Food and Agriculture Organization of the United Nations

The status of disaster risk management education in agriculture universities/colleges of Ethiopia

Cover photo: *Bahir Dar University 2013, DRSSD, MSc graduates (©Tesfahun Asmamaw)*

The status of disaster risk management education in agriculture universities/colleges of Ethiopia

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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Acknowledgments

This Explanatory study on the Status of Disaster Risk Management Education in agriculture universities/colleges of Ethiopia was prepared to assess the current status of Disaster Risk Management (DRM) education in agricultural universities/colleges of Ethiopia by integrating DRM issues in their core business processes: teaching-learning, research and community service. This report was submitted and presented to FAO Ethiopia Food and Nutrition Team in 2013 during my internship at FAO.

I gratefully acknowledge the contributions of Bahir Dar University (College of Agriculture and Environmental Sciences), Mekelle University (Collage of Dry land Agriculture and Natural Resource), Jigjiga University (College of Dry land Agriculture) and Jimma University (College of Agriculture and Veterinary Medicine), college deans, programme/department representatives, research and community service coordinators, and BDU higher officials for enabling me to complete this research. Most of all I would like to acknowledge Food and Agriculture Organization (FAO Ethiopia) for the technical and financial support. Any errors and omissions are those of the authors.

Acronyms and Abbreviations

BDU	Bahir Dar University
CAES	College of Agriculture and Environmental Sciences
CDANR	College of Dry land agriculture and natural resource
DRM	Disaster Risk Management
DRM-ATF	Disaster Risk Management- Agriculture task Force
DRMESMF	Disaster Risk Management Environmental and Social Management Framework
DRMFSS	Disaster Risk Management and Food Security Sector
DRMSD	Disaster Risk Management and Sustainable Development
DRR	Disaster Risk Reduction
DRSSD	Disaster Risk Science and Sustainable Development
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
HFA	Hyogo Framework for Action
IGAD	Intergovernmental Authority on Development
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
JUCAVM	Jimma University, College of Agriculture and Veterinary Medicine
KII	Key Informant Interview
LRMTP	Land Resources Management and Environmental Protection
NGO	Non-Governmental Organization
PG	Postgraduate
SPIF	Strategic Program and Investment Framework
UG	Undergraduate
UNISDR	United Nations International Strategy for Disaster Reduction

Executive Summary

As Ethiopia is one of the world's countries suffering by frequent disasters, the country needs to focus on strengthening universities' capacity on being both an effective local and global knowledge base for addressing localized environment and disaster management. In order to jointly promote and facilitate the mainstreaming of broader ex-ante disaster risk reduction into national and sector programmes in collaboration with Ethiopian universities, this study was initiated by Food and Agriculture Organization (FAO) to assess selected Ethiopian universities/agriculture colleges status of Disaster Risk Management (DRM) education.

Four universities were selected and examined by three core business process: teaching-learning, research and community service. The four schools selected were Mekelle University (Collage of Dry land Agriculture and Natural Resource); Bahir Dar University (College of Agriculture and Environmental Sciences); Jigjiga University, (College of Dry land Agriculture) and Jimma University (College of Agriculture and Veterinary Medicine).

The information was gathered through document review, key informant interviews, and survey questionnaires. This data was evaluated and analysed using the Indicator approach to determine and analyse the status of DRM education. The following criteria were used to identify DRM related activities associated with core business processes of higher education institutions: 1) whether the courses, research or community service activities have a focus on hazards of different categories that potentially affect the agriculture sector; and 2) whether the courses, research or community service activities deal with issues of vulnerability related to agriculture and natural resources.

The study has found that the percentage of courses related to DRM offered in Agriculture universities/colleges ranges from 17% to 25%. The maximum percentage of DRM related courses that are included in the agriculture program curricula are offered in Bahir Dar University, where DRM education is being offered at both undergraduate and graduate program level. In Jimma University where there is no DRM education at a program level, more than 20% of the courses offered in agriculture programs are related to DRM.

There are also a large percentage of professionals with DRM backgrounds in all of the universities, ranging from 30% to 65%. In terms of student-teacher (with DRM background) ratio, Bahir Dar university is close to the minimum standard set by the Ministry of Education, meeting 94% of the minimum standard. Jigjiga, Jimma and Mekelle universities meet only 23.40%, 55.20% and 59% of the minimum standard. However, as DRM is a new and emerging field of study, the course descriptions of agriculture program

curricula's still lacks inclusion of basic DRM concepts and principles. These percentages indicated the need for curriculum revision and provision of basic DRM training for professionals who teach in the mainstream agriculture programs.

In terms of DRM related research outputs, 32.35%, 11.11%, 26.85%, and 33.33% of research conducted and completed in 2012/13 by M.Sc.. Graduate students and staff members of Bahir Dar, Jigjiga, Jimma, and Mekelle universities are related to DRM and other environmental concerns. According to the discussion with Research and Community Service Coordinators of sample universities, there still remain limitations in publishing and communicating research results. In relation to DRM related community services, Jimma and Mekelle Universities have extended DRM related services through community outreach, where at least 50% of their services are related to DRM. Moreover, these universities offer such services three to four times a year.

The overall DRM education index shows that; Bahir Dar University had the highest DRM education index among sample universities, indicating a better position towards DRM education. Jimma University had a relatively higher DRM education index than Mekelle (0.646 vs. 0.479, respectively). Jigjiga University had the lowest DRM education index (0.071), indicating relatively poor progress towards DRM education.

The study strongly suggests that FAO should initiate tailor-made capacity building programs to enable all teachers to be introduced to the issues related to DRM; in collaboration with Bahir Dar University's DRM program. This will build the capacity of teachers in different agricultural education programs related to DRM, which is an emerging field of study.

By evaluating the needs and demands of FAO and different agriculture sectors of the national government along with considering the possible opportunities found with GTP, national curriculum harmonization, DRM ATF and higher education development programmes; FAO should address the challenges resulting from an underdeveloped culture of interdisciplinary study/ research to mainstream DRM programs.
The study suggests that in order to facilitate exchange of information and research results between universities and other stakeholders (through documentation and knowledge management), through already existed opportunities such as International Day for Disaster Reduction and DRM ATF, Strengthening linkage between agriculture research institutes, AU DRM research centre, FAO and DRMFSS is very critical.

1

Introduction

Throughout its history, Ethiopia has experienced frequent disasters that include but not limited to droughts, floods, human and livestock diseases, crop pests, as well as seismic and volcanic activities. Even though Ethiopia has a history of recurrent droughts that spans back to the 1970s, its magnitude, frequency, and impacts in affected areas have resulted in severe expansion of desertification. This phenomenon is explained by increased climate variability, deforestation, land degradation, settlement patterns and rapid annual population growth rate (DRMESMF, 2011).

Currently, "the agricultural sector" critically important to both overall economic performance and poverty alleviation remains dominated by a subsistence, low input and low output rain fed farming system in which droughts periodically reverses performance gains with devastating effects on household food security and poverty levels" (Demese Chanyalew, 2010). For example, as indicated by the Annual Statistical Review of UNISDR, in 2011, 4.8 million people in Ethiopia have been affected by droughts and consecutive famines (UNISDR, 20011).

Recognizing the pressing challenges of disasters to the country's development, the State Minister of Agriculture, Mr. Mitiku Kassa, in his official statement at the fourth session of the global platform for disaster risk reduction in Geneva 2013 stated, *"though Ethiopia is one of the world's fastest growing economies and is well engaged towards reaching its development targets set out by the Government's Growth and Transformation Plan by 2015, climate associated hazards continue to pose a higher risk of losing hard-won development gains, contribute to growing food insecurity and hinder progress towards eradicating poverty and attaining sustained economic development."* The insight of Kassa's statement reflects the need for Ethiopia to primarily focus on building a disaster risk resilient nation, through both legal and institutional frameworks. This has become one of the main development agendas of the Ethiopian government.

As a result, Ethiopia has emerged as a leading nation in the developing world in the field of Disaster Risk Management (DRM) by undertaking comprehensive risk assessment exercises, establishing an efficient institutional set-up, formulating policies and strategic frameworks, and developing national and sub-national DRM platforms. As stated by Mr.

Kassa, “Ethiopia’s Disaster Risk Management approach is in line with the Hyogo Framework for Action (HFA), the Africa Regional Strategy for Disaster Risk Reduction and its Programme of Action, and the Intergovernmental Authority on Development (IGAD) Disaster Risk Management Programme” (Demese Chanyalew, 2010). Likewise, knowledge management and education is clearly stated as one of the five priority activities to build a disaster resilient nation identified by HFA (Hyogo Framework for Action: 2005–2015).

However, focus is still lacking on organizing and targeting collaborated efforts between universities and national agricultural research institutes. More deliberation would increase scope and foster highly trained and qualified scientists from universities for improved disaster risk reduction capacity building in the country. In order to fully operationalize efforts and advance progresses that have been made by the government related to DRM policy and practice, the role of universities has become critical. In Ethiopia, though universities are recognized for their role in human resources development, they are not equally recognized for the role they could play in the reduction of both present and future disaster risks. The latter is a major bottleneck for achieving sustainable agricultural development. Ethiopia needs to focus on strengthening universities’ capacity to be an effective local and global knowledge base for addressing both local and regional issues on environmental and disaster management. Recognizing universities’ capacity for strong and effective collaboration with other development partners is vital to mainstream and build disaster risk reduction capacity for sustainable and resilient agricultural development throughout Ethiopia.

The recognition of the strength of universities is a major reason why FAO initiated this exploratory study. The study assessed the status of DRM education in selected Ethiopian universities, and on how they achieve their objectives strategically through undertaking inter-disciplinary policy and applied DRR research; creating a network of knowledge management institutions linked with climate change, environment management and sustainable development. The study jointly promotes and facilitates the mainstreaming of broader ex-ante disaster risk reduction into national and sector programmes together with Ethiopian universities.

2

Disaster Risk Management Education

2.1. Global Context

Over the last two decades interest in risk management has emerged from earlier studies of specific hazards, the responsibilities of civil defence authorities and the largely structural nature of physical protection. Education and training about disaster and risk management could no longer be considered as an area of specialist scientific study (ISDR, 2004). During this period, the institutional emphasis related to education and training has changed dramatically. Because of the dynamic nature of hazards and the more complex conditions of risk, increased attention is being given to wider public involvement in learning about risk reduction. As the advancement and expansion of DRM education represents a long-term goal in Ethiopia, improved institutional facilities and strong professional relationships are required for educating future generations.

On a professional level, the very concept of a disaster manager fostered in the 1980s and early 1990s no longer sufficiently conveys the expanded roles and responsibilities involved in contemporary strategies of disaster risk reduction (ISDR, 2004). More attention is being given to integrating disaster risk reduction into national development planning processes and in fostering more resilient local communities. Yet, a need remains to accommodate the combined influences of environmental and land management issues, climatic uncertainty, changing demographics and the pressing demands for sustainable livelihoods. These concepts are now being conveyed increasingly through educational efforts which concentrate on improving knowledge and understanding and through a variety of training programmes which aim to improve skills and abilities.

Disaster risk management has multi-sectoral and multi-disciplinary nature (Holloway, 2009). It is clear that disaster risks can only be managed on a multidisciplinary basis that narrows the gaps between researchers and practitioners, teachers and students. While there is a much greater need for wider dissemination of professional and technical knowledge, it is equally important to expand the study and comprehension of the underlying social and economic dimensions of risk.

Nevertheless, according to the 2009 Global Assessment Report, national efforts were mainly focused on strengthening policy, legislation and institutional frameworks (HFA Priority Areas 1). Many countries reported limited progress in using knowledge; innovation and education to build a culture of resilience and address the underlying drivers of risk (HFA Priority Areas 3 and 4).

2.2. Ethiopia Context

Following the global shift in disaster management from managing disaster events to managing disaster risks through development, the need for increasing knowledge and capacity of DRM practitioners and decision makers has increased. Alongside this paradigm shift, the role of public awareness and training has begun to be recognised for the first time by Ethiopia's 1993 National DRM Policy document. However, the policy did not assign institutional responsibility to DRR education and training.

DRR training and awareness programs implemented since the 1990s are generally donor /NGO-led and have no basis in legislation. Projects like this are still on-going in many areas of Ethiopia. The National Education and Training Policy of 1994 technically still apply as Ethiopia's overall policy towards education. There have been limited efforts to consider DRR curriculum in the Education Sector Development Programs (which are issued every four years) that provide the current practical aims and details.

The 1993 National DRM Policy loosely emphasized the role of DRR education and awareness. Yet, the newest DRM Policy of Ethiopia, which was ratified recently in 2013, acknowledges that raising the levels of disaster prevention through education and public awareness would greatly contribute to reducing the impacts of such disasters. The new DRM Policy emphasized the need for mainstreaming DRM into appropriate subjects at primary and secondary schools and encouraging extracurricular DRM activities which will assist in instilling future generations with a culture of resilience to disasters. The Policy also encourages higher learning institutions and think tanks to conduct DRM research; to develop expertise and teaching modules, and cultivate a higher sense of professionalism.

The current draft of the Strategic Programme and Investment Framework (SPIF) attempts to implement the Hyogo Framework's priority action regarding the use of knowledge, innovation and education to build a culture of safety and resilience at all levels. It states that it is paramount in the DRM mainstreaming effort to establish a strong link with the education system; through the integration of DRM in the school curricula at primary, secondary, and tertiary levels.

The Strategic Programme and Investment Framework (SPIF) contain a summary matrix of DRM Programmes where DRM higher education, short courses and scholarship programs are listed as an intervention under the Capacity Development Programme. This demonstrates a commitment to mainstreaming DRR and DRM into education at all levels. Implementation will depend on the capacity of the Disaster Risk Management and Food Security Sector (DRMFSS) and the Ministry of Education (MOE) to coordinate this policy; and for the MOE to successfully mainstream these requirements into its own policy.

Furthermore, a positive initiative to increase Ethiopia's knowledge and capacity in DRM generally has been the establishment of a new Department of Disaster Risk Management and Sustainable Development in the Faculty of Agriculture and Environmental Sciences at Bahir Dar University (BDU). This is a response to an identified need to build more resilient communities through strengthened capacity and sustainable development in Ethiopia. A three year interdisciplinary undergraduate curriculum was created in 2005 by a joint committee of experts, which is now being supplemented by an interdisciplinary Master of Science program in Disaster Risk Science and Sustainable Development. The curriculum is structured broadly to have both a DRR component that develops the skill to assess the underlying vulnerabilities of different livelihood systems, contributing to sustainable development, and a reactive component that addresses all stages of the disaster risk cycle.

3

Why DRM Education in Agriculture?

Three out of four people in developing countries live in rural areas and are highly dependent on agriculture for their food security and livelihoods. Disasters tend to have the most severe consequences on poor, vulnerable and agriculture based populations. Countries like Ethiopia, where the agricultural sector plays an important role in the national economy both as a way of life and as the primary source of livelihood, is particularly vulnerable to disasters often casing widespread food insecurity. Recurrent hazard exposure and disasters often move people off the development track. Even worse, such shocks can push people into perpetual poverty.

FAO estimates that there are still over 850 million undernourished people of which 820 million are in developing countries living in rural areas, poor, dependent on agriculture and/or agriculture related activities for their livelihood and are among the most vulnerable to disasters (FAO, 2007).

To make matters worse, as a result from past, current, and future greenhouse gas emissions, climate change has the potential to adversely impact nations' socio-economic development (IPCC, 2007). Its impacts will be both short term, resulting from more frequent and more intense extreme weather events, and long term, causing changes to temperatures and precipitation patterns.

Like in many other developing countries, Ethiopia is vulnerable to adverse impacts of climate variability. This is because of community's low adaptive capacity as well as the country's socio-economic systems high sensitivity to climate variability; taking into consideration that much of the population in the primary sector are farmers or pastoralists who carry the heavy brunt of negative climate impacts. Agriculture is inherently sensitive to climate conditions and is one of the most vulnerable sectors prone to risks and impacts of global climate change. In other words, a change in climate conditions could directly impact productivity levels and diminish livelihoods.

It is highly observed that higher temperatures reduce yields of desirable crops while encouraging weed and pest proliferation. Changes in precipitation patterns increase the likelihood of short-term crop failures and long-term production declines. Rising temperatures and changes in rainfall patterns have also indirect effects on agricultural production through changes in irrigation water availability. In addition, there are likely to be more extreme weather conditions: changes in the intensity and frequency of floods, along with droughts and storms, will create significant uncertainties for agricultural production (FAO, 2008).

It is evidently proven in the 21st century that the lack of appropriate climate associated hydro meteorological risk management tools and methods are the greatest challenges faced by policy makers and development practitioners. Without these important tools it is difficult to deal with the variety of risks that farmers have to face in order to improve their lives and livelihood as well as progression of agriculture development across the world to end hunger and acute poverty (FAO, 2008).

To this end, it is alleged that higher agricultural education (HAE) can contribute much for the sustainability of agricultural development, although it has often failed to adjust its "curricula and management curricula to respond to the changes affecting agriculture" (Atchoarena, 2003). For the vast majority of rural people dependent on agriculture, education is a key factor that could help reduce the level of human vulnerability to natural hazards that leads to extreme poverty, hunger and death.

In the context of climate change and increased frequency of climate associated risks that mainly damage the agriculture sector, higher agricultural education needs to look the issue of DRM beyond the provision of agronomists. This is because higher agriculture universities/ colleges must be innovative and inclusive in order to deal with the changing environment. Therefore, mainstreaming disaster risk management education is key to manage current as well as future disaster risks that affect the agriculture sector of the country in a very systematic way.

4

Objectives and methods of the Study

The major objective of the study was to review and analyse the current status of agriculture universities/colleges of Ethiopia related curriculum on Disaster Risk Management (DRM). Specifically, the study aimed to:

1. Determine the current status of DRM education in teaching-Learning, research and community services provided by agriculture universities/colleges.
2. Identify the needs of agriculture universities/colleges to integrate DRM education in their mainstream fields of study.
3. Suggest DRM education capacity building intervention points for FAO.

4.1. Targeted /Sampled Universities

According to MOE, Higher Education in Ethiopia includes institutions that provide three, four or more years of undergraduate programs, as well as those offering postgraduate programs (master's and Ph.D.). Currently there are 31 higher education institutions in the country. Because of the purpose of the study is to review the status of DRM education in Agriculture universities/colleges, four universities involving in agriculture related programs were selected purposively as a sample. These are Mekelle University (Collage of Dry land Agriculture and Natural Resource); Bahir Dar University (College of Agriculture and Environmental Sciences); Jigjiga University, (College of Dry land Agriculture) and Jimma University (College of Agriculture and Veterinary Medicine).

4.2. Research Design

This paper endeavours to show the current status of agriculture universities/colleges of Ethiopia that have integrated Disaster Risk Management (DRM) in their core curricular process. The sampled universities that have a focus on agricultural education were invited to provide information on their organizations, particularly on the nature and scope of DRM and Environment activities that are being undertaken in their core business processes. To

assess the status of agriculture universities/colleges regarding DRM education, the following assessment approaches and methods were employed:

4.2.1. Document Review

Relevant curriculum of selected programs of targeted universities that is more likely to have courses which address disaster and climate risk concerns were reviewed. Particularly, the course descriptions of both undergraduate and postgraduate programs were studied to document the availability of courses that deal with disaster and climate risks. In addition, staff and M.Sc. students research outputs submitted in the academic year of 2012/13 of sampled universities were reviewed to determine the proportion of M.Sc. students and staff members research title that focuses on disaster and climate risks.

4.2.2. Focus Group Interview

A focus group discussion involving program managers, program representatives and curriculum review committee members for each of the targeted universities was conducted to assess the current capacities and future plans of curriculum and research development related to disaster risk management and climate change concerns.

4.2.3. Key Informant Interview

Interviews were conducted with college/school/institute directors and deans of targeted universities. These interviews were undertaken to explore current capacities and future plans of curriculum and research development related to disaster risk and climate change concerns. Interviews with research and community service coordinators were also conducted in order to examine capacity gaps in enhancing the quality of research and community services that deal with disaster and climate risk issues.

4.2.4. Method of Analysis

The information was gathered through document review, key informant interviews, and focus group discussions. Survey questionnaire were evaluated and analysed to explore the current status of sampled agriculture universities/ colleges of Ethiopia in mainstreaming DRM in their program; and to identify potential capacity building intervention points for FAO. Indicator approach was employed to determine and analyse the current status of DRM education. Indicators were identified based on the three core curricular processes of higher education institutes. These processes include: teaching-learning, research and community services. Indicators related to teaching-learning include the number of DRM related courses as well as assigned credit hours to the courses; the number of teachers with DRM background; and the student-teacher (with DRM background) ratio. Indicators under the

research component were number of DRM related research outputs (both staff and M.Sc. research outputs conducted in the previous year prior to the study) and DRM related thematic areas identified at college level. Indicators related to community services include the type and frequency of services related to DRM provided. The following criteria were used to identify DRM related activities associated with core business processes of higher education institutions: 1) whether the courses, research or community service activities have a focus on hazards of different categories that potentially affect the agriculture sector; 2) whether the courses, research or community service activities that deal with issues of vulnerability are related to agriculture and natural resources.

5

Result and Discussion

5.1. Introduction

The findings of the study on the status of DRM education in agriculture universities of Ethiopia are organized into three core processes of the universities. The first section outlines the status of DRM education of teachers-learning process of agriculture universities/colleges, focusing on curriculum, staff profile and the student as well as teacher ratio with DRM backgrounds. The second part of this chapter outlines the status of DRM education in research project development core process of agriculture universities that focuses on research of thematic areas, research infrastructures and seminars related to key areas of DRM and environmental concerns. The third section describes the status of community service related to DRM offered by agriculture universities. The last section outlines the status of networking and partnership efforts of agriculture universities related to common agendas of DRM and climate change.

5.2. The Case of Bahir Dar University

5.2.1. Overview

The College of Agriculture and Environmental Sciences (CAES) is one of the five colleges of Bahir Dar University (BDU). It was launched in 2005 G.C. It is currently running nine undergraduate B.Sc. programs delivered in fulltime, evening, summer and distance modes. All programs offered are three year programs in regular mode except for the Water and Irrigation Management program, which takes four years, as well as the mid-career Extension Program, which takes two and half years to complete. The programs given at the University are namely Natural Resources Management, Animal Science and Technology, Rural Development, Plant Science, Disaster Risk Management and Sustainable Development, Fisheries, Wetland and Wildlife Management, Water Resource and Irrigation Management, mid-career Extension and Agricultural Economics.

The College also launched ten post graduate programs (M.Sc.) as of 2009 that are thesis based. Apart from the thesis work, which has 6 credit hours, a minimum of 29 credit hours of lectures has to be taken by the student to complete the master's program. The master's programs offered at the College are: Land Resources Management, Fisheries and Wetland Management, Plant Breeding, Agronomy, Animal Breeding and Genetics, Animal Production, Disaster Risk Science and Management, Plant Protection and Horticulture. In addition, the college plans to launch Ph.D. programs in Soil Science, Fisheries, Animal Nutrition, Agronomy and Plant Breeding.

5.2.2. DRM Education: Teaching learning

There are nine undergraduate and seven postgraduate programs related to agriculture in Bahir Dar University's College of Agriculture and Environmental Sciences. Four sub components were used as a criterion to measure the status of the college regarding teaching – the learning status percentage share of DRM related courses in both undergraduate (UG) and post graduate (PG) programs, the percentage share of credit hours assigned for DRM related courses in both UG and PG programs, the percentage share of professionals with DRM related background, and finally the student to teacher ratio with DRM related backgrounds.

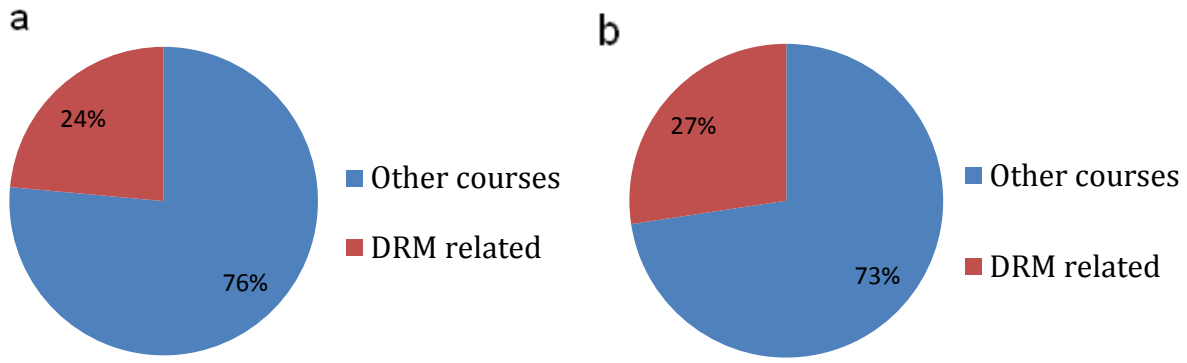

Figure 1 Percentage share of DRM related courses in undergraduate programs a) compared to total number of courses b) compared to total credit hour of courses (College level analysis).

Figure 1a shows, the total number of courses in undergraduate study divided among DRM related courses to other courses. Based on this, DRM related courses represent almost a quarter of the courses offered in the college. Taking into account the amount of hours of the DRM related courses, they account for 27% of the credit hours, Figure 1b.

BDU has DRM curriculum at both graduate and postgraduate levels. All programs under College of Agriculture and Environmental Sciences (CAES) offer courses that deal with disaster and climate risks as well as other environment related issues. The 24% share of DRM related courses from all courses in the CAES can be judged relatively good. This is because of the presence of DRMSD at program level. The share of DRM courses in other programs at BDU is still less than the DRMSD department. Thus, mainstreaming DRM related courses is needed in other programs of the CAES of BDU.

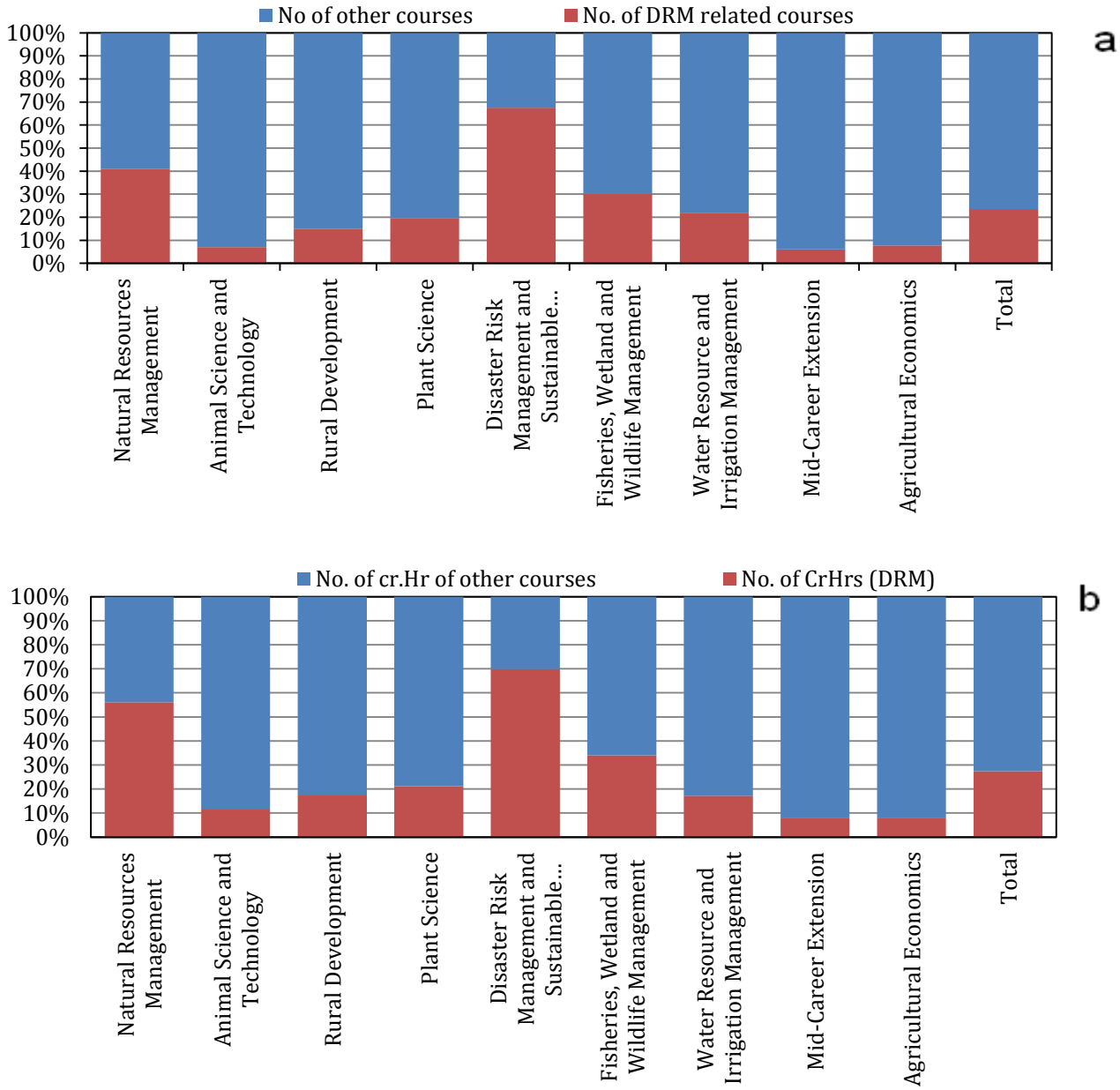

Figure 2 Percentage comparison of DRM related courses with other courses in each undergraduate program a) No. of courses b) No. of Credit Hours (program level analysis).

Figure 2a) and b) shows the contribution of DRM courses in each department considered in this study. On this basis most departments have less than 25% courses related to DRM except for DRMSD and NARM, which have more than 40% of DRM related courses. The amount of Credit hours also shows a similar trend.

As expected DRMSD has the highest share (67.5%) of DRM related courses, followed by the Natural resource management department (41.07%) of. Fisheries, Wetland and Wildlife Management program has the third highest share (30.23%) of DRM related courses offered at CAES, both being sub-programs under Rural Development program have the least share (7.69% & 6.06% respectively) of DRM related courses from CAES.

Though there are relatively high numbers of professionals with DRM background in Agricultural economics and mid-career extension programs (see table no 4 in the forthcoming sections), there appears to be limited number of DRM related courses compared to other programs of the college. This is explained by the lack of relevant stakeholders during the design of the curricula, which is partly because of limited exposure of teachers to disaster risk science subjects. Therefore, curriculum revision and training for staff members is required.

The share of Postgraduate DRM courses College level analysis

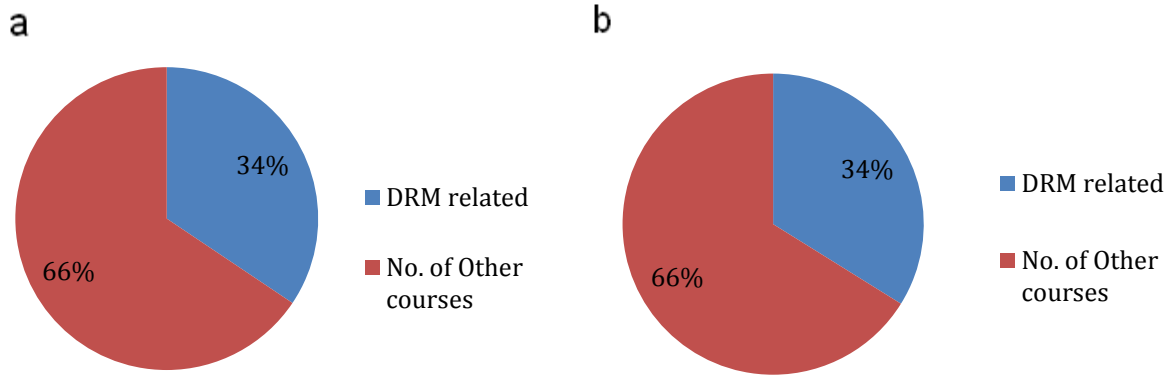

Figure 3 Percentage comparison of DRM related courses with other courses in postgraduate programs a) Compared to total number of courses b) compared to total credit hour of courses.

The same kind of analysis used for undergraduate courses were made on the postgraduate courses. The analysis reveals that both the number of courses and number of credit hours

related with DRM courses takes 34% share of the overall courses as shown in Figure 3a and b.

The share of DRM related courses Department (program) level analysis

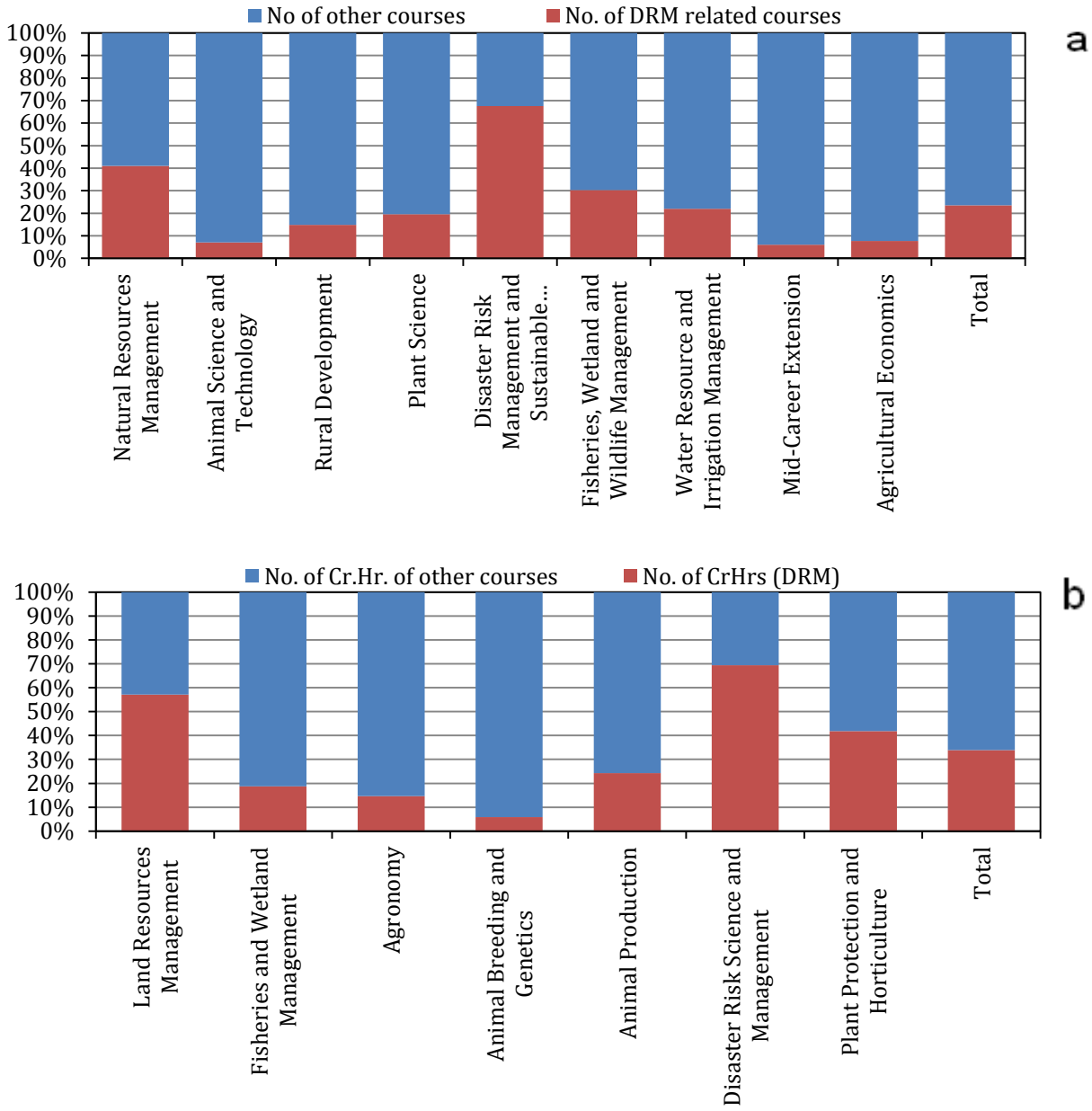

Figure 4 Percentage comparison of DRM related courses with other courses in Postgraduate program a) No. of courses b) No. of Credit. Hours.

Further analysis was made to see the contribution of DRM related subjects in each department (Figure 4a and b) and the findings revealed that there were similar results observed with the findings on undergraduate studies.

According to the college program coordinators, the current efforts/initiatives undertaken by the university/ college/ school, related to curriculum and research development that deals with disaster, climate change or other environmental concerns are curriculum being implemented and developed for both for post and undergraduate programs, DRM that are integrated within Rural Development (RUDV), Agriculture Economics (AGEC), and Fisheries, Wetland and Wildlife Management (FWWM) programs. There are many researches being conducted by college staff of different programs. For instance, the DRMSD program members are conducting research and community services related of DRR and Climate change.

Regarding curricular and research development future plans, the college is envisaging to integrate DRR and climate change concerns in the curriculum of other programs, conduct workshops to staff of the college and to the public especially on Climate Change Adaptation (CCA), and will also endeavour to establish relevant laboratories.

According to key informants interviewed, the required capacity building needs of the college, to realize the implementation of the plans, will be to train related Staff members of the college on DRM. This would allow them to have deeper knowledge about DRR and CCA which will provided them with the required tools to teach students on the subject.

5.2.3. Professionals with DRM Related Background

The other key indicators used to determine the teaching-learning status of CAES were percentage share of professionals with DRM related background and the student to teacher with DRM related background ratio. Based on the survey conducted year, 2012, there are a total of 106 teachers for both the undergraduate and postgraduate programs at Bahir Dar University, College of Agriculture and Environmental Sciences.

Figure 5a shows the percentage contribution of both undergraduate and postgraduate students enrolled in DRM courses. Based on the figure, undergraduate students account about 90% of the total students enrolled for the year 2012/13. Even in some departments such as rural development and Water resource and irrigation management the level of study is limited with undergraduate study.

Whereas, when observing the percentage combination of professionals based on their level of study, as shown in Figure 5b, it is easy to notice that most departments have good proportionality among Ph.D. and M.Sc. holders, with the exception for Water resource and irrigation management program.

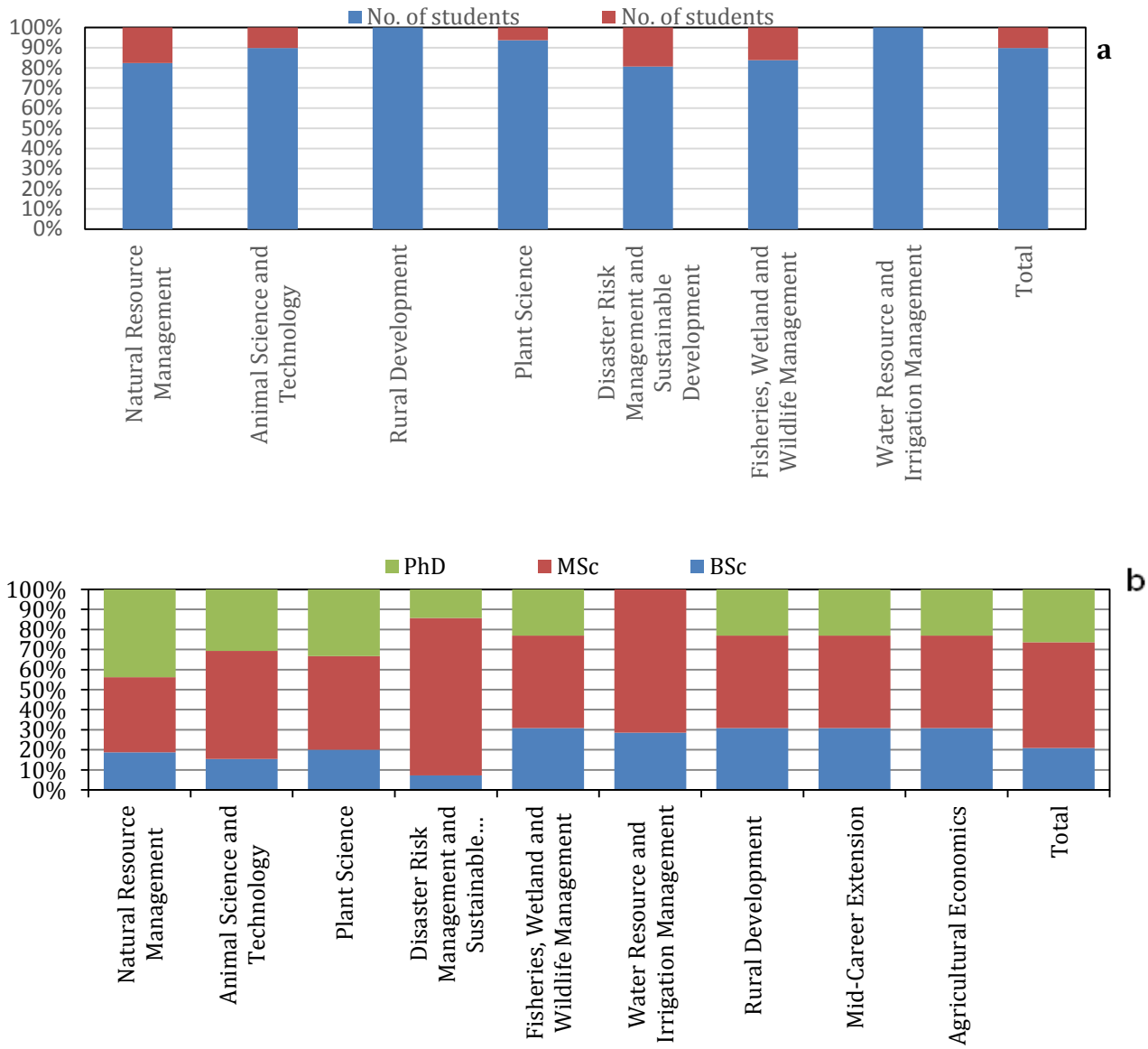

Figure 5 a) Number of students in Bahir Dar University College of Agriculture and Environmental Sciences in the year 2012/13 distribution among department depending on undergraduate and postgraduate b) Distribution of teachers among department depending on level of qualification.

To find out the percentage contribution of DRM related trained professionals, Figure 6 plots this distribution based on the overall departmental level. The results indicated that overall DRM related professionals account more than half of the college staff which could be taken as a positive sign. But the department with the least level of DRM professionals is with the Plant science department accounting only 25%. Even though this figure show the

professionals are balanced in numbers, students on the other hand spend most of their time taking courses which are remotely related with DRM, as shown in Figure 1to Figure 4.

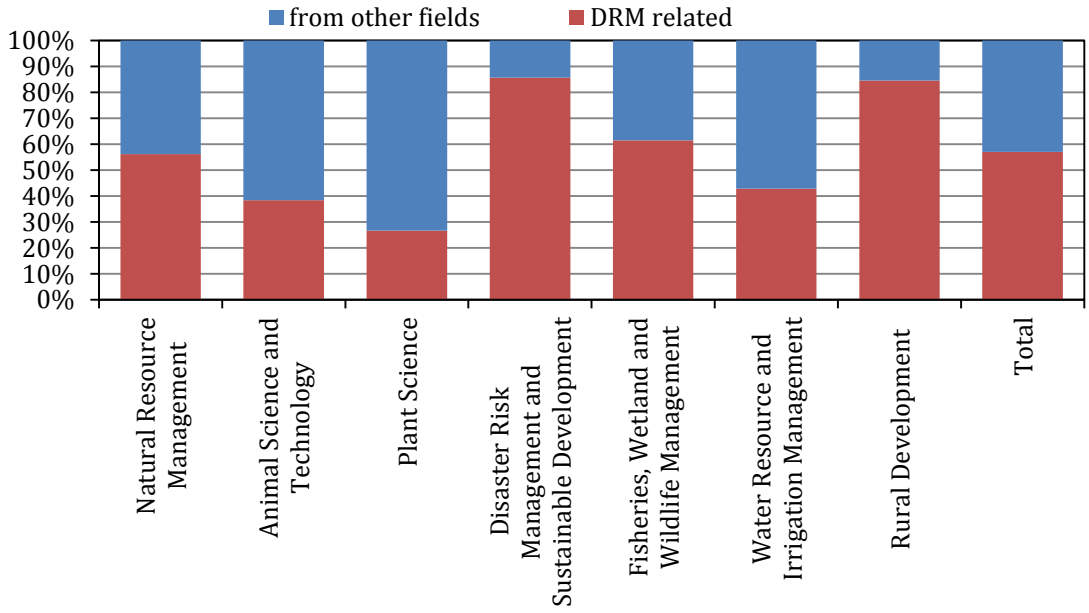

Figure 6 Percentage distribution among DRM related professionals and other fields trained professionals.

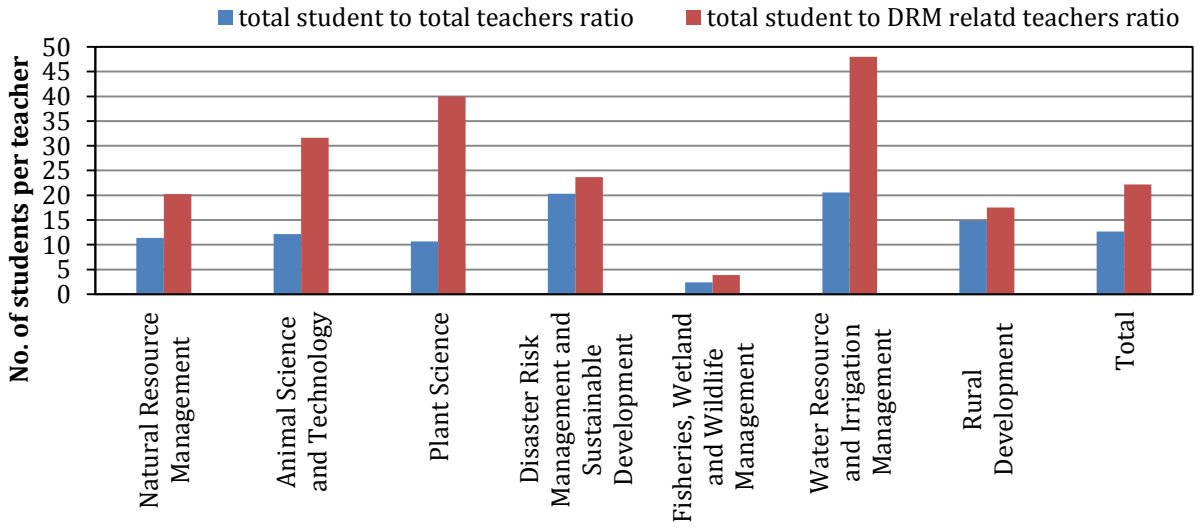

Figure 7 Students to teachers' ratio

To evaluate quality of education, the Student to teacher's ratio is defined as the ratio of number of students to number of teachers. The total number of teachers in the college and

also DRM related teachers has been considered for this report. These ratios can be taken as an indication criterion for education quality. The first ratio that was calculated was the total number of students in the college to the total number of teachers. As indicated in Figure 7, the overall ratio is below 15 students per teacher which can be taken as a positive sign for having good quality of education. In departmental level this number varies between 2 and 20 students per teacher. The second ratio calculated was the total number of students in the college to the number of DRM related teachers; based on the results, there are 22 students for every DRM related trained teacher allocated. In departmental level this number varies between 4 and 48 students per teacher. Generally based on the ratios the level of education quality is expected to be good, given that other factors which are needed for good quality are fulfilled.

5.2.4. DRM Education: Research and Community Services

There are four major thematic areas of research in the college. These are Food security and livelihood, Natural resource management, Fisheries management and aquaculture and Disaster risk reduction. Related to these thematic areas, a number of community services are being offered under each program offered at the college which are funded both by the University and external donors.

In the previous academic year, 2011–2012, out of a total twenty two M.Sc. students research outputs, only three (13.63%) were DRM related, and out of the seventeen completed and on-going staff research outputs, seven (41.1%) were DRM related.

The college also offers community and consultancy services for various stakeholders, with thematic areas ranging from Disaster risk management, Fisheries resource and aquaculture management, Livelihood and food security to Natural resource management.

According to key informants interviewed, the major services offered during the previous academic year, were training & provision of materials pertaining to postharvest fish preservation, as well as training on technical support on improved seed utilization by projects such as integrated seed sector development, CASCAP and farmers research groups. These projects were financially and technically supported by the Netherlands and JICA. In addition, the department of DRMSD has been offering community based DRR planning.

The main Objectives of the service were to increase the shelf life and quality of fish, increase productivity of crop production, and farmers based research or participatory research approach. The research and community service coordinator of the college also explained about the unique nature of the service by stating that" Training is offered to farmers who produce postharvest material by themselves. Voluntary farmers are involved

in the implementation and these farmers will be organized to produce improved varieties that would be distributed to other farmers. Best practices are up and out scaled and the research is also done by farmers themselves, and farmers are actively participating in the research."

These services are being offered once a year by a team of experts from the college and experts from research centres (fish research centre, ISSD and CSCAP as per request from stakeholders, usually during the summer season for fish producers and farmers producing crops.

The major sources of fund to run the service were from Bahir Dar University, the Netherlands and JICA. The major community and/or consultancy service capacity gaps in dealing with disaster risk, climate change and other environmental concerns that were identified from the key informant interviewed are lack of early warning methods, facilities in terms of determining climate change and environmental factors, and organized institution in terms of human resource and structural arrangements.

In order to address the above-mentioned identified capacity gaps, the research and community service coordinator of the college recommended creating structural arrangements as a first step, which would be a basis in fulfilling capacity needs of concerned professionals in human resources as well as some facilities pertaining to environment or climate change.

Networking and Partnership

Furthermore, the college is currently working with national as well as international institutions/organizations such as Amhara Agricultural Research Institute, Amhara Bureau of Agriculture (BoA), Ministry of Agriculture, Disaster Risk Management & Food Security Sector, Ghent University Belgium, Wageningen International The Netherlands; University of Arizona US, University of Jaume I Spain, the World Agro forestry Centre (ICRAF), Sasakawa Africa fund for Extension Education, Dry land Coordination Group (DCG) Norway, International Water Management Institute (IWMI), University of Cape Town South Africa, Stellenbosch University South Africa, and NCCR-North South Bern University Switzerland.

5.3. The Case of Mekelle University

5.3.1. Overview

The Arid Zone Agriculture College, currently known as the College of Dry land Agriculture and Natural Resources, is one of the colleges that was established in 1993 to address the

huge gap in trained professionals in the field related to sustainable development of the dry lands and improvement of the welfare of the people inhabiting these areas. CDANR has made significant contribution in human resource training in the past 16 years. At its inception in 1993, it started training in three areas: the Department of Animal and Range Sciences (ARS), the Department of Dry land Crop Science (DCS), and the Department of Soil and Water Conservation (SWC).

To cater the educational needs of the population, the program diversity has been increasing over the years. In 1995 a diploma program in soil and water conservation was initiated in its continuing education program. In 1996, a diploma program in General Agriculture was launched mainly to train certificate holders working as extension agents in different regions. In the same year the same program in a degree level summer program was initiated. Since 2003, it has added two new B.Sc. programs, namely the Department of Cooperatives and the Department of Natural Resources Economics and Management. The three oldest departments have also expanded their focus in many ways. The Department of ARS has expanded to include wildlife stream; the SWC program is broadened to include Dry land Forestry and Environmental Protection; and the Dry land Crop Science program is widened to encompass Horticulture Stream. The annual intake in its regular B.Sc. programs has increased from 42 students in 1993 to 700 in 2007. However, there has been a slight reduction in the number of regular B.Sc. Programs intake of 2010/11, with only 558 students.

5.3.2. DRM Education: Teaching learning

There are 12 undergraduate and five postgraduate programs in Mekelle University, college of Dry land Agriculture and Natural Resources. Similar to BDU, key indicators used to determine the learning status of Mekelle University (MU) were the percentage share of professionals with DRM related background and the student to teacher with DRM related background ratio.

Figure 8 and Figure 9 shows the percentage contribution of DRM related undergraduate courses in terms of number and total credit hours given, as it can be observed, the overall DRM courses contribute less than 20% both in terms of number of courses and credit hours.

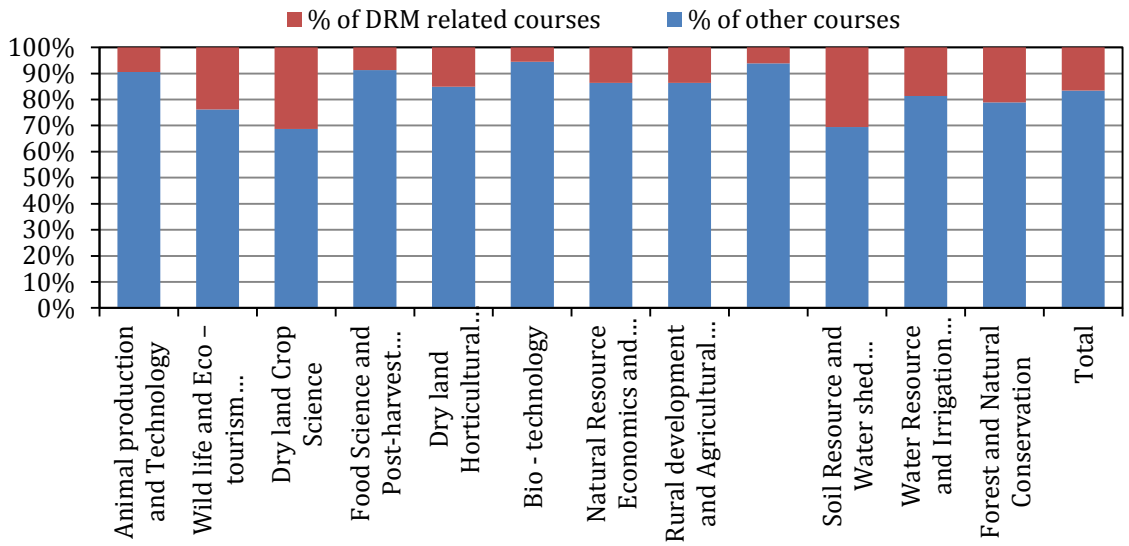

Figure 8 number of DRM related Courses in undergraduate programs in percentage as compared to other courses in Mekelle University, college of Dry land Agriculture and Natural Resource.

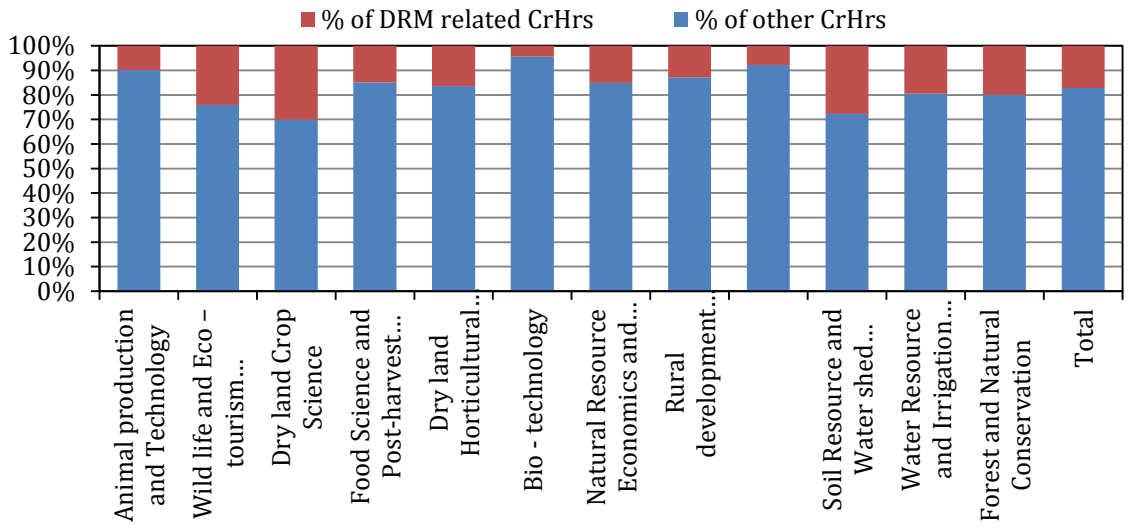

Figure 9 Number of DRM related Credit Hours in undergraduate programs in percentage as compared to other courses in Mekelle University, college of Dry land Agriculture and Natural Resource.

Figure 10 and Figure 11 shows the percentage contribution of DRM related postgraduate courses in terms of number and total credit hours. As it can be observed, the overall DRM courses contribute around 40% in number of courses and close to 45% in total credit hours.

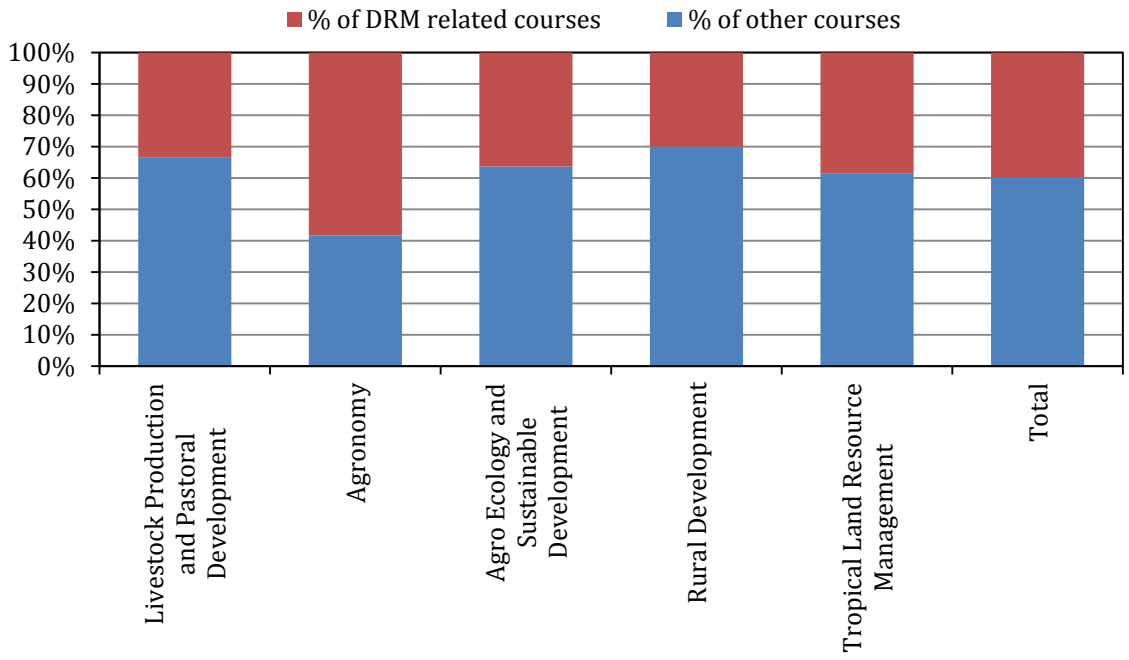

Figure 10 Number of DRM related Courses in postgraduate programs in percentage as compared to other courses.

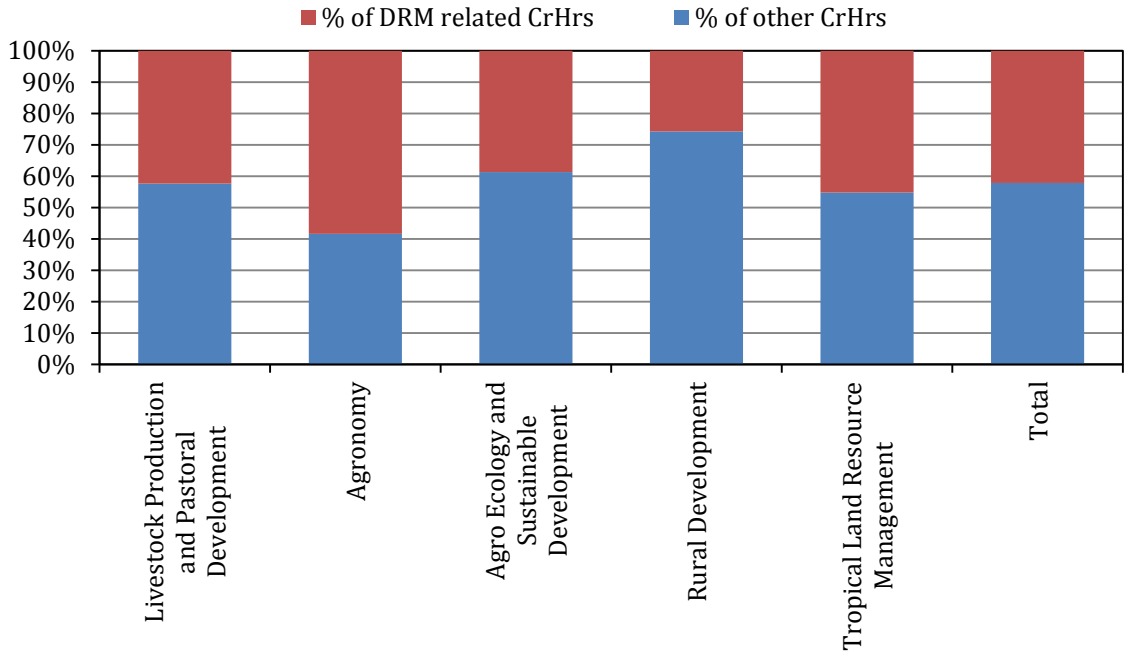

Figure 11 Number of DRM related Credit Hours in postgraduate programs in percentage as compared to other courses.

5.3.3. Professionals with DRM Related Background

Similar to BDU, the indicator taken to determine status of DRM education under teaching learning was the number of teachers with DRM related professional background.

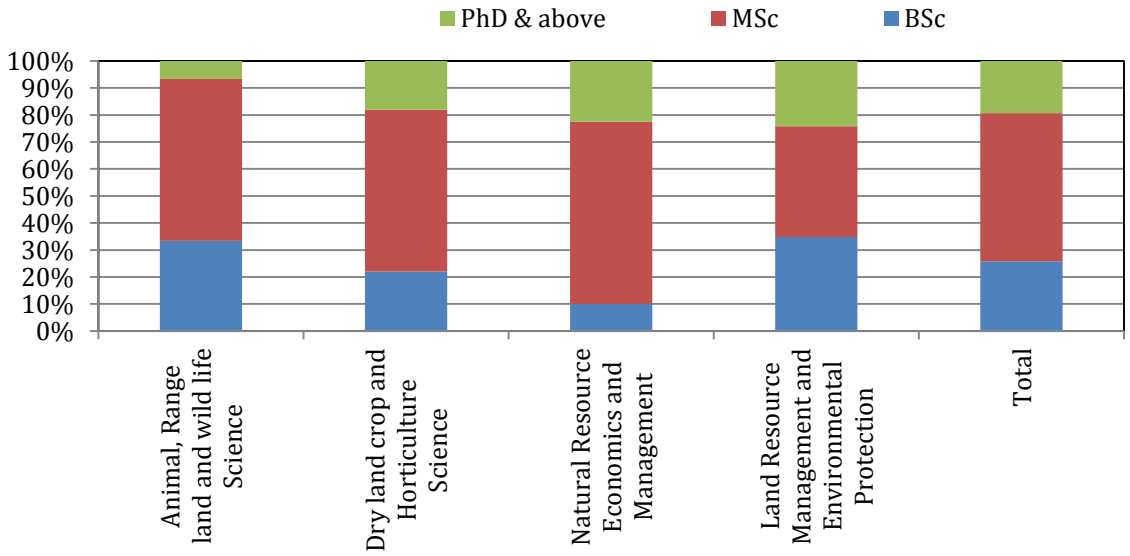

Figure 12 Share of staff members' qualification level

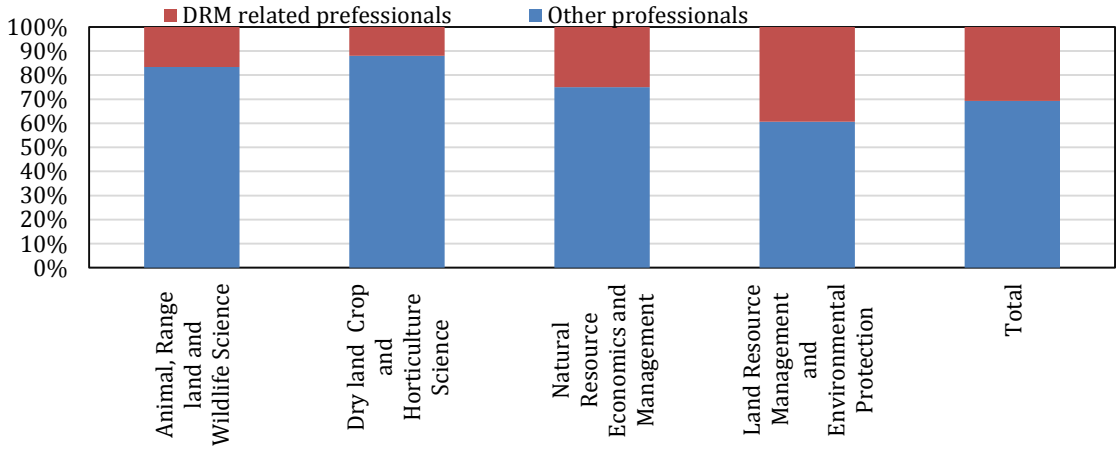

Figure 13 Percentage distribution among DRM related professionals and other fields trained professionals.

Based on a survey conducted in 2013, there are a total of 186 instructors teaching in both undergraduate and postgraduate programs at the college, of which 25.8% are B.Sc. holders, 54.8% M.Sc. and 19.4% Ph.D. holders respectively (Figure 12). About 30% of all teachers are professionals with some DRM related background as showed in Figure 13.

As the result shows (see Figure 14) the overall students to teachers' ratio is 10 students per teacher were as the students to teachers with DRM related background ratio is 34 to 1, which is still close to the standard defined by ministry of education.

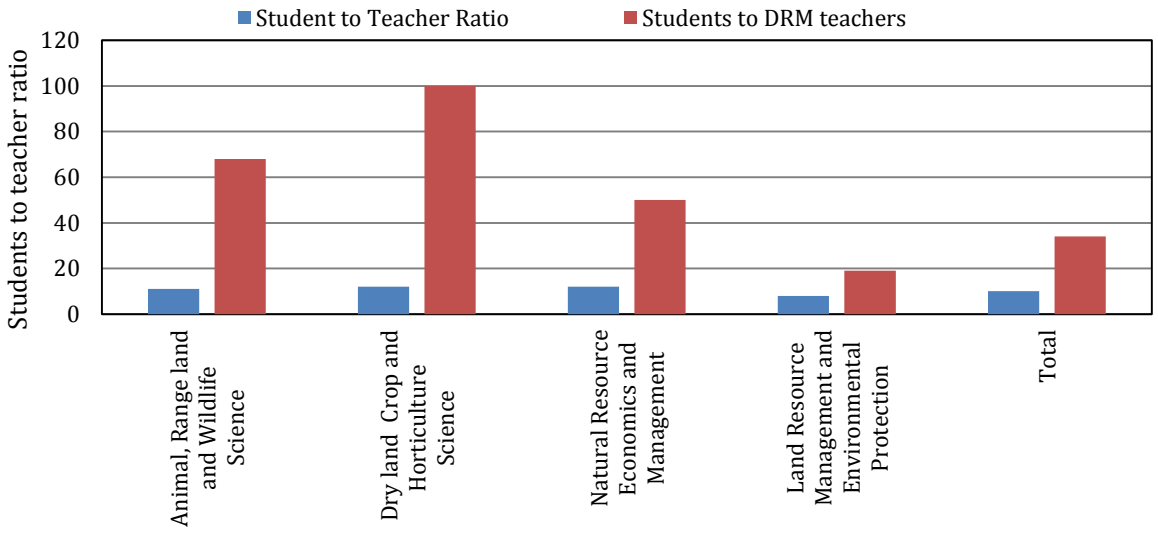

Figure 14 Students to teacher ratio

5.3.4. DRM Related Research and Community Services

According to the College's Research and community service coordinators, the college offers community services and Consultancy two to three times a year. Among the types of Consultancy and/ or community services offered in the college in the previous academic year 2012/13, trainings were given on Land rehabilitation and restoration, sustainable land management, integrated participatory watershed management, climate change adaptation and mitigation as well as on agro ecology and sustainable development to farmers. Improved climate resilient farms were also established. The 'Desaa' national forest priority area was nominated as a UNESCO site during the same academic year. As the research and community service coordinator indicated during the interviews, of all the total 30 community services offered in the previous academic year, almost half of these were on DRM, climate change and environmental issues.

The objectives of the services were to recruit, develop, and build technical capacity in order to advance the research mission of the college. This mission is to provide outstanding services to the research community that is recognized for being proactive, friendly, effective and responsive. To build and support appropriate units/centres in order to grow and strengthen the University's infrastructure that is needed to support research across and within colleges. To assist the college in attracting fund and managing properly

sponsored research grants, as well as to provide proactive outreach and services to researchers as means to enhance innovations. To facilitate economic development that ensures the University's compliance with applicable research regulation and legislation, through active monitoring of the environment and internal control management. To develop and cultivate good relationships with beneficiaries, funding agencies, and government officials in order to work together and to help college members secure support for CDANR research efforts and finally to highlight and publicize successes in research, scholarship and creative endeavour to relevant internal and external audiences.

The unique nature of the services, as explained by the research and community service coordinator, is taking responsibility and ownership for decisions, actions and results, that are accountable for both how and what is being accomplished. The person also added on the importance of working cooperatively as a member of a team, and being committed to the overall team objectives rather than own interests. The person also emphasized on demonstrating honest and ethical behaviour that displays high moral standards which are interpersonal qualities that widely exudes trust, respect and honour. These qualities demonstrates energy and commitment that are required to improve results by taking initiatives that often involves calculated risks while considering the common good, understanding, acceptance and support to the university's broad mission and fostered values.

A recommendation made by the college research and community service coordinator is developing the capacity of the college to conduct research and community services to stakeholders. This can be done through the allocation of funds to develop curriculum at all levels (UG and PG) in order to start new programs on Risk and disaster management.

5.4. The case of Jimma University

5.4.1. Overview

Jimma University, college of Agriculture and veterinary Medicine (JUCAVM), co-founder of the Jimma University, is dedicated in advancing agricultural development through training, knowledge generation and service delivery in the country. The college trains high calibre professionals in broad areas of agriculture and veterinary medicine, both at graduate and undergraduate levels. The college upholds the values of educational relevance, transparency, social accountability, gender sensitivity, equity, community participation and empowerment. In line with this, the college works in partnership with training, research, industry and extension/service institutions locally, nationally and internationally.

JUCAVM comprises of five departments in the fields of agriculture namely, Horticulture & Plant Sciences, Animal Sciences, Natural Resource Management, Agricultural Economics & Extension and Post-harvest Management and, School of Veterinary Medicine. The different departments at the college offer a wide variety of training programs both at undergraduate and graduate levels.

5.4.2. DRM education: Teaching learning

There are 9 undergraduate and 22 postgraduate programs related to agriculture in Jimma University. As shown in Figure 15, of all the courses in the undergraduate programs, less than 20% are DRM related. The highest percentage of DRM related courses (30%) are found in Natural Resource Management and Doctor of Veterinary Medicine programs. Similarly among all courses offered in the postgraduate programs, about 30% of them are DRM related.

In postgraduate programs, the highest percentage of courses (more than 75%, Figure 16) related to DRM is offered in the Plant Pathology program. This is because the program focuses on the nature and causes of plant disease, where it can be categorized under biological hazards according to the ISDR classification of hazards. The main objective of the program is to produce well qualified and competent graduates having strong theoretical knowledge and practical skill in Plant Pathology that would help manage plant diseases.

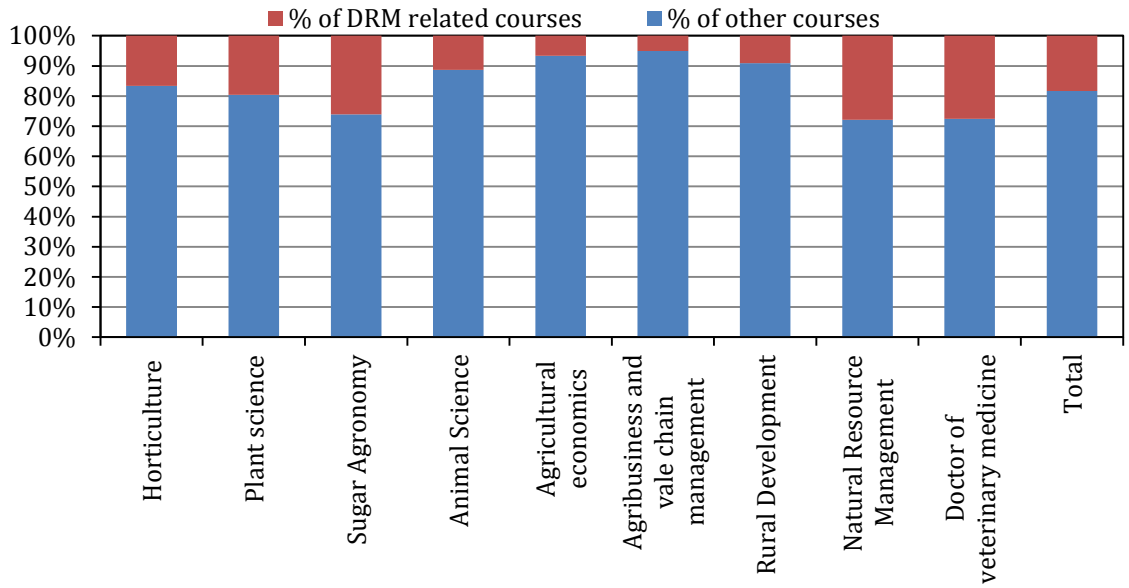

Figure 15 Percentage of DRM related Courses as compared to other courses in the undergraduate programs.

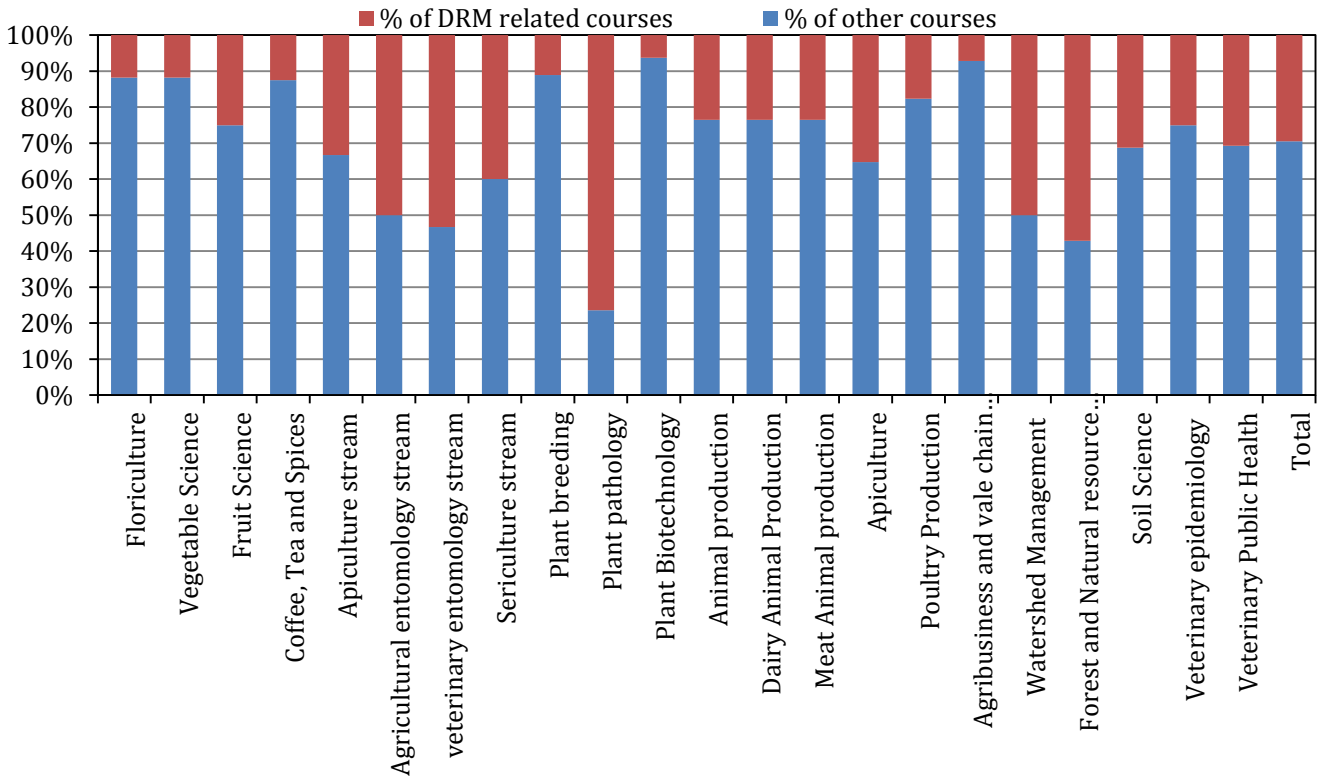

Figure 16 Percentage of DRM related Courses as compared to other courses in the postgraduate programs.

5.4.3. Professionals with DRM Related Background

In Jimma University, there are a total of 106 instructors that teaches all the courses in both undergraduate and postgraduate programs, of which 18%, 66%, and 16% of them are B.Sc., M.Sc., and Ph.D. holders respectively (see Figure 17). Among all teachers, 42% are professionals with some DRM related background as indicated in Figure 18.

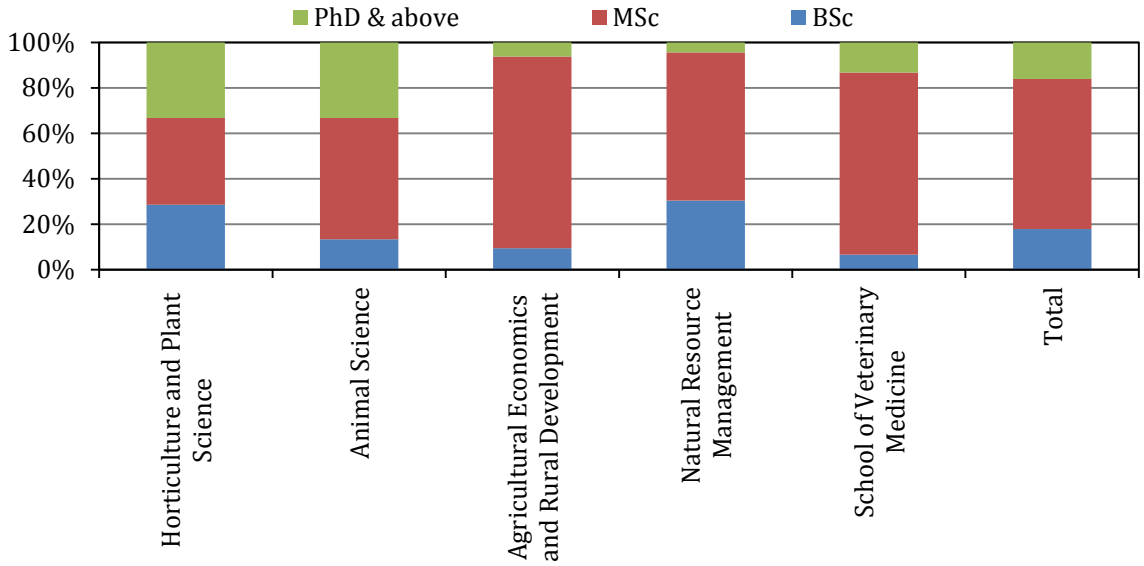

Figure 17 Share of staff members' qualification level

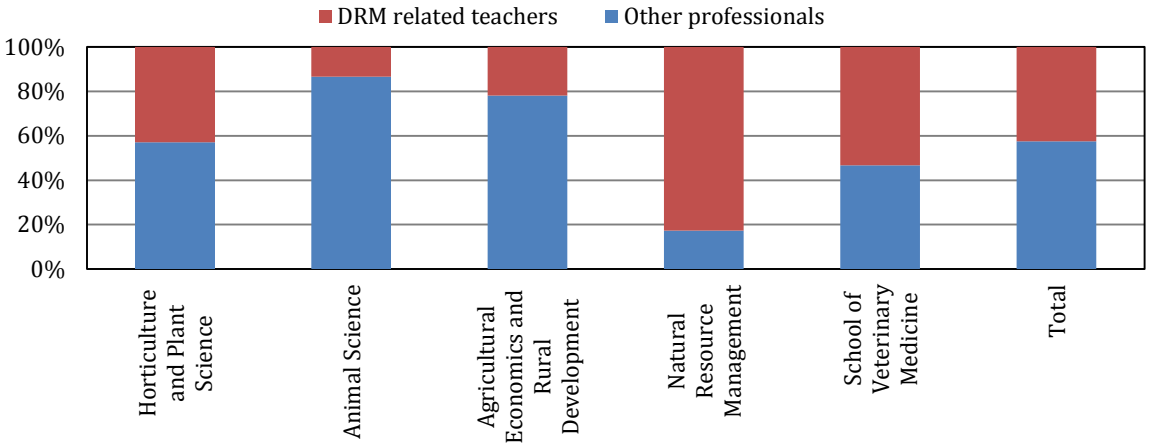

Figure 18 Percentage distribution among DRM related professionals and other fields trained professionals.

In terms of student-teacher ratio, there is on average one teacher with DRM related background for 36 students. This is very close to the standard set by the Ministry of Education. However, in some departments, there is critical shortage of DRM professionals. For example, student-teacher with DRM background ratio in the department of Animal Science is found to be one teacher for 295 students, while 11% of the courses in the department are related to DRM (see Figure 19).

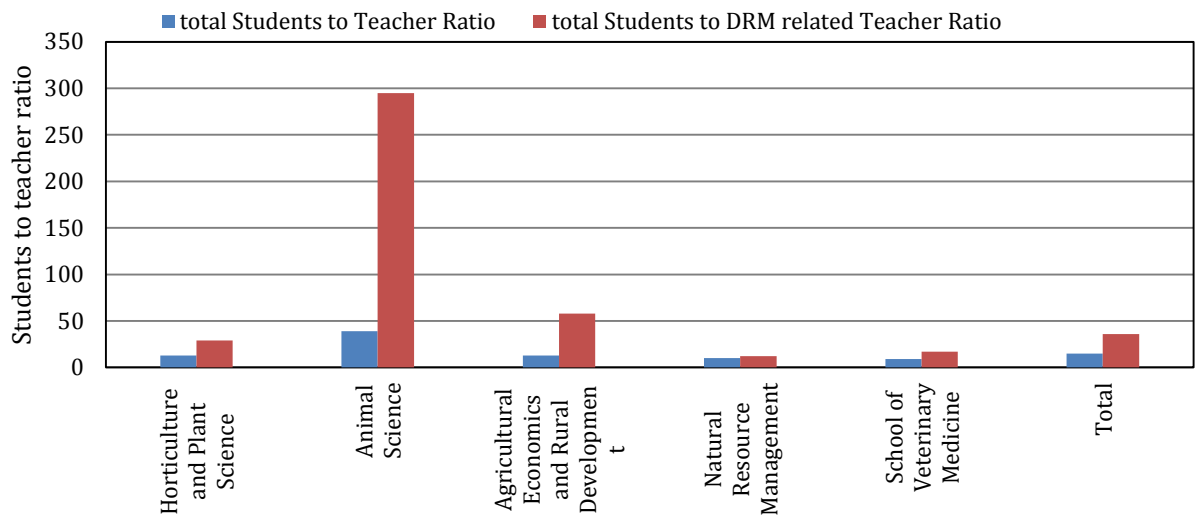

Figure 19 Students to teachers' ratio

5.4.4. DRM Related Research and Community Services

In the previous academic year, 11out of the 32 staff conducting research, had DRM related research outputs, and the same goes for 23% M.Sc. students' research outputs. According to Jimma University's community service coordinator, they offer community service as one of their core business process.

The community and consultancy service thematic areas of the college are namely field crops production, horticultural crops production, animal production, natural resources management, veterinary Medicine and Post-harvest management. The types of Consultancy and/ or community services offered at the college, in the academic year 2012/13, were demonstrations on crop production activities, natural resources management, post-harvest management, awareness creation on use of resistant varieties of coffee for coffee berry diseases (as a climate change adaptation measure), application of fungicides, methods of compost preparation (to be taken as means to alleviate problem of drought by increasing the water holding capacity of the soil), natural resources management, animal health care, post-harvest management, improved coffee varieties seedling distribution to farming communities, provision of modern Box Hive and chicken brooder, vaccines and other services for different domestic animals for communities in both Jimma town and farming communities.

The major objective of the service is to contribute in solving community development problems, or those that are felt as priorities. As clearly indicated by the coordinator on the unique nature of the service, Jimma University College of Agriculture and Veterinary Medicine aspires to become the leading higher education in the core academic activities in

relation to teaching/learning, research, and to deliver services to the community at large. To implement its core mandate the college has developed a strategy called Community Based Education (CBE) that has components of Community Based Training Program (CBTP), Development Team Training Program (DTTP) and Student Research Program (SRP).

5.5. The case of Jigjiga University

5.5.1. Overview

College of Dry land Agriculture (CDA) was established in 2000 with two departments namely Animal and Range Science, and Dry land Crop Science. In 2000, the college opened another new department called Food Science and Nutrition. In the 2000/01 academic year, the college received 190 students who were assigned under the three departments.

Regarding practical issues, the college already was given rooms for laboratory activities from the newly completed building inside the campus. The college is preparing itself to open four laboratories of Animal nutrition, animal product processing, herbarium and soil laboratories.

Having dual purposes for students' practical work and as an income generation source for the University, the college is endeavouring on establishing different farms inside the campus. Accordingly, poultry and beef farms are planned to be opened soon. Regarding the institutional transformation, the college has harmonized the curriculum in line with the modular system and has implemented it since the 2005 academic year. The college has also implemented the Balanced Score Card system (B.SC.) for the last two quarter 2012. Besides, l to 5 peers learning has been applied.

Last but not least, while conducting a big project in Jigjiga and Awubere Woreda, which was sponsored by Mercy Corps Ethiopia, the college is on the verge of conducting four researches that are expected to be completed soon.

5.5.2. DRM education: Teaching learning

There are 4 undergraduate but no postgraduate programs related to agriculture in Jigjiga University.

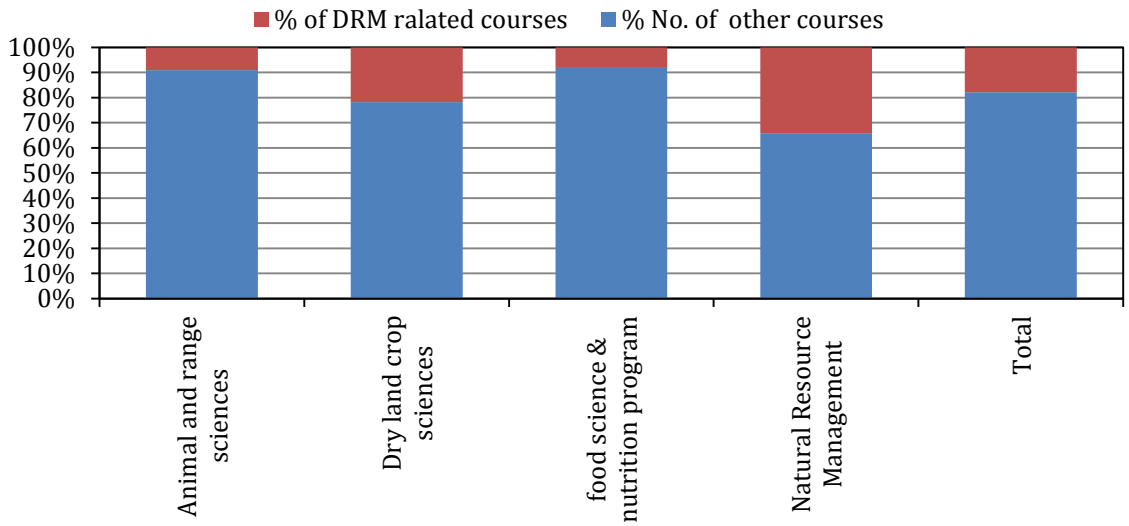

Figure 20 Number of DRM related Courses in undergraduate programs in percentage as compared to other courses. (Jigjiga)

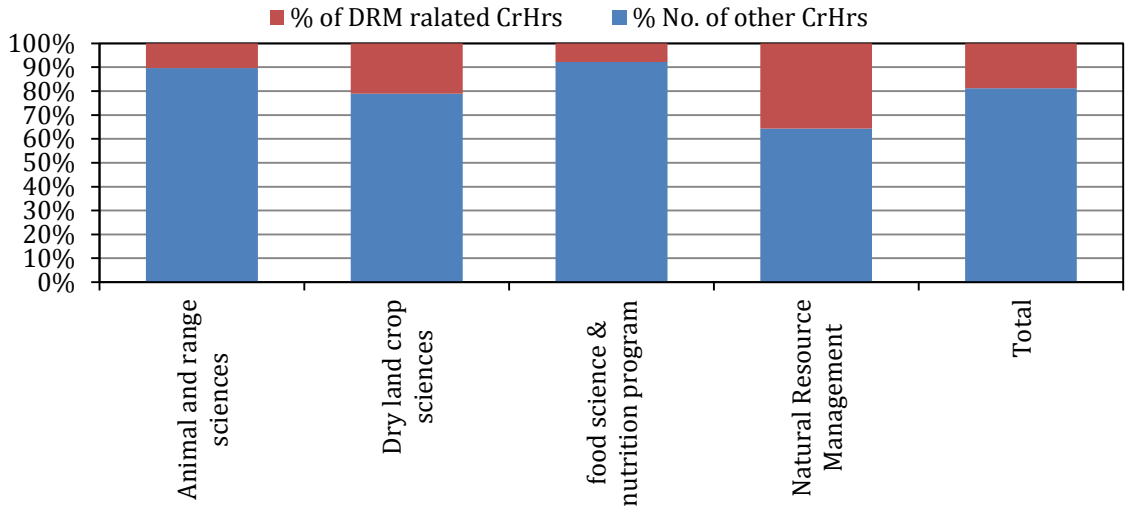

Figure 21 Number of DRM related Credit Hours in undergraduate programs in percentage as compared to other courses.

Figure 20and Figure 21 shows the percentage contribution of DRM related undergraduate courses in terms of number of courses and total credit hours given. As observed, the overall DRM courses contribute less than 20% both in terms of number of courses and credit hours. The Natural Resource Management department has the highest Number and credit hours, which is about 35%.

5.5.3. Professionals with DRM Related Background

In Jigjiga University all the students are in undergraduate study, indicating post graduate programs are still not opened. The situation could be related with the staff members qualification as it can be seen from Figure 22, the departments under study, have no Ph.D. holders. All the staff members are B.Sc. and M.Sc. holders, and overall M.Sc. holders account for 80% of the whole staff.

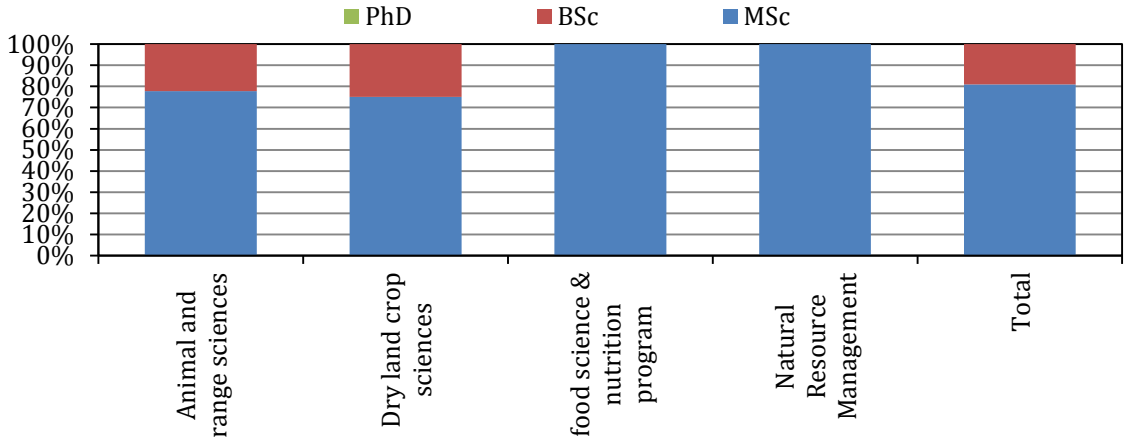

Figure 22 Percentage contributions of staff members depending on their qualification level.

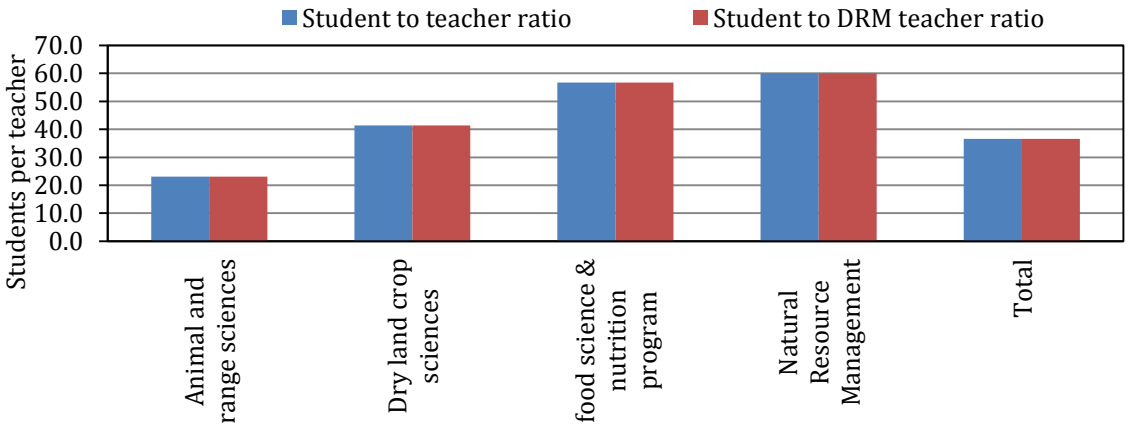

Figure 23 Student to teacher ratio comparing the DRM related staff to overall staff, in this particular university all staff members are DRM related.

The students to teachers' ratio ranges from 22 to 60 students per teacher and overall the ratio was found to be close to 35 students per teacher. As shown in Figure 23students to DRM related teachers ratio is similar to all staff members ratio, this is due to the fact that all staff members have DRM related back ground.

5.6. Comparison of Sample universities towards DRM education

As shown in Table 1, the percentage of courses related to DRM offered in Agriculture universities/colleges ranges from 17% to 25%. The maximum percentage of DRM related courses that are included in the agriculture program curricula are offered in Bahir Dar University where DRM education is being offered at both undergraduate and graduate program level. Surprisingly, in Jimma University where there is no DRM education at program level, more than 20% of the courses offered in agriculture programs are related to DRM.

There are also quite a large percentage of professionals with DRM background in all universities which ranges from 30% to 65%. In terms of student-teacher (with DRM background) ratio, Bahir Dar university is very much close to the minimum standard set by the Ministry of Education, which meets 94% of the minimum standard whereas Jigjiga, Jimma and Mekelle universities meets only 23.40%, 55.20% and 59% of the minimum standard. However, as DRM is a new and emerging field of study, the course descriptions of agriculture program curricula's still lacks inclusion of basic DRM concepts and principles. This indicated the need for curriculum revision and provision of basic DRM training for professionals who teach in the mainstream agriculture programs.

Table 1 DRM education status of universities that have agriculture colleges/programs

DRM Education Indicators	Bahir Dar University	Jigjiga University	Jimma University	Mekelle University
% of courses related to DRM	25.50	17.78	23.40	18.88
Student- teacher (with DRM related background) ratio as percent of the common standard	94.00	23.40	55.20	59.00
% of staff members with DRM related background	64.83	42.85	42.45	30.64
% of DRM related research output	32.35	11.11	26.85	33.33
% of community service related to DRM	25.00	20.00	60.00	50.00

In terms of DRM related research outputs, 32.35%, 11.11%, 26.85%, and 33.33% of researches conducted and completed in 2012/13 by M.Sc. graduate students and stuff members of Bahir Dar, Jigjiga, Jimma, and Mekelle universities are related to DRM and other environmental concerns. However, according to the discussion with Research and Community Service Coordinators of sample universities, there still remain limitations in publishing and communicating research results. When it comes to DRM related community services, Jimma and Mekelle universities have gone far in extending DRM related services

to outreach communities, with at least 50% of their services covering DRM. Moreover, these universities offer these courses three to four times in a year.

Figure 24, shows DRM education status of sample universities based on the five indicators discussed above. The centre of the radar represents poor or no progress towards DRM education and the outer perimeter of the radar represents very good progress towards DRM education.

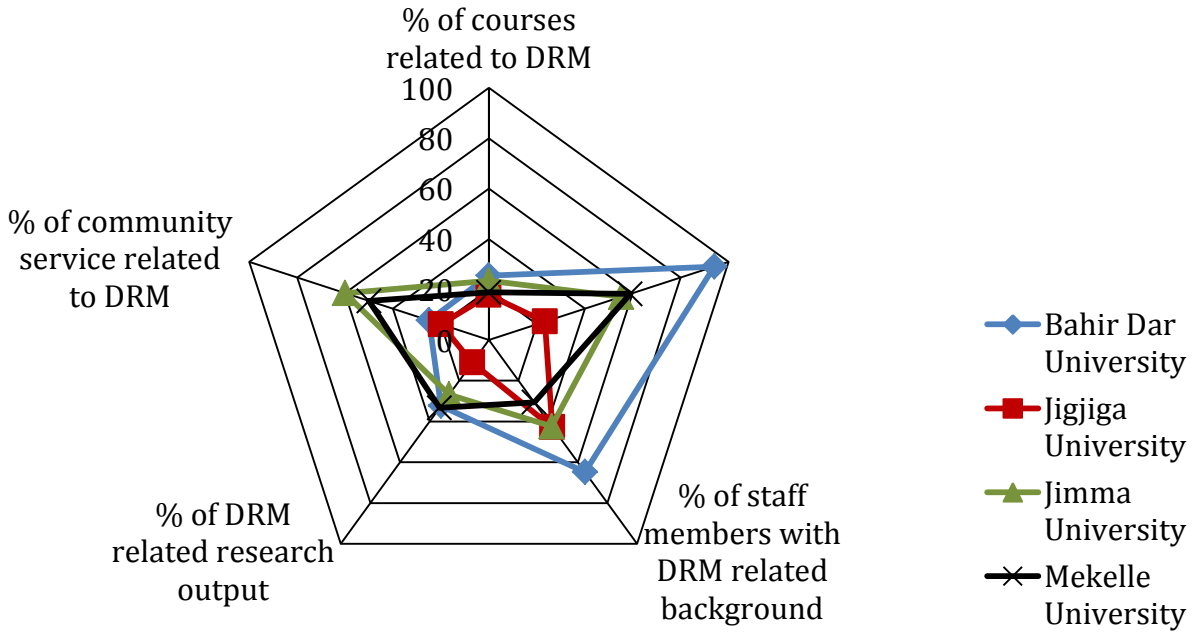

Figure 24 DRM education status of sample universities based on the five indicators.

Figure 25, shows strengths and weaknesses of universities in terms of teaching-Learning, research and community service major components of DRM education. As shown by Figure 25, in terms of teaching-Learning, Bahir Dar university is in a very good position as it is the first and only university to have DRM curriculum offered at both undergraduate and postgraduate levels. However, in terms of research and community services related to DRM, Mekelle and Jimma universities are relatively in a good position, given they don't have DRM curriculum offered at program level. Among all sample universities, Jimma University is by far better in providing DRM related community services as community-based education is the main focus of agriculture program curricula.

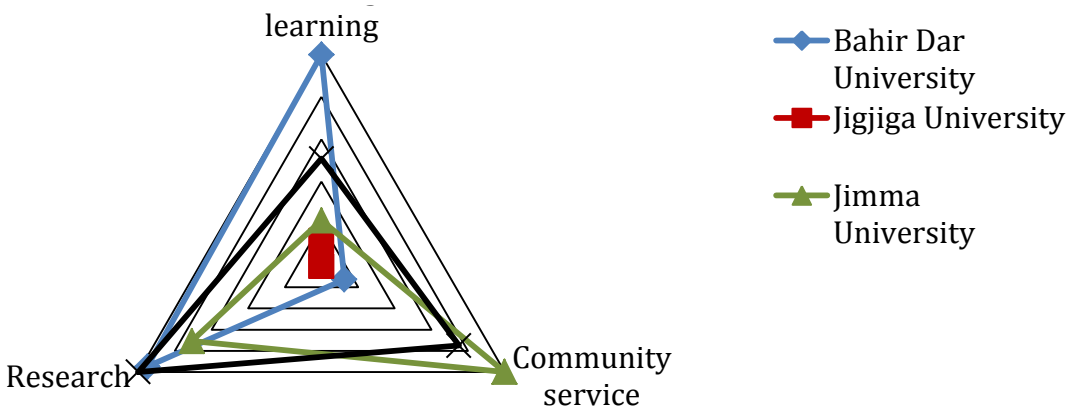

Figure 25, DRM education status of sample universities based on the three major components.

Index values should be interpreted as relative values to be compared within the sample Universities only. The DRM education index is on a scale from 0 (poor DRM focus) to 1 (better DRM focus).

The overall DRM education index is shown by Figure 26; Bahir Dar University had the highest DRM education index among sample universities, indicating better position towards DRM education. Jimma university had also relatively a higher DRM education index than Mekelle (0.646 vs 0.479, respectively). Jigjiga University had the lowest DRM education index (0.071), indicating relatively poor progress towards DRM education.

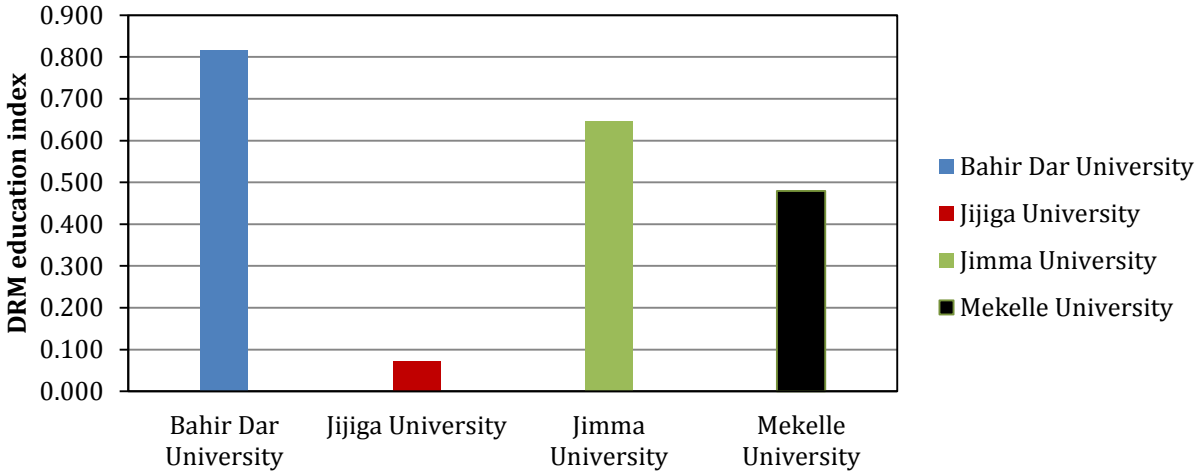

Figure 26 Overall DRM education index

6

Conclusion and Recommendations

Based on the above-mentioned results and discussions the following conclusions are drawn

- Based on the data presented, universities are creating awareness to the societies through community service and research.
- Based on the criteria placed BDU found to be with highest DRM index.
- The share of DRM related courses offered visas vis the total courses provided are found to be from fair to good.
- In all universities the student to teacher with DRM related background is in good range.
- As emerging field of study, teachers in different agricultural education programs have gaps related to DRM.
- Not well developed culture of interdisciplinary study/ research activities.
- Documentation and knowledge management to facilitate exchange of information and research results between universities and other stakeholders

6.1. Strategic Approach: Implication for FAO

Challenges	Possible FAO intervention to address the challenges	Existing opportunities
As emerging field of study, teachers in different agricultural education programs have gaps related to DRM.	Initiate tailor_ made capacity building program to enable all teachers introduced the issue of DRM	BDU DRM program

Not well developed culture of interdisciplinary study/ research activities	Harmonizing research and community service agendas of agriculture colleges considering the needs and demands of FAO, agriculture sectors of the national government	GTP, National DRM Strategy, National curriculum harmonization, DRM ATF (FAO), university focal person would help the harmonization process, higher education development programme.
Documentation and knowledge management to facilitate exchange of information and research results between universities and other stakeholders	Strengthening linkage between agriculture research institutes, AAU DRM research centre, FAO and DRMFSS	International Day for Disaster reduction, DRMATF,

Human capacity building

Initiate tailor_ made capacity building program to enable all teachers introduced to the issue of DRM together with BDU DRM program, to capacitate teachers in different agricultural education programs related to DRM because it is an emerging field of study.

Networking and partnership

By considering the needs and demands of FAO and agriculture sectors of the national government and taking the possible opportunities such as the GTP, National curriculum harmonization, DRM ATF and higher education development program, FAO should address the challenges coming from not well developed culture of interdisciplinary study/ research to better mainstream DRM.

Finally the study suggests that in order to facilitate exchange of information and research results between universities and other stakeholders (Documentation and knowledge management), there is a need to use already existed opportunities such as International Day for Disaster reduction and DRM ATF which would Strengthen linkage between agriculture research institutes, AAU DRM research centre, FAO and DRMFSS.

6.2. Action points

1. Training of teachers in the mainstream programs of Agriculture colleges/universities on DRM.
2. Provision of training materials that should include the following four modules.
    - DRM and Crop production
    - DRM and Animal production
    - DRM and Natural resource management
    - DRM and Rural development

3. Harmonise the research and community service Agendas of Agriculture colleges related to food security and DRM

4. Provide technical and financial support for Agriculture colleges to establish

    - DRM related knowledge management systems that can facilitate teaching and communication.
    - DRM related research resources and infrastructure
    - Resources for expanding DRM related community services

References

Atchoarena, D. and L. Gasperini, eds. 2003. Education for Rural Development. Towards New Policy Responses FAO/UNESCO-IIEP

Demese Chanyalew, B. A. 2010.Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) 2010-2020. Draft Federal Democratic Republic of Ethiopia Ministry of Agriculture and Rural Development

DRM ESMF. 2011. Ethiopia Disaster Risk Management Country Plan Project, Phase I

FAO. 2007. Climate change and food security: a framework document Rome Partnership for Disaster Risk Management. Disaster Risk Management in food and agriculture.

FAO. 2008. Climate change and food security: a framework a framework document Rome Partnership for Disaster Risk Management. Disaster Risk Management in food and agriculture.

Holloway, A. 2009.Crafting Disaster Risk Science: Environmental and geographical science sans frontières. Gateways: International Journal of Community Research and Engagement **ISDR.** 2004 living with risk: a global review of disaster reduction initiatives. Geneva, Switzerland.

IPCC, 2007. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY.

Kassa, M. 2013, May 19–23; GENEVA, SWITZERLAND Prevention web.net. Retrieved August 02, 2013, from PreventionWeb http://www.preventionweb.net/english/professional/contacts/v.php?id=1171.

Appendix

Appendix I, Bahir Dar University

Table 2 Percentage share of DRM related courses in each undergraduate program, CAES.

Undergraduate Program	No. of all courses		No. of DRM related courses		% of courses related to DRM	
	No. of courses	No. of Cr.Hrs.	No. of courses	No. of Cr.Hrs.	% of courses	% of Cr.Hrs.
Natural Resources Management	56	116	23	65	41.07	56.03
Animal Science and Technology	71	114	5	13	7.04	9.03
Rural Development	47	110	7	19	14.89	17.27
Plant Science	46	113	9	24	19.56	21.23
Disaster Risk Management and Sustainable Development	40	113	27	79	67.5	69.91
Fisheries, Wetland and Wildlife Management	43	109	13	37	30.23	33.94
Water Resource and Irrigation Management	41	116	9	20	21.95	17.27
Mid-Career Extension	33	90	2	7	6.06	7.77
Agricultural Economics	39	116	3	9	7.69	7.75
Total	416	997	98	273	23.56	27.38

Table 3 Percentage share of DRM related courses in each post graduate program, CAES.

Post graduate Program	No. of all courses		No. of DRM related courses		% of courses related to DRM	
	No. of courses	No. of Cr.Hrs.	No. of courses	No. of Cr.Hrs.	%age of courses	%age of Cr.Hrs.
Land Resources Management	15	35	7	20	46.66	57.14
Fisheries and Wetland Management	10	32	2	6	20	18.75
Agronomy	13	34	2	5	15.38	14.70
Animal Breeding and Genetics	12	34	1	2	8.33	5.88
Animal Production	14	37	3	9	21.42	24.32
Disaster Risk Science and Management	13	36	10	25	76.92	69.44
Plant Protection and Horticulture	16	43	7	18	43.75	41.86
Total	93	251	32	85	34.41	33.86

Table 4 Number of UG and PG students and teachers in Bahir Dar University, College of Agriculture and Environmental Sciences in the year 2012/13

Name of Programs	No. of students			No. of teachers			
	UG	PG	Tot	B.Sc.	M.Sc.	Ph.D.	Tot
Natural Resource Management	150	32	182	3	6	7	16
Animal Science and Technology	142	16	158	2	7	4	13
Plant Science	150	10	160	3	7	5	15
Disaster Risk Management and Sustainable Development	229	55	284	1	11	2	14
Fisheries, Wetland and Wildlife	26	5	31	4	6	3	13

Management							
Water Resource and Irrigation Management	144	NA	144	2	5	0	7
Rural Development	193	NA	193	4	6	3	13
Mid-Career Extension	70	NA	70				
Agricultural Economics	36	NA	36				
Grand Total	1140	118	1258	19	48	24	91

Source: own survey

Table 5 Teaching-learning (DRM related professional background) Bahir Dar University

	DRM related Background	No. of B.Sc. holders	No. of M.Sc. holders	No. of Ph.D. holders	Total
Natural Resource Management	Environmental Science	0	2	2	4
	Tropical Land Resources Management	0	0	1	1
	Land Resources Management	2	1	0	3
	Soil and Water Management	1	0	0	1
Animal Science and Technology	Animal Nutrition	0	1	2	3
	Tropical Animal Disease	0	0	1	1
	Veterinary Pathology	0	0	1	1
Rural Development	Agricultural Economics	0	2	0	2
	Development Economics	0	1	0	1
	Regional and Local Development Study(RLDS)	0	2	0	2
	Sociology and Anthropology	0	2	0	2
	Rural development	3	6	2	11
Plant Science	Plant Pathology	0	1	2	3
	Entomology	0	1	0	1

Disaster Risk Management and Sustainable Development	Environmental Science	0	1	0	1
	Entomology	0	1	0	1
	Development Study	0	1	2	3
	Social Anthropology	0	1	0	1
	Disaster Risk Management & Sust. Dev't	1	4	0	5
	Public health	0	1	0	1
Fisheries, Wetland and Wildlife Management	Fisheries, Wetland and Wildlife Management	4	2	0	6
	Ecological Systematic zoology	0	1	0	1
	Environmental sciences	0	1	0	1
Water Resource and Irrigation Management	Hydrology and Water Resource Management	0	1	0	1
	Water Resource and Irrigation Mgmt.	2	0	0	2
Total		13	33	13	59

Source: own survey

Table 6 Student-teacher ratio

Name of Program	Students to teachers ratio	
	Total student to total teachers ratio	Total students to teachers with DRM related back ground ratio
Natural Resource Management	11	20
Animal Science and Technology	12	32
Plant Science	11	40
Disaster Risk Management and Sustainable Development	20	24
Fisheries, Wetland and Wildlife Management	2	4
Water Resource and Irrigation Management	21	48
Rural Development	15	18
Total	13	22

Source: own survey

Identified DRM related courses - Bahir Dar University, College of Agriculture and Environmental Science

Course code	DRM related courses	Cr.Hrs.	Target groups
Narm1014	Soil & Water Conservation	3	Narm year I
Narm2023	Forest Inventory and management	3	Narm year II
Fwwm2035	Wildlife Resources and Management	3	Narm year II
Narm2031	General Ecology	3	Narm year II
Fwwm1025	Wetland management	3	Narm year II
Narm2032	Integrated watershed Management	3	Narm year II
Narm2035	Land Evaluation& Land use Planning	3	Narm year II
Wrim2025	Hydrology	3	Narm year II
Wrim4091	Water Resources Planning and Management	3	Narm year II
Narm3041	Int. Environmental Science	3	Narm year III
Narm3052	Natural .Resources population & Environment	3	Narm year III
Agec1014	Natural Resources and Environmental Economics	3	Narm year III
Narm3053	Climatology& meteorology	3	Narm year III
Narm3055	Environmental Impact Assessment	3	Narm year III
Narm3054	Renewable Energy Production and Management	3	Narm year III
Narm3062	Participatory Natural Resources and conflict management	3	Narm year III
Nrlm612	Integrated soil fertility management	3	Nrlm, M.Sc. year I
Nrlm614	Soil and water conservation	3	Nrlm, M.Sc. year I
Nrlm621	Agricultural water management	3	Nrlm, M.Sc. year I
Nrlm642	Integrated watershed management and land use planning	2	Nrlm, M.Sc. year I
Nrlm643	Environmental Impact Assessment	2	Nrlm, M.Sc. year I
Nrlm647	Economics of land resource management	2	Nrlm, M.Sc. year I
Nrlm649	Climatology and agro-meteorology	2	Nrlm, M.Sc. year I
Fwwm2045	Wildlife Ecology & Management	2	Anpt year I
Anpt1013	Parasitology of Farm Animals	3	Anpt year I
Anpt1014	Animal Health & Disease Management	3	Anpt year I

Anpt1015	Food Hygiene & Public Health	2	Anpt year I
Anpt2024	Range ecology and Management	3	Anpt year II
Angb638	Animal Genetic Resource and Conservation	2	Animal breeding M.Sc. year I
Anst 601	Advanced Animal Nutrition	3	Animal production M.Sc. year I
Anst 603	Advanced forage Production & Range Management	3	Animal production M.Sc. year I
Anst 615	Farm Animal Diseases and Management	3	Animal production M.Sc. year I
Anpt604	Rangeland Management	2	Animal protection M.Sc. year I
Annt 612	Applied Monogastric Nutrition	3	Animal protection M.Sc. year I
Annt 622	Applied Ruminant Nutrition	3	Animal protection M.Sc. year I
Annt 711	Animal Nutrition	1	Animal protection M.Sc. year I
PLPP 601	Post-harvest pest management	2	Plant protection M.Sc. year I
PLPP 621	Insect Morphology and Taxonomy	3	Plant protection M.Sc. year I
PLPP 602	Advanced Integrated Pest Management	3	Plant protection M.Sc. year I
PLPP 604	Agricultural Pesticides	3	Plant protection M.Sc. year I
PLPP 642	Weed Biology, Ecology & Management	3	Plant protection M.Sc. year I
PLPP 615	Plant Disease Epidemiology (E)	2	Plant protection M.Sc. year I
PLPP 608	Plant Pest Interactions (E)	2	Plant protection M.Sc. year I
Narm1056	Agro-Climatology	2	Plant Science year I
Plsc1014	Plant Ecology	2	Plant Science year I
Plsc2024	Plant Genetic Resource Conservation & Use (E)	2	Plant Science year I
Narm2032	Integrated Watershed Management (E)	2	Plant Science year I
Plsc2041	Soil fertility and Plant Nutrition	3	Plant Science year III
Plsc3071	Agricultural Entomology	3	Plant Science year III
Plsc3072	Plant Pathology	3	Plant Science year III
Plsc3073	Weeds and Weed Management	3	Plant Science year III
Plsc3074	Agricultural Pesticides & IPM of Major Crops Pests	3	Plant Science year III
Narm3051	Introduction to Environmental Sciences	2	DRMSD year I
Drms1011	Introduction to Disaster Risk Management	3	DRMSD year I
Drms1012	Natural Hazards	3	DRMSD year I
Drms1013	Anthropogenic Hazards	3	DRMSD year I
Drms1014	Sociology for Disaster	3	DRMSD year I

Drms1015	Climate Change and Disaster	3	DRMSD year I
Drms2021	Environmental Impact and Risk Assessment	3	DRMSD year II
Drms2022	Perception and Identification of Risk	3	DRMSD year II
Drms2023	Emergence Information Management	2	DRMSD year II
Drms2024	Early Warning Systems	3	DRMSD year II
Drms2031	Disaster Risk Mitigation and Prevention	3	DRMSD year II
Drms2032	Disaster Preparedness and Response	3	DRMSD year II
Drms2033	Disaster and Development Logistics	2	DRMSD year II
Drms2034	Drought and Flood Management	4	DRMSD year II
Drms2041	Sustainable Development	3	DRMSD year II
Drms2042	Livelihoods	3	DRMSD year II
Drms2043	Pastoralism, Disaster & Development	3	DRMSD year II
Drms2044	Relief and Development	3	DRMSD year II
Drms3046	Development Planning and Disaster Management	3	DRMSD year III
Drms3051	Statistics for Disaster Risk Management	3	DRMSD year III
Drms3052	Research Methods in Disaster Risk Management	3	DRMSD year III
Drms3053	Community Based Disaster Management	3	DRMSD year III
Drms3061	Gender, Disaster and Development	3	DRMSD year III
Drms3062	Migration and Refugee	3	DRMSD year III
Drms3063	Health and Nutrition in Disaster	3	DRMSD year III
Drms3064	Disaster and Trauma Counselling	3	DRMSD year III
Drss 601	Conceptual Understanding of Disaster Fundamentals	3	DRSSD M.Sc. year I
Drss 611	Political and Institutional Environment	3	DRSSD M.Sc. year I
Drss 642	Methodological Application of Disaster Research	3	DRSSD M.Sc. year I
Drss 652	Management of Disaster Risks	3	DRSSD M.Sc. year I
Narm1037	Introduction to natural resources management	3	FWWM year I
Narm2031	General Ecology	3	FWWM year I
Fwwm1011	Ecology of inland water bodies	3	FWWM year I
Fwwm1014	Water quality management	3	FWWM year I
Fwwm1021	Introduction to Wetlands and Watersheds	3	FWWM year I
Fwwm1022	Integrated Wetland Management	3	FWWM year I

Fwwm2031	Wildlife Ecology	3	FWWM year II
Fwwm2033	Mammalogy (E)	3	FWWM year II
Fwwm2034	Ornithology	2	FWWM year II
Fwwm2043	Protected Area Planning and Management	2	FWWM year II
Narm3055	EIA	3	FWWM year II
Fwwm3064	Fish Nutrition	3	FWWM year III
Fwwm3065	Fish diseases	3	FWWM year III
Fawm 612	Wetlands Ecosystem management	3	FWWM M.SC. year I
Fawm 632	Environmental Policy and Advocacy	3	FWWM M.SC. year I
Wrim1021	Climatology and Modelling	2	Wrim year I
Wrim2034	Water Diversion & Distribution Structures	3	Wrim year I
Wrim2035	Small Dams and Structures	3	Wrim year I
Wrim2044	Land Drainage & Salinity Management	3	Wrim year II
Narm 1014	Soil and Water Conservation	3	Wrim year II
Wrim2051	Watershed and River Basin Management	3	Wrim year III
Wrim3061	Rural Water Supply and Sanitation	3	Wrim year III
Wrim3071	Water Resources Planning & Management	3	Wrim year III
Narm3055	Environmental Impact Assessment	3	Wrim year III
NARM 1037	Introduction to Natural Resource Management	3	AE year I
ADEC 2035	Natural resource and environmental economics	3	AE year III
Narm1014	Soil and Water Conservation	3	RD year I
Drms2035	Risk and Emergency Management	2	RD year I
Agec1014	Natural Resource and Environmental Economics	3	RD year I
Rudv3061	Community Development	3	RD year III
Rudv3062	Sustainable Development and Rural Livelihoods	3	RD year III
Rudv3063	Population and Development	2	RD year III
Rudv3064	Pastoralism and Agro pastoral Development	3	RD year III
Narm 3911	Soil and Water Management	4	MCE year III
Rudv 3531	Farming systems & Livelihood Analysis	3	MCE year III

Appendix II, Mekelle University

Table 7 Percentage share of DRM related courses in each undergraduate program Mekelle University, College of Dry land Agriculture and Natural Resources.

Departments	Undergraduate Programs	No. of all courses		No. of DRM related courses		% of courses related to DRM	
		No. of courses	No. of Cr.Hrs.	No. of courses	No. of Cr.Hrs.	% of courses	% of Cr.Hrs.
Animal, Range land and wild life Science	Animal production and Technology	53	121	5	12	9.43	9.92
	Wild life and Eco – tourism Management	42	112	10	27	23.81	24.11
Dry land crop and Horticulture Science	Dry land Crop Science	48	123	15	37	31.25	30.08
	Food Science and Post-harvest technology	46	80	4	12	8.70	15.00
	Dry land Horticultural Science	53	116	8	19	15.09	16.38
	Bio - technology	36	112	2	5	5.56	4.46
Natural Resource Economics and Management	Natural Resource Economics and Management	44	99	6	15	13.64	15.15
	Rural development and Agricultural extension	44	116	6	15	13.64	12.93
	Mid-career in Agricultural extension	33	90	2	7	6.06	7.78
Land Resource Management and	Soil Resource and Water shed Management	36	108	11	30	30.56	27.78

Environmental Protection	Water Resource and Irrigation Management	43	118	8	23	18.60	19.49
	Forest and Natural Conservation	52	120	11	24	21.15	20.00
Total		530	1315	88	226	16.60	17.19

Table 8 Percentage Share of DRM Related Courses in Each Post Graduate Program at Mekelle University, College of Dry land Agriculture and Natural Resources

Departments	**Post graduate Programs**	**No. of all Courses**		**No. of DRM Related Courses**		**% of Courses Related to DRM**	
		No. of Courses	**No. of Cr.Hrs.**	**No. of Courses**	**No. of Cr.Hrs.**	**% of Courses**	**% of Cr.Hrs.**
Animal, Range land and Wildlife Science	Livestock Production and Pastoral Development	12	26	4	11	33.33	42.31
Dry land Crop and Horticulture Science	Agronomy	12	36	7	21	58.33	58.33
Natural Resource Economics and Management	Agro Ecology and Sustainable Development	11	31	4	12	36.36	38.71
	Rural Development	10	35	3	9	30.00	25.71
Land Resource Management and Environmental Protection	Tropical Land Resource Management	13	31	5	14	38.46	45.16
Total		58	159	23	67	39.66	42.14

Table 9 Number of UG and PG Students and Teachers in Mekelle University, College of Dry land Agriculture and Natural Resources in the Year 2012/13, Student – Teacher ratio (General)

Name of Programs	No. of Students			No. of Teachers				DRM related teachers	Student to Teacher Ratio
	UG	PG	Tot	B.Sc.	M.Sc.	Ph.D. & above	Tot		
Animal, Range land and Wildlife Science	325	15	340	10	18	2	30	5	11
Dry land Crop and Horticulture Science	585	14	599	11	30	9	50	6	12
Natural Resource Economics and Management	427	69	496	4	27	9	40	10	12
Land Resource Management and Environmental Protection	482	14	496	23	27	16	66	26	8
Total	1819	112	1931	48	102	36	186	57	10

Table 10 Percentage Distribution among DRM Related Professionals and Other Fields Trained Professionals in Each Program.

Name of Programs	No. of all Teachers				No. of Teachers with DRM Related Professional Background				
	B.Sc.	M.Sc.	Ph.D.	Total	B.Sc.	M.Sc.	Ph.D.	Total	% of Teachers
Animal, Range land and Wildlife Science	10	18	2	30	0	5	0	5	16.7
Dry land Crop and Horticulture Science	11	30	9	50	0	4	2	6	12
Natural Resource Economics and Management	4	27	9	40	3	7	0	10	25
Land Resource Management and Environmental Protection	23	27	16	66	12	10	4	26	39.4
Total	48	102	36	186	15	26	6	57	30.6

Identified DRM related courses - Mekelle University, Dry land Agriculture and Natural Resources

Table 11 Dry land Crop and Horticulture Science

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
BIOT1056	Biodiversity and Conservation of Germplasm	2	Biotechnology Year I UG Students
BIOT 2086	Environmental Biotechnology	3	Biotechnology Year III UG Students
DLA 4011	Dry land Farming and Watershed Management	3	Dry land Agronomy PG Year I Students
DLA 4012	Soil Fertility Management	3	Dry land Agronomy PG Year I Students
DLA 4013	Sustainable Agriculture in Different Agro-ecosystem	3	Dry land Agronomy PG Year I Students
DLA 4014	Advanced Agro-climatology	3	Dry land Agronomy PG Year I Students
DLA 4015	Irrigation Agronomy	3	Dry land Agronomy PG Year I Students
DLA 5041	Integrated Pest Management	3	Dry land Agronomy PG Year II Students
DLA 5042	Post-harvest Pest Management	3	Dry land Agronomy PG Year II Students
LARP1032	Soil Fertility and Plant Nutrition	2	Dry land Crop Sciences UG Year I Students
LARP1033	Management of Arid and Salt Affected Soils	3	Dry land Crop Sciences UG Year I Students
DCHS1035	Agro-climatology	2	Dry land Crop Sciences UG Year I Students
DLCS1036	Stress Physiology	2	Dry land Crop Sciences UG Year I Students
LARP1037	Land Use Planning (E)	2	Dry land Crop Sciences UG Year II Students
LIPT2048	Pasture and Forage Crops Production	2	Dry land Crop Sciences UG Year II Students
DLCS2052	Plant Pathology	3	Dry land Crop Sciences UG Year II Students
DLCS2053	Weeds and their Management	3	Dry land Crop Sciences UG Year II Students
DCHS2054	Agricultural Entomology	3	Dry land Crop Sciences UG Year II Students
DLCS2055	Pesticides and IPM	3	Dry land Crop Sciences UG Year II Students
DLCS3075	Crop Breeding for Stress Environment	2	Dry land Crop Sciences UG Year III Students
DLCS3076	Crop Biodiversity Conservation and Mgmt.	2	Dry land Crop Sciences UG Year III Students
LARP3091	Irrigation Agronomy and Drainage	3	Dry land Crop Sciences UG Year III Students

LARP3092	Water Management in Dry land Ecosystems	3	Dry land Crop Sciences UG Year III Students
DLCS3093	Drought Management and Risk Mitigation	2	Dry land Crop Sciences UG Year III Students
FSPT 1053	Human Nutrition	3	Food Science and Post-harvest Technology Year I Students
FSPT 2073	Food Hygiene and Safety	3	Food Science and Post-harvest Technology Year II Students
FSPT 2083	Handling and Storage of Animal Products	3	Food Science and Post-harvest Technology Year II Students
FSPT 3133	Food Waste Management and Environmental Sanitation	3	Food Science and Post-harvest Technology Year III Students
DCHS1045	Plant Ecology	2	Dry land crop and horticulture Science year I students
LaRP2072	Soil Fertility & Plant Nutrition	2	Dry land Crop and Horticulture Science Year II Students
DCHS2073	Agro-climatology	2	Dry land Crop and Horticulture Science Year II Students
DCHS2074	Irrigation and Drainage	3	Dry land Crop and Horticulture Science Year II Students
DCHS2075	Management of Salt Affected Soils	2	Dry land Crop and Horticulture Science Year II Students
DCHS2081	Horticultural Pathology	3	Dry land Crop and Horticulture Science Year II Students
DCHS2082	Agricultural Entomology	3	Dry land Crop and Horticulture Science Year II Students
DCHS2083	Weeds & Weed Management in Horticulture	2	Dry land Crop and Horticulture Science Year II Students

Table 12 Animal, Rangeland and Wildlife Science

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
AnPT1013	Animal Health and Disease Management	3	Animal production and Technology Year IUG
AnPT1022	Principles of Animal Nutrition	2	Animal production and Technology Year IUG
AnPT1024	Applied Animal Nutrition	2	Animal production and Technology Year I UG
AnPT2031	Range and Wildlife Ecology	3	Animal Production and Technology Year II UG
AnPT2033	Livestock Production and Environment	2	Animal Production and Technology Year II UG
WEtM1055	Wildlife Nutrition	2	WEtM Year I Students
WEtM1061	Rangeland Ecology and Management	3	WEtM Year I Students
WEtM1062	Forest Ecosystem Conservation and Management	3	WEtM Year I Students
WEtM2071	Protected area Planning and Management	3	WEtM Year II Students
WEtM2072	Wildlife Ecology and Management	4	WEtM Year II Students
WEtM2073	Wildlife Pest and Disease Management	3	WEtM Year II Students
WEtM2074	Conflict Resolution and Management in Wildlife	2	WEtM Year II Students
WEtM2075	Community based Wildlife Conservation	3	WEtM Year II Students
WEtM3113	Advocacy and Promotion in Wildlife Conservation	2	WEtM Year III Students
WEtM3126	Introduction to Natural Resources Economics	2	WEtM Year III Students

Table 13 Livestock Production and Pastoral Development

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
LPGS 519	Rangeland Monitoring and Evaluation	3	LPGS Year I Students
LPGS 514	Advanced Animal Nutrition	3	LPGS Year I Students

LPGS 516	Advanced Rangeland Rehabilitation and Improvement	3	LPGS Year I Students
LPGS 520	Pastoralism and Social Anthropology	2	LPGS Year I Students

Table 14 Natural Resource Economics and Management

Course Code	**DRM Related courses**	**Cr.Hrs.**	**Target Groups**
LRMP1053	Forestry and wild life management	2	Year I NREM
NREM1055	Resources use conflict and management	2	Year I NREM
LRMP1056	Land use planning	2	Year I NREM
NREM3121	Environmental Valuation and accounting	3	Year III NREM
NREM3122	Natural resources and Environmental policy and law	3	Year III NREM
NREM3123	Environmental Impact assessment	3	Year III NREM

Table 15 Rural Development and Agricultural Extension

Course Code	**DRM Related Courses**	**Cr.Hrs.**	**Target Groups**
NaRM-M1043	Introduction To Soil And Water Management	2	Year I RDAE
NaRM-M1043	Soil Conservation And Water Shade Management	2	Year I RDAE
APMA-M1053	Agro-Metrology And Response Farming	2	Year II RDAE
RDAE-M2071	Agricultural Knowledge And Innovation System	3	Year III RDAE
RDAE 3112	Rural Livelihoods And Social Welfare	3	Year III RDAE
RDAE 3112	Environment And Sustainable Development	3	Year III RDAE

Table 16 Agro Ecology and Sustainable Development M.SC.

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
AESD621	Livestock Production Systems and the Environment	3	
AESD631	Crop Production Systems and Integrated Pest Management	3	
AESD602	Integrated Natural Resources Management	3	
AESD612	Socioeconomic and Institutional Aspects of Agro ecosystems development	3	

Table 17 Rural Development M.Sc.

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
FE_6823	Rural Poverty, Food Security and Sustainable Livelihoods	3	
FE_6804	Regeneration and Conservation of Natural Resources	3	
FE_6812	Water Resources Management	3	

Table 18 Land Resources Management and Environmental Protection, Forest and Nature Conservation (LRMTP)

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
FONC1041	Introduction to Dry land Forestry	2	Forest and Nature Conservation Target Groups Year I Students
FONC1045	Introduction to Meteorology and Climatology	2	Forest and Nature Conservation Target Groups Year I Students
FONC1042	Biodiversity Conservation	2	Forest and Nature Conservation Target Groups Year II Students
FONC3121	Ecological Anthropology	2	Forest and Nature Conservation Target Groups

			Year II Students
FONC2062	Land use Planning and Watershed Management	3	Forest and Nature Conservation Target Groups Year II Students
LARP2081	Principle of Soil and Water Conservation	2	Forest and Nature Conservation Target Groups Year II Students
FONC2083	Approach to Sustainable Land Management	2	Forest and Nature Conservation Target Groups Year III Students
FONC2091	Introduction to Environmental Sciences	2	Forest and Nature Conservation Target Groups Year III Students
FONC2093	Climate Change and Forestry	2	Forest and Nature Conservation Target Groups Year III Students
FONC2095	Environmental Impact Assessment	2	Forest and Nature Conservation Target Groups Year III Students
FONC2073	Dry land Forest and Woodland Management	3	Forest and Nature Conservation Target Groups Year III Students

Table 19 LaRMTP (Land Resources Management and Environmental Protection) Soil Resources and Watershed Management

Course Code	**DRM Related Courses**	**Cr.Hrs.**	**Target Groups**
SRWM1061	Soil Fertility and Plant Nutrition	3	Year I SRWM Students
SRWM1062	Management of Acid and Salt Affected soils	2	Year I SRWM Students
SRWM1062	Management of Acid and Salt Affected soils	2	Year I SRWM Students
SRWM2072	Water Resource Planning and Management	3	Year I SRWM Students
SRWM2073	Irrigation and Drainage	3	Year I SRWM Students
SRWM2074	Water pollution and Management	2	Year I SRWM Students
SRWM2082	Land Evaluation and Land Use Planning	3	Year II SRWM Students
SRWM2091	Watershed Management	3	Year II SRWM Students

SRWM2093	Soil and Water Conservation	3	Year IISRWM Students
SRWM3111	Environmental Science and Impact Assessment	3	Year III SRWM Students
SRWM3112	Integrated Environmental Planning and Management	3	Year III SRWM Students

Table 20 LaRMTP (Land Resources Management and Environmental Protection) Water Resources and Irrigation Management

Course Code	**DRM Related Courses**	**Cr.Hrs.**	**Target Groups**
WRIM1031	Climatology and Agro-meteorology	2	Year I WRIM
WRIM2051	Soil and Water Conservation Engineering	3	Year II WRIM
WRIM 2052	Integrated Watershed and River Basin Management	3	Year II WRIM
WRIM 2052	Integrated Water Resources Management	3	Year II WRIM
WRIM3092	Drought Mitigation and Risk Management	3	Year III WRIM
WRIM3103	Land Drainage and Salinity Management	3	Year III WRIM
WRIM3112	Water Pollution and Wastewater Management	3	Year III WRIM
WRIM3113	Environmental Impact Assessment	3	Year III WRIM

Table 21 LaRMTP (Land Resources Management and Environmental Protection) Tropical Land Resource Management (M.SC.)

Course Code	**DRM Related Courses**	**Cr.Hrs.**	**Target Groups**
LARMEP40114	Environmental Pollution and Management	2	
LARMEP40115	Advanced Sustainable Land Management	3	
LARMEP40111	Tropical soil and Nutrient Management	3	
LARMEP40112	Integrated Water Resource Management	3	
LARMEP40113	Ecology and Management of Forest Resources	3	
LARMEP40114	Environmental Pollution and Management	3	

Appendix III, Jimma University

Table 22 Percentage Share of DRM Related Courses in Each Undergraduate Program, Jimma University, College of Agriculture and Veterinary Medicine (JUCAVM).

Departments	Undergraduate Programs	No. of All Courses		No. of DRM Related Courses		% of Courses Related to DRM	
		No. of courses	No. of Cr.Hrs.	No. of courses	No. of Cr.Hrs.	% of Courses	% of Cr.Hrs.
Horticulture and Plant Science	Horticulture	42	112	7	17	16.67	15.18
	Plant science	46	112	9	23	19.57	20.54
	Sugar Agronomy	46	112	12	31	26.09	27.68
Animal Science	Animal Science	44	112	5	14	11.36	12.50
Agricultural Economics and Rural Development	Agricultural economics	45	112	3	8	6.67	7.14
	Agribusiness and vale chain management	20	112	1	5	5.00	4.46
	Rural Development	44	116	4	10	9.09	8.62
Natural Resource Management	Natural Resource Management	43	119	12	33	27.91	27.73
School of Veterinary Medicine	Doctor of veterinary medicine	80	224	22	61	27.50	27.23
Total		410	1131	75	202	18.29	17.86

Table 23 Percentage Share of DRM Related Courses in Each Post Graduate Program JUCAVM.

Departments	Post Graduate Programs	No. of All Courses		No. of DRM Related Courses		% of Courses Related to DRM	
		No. of Courses	No. of Cr.Hrs.	No. of Courses	No. of Cr.Hrs.	% of Courses	% of Cr.Hrs.
Horticulture and Plant Science	Floriculture	17	41	2	5	11.76	12.20
	Vegetable Science	17	39	2	5	11.76	12.82
	Fruit Science	16	39	4	11	25.00	28.21
	Coffee, Tea and Spices	16	39	2	5	12.50	12.82
	Apiculture Stream	15	36	5	11	33.33	30.56
	Agricultural Entomology Stream	16	37	8	18	50.00	48.65
	Veterinary Entomology Stream	15	36	8	18	53.33	50.00
	Sericulture Stream	15	36	6	13	40.00	36.11
	Plant Breeding	18	54	2	5	11.11	9.26
	Plant Pathology	17	34	13	29	76.47	85.29
	Plant Biotechnology	16	37	1	2	6.25	5.41
Animal Production	Animal Production	17	32	4	9	23.53	28.13
	Dairy Animal Production	17	32	4	9	23.53	28.13
	Meat Animal Production	17	32	4	9	23.53	28.13
	Apiculture	17	32	6	15	35.29	46.88
	Poultry Production	17	35	3	8	17.65	22.86
Agricultural Economics and Rural Development	Agribusiness and Value Chain Management	14	38	1	2	7.14	5.26
Natural Resource Management	Watershed Management	14	35	7	15	50.00	42.86
	Forest and Natural Resource Conservation	14	35	8	17	57.14	48.57
	Soil Science	16	35	5	11	31.25	31.43
School of Veterinary Medicine	Veterinary Epidemiology	12	36	3	9	25.00	25.00
	Veterinary Public Health	13	36	4	9	30.77	25.00

Total	Total	346	806	102	235	29.48	29.16

Table 24 Number of UG and PG Students and Teachers in the Year 2012/13 JUCAVM

Name of Programs	No. of Students			No. of Teachers				DRM related teachers				Student to Teacher Ratio	Student to DRM Teacher Ratio
	Undergraduate	Postgraduate	Total	B.Sc.	M.Sc.	Ph.D. & above	Total	B.Sc.	M.Sc.	Ph.D. & above	Total		
Horticulture and Plant Science	236	28	264	6	8	7	21	2	4	3	9	13	29
Animal Science	571	18	589	2	8	5	15	0	0	2	2	39	295
Agricultural Economics and Rural Development	373	32	405	3	27	2	32	0	7	0	7	13	58
Natural Resource Management	210	25	235	7	15	1	23	7	12	0	19	10	12
School of Veterinary Medicine	122	15	137	1	12	2	15	0	6	2	8	9	17
Total	1512	118	1630	19	70	17	106	9	29	7	45	15	36

Identified DRM Related Courses - Jimma University

Table 25 Horticulture

Course Code	DRM Related Courses	Cr.Hrs.
Hort1034	Soil and Water Conservation	2
Hort1042	Greenhouse Operation, in Production and Management of Horticultural Crops	3
HORT3171	Postharvest Physiology and Handling of Horticultural Products	3

HORT3173	Food Safety and Quality of Horticultural Produces	1
HORT2101	Horticultural Entomology	3
HORT2102	Horticultural Pathology	3
HORT2103	Weed and Weeds Management in Horticultural Crops	2

Table 26 Plant Science

Course code	**DRM related courses**	**Cr.Hrs.**
Plsc1016	Plant Ecology	2
Plsc1022	Soil Fertility and Plant Nutrition	3
Narm1023	Soil and Water Conservation	2
Plsc2051	Agricultural Entomology	3
Plsc2052	Plant Pathology	3
Plsc2053	Weeds and their Management	3
Plsc2054	Management of Crop Diseases and Insect Pests of Economic Importance	3
Plsc2061	Agro-climatology	2
Plsc3095	Postharvest Physiology and Handling of Horticultural Crops	2

Table 27 Sugar Agronomy

Course Code	**DRM Related Courses**	**Cr.Hrs.**
Plsc1014	Agricultural Microbiology	3
Plsc1016	Plant Ecology	2
Plsc1022	Soil Fertility and Plant Nutrition	3
Narm1023	Soil and Water Conservation	2
Plsc2051	Agricultural Entomology	3

Plsc2052	Plant Pathology	3
Plsc2053	Weeds and their Management	3
Plsc2054	Management of Crop Diseases and Insect Pests of Economic Importance	3
Plsc2061	Agro-climatology	2
Plsc2062	Field Crops Production	3
Plsc2063	Industrial Crops Production	2
Plsc3095	Postharvest Physiology and Handling of Horticultural Crops	2

Table 28 Animal Science

Course Code	**DRM Related Courses**	**Cr.Hrs.**
AnSc 2032	Forage and Pasture Production	3
AnSc 2033	Range Ecology and Management	3
VetM 3102	Veterinary Parasitology	2
VetM 3103	Animal Health and Disease Control	3
VetM 3104	Food Hygiene and Veterinary Public Health	3

Table 29 Agricultural Economics

Course Code	**DRM Related Courses**	**Cr.Hrs.**
NaRM1052	Soil and Water Conservation	2
NaRM1051	Introduction to Natural Resource Management	3
AgEc3123	Natural resource and Environmental Economics	3

Table 30 Agribusiness and Value Chain Management

Course Code	DRM Related Courses	Cr.Hrs.
ABVM 412	Change Management	5

Table 31 Rural Development

Course Code	DRM Related Courses	Cr.Hrs.
NaRM1041	Introduction To Soil And Water Management	2
NaRM1043	Soil Conservation And Water Shade Management	2
RDAE 2076	Agricultural Knowledge and innovation system	3
RDAE 3114	Environment and Sustainable Development	3

Table 32 Natural Resource Management

Course Code	DRM Related Courses	Cr.Hrs.
NaRM1043	Climatology and Meteorology	2
NaRM1052	Integrated Soil Fertility Management	3
NaRM1061	Biodiversity Conservation and Management	3
NaRM2111	Land Use Planning	3
NaRM2112	Land Degradation and Rehabilitation	2
NaRM2114	Rangeland Ecology and Management	3
NaRM3131	Natural Resources and Environmental Economics	3
NaRM3121	Climate Change Adaptation and Mitigation	3
NaRM3122	Renewable Energy Production and Management	3
NaRM3151	Environment and Development	3
NaRM3152	Natural Resources Policy and Law	2

NaRM3153	Participatory Natural Resource and Conflict Management	3

Table 33 Doctor of Veterinary Medicine

Course Code	**DRM Related Courses**	**Cr.Hrs.**
AnSc 222	Animal Nutrition	3
CLIS 641	Poultry Diseases	3
AnSc 332	Apiculture And Bee Diseases	2
CLIS 602	Wildlife Health	2
MIVP 731	Experience in Vet. Public Health	3
CLIS 721	Vet epidemiology and economics	3
MIVP 301	Vet. Microbiology I	4
PAPA 311	Vet. Parasitology I	4
PAPA 321	Vet. General Pathology	4
MIVP 421	Vet. Immunology	3
BISC 511	Vet. Toxicology	2
CLIS 541	Clinical Practice I	1
MIVP 512	Vet. Public Health II	4
CLIS 552	Clinical Practice II	1
CLIS 501	Camel Health and Production	3
AnSc 311	Fisheries and Fish Diseases	3
PAPA 631	Vet. Clinical Pathology I	3
CLIS 611	Vet. Epidemiology	3
CLIS 641	Poultry Diseases	3
AnSc 332	Apiculture And Bee Diseases	2

CLIS 602	Wildlife Health	2
CLIS 632	Vet. Preventive Medicine	3

Table 34 Floriculture M.Sc.

Course Code	**DRM Related Courses**	**Cr.Hrs.**
HORT 531	Integrated Pest Management of Horticultural Crops (E)	2
HORT 522	Community Based Education	3

Table 35 Vegetable Science M.Sc.

Course Code	**DRM Related Courses**	**Cr.Hrs.**
HORT 531	Integrated Pest Management of Horticultural Crops (E)	2
HORT 522	Community Based Education	3

Table 36 Fruit Science

Course Code	**DRM Related Courses**	**Cr.Hrs.**
HORT 531	Integrated Pest Management of Horticultural Crops (E)	2
HORT 522	Community Based Education	3
HORT 591	Advanced Tropical Fruits	3
HORT 592	Advanced Sub Tropical and Temperate Fruits	3

Table 37 Coffee, Tea and Spices

Course Code	DRM Related Courses	Cr.Hrs.
HORT 531	Integrated Pest Management of Horticultural Crops (E)	2
HORT 522	Community Based Education	3

Table 38 Plant Breeding

Course Code	DRM Related Courses	Cr.Hrs.
HORT 522	Community Based Education	3
PLPB 552	Plant Microbial Interaction and Breeding for Biotic Resistance	2

Table 39 Apiculture Stream

Course code	DRM Related Courses	Cr.Hrs.
Ento. 531	Insect Ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2
Ento. 541	Insecticide Toxicology	2
CBE. 631	CBTP	3
Ento. 502	Beekeeping and its Management	2

Table 40 Agricultural Entomology Stream

Course Code	DRM Related Courses	Cr.Hrs.
Ento. 531	Insect Ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2

Ento. 531	Insect Ecology and Behavior	2
Ento. 541	Insecticide Toxicology	2
CBE. 631	CBTP	3
Ento. 602	Economically Important Insect Pests of Ethiopia	2
Ento. 612	Integrated Pest Management	3
Ento. 622	Insect-plant Interaction and Resistance Breeding	2

Table 41 Veterinary Entomology Stream

Course Code	**DRM Related Courses**	**Cr.Hrs.**
Ento. 531	Insect Ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2
Ento. 541	Insecticide Toxicology	2
CBE. 631	CBTP	3
Ento. 702	Introduction to Veterinary Entomology	2
Ento. 712	Biological and Mechanical Arthropod Vectors of Animal Diseases	3
Ento. 752	Epidemiology of Insect Borne Diseases in Animals	2

Table 42 Sericulture Stream

Course Code	**DRM Related Courses**	**Cr.Hrs.**
Ento. 531	Insect ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2
Ento. 531	Insect Ecology and Behavior	2
Ento. 541	Insecticide Toxicology	2

CBE. 631	CBTP	3
Ento 812	Moriculture and Eri-silkworm Host Plants Production and Management	2

Table 43 Plant Pathology

Course Code	**DRM Related Courses**	**Cr.Hrs.**
PLPA 511	Cropping Systems and Crop Ecology (E)	2
PLPA 521	Host-Pathogen Interaction and Breeding for Disease Resistance	3
PLPA 531	Plant Bacteriology and Virology	3
PLPA 541	Agricultural Mycology	2
PLPA 551	Agricultural Meteorology (E)	2
PLPA 561	Biological Control (E)	2
PLPA 571	Plant Disease Epidemiology	2
PLPA 502	Agricultural Pesticides & Environmental Safety Issues	3
PLPA 512	Integrated Pest Management	2
PLPA 532	Post-Harvest Disease Management	2
PLPA 542	Agricultural Nematology	2
PLPA 552	Seed Pathology (E)	2
PLPA 562	Conventional & Molecular Methods in Plant Disease Diagnosis	2

Table 44 Plant Biotechnology

Course Code	**DRM Related Courses**	**Cr.Hrs.**

BLBT 552	Applications of Biotechnology in Medicine, Industry, and Environment	2

Table 45 Animal Production

Course Code	DRM Related Courses	Cr.Hrs.
ANPR 501	Advanced Animal Nutrition	3
ANPR 562	Pasture and Range Management (E)	2
ANPR 572	Animal Ethology(E)	2
ANPR 582	Animal Health (E)	2

Table 46 Dairy Animal Production

Course Code	**DRM Related Courses**	**Cr.Hrs.**
ANPR 501	Advanced Animal Nutrition	3
ANPR 632	Ruminant Nutrition (E)	2
ANPR 562	Pasture and Range Management (E)	2
ANPR 582	Animal Health (E)	2

Table 47 Meat Animal production

Course Code	**DRM Related Courses**	**Cr.Hrs.**
ANPR 501	Advanced Animal Nutrition	3
ANPR 632	Ruminant Nutrition	2
ANPR 562	Pasture and Range Management	2
ANPR 582	Animal Health (E)	2

Table 48 Poultry Production

Course Code	**DRM Related Courses**	**Cr.Hrs.**
ANPR 501	Advanced Animal Nutrition	3
ANPR 712	Pollination and Natural Conservation	3
ANPR 582	Animal Health	2

Table 49 Apiculture

Course Code	DRM Related Courses	Cr.Hrs.
ANPR 501	Advanced Animal Nutrition	3
ANPR 722	Bee Toxicology	2
ANPR 742	Bee Health	3
ANPR 752	Bee Theology and Ecology	3
ANPR 762	Botany of Bee Flora	2
ANPR 772	Seasonal Management of Honey Bees	2

Table 50 Agribusiness and Value Chain Management

Course Code	**DRM Related Courses**	**Cr.Hrs.**
ABVM 542	Financial and Risk Management	2

Table 51 Watershed Management

Course code	**DRM related courses**	**Cr.Hrs.**

NRM 531	Rehabilitation and Restoration of Degraded land	2
NRM 541	Natural Resource Economics and policy	3
NRM 611	Current topics in Natural resources Management	1
NRM 521	Climate change and Adaptation (E)*	2
NRM 551	Environment and development (E)*	2
NWSM522	Integrated Watershed Management	3
NWSM542	Integrated Water Resources management	2

Table 52 Forest and Natural resource Conservation

Course Code	DRM Related Courses	Cr.Hrs.
NFNM512	Forest Conservation and Management	3
NFNM552	Aquatic and Terrestrial Ecosystem Management (E)*	2
NFNM542	Conflict Management and Resolution (E)*	2
NRM 531	Rehabilitation and Restoration of Degraded Land	2
NRM 541	Natural Resource Economics and Policy	3
NRM 611	Current Topics in Natural Resources Management	1
NRM 521	Climate Change and Adaptation (E)*	2
NRM 551	Environment and Development (E)*	2

Table 53 Soil Science

Course Code	**DRM Related Courses**	**Cr.Hrs.**
SOSC 522	Soils and Plant Nutrition	3
SOSC 532	Soil and Water Conservation	3
SOSC 552	Management of Problematic soils	2

SOSC 582	Soil-Plant-Water Relationships	1
SOSC 592	Irrigation Water Management	2

Table 54 Veterinary Epidemiology

Course Code	**DRM Related Courses**	**Cr.Hrs.**
CLIS 711	Epidemiology of Infectious and Parasitic Animal Diseases	3
CLIS 732	Preventive Veterinary Medicine and Herd Health	3
MIVP 722	Advanced Veterinary Public Health	3

Table 55 Veterinary Public Health

Course Code	**DRM Related Courses**	**Cr.Hrs.**
MIVP 752	Food borne Infection and Intoxications	2
MIVP 711	Environmental Hygiene in VPH	2
DTTP	Community Based Education	3
MIVP 701	Advancements in Vet Public Health	2

Appendix IV, Jigjiga University

Table 56 Percentage Share of DRM Related Courses in Each Undergraduate Program, JJU, College of Dry land Agriculture (CDA)

Undergraduate Program	No. of all courses		No. of DRM related courses		% of courses related to DRM	
	No. of courses	No. of Cr.Hrs.	No. of courses	No. of Cr.Hrs.	% of courses	% of Cr.Hrs.
Animal and range sciences	44	96	4	10	9.09	10.42
Dry land crop sciences	46	123	10	26	21.74	21.14
food science & nutrition program	49	128	4	10	8.16	7.81
Natural Resource Management	41	115	14	41	34.15	35.65
Total	180	462	32	87	17.78	18.83

Table 57 Number of UG and PG Students and Teachers in the Year 2012/13, CDA

Name of Programs	No. of students			No. of teachers				Student to teacher ratio
	Undergraduate	Postgraduate	Total	B.Sc.	M.Sc.	Ph.D.	Total	
Animal and Range Sciences	208	0	208	2	7	0	9	23
Dry land Crop Sciences	331	0	331	2	6	0	8	41
Food science & Nutrition Program	170	0	170	0	3	0	3	57
Natural Resource Management	60	0	60	0	1	0	1	60
Total	769	0	769	4	17	0	21	36

Identified DRM related courses Jigjiga University

Table 58 Animal and range sciences

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
ARSc1023	Veterinary Parasitology	2	ARSc Year I
ARSc1024	Animal Health and Disease Control	3	ARSc Year II
NaRM2055	Wildlife Ecology and Management	3	ARSc Year II
Soci3101	Sociology of Pastoral and Agro-pastoral Society	3	ARSc Year III

Table 59 Dry land Crop Sciences

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
DLCS1024	Plant Ecology	3	DCS Year I
LARP1032	Soil Fertility and Plant Nutrition	2	DCS Year I
LARP1033	Management of Arid and Salt Affected Soils	3	DCS Year I
DCHS1035	Agro-climatology	2	DCS Year I
DLCS2052	Plant Pathology	3	DCS Year II
DLCS2053	Weeds and Their Management	3	DCS Year II
DCHS2054	Agricultural Entomology	3	DCS Year II
DLCS2055	Pesticides and IPM	3	DCS Year II
DLCS3075	Crop Breeding for Stress Environment	2	DCS Year III
DLCS3076	Crop Biodiversity Conservation and Mgmt.	2	DCS Year III

Table 60 Food Science & Nutrition Program

Course Code	DRM Related Courses	Cr.Hrs.	Target Groups
FScN 4132	Medical Nutrition Therapy	3	FSNP Year I
FScN 4133	Community Nutrition	3	FSNP Year I
FScN 4135	Food Security & Nutrition Strategy	3	FSNP Year II
FScN 4152	Food Safety & Public Health	3	FSNP Year III

Table 61 Natural Resource Management

Undergraduate students: year I____ year II_____ year III____ **Post graduate Students: year I____ year II_____**			
Course Code	**DRM Related Courses**	**Cr.Hrs.**	**Target Groups**
NaRe 222	Introduction to Environmental Hydrology	2	Year I NARM Students
NaRe 402	Restoration Ecology	3	Year I NARM Students
NaRe 202	Applied Climatology	3	Year I NARM Students
AgEc 372	Natural Resource Policies & Laws	3	Year I NARM Students
NaRe 331	Wildlife Conservation and Management	3	Year II NARM Students
AgEc 421	Natural Resource and Environmental Economics	3	Year II NARM Students
NaRe 322	Land Evaluation and Watershed Management	3	Year II NARM Students
NaRe 332	Biodiversity Conservation & Management	2	Year II NARM Students
NaRe 431	Environmental Impact Assessment	2	Year II NARM Students
NaRe 302	Forest Resource Management	3	Year III NARM Students
NaRe 422	Natural Resource Mgmt. Extension Techniques	2	Year III NARM Students

NaRe 432	Environmental Data Analysis & Modelling	3	Year III NARM Students
NaRe 411	Soil and Water Conservation & Management	3	Year III NARM Students
NaRe 421	Rangeland Ecology & Management	3	Year III NARM Students
	Water Harvesting	3	Year III NARM Students

Appendix V, Semi Structured Questionnaire

SEMI STRUCTURED QUESTIONNAIRE for program representatives in Agriculture universities/colleges

Status of Disaster Risk Management Education in Ethiopian Higher Education

Dear Sir/Madam!

The central objective of this semi structured questionnaire is to assess the current status of agricultural universities of Ethiopia related to Disaster Risk Management (DRM) education. Thus, your input is considered very valuable to this exploratory study.

1. General information

1.1.	University:	
1.2.	College/Schools:	
1.3.	Department/Programme:	
1.4.	Year of service in the university:	
1.5.	Position in the program:	

2. Teaching –learning

2.1. Please provide mode delivery and no. of students as indicated in the table below

Program/department	**Mode of program delivery**	**No of students**	
		Under Graduate (UG)	**Post Graduate(PG)**
	Regular ☐		
	Distance ☐		
	Extension/Evening ☐		
	Regular ☐		
	Distance ☐		
	Extension/Evening ☐		

2.2. Please provide no. of courses offered in your program at B.Sc./M.Sc./Ph.D. as indicated in the table below

Program/department	**Total No. of courses**					
	Under graduate			**Post graduate**		
	Elective	**Major**	**Common**	**Elective**	**Major**	**Common**
Name of the undergraduate program_____						

Name of the postgraduate program_____						
Other_____						

2.3. Does your program have courses that deal with disaster/climate risks or other environmental concerns? A. Yes b. No

2.4. If your answer is yes for Q. no. (2.3)1, please complete the following table

courses that deal with disaster/climate risks or other environmental concerns	Total No. of courses								
	B.Sc.			**M.Sc.**			**Ph.D.**		
	Elective	**Major**	**Common**	**Elective**	**Major**	**Common**	**Elective**	**Major**	**Common**
	√								

2.5. Does your program offer short term courses/training that is/are offered in your university at departmental or programme level? A. Yes b. No

2.6. If yes, please specify the title of the short course. Please complete the following table

Collage(program)	**Short courses offered in your program**	Objective of the short course	How often do you offer the short courses per year	Who are the target groups	Source of fund to run the short course	Which short courses deal with Disaster/climate/other environmental issues

2.7. Please provide information about profile of your staff members in the program as indicated in the table below.

Program /department	No. of staff members			No. staff members with DRM , Environment related background		
	B.Sc.	**M.Sc.**	**Ph.D.**	**B.Sc.**	**M.Sc.**	**Ph.D.**

3. Research and development projects

3.1. Is DRM your research thematic area? A. yes B. No

3.2. If your answer is 'yes' for the above question, what are research thematic areas related to DRM your program focuses on?

_____

_____

Please provide profile of the research outputs as indicated in the table below

Program/department	no. of research outputs in the previous academic year (2012)		No. of research out puts that deals with DRM, CC and other environmental issues in the previous academic year (2012)	
	Staff researchers	**M.SC. Students**	**Staff researchers**	**M.SC. Students**

4. Consultancy and community services

4.1. Does your program offer Consultancy and community services? A. Yes b. No

4.2. If yes, please specify Consultancy and community services offered as indicated in table below

Collage(program)	Consultancy and community services offered in the program	Objective of the service	How often do you offer the service in a year	For whom is the service offered	Source of fund to run the service	Which services deal with Disaster/climate/other environmental issues

4.3. If your answer is no for question …, please specify the reasons?_____

_____

5. Networking and partnership

5.1. Does the program have partnership with other institutions/organizations having a common agenda related to disaster and climate change/environmental concerns? Yes B. No

5.2. If 'yes' please specify the name of the institutions that your program has active partnership with as indicated the table below.

Name of partner institution	**Partnership objective**	**When is the partnership established**

Appendix VI, Focus Group Discussion

FGD for program and college representatives in teaching learning, research and Community service

1. Does your collage have focus on disaster, climate change and other environmental concerns?
2. What do you think are the key capacity gaps to better incorporate disaster, climate change and other environmental concerns into your program curriculum, research and short courses in terms of professionals, resource and financial requirements?

   _____
   _____
   _____
   _____
   _____

3. What do you recommend to address the above identified capacity gaps?

Appendix VII, Key informant questions

Key informant questions

1. What are the current efforts/initiatives undertaken by the university/college/school related to curriculum and research development that deals with disaster, climate change or other environmental concerns? What are the capacity gaps?
2. Are there future plans related to curriculum and research development that deals with disaster, climate change or other environmental concerns?
3. What are the required capacity buildings needs to realize implementation of the plans? See section?
4. What are the enabling environments that enhance partnership with other institutions/organizations in dealing with common challenges related to disaster, climate change and other environmental concerns?
5. What are research thematic areas of the university/college/school?
6. How is this research thematic areas related with the global and national concerns of disaster risk, climate change and other environmental concerns?
7. What are research capacity gaps in dealing with disaster risk, climate change and other environmental concerns?

Appendix VIII, Key informant and Focus group discussion interviewee

No	Name	Organization	Position
1	Dr. Kefyalew alemayehu	BDU	Animal science program coordinator
2	Dr. Hailu	BDU	Vice dean, College of Agriculture and

	Mazenngia Abera		environmental Science
3	Hahanibal	BDU	Water Resource And Irrigation Management department
4	Dr. Getachew Fiseha	BDU	Natural resource management program coordinator
5	Dr. Beneberu Assefa	BDU	Rural Development programme coordinator
6	Dr. Gebeyehu	BDU	Fisheries, Wetland and Wildlife Management program coordinator
7	Tesfahun Asmamaw	BDU	Disaster Risk Management and Sustainable Development program coordinator
8	Azanaw Abebe	BDU	Mid-Career Extension program coordinator
9	Yemahneh Asmelashi	BDU	Agricultural extension program coordinator
10	Dr Mussie H/melekot	BDU	College Research and community service coordinator
11	Mengistie Taye	BDU	College program manager
12	Dr. Belayneh Ayele	BDU	Dean, College of Agriculture and Environmental science
13	Dr. Merkuz		Plant science program coordinator
14	Kebede Manjur	Mekelle University	Natural Resource Economics and Management program coordinator
15	Alemeyehu Tadesse	Mekelle University	Animal range land and wildlife Sciences program coordinator
16	Dr. Mengisteab Hailu	Mekelle University	Department of Land Resource management and environmental protection coordinator
17	Girmay Gebru	Mekelle University	Dry land crop science program coordinator
18	Dr. Emru Brhane	Mekelle University	Collage research coordinator
19	Dr. Fassile Kebede	Mekelle University	Journal of Dry land s coordinator
20	Hailay Mehari	Mekelle University	Head, College Quality Assurance Office
21	Dr. Atnkut Mezgebu	Mekelle University	Dean, College of Dry land Agriculture and Natural Resources

22	Dr. Yohannes Tekle	Mekelle University	Research and community service coordinator
23	Yonatan	Mekelle University	librarian
24	Ato G/medhin G/selasie	JJU	College of Dry land Agriculture dean
25	Ato Sied Mohamed	JJU	research and community service directorate director
26	Minda Shiferaw	JJU	Dry land Crop Science program coordinator
27	Anbissa Muleta	JJU	Food science & nutrition program coordinator
28	Bosenu Abera	JJU	Animal science
29	Tadious Shiferaw	JJU	Natural Resource Management
30	Girma Shimelis	JJU	library director
31	Dr. Derbew Belew	Gimma University	Dean
32	Tariku Mekonen	Gimma University	Head, Department of Natural resource Management
33	Adugna Enyew	Gimma University	Head, Department of Agricultural economics and extension
34	Meseret Molla	Gimma University	Head, Department of Animal Science
35	Techale Birhan	Gimma University	Head, Department of horticulture Plsc
36	Dr. Abebe Fromsa	Gimma University	Head, School of Veterinary medicine
37	Dr. Ali Mohammed	Gimma University	Head, Department of Post-Harvest Management
38	Dr. Sentayehu Alamrew	Gimma University	Head of CBE
39	Enanu Tilahun	Gimma University	Library officer
40	DR. Debela Hunde	Gimma University	Post graduate research coordinator

In order to fully operationalize efforts and advance progresses that have been made by the government related to DRM policy and practice, the role of universities has become critical. Ethiopia needs to focus on strengthening universities' capacity to be an effective local and global knowledge base for addressing both local and regional issues on environmental and disaster management.

Recognizing universities' capacity for strong and effective collaboration with other development partners is vital to mainstream and build disaster risk reduction capacity for sustainable and resilient agricultural development throughout Ethiopia.

This technical report was prepared for FAO Ethiopia in 2013 for the Food and Nutrition Security Team. The purpose of this report preparation was to jointly promote and facilitate the mainstreaming of broader ex-ante disaster risk reduction into national and sector programmes in collaboration with Ethiopian universities. This study was initiated by Food and Agriculture Organization (FAO) to assess selected Ethiopian universities/agriculture colleges status of Disaster Risk Management (DRM) education.

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