MASTER OF SCIENCE IN MANAGEMENT OF NATURAL RESOURCES AND SUSTAINABLE AGRICULTURE (MSc. MNRSA)

13.1.0 NATURE OF THE PROGRAMME

13.1.1 Name of the degree
The degree is called Master of Science in Management of Natural Resources and Sustainable Agriculture (MSc. MNRSA).

13.1.2 Regulations and Guidelines for MSc. MNRSA
The current regulations and guidelines for higher degree at Sokoine University of Agriculture as stipulated in the Prospectus and in the “Regulations and Guidelines for higher degrees” apply except where indicated otherwise.

13.2.0 COURSE STRUCTURE AND CONTENTS

13.2.1 Course Structure

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ELECTIVE COURSES

| MN 606      | Ecology and Tropical Biology                                       | 2.0     |
| MN 607      | Social Anthropology                                               | 1.0     |
| MN 608      | Sustainable Agriculture                                           | 1.0     |
| MN 609      | Development Economics                                             | 1.0     |
| MN 610      | Project Appraisal                                                 | 2.0     |
| MN 611      | Applied Social Anthropology                                        | 1.0     |
| DS 604      | Political Economy and Agrarian change                              | 2.0     |

13.2.2 Course contents
13.2.2.1 University wide courses

**AEA 600**  **Statistics**  (3.0 credit hours)

**Objective:**
To give an introduction to the basic statistical models and methods that are used in applied research.

**Contents:**
See 1.2.2

**EE 600**  **Research Planning and Management**  (2.0 credit hours)

**Objective:**
To give an overview of various research methods and to prepare the students for their field research and dissertation work.

**Contents:**
See 3.2.2

**AE 601**  **Introduction to computer programming**  (1.5 Credit hours)

**Objective:**
To introduce students to the basic concepts of computer programming

**Contents:**
Computer concepts: general description of computers; hardware versus software. Algorithms; design and construction. High level languages e.g. PASCAL, QBASIC, C etc Programming techniques: treatment of sequences of data; searching in tables; sorting; etc. Software packages – examples and application: e.g. computer aided design, electronic circuit analyses.

13.2.2.2 Faculty compulsory courses

**MN 601**  **Conservation and Management of Natural Resources in the tropics**  (2.0 credit hours)

**Objective:**
To acquire ecological principles in conservation and management of natural resources in the tropics. To demonstrate linkages between natural and social sciences.

**Contents:**
Global environmental issues: Potential climate changes (global warming): Loss of genetic resources and biodiversity; Inappropriate agricultural practices (with respect to potential for sustainability) and their effect on soil, vegetation and water resources.


Problem oriented case studies on topics of relevance to the tropics not covered in formal lectures. Topics will be assigned to students in groups of not more than four members.

**MN 602 Resource Economics** (2.0 credit hours)

**Objective:**
To give insights into general economic concepts and economic analysis. To give knowledge of concepts, theories and methods within environmental and resource economics. To show examples of how theories can be applied in practical problems in low income countries.

**Contents:**
*Part 1: Macroeconomics and welfare theory*

*Part 2: Resource economics*
Time and natural resource use. Optimal use of non renewable resources. Optimal use of renewable resources. Land tenure and resource use. Production economics.

**MN 603 Tropical Production Systems** (3.0 credit hours)

**Objectives:**
Understanding the farm as a production system depending on interactions with and management of the natural resource base, and also characterized by internal interactions within the system. Learning methods of agricultural systems research.
Contents:
Agro-ecological analysis of farming systems, cropping and livestock systems including mixed farming and pastoral systems, management of genetic resources, management of soil resources, indicators of sustainable farming system, agricultural systems research methods.

MN 604 Seminar (2.0 credit hours)

Objectives:
This is the backbone course to this programme. Each student will is required to give a seminar as instructed by the Lecturer in charge. Seminar topics cut across all courses and other pertinent issues in the world.

Contents:
Case studies, discussion papers, articles, guest lectures and group work related to topics such as sustainable resource use, distribution and control of resources, food security, population expansion, indigenous knowledge and genetic resources.

MN 605 Resource Assessment (2 credit hours)

Objectives:
To give broad introduction to resource assessment techniques.

Contents:

13.2.2.3 Optional Courses

12 MN 606 Ecology and Tropical Biology (2.0 credit hours)

Objectives:
To acquire basic principles in ecology at sufficiently broad level to understand and follow advanced course in applied ecology and management of natural resources.

Contents:
Review of basic concepts of ecology: Ecosystems; Energy budgets; Nutrient flow, population dynamics and demography; Evolutionary biology; Community structure and function; Biodiversity. Biogeography and ecological characteristics of major tropical
formations; Tropical forests, savannahs and deserts. Human ecology (food acquisition strategies, population dynamics, ecology and human diseases) and principles of nature conservation.

MN 607      **Social Anthropology** (1.0 credit hours)

**Objectives:**
To introduce students to the basic concepts and theories in social anthropology, and to illustrate how the discipline can contribute to natural resources management.

**Contents:**
Basic anthropological theory: the concepts of culture and society, modes of social organization etc and ecological approach in anthropology, and the concept of indigenous technical knowledge.

MN 608      **Sustainable Agriculture** (1.0 credit hours)

**Objectives:**
To introduce students to the basic concept and theories in sustainable agriculture and to promote understanding of the interrelationships of interdisciplinary issues relevant to the management of natural resources.

**Contents:**
*Part 1: Bio-physical aspects of Sustainability*

*Part 2: Farming systems and cropping management*
Agro-ecology and alternative agriculture, Crop rotation, residue management, integrated pest management, plant protection, genetic resources, biodiversity conservation, cropping systems, agro forestry and agricultural ethics.

*Part 3: Socio-economic aspects of Sustainable Agriculture.*
Community and institutional factors. Local economy, organisational structure and impacts of sustainability to economic productivity. Environment and people.

MN 609      **Development Economics** (1.0 credit hours)

**Objectives:**
To give a broad introduction to development economics and development theory.
Contents:

MN 610       Project Appraisal (2.0 credit hours)

Objectives:
To give an introduction to project appraisal techniques, focussing on cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA). After the course the student should be able to carry out CBAs and evaluate and co-ordinate project appraisals.

Contents:

Discounting, Risk and uncertainty. Decision criteria. Case studies and exercises.

MN 611       Appraisal Social Anthropology (1.0 credit hours)

Objectives:
To demonstrate how anthropological models and methods can be applied in practical fieldwork.

Contents:
In the first part of the course focus is on anthropological models and methods particularly relevant to natural resource management. In the second part, examples are given on how these models have been applied in practical fieldwork. In the third part, the students utilize their anthropological skills to make an analysis of a central sociocultural feature selected from local communities.

DS 604       Political Economy and Agrarian Change (2.0 credit hours)

Objectives:
To introduce political economic concepts and interpretations of development, environment, natural resource management and social justice.

Contents:
This course examines the process that make rural societies what they are, what factors bring socio-economic change. It examines the social relationship as a whole and sees how
they influence the structure of ownership of resources. It also examines how this structure of ownership affects the course of development in rural societies.