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1.0 INTRODUCTION

1.1 Background Information

Ardhi University (ARU) is a public University established by the Ardhi University Charter of 2007. ARU is the result of transformation of the former University College of Lands and Architectural Studies (UCLAS), which was a constituent college of the University of Dar Es Salaam. ARU has six Schools, one Institute and four Centers, through which it offers a range of both Undergraduate and Postgraduate Programs. It also has several academic directorates one of which is the Directorate of Postgraduate Studies Research and Publications (DPRP).

Until recently ARU has been operating its research activities based on the Research Agenda prepared in 2004 by UCLAS. The research agenda was in line with the vision, mission, objectives and functions of UCLAS.

When UCLAS was transformed into ARU in 2007, its vision, mission and objectives did not remain the same as those of UCLAS. In addition, the environment at ARU also changed, for example, the number of programs increased; from 6 programs in 2007 to 52 in 2013. Also the number and diversity of academic staff who can carry out and supervise research has increased and diversified. This Research Agenda is therefore prepared to replace the 2004 Research Agenda so as to accommodate the current vision, mission and functions of Ardhi University in the current environment. The Research Agenda has been prepared through consultations of various national and international documents and consultation with various stakeholders in Tanzania.

The Agenda aims at directing Schools/Institute/centres at ARU to carry out research that has a contribution to the national development and improve livelihoods of the communities in Tanzania. It will, therefore, guide the units in their move to contribute in addressing issues and objectives of various strategies and national plans including: The Tanzania Development Vision 2025 and the National Strategy for Economic Growth and Poverty Reduction II (NSGPR II). It is also designed such that it serves as a framework for prioritizing and coordinating research at University level to ensure that the outputs are relevant to the country’s development needs. In addition, the agenda also aims at enduring that knowledge generated from research is
instrumental in enriching and improving teaching, learning, and community services because through research staffs acquire practical experience and new information that is crucial towards imparting the necessary skills and knowledge to students and link to the industry.

1.2 Ardhi University Vision
The vision of ARU is to be a centre of excellence in seeking knowledge and disseminating the same to a wide spectrum of beneficiaries at national, regional and global levels.

1.3 Ardhi University Mission
The mission of ARU is to provide integrated teaching, research and public services that are geared towards sustainable socio-economic development of Tanzania and the world at large.

2.0 SITUATION ANALYSIS

2.1 Management and Coordination of Research at ARU
The office of the Deputy Vice Chancellor for Academic Affairs (DVC AA) is responsible for the overall administration of research activities at University level. Through the Senate Higher Degrees Research and Publication Committee (SHDRPC), the DVC AA oversees research activities and the enforcement of the same at the University. Schools and the Institute are the key organs that closely work with SHDRPC to manage and ensure the quality of the research activities at the University.

2.2 Achievements of research activities at ARU (2007 - 2014)
In recent years, research activities, including facilities for research management have improved significantly. This includes well equipped Environmental Engineering laboratories, GIS and other specialised ICT facilities, laboratory and equipment for Geomatics and a resource centre for the Disaster Management Training Centre. Also funding (both local and external) to support research and outreach activities undertaken by the various research units (the Institute (IHSS) and Schools) have not only been diversified but have also increased (7 research projects in 2007 to 18 research projects in 2013). There has also been a number of research funded programmes which in one way have endeavoured to enhance research capacity. Some of these Programmes have been funded by World Bank, SIDA, European Union, Royal Government of Norway and others, and by the Government of Tanzania. As a result of these research activities the number of publications in peer reviewed journals has increased from 30 in 2007 to 140 in 2012. The
University Intellectual Property Right was put in place in 2012. It aims at protecting creative innovations by ARU staff members and its collaborators. In 2012 ARU was granted a Certificate of Patent from BRELA for innovations of a “Method of purification of drinking water using coagulant protein purified from parkisonia aculeate seed”. This is the first patent that ARU has secured and it constitutes an important mile stone. During the same period, researches by ARU had some impacts in influencing policy development and policy changes (e.g. development of the Urban Management and Development Policy and contributions to the REDD National Strategy).

2.3 Journals Published at ARU

ARU owns the Journal of Building and Land Development which is produced biannually with papers from within and outside the country. In addition, the Land Administration Unit (LAU) of ARU in collaboration with similar units from East African countries has established the Journal of Land Administration in Eastern Africa. Together with other journals published elsewhere in the world, these journals provide yet another outlet for ARU staff members to publish their research works.

3.0 THE NEED FOR A RESEARCH AGENDA

Although over the years ARU has been and continues to undertake research and development activities, in many cases the research results are not effectively utilized by the end users for the purpose of achieving the overall national goal of sustainable development and poverty reduction. In addition, research is carried out based on individual mandates, availability of research grants, or even conditions set up by the development partners and collaborating research institutions without looking at the priority areas of research in the University and Country. Among critics of research in Tanzania is the fact that most of them have not been geared at addressing the national developmental goals and many times research results respond poorly to users’ needs. Introduction of new programs at ARU in the period between 2007 and 2010, accompanied by staff recruitment in these new areas, also call for refocusing of the research agenda. ARU is, therefore, determined to develop a comprehensive University research agenda which all research units will subscribe to and to which resources will be focused. The University also needs to ensure that research projects conducted are geared towards solving problems in national priority
areas. Based on this research agenda, schools, institute and centres will each develop its own research agenda.

4.0 OBJECTIVES OF THE RESEARCH AGENDA

This research agenda is developed to serve as a guide for the university in the prioritization of research activities and the conduction of relevant research projects for the benefit of the country and its society so that the available resources are used to achieve tangible outcomes and made impacts to the society. It also provides opportunity for research units to draw programs for human- and physical resources development as well as to use it as a negotiation tool for financial resources mobilization from development partners and research funding agencies.

The overall objective of this Research Agenda is to guide the realization of the University’s strategic objectives within the framework of the Corporate Plan, and to ensure that research projects carried out are of high quality and relevant to the country’s needs and development in general.

Therefore, the specific objectives of this Research Agenda are;

i) To set an inclusive and comprehensive Agenda that all academic units will subscribe to and to which the resources will be focused and that will serve as a guide in the prioritization of their research activities

ii) To align the research efforts with National goals

iii) To guide the allocation of research resources from the Government and other sources

iv) To promote the culture of conducting demand driven research.

5.0 THE CONTEXTUAL FRAMEWORK

There are many developments on research at Ardhi University and in Tanzania, in general, which are presenting imperative, opportunities and challenges for an effective institutional research agenda. These developments are related to the evolving institutional, national legal, policies and strategies, and international instruments. They also relate to roles, interests and capacities of key players for implementation of this agenda. Some of these instruments are presented here so that they can be used to identify and develop research themes and research areas.
5.1 University Plans and Policies

5.1.1 ARU Corporate Plan 2008/9-2018/19

Ardhi University 2008/9-2018/19 Corporate Plan is guided by the need to overcome internal constraints and weaknesses as well as exploit external opportunities and address the challenges the University is currently facing. In particular the Plan identifies areas that need to be improved for the purpose of ensuring the efficient operation of the University, as well as directions and goals in response to existing and anticipated challenges and opportunities. Some of the critical elements identified in the Corporate Plan are teaching, research, innovation and publication, and consultancy.

According to the Corporate Plan, the main activities that directly concern research activities at ARU include strengthening of research administration, developing and implementing research agenda, mobilizing funds for research activities, improving the capacity of Ardhi Publishing Centre (APC), establishing specialized centres for specialized research areas, improving dissemination of research findings, creating a database for research activities, developing and implementing ARU Intellectual Property Rights and Policy

5.1.2 Three Year Medium Rolling Term Strategic Plan 2014/15 – 2017/2018

Currently the University is operating under the Three Year Medium Term Rolling Strategic Plan 2014/15 – 2017/2018 (MTSP) based on the University Corporate Plan. MTRSP is addressing, among others, development of strategies for supporting and building capacity of young academic staff to do research; development of a research agenda; and, development of strategies and capacity to search for various sources for funding research.

5.1.3 The ARU Research Policy (2012)

The ARU Rolling Strategic Plan has been developed with a view to enhance the University’s capacity to carry out its core mission of training, research and consultancy. Under the research component, the strategic plan emphasis on the following key areas. ARU research policy has captured most of these provisions of the rolling strategic plan. This research agenda is, therefore, a way forward towards implementing the following provisions:
i. Developing strategies for supporting and building capacity of young academic staff to do research and consultancy

ii. Developing mechanisms to ensure the balance between teaching, research and consultancy

iii. Developing strategies to ensure quality control of consultancy services and for converting consultancy services into publications.

iv. Develop new strategies and capacity to look for external funding sources for research

5.2 **National Policies, Plans and Strategies**

There are many developments on research in Tanzania which present opportunities for developing an effective institutional research agenda. These developments are related to the evolving policies. They also relate to roles, interests and capacities of key players for implementation of this agenda

5.2.1 **The Tanzania Development Vision 2025**

The Ardhi University Research Agenda is expected to enable the University to play a positive role in the realization of the national development vision. The Tanzania development Vision 2025, envisages a nation imbued with the following attributes: high quality livelihood, peace, stability, unity, good governance, a well educated and learning society, and a strong and competitive economy capable of producing sustainable growth and shared benefits. To achieve this, Science, Technology and Innovation (STI) form the basis for sustainable economic growth and prosperity in a society through increased productivity. This research agenda is thus an important element to the University in support of the Tanzanian STI system.

5.2.2 **Five Year Development Plan (2011/12 – 2015/16)**

The Five-Year Development Plan has taken into account overall national development goals and policy objectives; sectoral initiatives, the National Strategy for Growth and Reduction of Poverty, MKUKUTA II, MKUZA II (Zanzibar), the key benchmarks of Long Term Perspective Plan (2011/12 - 2025/26), as well as findings of the Review of Vision 2025. The Plan is underpinned by specific strategies to fast-track realization of the Vision 2025 goals and objectives. These include sustainable and effective utilization of existing human and natural capital, and creation of an enabling environment for the private sector to invest and participate in
a wide range of business opportunities in the next five years. It is the government’s expectation that this Plan will help scale up the country's efforts of promoting socioeconomic development.

5.2.3 The Tanzania Long Term Perspective Plan (LTPP), 2011/12-2025/26

Tanzania’s Long Term Perspective Plan (LTPP) is a vehicle for implementing the Tanzania Development Vision 2025, which emphasizes Tanzania’s cherished goal of becoming a prosperous Nation, through eradicating poverty, ignorance and disease in the drive to becoming a Middle-Income Country. LTPP sets the strategic direction and delineates the long-term objectives, targets, and pillars for a more focused guidance, coordination and harmonization of the country’s growth process. The Plan has emphasized on the following sectors where ARU can actively participate: Agriculture including livestock, fishing and forestry; Infrastructure including Transport (road, railway, marine, air, pipeline and meteorology) and energy. Other sectors are Land issues; Housing, and Human Settlements; Services which include trade and commerce, financial services, Information and Communication Technology (ICT) and Science, Technology and Innovation and, Research and Development.

5.2.4 The National Research and Development Policy (2010)

The Research and Development Policy of 2010 seeks to address the challenges of Research and Development by increasing the contribution of research to the development of the country. The policy has identified the following focal areas, among others, for articulation:

i. Prioritization of research areas
ii. Enhancement of research capacity in ICT and socio economic discipline with the view of increasing the use of ICT in research
iii. Commercialization and dissemination of research results which aims at establishing effective mechanism that will ensure the identification and translation of innovative research results into products, processes and services
iv. Research ethics and intellectual property rights to foster ethics management and foster equitable sharing of research resources and benefits
v. Collaboration, partnership and networking
vi. Regional and international cooperation.
5.2.5 The National Strategy for Growth and Reduction of Poverty (NSGRP II)

The National Strategies for Growth and Reduction of Poverty (NSGRP) or MKUKUTA (and MKUZA for Zanzibar) as are commonly known in kiswahili; are medium term plans geared towards implementing poverty eradication related strategies of the Vision 2025. They seek to address poverty issues in three Clusters, namely (1) Growth and income poverty eradication (2) Improvement of quality of life and social well-being, and (3) Governance and accountability in which goal 6, among others, calls for partnership between the public and its institutions with the government.

Regarding the strategies, the following aspects therein are relevant to achieving the ARU objectives.

i. Good governance,
ii. Human settlements development,
iii. Infrastructure provision,
iv. Environmental protection and preservation,
v. Institutional empowerment and capacity building,
vi. Containing extreme vulnerability among the poor.

5.2.6 The National Land Policy (1995)

Being the first comprehensive land policy since independence, it was prepared by the Tanzanian government to guide land tenure, land management and administration, access to land, land use and disposal as well as resolving land conflicts. The general objective of the policy is to promote and ensure a secure land tenure system; to encourage the optimal use of resources and facilitating broad based social and economic development. The policy has the following aspects relevant to competences of ARU.

i. Land acquisition
ii. Land administration
iii. Land tenure system
iv. Land registration
v. Improve access to land by all sections of the society
vi. Land use conflict resolution
5.2.7 National Gender Policy (1999)

The key objective of the policy is to provide guidelines that will ensure that gender sensitive plans and strategies in all sectors and institutions are developed. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role-played by each member of the society. In view of this, this research agenda has taken on board gender issues for ensuring that research results benefit both genders equitably.

5.2.8 National Water Policy (2002)

The main aim of the National Water Policy, 2002, is to develop a comprehensive framework of sustainable development and management of the Nation’s water resources, in which an effective legal and institutional framework for its implementation will be put in place. The policy recognizes the heavy dependence of the poor on the environment (soil, water and forests), in particular household’s reliance on environmental resources for income generation. Water is considered to be a key factor in the socio-economic development and the fight against poverty. Some of the issues from the policy which need to be addressed and where ARU can participate through this research agenda, include lack of access to good quality water for both urban and rural inhabitants and deterioration of aquatic systems and its impact on biodiversity.

5.2.9 National Environmental Policy (1997)

The National Environment Policy (1997) is the main policy document addressing environmental management issues in Tanzania. The Policy aims at ensuring environmental sustainability, security and equitable use of resources for sustaining the livelihoods of the present and future generations; raising public awareness and understanding of essential linkages between environment and development; promoting individual and community participation in environmental actions; promoting international cooperation on the environmental agenda. The Policy identifies six major environmental problems that need urgent attention. These are: land degradation, lack of access to good quality water for urban and rural inhabitants, environmental pollution, loss of wildlife habitats and biodiversity, deterioration of aquatic systems and deforestation. The policy also addresses intervention measures to be taken against environmental hazards and disasters. In view of this, formulation of research agenda by institutions including
ARU for identification of critical thematic areas which need to be investigated is necessary for better-targeted management interventions.


The National Energy Policy aims at ensuring availability of reliable and affordable energy supplies and their use in a rational and sustainable manner in order to support national developments. Pertinent to the environment sector, the Policy addresses issues pertinent to efficient energy production, procurement, transportation, distribution and end-use systems in an environmentally sound and sustainable manner. Though not categorically mentioned in the policy but from ARU’s experience, issues of land acquisition, formulation of resettlement action plans, property valuation and compensations, and, energy transportation, in the energy sector development process are pertinent to activities of ARU that this research agenda needs to incarcerate.

5.2.11 The National Agricultural Policy (2012)

The goal of the national agricultural and livestock policy is the improvement of the well-being of the people whose principal occupation and way of life is based on agriculture. The policy recognizes the dominance of small holders and livestock keepers and thus focuses on improving the scale of the dominant activities and income levels through promotion of commercialized agriculture. The policy underscores the need for research with a focus on, among other things, security of land tenure in the agricultural sector; urban and peri-urban agriculture, and, global warming. These issues lie within the capabilities where ARU can adequately participate.

5.2.12 National Forest Policy (1998)

The overall goal of the national forest policy is to enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations. Among the main policy issues where ARU has the capacity to participate include ensuring ecosystem stability through conservation of biodiversity and management, carbon stock determinations through emerging technologies (e.g. through the use of remote sensing).

5.2.13 The Tanzania Wildlife Policy (1998)

The Wildlife Policy under sores the need for proper management of wildlife which is among the natural resources with great biological, economical and environmental cleaning, climate
ameliorating, water and soil conservation, and nutrional values that must be conserved. The policy insists on involving a broader section of the society in wildlife conservation particularly the rural communities and the private sector. The policy restricts the role of the public sector to stimulation and guiding the local communities and the private sector by administering, regulating and promoting the management of the wildlife resource. The policy clearly underscores the need for research in the various aspects of wildlife.

5.2.14 National Livestock Policy of Tanzania (2006)

The aim of the National Livestock Policy is to support the livelihoods of livestock farmers thus addressing the goals set in the National Strategy for Growth and Reduction of Poverty (NSGRP). The livestock industry stakeholders’ meeting held in 2001 identified constraints that need to be addressed in order to achieve the objectives of the policy. Those that give opportunity to ARU to research on include; the existing land tenure system that does not provide for proper arrangement to allocate land and give ownership of grazing areas according to traditional or legal procedures; frequent changes of livestock grazing areas into crop cultivation, game reserves and the migration of livestock farmers that limit them to develop their areas; peri-urban livestock farming, and environmental conservation.

5.2.15 The Mineral Policy of Tanzania (2009)

The Mineral Policy of Tanzania aims at, among others, strengthening integration of the mineral sector with other sectors of the economy; improving economic environment for investment and strengthening environmental management. Policy issues raised that are relevant to the capabilities of ARU include establishment of adequate land and property compensation and relocation schemes. Others are promotion of relationship between mining companies and communities surrounding the mines, in particular, participation of communities in during the Environmental and Social Impact Assessment (ESIA) studies.

5.2.16 The Construction Industry Policy (2003)

The construction industry embraces the process by which the physical infrastructure are planned, designed, procured, constructed, altered, repaired, maintained or demolished. It is a deliberate and managed process to improve, the capacity and effectiveness of the construction industry to meet the national economic demand for buildings and other physical infrastructure facilities. The policy directions, among others, support Human settlement development in both urban and rural
areas. Though the policy acknowledges that the majority of the issues pertinent to the human settlement shall be resolved through the national Human Settlement Development Policy, it sees the supportive role of the construction policy is important.

5.2.17 The National Human Settlement Development Policy (2000)

Human settlement development and shelter delivery are inseparable and require coherent and comprehensive efforts that link them in a common framework. The policy arose from the government’s decision to address human settlements conditions in the country in recognition and commitments to the United Nations’ Habitat Agenda II. Among the issues that ARU can participate include: availability of and access to land, infrastructure and social services development, village planning, provision of shelter and housing and, urban development issues.

5.2.18 Tanzania Natural Gas Policy (2013)

The Natural Gas Policy provides a framework for guiding the development of the natural gas industry to ensure optimal benefits to the national economy. The formulation of this Policy was aligned with the Tanzania Development Vision 2025, the National Energy Policy of 2003, other sectoral and cross-sectoral policies, the Tanzania Five Year Development Plan (2011/12-15/16) and the National Strategy for Growth and Reduction of Poverty 2010-15. Maximization of the gas benefits are attained through the optimization of upstream (exploration, production and the environment), midstream (transportation and distribution etc), and downstream (marketing etc) activities. These activities are inherently ‘natural monopolies’ and therefore subjected to regulations. Research to formulate regulations will be needed for the midstream and downstream natural gas industry.

5.2.19 The National Five Years Development Plan II (2016/17 – 2020/21)

The National Five Years Development Plan II (FYDP II) is built on three pillars of transformation, namely industrialization, human development, and implementation effectiveness which keeps an eye to build a base for transforming Tanzania into a semi-industrialized nation by 2025. It outlines new interventions to enable Tanzania industrialize in a way that will transform its economy and its society. It is expected that this plan will help to transform Tanzania and become a semi-industrialized country by 2025 thereby improving the livelihood conditions of the citizens of Tanzania.
5.2.20 Integrated Industrial Development Strategy (IIDS – 2025)

IIDS – 2025 is a response to the need for a dynamic strategy to guide the process of resource-based industrialization. IIDS reflects the difficulties faced by Sub-Saharan African countries in attracting and retaining labor intensive industries as a growth strategy given higher labor costs and low skills levels. Tanzania is implementing initiatives to facilitate the delivery of cost-effective and reliable infrastructural services in transportation, power and energy sectors with a view to building a conducive investment climate. Major instruments for realization of industrial development include the accumulation and concentration of industrial firms through cluster development, supported by Special Economic Zones (SEZ) and establishment of Corridor development areas.

5.2.21 Other Relevant Laws and National Strategies

Preparation of this research agenda also took into consideration the role of other national strategies, which have a bearing on capabilities and activities at ARU. Among those, that a have direct link into the activities at ARU are:


The strategy provides for measures and directions that have to be taken to combat land degradation and protection of water sources in the country. Key challenges that have been highlighted include: i) prevention of environmental degradation due to illegal human activities, ii) limited public awareness on environmental management issues, iii) land use conflicts (agriculture, mining, establishment of protected areas), and iv) pollution emanating from indiscriminate use of plastics. Different stakeholder Ministries and Institutions are involved in the implementation of short, medium and long-term measures to address these issues.

5.2.20.2 Strategic Plan for Implementation of Land Laws (2005)

In 2005 the Government of prepared a Strategic Plan for Implementation of Land Laws (SPILL) in order to provide a broad framework for implementation of Land Act No. 4 of 1999, Village Land Act No 5 of 1999 and the Courts (Land Disputes Settlement) Act No 2 of 2002 commonly
known to as the new land laws of Mainland Tanzania. These laws replaced the Land Ordinance of 1923 and grounded in the fundamental principles of the National Land Policy of 1995. During the implementation of SPILL stakeholders raised concerns regarding the laws. The concerns called for changes in the legal framework including new laws like the Land Valuation Bill, Land Acquisition and Compensation Bill and the Real Estate Bill; and changes in the policy context which include the Big Results Now initiative, Tanzania Land for Transparency Partnership, Kilimo Kwanza, and Decentralization by Devolution.

5.2.20.3 Mortgage Financing (Special Provisions) Act 2008

This Act was written to amend certain laws with the view to providing further provisions for mortgage financing. Such laws include the Land Act CAP 113, the Land Registration Act CAP 334, and, the Civil Procedure Act CAP 33. The impacts of these amendments are in real estate dynamics, real estate finance markets. All these are the areas where has the expertise and can contribute through research.

Essentially, these strategies in one way or another emphasize on addressing the required interventions by providing key research outputs that can contribute towards achieving the National development agendas.

5.3 Regional and International Conventions and Strategies

5.3.1 The East African Cooperation Treaty

Chapter Sixteen of the East African Cooperation (EAC) Treaty addresses regional co-operation in the development of human resources, science and technology. The treaty amongst other things recognizes the fundamental importance of science and technology in economic development. Article 103, sub-article 1 (a) of the treaty requires partner states to undertake and promote co-operation in the development of science and technology within the Community through joint establishment and support of scientific and technological research in institutions in the various disciplines of science and technology.

5.3.2 The United Nations Habitat Agenda II

Habitat II, the Second United Nations Conference on Human Settlements was held in Istanbul, Turkey from June 3–14, 1996, twenty years after Habitat I held in Vancouver in 1976. The
objectives for Habitat II were stated as to arrest the deterioration of global human settlements conditions and ultimately create the conditions for achieving improvements in the living environment of all people on a sustainable basis, with special attention to the needs and contributions of women and vulnerable social groups whose quality of life and participation in development have been hampered by exclusion and inequality, affecting the poor in general; to adopt a general statement of principles and commitments and formulate a related global plan of action capable of guiding national and international efforts. Issues raised in this agenda are in line with the nation’s human settlement policy, gender policy, the national strategy for reduction of poverty, e.t.c; as such ARU’s participating in national development through this agenda is important.

5.3.3 The Sustainable Development Goals

The Sustainable Development Goals form a blueprint agreed to by all the world’s countries and the world’s leading development institutions. The goals are: eradicating extreme poverty and hunger; achieving universal primary education; promoting gender equality and promote women; reducing child mortality; improving maternal health; combating diseases, ensure environmental sustainability and global partnership for development.

6.0 PRIORITY RESEARCH AREAS AND RESEARCH THEMES

The priority research areas described in this section have been identified using the following considerations;

I. **Relevancy**: Contribution to the national and sectoral objectives based on the national policies and strategies as cited in sections 5.2, 5.3 and 5.4. In addition, genders issues are considered in all thematic areas.

II. **Feasibility**: Capacity of the University to support the research based on the available human resource and research facilities.

III. **Impact of the Research Outcome**: Chance/opportunity to implement the research; use of the research results; and link of the research to policy decisions, and

IV. **Opportunity to Strengthen Collaboration with Partners and Multidisciplinarity**: Presence of capable partners; availability of partner infrastructure and resources;
possibility that potential partners will collaborate to undertake the research; possibility of greater research outcome with partner involvement

V. Emerging Issues: Urgency to act on issues that need immediate attendance/solutions.

From the foregoing discussion, the following research themes and areas are derived to constitute the framework for the ARU research agenda.

6.1 Environment and Natural Resources

Human activities on harnessing of natural resources have been environmentally destructive, leading to concerns about sustainable development. There have been, however, some efforts towards redressing the effect of human actions on the environment. These efforts have yet to bear lasting impact. Research has to be undertaken such that this negative impact on the environment is minimized.

Research Areas
i. Land, aquatic and air resources management
ii. Environmental management and protection
iii. Ecosystem management
iv. Taxation in natural resources

6.2 Building Technologies and Construction

The construction industry is a fundamental economic sector which permeates most of the other sectors as it transforms various resources into constructed physical economic and social infrastructure necessary for socio-economic development. It embraces the process by which the physical infrastructure are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished. Thus, the realization of Vision 2025 partly depends on the development and existence of a reliable and competitive local construction industry that is capable of delivering quality services and value for money in the development and maintenance of the physical infrastructure.

Research Areas
i. Development of Construction materials and Technology
ii. Infrastructure planning, development and maintenance
iii. Quality and productivity in the construction industry
iv. Development and management of the informal construction sector
v. Protection and conservation of historic buildings and sites
vi. Sustainable construction and green architecture
vii. Capacity building in construction
viii. Project management
ix. Construction economics and Management

6.3 Energy and Mineral Resources Development
Domestic energy demand has grown rapidly due to population growth and the increase in economic activities in the country. The estimated total energy consumption is more than 22 million tons of oil equivalents. Other abundant, but so far not fully tapped, indigenous energy sources which could be harnessed include: solar, wind, natural gas and geothermal energy. There is a need, therefore, to enhance the development and utilization of indigenous and renewable energy and technologies. On the other hand mining industry has significantly developed over the past fifteen years. Development in this sector is expected to grow with other types of industry in the country. It is important, therefore, that these developments are accompanied with environmentally sustainable plans

Research Areas
i. Renewable energy technologies
ii. Sustainable energy production
iii. Energy conservation
iv. Sustainable oil and gas exploration and transportation

6.4 Housing and Human Settlements Development
Although Tanzania is well endowed with sizeable land resource (952,067 Km²), land resource is yet to be optimally used to support efforts to address poverty. This is inter alia because of ineffective land use planning in urban and rural areas. Also, rapid urbanization amidst increasing poverty and ineffective development control has resulted into unregulated development and growth of informal settlements. This has culminated into sprawling cities beyond the servicing capacity, dysfunctional city structures and increasing governance challenges. In addition, increasing marginalization of the poor by limited provision and access to urban services and employment opportunities jeopardize inclusiveness and good urban governance in cities. Housing systems are important factors in safeguarding social cohesion. This theme also aims at
identifying and providing tools to tackle problems related to the existing housing stock and its management, urban related policies and at the existing and emerging housing problems.

i. Sustainable urbanization, inclusive cities and urban transport;
ii. Urban governance and financing;
iii. Informal urbanization and poverty reduction; and
iv. Land use planning and provision of public services.

v. Urban and Rural planning and design
vi. Affordable housing technologies and standards
vii. Housing finance and housing support services
viii. Infrastructure planning, development and maintenance

6.5 **Land administration and Property Rights**

Land administration is a critical component of efficient land management; because it is on the basis of land administration that the government formulates coherent land use development plans, effective property tax and land rent systems as well as develops efficient land markets. Research requires addressing issues of human resources capacity and equipment; information and dissemination requirements; and policies in land administration processes.

**Research Areas**

i. Land tenure security and land rights
ii. Land surveying and registration
iii. Investments and land grabbing
iv. Land use and land use conflicts
v. Land ownership and investment
vi. Land reform and formalization
vii. Land markets

6.6 **Water Resources and Waste Management**

Good water quality is important for all life forms. Tanzania aims to provide her urban and rural population with clean and safe drinking water, by protecting water sources and preventing environmental pollution. Tanzania aims at improving access to clean and safe drinking water, by protecting water sources and preventing environmental pollution. Research is, therefore, needed
to generate baseline information on water sources, usage and disposal of waste water and improvement of water resources management in the country.

**Research Areas**

i. Low cost and ecological sanitation  
ii. Water supply and sanitation  
iii. Indigenous technology in water management  
iv. Waste management treatment, recycling, re-use and disposal  
v. Solid waste management  
vi. Hazardous waste management  
vii. Water resources engineering and management  
viii. Protection and conservation of natural resources  
ix. Air pollution management

### 6.7 Real Estate, Finance and Investment

In the wake of rapid urbanization, formalization and financial markets globalization real estate development, finance and investment are increasingly becoming key sectors of the economy. The link between real estate investment market and the country’s financial system is becoming stronger as new real estate developers, financiers and investors emerge. Research on these emerging fields of real estate in Tanzania is necessary to supplement ensure that pursuit of these activities is based on informed decisions.

**Research Areas**

i. Real estate markets development  
ii. Real estate dynamics  
iii. Real estate investment vehicles  
iv. Development of mortgage and other real estate finance markets  
v. Facilities management  
vi. Mortgage and other real estate finance

### 6.8 Positioning, Mapping and Geodynamics

Tanzania’s land delivery system in general operates on land surveying using the fixed boundaries approach for each land parcel that is to be registered and entered into the national cadastre. In order to achieve this, a rigorous system of geo-referencing is necessary. Such a system has many other applications which include: support for topographic mapping against which land use and settlement planning is done; facilitation for fixation of corner boundaries on each registerable
land parcel; provision of a framework for the planning, design and construction of engineering infrastructure and, prepares baseline information for mining, gas and oil exploration.

**Research Areas**

i. Geodetic datum redefinition  
ii. Geodynamics and geo-hazards  
iii. Horizontal, vertical and gravity networks  
iv. Spatial data infrastructure development  
v. Remote sensing/GIS for natural resources assessment  
vi. Ocean dynamics and early warning systems

6.9 **Cross Cutting Issues**

6.9.1 **Gender and Empowerment**

The government has put in place polices, laws and action plans for equitable distribution of social and economic opportunities including those related to resources and development. Consideration of gender perspectives is necessary in order to foster equality and harmony in the society. There is thus a need to take affirmative action in promoting research that addresses challenges related to gender issues.

**Research Areas**

i. Gender, land and property rights;  
ii. Gender empowerment and natural resource management  
iii. Gender and construction  
iv. Gender and environment

6.9.2 **Information and Communication Technology, Documentation and Dissemination**

The application of Information and Communication Technology (ICT) in research is increasingly becoming important. Currently Tanzania aims at building on the public-private partnership (PPP) model to transform the country into a key player in the global ICT scene through higher education institutions with focus on quality education, research, entrepreneurship and innovation. The ultimate goal is to make the education sector the engine and leader for providing human resources, research and dissemination of the results thereon, and documentation.
Research Areas

i. Information literacy
ii. ICT and library development
iii. ICT security systems
iv. Indigenous knowledge
v. Knowledge management
vi. Information resource sharing and networking
vii. Information user needs

6.9.3 HIV/AIDS and Contemporary Diseases

HIV/AIDS and other contemporary diseases are national and global disasters and are creating a crisis in all walks of life affecting particularly young men, women and children. HIV/AIDS is causing shortages for skilled and unskilled. In addition, HIV/AIDS depletes financial resources in the form of diagnosis and treatments costs of associated diseases. Other diseases like malaria, dengue, and cholera etc. cause similar problems. Concerted efforts need to be directed towards creating awareness among the stakeholders on the importance of controlling the rate of new infections in accordance with the national policies and strategies.

Research Areas

i. Determinants of HIV/AIDS and the contemporary diseases
ii. Behavior change and communication (BCC)
iii. Impacts of the diseases
iv. Management and control and diseases

6.9.4 Climate Change and Disaster Management

Tanzania like in many other countries in the world is being experiencing climate change impacts in both urban and rural areas. Consequently there is an increase of meteorological disasters in the country including droughts, floods and coastal erosion. At the same time limited efforts are being done in terms of minimizing impacts of climate change especially in urban areas. There is therefore a need to improve the capacity in terms of human and facilities in order to mitigate and adapt to climate change impacts and also mainstream climate change adaption in human settlements. ARU needs to carry research on climate change impacts, vulnerability and risk assessments.
Research Areas

i. Climate change impacts;
ii. Geodynamics and geo-hazards
iii. Meteorological hazards
iv. Vulnerability and risk assessments, and
v. Climate change adaptation plans and mitigation
vi. Disaster risk reduction

6.9.5 Industrial Development

Industries promote sustainable productive base which enhances the growth rates and sustainability of economic growth. Due to a very strong link between industries and other sectors like agriculture, there is no doubt that industrial development will catalyze the growth of other production sectors thereby enhancing production. The multiplier effects brought by industrial production can be viewed as a crucial tool of fighting poverty. For Tanzania to become a middle income country by 2025, emphasis in industrial development is indispensible. However, the industrial development should be realized through the application of modern, green technology in order to protect our environment. In this theme, Ardhi University can research on the following areas:

i. Green Industrial development
ii. Occupational health and safety
iii. Land administration for industrial development
iv. Industrial planning, design and development
v. Entrepreneurship development
vi. Capital and money markets
vii. International trade and external competitiveness
viii. Value addition in agro products and natural resources.

6.9.6 Ethical Issues

Ethics involves systematizing, defending and recommending concepts of right conduct, often in particular circumstances. From a professional point of view ethics are a set of principles that
guide professionals in their service to the public, including their decision-making. Fundamental to the concept of public, ethics is the notion that decisions and actions are based on what best serves the public's interests, as opposed to the personal interests. ARU’s research Policy emphasizes on ethical behavior in research.

**Research Areas**

Ethics in all the above themes.

### 7.0 IMPLEMENTATION, MONITORING, EVALUATION AND REVIEW

#### 7.1 Implementation and resources

The day to day management of research activities shall be implemented at Departmental level under their respective Higher Degrees, Research and Publications Committees. The Departments shall initiate, draw out and prioritize respective themes for research. At School/Institute level, the Higher Degrees, Research and Publications Committees shall be in charge in implementing the research agenda, and at the university level, the Senate Higher Degree, Research and Publication Committee will oversee the implementation of the research agenda. Other mandates shall follow the ARU research policy guidelines. The source of funds for research activities is local, and in particular from Government subversion. Research funds will also be solicited from other sources international and local sources, both public and private.

#### 7.2 Monitoring

In view of the envisaged rapid technological changes, this Research Agenda shall continuously be monitored in order to determine its relevance. Monitoring shall include backstopping and getting progress reports of both on-going and envisaged research projects.

Monitoring shall be done in three levels namely; implementation monitoring whereby progress in implementing the proposed research agenda areas will be monitored; strategic monitoring in which the achievement of objectives will be assessed and impact monitoring in which impacts created by research will be evaluated as a basis for research agenda review. The departmental and schools and Institute committees will be responsible for monitoring.

#### 7.3 Evaluation

The quantity and quality of the contributions, or lack thereof, shall be a measure of the quality of the research projects emanating from the guidance of this Research Agenda. Evaluation of the
implementation of the agenda will be by regularly taking stock of completed and ongoing research activities in the various research units of the University. The exercise will involve listing down published and unpublished research papers, research project reports, research workshops, and conferences. This will reflect on the quality and relevance of the Agenda and thus influence on the decision on whether or not to carry out a review. The Senate Higher Degree, Research and Publication Committee shall submit the progress reports on the implementation of the Research Agenda to Senate.

7.4 Review

This Research Agenda being a dynamic planning document shall be reviewed as frequently as desired. Based on the reviews, and in consultations with stakeholders, department and /or Schools may revise the Research Agenda. An evaluation of the outcomes of this research agenda will provide information on the extent to which it is implemented, and the progress being made in achieving its objectives. An overall review will be undertaken after every five years to include contemporary development in the relevant fields.
1. Ardhi University 2014. Institutional Self-Assessment for Reaccreditation of Ardhi University


3. Ardhi University, 2011. The University Research Policy


18. The University College of Lands and Architectural studies (UCLAS), 2004 Research Activities: Research Agenda, Projects and Publications. Dar es Salaam

