



Report describing the indicators, data collection and processing procedures, and recommendations of those organisations where indicator data can be obtained from for the agriculture sector in the Kingdom of Eswatini

Deliverable 8

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Acronyms and Abbreviations

ACAT	Africa Cooperative Action Trust
CSER	Centre for Sustainable Energy Research
ESWADE	Eswatini Water and Agricultural Development Enterprise
INDC	Intended Nationally Determined Contribution
MNRE	Ministry of Natural Resources and Energy
MoA	Ministry of Agriculture
MoH	Ministry of Health
MEPD	Ministry of Economic Planning and Development
MTD	Ministry of Tinkhundla and Development
MTEA	Ministry of Tourism and Environmental Affairs
NDMA	National Disaster Management Agency
NERMAP	National Emergency Response Mitigation and Adaptation Plan
UNESWA	University of Eswatini
UNFCCC	United Nations Framework Convention on Climate Change

Summary

This is a brief report describing the indicators, data collection and processing procedures, and recommendations of the organisations where indicator data can be obtained from for the agriculture sector.

Introduction

The Kingdom of Eswatini developed its Intended Nationally Determined Contributions (INDC), now referred to as Nationally Determined Contributions (NDC) and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, which presented its proposed actions in reducing Greenhouse Gas (GHG) emissions and building resiliency to climate change. The country is currently in the process of reviewing and updating its NDC to increase its ambition towards achieving the Paris Agreement.

This project (consultancy), therefore, aimed to support the Ministry of Tourism and Environmental Affairs (MTEA) in developing the revision to the NDC submitted to the UNFCCC through supporting the development for Tier 2 GHG inventory in the livestock sector, providing recommendations on possible next steps towards a low carbon livestock sector, and development of an assessment of the potential to reduce GHG emissions across the agriculture sector in the Kingdom of Eswatini.

This report briefly describes the climate change indicators, data collection and processing procedures, and recommendations of the organisations where indicator data can be obtained for the agriculture sector.

Climate Change Indicators, data collection and processing procedures, and recommendations for organisations

This assignment was aimed at using T2EFs for the livestock sector in the Kingdom of Eswatini, to enhance the review and updating of the Nationally Determined Contribution (NDC). The country's first NDC target for the agriculture sector is to increase the contribution of agriculture to economic development, to support both food security and exports, as well as to reduce poverty and improve food and nutrition security through sustainable use of natural resources, improved access to markets, and improved disaster and risk management systems by 2030. Table 1 present indicators that are useful in tracking progress towards the implementation and achievement of the NDC to meet the 2030 targets, especially monitoring the contributions of the agriculture sector towards the 2030 climate change mitigation targets. The quantitative indicators are shown in Table 1 and cover the following target areas:

- Improved animal genetics and breeding to increase productivity in the beef and dairy products
- Reduced population of none or less productive animals

- Improved digestibility of pastures through introduction of forage legumes or fodder trees
- Efficient use of crop residues through fortification
- Improved grazing management systems
- Introduction of better systems to manage manure from livestock
- Use of bio-gas digesters
- Improved the drought management plan for future events
- Improved animal health and husbandry
- Increased beef productivity

Table 1 The indicators and data collection sources

Indicators	Data collection & Processing	Organization where indicator data can be sourced	Line Ministry
Supporting indicators on reduction of GHG emissions from the livestock sector through improved animal genetics and breeding to increase productivity in the beef and dairy products			
At least one national artificial insemination (AI) centre A percentage of cattle included in artificial insemination programmes.	Livestock sector briefs, MoA (Livestock Unit) Annual performance reports	ESWADE, MoA (Livestock Unit), Ministry of Economic Planning and Development (MEPD)	MoA MEPD
Training programmes on AI for extension officers and farmers	Annual reports on trained extension officers and farmers from both SNL and TDL areas	UNESWA, ESWADE, MoA (Livestock Unit)	MoA
Supporting indicator on reduction of GHG emissions from the livestock sector through reduced population of draught animals			

Decreased number of draught animals nationally, and increased number of productive livestock	Annual livestock census, MoA (Livestock Unit) Annual performance reports	MoA (Livestock unit)	MoA
Supporting indicators on reduction of GHG emissions from the livestock sector through improved digestibility of pastures through introduction of forage legumes or fodder trees			
Established rangelands management committees Percentage of livestock feed requirements met by different feed types (such as pasture, crop residues, concentrates etc.)	Annual rangelands assessment	Local traditional authorities and development committees, Range management office (MoA)	MoA Ministry of Tinkhundla and Development (MTD)
Developed community land use map	Land use maps updated annually	Surveyor General's Office, Range management office (MoA)	Ministry of Natural Resources and Energy (MNRE) MoA
Controlled grazing in zoned/demarcated rangelands/grazing areas	Community-based rangeland information base and management reports	Local traditional authorities and development committees, Range management office (MoA), World Vision	MoA MTD
Community rangelands/grazing lands with planted legumes and/or fodder trees	Annual rangelands assessment	Range management office (MoA), World Vision	MoA

Supporting indicator on reduction of GHG emissions from the livestock sector through efficient use of crop residues through fortification			
Efficient use of crop residues through fortification	Annual surveys on users of biodigesters on both SNL and TDL	ESWADE, Malkerns Research Centre, UNESWA	MoA
Supporting indicator on reduction of GHG emissions from the livestock sector through improved grazing management systems			
Improved grazing management systems nationally	Annual rangelands assessment	MoA (Livestock unit), Micro-projects	MoA
Supporting indicator on reduction of GHG emissions from the livestock sector through improved manure management systems			
Improved manure management systems nationally and increased number of farms where daily spread is practised	Annual livestock census	MoA (Livestock unit)	MoA
Supporting indicators on reduction of GHG emissions from the livestock sector through improved bio-gas generation and usage			
Bio-gas generation from the agriculture sector and improved usage Tonnes of manure treated using anaerobic digesters Annual capacity of anaerobic digesters	Inventory of national bio-gas generators, Annual performance reports	Department of Energy (MNRE), ACAT, UNESWA, ESWADE, MOA	MoA
Supporting indicators on reduction of GHG emissions from the livestock sector through improved the drought management plan for future events			

Improved and efficient early warning systems	Vulnerability assessment & analysis reports, Reviews on implementing NERMAP	NDMA, Department of Meteorology (MTEA), ESWADE, UNESWA, MOA	MoA MTEA
Improved water availability in rangelands groundwater sources	Community-based rangeland information base and management reports, MoA (Livestock Unit) annual reports	Department of Water Affairs (MNRE), ESWADE, WaterAid Eswatini, MoA, Micro-projects	MoA MNRE
Supporting indicators on reduction of GHG emissions from the livestock sector through improved animal health and husbandry			
Number of extension officers	Livestock sector briefs, MoA (Livestock Unit) Annual performance reports	MoA (Livestock unit), ESWADE	MoA
Training programme(s) on animal health and husbandry for both SNL and TDL farmers	Annual reports on training programmes and trained farmers in both SNL and TDL	UNESWA, ESWADE, MoA (Livestock unit)	MoA
Supporting indicators on reduction of GHG emissions from the livestock sector through increased beef productivity			
Livestock feed production programmes targeting both SNL and TDL farmers	Annual reports on undertaken trainings and trained farmers	ESWADE, MoA	MoA

	in both SNL and TDL		
Improved quality of beef outputs	Quarterly beef slaughter reports, Livestock sector briefs	Eswatini Meat Industries, Eswatini Meat Wholesalers, ESWADE, MoA	MoA
Supporting indicators on reduction of GHG emission for other non-livestock Agricultural sector focused on energy			
Renewable energy use in Agriculture	Biomass co-generation of electricity (% to electricity usage)	MNRE and Research institutions including the CSER	MNRE/MoA
	Solar irrigation (ha)	MNRE and Research institutions including the CSER	MNRE/MoA
	On-farm biodigesters	MNRE and Research institutions including the CSER, ESWADE	MNRE/MoA
Decarbonisation of sugar cane farming, harvesting, and processing	Harvesting of sugarcane farm hectares	Sugar cane growers	Ministry of Agriculture
Air particulates from sugar burning in the atmosphere	Surveys	MoH and Research institutions including the CSER	Ministry of Health

Barriers and measures identified, and adoption rates estimated by stakeholders

A stakeholder meeting was held to validate the agriculture sector mitigation analysis. A template developed by Price Waterhouse – Coopers was used to carry out the activity. The stakeholders identified the barriers to implementing the mitigation actions. They also made recommendations (measures for overcoming the barriers). Lastly, stakeholders also estimated adoption rates for each mitigation action for both SNL and TDL systems in

Eswatini. These identified barriers and recommendations, as well as the adoption rates are presented in Table 2.

Table 2 NDC targets, indicator, barriers, recommendations and adoption rates for the Agriculture sector

Mitigation Measures	Target	Adoption rates (%)		Barriers	Recommendations
		SNL	TDL		
Artificial Insemination	Improve animal genetics and breeding to increase productivity in the beef and dairy products	50	80	<ul style="list-style-type: none"> • No AI centre in Eswatini • Dairy board more into dairy limited to dairy livestock • Poor AI skills in extension service as well as farmers, • High AI costs • Poor head management and adoption rates 	<ul style="list-style-type: none"> • Establish AI centre to provide service to farmers at a reasonable cost, • Control herd management (paddocks)
Reduce draught animal population (Oxen)	Reduce the population of none or less productive animals	30	90	<ul style="list-style-type: none"> • Cultural/Emotional attachment to livestock 	<ul style="list-style-type: none"> • Restructure herd composition instead of reducing the population

Increment the digestibility of pastures, introduction of legumes	Improve digestibility of pastures through introduction of forage legumes or fodder trees	40	20	<ul style="list-style-type: none"> • Poor management of communal grazing land (grazing lands managed by Chief) 	<ul style="list-style-type: none"> • Rangelands need to be demarcated and allocated to specific dip tanks • Planting of forage legumes and/or fodder trees should be done in rangelands to improve them • Committees to control and improve through a 99 years lease should be established in SNL • Community land use map clearly demarcating grazing areas should be developed and continually updated
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Use of urea for crop residues	Efficient use of crop residues through fortification	70	70	<ul style="list-style-type: none"> • Availability, collection, and transportation of the residue is an additional cost • Most farmers do not keep livestock for commercial purposes 	<ul style="list-style-type: none"> • Crop residues from dryland farming should be fortified • Promote commercialization of livestock on SNL
Manure management in daily spread	Improve grazing management systems	20	100	<ul style="list-style-type: none"> • Night kraaling favoured by Emaswati farmers 	<ul style="list-style-type: none"> • farmers should increase free ranging, links to improving digestibility
Manure management dry lots	Introduction of better systems to manage manure from livestock	30	NA	<ul style="list-style-type: none"> • Collection of the raw material (cattle manure) - a critical mass to warrant further processing 	<ul style="list-style-type: none"> • Take advantage of the vemi compost initiative by encouraging farmers to collect and sell cow dung
Manure management in anaerobic digesters	Use of bio-gas digesters	5	2	<ul style="list-style-type: none"> • Technology and costs, quantity of manure not enough 	<ul style="list-style-type: none"> • Promote technology in feedlots and dairy farms with the

					right economies of scale
Drought management	Improve the drought management plan for future events	NA	NA	<ul style="list-style-type: none"> • Drought preparedness is weak (Early warning systems inefficient) 	<ul style="list-style-type: none"> • Strengthen early warning systems • Increase availability of water in rangelands groundwater sources
Reduced mortality and increased fertility rates	Improve animal health and husbandry	80	80	<ul style="list-style-type: none"> • Resources for capacity building exercises to farmers • inadequacy of extension officers 	<ul style="list-style-type: none"> • Training of farmers, increase number of extension officers
Livestock: Promote feed lotting using grain diets	Increase beef productivity	80	80	<ul style="list-style-type: none"> • Livestock not kept for commercial purposes • Stock unavailability • High cost of feed 	<ul style="list-style-type: none"> • Farmers should be assisted to prepare own feed to reduce feed cost

				<ul style="list-style-type: none">• High maintenance costs	
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