ANNUAL RESEARCH REPORT 2010

Compiled by the Research and Publications Office

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MISSION AND VISION STATEMENT

Mission

To provide quality higher education through teaching, research and advisory services to our customers with the view to produce productive and competitive human resources capable of driving public and private institutions towards a knowledge-based economy, economic growth and improved quality of life.

Vision

To be a beacon of excellence and innovation in teaching, research and extension services.

MESSAGE FROM THE VICE-CHANCELLOR

During the year under review, the University of Namibia (UNAM) continued to strengthen its research activities through a number of newly incorporated structural changes, as stipulated in its Strategic Management Plan. All the departments/centres/faculties committed themselves towards aligning with the University’s new Agenda for Change, which included the development of their respective Management Plans for the next five years because research is one of the three key functions of any Higher Education Institutions, that is central to the advancement and dissemination of knowledge for the country’s social and economic development.

I must also mention that the year 2010 has also seen the acceptance of the University’s very first efforts in registration of 7 patents that recognize the successful development of potential drugs against the chloroquine resistant strain of the Malaria Parasite. Thus, I regard this endeavor as an important step towards improving UNAM’s efforts to attaining Intellectual Properties (IP) and Commercialization policies and guidelines. The University therefore, continues to conduct research activities in all relevant disciplines in order to increase research capacity and output, specifically through its well-established centres that are dedicated to carry out research. These include the Multidisciplinary Research Centre (MRC) and the Dr Sam Nujoma Marine & Coastal Resources Research Centre (SANUMARC).

Finally, I encourage the Research and Publications Office (RPO) under the realm of the Office of the Pro-Vice Chancellor for Academic Affairs and Research (PVC: AA & R), to continue coordinating and managing all UNAM research related activities in order to fulfill UNAM’s mandate, that is, “to undertake research, to advance and disseminate knowledge…and to contribute to the social and economic development of Namibia.”

Prof. Lazarus Hangula
Vice- Chancellor
Research performance and productivity at the University of Namibia (UNAM) continues to take long strides due to the hard work and dedication of our academics. A variety of research activities have been conducted in the various UNAM Faculties and Centres across the country. Off all publications (258) produced during the year under review, 17% are peer-reviewed journal articles and 15% are books and book chapters. This is a commendable output and achievement by our academics and their post-graduate students. This has been possible because the University continues to create a conducive environment for research, despite the challenges we face. It is expected that output will significantly increase in the coming years. Unfortunately, the Namibia Development Journal (NDJ), suffered technical problems at the end of the year resulting in its inactivity.

I would like to urge all academic staff members to engage in research so as to increase our research output. It is only through creation and disseminating of knowledge that we can realize our goal of transforming our nation into a knowledge-based society. Thus, my Office will leave no stone unturned in our quest to promote research in the University. In our country and in the region at large, we continue to face challenges that continuously require research in order to solve them. Climate change, health-related problems (including HIV & AIDS, Malaria, emerging diseases), natural disasters, food insecurity, poverty, social inequality, gender-based violence, and many others continue to affect our society. I would like, therefore, to encourage staff members to form Research Groups around identified thematic areas in order to carry out focused research and complement our government’s efforts in dealing with these challenges. The Research & Publications Office (RPO), a Unit directly under my Office, has done a tremendous job in cultivating a culture of research among our staff. During 2010, staff members from the RPO conducted sensitization workshops in the new UNAM Campuses (former Colleges of education) as a way of induction and emphasizing the importance of research at the University. I would like to encourage the RPO staff to continue with capacity-building workshops for all staff members in order to enhance research capacity at our institution. The Research & Publications Committee (RPC) has continued to evaluate proposals and allocate research funds to deserving academics to conduct research. However, the University continues to be constrained by the limited amounts it can allocate for research projects. I would, therefore like to encourage staff members to vigorously apply for external research funds. This will go a long way in complementing the University’s efforts in promoting research.

Lastly, I would like to congratulate all our researchers for their achievements in 2010. We are very grateful to all our sponsors, collaborators and partners who contributed to the good research results produced by the University. I would like to wish all our staff members a very productive 2011.

Prof. Osmund D. Mwandemele
Pro Vice-Chancellor: Academic Affairs & Research
MESSAGE FROM THE RESEARCH AND PUBLICATIONS OFFICE

The daily functions of the Research and Publications Office are embedded in the mission of the University in providing quality research advisory services. This year, the Research and Publications Office welcomed its new Deputy Coordinator, Dr. Gilbert Likando, who took over from Dr. Kenneth Matengu. Prof. Isaac Mapaure continued to head the Research & Publications Office (RPO) as Research Coordinator, assisted by Ms. Pam Claassen, the Research and Publications Officer.

During the year under review, the Office went on a familiarization tour to get to know the newly integrated former Colleges of Education, as well as to welcome them to the UNAM Family. Campuses visited were: Katima Mulilo, Rundu and Hifikepunye Pohama. Another entity that was visited is the Sam Nujoma Marine and Coastal Resources Research Centre (SANUMARC). The objective of the tours was to inform these campuses on the functions and services provided by the Research & Publications Office, and also to listen to their respective research needs, which is unique to each of their situation. The Research & Publications Office was very well received and campuses were satisfied with the advice given to them.

The Research & Publications Office staff held a Planning Retreat to tease out the strategic focus of the Research & Publications Office. The functions of the RPO include advising staff members on procedures for applying for research and conference grants, overseeing processes for the effective implementation of UNAM’s Research Strategy, and monitoring issues relating to quality research. This year, the University has also awarded funding towards our very first application for patenting an anti-malaria drug, which is encouraging as one of the numerous applied research activities. Numerous applications for conference attendance were processed to enable those researchers whose conference papers were accepted, to showcase their research results to interested international audiences. The demand for conferences was high, to the extent that the budget was exhausted. The funding allocation was evenly spread over the various Faculties and Centres to ensure optimum exposure of research activities at the University across the different disciplines.

The RPO has also put up its new website spearheaded by Dr. G. Likando, keeping the research fraternity informed on all matters pertaining to research and publications at the University. The website is structured in a user friendly manner to give visitors easy access to the various publications produced. The website aims at being as current as possible, uploading new publications as they are received from researchers. The presence of the new Website has already assisted in forging research collaborations with other research institutions worldwide.

As a result of their research activities, various staff members produced numerous publications. These include various publications in categories such as Books, book chapters, refereed journal papers and other categories of publications that include: monographs; consultancy, technical and commissioned reports; contributions as editors; creative works, and well as articles in popular publications, to name but a few. A breakdown of the publications output during the year, is reflected in the chart below:
The Research and Publications Office will continue to execute its mandate which is focused mainly on coordinating and managing research activities, as well as facilitating research capacity building and promoting excellence in research.

Prof. Isaac Mapaure
Research Coordinator
1. ACTIVITIES OF FACULTIES AND CAMPUSES

1.1 FACULTY OF AGRICULTURE AND NATURAL RESOURCES

INTRODUCTION

Within the framework of its mission, that is, “to promote agriculture and natural resources development and management in Namibia through teaching, research and extension to communal and commercial farming communities and to provide community services through provision of advisory, consultancy and extension services on the proper and sustainable use of Namibia’s agriculture and natural resources”, the Faculty of Agriculture and Natural Resources is providing and improving knowledge through quality research, thus continuously contributing to development in Namibia.

The Faculty of Agriculture and Natural Resources wishes to maintain an active and sustainable research enterprise through a multidisciplinary approach and by strengthening collaboration with national research institutions, private enterprises and the farming communities.

The Faculty of Agriculture and Natural Resources (FANR) has a key role to play in the attainment of some of the broader national objectives. It finds its most relevant application to the Vision 2030 objective of ensuring the development of Namibia's natural capital and its sustainable utilization for the benefit of the country's social, economic and ecological wellbeing. This objective in turn, informs the NDP3 Key Result Area – utilization of natural resources and environmental sustainability. Through teaching, research and extension services, FANR contributes to the productive use of research and development driven technology and empowers people to actively contribute towards transitioning Namibia to a knowledge based economy.

DEAN’S REPORT

Sustainable agriculture and rural development in Sub-Saharan Africa, and indeed in Namibia, depends very much on the strength of national research systems. Both production and productivity in the agricultural sector must be increased urgently and substantially to avoid further marginalization of the region. Substantial improvement in the capacity and productivity of a national research system is a prerequisite and thus even more urgent.

Many Sub-Saharan countries have not fully exploited the highly trained human resources available in their national universities in strengthening their national research capacities to solve agricultural production and productivity problems, and thereby ensure access to low cost food to consumers and remunerative returns to producers. Elsewhere such as USA, public investment rates of return from agricultural research through Federal-State Partnerships supported Land Grant Universities have been very high, exceeding 40%, with very significant contribution to maintaining a strong agricultural industry and an affordable food and fibre supply.

Namibia ought to learn from this and make use of its only University, the University of Namibia, through its Faculty of Agriculture and Natural Resources, which has excellent teaching and research facilities. There is a need to further enhance and improve research partnerships involving the Government, the
University, Farming Communities, NGO’s and the Donor Community to ensure that timelines, direction and magnitude of research results contribute more effectively towards food security, employment creation and thus poverty reduction of the rural poor.

The Faculty of Agriculture & Natural Resources in line with its mission statement has prepared it’s **Research Agenda 2010-2015** following careful consideration of the national agricultural and natural resources development objectives as contained in the Third National Development Plan (NDP III) and Namibia’s Vision 2030.

We believe that the identified research priority areas can contribute significantly towards socio-economic development, food security, equity and poverty reduction. The Faculty’s efforts have the full support of the University of Namibia.

All Departments in the faculty made significant efforts in collaborating with national and international institutions as a way of improving quality teaching. The Department of Integrated Environmental Science (DIES) has collaborated with two Finish Universities. In this collaboration, two students and one lecturer from the DIES visited the Finish Universities under an exchange program. The DIES has also collaborated in a program review with other three African institutions (Botswana College of Agriculture, Copperbelt University of Zambia and North Karelia University of applied Sciences.

The Department of Fisheries and Aquatic Science has been a recipient of the financial support from the Government of Norway which continued in 2010. Through the funds provided by the Norwegian Government, the Department managed to collaborate with a number of national and international institutions and these are: the Universities of Tromsø, Rhodes University, Cape Town, Western Cape, Bunda College of Agriculture, and the South African Institute for Aquatic Biodiversity, the National Marine Information and Research Centre (NatMIRC), Namibia Coast Conservation and Management (NACOMA), the South Africa Institute for Aquatic Biodiversity (SAIAB), the Kamutjonga Inland Fisheries Institute (KIFI) and the Namibia Nature Foundation (NNF). During the year, this department initiated a new research area on fish disease surveillance in collaboration with the Ministry of Fisheries and Marine Resources. The Research was focused on the identification of freshwater parasites with regular survey of both wild and cultured species from the Okavango region.

Mr. Stephen Barrion of the Food Science and Technology (FST) successfully secured collaboration between UNAM, Phytotrade Africa and Vital Solutions to undertake a Marura Project which is focusing on the “Ripening Process of Marura Fruit”. The project is to start in 2011. Further, Dr. Peter Bille and Ms. Martha Nambambi-Shikongo of the department of FST collaborated with the Indegenous Knowledge Systems Technology (IKST) Food Program at the UNAM’s Multidisciplinary Research Center (MRC) on the value addition and nutritional quality of indigenous traditional fruits and vegetables in Namibia. Dr. Bille also trained production staff at Neudamm Campus dairy section. The training was aimed at improving milk productivity and quality, as well as nutritional labeling on milk packaging.

**RESEARCH FOCUS AREAS**

The faculty continues to broaden its academic programmes across departments. The Department of Animal Science developed a Pre Vet Curriculum that was approved by the SENATE in August 2010. In the year under review, the Department of Animal Science, for the first time, took over the M.Sc. Rangeland Resources Management as a self-funded program since the expiration of SANTED support in 2009. The department managed to run this program successfully without any external support.

For quality output, the faculty, with the assistance of the Staff Development Office/HR continued to build its capacity through staff development. The majority of the academic staffs are M.Sc. holders and most of
them are currently pursuing their PhD studies at different universities in region and in the world. Close to 40% of FANR’s academic staff are thus not fully involved in carrying out active research work within their respective Departments.

DEPARTMENT OF AGRICULTURAL ECONOMICS

The mission of the Department is to contribute to the development of an efficient and sustainable agricultural sector through demand-driven collaborative research. The Department’s research priorities are guided by:

• The need to contribute to improved efficiency and productivity of crop and livestock production in communal and commercial farms.
• Aspiration to strengthening efficiency of agro marketing, farm finance, agribusiness management and extension approaches.
• Recognition of the importance of the economics of sustainable resource management in particular of land and water resources in the agricultural sector.
• Need to understand the factors affecting demand and consumption of food and issues relating to household food security.

In line with the above goals, the Department will undertake research covering the following topics:

Production efficiency of irrigated Agriculture (Duration 1-2 years)

This study will investigate production efficiency of small-scale and large scale commercial farmers participating in the Green Scheme. The focus will be on two crops maize and a high value crop like Irish potato. Through production efficiency analysis using the stochastic frontier production function, the study will identify resource use efficiency of key inputs such as land, labor, seed, pesticides, fertilizer, and water, and determinants of inefficiency. Thus, the results of the study will indicate areas that need attention in order to improve productivity or resource use efficiency on farms under the Green Scheme.

Technology adoption and transfer among Emerging farmers (Duration: 1-2 years)

This study will analyze the factors affecting technology adoption and transfer among small-scale farmers participating in the Green Scheme. Most of these farmers are coming from traditional farming characterized by poor farming practices, poor access to information on improved farming methods and low productivity. In order to be successful in commercial farming, small-scale irrigation farmers under the Green Scheme, have to adopt improved farming practices and technologies. Thus it is important to understand farmer’s information needs and factors which are likely to affect technology transfer and adoption.

Market access for small-scale farmers participating in the Green Scheme (Duration: 1-2 years)

This study will investigate the factors affecting market access for small-scale farmers participating in the Green Scheme. Traditionally small-scale farmers are poor participants in agricultural marketing, receive low prices and often fail to sell their produce in competitive markets. To motivate farmers to participate actively in the production, impediments to agricultural marketing should be removed. This research will provide key information on marketing aspects.
An evaluation of land resettlement programme in Namibia (*Duration: 1-2 years*)

Namibia has been implementing land resettlement programme as a strategy to improve income distribution and correct the imbalance in land distribution created by the colonial legacy. However, there are criticisms about agricultural performance in terms of efficiency and productivity of resettlement schemes.

Developing of a Farm Analysis Database of Emerging and Commercial Farms in Namibia (*Duration: 1-5 years*)

There is a need to continuously identify factors, which affect agricultural productivity on different types of farms operating in the country. Such studies are useful in suggesting measures to improve productivity and efficient resource allocation. Therefore, the objectives of this study to develop a panel database of farms in Namibia which can facilitate an examination of factors affecting the productivity of communal and commercial agriculture in Namibia, and compare productivity between communal and commercial farming enterprises, is important.

**DEPARTMENT OF ANIMAL SCIENCE**

The overall research priority of the Department of Animal Science is to improve livestock production among communal farmers of Namibia. This priority does not exclude commercial farmers. The department is willing to work with commercial farmers who approach it for advice or for research in specific problems. The department also places heavy emphasis on collaborative research. The department is always actively seeking more collaborative work both nationally and internationally. In the long run, the department hopes, together with other stakeholders, to help the people of Namibia to achieve household food security.

**Conservation of Indigenous Forages and Wild Food Plants from Rangelands of Namibia through Utilization** (*Duration: 3 – 5 Years*)

The overall objectives will be: to determine rangeland degradation levels and collect forage germplasm in Namibia that are naturally tolerant to grazing, extreme dry and cold conditions. This project intends to create fodder banks that is of interest in future plant breeding programs for conservation, reclaiming deteriorated rangeland and providing improved pastures in fodder bank development.

**Failure and success Factors of Management Information Systems in Livestock Production in Namibia**

The project purpose will be to create a supportive Livestock Appropriate Technology MIS model that will provide an opportunity to increase technology adoption (through updating and refinement of technologies so far developed in the livestock industry targeting smallholder farmer). The ultimate objective will be to correct current management programming issues at farmer level by finding the factors of success and failure in the adoption of tried and tested technologies. It is widely acknowledged that stakeholder involvement ensure that participants will make a good transition from research results then implementation to maintenance. But still many research situations have involved beneficiaries but with little adoption meaning there is more to it than that. This project will seek to find out why such a scenario is prevalent within the participating countries. Livestock businesses are spread out in different regions
within a country and it might be important for constant contact hence networked information management systems.

**Status and socio-economic importance of pigs rearing in Etayi constituency in Omusati Region**

The study is aimed at collecting baseline information on pig management systems and roles will be collected from community in Etayi constituency by using a structured questionnaire. Other aspects to be considered in the study will be types and availability of feed resources, breeding and management practices, socio-economic value of pigs, and challenges facing to pig production.

**Factors influencing Namibian household meat purchase behavior**

Since different consumers develop their own systems of deciding why they would or would not purchase meat, it is difficult to know which factors or combinations of factors are most important. Also, a study of this nature has never been done in Namibia. In other countries, some of the factors that influence consumer purchase behavior have been identified as cultural factors, psychological factors, lifestyle factors, and food trends. The objective of this study is to identify the factors that influence consumer purchase decisions.

Evaluation of entomopathogenic fungi, *Metarhizium anisopliae* and *Beauveria bassiana* as biological control agents for livestock ticks.

To search for alternative, affordable and environmentally more friendly method of tick control. **Rationale:** Currently ticks are controlled using chemical acaricides that are very expensive and pollute the environment and animal products. An alternative control method that is cheaper and less toxic to the environment and consumers of animal products is needed. Biological control using entomopathogenic fungi is the best alternative since the fungi penetrate the tick cuticle directly as opposed to other biological control agents that must be ingested. Entomopathogenic fungi have been shown to be safe for warm-blooded animals and to be fairly specific to non-target organisms. They can also be mass produced on locally-available raw materials thus conserving foreign currency.

**Selection of qualitative traits of indigenous chickens in Namibia**

The study is designed to explore the production potential of indigenous birds as a build up to previous work done by the Department of Animal Science, University of Namibia. It is expected that the results from the study would form a basis for the formulation of strategies for improvement of indigenous chickens’ productivity.

Replacement of maize with pearl millet (*Omahangu*) in broiler diets as a mean to reduce the cost of feeds hence increasing chicken production in Namibia.

One of the possible ways of reducing poultry feeds cost is to replace the conventional feed ingredients such as maize with cheaper, yet equally efficient, alternatives such Pearl millet. Therefore the aim of this is to study the viability of pearl millet as a replacement of maize in broiler diets as well as the assessment of cost reduction, when maize is replaced with pearl millet.
Chemical residues in commercial milk sold in and around Windhoek

To survey the presence of drug (antibiotic) and other chemical (acaricide) residues in commercial milk. Although many animal species are used as a source of milk by certain peoples, the cow by far supplies the largest proportion of milk used by man and its milk contains all the food constituents required in the human diet and in essentially proper proportions. It is commonly referred to as complete food and is good source of high quality proteins for man. In terms of costs, milk offers consumers important food at relatively low costs. Milk is one food in human diet consumed by large groups of people including infants, expectant mothers and the sick.

DEPARTMENT OF CROP SCIENCE

The Department of Crop Science follows the strategies stated in the National Development Plan III with respect to research as follows:

- Promote integrated plant nutrition, pest and disease management option
- Create the enabling environment for cultivation of indigenous plant resources
- Improve the production system of both communal and commercial farmers
- Promote the use of soil fertility enhancement technologies
- Create an appropriate environment for improved production and marketing for sustained long term production of crops/plants

The mission of the department is to develop and provide appropriate technologies for crop production that will contribute to national food security. The appropriate technologies aim at sustainability with consideration of the environment, gender issues, youth development and people living with HIV/AIDS. Emphasis is on the development of low input and labour saving technologies for efficient utilization of resources, particularly for the resource poor farmers. Food security requires an increase in productivity, utilization of indigenous crops and crop diversity. This is achieved through crop improvement, increased soil fertility, better soil and water management, introduction of new crops to the existing crop production system, improved pest management and improved seed and post-harvest technology.

The department will therefore aim at achieving these goals by carrying out research in several fields as outlined below:

Crop Protection and Post Harvest (Duration: 2-3 years)

To identify the most prevalent pest (diseases, insects, weeds, birds and rodents) of economic value in the field and in storage structures; To test and recommend appropriate control measures for pest in the field and in storage structures; and to identify and recommend appropriate processing technologies and storage structures.

Crop Improvement and Diversification (Duration: 2-3 years)
To improve and introduce new crop varieties adapted to local environment; To promote the cultivation and utilization of indigenous crops; and to train farmers and research personnel and seed production and multiplication.

**Cropping System** *(Duration: 2-3 years)*

To improve and promote suitable cropping systems.

**Soil and Water Management and Engineering** *(Duration: 3-4)*

To identify and promote appropriate and sustainable soil and water management technologies; and to measure, improve and promote the efficiency of draft power and related implements.

**DEPARTMENT OF FISHERIES AND AQUATIC SCIENCES**

The Department of Fisheries and Aquatic Sciences as part of the national agriculture research system aims to thrive in conducting research activities in the field of Fisheries and Aquatics Sciences with great emphasis on Aquatic Resources Management and Aquaculture research development to enhance resources sustainability and help promote food security of our country and that of the SADC at large.

Research priorities of the Department of Fisheries and Aquatic Sciences are based on the following research goals: (1) To develop, through excellence in fisheries research and provide necessary skills for meeting the professional needs of society with regard to sustainable fisheries resources development and management; (2) To provide the human resource skills in fisheries and aquaculture development to increase production of the fishery and aquatic resources of the SADC region in a sustainable manner, and (3) To provide through research in aquatic environments efficient water basin management strategies by improving current knowledge in the dynamics of the aquatic environments.

The Department of Fisheries and Aquatic Sciences is actively in partnership with other academic institutions and government agencies in fulfilling its research mandates. Some of these are: University of the Western Cape (UWC), University of Cape Town (UCT), Marine and Coastal Management (MCM), within the Department of Environment and Tourism of South Africa, National Marine Information and Research Centre (NatMIRC) within the Ministry of Fisheries and Marine Resources of Namibia, Rhodes University, Stirling University, Benguela Current Commission (BCC), Council for Scientific and Industrial Research (CSIR), Bunda College, University of Malawi, South African Institute for Aquatic Biodiversity (SAIAB).

**Freshwater Fish Biodiversity and Management** *(Duration: 3 Years)*

In joint cooperation with Rhodes University, the South Africa Institute for Aquatic Biodiversity (SAIAB) and the Ministry of Fisheries and Marine Resources Kamutjonga Inland Fisheries Institute (KIFI) initiated this project in 2008 with emphasis on the holistic management strategy for the fisheries of the Zambezi River and Eastern Caprivi Floodplains. This project eventually commenced beginning of 2010. This research aims to determine the environmental and human impacts on the fish and fisheries of the eastern Caprivi floodplains, with particular emphasis on the development of the Lake Liambesi fish stocks following the refilling of the lake. It also aims to contribute to the wealth and well-being of riparian
communities in the Caprivi region by contributing to the sustainable utilization of natural resources through developing recommendations for environmentally sound harvesting strategies. The expected outputs include; Management recommendations for the fisheries based on a comprehensive understanding of the biology and population dynamics of major target species and the social dimensions and indigenous knowledge of the harvesting fisheries. Another output is enhancing regional fisheries management and research capacity building by contributing towards the training of at least two M.Sc. graduates.

Study on Safety and Quality of Farmed Shellfish in Namibia (Duration: 3 Years)

Aquaculture is one of the fastest growing industries in the world. However, concerns have been raised over the safety of farmed shellfish due to seafood poisoning. Shellfish are filter feeders, and therefore accumulate contaminants from the environment in which they grow. There are no statistics and scientific reports on shellfish poisoning in Namibia resulting from consumption of contaminated shellfish. The scarcity of information on the presence of other common hazards such as heavy metals, viruses, protozoan and bacteria in farmed shellfish is another concern. The implication of consuming contaminated shellfish may be devastating; it may lead to loss of life and subsequently loss of revenue due to farm closures and loss of markets. The growing aquaculture industry therefore needs a practical approach to assure the safety as well as the quality of farmed shellfish. Depuration is a technique that is used to expel contaminants from shellfish in many parts of the world. It involves placing shellfish in flowing clean seawater after harvest so that the animals resume pumping activity to enable them to expel contaminants from their gills and intestinal tract over a period of time. It is recommended that depuration be used in combination with a disinfectant to increase its efficacy. However, results from various studies show that when used in combination with disinfectants such as ozone, UV radiation, chlorine, chlorine.

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It is envisaged that the study will contribute to the scientific knowledge in the field of shellfish safety through publication of papers. The study will also assist in the development of a practical strategy to eliminate/reduce hazards that may be present in farmed shellfish to acceptable levels as required by markets. The outcome of the study will also enable policy makers in governments and other stakeholders to develop policies on the safety of farmed shellfish. Another output is enhancing regional research capacity building by contributing towards the training of Ph.D. graduate.

**Marine Zooplankton Research (Duration: 2 Years)**

This project was initiated in joint cooperation between the Department of Fisheries and Aquatic Sciences, University of Western Cape, National Marine Information and Research Centre (NatMIRC) and University of Tromsø, Norway. This study commenced at the beginning of 2010. This study aims to examine, and compare, the effects of different preservation methods (e.g. fresh, formalin, alcohol, and freezing) on body length, width and mass of Zooplankton found off the Namibia coast. Furthermore this study aims to examine if there have been changes over time in body size (length and weight) of key zooplankton species related to long-term environmental variability (on a multi-decadal scale) and possibly also to climate change. This information will provide length-weight conversion factors as well as enable standardization and comparison with methods on a national, regional and international level, and will allow zooplankton biomass indices to be derived from numerical abundances of species. This project will in addition contribute to regional marine resources management and research capacity building by contributing towards the training of at least two M.Sc. graduates.

**Seasonal Changes in the Abundance and Distribution of the Jellyfish (Chrysaora Ephyrae) Off Namibia (Duration: 2 Years)**

Jellyfish are common components of the zooplankton off Namibian coastal waters, and are likely to be having a strong impact on the functioning of the pelagic system. Jellyfish can be voracious carnivores and will effectively eat whatever contacts their tentacles/oral arms, triggers the nematocysts and then doesn’t subsequently manage to escape. While crustacean zooplankton are likely to be the dominant prey items, jellyfish have been shown elsewhere to consume large numbers of fish eggs and larvae and can, when
present in bloom numbers, have a generally adverse affect on fish recruitment. A jellyfish (or medusa) represents the conspicuous, dispersive and sexually active part of the life cycle of the animal, and it typically alternates with a small, cryptic benthic polyp phase that buds off ephyrae asexually when environmental conditions are appropriate. The appearance of jellyfish in the water column tends therefore to be markedly seasonal, as a number of essentially seasonal cues have been observed to induce strobilation (asexual budding process). The most common cue to ephyra release is a drop in water temperature so that young jellyfish are usually first seen towards the end of winter in temperate latitudes. Whilst the Namibian marine ecosystem is considered to be temperate in nature, biogeographically cold temperate, it is not classically temperate as is a coastal upwelling system. Sudden decreases in bottom temperature can be experienced after prolonged alongshore wind stress at any time of the year, which means that ephyrae should be found in the water column at any time of year – or at least at a time of the year reflecting appropriate wind stress.

This latter hypothesis will be investigated here using archived plankton samples that were collected along the length of the Namibian coast during the 1970s as part of the SWAPELS programme.

**Bioaccumulation of Trace Metals in Northern Namibia Floodplains (Duration: 3 years)**

This research is focused on the mobilization and fate of inorganic contaminants (primarily heavy metals) due to re-suspension of cohesive benthic sediments in aquatic systems during natural episodic events (floods) and seeking to answer fundamental questions about the transport and fate of priority metal contaminants (e.g. Pb, Zn, Cu, and Cd) between benthic sediments, the water column and the fauna of aquatic systems. This research will combine bioaccumulation and column studies of benthic sediment resuspension with bench-scale studies of interactions between these metals with the sediments. In addition, the uptake of these metals by fish species will be evaluated as a potential index for the assessment of ecosystem and human health associated with mobilized metals along the aquatic food chain.

Data obtained will be utilized to develop models of metal mobilization and spatial distribution in the aquatic systems, while numerical models will be applied in the study of contaminated sediment resuspension subject to natural episodic events.

With the recent flooding in several northern parts of Namibia, this research will underpin the development of effective Water Basin Management Planning by improving our current understanding of the prediction of heavy metal movement in water bodies as a result of episodic events (flooding) leading to better risk assessment for both aquatic biota and human exposure to these pollutants. Such knowledge is central to the development of sediment quality guidelines and the management of priority substances within the environment.

**Silver Kob Culture Research (Duration: 3 Years)**

The Namibian Government has identified aquaculture as a key growth area in the diminishing fishing sector. The Namibian marine aquaculture industry has concentrated on oyster farming for the most part, but the sub-sector needs to diversify away from shellfish to allow for future growth and stability. The silver kob appears to be a strong candidate for aquaculture in Namibia, and this project aims to investigate
key aspects of the propagation, husbandry, larviculture, environmental tolerances, growth and survival of the species under captive conditions; in order to assess its potential.

For most of the Namibian coast, marine aquaculture is restricted to onshore farming in ponds or tanks. This is relatively expensive, and therefore limits cultivation to higher-value species, such as the silver kob, *Argyrosomus inodorus*. The silver kob grows relatively quickly, is sort-after for its palatability, can be induced to spawn under artificial conditions and is commonly available, making up some 70% of recreational shore angling catches and 58% of all line fish catches in Namibia.

The research consist of six parts, including an examination of the reproductive biology of silver kob using fish sampled throughout the year; the development of a spawning protocol for brood stock fish using hormonal and environmental induction; a description and photographic documentation of the egg and larval development of the species; the development of a technique for the larviculture of silver kob; the development of a method to wean post-larvae from live to inert artificial food, and the observation of the effects of different feeding regimes on the growth and survival of these fish; and lastly, the elucidation of the temperature preference of the species, and it’s tolerances for the key limiting environmental factors in tank culture, such as oxygen levels and ammonia concentrations.

**Ecosystem Effects of Bottom-Trawling in the Benguela System (Duration: 3 Years)**

This research focuses on potential effects caused by bottom-trawling to the demersal fish communities off the Namibian coast. Investigations seek to detect possible changes in the community structure, size structure, species diversity, abundances and biomasses of demersal fish communities. Bottom-trawling is known to have major threats to the structure and function of marine ecosystems since it impacts on community structure and life traits of organisms. Several studies have been done in other parts of the world (e.g. North Sea, Newfoundland, off Alaska, Australia, and Japan) but none was conducted in the Benguela System. Namibia boosts a fairly large export of fish and fish products to Spain (which is further distributed to other EU nations). Of these fish exports, the two species of hake (*Merluccius capensis* and *M. paradoxus*) dominate and forms Namibia’s most valuable fishery. These species are caught in bottom-trawls and long-lines. Thus, for the very first time the Benguela system is being studied through this research to unravel the effects of bottom-trawling, and to make use of this valuable information towards an ecosystem approach to fisheries management. Whereby a healthy ecosystem would be able to sustain a healthy fish population, thus a need to balance our harvesting habits and the resource base, without harming the environment within which the fish live. Without knowledge on the existing effects of bottom-trawling, we may fall in a poor management of our fisheries stocks. An important output is enhancing regional fisheries management and research capacity building by contributing towards the training of a Ph.D. graduate.

**DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

The mission of the department is to create, analyze, and share knowledge of Food Science & Technology to enhance food safety, nutrition, and quality so as to improve the lives of people as well as economy and social well being. The research priorities are the foundation to responses to the emerging needs: (1) To develop value added products from indigenous natural resources; (2) Analyze indigenous fruits and vegetables to identify functional ingredients that are of potential commercial value and (3) Establish new
interdisciplinary research programs such as food nutrition and food safety congruent with development of economic globalization and the increase in international trading of food products.

**Food Safety & Quality Control (Duration: 2 - 3 years)**

The safety of food, whether produced for home consumption, imported or exported is one of the concerns of the Government of the Republic of Namibia. This has resulted in the review of the food legislation for the purpose of amending those laws which are outdated and/or introducing new legislations. This also precipitated Namibian accession to the membership of FAO/WHO Food Standards Programme – the Codex Alimentarius Commission. The research agenda of the Department on food safety and quality control will concentrate on conducting Risk Assessment and Risk Management programme and identify possible commodities which are affected by mycotoxins such as aflatoxins in peanut, crops such as maize, and pearl-millet (*Mahangu*) in an effort to prevent adverse health effects on the consumers.

**Food Processing & Product Development (Duration: 3 - 4 years)**

This research agenda falls within the Government’s desire to promote value added products from local agricultural produce that are nutritious and safe for human consumption; and that are fulfilling the standards and specifications of the importing countries. New products and their processes are to be developed and the physico-chemical compositions of these products are analyzed and documented.

**Nutritional Research (Duration: 2 - 3 years)**

Micronutrient deficiency has been identified as one of the serious problems affecting a significant proportion of the Namibian population. Thus research on Vitamin A deficiency (*xerophthalmia*), food iodine (*goiter*), iron deficiency (*anaemia*) and niacin deficiency (*pellagra*) will be undertaken to promote food fortification and/or to monitor and enforce standards and guidelines emanating from legislations requiring inclusion of these in food products.

This research agenda arises out of the need to reduce micronutrient deficiencies in Namibia and conforms to the pledge made by the Government of the Republic of Namibia to declare Vision 2030 as “Food self-sufficient and Industrial Nation”.

**Food Composition Data (Duration: 4 - 5 years)**

The nutritional profile of foods consumed in a society is very important and contributes to the understanding of issues related to health. Food processing is also very much dependent on these basic data to improve quality and safety. The nutritional profile if found to be desirable. It will assist in the commercialization of the food products based on their known inherent nutritional composition. The Department is therefore to do an analysis on food in order to compile a Food Composition Data Base.

**Value Addition Research (Duration: 5 years)**

The Department of Food Science & Technology intends to promote processed and value added products derived from crops and livestock raw materials. Thus teaching and research trainings in these areas will concentrate on improving the technical utilization of commodities such pearl millet (*Mahangu*),
indigenous fruits & vegetables, milk, sea-foods, and meat for the purpose of producing nutritious, organoleptic and safe food for human consumption.

This research agenda is not only aimed at producing processed, nutritious and safe food, but will also strengthen entrepreneurship and food security in the country, which is long overdue.

**DEPARTMENT OF INTEGRATED ENVIRONMENTAL SCIENCE**

The key objective of the Department of Integrated Environmental Science (IES) is to provide training in the field of forestry, wildlife management and general environmental sciences. Its mandate is to conduct research aimed at knowledge expansion in the area of natural resource management. The department aims to conduct research that is in line with the national research needs articulated from the NDP III and vision 2030 of Namibia. It is envisaged that results from research will, ultimately contribute to improved livelihoods as well as the economic development of Namibian people. Due to the integrative nature of natural resource management and the broad subject context of the department, collaboration will be emphasized. The following research themes will be prioritized:

**Agroforestry Systems for Food Security and Rural Incomes** *(Duration: 4-5)*

Tree resources are a major contributor to food security and incomes of rural households and especially so in arid and semi-arid areas where crop production is hindered by harsh climatic conditions. Research will be conducted with indigenous and exotic tree and shrub species. The aim will be to identify and promote possible breeding schemes. Research results may be incorporated into current farming systems to improve food security, contribute to household incomes and ensure that the environment is conserved. The ultimate goal is to come up with agroforestry technologies (packages) that utilize a wide range of tree diversity, that can easily be adopted by farmers and have a direct positive impact on their welfare. Specifically the following will be given attention:

- Fruit trees
- Fodder and live fencing species
- Fuel-wood species
- Species for soil improvement
- Bio-fuel species
- Sericulture species

**Utilization of Non Timber Forest Products (NTFPs)** *(Duration: 2-3 years)*

Tropical ecosystems are some of the most species rich in plant and animal life. The challenge lies in development and utilization of this biodiversity. Research will be conducted in:

- Identification, domestication and commercialization of high value indigenous species (food, medicinal etc.). The main focus will be on, propagation, product developmet, value addition and marketing.
- Use of plant extracts for pest and disease control
- Develop research activities focusing on identifying effective community-based strategies for improved management, processing and marketing of Non Timber Forest Products (NTFPs) such as honey etc.
Wood Based Industries *(Duration: 5 years)*

Namibia imports at enormous costs, a lot of timber, power transmission posts and fencing materials. Although the harsh climatic conditions in Namibia make growing of many timber species uneconomical, fast growing species can be promoted to supplement the imports. Research in this area will seek to:

– Identify exotic and indigenous species that will grow fast enough under the Namibian climatic conditions to yield products that will compete favorably with the imported wood. Growth rates of target indigenous species will be determined.

– Identify indigenous species that can produce fencing materials and determine the silvicultural strategies required for sustainable production and wood treatment methods to increase durability.

– Monitoring patterns of wood consumption in different regions of Namibia

*Environmental Conservation (Duration: 4 years)*

*a) Integrated Water Management*

The wide network of *oshanas* which traverses across Omusati Region makes the region highly vulnerable to intermittent seasonal floods; as such local communities that are within this network would always be adversely affected by such floods. It is therefore essential to establish a regional flood monitoring system to provide early warning information to local people so that they can take precautions. Baseline studies for *Oshana* ecosystems are required so that an integrated water management system of seasonally flooded areas in Northern regions of Namibia is developed. Research should be conducted to develop suitable techniques for water harvest and utilization of this resource into agricultural systems. Flooding and drought phenomenon are associated to the changing patterns of climate. Studies on climate change will focus specifically on:

– The impact of climate change and adaptation on agriculture and other land-uses

– Methodologies for measuring adaptation strategies of farming practices and systems for farmers

– Assessment of vulnerability of different communities under varying farming or other land management systems.

*b) Management of invasive plant species*

i. Develop objective criterion of quantifying invasiveness

ii. Study behavior of some key tree/shrub invasive species and determine control measures

*c) Long-term analysis of deforestation process*

*d) Restoration of sand dune areas through screening plant species that can tolerate salty conditions for sand dunes stabilization and for Namibian coastal area landscaping.*

*Community Based Natural Resource Management (Duration: 4 years)*
Conservation efforts will normally fail if they do not receive community support and many projects fail to have impact due to failure of project designers to understand the communities they intend to help. Management of natural resources in Namibia and especially in many parts in the North is complicated by the fact that the resources are communally owned. Studies will be conducted in the broad area of

- Community perceptions of natural resource management
- Community based natural resource management

The Namibia forest policy and the Forest Act 12 of 2001 which is focusing on community based management of forest resources has been in force since 2001 (Government Republic of Namibia 2002). Policy analysis studies are required to investigate the success of this policy in terms of combating desertification, improving law compliance and achievement of sustainable forest management. Experiences learned during the implementation of the forest policy of 2001 could be used to identify best practices for improving forest law compliances in the forestry sector.

**Wildlife Management (Duration: 5 years)**

Article 12 (l) of the Namibian constitution specifically obliges institutions to sustainably utilize natural resources for the benefits of all Namibians. Through this article, the policy to promote establishment of conservancies was developed giving local communities rights to wildlife management and tourism. By 2005, about 44 conservancies were registered and they covered about 13% of Namibia land cover adding to the current 16.5% land cover within national parks and forest reserves (Namibia Association of CBNRM Support Organization (NACSO), 2005). Establishment of conservancies has a greater impact on sustainable utilization of wildlife resources as well as habitat conservation.

Scientific information is therefore needed to support the communities in decision making with regard to governance, benefit sharing and handling the human wildlife conflict within conservancy areas. Following the recent policy on translocation of wildlife into their former ranges (commercial farms and conservancies) where they have been depleted, it is important to assess the impact of this translocation on wildlife behavior (reproduction cycle, competition, birth rate, diseases etc) as well as on human wildlife conflict (does it has any potential to mediate the conflict). Impact on socio economic values of people living adjacent to conservancies or people owning wildlife ranches could also be assessed to scientifically ascertain the overall success of conservancy establishment.

**Management of Indigenous Woodlands (Duration: 4-5 years)**

Namibia is a dry country with only about 300 ha land under experimental plantation (Mendelsohn, 2005). About 60% of the country is covered with indigenous savanna woodlands that are providing livelihood products to the rural communities. Continuous research studies are needed to develop strategies for practical and effective management of these woodlands. Results could be used to advice the communities on sustainable silvicultural practices as well as harvesting methods for the different woodlands available in the country.
It is estimated that about 8-10 million ha of indigenous woodlands are infested with bush encroachment around areas of Tsumeb, Grootfontein, Otjiwarongo, Okahandja and Omaruru (DoF, 2007). Bush encroachment is viewed as a serious problem for farmers in Namibia because it interferes with the growth of grazing for ranching livestock and wildlife. It is estimated that due to bush encroachment the agricultural sector loses about N$100 million annually. Research studies to address the issue of bush encroachment is required especially in the areas looking at utilization of unwanted bush into some forms of economic value such as production of energy. Long term monitoring studies focusing on best methods for restoring bush encroached woodlands to improve grazing and the carrying capacity of the range.

**MERITORIOUS RESEARCH AWARDS**

Dr P Bille (Department of Food Science and Technology) received the Faculty award for 2010 and was amongst the nominees for the University reward.

**RESEARCH OUTPUT FOR 2010**


Jia, L.; Shigwedha, N. and Mwandemele, O.D. (2010). Use of $D_{\text{acid-}}$, $D_{\text{bile-}}$, $\zeta_{\text{acid-}}$ and $\zeta_{\text{bile-}}$-values in evaluating bifidobacteria with regard to stomach pH and bile salts sensitivity. Journal of Food Science, 75, M14 – M18.


1.2 FACULTY OF ECONOMICS AND MANAGEMENT SCIENCE

SECTION 1

Student Statistics for 2010

Student Regional Distribution for 2010

SECTION 2: STAFF

Academic and Administrative staff by Gender and Nationality for 2010

<table>
<thead>
<tr>
<th>Department/Unit</th>
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<th>Non-Namibian</th>
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<td>Political &amp; Administrative Studies</td>
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<td><strong>5</strong></td>
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SECTION 3: STAFF DEVELOPMENT

STAFF DEVELOPMENT

22
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<th>Faculty</th>
<th>Department</th>
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<th>No. returned During the year</th>
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UNIVERSITY STAFF ON TRAINING FOR 2010

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</tbody>
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SECTION 5

INTRODUCTION

The Faculty of Economics and Management Science (FEMS) under the leadership of Dr. O. Kakujaha-Matundu as Acting-Dean, has five (5) departments, namely Accounting, Auditing and Income Tax, Economics, Management Science, Namibia Business School and Political and Administrative Studies. The respective HODs of these departments are Prof. U.L. Paliwal, Dr. E. Kaakunga, Ms. J. Haubas, Mr. M. Hengari and Dr. L. Blaauw.

The mission of FEMS is to engage in partnership with major stakeholders in market relevant, academic and technical training, research and educational programmes, and to create a conducive learning environment that provides for innovation, knowledge building, development professional of and functional skills as well as market related competencies.

ACADEMIC ACTIVITIES

The shortage of staff continues to be of the challenges faced by all the departments in the faculty. The situation necessitated engaging part time lecturers. Another challenge is the lack of space for offices and computer labs. The only department that has a computer for undergraduate students is the departments of Accounting, Auditing and Income Tax. The economics department has small computer lab which is restricted to the graduate students while the business school owns a computer lab with limited equipments. It is important to note that during the academic year 2010, the department of economics was able to lunched the collaborative masters programme in economics with the support from the African
Economic Research Consortium (AERC). Furthermore, two postgraduate programmes of the business school were approved by Senate during the period under review. These programmes are the Master of Business Administration in Finance and Doctor of Business Administration.

Staff development was and continues to be a challenge in that when there is shortage of staff it is difficult to release any of those on board to go and study. Once again, it is hoped that the situation will be addressed soon.

**RESEARCH AND PUBLICATIONS**

**Books**


**Book Chapters**


Du Pisani, A. 2010. ‘Language and Development’ in Mbongeni and Malaba (eds). *Policy and Practice in English Language Education in Namibia.* Windhoek: Macmillan Education.

Kaapama, P. “Politics of the Land Question in Post Settler Colonial Africa: Some Comparative explorations of Zimbabwe, Kenya, Namibia and South Africa” in Du Pisani, A.


**Journal Articles**


**Published Conference Papers & Unpublished Research Output**


Kakujaha-Matundu, O. Midterm Review of Kreditanstalt Fur Wiederaufbau


Osterkamp, R. General Accounting in Namibia, to be Published in the Proceedings of the Accounting and Finance Conference by the Department of Accounting, Auditing and Income Tax University of Namibia


**Study Guides and Training Manuals**


Dhlamini, B. (2010) Auditing 1 A & B, Centre for External Studies, University of Namibia


Kaakunga, E. (2010) Managerial Economics, Centre for External Studies, University of Namibia

Paliwal, U.L. (2010). Management Accounting 1 B, Centre for External Studies, University of Namibia


Thomas, R. (2010). Business Statistics, Centre for External Studies, University of Namibia

**COMMUNITY SERVICE**

**Prof. A du Pisani**

- Chairperson of the Research and Publications Committee of the NCHE
- Trustee of the Institute of Public Policy Research (IPPR)
- Board member of the John Maufangeyo Art Centre
- Member of the UNAM Task Force of Think Tanks

**Mr. V. Tonchi**

- Board member of PACON
- Chairman of the Electoral Commission of Namibia
- Board member of NAMPA
- AU Election Observer

**Prof. P. van Rooyen**

- External examiner – University of Stellenbosch
Dr. Blaauw
- External Examiner – Polytechnic of Namibia

Prof. U.L. Paliwal
- External examiner – Polytechnic of Namibia

Dr. E. Kaakunga
- Chairperson of the faculty postgraduate committee
- Member of UNAM postgraduate committee
- External Examiner – Polytechnic of Namibia

Dr. R. Chifamba
- Setting up Comprehensive Examinations for the Collaborative PhD programme in Economics for the African Economic Research Consortium (AERC)

Prof. J.E. Odada
- External Examiner – Polytechnic of Namibia

Dr. O. Kakujaha-Matundu
- Board member – Bank of Namibia
- Board member – Allan Gray Orbis Foundation
- Commissioner – Namibian Competition Commission

Ms. J. Mumangeni
- Member of Forum for African Women Educationalist in Namibia – Research Committee
- Faculty representative – faculty of Science Board Meeting

Mr. E. Naimhwaka
- Chairperson of the Selection Committee – Athletics Namibia

Dr. R. Osterkamp
- Chairperson of Ethiopia Committee Munich
- Coordinator of Bi-weekly Departmental Lecture Series

CONCLUSION

It is important to note that despite various challenges facing the faculty. It has managed to lunch masters degrees and a Doctor of Business Administration. Members of the faculty were involved in research activities despite heavily teaching work load. The research output includes books, chapters in books, journal articles, conference papers among others. It was indeed a success story. Two staff members are pursuing their PhDs while one staff member is expected to complete her masters degree this year.

1.3 FACULTY OF EDUCATION
INTRODUCTION

This Research Report covers the year 2010. It reflects some of the research carried out and papers published by members in the Faculty of Education. A variety of topics were tackled and several papers presented at workshops and conferences. Some of these papers will undoubtedly be turned into refereed journal articles during 2011.

MISSION OF THE FACULTY OF EDUCATION

The research mission of the Faculty is to address areas pertaining to education in Namibia in general and the region and provide leadership in this area.

VISION OF THE FACULTY OF EDUCATION

To become a Centre of Research Excellence in the country and beyond

Mandate

The Faculty of Education mandate is to prepare teachers at all phases of the Namibian education system. Accordingly, our research activities span all these phases (Pre-Primary to Secondary Education). It is our vision to provide better practical ideas on how to provide quality practice by teachers, managers of the schools and community activist/movers in our country.

STAFFING SITUATION/SIZE OF FACULTY

During the year under review, the Faculty comprised three Full Professors, nine Senior Lecturers, 26 Lecturers and one Assistant Lecturer. In all respects all the members of staff in the Faculty have carried out research of one kind of research and are capable of doing research. It is our view that with the respect to research, the staff is more than capable.

DEAN’S REPORT

The Faculty has great potential to carry out research. Unfortunately, funding and time appear to pose challenges for most of the staff members. Most carry heavy teaching loads, administrative and supervisory roles of graduate students which often make it very difficult to do large scale research that requires travel and lodging away from the work station days on end. Even though research is one of our major activities as academic staff members in the University, UNAM is currently a teaching University.
Our short term goal is to ensure that we create more or less semi-permanent research teams based on staff members’ own expressed interests and needs. In this way high quality research will be produced.

In the medium term the Faculty intends to bring the newly joined members of staff from the former colleges of education into the culture of carrying out research, by forming research Teams that will include them in joint research activities. Accordingly, the Faculty research fund portion needs to be increased in cognizant of the increased number of staff and diverse of areas of research that will emanate from the now reality after the merger.

Our long term goal as a Faculty is to ensure that we provide practitioner relevant research that will result in greatly improved practice by our stakeholders and the communities in which our students serve upon graduation. In addition, we intend to strengthen our research through joint research in cooperation with our link partners. These include Universities in the region and international partners. It should be pointed out that the Faculty does not at present have a specific research agreement with any of our partners, but in 2010 staff in the Faculty is involved in a comparative research with colleagues at the University of Zambia and Hedmark University College in Norway on Language and initial Literacy in the three countries. As of now the instruments are being developed for pilot testing.

In addition, the Faculty intends to increase research capacity of all staff through obtaining formal qualifications, joint research activities, attending conferences and seminars and workshops within the country and outside. It is also our hope to produce textbooks that will be used by our students and by learners in our schools at all levels of the education system.

RESEARCH FOCUS AREAS

As indicated in this report the Faculty’s research areas are varied and include; instruction and learning in the classroom, management, i.e., how managers facilitate the learning process in the schools, impact of HIV and AIDS in our schools and community, the roles of ICTs in the classroom and how the facilitate learning, special needs students and how to provide inclusive learning, gender and literacy with respect to lifelong learning.

These areas are all geared towards improving the education system in our country and ensuring that teachers are provided with the skills and information essential in making them effective practitioners. In addition, these areas are important in ensuring that our Lifelong Education graduates play an important
and catalytic role in improving the living standards of our people by raising the participative level of our communities in entrepreneur activities.

**RESEARCH OUTPUT**

**CHAPTERS IN BOOKS**


**REFEREED JOURNAL ARTICLES**


MONOGRAPHS


PUBLISHED CONFERENCE PROCEEDINGS AND PAPERS DELIVERED


Zimba, R. F. (2010). Nature and distinctions of theses and dissertations. Presentation made at a seminar jointly organized by the Teaching and Learning Improvement Unit and the Centre for Quality Assurance and Management, University of Namibia, 8-11-2010


Zimba, R. F. (2010). The importance of Early Childhood Care and Development, Paper presented at the Early Childhood Development Seminar Organized by the City of Windhoek, Safari Court Hotel, 9-4-2010

**STUDY GUIDES AND TRAINING MANUALS**


Beukes, F. (2010). Introduction to Business Management. CES.


Hamunyela, M. (2010). Community Development in Adult Education. CES.


Hamunyela, M. (2010). Teaching Methods in Adult Education. CES.

Kanyimba, A. (2010). Literacy for Economic Empowerment and Sustainable Living (for the San people) for UNESCO (supported by a written Teacher’s Manual).


**CONSULTANCIES**

Evaluation of Psycho-social support services in Primary and Secondary Schools in Namibia. Nov 2009 to June 2010. Funded by Ministry of Education/ Global Fund/ UNICEF. Prof. Tania Vergnani (UWC), Dr. Elzanne Frank (University of Stellenbosch; Dr. J. Mushaandja and Dr. C. K. Haihambo (UNAM).


The development of a diploma in Early Childhood and Pre-primary Education. 2009 to 2010. Funded by NAMCOL. Dr Engelbrecht and Mr Hengari.

UN-Spanish MDG-Fund: JP on Sustainable Cultural Tourism in Namibia: KatimaMulilo Cultural Trail & Information/Interpretive Centre Proposal, Caprivi Region. Commissioned by UNESCO, under the auspices of UCCB). Dr. B. Kangumu& Dr G. Likando

UN-Spanish MDG-Fund: JP on Sustainable Cultural Tourism in Namibia: MunyondogwaKapande Cultural Village Proposal, Kavango Region. Commissioned by UNESCO, under the auspices of UCCB). Dr G. Likando, Dr B. Kangumu and A. Nambandi

UN-Spanish MDG-Fund: JP on Sustainable Cultural Tourism in Namibia: Tsumkwe Cultural Village (N//oaq'ae Culture Village Proposal, Otjozondjupa Region. Commissioned by UNESCO. Dr G. Likando, Dr B. Kangumu and A. Nambandi

Vocational Education syllabi for Schools with Special Needs Learners. Ms. P. February, Dr. C. Haihambo, Mr. J. Hengari and Dr C. Brunette


CONCLUDING REMARKS

All in all given that the Faculty of Education had been actively involved in the merger activities including and the development of Curriculum for both the B. Ed (Lower Primary and Upper Primary) for the larger part of 2010, I am satisfied and happy with the varied research carried out in the Faculty and papers in refereed journals and those presented by the staff during the year at workshops, conferences and seminars. Indeed they deserve to be commended for a job well done. As I conclude this report I look forward to the
2011 academic year which promises to produce more published papers than this year given the number of research and projects staff is involved in now.

1.4 FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

1. Vision of the Faculty
To be the best Engineering School in Southern Africa

2. Mission of the Faculty
To train professional engineers in various disciplines and carry out applied research in engineering and information technology so as to enable Namibia realize vision 2030

3. Research Goals

3.1 In the short term, the Faculty intends to continue with research in nano-technology (production of carbon nanotubes, nanoballs and nano-composites), information technology (artificial intelligence), electro-refining of blister copper and solid waste management.

3.2 In the medium term, the Faculty intends to carry out research in renewable energy, climate change, conservative agriculture technologies, corrosion and corrosion control, establishment of small and medium scale manufacturing industries in the country as well as water and flood management.

3.3 In the long term, the Faculty intends to carry out industry-based projects that will be undertaken by our own M.Sc. and PhD students as well as post doc fellows in various fields of engineering on offer at the Faculty, with special emphasis to the mining industry, the construction industry, water management, electric power generation including nuclear power, environmental engineering, value addition of Namibian natural products, telecommunication engineering and technologies, electronics, information technology, computer engineering and appropriate technology.

4. Research Collaboration

4.1 Department of Mining and Metallurgical Engineering
Professor F.P.L. Kavishe was instrumental in initiating a network of university researchers in materials science and engineering that culminated in the formation of the African Materials Science and Engineering Network (AMSEN). The network is made up of Wits University; University of Namibia; University of Botswana; University of Nairobi, Kenya; and the Federal University of Technology Akure (FUTA), Nigeria. Professor Kavishe is the Secretary General of AMSEN.

The aim of AMSEN is to encourage participating universities to put in place mechanisms to develop and retain faculty members through joint research in materials science and engineering as well as postgraduate
AMSEN is a network under the auspices of the Regional Initiative in Science and Education (RISE). RISE is supported by a grant from the Carnegie Corporation of New York. Mr. Willem Nashidengo, an SDF in the Department of Mechanical and Industrial Engineering, is one of those who obtained an AMSEN scholarship for MSc studies at Wits University, where he is expected to study corrosion along the Namibian coast. Through AMSEN, the Department will also acquire lab equipment for the production of carbon nanotubes in Namibia.

Through the contacts made in the AMSEN project, Professor Kavishe is the co-supervisor of the following postgraduate students, all of whom have submitted their research proposals at their respective universities:

Mr. John Mwero  
PhD student (University of Nairobi Kenya)  
“An investigation of sugar cane waste ash as a cementing material.”

Mr. Bernard Odera  
PhD student (Wits University South Africa)  
“Investigation of selected quinary alloys based on an optimum quaternary alloy from the Platinum-Aluminium-Chromium-Rubium alloy system.”

Mr. I.O. Oladele  
PhD student (Federal Univ. of Technology Akure Nigeria)  
“Development and characterization of natural fibre reinforced polymer composites.”

Mr. Lloyd Nyemba  
MSc student (Wits University South Africa)  
“Reinforcement of synthetic rubber with carbon nanoballs to produce nanocomposite ion exchange membranes.”

Mr. Odilon Ilunga  
MSc student (Wits University South Africa)  
“Thermo-mechanical behaviour of electro-refined Blister Copper from the Tsumeb Smelter in Namibia.”

Mr. Graham Bathgate  
MSc student (Wits University South Africa)  
“Continuous production of single-walled carbon nanotubes using a Swirled Floating Catalytic Chemical Vapour Deposition Reactor.”

In addition, Professor Kavishe is the main supervisor for Mr. A. Ghania, a PhD student in Computer Engineering at the Faculty of Engineering and IT, Ongwediva campus. The topic of the study is: “Neuro-genetic approach for satellite attitude control.”

4.2 Department of Mechanical and Industrial Engineering
With low number of Academic and Technical staff in the Department, it was difficult to carry out research as most of the staff efforts were directed to teaching and administrative duties. Consequently, research and publications output was low. Dr Ogunmokun was involved in two collaborative studies with staff from the Faculty of Agriculture and Natural Resources as follows:


(iii) In association with three other colleagues of the Faculty of Agriculture and Natural Resources, Dr Ogunmokun embarked on a project on Conservation Agriculture.

4.3 Department of Electronics and Telecommunication Engineering

The staffing level during the year under review for this department was very low. The remaining staff dedicated most of their effort to teaching. Consequently, no research or publication was carried out. However, Mr. E. Ruhunga was able to make arrangements for collaborative research with the northern electricity distribution company (NORED), who are willing to work with this department and carry our joint research in electric power engineering and renewable energy. This department will also benefit from a signed MOU between UNAM and NamPower with respect to joint research activities in electric power engineering and energy in general.

5. Publications

In 2009, Professor F.P.L. Kavishe produced a Teaching Manual called “Mechanics of Materials”, which will be used for teaching the following modules:

TMEE3642: Solid Mechanics I

TMEE3622: Strength of Materials.

1.5 FACULTY OF HUMANITIES AND SOCIAL SCIENCES

The Faculty of Humanities and Social Sciences consists of the following departments:
• Department of Geography, History and Environmental Studies;
• Department of Human Sciences
• Department of Information and Communication Studies;
• Department of Language and Literature Studies;
• Department of Sociology; and
• Department of Visual and Performing Arts.
The departments have different sections within them and they constitute thirteen disciplines.
The **Mission** and **Vision** of the Faculty of Humanities and Social Sciences are:

- **Mission** - *To provide quality higher education through teaching, research and advisory services to our customers with the view to produce productive and competitive human resources capable of driving public and private institutions towards a knowledge-based economy, economic growth and improved quality of life.*
- **Vision** – *To be a beacon of excellence and innovation in teaching, research and extension services.*

**Mandate:** The Faculty’s mandate is to develop, through excellence in teaching and research, the skills and competencies necessary for meeting the professional needs of society.

**Dean’s Report**

The short and medium term goals are to:

- improve research and output.
- strengthen knowledge and dissemination.
- implement best practice in knowledge creation.
- launch a peer-reviewed Faculty Journal titled *Journal for Research in Humanities and Social Sciences.*

The Faculty’s long-term research goal is to develop priorities based on NDPs, ETSIP and Vision 2030. The main funder for research activities in the Faculty has been the University. Other funds came from Information and Management Network and International Federation of Library Associations. The research output of the Faculty has been on the low side. The Faculty Management is working very hard to promote a research culture through its annual research conference and the establishment of a refereed journal.

**Research Focus Areas**

**Studies on Language, Cultural Development and Globalization:** Research activities are spearheaded by the different sections of the Literature and Language Studies Department. The sections in this Department include: African Languages, Afrikaans, German, Portuguese, French, and Spanish. The focus research area is on cultural development and local languages, teaching and learning of languages, language and education in Namibia, language policy research, bilingualism, minority languages, indigenous knowledge, language and transfer of technology, foreign language teaching and its strategic role in Namibia’s development, identity and globalization.

**Studies on Namibia’s Transition to a Knowledge Based Society:** This research area is spearheaded by Information and Communication Studies. The focus research area will be on the creation of knowledge based economies, knowledge and innovation behaviour, media and democracy, corporate communication and good governance, audience research and consumption patterns of media products, development journalism, access to information by different sectors in Namibian society e.g. small business, education, agriculture, etc. Indigenous knowledge management, ICTs diffusion and consumption patterns, e-commerce, health communication and behaviour change, and e-government and knowledge and technology transfer, information and media literacy/education.

**Studies on Quality of Life in Namibian Society:** This research is being conducted by the Human Sciences Department comprising of the sections: psychology, social work, religion, philosophy and ethics. Other departments which could join in joint research activities are sociology. The focus research areas are reality of life and wellbeing, health and wellness, domestic gender based violence and other
forms of violence, corruption behaviour in society, ethics, religion and society, role of the family, industrial and workplace productivity, and human rights.

**Studies on Societal Roles of the Arts:** This research is under the Performing and Visual Arts Department. The main research areas are consumption patterns of the arts, indigenous forms of visual and performing arts, ethnomusicology, commercialization of indigenous art forms, art and design as an emerging industry in Namibian society, arts and culture, art and development communication, art and tourism, art education. The tourism studies section may partner in some of the researchers spearheaded by the Department.

**Studies on Development Management:** This research area is under the Department of Sociology. The main focus areas for research are sociological aspects of development; youth unemployment and disempowerment, gender relations, health and well-being, industrial sociology, performance of different development sectors in society, debt relief and foreign aid effectiveness, social transformations, knowledge and technology transfer, rural development and development policy research including MDGs.

**Studies on Namibian Environment, Historical Development, Tourism and Climate Change:** The Department of Geography, History, Tourism and Environmental Studies Department is responsible for this research area. The research focuses on the impact of climate change on Namibia, natural resources sustainable use, tourism and development, historical research in different parts of Namibia, arid climate adaptations and livelihoods, reconciliation and racism, geographical information systems, researching environmental education.

**Cross cutting Issues:**
- Poverty Eradication
- Education social impact and relations with employers including tracer studies.
- Gender relations

The six thematic areas identified here need to be fleshed out through concept papers prepared by different departments in the faculty. The faculty research agenda should also be brought into line with Namibia’s Vision 2030 and UNAM’s research agenda.

The Third Annual Faculty Research Conference will be held in September 2011. The research focus areas for this Conference are:
- Adolescence & Youth Development
- Women and gender issues
- (Un)Employment and decent work
- Violence, crime and human trafficking
- Language/linguistics and Literature
- HIV/AIDS
- Health related issues
- Happiness/Attitudinal issues
- Environmental issues
- New media and digital innovation
- Information and literacy education
• Indigenous knowledge system
• Heritage and Tourism
• Creative industry
• Crafts and design
• Fashion and identity
• Arts and education
• Morals and ethics in the Namibian context
• Libraries in the 21st centuries
• Relevance of social sciences research

Meritorious research awards
None for 2010.

Research Output

Books
Tyson, R. (2010). So this is Democracy? Windhoek: MISA

Chapters in books

Conference papers delivered


Uutoni, W., Yule, W. and Nengomasha, C. T. (2010, September). *Electronic Governance (e-governance) and hybrid libraries in Namibia*. A paper presented at the Faculty of Humanities and Social Sciences Research Conference. University of Namibia

**Monographs**


**Newspapers articles**


**Others**


**Referred journal articles**


Hunter, J.H. (To be published by University of Bamberg, Germany in *Journal for African Studies*). The Bible and the quest for development justice: the case of orphans in Namibia.


**Reports**


**Study Guides and Training Manuals**


Maree, M (2010). *An Evidence Based Guide on the “prevention of alcohol and drug abuse amongst secondary school learners in Namibia”* (Phase two)


**Translated work**

Hunter, J.H. Translation of the Book of Lamentations in the Old Testament from Hebrew into Afrikaans. To be published as part of a Southern African project on translation.

**Works of Art, Inventions and Innovations**

A. **CREATIVE RESEARCH) DANCE PERFORMANCES:**


Olivier-Sampson S. October 2010. *International Oriental Dance Festival*, Gala evening and fringe performances, choreography and dance performance, Bay Hotel Camps Bay Cape Town and Waterfront Cape Town, South Africa.
Olivier-Sampson S. October 2010. Dance, featuring performer, 20 minute production, Al Diwan, Seapoint Cape Town, South Africa.
Olivier-Sampson S. March 2010. Raqs Mahrain, choreography and dance performance including Bellydance Superstar “Ansuya”, Cape Town, South Africa.

B. CREATIVE RESEARCH (THEATRE PRODUCTION):

C. CREATIVE RESEARCH (EXHIBITIONS & FASHION SHOWS):

D. CREATIVE RESEARCH (PROFESSIONAL WORKSHOP PARTICIPATION)

E. POPULAR MAGAZINE ARTICLE:

CONCLUSION
It can be concluded that more research and publication can be achieved through improved funding from the Research and Publications Committee and collaboration with other institutions and organisations. We should continue to demonstrate, through our research and publication, that the humanities and social sciences have a vital role to play in shaping our society and making its members fit in or adjust to a community of societies presented by the global village we are living in.

1.6 FACULTY OF LAW

INTRODUCTION
The Faculty of Law consists of The Academic Legal Training Programme (ALTP), the Justice Training Centre (JTC), the Human Rights Documentation Centre (HRDC), and the Centre for Applied Social Studies (CASS). The various components, operating under the umbrella of the Faculty, have a generic responsibility for academic and professional legal training for the B. Juris and LLB degrees, professional qualifications for admission as legal practitioners, human rights, and capacity building. The Faculty also avails its services to the members of the community by providing tailor-made programmes for the civil service and legal aid to indigent persons who cannot afford the services of legal practitioners.

Having regard to the above, the Faculty of Law has charged itself with the principal mission of producing high quality law graduates, who are well equipped to practice law, contribute to the development of law in Namibia, and endowed with the requisite academic and intellectual wherewithal to stand on their own in the international community. Through the activities and programmes of the two components, Justice Training Centre, and the Human Rights Documentation Centre, the Faculty aims at improving the quality of the administration of justice and creating a culture of awareness of human rights in the country and Southern Africa. Through its research programme and the pool of materials, the Faculty is desirous to serve as a national and regional resource center and to undertake research which identifies the relationship between Namibian law and other elements in society within the overall objective of playing a meaningful role in the development and adaptation of the law to the rapidly changing socio-economic conditions in the country, and in Southern Africa.
Namibia has taken stock of its future in the adoption of Vision 2030 to guide its developmental path. It is proposed *inter alia* that the Republic of Namibia will emerge as a prosperous, peaceful and industrialized constitutional democracy observing all the tenets of the rule of law. Throughout this national document, it is evident that the realization of this vision will strongly depend on the role of law and lawyers in our society. Ever since the inception of the Faculty and to date, the research activities of the members of staff, in the various departments and centres have been motivated by this goal. The research output of the Faculty for the year 2010 is a reflection of the efforts of the Faculty to achieve this goal.

**Fritz Nghiishilwa**

**Judgment Notes**

2010  *Adda K. Angula & Others v The Board for Legal Education*  2009 Namibia Law Journal vol. 2, Issue1

**Sam Kwesi Amoo**

**BOOKS**

2010  *Property Law in Namibia.* To be published by Pretoria University Law Press

**CHAPTERS IN BOOKS**

2010  “The Relevance of Jurisprudence as a Course of Study” in *Justice from within: Legal pluralism in Africa and beyond*, the Festschrift for Manfred O. Hinz.Oliver C. Ruppel & Gerd Winter (eds.)


**ARTICLES IN REFEREED JOURNALS**


2010  “The Property Rights of Women in Namibia and HIV/AIDS. A Myth or Reality?” To be published in *University of Botswana Law Journal* July-December 2010

Prof. Nico Horn

BOOKS


CHAPTERS IN BOOKS


ARTICLES IN REFEREED JOURNALS


STUDY GUIDES AND TRAINING MANUALS

Editor-in-chief: Updating and Namibianising of material of LEAD RSA for use in Justice Training Centre Namibia

**CONFERENCE PAPERS**


**BOOKS**


**CHAPTERS IN BOOKS**


ARTICLES IN REFEREED JOURNALS


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CONFERENCE PAPERS


**Chiko Mchombu**

**CHAPTERS IN BOOKS**


**ARTICLES IN REFEREED JOURNALS**


**CONFERENCE PAPERS**


**Ms. Yvonne Dausab**

**CHAPTERS IN BOOKS**

CONFERENCE PAPERS

Presented a lecture on: Access to Justice: The Use of International Law Clinics to Advance the Case for the Vulnerable Members of Society. This lecture was converted into an article for publication in the Maryland Journal of International Law. 2010.

1.7 FACULTY OF HEALTH SCIENCES

ANNUAL RESEARCH REPORT SCHOOL OF NURSING AND PUBLIC HEALTH
2010

INTRODUCTION:
The School of Nursing and Public Health is mandated to train health professionals (Nursing, Public Health, Radiographers). This is done through teaching, research, consultancy services and community services. The aim to conduct research is not only to contribute to a new body of knowledge, but also to the socioeconomic development of the country.

Nursing research focus on:
• Gather information on nursing care to improve nursing practices
• HIV/AIDS related care practices
• Health information to inform decision makers and policy developers in the health care sector

THE VISION
To remain the center of excellence for Nursing and Public Health programmes guided by evidence-based research. The ultimate aim is to produce competent health care professionals who will contribute to the cultural, political and socio-economic wellbeing of the country.

THE MISSION
The mission of the School of Nursing and Public Health is to engage in the national development agenda through teaching and learning, research and community service. Providing professionally qualified, competent health care professionals, whose knowledge, skills and practice in Nursing, Public Health and Radiography are in tune with the health needs of the society, practice patterns and scientific advancements. These professionals will competently be trained using the four pillars/approaches of Primary Health Care (PHC) e.g. Alma Alta paradigm shift philosophy. Goals for research will be presented as short-term, medium term and long-term.

DEANS REPORT
As many researchers will agree, Namibia is rich with regard to natural resources that underscore the necessity and importance of research in Namibia. Health professionals do participate in health research in variety of ways on a daily basis when they interact with clients and patients.
The School of Nursing and Public Health has collaboration in research with University of Washington, University of Johannesburg, University of Toronto (Canada), Equinet and with the Ministry Health and Social Services (MoHSS). The School of Nursing has just completed a needs assessment with the Universities of San Francisco and Washington during which the need was identified for research agenda, but lecturer face obstacles involving themselves in research e.g. workloads in theory and clinical practice and staff development pressures (involvement in own studies) However, staff members are involved in consultancies and research as is evident from the list of publications submitted for 2010. The research goals are listed short-term, medium and long-term.

SHORT TERM GOALS
- Conduct high quality research through a range of creative and appropriate methodologies;
- Provide a high profile forum for research seminars, symposia, capacity building;
- To foster inquiring, critical thinking and researchers who are capable of independent research activities through Workshops, Seminars and Symposia;
- Provide research skills at different levels to students and lecturers through thesis workshops;
- Prepare professionals for their role as peer reviewers and authors for research activities;
- Enhance skills to be effective in supervising of students;
- Capacitate lecturers to publish in academic journals and other media
- Increase the number of postgraduate research students within the School;
- Dissemination of research generated knowledge to stakeholders to inform policy, practice and education in nursing and health care;
- Increase inter-institutional collaboration, in particular with national and international research centres of excellence

MEDIUM TERM GOALS
- Coordinate research with the assistance of partners, teams and networking;
- Promote dissemination of research results and implementation of successful research initiatives;
- Monitor research performance within the School of Nursing and Public Health
- Conduct joint/team research with other agencies/institutions

LONG TERM GOALS
- To continuously conduct research and publish in international/academic journals
- To collaborate with renowned universities in research
- To become a centre of excellence in research
- To build capacity in research, and publication

Most of these will be done in collaborations with the partner Universities and Stakeholders. Research teams are encouraged and some of the colleagues worked in teams when conducting research or participating through UNAM Coordinating Consultancy Bureau (UCCB) and
Multidisciplinary Research Centre (MRC), our main stakeholders, Ministry of Health and Social Services, as well as with the University of Stellenbosch in TB project in particular. In this project the School of Nursing, School of Medicine is teaming up with colleagues from Stellenbosch University. This project is spearheaded by the deputy dean, Dr. M. van der Vyver, and is externally funded. The research output can be seen as indicated in the report. It is my conviction that research will further improve in the years to come, with more capacities that will be built in research and publication.

Furthermore, the School has strong links with University of Johannesburg; two professors, Prof. M. Poggenpoel and Prof. C. Myburg who support and capacitate young researchers and study supervisors by visiting the University three times a year. They conducted seminars at various occasions.

The School, through its collaboration with the University of Washington conducted 1 week thesis workshops for lecturers and 1 week research workshops for masters and doctoral students during February each year (2010, 2011). These workshops cover the research process, in particular research methodology and various data analysis methods for qualitative and quantitative study methods, as well as literature internet search.

**RESEARCH FOCUS AREAS**
The majority of staff members in the School of Nursing and Public Health are Masters Degree holders and quite a significant number are pursuing doctoral degrees. Some also registered for their masters’ degrees. Not all staff is active in research, accept for their own studies.

The research priorities of focus areas are setup in collaboration with our key stakeholders, especially Ministry of Health and Social Services.

**Research focus areas in priority order are;**

**MAERNAL AND INFANT MORTALITY**
- Reduction of maternal and infant mortality rates in Namibia, which main course in pre-eclampsia.
- The reduction of maternal and infant mortality, goal 5 of the Millennium Development Goals (MDG), is a challenge. Many countries are not doing very well with regards to this goal. The School is represented on various committees within MoHSS with regards to reduction of maternal and infant mortality in Namibia.

**HIV/AIDS AND TUBERCULOSIS**
HIV/AIDS remains a main concern for all Namibians, including Tuberculosis (TB), the co-infection of HIV and AIDS. In order to reduce the impact of these diseases, the School is closely working with the stakeholders to reduce infections as well as to mitigate the impact. It is
imperative to determine the Multi-Drug Resistance (MDR) and Extreme Multi-Drug Resistance of TB and Anti-Retroviral Therapy (ART) on patients.

SHORTAGE OF HUMAN RESOURCES AND RENTENTION OF HEALTH PROFESSIONALS
The shortage of health care professionals is affecting the health care delivery all over the world, especially in African countries, in such a way that the entire health care services deteriorates in many countries. This is due to attrition rates e.g. migration, death, illness, retirement, etc. The School also collaborates in this regard with Equinet (RSA). Research in these areas is imperative.

DILEMMA IN PROFESSIONAL ETHICS
It is expected from health professionals to demonstrate professional ethics and behavior in their respective working environments and event outside that environment. Research in this area is needed and will receive attention in the future.

NON-COMMUNICABLE DISEASE (NCD)
Non-communicable Diseases are diseases which refer to chronic diseases that also contribute to death if it is not taken care of. They are cancer, diabetes, hypertension, arthritis, etc. These diseases do not get the attention it deserves, whereas some of it can be fatal if not detected and treated on time. Research is needed to prevent complications and promote healthy living. The benefits of research in all above-mentioned areas are;

- Decrease in defaulter rates with regard to TB and Anti-retroviral treatment.
- Increases in treatment adherence of patients with regards to TB and Anti-retroviral Therapy
- Reduction in maternal and child mortality and also to contribute to coverage of quality health care of mothers and children
- Promotion of ethical behavior and professionalism is crucial under health care professionals that need attention it deserved. It is imperative to promote ethical behavior and professionalism among health care professionals.

MERITORIOUS RESEARCH AWARDS
Dr. L. Haoses-Gorases, Dean: School of Nursing received a merit award in the faculty for overall performance in all three areas, Teaching, Research and Community Service, but not a specific research award.

Contribution in book

During 2010, lecturers published various research studies. The following 8 (eight) articles and book chapters were published or are in press:

- Small, L.F. Quality of-life experiences from the perspective of patients receiving haemodialysis for chronic renal failure. Published in *Health SA Gesondheid 15 (1) November 2010*.
- Iipinge, S. & Pretorius, L. The stakeholders’ perceptions on the delivery and quality of sexually transmitted infections treatment by private practitioners in Windhoek Namibia. Accepted for publication in *Health South Africa*.
- Kalondo, L. Trauma Radiography and Patient Privacy. Presentation at the National Radiography Seminar.
- Taukuheke,L. The experience and challenges among patients on ARV treatment at Windhoek ARV Clinic.


• Thirion-Naudé, H. & Haoses-Gorases, L. 2010. Looking inside – a documentary on the therapeutic applications of radiography in the Primary Health Care setting. Namibian Ministry of Health: Namibian Broadcasting Commission. (Commissioned by the Permanent Secretary)

CONSULTANCY CONTRIBUTION

• Van der Vyver, J.M.’ Iipinge, S. & SHeehama, J. The evaluation of the mycobacterium tuberculosis specific host cytokine signatures in whole blood cultures supernatant as diagnostic markers for active TB infection. Funded by European and Developing Countries Clinical Trials Partnership (EDCPT).


• Iipinge, S., Shalyefu, R. Knowledge, attitudes, beliefs and practices about HIV/AIDS among first year students at UNAM


CONCLUSION

Although research is utmost important like any other domains, it remains a challenge to lecturers, who have full workload and with clinical component that occupy most of their time. Our gratitude is extended to lecturers who made efforts to conduct research and published some of it. Our partners (regional and international) have contributed to capacity building in research, mentoring ect. We will embark on a workshop that will focus on grant writing skills for research and also encourage team research and publication with in the faculty.
1.8 FACULTY OF SCIENCE

Mission

The Mission of the Faculty is to consolidate, teach and disseminate scientific knowledge in order for Namibia to achieve science-led development.

Vision

To promote the development of science, technology, and environmental studies, and to encourage and facilitate research activities which address the new demands of the national economy.

1. Department of Biological Science

Research Focus areas

Research areas in the Department currently include:
(1) **Applied and environmental and medical microbiology**: biological activity of antimalarial and antimicrobial compounds and animal host-parasite interactions; Malaria research and the use of natural plant extracts in malaria treatment.
(2) **Microbial pathogenesis, food safety and disease prevention**
(3) **Molecular and general genetics**: Molecular Marker technology
(4) **Crop Domestication**
(5) **Agricultural biotechnology**
(6) **Mushroom Production science**: The Department of Biological Sciences also hosts the Namibia Type Culture Collection of microorganisms as well as the Zero Emissions Research Initiative (ZERI) African Regional Project.
(7) **Pathobiology**: Understanding Molecular Mechanisms of Host-parasite Interactions, including parasitic plants, parasitology of *Plasmodium falciparum*
(8) **Conservation and management of Namibian biological diversity**: including forest management; rangeland management; vegetation dynamics; ethnobotany and traditional knowledge systems.
(9) **Population ecology**
(10) **Aquatic research**: Investigation of potential toxicity to humans of Windhoek’s drinking water due to the presence of Endocrine Erupting Chemicals (EDCs); Investigation of the presence and potential toxicity of heavy metals in surface water resources of Namibia; Biogeochemical and nutrient cycling in the water column and sediments of freshwater dams and reservoirs in Namibia; Carbon cycling and microbial diversity and activity in shelf sediments of the Benguela upwelling systems of the coast of Namibia; The sulfur cycle and the role of large sulfur bacteria in marine sediments off the Namibian coast.

Research outputs

- Books, (A)

None
Chapters in books, (C)

None

Refereed journal articles, (D)


• Shiponeni, N.N., Allsopp, N., Carrick, P.J, and Hoffman, MT. In press. Competitive interactions between grass and succulent shrubs at the ecotone between an arid grassland and succulent shrubland in the Karoo. *Plant Ecology.*

*Monographs, (B)*

None

*Published conference proceedings and Conference papers delivered, (F)/(K)*

• Du Preez, C.I., Bock, R. and Mumbengegwi, D.R. (2010, 15-17 September); Validation of ethno-medicinal plant knowledge in the Oshikoto region through botanical identification and biological assessment of its value as complementary medicine for malaria. Presented at National Research Symposium, Safari Hotel, Windhooek


• Mapaure, I. (201, 9-12 March, 2010). Building Capacity to Assess and Increase the Climate Change Mitigation and Adaptation Capacities of Vulnerable Communities in Southern Africa – Namibia Progress Report. Presented at a HED Climate Workshop, Rhodes University, South Africa.


**Study Guides and Training Manuals (H)**


Works of Art, Inventions and Innovations (J)

None

Patents registered

None

Popular publications (L)


2. Department of Chemistry and Biochemistry

Our researchers collaborate extensively in several strategic theme areas, including:

1. **Build Environment, Sustainable Energy, Climate Change Adaptation and Mitigation**

   Application of green chemistry to synthetic organic chemistry, specifically in alternative reaction media (including solvent-free synthesis) and alternative activation (e.g. microwave, ultrasound, etc.) • Wastewater treatment • Resource efficiency measurements and Carbon footprinting • Climate Change technologies • Carbon Management • Environmental Management Systems and ISO standardization of Organization • Environmental Policy • Sustainable Energy • Renewable energy sources) • Environmental Radiochemical Analysis (Research Team: Dr E Naomab, Dr HR Lotfy, Ms C Raidron, Dr ERT Elago, Mr G Uiseb)

2. **Improvement and value addition of Plants and Crops and Food Chemistry**

   Biochemical and Chemical characterization and molecular, environmental and nutritional evaluation of local plant and crop species • Screening, isolation, purification and characterisation of novel enzymes from microorganisms and/or plants• Studying the fermentation/cultivation conditions for the production of enzymes and other functional compounds produced by microorganisms, in particular fungi • Plant Resources • Plant Environment Interactions and adaptation strategies, enhancing coping strategies of communities to climate change variability • Value addition and improvement of local plant/crop species •
   (Research Team: Dr M Kandawa-Schulz, Dr E Naomab, N Pogori, Ms C Tjiurutue)

3. **Medicinal Chemistry**

   • Synthesis of coordination complexes containing thio-based ligands • Synthesis of coordination complexes containing nitroxylic ligands • Screening for biologically active products in medicinal plants and subsequent chemical, biochemical and pharmacological studies on plant secondary metabolites • Establishment of seasonal occurrence of algal marine biotoxins along the central Namibian coast. Design and synthesis of potential antiinfective agents modelled on natural products. (Research Team: Prof. EMR Kiremire, Dr HR Lotfy, N Pogori, Ms C Raidron, Ms T Thomas, Dr RH Hans)
4. **Computational Chemistry/Bioinformatics**

- Electronic structure of semiconductor clusters
- Computational modeling of the interaction of ozone with thio-phenol, seleno-phenol and DNA bases
- Bioinformatics for small scale genome project for local species, AKA X-species hybridization
- Gene Ontologies for Namibia Fauna and Flora
- Systems biology for biochemist **(Research Team: Prof. Edet Archibong, Dr E Naomab, Dr M Kandawa-Schulz)**

5. **Industrial Chemistry and Nanotechnology**

- Nanomaterials, Applied Chemistry and Chemical Engineering **(Research Team: Prof J Wang, Dr E Naomab)**

**Publications**

**Refereed journal articles:**


4. Jose C. Jackson, Kwaku G. Duodu, Mette Holse, Margarida D. Lima de Faria, Danie Jordaan, Walter Chingwaru, Aase Hansen, Avrelija Cencic, Martha Kandawa-Schultz, Selalelo, M. Mpotokwane, Percy Chimwamurombe, Henrietta L. de Kock, and Amanda Minnaar; Advances in Food and Nutrition Research, Volume 61; ISSN 1043-4526, DOI: 10.1016/S1043-4526(10)61005-4


Published conference proceedings and Conference papers delivered


3. Department of Computer Science

Publications

Journal Articles:


Conference Papers:


4. Department of Geology

During 2010 staff members in the Geology Department were engaged in the following collaborative research projects:

Dr. F. Kamona:

A. Exploration guides for mineral deposits in Namibia:
   Research focus: Investigating characteristic features of mineral deposits in different tectonic settings in Namibia with a view to establishing exploration guides for mineral exploration. Current research is taking place in the Otavi Mountainland for carbonate-hosted Pb-Zn deposits and the Erongo region for uranium mineralisation associated with both primary and secondary uranium deposits.

B. Environmental-geochemical project in mining areas:
   Research focus: Investigating the environmental impact of past and current mining activities in mining districts with a view to establish a geochemical baseline and identify polluted areas that pose a risk to humans and the local flora and fauna.
   Analytical expenses funded by the Czech Geological Survey.

C. The Tectonic and Geochronological Evolution and Metallogeny of the Matchless Belt:
   Research focus: Investigating the geological evolution, setting and metallogeny of the Matchless Belt in Namibia which hosts Cu-Au deposits at e.g. Otjihase and Matchless Mine. This project was initiated in 2010 in collaboration with the Swedish Geological Survey, Uppsala University (Sweden), The Geological Survey of Namibia and Weatherly International PLC.

D. UNESCO-IGCP Project 580: Magnetic Susceptibility, Correlations and Palaeoenvironments:
   Research focus: Investigating the magnetic susceptibility, stratigraphic correlations and palaeoenvironments in sedimentary basins of the Karoo with a view to establishing local and regional correlations.
   The first meeting of this new IGCP 580 project was held in Liege, Belgium at the Liège University from 2 to 5 December 2009 and it included a field trip and training programme on the methods and
application of magnetic susceptibility in palaeoenvironments.

**Publications:**


Funding for the above projects is partly provided by UNAM, UNESCO-IUGS, NAMCOR and the Geological Survey of Namibia who assist with travel costs, research materials, analytical costs and research equipment.

**Dr. Ansgar Wanke**

In 1999 Dr. Ansgar Wanke and other researchers discovered fossil remains of giant *Temnospondyl* amphibians in Permian lacustrine deposits located in the vicinity of Doros Crater in the southern Kaokoveld. The *Temnospondyl* amphibians near Doros Crater have sterospondylous vertebrae, which had been unknown before the Middle Triassic. This made the discovery quite spectacular, as the finding near Doros Crater give clear evidence that the Mesozoic radiation among temnospondyl amphibians into the *Sterespondylidae* obviously occurred much early than previously known (Warren et al, 2001).

In August 2010 a group of researchers from South Africa and Argentinia contacted the UNAM geology department and Dr Wanke guided the group to the fossil discovery of 1999. One week of intense field work did unfortunately not reveal much new fossil material, but yielded a number of new thoughts on the palaeoecology and taphonomy of the *Stereospondylidae* amphibians.

The samples collected during the 2010 field trip are currently prepared for further investigation by Dr R. Smith at the Natural History Department of the Iziko South African Museum in Cape Town. The samples are extreme fragile and preparation may take up to two years. Dr. Wanke has developed four honours research projects which aim to re-interpret the depositional and post-depositional processes of the strata in which the fossil *Stereospondylidae* have been discovered. The honours projects started in May 2011. First results are expected in the first half of 2012.


**Dr H Wanke**

**Focus area: Hydrogeological/hydrological research to support sustainable supply of potable water**
This research field aims at supporting Namibia’s strategies to sustainable supplying potable water to their residents at adequate quantities and qualities. The country experienced a population growth rate of just over 2.5% per annum over the previous decade (Central Bureau of Statistics, 2003). Moreover one of the mission statements of Vision 2030 (Office of the President, 2004) is to transform Namibia into an industrialized nation over the next two decades. The subsequent effect of these two facts is currently – and will also be in the future – an increase in water demand. Furthermore against the background of climatic change and its unknown influences on groundwater quantity and quality, studies leading to a thorough understanding of all national and transboundary groundwater systems are necessary to prepare the nation for challenges arising from climatic change.

For the following projects funding was applied for and approved and data collection started:

- Identification of sources of nitrate in groundwater in Namibia (isotopic study) (funding from UNAM Research & Publication Office)
- Hydrochemical modeling of four Managed (artificial) Groundwater Recharge projects in Namibia (funding from UNAM MRC)
- Study of water quality of hand dug wells including identification of possible contamination sources and development of an improved well design (funding from UNAM MRC)
- Identification of pollutants at the outflow of Goreangab Dam and distribution paths along tributaries to Swakop River and the groundwater system with special emphasis on implications for the Swakoppoort Dam (funding from NamWater)

No research outputs are published so far as data collection and data analyses are still in progress.

**Research Report for 2010: Benjamin S. Mapani, Geology Department.**

In 2010 the main research activities were in three main areas

1. Naukluft Isotopic, groundwater and structural studies
2. Studies on the Rehoboth and Hohowarte basement areas
3. Studies in the Khan-swakop river areas on uranium in groundwater and from dust.

1. Naukluft Project.

This project has reached an advanced stage. Two abstracts were submitted and one manuscript for publication in geology. The authors are still awaiting reviewer comments.

This the final phase of pump tests will be carried out in 2011. After that a modeling of the groundwater system will commence.

2. Crustal studies on the Rehoboth and Hohowarte Inliers.

A research agreement was reached between the author and Prf. Cornell of Gothenburg University. Studies were to involve Honours and Masters students from both Universities in 2011. Work will cover geochronology and geochemistry of the lower crust between the two departments.
3. Groundwater and Dust studies in the Khan-Swakop River areas. The project was sponsored by BGR-Geological Survey of Namibia, where four (4) honours students did project on uranium migration into ground water (2-students) and uranium migration into dust (2-students). These projects cost an estimated N$250 000 which was paid by BGR in analytical and transport expenses. It is expected that results from these two projects will be written up in 2011.

Masters Students under Dr. B.S. Mapani
The following students were being supervised by Dr B Mapani

(i) Mr Paulo Tanganha- who has been working on the “Resource estimates of alluvial diamonds in the Lunda-norte area, Angola”; managed to complete his data analysis. He is now working on the final manuscript. Due to confidentiality agreements his results will be made available after completion of his thesis.

(ii) Ms Winnie Kambinda- is currently modeling the groundwater aquifers in the Naukluft area. At present enough hydrochemistry data has been obtained and she requires more pumping tests. It is expected that she will complete this aspect in 2011 and submit her thesis.

(iii) Mr Ewereth Muvangua- Although he registered, he has not yet completed his project proposal arrangements. Meanwhile he has begun collecting data from the Damara belt for his analytical work. Mr Muvangua is sponsored by a joint research applied for by Dr B.S. Mapani and Prof D. Forster from Florida USA.

RESEARCH OUTPUTS


5. DEPARTMENT OF MATHEMATICS

Introduction
In 2010 the new Bachelor of Science program in the department has been fully implemented. This constitutes an improvement brought about as a result of the major-minor system adopted by the faculty. The new program provides a much more thorough training.

Activities of the Department
In order to improve the pass rates of first year mathematics, the department designed a special mode of first year mathematics. The submission of the department was eventually approved by the University Senate, and the special mode will be implemented in 2011.

The department also worked on a Master’s program, which will most probably be implemented in 2012.
Research and Publications


Dube, T. and Mugochi, MM. A note on almost uniform nearness frames. Quaestiones

6. Department of Physics

(g) JOURNAL ARTICLES


7. Department of Statistics

Research focus areas

- Aging is one of the most important population concepts in the world. With increasing number of elderly population, Governments need to prepare in terms of providing social services including health services. It is therefore of importance that the Statistics department looks at all demographic dynamics which might have an influence on aging population and do the projections. Thus one of the research focus area is “Modeling Aging Population”.

Research Output:

*Chapters in books*

*Refereed journal articles*

*Conference papers delivered*

*Study Guides and Training Manual*
- Introduction to Statistics by C J Mahindi
- Statistical Methods and Research by Mr CJ Mahindi
- Multivariate Distribution by P Iiyambo
- Quality Control by I Neema
- Data Processing by I Neema
ACTIVITIES OF ACADEMIC CENTRES

2.1 CENTRE FOR EXTERNAL STUDIES (CES)

The Centre for External Studies (CES) at the University of Namibia is one of the leading service providers in Open and Distance Education in Namibia. CES is committed to Vision 2030 to ensure that Education for All is indeed accessible to all to reach their full potential and take their place in Namibia. As a Distance and Open Learning Centre, we are committed to quality education that would contribute to the optimal development of individuals, and at the same time, ensuring development of the socio-economic growth of Namibians.

In line with its vision and mission, CES comprises of the following Departments: The Department of Materials Development and Instructional Design, the Department of Student Support, the Department of Continuing Education and a large Administrative section which is responsible for the smooth running of the Centre. Every year each department sets academic goals, activities and targets to be achieved during that academic year. One of CES’s academic goals for 2010 was to revive its research committee with the aim to ensure best practice in the areas of learning materials, academic support and technologies that would put CES in line with other ODL institutions internationally, as well as making CES aware of the individual needs of its students.

1. Director’s Report

Although the CES mainly conduct research in the area of open and distance education it also have strong research links with some of the academic staff from other faculties within the University. Some of these links are with the Faculty of Education’s Department of Lifelong Learning and the Department of Inclusive Education. Other research projects are also developing between the department of Mathematics and that of the faculty of Medical Health Sciences. When looking at collaborative attempts with other ODL institutions locally, I’m happy to report that various research initiatives have taken place; as a result
of a series of research related workshops which were facilitate by Dr Anthony Brown of CES, and organized through NOLNET. Furthermore, CES has continued its community outreach and research activities with UNESCO, the Ministry of Education, and the Ministry of Health and Social Services. Staff members from CES also belong to various research bodies within Namibia as well as within the SADC Region. Examples of such research bodies are: Distance Education Association of Southern Africa (DEASA), Namibian Educational Research Association (NERA) and Namibian Open Learning Network Trust (NOLNET). The Director of CES is the country representative for DEASA as well as the Vice Chairperson for the NOLNET Board of Trustees. Due to CES’s links with DEASA, CES also has existing networks with the University of Botswana and the Commonwealth of Open Learning in Canada. During the year under review, CES has also strengthened its links with the FernUniversity of Hagen in Germany.

Apart from striving to produce quality research and publications, some of its short, medium and long term research goals set for 2010 and beyond included the following:

**Short term goal:**

Through the revitalization of CES’s research committee, academic staff members were challenged and motivated afresh on how different research activities within CES could be improved on the basis of the services rendered to distance education students and partners.

**Medium research goals**

Most of the academics at CES were involved with medium research goals, which resulted in conference papers or publications during 2010. Some of the research areas included the following:

- Explore how technology could be used to improve student support;
- Collect Empirical evidence to strengthen policy and practice in distance education;
- Establish inter-research activities with other faculties within the university and ODL institutions; and
- Conduct the training needs assessment among San women and girls of Namibia.

**Long term research goals**

One of CES’s long term research goals is to ultimately develop and grow into competent professional ODL academics which will be recognized internationally for their pioneering work. One such an attempt
has started during 2010, where the wish was expressed to launch a book on ODL in Namibia during an ODL conference which will take place in October 2011.

CES was actively involved with community outreach activities and research during the year under review. Two of the four proposals which were submitted to the Research and Publication Office, were successful. A total amount of N$ 157,000 was approved for the two successful proposals. The two unsuccessful proposals were referred back to the authors with the request to resubmit once they have adhered to the comments made by the committee.

**Figure 1: CES Research committee**

3. **Research Focus Areas**

CES, being an open and distance learning arm of the University, her research activities focuses on issues related to education for development in general but more specifically on educational approaches, methods and practices, distance and open learning, lifelong learning, adult education and educational policy. The following areas in research were found interesting and worthwhile doing among the CES academic staff.

3.1 **Assignment writing practices: Ms E Venter and Ms E Tjiramba**

Both authors of this research paper are from the Student Support Section. Since students often have problems understanding or answering assignment questions correctly, the authors felt intrigued by the way students interpret instructions as set out by lecturers. What does a student do when he/she don’t
understand a question in an assignment? What skills are students applying to assist them understanding how to go about answering their assignments? eventer@unam.na vtjiramba@unam.na

3.2 Open and Distance Learning (ODL) at tertiary Level: It’s Potential to Contribute to a Knowledge Society: Dr H Nekongo-Nielsen and Dr F Beukes

These authors are planning a tracer study on ODL graduates who studied through the means of Open and distance learning programmes from 2000 up to 2007. The study will concentrate on their specific field of study and work they are involved in. The study will however also look at other areas which might be found useful for society, but which is not offered through higher education ODL programmes in the region. hnnielsen@unam.na fbeukes@unam.na

3.3 The Psychosocial Needs of San learners: Towards coping strategies for retaining San Learners in secondary schools in Namibia: Dr A Brown and Mr J Ndimwedi

There are currently more than 38,000 San people living in Namibia with 7 distinct languages. They are the most disadvantaged group in Namibia in nearly all social and economic indicators including education. San learners are the unfortunate victims of a number of negative stereotypes that pervade almost all aspects of their lives. In school, this gives rise to bullying, not just by other learners but also by teachers, who are known to make examples of their San learners in class and in assemblies. This study intends to investigate the psychosocial factors contributing towards the high dropout of San learners and develop strategies to support these learners in school. Five regions will be visited across Namibia. abrown@unam.na jndimwedi@unam.na

3.4 Distance education undergraduate students' experiences of project work supervision in Namibia: Dr N Mbukusa

Despite several international studies that have been conducted on MA and PhD supervision, little qualitative investigation has been conducted on students doing undergraduate project work in an attempt to understand how the supervisory relationship is experienced. In response, 16 students from rural and urban schools studying at the Centre for External Studies, University of Namibia (CES-UNAM) were interviewed using focus group interviews. The study results centred on the theme of feedback as an academic support service with subthemes such as ineffective feedback from tutors, feedback too little too late from lecturers, inadequate vacation school guidance on supervision and lack of commitment from supervisors. nmbukusa@unam.na
4. Research Output:

4.1 A training needs assessment for vocational and skills development among San women and girls: Dr H Nekongo-Nielsen

An evaluation of recent publications revealed that there is not much information available on the training needs or income generating activities for San people, especially those targeting San women and girls. The aim of this study was therefore designed to find out the training needs and the need for income generating activities among San women and girls in the four regions of Caprivi, Kavango, Ohangwena and Omaheke, in order to develop interventions that would address the identified needs. The research report documented the identified training needs of San women and girls living under these varying circumstances and recommended appropriate interventions for sustainable income generating activities. This needs assessment was conducted by Dr Haaveshe Nekongo-Nielsen, for UNESCO. On the basis of the recommendation learning materials were developed by CES and The department of Lifelong Learning during the 2010 academic year. hnnielsen@unam.na

Figure 2: A focus group discussion meeting at Omega, I of the Mukwe Constituency’s in the Kavango region

4.2 Development of a toolkit for the work ethics programmes for San Women and girls.

As a result of the above-mentioned needs assessment, Dr Trudie Frindt and Dr Nekonko–Nielsen developed a 6-module Work Ethics toolkit for San Women and girls. A video on “San Women at Work” (in figure 3 below) was produced by Dr Trudie Frindt, to accompany the Work Ethics Toolkit. Dr
Nekongo-Nielsen also worked closely with colleagues from the Department of Lifelong Learning to develop a 6-modules literacy toolkit as well as a facilitator’s manual for illiterate San women. It must be mentioned that both facilitators’ manuals were developed with the purpose to train facilitators with the necessary skill to teach literacy as well as work ethics to San women. It is envisage that the training will commence during 2011.

Figure 3: Video on San Women at Work.

4.3 Higher Education Task force
During the year under review, a team of academics were tasked by the VC, Professor Lazarus Hangula to investigate the possibilities of establishing a UNAM campus in the Northern and Southern parts of Namibia. Dr Frindt was part of the Higher Education task force team which was led by Dr Kenneth Matengu. A report resulted from this investigation.

5. Books: Chapters in books:
• Refereed journal articles
Brown, A. (2011). Using the nominal group technique to explore trainee-teachers attitudes in Namibia towards school-aged children infected with HIV and AIDS, NERA.

- **Monographs:**

- **Published conference proceedings:**

- **Conference papers delivered:**


- **Study Guides and Training Manuals**


6. Conclusion

During the reporting period, CES realized a number of its goals and made definite stride towards reaching our goal of increasing our research output for 2010. Very special thanks must therefore go to the Chairperson of CES’s research committee, Dr Anthony Brown, for his timelessly efforts and energy in motivating and encouraging academics to get involved in research. Congratulations to our colleagues who received funding from the UNAM Research and Publications Office. You set a great example, and the rest of us will follow soon. Finally, thank you to all our partners in ODL, and special thanks to UNESCO who sponsored Dr Nekongo-Nielsen and Dr Frindt to participate in the OER initiative in Paris, during December 2010.

2.2 LANGUAGE CENTRE

Introduction
The vision of the Language Centre is to be the leading academic centre of excellence in offering modern, national and international languages

Mission
Our mission is to equip students and society at large with linguistic and general communication skills through quality teaching and consultancy services towards improvement of language proficiency.

Staffing situation/size of faculty or centre
Regarding staffing, the Centre has twenty four staff members, including administrative personnel. Two staff members are about to complete their PhDs. This will help the Centre greatly to overcome some of its challenges with respect to research.

Short, medium and long term research goals
Our short-term research goals are to build the necessary capacity through learning by doing, training and knowledge sharing so that we are in a position to conduct research that will generate knowledge and
sustain communication through language. While, our long-term research goals are to generate knowledge that will be used to power our teaching; such knowledge will also inform policy makers with respect to matters related to the teaching and development of languages. We will also illuminate further, through research, the link between language and thinking via collaborations with our colleagues in other departments, e.g. Biology and Psychology.

To get around the problem of low research output which can be attributed to the lack of capacity, the Language Centre hired a trainer to provide training in statistical data analysis using SPSS. The training in question, which was one week long, was very much appreciated by the staff members. It is hoped that the fruits of the data analysis training will be reaped this year. However, the Centre also shared knowledge with regard to research to fill the existing gaps in the know-how of staff members. Additionally, since time had been identified as one of the constraints, the Centre slightly reorganized its operations to free up time for research and organizational learning. This year, 2011, the Centre will provide training in research methods and qualitative data analysis. All these efforts are geared towards addressing the problem of low research output which has been crippling the Centre since its inception. Clearly, although its research output is still minimal, the Centre is moving in the right direction.

**Research partnerships and networks; research teams and programmes**

In terms of networking, the Language Centre will continue to consolidate its links with the Centre for Kiswahili Studies at the University of Dar es Salaam. Through such networking, expertise, especially in the area of research into languages will be shared. The Centre in question celebrated its 80th birthday this year, meaning that there is a lot we can learn from them. The language Centre will also continue to forge links with other institutions as far as research is concerned through its Research Unit, which was revived last year and is now aggressively encouraging research at the Centre and collaboration with other institutions in the language teaching and learning industry.

**Research focus areas**

Last year, the focus areas were the language of instruction/learning and reading skills among primary learners in Namibian Schools.

**Reading**

The Centre conducted research into reading skills of pupils at Otjomuise Primary. The research in question was on “The influence of pleasure reading in English and writing instruction on reading and
writing abilities of Grade 5 learners at Otjomuise Primary School.” The funding (N$500.00) for the data analysis for this study was provided by the Language Centre

Published conference proceedings and conference papers delivered
Language of instruction/learning
The Centre, during the same year, contributed a chapter to a book on English in Namibia. The British Council funded the conference; some selected papers from this conference were later compiled into a book. This book was launched by the Ministry of Education in collaboration with the British Council this year (see details below). Moreover, a study into knowledge sharing at the Language Centre was designed but could not implement due to time constraints. Plans are under way to implement it this year, during the Second Semester.

Simasiku, L. (2010). Language Policy and Constitutional Elements: Is the official language synonymous with the language of instruction in the Namibian context. In M. Malaba (Ed), Policy and practice in English Language (pp. 6-13). Windhoek: Macmillan Education Namibia Publishers (PTY) Ltd.

In addition, in 2010, the Centre played an instrumental role in the winning of the English Language Proficiency Project (ELPP) tender, a multi-million dollar project, which is currently being spearheaded by the University Central Consultancy Bureau (UCCB). The Language Centre was part of the team that wrote the proposal. Moreover, the Centre contributed to the production of different materials related to the project after the tender was awarded to the University of Namibia, including the design of the needs analysis survey as well as benchmarks. The ELPP is designed to help Namibian teachers country-wide improve their proficiency in the English language and is in line with National Professional Standards for Teachers in Namibia.

Concluding remarks
The Centre formed a three man committee to coordinate the research activities of the Centre. A room has been identified at the Language Centre which will be turned into a Research Unit and will be fully furnished with technology and research journals on Language Teaching. I would like to thank the British Council who paid for the publication and hosting of the conference at which the paper on English was presented. My gratitude also goes to the University of Namibia that allowed one of our staff members to go on Sabbatical leave and conduct a study at Otjomuise Primary school. Lastly, I want to thank the staff members who have added value to the University through research.
2.3 MULTIDISCIPLINARY RESEARCH CENTRE (MRC)

1. Introduction

1.1 Background

The MRC’s mandate is:

- To promote applied research.
- Coordinate multidisciplinary research in national development priority areas across UNAM in partnership with others.
- Implement the commercialisation of targeted R&D activities, such as product development, patenting and value addition.
- Promote the dissemination of MRC research publications and other outputs.
- Carry out teaching and advisory services for the public.

During 2010, the MRC was deliberately focused on implementing the above mandate. The overall research performance was improved from better the previous year with respect to the number of manuscripts prepared, presentations made and seminars or workshops held and this is worth noting. A total of 13 technical papers, 14 articles of which 9 were submitted and published in peer reviewed journals, five booklets, three conference presentations were made and four seminars or workshops were organized. These outputs are an indication that the MRC is well on its way towards focusing on research leaving behind the consultancy of the former MRCC. In line with this strategic shift, the MRC has strived to increase its research muscles by increasing its staff complement of researchers and support staff whilst also increasing its collaborative research with UNAM faculty members. Going into 2010, the MRC had only 5 permanent staff positions with few contract staff. Four more contract staff was recruited: two researchers, a research coordinator and as assistant librarian for the resource centre and the driver. About 6 Post-graduate research fellows at Masters Level and 13 student interns from different faculties were brought on board. They were part of the capacity building programs and also played a vital supportive role in the Divisions of MRC. There were over 60 registered collaborative researchers from various faculties.

An amount of N$5million was allocated by the University of Namibia to MRC in order to strengthen collaborative research with UNAM faculties and other external stakeholders. In addition, the centre generated additional funding through donors such as Lux-development, International Atomic Energy Agency (IAEA), Research and Publication Office. Major partners were the Ministry of Health and Social Services, Directorate of Special Programs, Min of Education (Directorate of Research, Science and
Technology), Ministry of Environment and Tourism, Insaka Initiative (University of Montana (USA), University of Monash (RSA), University of Copperbelt (Zambia), University of Kwazulu Natal (RSA), University of Dublin, Ministry of Lands & Resettlement and Ministry of Gender Equality.

1.2 The MRC Management

MRC management consist of the (i) Director, Dr Hina Mu Ashekele, (ii) Deputy Director Dr Kenneth Matengu, (iii) Heads of Divisions, namely, the Social Science Division (SSD) headed by Dr Kenneth Matengu; Life Science Division (LSD) by Mrs Selma Lendelvo and Science, Technology & Innovation Division (ST&ID) by Dr Hina MuAshekele.

1.3 MRC Staffing

The staff component of MRC during 2010, was 38 members (Table 1), of which 10 (26%) were permanent staff and 28 (74%) on contract. The high percentage of contract staff is contributed by the inclusion of post-graduate research fellows and student interns drawn from faculties for capacity building purposes.

Table 1 MRC staffing

<table>
<thead>
<tr>
<th>MRC staff</th>
<th>Male</th>
<th>Female</th>
<th>Sub-Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Researchers</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Researchers</td>
<td>7</td>
<td>1</td>
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<tr>
<td>Assistant Researchers</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Administration</td>
<td>2</td>
<td>4</td>
<td>6</td>
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<tr>
<td>Postgraduate Research Fellows</td>
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<td>6</td>
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<tr>
<td>Student Interns</td>
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<td>11</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>22</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

1.4 MRC Research and Publication Committee

A new MRC Research and Publication Committee has been appointed by the Director; this Committee is composed of the following members:
1. Dr. Ahmad Cheikhyoussef (Chair)
2. Dr. Patrick F. Graz
3. Mr. Gert Van Rooy
4. Mr. Martin Shapi
5. Mr. Michael Conteh

The Committee conducted 6 video presentations on methods of writing a great research paper to all MRC and UNAM staffs, these presentations were as follows:

1. Picking an A+ Topic
2. Starting Your Research
3. Finding the Best Sources
4. Plagiarism
5. Taking Notes
6. How to Be Persuasive

These video presentations were purchased from Video Aided Instruction, Inc., Roslyn Heights, New York, USA. The purpose of these presentations are to stimulate and increase the number of publications at MRC and to build capacity of MRC junior researchers and to consolidate MRC research programs in conducting and carrying out high quality research.

2. Director’s Report

The Multidisciplinary Research Centre (MRC) is among the few Centers at the University of Namibia that focus primarily on research. The year 2010 was primarily focus of developing strategies to improve research outputs at the Centre, through the process of target setting, identification of collaborations, and mentorship activities. Although set targets, the overall performance better than the previous year.

The long term research goals

The long term goals of MRC are based on the purpose of establishment of the Centre which is to advance research and development in the country in support of Vision 2030 and the national development goals. MRC has been mandated by the University of Namibia to promote and coordinate applied and multidisciplinary research in national development priority areas. It is also envisage to play an important role in research findings and output dissemination using different channels.

Medium term goals

Strengthening research capacity at MRC through recruitment, collaboration, capacity building, staff development and student supervision is among the medium term goals. There some research programmes at MRC that are either led staff members without a PhD or dormant because of lack of staff. This will be
crucial for the achievement of the University strategic plan. This year, we welcomed the following contract staff: Dr Ahmad Cheikhyoussef, Mr Karl //Gowaseb, as Collaborative Research Coordinator; Ms Anna Ngula, in charge of Resource Centre and Mr Simeon Mukululwa, as driver.

**Short term goals**

This involves the accomplishment of annual activity plans of the active research programmes of the three Divisions of the Centre. Research at MRC is carried out by the researchers at the Centre in collaboration with internal and external researchers. The collaborative research approach at MRC was mainly implemented to strengthen research output at the Centre and enhance capacity in academic writing. The active research programmes are:

- Regional and Local Development
- Social Epidemiology
- Land
- Education
- Gender Training and Research
- Pharmaceuticals
- Civil Engineering and Information Development
- Indigenous Knowledge Systems Technology (IKST) (food and beverages)
- Water Engineering Technology and Management
- Renewable Energy Technologies and Management.
- Industrial Production Technology and Management
- Biodiversity and social-ecological systems.

In assessing our achievements over the period, we were pleased to note that the centre has brought in over N$5million (MoE last year alone), and additional funding through collaboration with donors which amounted to over N$ 2million. These donors included University of Mondena in Italy, The African Centre for disaster and risk management, European Union EP 7 and University of Maryland.

There has also been growth in temporary staff, while we operate with only 5 full-time staff. We have 6 contract staff members and 12 student interns who play a vital supportive role, and over 60 registered collaborative researchers from various faculties, although not all are active in research projects and programmes. There are also postgraduate research fellows registered with UNAM for their Masters Programmes and they have been involved in numerous projects under the supervision of researchers at the MRC.

**Partnerships and networks**
MRC implemented various projects through its three divisions during the year 2010 in partnership with stakeholders and collaborative networks. MRC collaborated with staff from different Faculties and Centres at the University of Namibia. External collaborators included the Ministry of Health and Social Services in terms of developing the 5 year Malaria programme review; Ministry of Lands & Resettlement; Ministry of Environment and Tourism; Ministry of Gender Equality on gender-based violence; the US Embassy on women and the law; and the National Council of Namibia; Namibia National Students’ Organization (NANSO) and Namibia Association for CBNRM Support Organisations (NACSO) on wildlife management issues.

In terms of international collaborators, there was also an engagement with the Malawi Law Commission and networking visits on Indigenous Knowledge Systems (IKS) to Botswana and South Africa. The Life Sciences Division worked together with University of Maryland and the Insaka Initiative which is a consortium of four universities (Montana (USA), Kwazulu-Natal (RSA), Copperbelt (Zambia), Monash (RSA branch)).

![Figure 1: MRC staff on a year-end review](image)

3. Research Focus Areas

MRC is made up of three Research Divisions reflecting its key thematic areas:

3.1 Social Sciences Division (SSD)

Dr K. Matengu the Head of Division supported by four researchers, namely; Mr G. van Rooy, Mr M. Shapi, Mr M. Conteh and Mr Z. Kazapua. SSD works collaboratively with mainly the Faculty of
SSD implemented the following five programmes during the year under revive.

1. Regional and Local Development, Programme Leader: Dr K. Matengu;
2. Social Epidemiology, Programme Leader: Mr G. van Rooy;
3. Land, Programme Leader: Mr M. Shapi;
4. Education, Programme Leader: Mr Z. Kazapua;
5. Gender Training and Research, Programme Leader: Mr M. Conteh.

3.1.1 Regional and Local Development Programme

This programme is an action oriented research program aimed at understanding and analysing the role of the development policy of the Republic of Namibia, in relation to the implementation of decentralization, NDPs, rural development strategies and the transformation into a knowledge economy. Additionally, the adoption of information and communication technologies as a development tool also forms part of the program’s research focus. The program also investigates impediments to cross-border cooperation of border towns and the anomalies of borders and borderland identity. In view of decentralization of immediate functions namely, rural water supply and development, and sanitation, for the year 2010, the program will mainly focus on analysing the:

- State of Rural Communities’ Access to Portable Water
- Perils and Promises of Community-Based Water Management
- Barriers to Decentralization: Analysis of Bottlenecks to the Integration of Decentralized Functions into Local Government.

Through this program two technical reports were produced. Two articles are in draft form and one book draft is under review.

Programme Leader: Dr K. Matengu; kmatengu@unam.na

3.1.2 Social Epidemiology Programme

This program was born out of the Poverty and Livelihood Program which primarily focused on research investigation dealing with HIV/Aids, and access to healthcare for vulnerable groups. The change was necessitated with respect to the nature of the current and future vision of the program and ultimately that of the Division. Currently the program does not have core funding, but most of its research projects are
long term research projects with a number of donors. As part of its capacity building, the program sent two UNAM staff members to Amsterdam for MSC- degrees in Medical Anthropology. Upon their return from their studies they re-joined the academic ranks of the University. It should be noted that with the new vision of the program it geared itself to facilitate policy that would enable low income earners to access proper medical healthcare on the on hand but also review existing health policies that hamper access to healthcare for vulnerable groups in the country. Furthermore, in the understanding of the relationship between the drivers of HIV/Aids research will be conducted with tertiary students to gauge their views on it. This would ultimately help UNAM to contribute to the debate of social uplifting of communities’ at large.

Programme Leader: Mr G. van Rooy; gvanrooy@unam.na

3.1.3 Land Programme

The main objective of the this programme is to conduct research on land matters in Namibia, especially on land reforms (focusing on equity, resettlement policies, tenure security or tenure reform in communal areas and gender dimensions). During the year under review the programme was involved in conducting with regard to the development of north east communal areas of the country. Furthermore, the issue of Indigenous knowledge System was one of the key activities in which the programme was engaged in. The above two areas of development research are essential to the overall development of the country because over 60% of Namibian population live in the rural areas and more so in the northern part of country. These people directly or indirectly derive their livelihoods from land; as a result development of communal land is crucial. The same can be uttered about the proper understanding of IKS practice in the same area. Most of these people have been practicing IKS in treating themselves or their animals which of great importance to learn and preserve it for the future generation. IKS is not only confined to human and animal treatment but is also use in crop farming house construction. This is an opportunity for Namibia to improve on traditional house construction as more than 50% of Namibia housing types are traditional dwellings. Finally, the program was also offering lectures on “introduction to Environmental Science to 2nd year Fisheries students at Neudam.

Programme Leader: Mr M. Shapi; mshappy@unam.na

3.1.4 Education Programme

Educational change and reform in Namibia have rarely had so much prominence within public policy discussion that it has been over the past five years. Bearing in mind the complexity of education and its
much needed positive impact on economic growth, poverty alleviation and employment creation, it has never been divorced from development and political confrontations. Educational change is a ubiquitous debate in Namibia. Yet action to bring about quality educational change is seemingly an elusive target. This action-oriented research program aims to investigate the system of education in Namibia in terms of its quality preparation, coordination, learner-student preparation and the trajectories of teacher perceptions and the idea of a learning nation. In addition, this program will focus on the role of higher education in addressing underdevelopment and poverty, as well as the effect of the absence of Early Childhood Development (ECD) is having on the quality of the Education System in Namibia. The program works collaboratively with the Faculty of Science and Faculty of Education at UNAM.

Programme Leader: Mr Z. Kazapua; zkazapua@unam.na

3.1.5 Gender Training and Research Programme

The GTRP is an educational as well as research programme within the Multi-disciplinary Research Centre (MRC) at the University of Namibia. Since Independence there has been an increasing recognition of the importance of integrating gender issues in Namibia’s overall economic and social development policies. The Namibian Constitution is based on the principle of equal rights and obligations for women and men. Equality between women and men is a matter of human rights and a condition for social justice; and also a necessary and fundamental pre-requisite for equality, development and peace. As a response to these challenges, the GTRP has carried out numerous gender-related training programmes aimed at developing gender awareness at the local, regional and national levels since 1995. The main objectives of the program are:

- To develop and teach interdisciplinary and short courses on Gender and Development in UNAM curriculum and for relevant stakeholders.
- To enable UNAM students to gain in-depth understanding and experience in gender and HIV and AIDS research through internships and fieldwork activities.
- To provide postgraduate training for Namibian researchers and University staff and student, government officials, NGO staff members and individuals with demonstrated potential and commitment to gender analysis and HIV and AIDS research.
- To develop linkages with national and international institutions involved in gender and HIV and AIDS related training, research and policy formulation.
- To promote awareness of gender issues among the general public through improved dissemination of research findings.
To improve the teaching and research facilities of UNAM in order to support gender and HIV and AIDS research and training.
To improve the socio-economic and legal situation of women in Namibia.
To reinforce academic links and networking in Southern Africa and Globally.

Programme Leader: Mr M. Conteh; mconteh@unam.na

Achievements of SSD during 2010

In terms of achievement the division through its various programmes has achieved some milestones during the year under review. The Land programme managed to attract funds to the tune of N$990,000.00. With regard to publications the programme produced three (4) technical reports and two peer reviewed papers. Finally, the programme offered an Introduction to Environmental Science course to 2nd year Fisheries students at Neudam Campus. The Regional and Local Development Program published a papers on IKS practices on the Sanga breed, Olive farming and technology; community-based practices on water; Land-use technology, Technology and social capital and a chapter in a book on the ‘errors of using GPRS in tracking animals’. In terms of income generation the programme managed to generate N$ 785,000.00

Epidemiology programme managed to kick start the Qualitative Survey data collection under Equitable Health project Work Package 3 run by a consortium of partners in Africa and Europe. The programme also completed the Okambilimbi Survey report and Research papers include 3 articles with consortium partners and one chapter in a book on the audit system. Furthermore, the programme gave support to the Namibia Vulnerability Assessment Committee and Disaster & Risk Management. Finally, the programme conducted KAP study among UNAM students.

The Gender Training and Research Programme achieved the following during the year under review; conducted a quantitative assessment of HIV and AIDS Workplace Programmes with GTZ; Lectured students in the first semester on contemporary social issues, the programme Coordinator was selected by the Department of State in the United States of America to participate in the International Visitors Leadership Programme (IVLP) on the theme Women and the Law: The US Experience from April 19 – May 7, 2010; also attended a Training on Women Leadership Skills in Washington DC The Programme also received visitors from the Malawi Law Commission and presented the Namibian Experience on issues around GBV with regard to preparation of a National Plan on Gender based Violence in Malawi. The programme also produced three papers covering issues on human trafficking, NANSO and the Students Uprising of 1988 and Social capital. And with regard to community engagement the programme
has made important contacts with Members of Parliament and institutions working on gender issues, the Girl Child, Human Trafficking and violence in general. These included the Women’s Parliamentary Caucus of the National Council of Namibia. The programme Coordinator accompanied the Women’s Caucus to provide technical assistance to the members and to assist with technical expertise in an effort to develop a centre for abused girls in Windhoek’s Khomasdal. In addition 23 Gender Based Violence awareness and advocacy radio talks were aired on the National Radio 92.6 FM during the reporting period.

3.2 Science Technology and Innovation Division (ST&ID)

Dr Hina MuAshekele, head the Division supported by Dr D. Mumbengegwi, Dr A. Cheikhyoussef and Mr Zenas Iileka, Ms I. Du Preez and Mr Joseph Sosinyi were the postgraduate research fellows.

They were supported by collaborative researchers from the Faculty of Science: Dr Heike Wanke (Department of Geology), Dr Ronnie Bock (Department of Biology), Prof Enos Kiremire (Department of Chemistry and Biochemistry ), Dr Erol Naomab (Department of Chemistry and Biochemistry), Dr Gladys Kahaka (Department of Chemistry and Biochemistry), Dr Renate Hans (Department of Chemistry and Biochemistry), Ms Celestine Raidron (Department of Chemistry and Biochemistry), Ms. Sanette Potgieter (Department of Chemistry and Biochemistry)and Dr. Martha Nambabi & Dr Peter Bille from the Department of Food Science and Technology.

Five following programmes were implemented by the division:

- Pharmaceuticals, Programme Leader: by Dr D. Mumbengegwi
- Civil Engineering and Information Development, Programme Leader: Dr H. MuAshekele
- Indigenous Knowledge Systems Technology (IKST) (food and beverages), Programme Leader: Dr A. Cheikhyoussef
- Water Engineering Technology and Management, Programme Leader: Dr H. Wanke
- Renewable Energy Technologies and Management, Programme Leader: Mr Z. Iileka
- Industrial Production Technology and Management, Programme Leader: Dr H. MuAshekele.

3.2.1 Pharmaceuticals Programme

The general aims of this programme are to carry out scientific research on medicinal plants to identify those with potential for economic benefit to the economy and to further transform these plants into the product forms and services of standardized and scientifically authenticated quality.

The main achievements for the discovery and development of Anti-malarial medicines in 2010 are:
Synthesis and screening of synthetic, organic and natural plant products for antimalarial properties.

Identification, Phytochemical screening and characterization of antimalarial compound classes in natural plant products

12 Medicinal plants identified, harvested and screened for compound classes with known anti-malaria activity.

Malaria laboratory equipment acquired (through engagement of stakeholders), installed and personnel trained.

Preparation of Laboratory Biosafety Guidelines Manual.

- **Capacity building**
  - Recruitment of postgraduate research fellow and 3 student interns trained in biosafety.

- **Fund Raising**
  - Seven proposals prepared, 2 funded by RPO ($N 170 000),
  - Two concepts notes selected for development into full proposals (IAEA, 3yr for $US 500 000), (MCA-N with IKST Food program $N1.3 million)

- **Stakeholder engagement**
  - Participated in MoHSS NVDCP Malaria Program review.
  - Development of SARN operational research plan and nominated as Co-ordinators of SARN operational research proposal development and implementation in Namibia.

- **Pharmaceutical services-TWG on Pharmacy Curriculum and Competency framework.**

- **National Pharmaceutical Master plan.**

- **Collaborative research with MRC IKST Food programme, SSD and MoE on IKS National project.**

- **Research Outputs**
  - Two research seminars or workshops for malaria research conducted.
  - Four presentations made at National Science week (2 poster), MoE National research symposium (oral presentation) and Heritage and Culture in Modern Namibia Lecture Series (oral presentation)

- **Community engagement**

The MoHSS was assisted to write a Malaria Project for submission to Global Fund. The Malaria team also participated in various meeting including, the Eastern and Southern Africa Annual Review and Planning meeting; MoHSS Biomedical Research Ethics Committee; UNAM Institutional Review Board, Namibia Development Journal Reviewer and the Pharmaceutical programme. Stakeholder engagement-Participated in MoHSS NVDCP Malaria Program review; Development of 2011-2015 Strategic plan,
Development of SARN operational research plan and nominated as coordinators of SARN operational research proposal development and implementation in Namibia, Pharmaceutical services-TWG on Pharmacy Curriculum and Competency framework, National Pharmaceutical Master plan, IKST program, SSD/MoE IKS project.

Programme Leader: by Dr. D. Mumbengegwi; dmumbengegwi@unam.na

Figure 2 Pharmaceuticals Programme research team
3.2.2 Civil Engineering and Information Development Programme

The purpose of the programme is to develop technology, material and human resources which will be able to address the needs for adequate housing, building skills, proper roads and appropriate building regulations. Program research areas are:

- Appropriate Construction Technology
- Construction Management and Building Economics
- Public-private-partnerships with SME contractors

Programme Leader: Dr H. MuAshekele; hmuashekele@unam.na

3.2.3 Indigenous Knowledge Systems Technology (IKST) food Programme

This research programme is a collaboration research work between the Science, Technology and Innovation Division (STID) of the Multidisciplinary Research Center (MRC) and the Department of Chemistry & Biochemistry and the Department of Food Science and Technology. The overall idea of this programme based on the transformation of indigenous knowledge and skills which are unique to certain indigenous communities, cultures or societies into value added products. This program aims to setup the IKST laboratories (Biochemical and Microbiological Labs), to conduct research in various fields of IKST; in particular in the Ethnobotany, indigenous fruits and traditional foods and beverages field to determine the composition of nutritional profiles and functional elements, also to establish IKST database at MRC. Two research teams have been formed; the Biochemical research team: responsible for the nutritional analysis and bioactive components chemical profiling from indigenous plants and traditional food
products, and the Microbiological analysis research team: responsible for the microflora screening and identification of the functional components (enzymes, peptides, bio-surfactants, prebiotics, probiotics, etc...). Two peer reviewed articles were published this year, 2 papers presented at national research symposium, one research article under review and two articles are in draft form. Research in IKST can support the policy development in building national capacities for research; increase the need for indigenous plant protection; finding new compounds from medicinal plants for medicine development to fight diseases like Malaria, HIV and improving livelihoods through enhanced food security, development of improved traditional foods and methods of production and improved agricultural methods.

Programme Leader: Dr A. Cheikhyoussef; acheikhyoussef@unam.na

![Figure 4 Laboratory analysis for some of the traditional fruits, food and beverage products within the IKST Food programme](image)

3.2.4 Water Engineering Technology and Management Programme

The general aims of this program are to study and apply engineering principles that underlie energy phenomena, in order to supply affordable energy to the majority of deprived Namibian citizens. Programme research areas are: Hydrogeology and Water quality.
3.2.5 Renewable Energy Technologies and Management Programme

The aims of this programme are to identify, design and fabricate renewable energy-powered technologies (RET) and service solutions. Apart from the commercialization focus, it also carries out scientific investigations to understand and apply the engineering principles underlying energy phenomena as well as to optimally manage energy supply systems. Program research areas are:

- Scientific Research in energy technology and management.
- Design and Fabrication.
- Commercialization of (RET).
- Public-private-partnership.

3.2.6 Industrial Production Technology and Management Programme

The general aims of this programme are to identify and develop the appropriate processing and production technologies for value-addition as may be relevant production requirements of local industries. Program research areas are:

- Appropriate SME Production Technology and Import Substitution.
- Scientific research and product development in mechanical engineering.
- R&D, commercialization (Innovation, value-addition, quality control, production economics, technology management, IPR).
- Private-public-partnerships, entrepreneurship for manufacturers.

3.3 Life Sciences Division

Mrs Selma Lendelvo, head of Division joined in January by Dr P. Graz, senior researcher and Mr J. Nakanyala postgraduate research fellow. Mr A. Mosimane, a researcher, was on staff development leave for his PhD at Kwazulu Natal University, RSA. Two junior researchers, Ms. J. Mbandi and Ms. D. Simpson left the life sciences division mid-year to take up master's studies in the Netherlands and USA respectively. Due to the limited staff, the life sciences division focused only on research in terrestrial ecosystems. In this focus area the division supported by several collaborative research projects together
with the Faculty of Humanities and Social Sciences – specifically Dr Martin Hipondoka, Ms Rosemary Ihula, and Ms Ellen Kimaro Ms Magret Angula from the Department of Geography, Environmental Sciences and History – the faculty of science – specifically Dr John Mfune and Prof. I. Mapaure – and the Etosha Ecological Institute - Mr Martin Kasaona.

Most emphasis was, however, placed on capacity building within the LSD with a number of related workshops presented. International collaboration with the University of Ballarat, Australia, revolved around studies related to water-point development in arid lands.

Achievements of LSD during 2010:

Projects undertaken by the LSD during 2010 dealt with social-ecological systems and studies related to water-points in arid regions. In addition, a workshop on climate change was organized – this discipline had to be abandoned later on due to lack of staff.

Much of the activities were related to studies within the Etosha National Park: (i) vegetation condition around water points, (ii) impact of tourism and tourist roads on the Etosha landscape, and (iii) Human-Wildlife Conflict in the surroundings of the Park.

Three 3 papers were submitted for publication. One was to the Scientific Society of Namibia. One article on habitat restoration in Australia and one sent to a journal on environment and management focusing on a GIS based model of grazing impacts around water-points. The GIS study was also presented at the MoE Symposium.

The LSD strengthened its networking through the INSAKA consortium dealing with social-ecological issues in Southern Africa. Namibia is a key player in this field. In addition, collaboration with the Directorate of Forestry was strengthened through the development of joint research proposals. These are pending decisions for funding from the German BMBF.
4. Research Output

4.1 Refereed journal articles


### 4.2 Published conference proceedings and Conference papers delivered


### 4.3 Study Guides and Training Manuals


### 5. Concluding Remarks

I would like to comment the tireless efforts and commitment of all researchers at MRC for working towards improving research outputs during 2010. The establishment of the food pharmaceuticals research were among the limelight of the Centre and I would like to appreciate Dr Mumbengegwi and Dr Cheikhyoussef for their work. Dr Graz also joined the Life Sciences Division during 2010 and his presence contributed positively to skills development in the Division as well as MRC as a whole. The availability of funding was one of the contributing factors towards better performance at the MRC and I would like to thank all researchers for playing an important role in fund-raising. I also was to commend the junior researchers and the students for the support they rendered to the research teams in the execution of the research projects. Finally, thank you to all supervisors and collaboration staff for strengthening research capacity and outputs at the MRC.

### 2.4 SAM NUJOMA MARINE AND COASTAL RESOURCES RESEARCH CENTRE (SANUMARC)

**Introduction**
The Sam Nujoma Marine and Coastal Resources Research Centre’s vision is to become a centre of excellence in Science and Technology research in marine and coastal resources, in order contribute to global efforts in promoting food security and eradicate poverty. With this vision in mind and guided by its mission to promote sustainable development and responsible utilisation of marine and coastal resources based on environmentally sound management for the benefit of Namibia and the people of the SADC region, the Centre achieved significant scientific breakthroughs in 2010. SANUMARC can now boast of the needed infrastructure to attract the best marine scientists and postgraduate scholars in the world to Namibia. In addition, the Centre completed a study looking at the effect of its development projects on the community, which should help the Centre in understanding where the projects sometimes go wrong.

SANUMARC had another interesting year in 2010. For the most part, research activities were successful, with breakthroughs in finfish larviculture, encouraging results with semi-saline hydroponic vegetable production, and steady progress towards the introduction of button mushroom farming technology at the coast.

**SANUMARC Research staff complement for 2010.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr L.K. Oellermann</td>
<td>Commonwealth Advisor &amp; Director</td>
</tr>
<tr>
<td>Mr F. Mwazi</td>
<td>Researcher (Coastal agriculture)</td>
</tr>
<tr>
<td>Mr M. N. Kooitjie</td>
<td>Assistant Researcher (Mariculture)</td>
</tr>
<tr>
<td>Ms D. Shuuluka</td>
<td>Assistant Researcher (Seaweeds)</td>
</tr>
<tr>
<td>Mr F. Mubiana</td>
<td>Technologist (Mushrooms)</td>
</tr>
<tr>
<td>Ms N. Amutenya</td>
<td>Technologist (Mariculture)</td>
</tr>
</tbody>
</table>

**Research activities in 2010**

**Propagation and Rearing of the Silver Kop**

The Namibian marine finfish, *Argyrosomus inodorus* (silver kob) was successfully spawned at SANUMARC for the first time on Thursday 18th & Friday 19th February 2010 in the Keto Mshigeni Mariculture Building (KMMB). Spawning was induced using a Gonadotropin analogue called Luteinising Hormone Releasing Hormone (LH-RHa). Eggs were collected from the brood stock tanks and incubated in incubator cones for 48 hours. After hatching, the larvae were transferred to larval tanks containing “green water” (micro-algae). Once the larvae began exogenous feeding, rotifers (*Brachionus* sp, 60 – 150 µm) were added to the water. After 10 days post hatching the larvae was large enough to feed on *Artemia*
nauplii (> 250 µm). The daily growth of the larvae was monitored from hatching until metamorphosis, by taking a sample of 1 – 3 larvae per day (Figure 1).

**Figure 1.** Silver kob development: (a) One day old yolk sac larva; (b) 10 day old larva showing gas bladder inflation; (c) 20 day old larva showing spinal flexion to form caudal peduncle; (d) 30 day old larva, post metamorphosis and undergoing settlement.
Figure 2. Average size of the silver kob when weaned onto the 2 – 3 mm feed pellets manufactured by Marifeed (Pty) Ltd.

Table 1. A summary of the larval culture stage of the silver kob, including estimated survival, feeding and developmental stages from hatching to transfer to the juvenile on-growing system.

Sulphur and low oxygen tolerance of marine inshore species and Harmful Algal Blooms

The kick-off workshop for the two Benguela Current Commission Science Programme funded projects, which are collaborative efforts between the Ministry of Fisheries & Marine Resources of Namibia (MFMR), the Directorate of Marine & Coastal Management in South Africa (MCM), the Institute for Fisheries Research (INIP) in Angola and SANUMARC, was held at NatMIRC from 6th – 8th July 2010. The full titles of the two projects are BCC/EAF/08/09: “The impacts of hydrogen sulphide and low oxygen levels on inshore marine species”; and BCC/WQP/08/04: “The impacts of harmful algal blooms on the inshore environment”.

Representatives from all four institutions met to discuss vital issues relating to the projects, such as institutional capacity, budget, research methodology, financial management, etc. On the second day of the workshop, a practical session in the NatMIRC laboratory was held to familiarise the project participants with the equipment used for the proposed experiments, as well as to develop a standardised experimental protocol.
The first deliverable for the HAB and sulphur projects was a desktop study of the environmental and economic effects of these events along the Benguela coastline. The inception reports for both projects have been submitted to, and accepted by the Benguela Current Commission.

Isolation of local marine micro-algae
SANUMARC hosted the ACP S&T Bio-fuel Oil Project workshop in Namibia, from the 3rd to 5th June. One of the outcomes of this very successful workshop was the agreement, by various parties who attended the workshop, to set up a pilot scale micro-algae project along the coast. The concept involves the culture of the halophilic micro-algae *Dunaliella salina*, to produce β-carotene and provide glycerol as a fuel source, which one can use directly in a Combined Heat & Power (CHP) generator running on the patented McNeil Cycle. It turns out that *Dunaliella*, the species we have been collecting and trying to isolate from the local saltpans over last few years, is rich in glycerol (80% v/v). Until recently, glycerol could not be burned effectively in an engine, and needed to be reduced and purified into bio-diesel, resulting in a 70% loss of volume, and increase in production costs.

The ACP S&T Bio-fuel Oil Project partners met up in Accra, Ghana at the third workshop in the series, during 5th – 10th October. During this workshop, we had an opportunity to plan the Namibian micro-algae project further. SANUMARC and its partners hope to set up a halophyte micro-algae pilot project in Henties Bay.

Commercial kelp farming in Namibia
Since returning to office, Ms Diina Shuuluka has become involved in developing a research project with Kuiseb Fishing Enterprises (KFE), to investigate the feasibility of culturing the kelp *Laminaria pallida* in Walvis Bay. The objectives of the project will be to: determine the ecological conditions at a selected sea region for *Laminaria* culture, design appropriate rafts/longlines for *Laminaria* culture, compare growth and survival of young sporelings and sporophytes under different environmental conditions in the laboratory, determine the effect of environmental conditions on the growth and survival of *Laminaria pallida* during the grow-out phase and finally, develop a management protocol for the grow-out stage.

Evaluation of *Agaricus* mushroom strains at the Namibian Coast
The Centre successfully completed the first phase of the programme that aims to introduce button mushroom (*Agaricus*) culture to Namibia in 2009. This involved the inoculation of an agar plate containing growth medium with spores. The second phase was initiated in February 2010, which involved the inoculation and mycelia colonisation of a small volume of organic substrate in a propagation bottle. Once we were confident of routine success with this stage, experiments were carried out to test the adaptability and performance of *Agaricus* species (*Agaricus birtoquis*, *Agaricus bisporus*: 096 and
*Agaricus bisporus*: 097) on different cellulosic substrates such as whole wheat grain, whole sorghum grain and whole rice grain.

We examined the substrates in the replicated treatments daily for contamination, and measured the growth of mycelia on these substrates every four days. The results of the experiment revealed that there was no significance difference ($P \geq 0.05$) in the number of days taken for the completion of mycelia growth in all species when cultured on whole sorghum grain. Most of the bottles reached maximum growth (complete colonisation) on the 20\textsuperscript{th} day of colonization. Based on the results of the experiment, it was concluded that wheat grain is the best substrate for the *Agaricus* strains used. This was probably due to various factors, including the surface area of the grains and their nutrient content.

Based on the rate of colonisation, it was concluded that the AB096 strain was the best *Agaricus* mushroom for culture under the conditions experienced in Henties Bay. It should be noted that only 6 of the 81 bottles were contaminated in the experiment, which is very good. The combination of wheat substrate and AB097 strain showed the highest incidence of contamination, at 7.4%.

**Figure 3.** Examples of sample bottles containing mycelia of *Agaricus birtoquis* and *A. bisporus* strain 096 & 097 colonising (A) whole wheat grain, (B) whole sorghum grain and (C) whole rice grain.

**Figure 4.** Mycelia growth for three strains of *Agaricus* mushrooms over time in sorghum (A), wheat (B) and rice grain (C) substrates.
SANUMARC’s community mushroom projects were first initiated in 2004. Since then, no one has carried out a study to determine the impact of the socio-economic aspects of mushroom farming and its contribution to urban agriculture development. The efficacy of Namibia’s community projects have been questioned in various forums, and in an attempt to understand the real value of the mushroom projects, SANUMARC carried out a socio-economic study titled “Challenges and opportunities of oyster mushroom farming in peri urban areas: the case of Erongo Region, Namibia” in 2010.

The primary objective of the study is to develop a framework that we can use as a guiding tool for future institutional interventions to promote peri-urban small-scale mushroom projects. This study also formed part of the Centre’s Mushroom Technologist, Mr Fabian Mubiana’s Masters Degree in Development Studies from the University of the Orange Free State, in South Africa.

Bio-saline Agriculture
The Centre initiated the third phase of the bio-saline agriculture project, involving the evaluation of the effect of saline water on selected vegetables grown in hydroponic floating systems, in February 2010, and completed the project in July. In summary, this phase of the hydroponics experiment involved moving the hydroponics tables out of the Centre’s greenhouse and into the shade-netted vegetable garden. Cabbage and spinach were selected as the experimental crops, as they were best performing species and varieties in the greenhouse experiments.

In the spinach (*Beta vulgaris* var. *cicla*; variety: Swiss chard-Ford hook giant) experiment, the control group grew significantly higher (*P* ≤ 0.05) than the plants subjected to 10 ppt saline water, but there was no significant difference (*P* ≥ 0.05) for plants watered with 5 ppt saline water. The leaf width decreased significantly (*P* ≤ 0.05) with the increase in salinity while the number of leaves in all treatments increased significantly over time, from 14 to 35 days after transplanting. The yield potential of the spinach decreased significantly when we harvested the plant leaves several times; in terms of quantity (fresh weight) and quality (sugar content). Thus during the first harvest spinach had better quality in terms of sugar content and in terms of weight to subsequent harvests. We attributed this to the fact that we did not apply fertilizers after each subsequent harvest, with the first harvest benefiting from the application of fertilizers at the beginning of the experiment.

In the experiment where cabbage (*Brassica oleracea* var. *capitata*: Copenhagen variety) was grown in the hydroponic systems in SANUMARC’s vegetable garden, the results showed that the plant height of the control group increased significantly (*P* ≤ 0.05) from 14 days to 35 days after transplanting compared to plants that utilized 5 & 10 ppt saline water. The number of leaves decreased significantly (*P* ≤ 0.05) as salinity increased. In terms of quality, the cabbage plants subjected to a salinity level of 10 ppt scored a
significantly higher sugar content (Brix %) ($P \leq 0.05$) than the control group, but grew a smaller head on average, resulting in significantly lower fresh weights when compared to the control group ($P \leq 0.05$).

**Figure 5.** Spinach transplanted (A) and growing (B) in hydroponic tables in the SANUMARC vegetable garden.

**Figure 6.** Cabbage growing in hydroponic tables in the SANUMARC vegetable garden.

**PUBLICATIONS, TECHNICAL REPORTS, PAPERS & PRESENTATIONS**

A list of the publications, technical reports, papers and presentations prepared by the Centre’s staff members in 2010 follows:


3. ACTIVITIES OF OTHER UNITS

4.1 UNIVERSITY OF NAMIBIA LIBRARY

1. Introduction

The mandate of the University Library is to support learning, teaching and the research programmes of the University. The Library fulfills this important mandate by providing information facilities, services and resources to the University students, staff, and the general public. Because of this mandate the Library staffing does not include a separate section that concentrates on research but all staff members are encouraged to partake in research and publish research outcomes.
Our **mission** is ‘to link faculties, departments and students with information enabling the University to achieve excellence in teaching and learning, research and study and to preserve the institutional memory for prosperity’.

Our **vision** ‘is to excel in linking our users with information’.

These are the broad statements that guide the areas of our research focus which are to investigate the information needs and information seeking behaviours users, gain a better understanding of the new developments and trends in information and ICTs, and examine our internal processes to make them more efficient. All these will ultimately help us to devise appropriate strategies to be more responsive to the information needs of our students, staff and other group of users we serve.

**2.0 University Librarian report**

The Library is entrusted with an important responsibility of supporting the University curriculum with adequate, relevant and up-to-date information facilities, services and resources. To accomplish this responsibility, librarians have to continually engage in research projects that will generate findings with practical implications for improving library services and generally contribute to the body of knowledge in the library and information profession. What follows below are the short, medium and long term research goals for the University Library.

**2.1 Short term research goals**

- Investigate the best practices in delivering Information Literacy (IL) instruction to University students and staff.
- Develop standards and tools for collection evaluation and assessment
- Understand the usage statistics from the Library Millennium system to improve services

**2.2 Medium term research goals**

- Develop standard research instruments for user needs assessment surveys
- Gain a better understanding of the context under which our high school learners are being prepared as information users to effectively cope with tertiary education
- Investigate and understand modern information tools used by University students to locate information for academic purposes.

**2.3 Long term goals**
• Explore the applications of social networking software in linking our users with relevant information and also marketing library services
  • Application of strategic planning in the management and operations of our services
  • Investigate the establishment of a digital library project

3.0 Research focus areas

3.1 Users studies

User studies will investigate students and staff perception of library services, facilities and resources in relation to the information support we provide to students and staff. These types of studies will gather key facts about whether various library services are in line with the UNAM objectives. User studies are thus critical for the Library to measure its performances against its objectives. They further help to identify strengths and weaknesses in the library operations and direct future Library developments and growth. Thus, user studies are important in guiding the library to make informed decisions about the acquisitions of adequate and relevant resources for the users.

3.2 Collection evaluation

Collection evaluation studies will essentially examine gaps in the print and online collections. This is important to discover whether the Library collections are indeed meeting the University curriculum needs. Equally important, these kinds of studies will be aimed at determining whether the Library budgetary allocation is being utilized for the acquisitions of materials and resources to support the University curriculum. Collection evaluation studies will also be geared towards identifying strengths and weaknesses in the collections acquired for both undergraduate and postgraduate levels of studies, and the adequacy of the collections to serve different categories of users, e.g., users with physical disabilities, distance education students, etc. These studies can help the Library in developing a standard model for evaluating library collections in terms of relevance to the curriculum and research, currency, effectiveness, breadth and depth of each collection per discipline.

3.3 Strategic planning and management studies

These will explore the applications of strategic thinking in planning Library operations for the benefit of the users. They will help the Library in planning innovative library services responsive to the information needs of the library’s users. They will further bring to the fore the key strategic issues which are critical factors for the Library to fulfil its mission and vision more effectively and efficiently. Strategic planning studies will also help to inform the Library Management of the new developments and trends in the information field and thus enable the Library to chart its future direction in line with new trends in ICTs.
Research on Library performance measurements and Library benchmarking criteria for performance for part of this research focus area. They will examine weaknesses in the performance of departments and individuals and help to take remedial actions.

4.0 Research output

Peer-reviewed publications


5.0 Conclusion

The Library is committed to engage in research projects that have practical implications to improve library operations and services. Hence, research is an important priority in both short and long term plans of the Library. Some of the research goals feature prominently in the newly approved 2 years institutional cooperation between the UNAM Library and the Libraries of the Universities of Helsinki and Tampere in Finland, whose main objective is to enhance human resources capacity at the UNAM Library. Some of the research focus areas are well captured as expected outcomes in this institutional cooperation.