

Annual Operational Plan

**Directorate:
Agricultural Resource Management**

**Sub-Directorate:
Natural Resources**

Financial year: 2019-2020

**FELICITY MITCHELL
Scientific Manager**

05/03/2019

1. Introduction

Vision

To characterize, enhance resilience and productivity of the natural resources of KZN.

Mission

The Natural Resources Subdirectorate (NRS) serves to characterize the natural resources of KZN (land, vegetation, climate, terrain), optimize agricultural potential and enhance productivity and resource resilience through sustainable natural resource management in KZN.

The Section is headed by a Scientific Manager and comprises Production Scientists in various disciplines (soil, veld, climate, hydrology) as well as GIS specialists who undertake the use, administration and safekeeping of spatial data of DARD, one technician and an administrative officer.

2. Customers and socio-economic impact

Clients of NRS are Extension Services, commercial and small-scale farmers, agricultural supplier companies, students, municipalities, land use consultants and the general public.

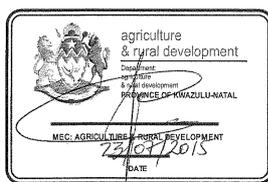
The nature of the work is such that the natural resources of KZN are assessed, classified, researched and managed to optimize their productivity whilst ensuring sustainable use and reducing the threat of degradation. Provincial databases are improved and maintained to facilitate spatial representation of the resources of KZN.

The technology transferred to the various clients serves to improve natural resource management (NRM) and the understanding around sustainable utilization of resources as well as protect high value agricultural land from non-agricultural use. This, in turn, will prevent the loss of highly productive land, improve production and increase profitability and household food security, whilst conserving a sustainable environment.

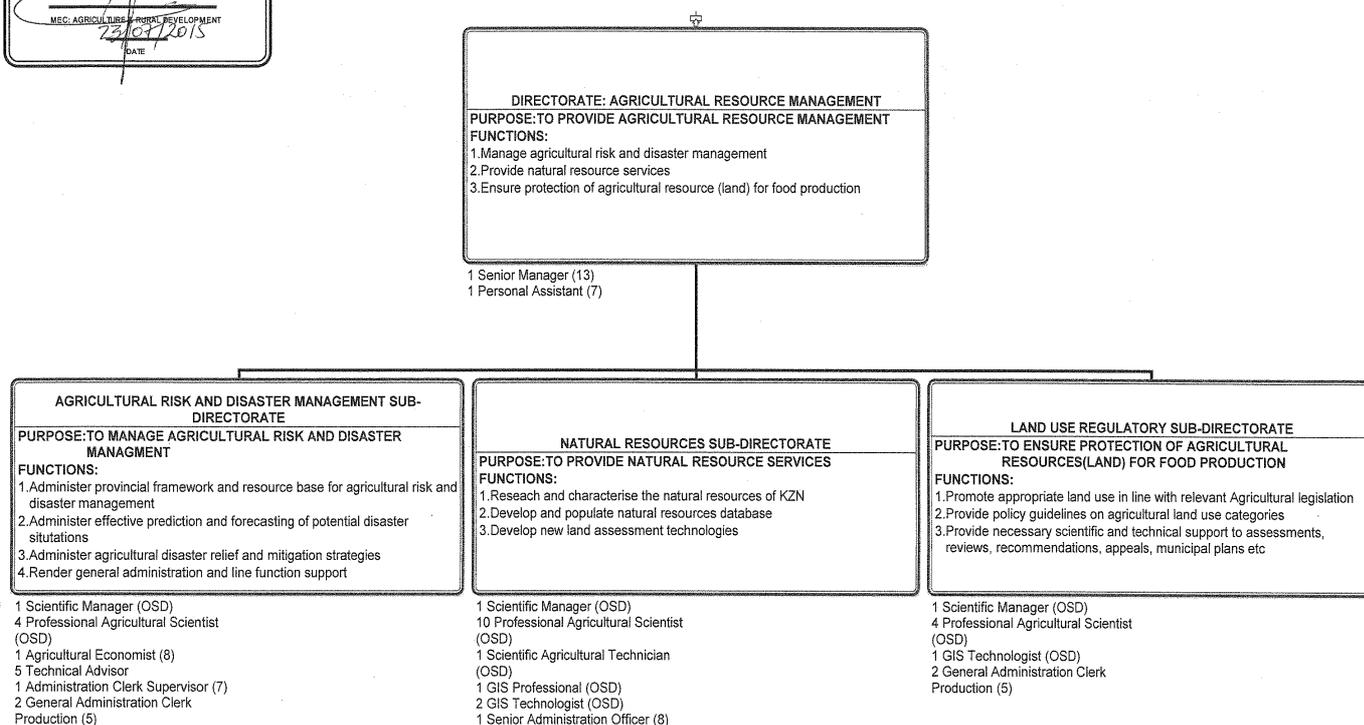
3. The focus of the Section is:

1. To identify, survey and research current land use, soil types, veld condition and land degradation in the Province on a scientific basis.
2. To develop, improve and maintain Provincial soil, vegetation and other spatial databases for land use planning and preservation of high value land.
3. Develop the Bioresource Programme by compiling additional resource data, improve data accuracy and determine agricultural potential and sustainability for land use planning.
4. To develop new technologies for land assessment and improve natural resource management to enhance economically and environmentally sustainable agriculture.
5. To transfer technology and skills through mentorship and training.

4. Staff component
The Subdirectorate



DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT
ORGANISATION AND POST ESTABLISHMENT STRUCTURE JULY 2015



Designed and maintained by the Directorate: Management Advisory Services

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5. The aims and the objectives (Key Results Areas) of the Section are:

1. Conduct research projects with practical application to improve NRM Develop spatial decision support tools for sustainable land use management (Bioresource Programme, GIS, Remote sensing).
2. Undertake surveys and land use plans to preserve agricultural land for sustainable production
3. Transfer technology
4. Personnel training and skills development
5. Administrative tasks
6. Networking and linkage with relevant organizations

6. Research Projects: Natural Resources

Project Number	Researcher/s	Short Title	Objectives	Start & Finish (year)	Linkages with MTSF & PGDP	Outputs for the year
PEDOLOGICAL RESEARCH						
NRS 2016/01/SR	K Barichiev	Spatial Variability of Key Pedological and Chemical Indicators under various land uses	<ol style="list-style-type: none"> 1. Comparing pedological and chemical boundaries in various crops on yield variability 2. Spatial homogeneity between chemical and current farm management 3. Chemical indicators mapping at various profile depths 	2016 – 2020 On-going	MTSF outcome 7; PGDP 1, 9, 11, 21.	Progress reports Presentations Publications
VEGETATION RESEARCH						
NRS 2016/01/VR	M Keith	Impact of natural resource management practices on the vegetation of the Maputaland Coastal Grasslands	<ol style="list-style-type: none"> 1. Measure the species composition for grass, forbs and woody vegetation 2. Calculate veld condition and grazing capacity for the different grazing systems 	2016-2019 Completed	MTSF outcome 7; PGDP 1, 9, 21, 23, 24	Progress report Final publication
NRS 2016/02/VR	M Keith	Impact of Curry's Post weed on Rangeland in KZN	<ol style="list-style-type: none"> 1. Measure the species composition for grass, forbs and woody vegetation 2. Calculate veld condition and grazing capacity for the different grazing systems 	2019-2020 New project on-going	MTSF outcome 7; PGDP 1, 9, 21, 23, 24	Progress report Final publication Presentation
NRS 2016/03/VR	J Botha	Elephant Impact Assessment on Rangeland	1. Biennial monitoring of the impact of elephant on rangeland in Nambiti Game Reserve	2016- On-going	MTSF outcome 7; PGDP 1, 9, 21, 23, 24	Publications Presentations

NRS 2017/01/VR	J Botha	Application of Remote Sensing Derived Products for Rangeland Management in KZN	<ol style="list-style-type: none"> Using RS to calculate carrying capacity modelling Using RS to calculate carrying capacity modelling 	On hold until we can appoint remote sensing capability	MTSF outcome 7; PGDP 1, 9, 21, 23, 24	Publications Presentations
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CLIMATE AND HYDROLOGICAL RESEARCH

NRS 2015/01/CR	D Chapman	Analysis of weather data for improved modelling and climate change trends	<ol style="list-style-type: none"> Analysis of long running climate records to improve the accuracy of the data in the BRP Analysis of KZN climate for the over-wintering of Fall Army Worm 	2016 – 2020 Ongoing	Outcome 7 of MTSF PGDP 1, 9, 11, 21, 23, 24.	Progress Report Presentations 1 publication (2019)
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APPLIED RESEARCH

NRS 2009/01/AR	F Mitchell	Improving the Production of Sugarcane of Small Scale Growers In The Noodsberg Area	<ol style="list-style-type: none"> To match agronomic practices to the resource base To grow suitable seedcane for local small sugarcane growers To assess the value of technology transfer and adoption. To evaluate demonstration plots as a site for training, technology transfer, evaluating varieties under local conditions and seedcane nurseries. 	2009 – ongoing	MTSF outcome 7; PGDP 1, 9, 11, 21.	Progress Report Publications Presentations
NRS 2013/01/AR	F Mitchell	The Impact of Soil Type on Sugarcane yield and management	<ol style="list-style-type: none"> To assess the economic value of good agronomic practices based on soil form. The assessment of variety and herbicide choice based on soil form 	To be proposed 2019	MTSF outcome 7; PGDP 1, 9, 11, 21.	Progress Report Publication Presentation

7. Mentorship and In-field Training

Project Number	Researcher	Short Title	Objectives	Start & Finish (year)	Linkages with MTSF & PGDP	Outputs for the year
NRS 2012/01/DEM	F Mitchell	Small sugar demonstration plots	To implement correct agronomic practice and effect training of SSG's and extension staff	2012 – on-going	MTSF outcome 7; PGDP 1, 9, 11, 21.	Annually 5 demonstration days with lectures and practicals
NRS 2015/02/DEM	C Botha/M Keith/J Taylor	Rangeland condition assessment and survey data collection	To ensure the effective utilization and management of rangelands in KZN	ongoing	MTSF outcome 7; PGDP 1, 9, 11, 21.	Annually 5 demonstration days with lectures and practicals
NRS 2015/03/DEM	C Botha/M Keith/J Taylor/ F Mitchell/K Barichievy	Soil classification and land assessment and survey data collection	To ensure sustainable land use planning and match enterprises to soil type in KZN	ongoing	MTSF outcome 7; PGDP 1, 9, 11, 21.	Annually 6 demonstration days with lectures and practicals

8. Other Projects

Project Number	Researcher	Objectives	Start & Finish (year)	Outputs for the year
Land capability & Agro-biodiversity zones verification	All NRS staff	To undertake groundtruthing of the land capability dataset to improve the accuracy of information used for planning	Per spatial unit eg. Local Municipal Boundary annually	A verified dataset as to land potential to guide municipal and other plans so as to preserve agricultural land for food security

BRP updates	D Mashele and other staff	To undertake updates of the BRP to improve the accuracy of information used for planning	On-going	An updated dataset to improve the quality of information held in the Bioresource Programme to guide municipal and other plans so as to preserve agricultural land for food security
Cedara and Kokstad Farms shapefiles and databases	D Chapman	Develop shapefiles of the Cedara and Kokstad Research Farms (fields and rangeland for resource management planning)	2017-2021	A verified and accurate dataset of the Cedara and Kokstad farm field and rangeland boundaries to effect better resource management. Bartlow Combine, OSCA and Makhatini and Dundee to follow.

9. Undertake Surveys and Land Assessments to ensure Sustainable NRM

Specialist Field	Researchers	Objectives	Start & Finish (year)	Outputs for the year
Soil surveys	Soil Scientists (assisted by other staff)	To undertake soil surveys and to assess land potential with recommendations on appropriate land use and management	On demand and as part of the BRU/Land categories verification process.	Spatial data layer mapped Soil survey report completed and published as Agri Report in Library Data added to Provincial dataset and BRP
Vegetation surveys	Grassland Scientists (assisted by other staff)	To undertake vegetation (grass and bush) surveys and to assess grazing potential with recommendations on appropriate land use and management	On demand and as part of the BRU/Land categories verification process.	Spatial data layer mapped Vegetation survey report completed and published as Agri Report in Library Data added to Provincial dataset and BRP
Land use assessments	Production scientists and scientific manager	To undertake land use surveys which include both soils and vegetation surveys to assess land potential with recommendations on appropriate land use and management	On demand and as part of the BRU/Land categories verification process.	Spatial data layer mapped Land assessment report completed and published as Agri Report in Library Data added to Provincial dataset and BRP
Support to Strategic Projects	All staff	To provide specialist support to all strategic project as requested including the Provincial Agricultural Masterplan.	On demand and if capacity allows	Specialist reports/information/maps and datasets

10. Technology Transfer

Actions	Name	Outputs for the year
Soil Classification Short Course (May)	NRS scientists	To transfer appropriate technologies on the identification of soil form and family, land capability and soil potential for agricultural production. It includes the identification of wetland soils and the delineation of wetland boundaries. Target: all farmers, planners and extension staff. Course notes will be provided and practical demonstrations conducted.
Bioresource Programme Introductory Course	D Mashele	To familiarize land use planners and extension staff on the interpretation of natural resource information accessed through the Bioresource program to guide appropriate land use across KZN. Course notes will be provided and practical demonstrations conducted
Bioresource Programme Advanced Course	D Mashele	The use of the Bioresource program and its associated mapping tools and querying capabilities to guide appropriate land use across KZN. Course notes will be provided and practical demonstrations conducted
Veld Management Course	NRS scientists	The identification of grass species, calculation of veld condition and management of veld in the various Bioresource Groups of KZN. Course notes will be provided and practical demonstrations conducted
South African Soil Surveyors Organization (SASSO)	NRS Field scientists	Quarterly workshops are held across SA at which soils are classified and appropriate land use is discussed, improving the understanding of pedogenic processes and chemical and physical properties of soils, and their potential to produce or perform other ecosystem services. Improved skills and advisory.
Scientific Symposia and Congresses	Relevant staff	Annual symposia and Congresses are attended and staff present research findings and publish scientific journal articles on research projects undertaken each year in various specialist fields (vegetation, soils, land use, climate, GIS, remote sensing, modeling).
DARD Research Symposium	Relevant Staff	To publicize the activities and research results of NRS to fellow researchers and Extension staff. Documentation will be provided.

Actions	Name	Outputs for the year
Agri-Reports (Cedara Library)	Relevant staff	Land use assessment reports and other natural resources specialist reports are published as reference documents in the Cedara Library as and when completed. These serve to document the findings of various investigative surveys and add data to the Provincial datasets.
<i>Ad hoc</i> specialist advice and documents to clients	Relevant staff	To provide relevant advice to clients either verbally, as reports, BRU reports or electronically, in response to information (data) request forms, emails, in person..
Invitations to present at various for a including planning meetings, information and farmers days etc	Relevant staff	To transfer the latest developments by the Unit with GIS, remote sensing, topics of interest and sustainable land use.
Input at Provincial, National and International policy fora	Relevant staff	Invited members of various Committees to give input on policies, legislation and planning to ensure the preservation and sustainable utilization of agricultural resources.

11: Personnel Training

Actions	Name	Outputs for the year
Attend relevant courses	Relevant Staff	Some staff will attend certain short courses to increase their knowledge.
Attending congresses, symposia, workshops, farmers days and other technology transfer events	Relevant Staff	Staff will attend relevant for a so to improve their knowledge and ensure professional development goals are met in terms of SACNASP and other council requirements.

12: Administrative Duties

Actions	Outputs for the year
Procurement & Budget Management	To procure the necessary equipment, inputs and other goods necessary for the Section.
Employee Performance Management Systems	To complete and submit all the required documents
KZN Pool and Subsidized vehicles	To complete and submit all the required documents and log sheets so that records of the vehicles' usage can be determined and sub-vehicle claims can be made.
Leave	To complete and submit leave forms.
S&T claims	Complete and submit the relevant forms.
Operational Plans	Operational Plan submitted
Quarterly and Annual Service Delivery Reports (APP Targets)	Quarterly reports submitted
Standard Operating Procedures (SOP's)	Developed and upgraded annually or as required

13: Networking and Linkages

Actions	Name	Outputs for the year
Extension staff	All staff as required	Networking & Advice
KZNDARD Research	All staff as required	Networking within Cedara
Universities	All staff as required	Networking
A.R.C.	All staff as required	Networking
Sugar Association	All staff as required	Networking
ICFR	All staff as required	Networking
Agri-Business firms	All staff as required	Networking
Scientific Societies	All staff as required	Attend congress & networking
International experts	All staff as required	Networking