CHALLENGES IN TRAINING OF PROFESSIONALS FOR THE CONSTRUCTION INDUSTRY IN TANZANIA: A CASE OF ARDHI UNIVERSITY

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Abstract

This paper highlights on the role of Ardhi University (ARU) as a higher learning institution and its participation in the training of technical manpower required by the construction industry in Tanzania. At the on-set the paper provides a brief historical background of ARU as well as a review of various national policies and targets for higher education in Tanzania. An analysis of the various existing academic programs including student's enrolment and out put of professionals from ARU over the past years is provided and linked with the professional skills and competencies expected by the construction industry based on literature review and a Labour Market Survey (LMS) carried out by the university recently. The challenges facing ARU and other institution of higher education in Tanzania in general are identified and discussed.

1.0 INTRODUCTION

The history of Ardhi University (ARU) dates back from 1956 when a Survey Training School (STS) was established at Mgulani, (now Salvation Army in Dar es Salaam); primarily to train Land Surveying Technicians to carry out cadastral survey works country wide. The STS was shifted to the Observation Hill (which is the present ARU location) in 1958, assuming its status as Ardhi Institute in 1972 when it begun offering two years diploma courses. Through an Act of Parliament No. 35 of 1974, it begun to offer Advanced Diplomas under the then Ministry of Lands and Natural Resources. In 1996 Ardhi Institute was transformed into a University College of Lands and Architectural Studies (UCLAS), a Constituent College of the University of Dar es Salaam. UCLAS was established to effectively and efficiently address current developments in the country relating to lands utilization and related fields of specializations. It replaced the former Ardhi Institute in order to provide more competitive academic outputs not only in terms of quality university-level training, but also quality applied research and expert services to the community.

The transformation of Ardhi Institute into UCLAS was also meant to provide a favourable environment for nurturance with view to realising a full-fledged University status. Thus in 2007, UCLAS was transformed into an independent University (ARU) following the approval of its Charter by the President of the United Republic of Tanzania. Currently therefore ARU is the only institution in the country that offers university-level training (both undergraduate and postgraduate), conduct research and offers expert serves to the community in the land based issues. The land based advanced diploma programs that were offered by the then Ardhi Institute and later Bachellor of Scince degrees by UCLAS under UDSM include Urban and Rural Planning (URP), Land Management and

Valuation (LMV), Architecture, Quantity Surveying (Building Economics) (BE), Environmental Engineering (EE) and Geomatics (Land surveying).

This paper highlights on the role of ARU as higher Learning Institution and its role or participation in the training of the skilled technical manpower required by the construction industry in Tanzania particularly the Architects, Quantity Surveyors, Land Surveyors, City/Municipal Planners, Engineers and Land Administrators. Prior to that, a brief review of various national policy framework and plan on higher education in Tanzania is presented.

2.0 A BRIEF REVIEW OF SOME NATIONAL POLICIES ON HIGHER EDUCATION IN TANZANIA

Contribution of higher education and training for national development is of paramount importance. This is because higher education sub-sector produces doctors, engineers, architects, teachers, top-level civil servants, and other highly qualified professionals including those engaged in various sectors of construction industry. As a result higher education and training in Tanzania is influenced by several policy frameworks and plans. Apart from the Tanzania Development Vision 2025 (URT 1996) and related Poverty Reduction Strategy Paper (URT, 2004), the other major relevant policy documents include the Employment Policy (URT, 1995), the National Science and Technology Policy (URT, 1996), the National Higher Education Policy (URT, 1999), Higher Education Sub-Master Plan (URT, 2003) and Science and Technology Sub-Master Plan (URT, 2003). An analysis of these policy documents brings out the following major policy directions related to higher education and training of professionals in the country for which ARU is one among important stakeholders.

- To expand student enrolment in science and technology;
- To enhance gender and equity in science and technology access and participation;
- To use science and technology as a key tool towards poverty reduction and sustainable national development;
- To have science and technology culture inculcated in the Tanzanian Society;
- To enhance funding for science and technology activities;
- To enhance availability of physical and technical resources for science and technology;
- To improve the national scientific and technological human resources capacity;
- To have youths and adults imparted with entrepreneurial skills to enable them to go into sustainable self-employment;
- To encourage flexibility in training programmes both in terms of contents and course delivery;
- To give emphasis on new and emerging areas of technology such as ICT and biotechnology;

- To promote strategic national research and development priorities;
- To exploit natural resources at no or minimum negative effects to the environment;
- To address and combat HIV/AIDS;

Apart from these policy directives, in terms of expansion of students' enrolment, the education sector reforms requires that 100% of all children reaching the primary school age should be admitted and ensure that at least 75% of all pupils completing primary school education join form I. Ultimately, at least 25% of pupils completing ordinary secondary schools should join Form V. Important is also the target to have at least 70% of Form VI leavers pass final examination with Division I to III. With respect to higher education, the participation rate is planed to increase from the current 1.43% to 12.5% by the year 2010 (URT, 2007). Obviously, these targets if realised will have a direct bearing in the operation of higher education institutions in Tanzania especially the capacity (including human resources) to manage and accommodate the anticipated influx of students completing high schools and competing for university education.

In an endeavour to implement these directives, higher learning institutions in Tanzania have formulated mission and strategies aimed at providing access to high quality education and training. Needless to say that the establishment of ARU was also meant to provide more competitive academic outputs with a view to assisting the government in the realisation of the above policy directives and reforms that are going on for poverty reduction within the various sectors of national development.

3.0 RELEVANCE OF ARU PROGRAMS TO CONSTRUCTION INDUSTRY

Ashworth (1994) has defined the construction industry to include building, civil engineering and process plant engineering, and is concerned with the planning, regulation, design, manufacture, installation and maintenance of buildings and other structures. For the purpose of this paper construction has also been defined as a process that consists of the building or assembling of infrastructure (wordnet.princeton.edu/perl/webwn 24/4/08). It is also worth noting that large scale construction is a feat of multitasking, normally managed by the project manager and supervised by the construction manager, design engineer, construction engineer or project architect. Those involved with the design and execution of the infrastructure in question must consider the environmental impact of the job (normally carried out by the Environmental Engineers or Environmental Scientist), the successful scheduling, budgeting, site safety, availability of materials, logistics, inconvenience to the public caused by construction delays and preparing tender documents (normally carried out by the Building Economists). In relation to the Real Estates, building construction is also defined as the process of adding structure to real property.

As noted from earlier discussions (in section one), the type and nature of the training programs at ARU are closely associated with the professional skills needed by modern construction industry. For instance, presently ARU is constituted by six schools and one research institute which together prepare professionals at graduate and postgraduate

levels in the fields of Architecture, Building Economics, Geospatial Sciences and Technology, Urban and Regional Planning, Environmental Science and Technology and Real Estate Studies. The Bachelor of Architecture degree programs aims at training students at professional level in the organization of space and the building process, while Environmental Engineering degree program is targets at training environmental engineers who among others have a broad and thorough understanding of the whole range of environmental conditions that effects the welfare of human beings and the environment. Details of the ARU programs and the corresponding main objectives are as summarized in Table 1. The objectives encompass the knowledge, professional skills, and competences to be acquired after the successful completion of the program.

Table 1: Selected ARU academic programs and the corresponding objectives

Program	Objective
Architecture (Arch)	Training students at professional level in the organization of space and the building process. It is also aimed at developing perceptions and rational thinking in finding solutions to design problems and construction of buildings.
Environmental Engineering (EE)	Training environmental engineers who among others have a broad and thorough understanding of the whole range of environmental conditions that affects the welfare of human beings and the environment. Environmental engineering graduates are trained to posses the skills required to prepare designs and supervise the construction, operation and maintenance of environmental engineering works
Urban and Regional Planning (URP)	To prepare graduates with the professionals ability to enforce the urban and land use development control legislation in terms of planning and land laws and zoning regulations as practiced by the central government and local authorities. Graduates of this programs can also coordinate the preparation and adoption of general schemes/strategic urban development planning frameworks through stakeholders participation and partnership as required by city councils, municipalities and town councils
Geomatics/Land surveying (Gm)	To train professionals capable of carrying out measurement, representation, analysis, management, retrieval and display of spatial data concerning both the Earth's physical features and the built environment. The discipline embraces by Geomatics include mapping sciences, GIS, geodesy, photogramerty, remote sensing, hydrograph and oceanography, engineering and mining surveys, and cadastral surveys.
Building Economics (BE)	To train personnel knowledgeable in construction costs matters. Specifically the coursed aims to produce graduates who are capable of entering managerial and execution positions in construction industry and especially in the allied profession of environmental economics, project management and the control, of construction costs.
Land Management and Valuation (LMV)	This program is concerned with the management and development of land within the economic, legal, sociological and technological framework of the country, and it provides a synthesis of a theoretical training and practical skills covering the areas of land management, land use, land development, land valuation, property management and land resettlement and reforms. The program is intended to produce graduates who would be able to apply competently the knowledge leant and skills acquired to a wide array of areas of expertise pertaining to the judicious and sustainable management of land and land based resources in both the urban as well as rural setting.

Out of the existing three undergraduate programs in each school, two were introduced recently (in academic year 2006/07) following a study by the former UCLAS (in 2003) as well as a mini Labor Market Survey (LMS) which was carried out in 2006 (Mshoro *et al.,* 2006) to trace the graduate and respective employers with a view to obtaining feedback to gauge the relevance of the academic programs and the performance of the former graduates in the labour market.

4.0 Students enrolment profile and ARU's proffesional out put

4.1 Students enrolment profile

In the last six years total ARU students' enrolment increased from 766 in the year 2001/02 academic year to 1,366 in 2006/07 academic year representing an increase of about 79% (Figure 1). Within this period the the proportion of female students enrolment also increased from 100 (13%) in 2001/02 to 226 (16.5%) in 2006/07 academic year.

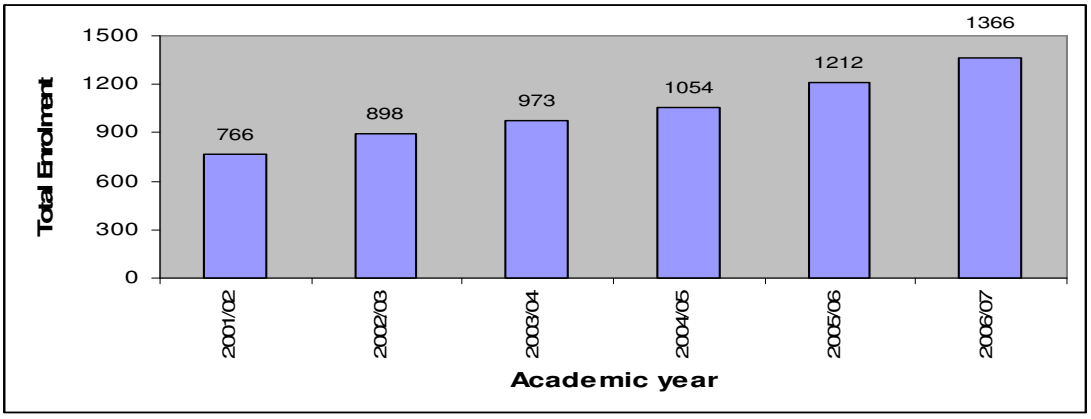

Figure 1: ARU students enrolment between 2001 and 2007

Notably the female students' enrolment is still low compared to the 50% target set by the univerity. Data in Tables 2 and 3 preseant students' enrolment levels for the academic year 2006/07 and the students enrolment levels by programs for the period 2001/02 to 2006/07, respectively. Postgraduate program commenced in the academic year 2002/03. The initial enrolment of postgraduate students was throgh the introduction of the postgraduate diploma and masters degrees in Urban Planing and Mangement in the department of Urban and Regional Planning. In 2006/07 academic year a total of 88 students were enroled in varuious masters and PhD programs at ARU.

Table 2: Students enrolment levels for the academic year 2006/07

Program	Year 1		Year 2		Year 3		Year 4		Year 5		**Total**	
	F	M	F	M	F	M	F	M	F	M	**F**	**M**
Diloma (GFM4)[1]	9	13	-	-	-	-	-	-	-	-	**9**	**13**
Undergraduate degree	71	303	43	279	42	215	37	201	3	40	**196**	**1038**
Postgraduate Diploma	2	20	-	-	-	-	-	-	-	-	**2**	**20**
Masters Program	7	26	11	34	-	-	-	-	-	-	**18**	**60**
PhD	-	4	1	1	-	-	4	-	-	-	**1**	**9**
Total	**89**	**366**	**55**	**314**	**42**	**215**	**41**	**201**	**3**	**40**	**266**	**1140**
Grand Total												**1366**

[1] Joint ARU/ITC Diploma course on geo-Informatics launched in September, 2004

Table 3: Students enrolment by academic program 2001/02- 2006/07

Program	2001/02		2002/03		2003/04		2004/05		2005/06		2006/07	
	F	M	F	M	F	M	F	M	F	M	F	M
Diploma							2	9	6	9	9	13
Undergraduate degree	100	666	127	752	129	804	163	836	174	946	196	1038
Postgraduate diploma			1	8	2	9	2	9	4	19	2	20
Masters degree			3	7	8	20	11	20	15	35	18	60
PhD								2	1	3	1	9
Total	**100**	**666**	**131**	**767**	**139**	**834**	**178**	**876**	**200**	**1012**	**226**	**1140**

Program wise analysis indicate that during the academic year 2005/06 and 2006/07 students' enrolment was highest in LMV (219) in 2005/06 and 261 (in 2006/07) followed by BE 202 (in 2005/06) and 220 (in 2006/07) as further detailed in Figure 2.

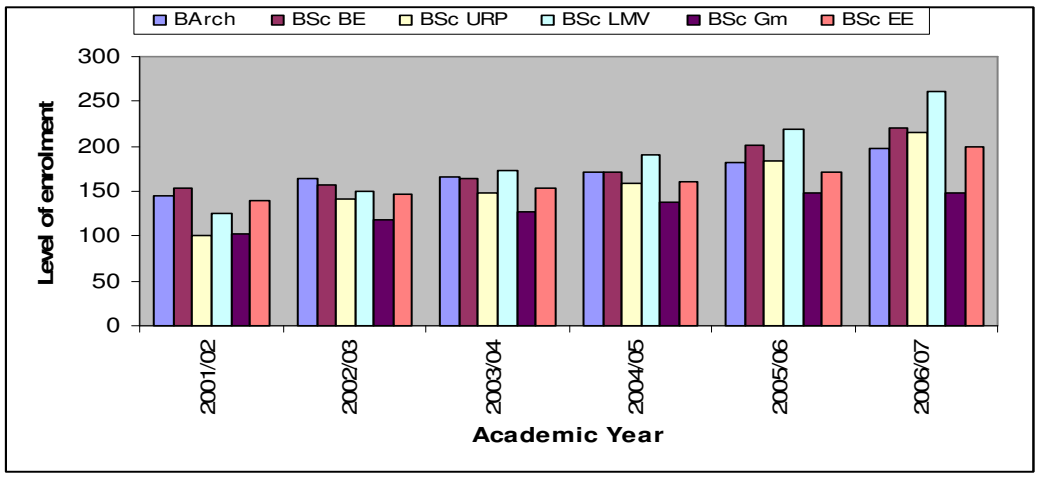

Figure 2: Program wise students' enrolment from 2001/02–2006/07 academic years

4.2 Construction industry professional out put from ARU

Students' out put is the most tangible university product that comes out every year. Data in Table 4 indicate that the number of various professionals that graduated from ARU (Architects, Building Economists, Urban and Regional Planners, Land Surveyors, Land Management and Valuation experts and Environmental Engineers) has almost doubled from 144 (in 2001/02) to 244 (in 2005/06). This is an increase of over 40%. Overall within this period a total of 930 professionals completed their studies at ARU. The increase of professional out put over the years is attributed to the increase in students' enrolment in various degree programs.

Figure 3 indicates further that out of the total number of graduands from ARU between 2001/02 to 2005/06 (930), the majority (180) were Building Economics, followed by Environmental Engineers (168). Others were Architects (144), Urban and Regional Planers (138), Land Management and Valuation experts (167) and Land Surveyors (133).

Table 4: ARU's Professionals outputs from 2001/02 to 2005/06

Academic year/Professionals trained	2001/02	2002/03	2003/04	2004/05	2005/06
Architects	37	23	24	22	38
Building Economists	30	33	33	39	45
Urban and Rural Planners	11	15	31	39	42
Land surveyors	23	24	21	27	38
Land management and valuation experts	15	27	32	45	48
Environmental Engineers	28	33	31	43	33
Total	**144**	**155**	**172**	**215**	**244**

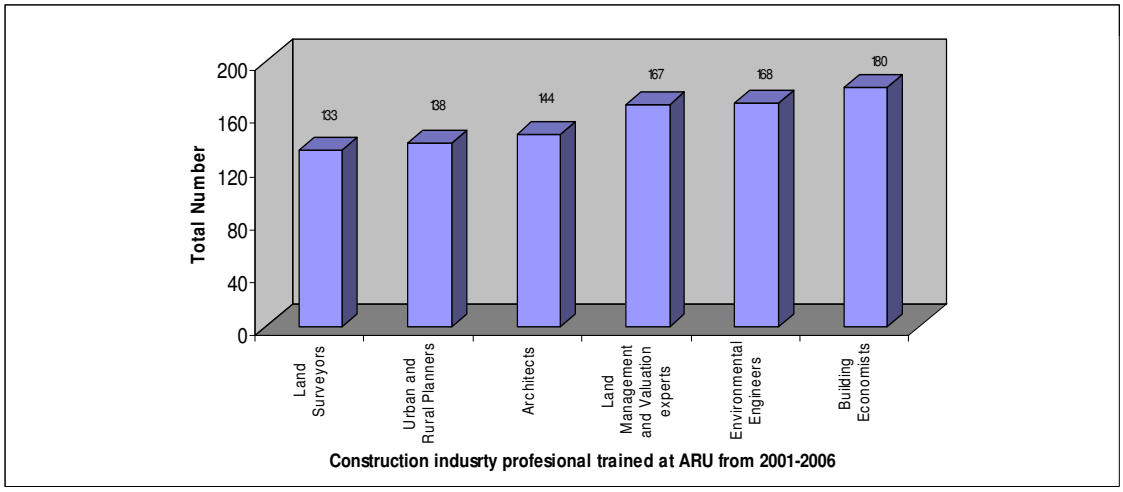

Figure 3: Construction industry professionals trained at ARU between 2001/02 and 2005/06

5.0 INTRODUCED NEW ACADEMIC PROGRAMS

In the academic year 2006/07, ARU introduced several new training programs. The introduction of those new programs was based on the results of a mini LMS which indicated specific personnel that are most wanted in the current globalized world as far as Land Development Management, Environmental Management and Human Settlements Management (and in essence the construction industry) are concerned. For convenience, these are grouped under the existing Schools as shown in Table 5.

Table 5: Specific ARUI-related personnel that are currently most wanted

School	Typical personnel that are currently most wanted
Architecture and Design (SADE)	General architects Landscape Architects Interior designers
Urban and regional Planning (SURP)	Urban & regional planners Urban planners and managers Regional planners and managers Housing and infrastructure planners
Construction economics and Management (SCEM)	Quantity surveyors/BE Building surveyors Construction managers
Geospatial sciences and technology (SGST)	Geomatics engineers Geoinformatics specialists Geodetic scientists
Real Estates Studies (SRES)	Valuation specialists Land administrators with expertise in legal issues Real estates specialists
Environmental Sciences and technology (SEST)	Environmental Engineers Municipal & industrial environmental engineers Environmental managers Environmental scientists Environmental laboratory technologists

Source: Mshoro *et al.,* (2006)

Notably the mini LMS indicated that the only programs that were being offered then (General Architect, Urban and Regional Planning, Building Economics, Land Management and Valuation, Environmental Engineering and Geomatics) were still marketable and in high demand and that some additional ones to meet the new and future market demand were needed. Data on Table 6 indicate that in each of the school at ARU currently there are at least three undergraduate and three post graduate (Diploma, MSc and PhD) programs. The recently introduced undergraduate programs in each school are BSc Inter design and BSc Landscape Architecture (SADE), BSc in Construction Management and BSc in Building Survey (SCEM), BSc in Geoinformatics and BSc in Geodetic Sciences (SGST), BSc Regional Development Planning and BSc Housing and Infrastructure Planning (SURP), BSc in Property and Facilities Management and BSc in Real Estate Finance and Investment (SRES), BSc Environmental Science and Management, BSc Environmental Laboratory Science and Management and Municipal Services Engineering (SEST).

Table 6: Degree Programs currently offered at ARU

School	Degree programs offered
Architecture and Design (SADE)	B Arch BSc Inter design BSc Landscape Architecture Postgraduate Diploma in architecture M Arch
Construction Economics and Management (SCEM)	BSc in Building Economics BSc in Construction Management BSc in Building Survey, Masters Degrees PhD Degree programmes in related field
Geospatial Sciences and Technology (SGST);	BSc in Geomatics BSc in Geoinformatics BSc in Geodetic Sciences Masters Degrees PhD Degree programmes in related field
Urban and Regional Planning (SURP)	Bsc in Urban and Regional Planning, BSc Regional Development Planning, BSc Housing and Infrastructure Planning, Masters Degrees programmes in related field PhD Degree in related field
Environmental Science and Technology (SEST);	BSc in Environmental Engineering, BSc Environmental Science and Management, BSc Environmental Laboratory Science and Management, Masters Degrees programmes in related field and PhD Degree in related field
Real Estate Studies (SRES	BSc in Land Management and Valuation BSc in Property and Facilities Management, BSc in Real Estate Finance and Investment, Masters Degrees programmes in related field and PhD Degree in related field

6.0 PROFESSIONAL COMPETENCES REQUIRED BY THE CONSTRUCTION INDUSTRY

Due to globalizing economy, students pursuing technical degree programs including those related to competence in construction industry, may not be adequately educated to meet the demand that will be expected out of their profession during the next decade in the ongoing changing scenario worldwide. Engineers, Architects or Planners of tomorrow for instance need to be conversant with several other allied skills outside their major discipline, failure of which effective communication might be extremely difficult in the multidisciplinary team that will develop next–generation products and services (Vishwakarma, 2008).

The LMS that was carried out by ARU to identify the professional skills and gaps needed by the market indicated key competences to be imparted to students in order to meet the modern workplace requirements (including also for the construction industry).These attributes and the corresponding percentage of respondents during the survey are as summarized in Table 7.

Table 7: Recommended key competencies to be imparted to students at ARU

Preferred key attributes/competencies of graduates in the most wanted professions	Proportion of respondents [%]
• Adequate theoretical knowledge and understanding, and ability to apply the same to identify problems • Ability to select relevant methods of doing specific tasks • Ability to consider quality of undertakings • Ability to supervise other workers • Ability to train juniors • Ability to coordinate relevant workplace activities • Entrepreneurial ability • Ability to negotiate • Computer application skills • Numerical skills • Ability to communicate orally • Ability to express oneself in writing • Ability to work under pressure with determination/self-confidence • Team-working ability • Ability to interpret requirements	Above 70
• Ability to estimate quantities and costs of materials and labour • Ability to make and interpret graphical presentations • Ability to prepare for performing specific practical tasks • Ability to consider safety • Environmental awareness	50 – 70
• Ability to apply knowledge and skills to solve problems • Ability to select equipment /facilities for doing specific tasks • Ability to do inspection work • Ability to perform condition monitoring work	25 – 50

Source: Mshoro *et al.,* (2006)

As can be observed from Table 7, modern trends require that professionals, in addition to applied competencies, should also possess the wider attributes such as ability to work under pressure with determination and self-confidence and inclination toward cooperation/team work. These attitudes are generated more in the pedagogical strategies used than in curriculum contents. Existence of pleasant educational environment, motivated lecturers/instructors, learning by problem solving, as well as use of diverse didactic media are often key to the creation of such personal attributes. It is therefore clear that not only that a curriculum should be orientated towards the generation of applied competencies based on specific occupational needs, but also that the pedagogical strategies should be much more flexible than those traditionally used.

For example, teaching and learning in all programs at ARU currently iclude the project-oriented teaching which engages learners in some kinds of projects in each semester that usually leads to a product. 'Projects' are tasks of research and development which are limited in time and with which students, individually or in groups, are introduced to the contents and methods of the subject and to autonomous work" (Burdewick, 2003). Project-oriented teaching and learning is centered on the learner and affords learners the opportunity for in-depth investigations of worthy topics. The learners are more autonomous as they construct personally-meaningful artifacts that are representations of their learning (Grant, 2002).

Vishwakarma (2007), has also reported some of the issues that globalizing economy will likely expect from the future professionals including those to be engaged in construction industry to be: possession of multifunctional attributes, ability to work in teams, ability to develop new processes and products as well as ability to undertake innovative task. These are further illustrated in Figure 4 and discussed in the subsequent sub-sections.

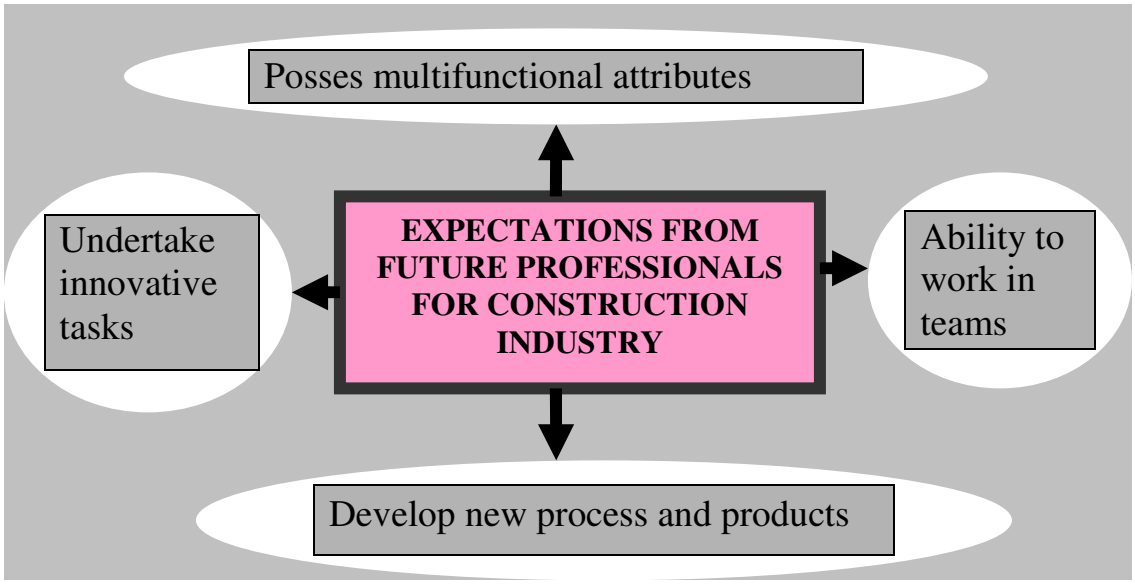

Figure 4: Expectations from the future professionals for construction industry

6.1 Possessing multifunctional attributes

Future graduates for construction industry profession apart from their competency in their area of specialization, will be expected to have the skill of managing their team members to make them focused towards achieving organization goals. They shall have to be: technically skillful, broadly knowledgeable, innovative and entrepreneurial, commercial savvy, knowledge about world markets, and professionally flexible and mobile.

6.2 Ability to undertake innovative tasks

Generally, knowledge applied to the tasks we already know how to do is productivity. However, knowledge applied to tasks that are new and different is innovation–the process of creating new enterprises and delivering new products and services. Within this context of productivity and innovation, professionals of tomorrow shall be expected to play an ever more significant role.

6.3 Developing new processes and products

The true wealth of any nation is embedded in its human capital. Construction industry professionals will now be supposed to develop the new processes and products and to create and manage new systems for civil infrastructure, manufacturing, health care delivery, information management, computer-communications, and others. They will have to put knowledge to work for society–and in doing so, enable a huge potential for the private sector to crate wealth and jobs.

6.4 Ability to work in teams

The changing environment additionally expects future professionals to be able to work in teams and communicate well. They must be flexible, adaptable, and resilient. Equally important, they must be able to view their work from a systems approach, effecting connections, and within the context of ethical, political international, environmental, and economic considerations.

7.0 CHALLENGES IN TRAINING PROFESSIONALS AT ARU

Although higher education is the key to the development of the country, there are several challenges currently facing not only ARU, but the higher education in Tanzania and Africa in general. Some of the principal challenges are discussed below.

7.1 Funding

ARU being a public university predominantly relies on the government for funding. Over the years however, government's subventions to the university has never being adequate. For example over the past five years while students enrolment at ARU has increased by 51% and the number of programs increased by more than 266%, there was a cumulative decrease in fund allocation to the university of 11% as illustrated in Figure 5.

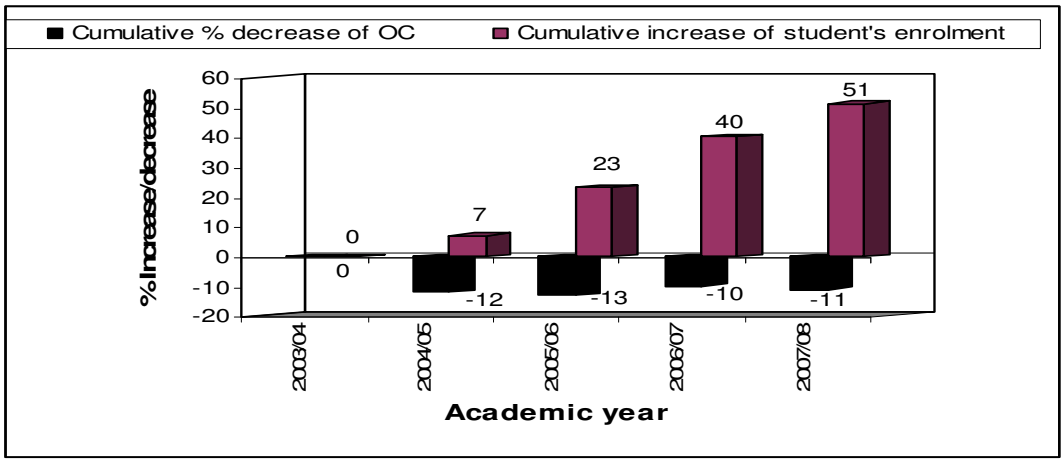

Figure 5: Cumulative increase/decrease of OC budget against students' enrolment at ARU

Figures 6 and 7 further indicate a difference between the actual university requirements and funding levels for the past five years for development and OC budgets.

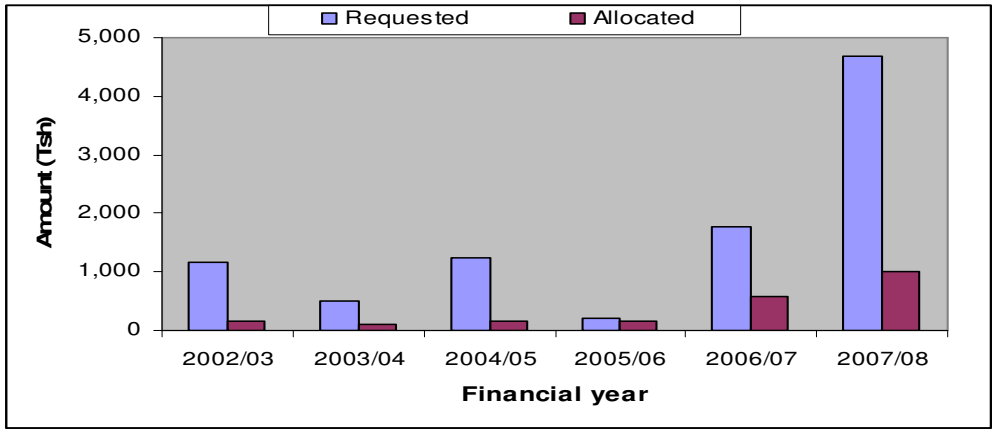

Figure 6: Requested against allocated Development budget between 2002 and 2007

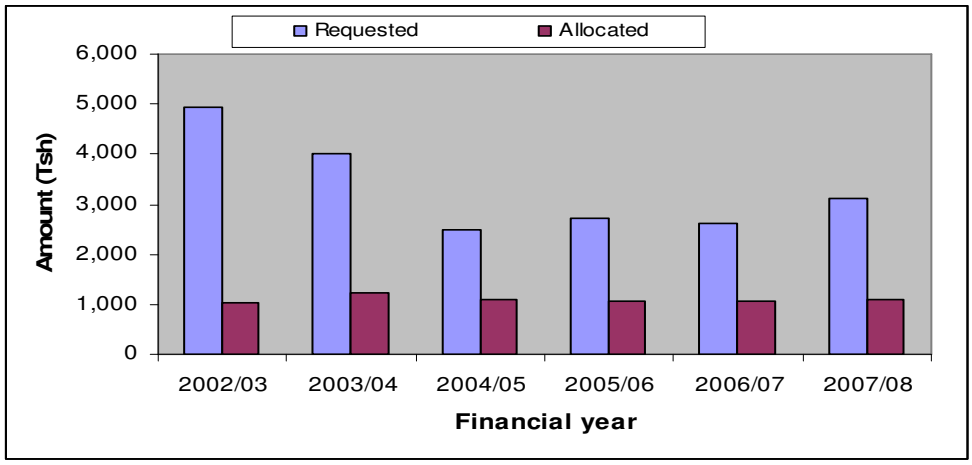

Figure 7: Requested against allocated Other Charges budget between 2002 and 2007

This trend suggests that there will not be enough money to meet the needs of the universities. Consequently funding will remain an important issue for the next years to come, suggesting also that universities needs to take on the responsibility of generating additional funds internally through innovative fund raising mechanisms.

It is worthy noting however, that inadequate funding is not unique to ARU or public universities in Tanzania only but also in other African based institutions. Falade (2008), citing Case (2006) indicted that engineering programmes in South Africa are costly for an institution to run and that in adequate funding from the government has raised concerns about the quality of engineering programmes in some of those departments.

7.2 Facilities

Due to lack of adequate funding there is inadequate supply of office space, laboratory space and other necessary equipment. Some laboratories have items and equipment which are very old and obsolete. As a result of increase in students' enrolment they are inadequate both quantitatively and qualitatively. This makes teaching and research in science and technology difficult and may lead to production of ill-prepared professionals. In another study, Falade (2008) has also reported that the inadequate teaching, laboratory and workshop facilities have contributed to the diminution of the quality of the engineering graduates in Africa.

Emphasizing on the need for adequate learning and teaching equipment, Reyes-Guerra (1989) has categorized students into three, namely: verbalizers, visualisers and doers. The verbalizers are those who learn easily if information is in written or spoken form. They benefit from lecturers, tutorials and hand outs. Visualizers learn easily when information is presented in pictorial or diagrammatic form while the doers learn more easily when information is presented through practical demonstration by the instructors. The inadequacy of facilities both qualitatively and quantitatively has put the visualizers and the doers at a disadvantage. The verbalizers may also have problem in a class with large students' population. The implication of this scenario is that only a small proportion of the students benefit from the current pedagogical system.

7.3 Staff situation

Like many other universities in Tanzania ARU is inadequately staffed both qualitatively and quantitatively. Between 2001 and 2007 the number of academic members of staff with PhD degree increased from 17 to 43 as illustrated in Table 9. This is considered to be a big achievement within that short period especially because it is normally difficult to get people trained to the level of PhD due to the fact that academic is not that much attractive. Experience has shown for instance that first degree (B.Sc. or BA) graduate can function well in the industry and earn better remunerations. Within the next few years however, the number of PhDs holders at ARU is expected to further increase as many of the staff members are currently pursuing their studies. Some of them are in the last stages and are finalizing their studies.

Table 9: Academic staff by qualification and sex at ARU

Academic year	PhD			Masters			1st Degree			Total		
	M	F	T	M	F	T	M	F	T	M	F	M+F
2001/02	16	1	**17**	63	10	**73**	-	-	-	79	11	**90**
2002/03	20	1	**21**	59	10	**69**	-	-	-	79	11	**90**
2003/04	28	5	**32**	50	6	**56**	8	4	**13**	85	14	**100**
2004/05	29	5	**34**	52	10	**62**	9	2	**11**	90	17	**107**
2005/06	35	7	**42**	52	8	**60**	10	4	**14**	97	19	**116**
2006/07	34	9	**43**	55	15	**70**	28	7	**35**	117	31	**148**

Data on Table 10 indicate that ARU students to staff ratio grew from 6.6:1 in 1999/2000 to 10.4:1 in 2005/06, but again reduced to 9.2:1 in 2006/07. The overall increase is largely attributed by students' enrolment expansion process due to the introduction of new programs and postgraduate studies at the university.

Table 10: Students-academic staff ration, 1999/00 – 2006/07

Academic year	Number of students	Number of Academic staff	Students/academic staff ratio
1999/00	592	89	6.6:1
2000/01	671	89	7.5:1
2001/02	766	90	8.7:1
2002/03	898	90	9.9:1
2003/04	973	100	9.7:1
2004/05	1054	107	9.8:1
2005/06	1212	116	10.4:1
2006/07	1366	148	9.2:1

8.0 CONCLUSION

This paper has attempted to highlight on the various academic or professional training programs currently available including recently introduced new programs at ARU and their relevance to the numerous disciplines in the construction industry. The paper shows that over the years, construction industry has been absorbing various professional such as Architects, Building economists, Town/City Planner, Environmental engineers, Land valuation experts and Land surveyors trained at ARU. The paper has also attempted to highlight on the forthcoming challenges ahead of the future professionals as well as what the society expects from them in the globalizing economy.

The problems that the universities in Tanzania including ARU are facing in the training of professionals for construction industry as presented in the paper include inadequate funding, lack of adequate training facilities as well as inadequate staff both qualitatively and quantitatively. In spite of the existing challenges and problems however, the university has managed to recruit and train more staff, increase students' enrolment over the year as well as the number professionals needed by the construction industry in Tanzania.

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