it is available at lower cost	Animal feed manufacturers, Financial institutions
		• Boosting commercialization and intensification of livestock production	MoA, BoA, NGOs, Investment Agency and entrepreneurs
		• Foster supply of feed processing and mixing equipment locally by encouraging small-scale production of such equipment by small-scale and micro-enterprises	EAFIA, MoA, EMDTI, MoT, MoI, Coop agency
		Boosting commercialization and intensification of livestock production to foster use of mixed feed	MoA, BoA, financial institutions and Investment Agency

		Foster feed marketing:
		• Develop market places for feeds an important step in the improvement of the operation of the feed market
		• Formation of vertical and horizontal linkages of feed producers to input suppliers, animal producers, cooperatives etc.
		• Encourage cooperative marketing to help reduce the impact of transportation and handling costs
		  ○ Motivate and support the suburb farmers surrounding the towns to specialize in supplying dry season roughage to urban/periurban farms
		  ○ Formation of producer groups, which could transport feeds from long distances and store for the next seasons.
			Animal feed producers, MoA, Cooperative agency, BoA, NGOs, EAFIA members etc.

	Multiple taxation	Avoid multiple taxation that escalates the cost of especially agro-industrial by-products	MoA, MoT, MoI, Revenue authority
		Availing facilities to determine the quality of ingredients within the time required management to make feed formulation decisions on "best" choice of ingredients based on a combination of price and nutritional value.	EAFIA, Animal feed producers, MoA, EMDTI, MoT, MoI

Constraints	Reasons behind constraint	Needed interventions	Responsibility
2. Soaring feed prices (Cont'd…)	Technical/infrastructural problems of the feed industry	Encourage/support feed mills to produce pelleted feed – some advantages of in using pelleted feed, one of which is that it reduces wastage when given to livestock. It also increases efficiency of utilization	Animal feed producers, EAFIA, financial institutions , EMDTI, MoT, MoI
		Help and advise feed processing plants to install liquid mixing accessories (fat and molasses)	Feed manufacturers, EAFIA, MoA, EMDTI, financial institutions , MoT, MoI
		Enhance ingredient and processed feed storage capacity to minimize fluctuations in ingredient and compound feed prices	Feed manufacturers, EAFIA, EMDTI, MoT
		Provide credit services for replacement of obsolete equipment, installation of auxiliary facilities	Financial institutions
		Provide training to personnel on maintenance and overhaul of feed mills	Feed manufacturers, EAFIA, MoA, EMDTI
3.Seasonal variability in feed quality and quantity	Poor public sector capacity for regulatory functions and quality assurance of raw materials and finished feeds	Strengthening the institutional and policy support for enforcement of feed quality standards • Speed up the coming into action of the drug and feed regulatory authority to enforce the regulation on feed quality • Revise the current feed standards and upgrade the "voluntary" standards to "mandatory"	MoA, EAFIA, BoA/livestock agency, donor agencies
		Awareness creation on the usefulness of implementing the quality standards on a mandatory basis to all parties involved	the EAFIA and other professional associations
		Establishment of an award scheme for recognition of consistent compliance to rules and regulations	MoA, EAFIA, the drug and feed regulatory Authority to be established
		Gradually start enforcement of the legislation and routine inspection practices commensurate with the increase in awareness: • Initially, public referral central labs can be established and/or the capacity of the lab at the Ethiopian Quality and Standards Agency (EQSA) be strengthened to support the feed inspection service. • The bigger feed mills should be encouraged to set up their own quality control labs in due course • Accreditation of service laboratories to increase chemical analysis capabilities for faster results • provide producers with simple and inexpensive quality control kits, and educate them to do their own monitoring as is done in some countries • Enforce regulations under which defaulting manufacturers can be reprimanded	MoA, EAFIA, the drug and feed regulatory Authority to be established
	Poor Storage Capacity	**Enhance storage capacity to purchase during times of plenty for use during periods of shortage**	Feed manufacturers, EAFIA,
		Encourage business ventures like UMB and Multinutrient block manufacture as a business venture and also serve as a source of supplement during periods of poor feed supply	
4.Lack of knowledge and skills	Poor access to skill building training	There is lack of experience and training in the more applied aspects of livestock feeding and management that needs to be upgraded through practical training of field staff;	MOA, BoA/livestock agency, NGOs
		Developing knowledge in Animal nutrition, feed formulation adapted to local conditions of animal production and feed milling technology	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops and others

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		upgrading the technological skill of feed mill operators to manufacture quality compound feeds and maintain equipment,	EAFIA, EMDTI, MoA, producers associations, coops and others
		Awareness of feed manufacturers that quality pays and customers of manufactured feeds (animal producers) that "cheap is not always economical." This is key in the enforcement of quality assurance and ultimately development of the feed milling industry and the livestock sector	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops , Colleges/Universities and others
		Equipping extension officers with appropriate skills in: • Feed supplementation packages to help increase the awareness of producers served by the extension agents on the use of compound feeds and consequently increase demand. • Provision of extension services to empower producers to demand for quality feeds	MoA, EAFIA, EMDTI, producers associations, exporters' associations, coops , Colleges/Universities and others
		Provide training on physical tests and judgement of ingredient and mixed feed quality to feed millers, feed buyers etc.	MoA, EAFIA, EMDTI, producers associations,
5.policy and institutional support for the development of the compound feed industry	Absence or weak advisory service provision	Promote use of appropriate technologies by strengthening advisory services	Extension service, private sector, NGOs
		Reduce the time livestock extension staff spend in activities other than livestock/forage extension to increase the amount of time spent on livestock extension	MoA, BoA/livestock agency, Local administration
		Morale among extension staff especially those engaged in livestock extension is often low. Consider incentives to boost moral	MoA, BoA/livestock agency
		The EAFIA come up with an "Animal Feed Service Bulletin" published regularly (quarterly, 6-monthly etc.) that contains results of the analysis and market information on feeds	EAFIA
		Organize professional advisory service e.g. on ration formulation and manufacture to give support to the industry	EAFIA, Private sector, EMDTI, MoA
	Inadequate institutional support services	Facilitate availability and accessibility to credit, land etc. especially to small feed producers and input suppliers	Financial institutions, local governments
		Increase research support to the feed industry. • Increase capacity of the public research sector to generate information on the feeding value of locally available resources through laboratory and field trials and make it available to the industry • Explore technology generation through contract research arrangements between the public and private sector (e.g. the feed milling industry)	Research institutions, Universities/Colleges feed manufacturers
		Strengthen input supply for feed production	MoA, EAFIA, EMDTI, MoT, MoI
		Increase extension support to the feed industry in terms of providing training and technical advisory services	MoA, EAFIA, EMDTI, MoT, MoI
		Enforce the quality control legislation and organize provision of quality inspection service	Drug & feed regulatory authority
	Weak or no producer organizations	Encourage formation of farmers and manufacturers associations to ease extension delivery, acquisition of credit, inputs and other services	MoA, Cooperative agency, BoA, NGOs, EAFIA members etc.

Constraints	Reasons behind constraint	Needed interventions	Responsibility
		Strengthening the Ethiopian Animal Feed Industry Association (EAFIA) to: • Serve as the mouthpiece of members to help solve their problems by bringing the same to the attention of relevant bodies • Set up an agreed vision and mission of the feed industry and help members to work towards that goal • Conduct of dialogue, public hearings, workshops to increase level of awareness, improve feedback mechanism and encourage private sector involvement in policy formulation; • Facilitate and make arrangements for experience sharing visits by members in the feed industry in a developed country and/or locally • Foster linkages with local and international government and non-government organizations for information networking and support to the sector	MoA, Cooperative agency, BoA/livestock agency, NGOs, EAFIA members etc.
5.Policy and institutional support (Cont'd…)	Inadequate policy support	Make policy and institutional arrangement for the regulation and guidance of the animal feed industry. This is necessary to enable all actors in the industry to play their roles effectively	MoA, EAFIA in conjunction with other concerned bodies
		Avoid multiple taxation at different stages of feed production	MoA, MoT, revenue authority, EAFIA & other concerned bodies
		Consider tax exemption/tax holidays for feed ingredients and compound feeds (like many other food items) at least for a period to give the initial push the industry needs to kick off	MoA, MoT, revenue authority, EAFIA, & other concerned bodies
		Give priority to the local feed industry over exports	MoA, EAFIA, other concerned bodies
		Promote involvement of all categories of stakeholders in the animal feeds industry (farmers, animal feeds manufacturers, traders, policy makers, local governments, civic organizations and other service providers in planning and implementation of the animal feeds industry	MoA, MoT, MoI, EAFIA & other concerned bodies
		Encourage regional and international collaboration in the area of feed production, research and quality control	MoA, MoT, MoI, EAFIA, research institutions , drug and feed regulatory authority & other concerned bodies
	Weak national capacity to oversee the progress of the livestock and consequently the feed sector	Creating favorable legal frame work for the sustainable development of the livestock industry	MoA, EAFIA
		Strengthening the capacity of institutions engaged in extension, research/education and regulatory aspects of the feed sector	MoA, BoA, EAFIA, producers associations, exporters'associations, coops and others
		Provide support services that increase productivity, value addition, and market access for livestock products (meat, milk, eggs etc.)	MoA, EAFIA, producers associations, exporters' associations, coops and others
		Formation of a lobby group aimed at inducing private-sector participation in the development of the livestock industry is essential. The functions of such a group could include: • Identifying flaws in livestock policies and taking steps to bring them to he attention of policy makers; • Forging working relations among trading communities, development organizations and policymakers; and • Creating forums whereby policy dialogue can take place with relevant bodies on all issues related to improving the participation of the private sector in the livestock industry development process	ESAP, EAFIA