A MARKET STUDY ON THE STATUS OF GRADUATE YOUTH EMPLOYMENT IN THE LAND SECTOR – BOTSWANA

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RESEARCH REPORT

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EXECUTIVE SUMMARY

The purpose of this study was to carry out a market study of youth land sector graduate employment in Botswana. The Botswana government has done so much in terms of promoting and achieving the Vision 2016 Pillars. One of the pillars was "an educated and informed nation by 2016". In addition, the Botswana government strives by the end of 2036 through its Vision to achieve a "knowledge-based economy" as one of the pillars. This is evident by the total number of graduates (117, 544) that have been produced from 2013 up to 2022 and out of this number, only 1,290 (1%) are in the land sector. In trying to empower the youths in Botswana, the government developed the National Policy on Youth in 1996 and revised it in August 2010. Despite such efforts, the national unemployment rate is still high at 25.4%. The land sector is not an exception and this study looked at graduate youth unemployment. The study adopted a mixed method type of research by applying both quantitative and qualitative research techniques in the collection and analysis of data. Below are the key findings of the study.

Key findings:

1) The land sector curricula were analysed and it was found that most of them are degree programmes spanning from four (4) to five (5) years of study.
2) In Botswana, all the land sector curricula have a provision for industrial training for two (2) months during winter break (June to July) and/or six (6) months (January to June) for the whole semester.
3) All the land sector curricula that are offered by universities in Botswana were deemed as relevant by industry stakeholders (employers) and employees.
4) In terms of the industry needs, most of the land sector graduates are sought after by employers in terms of what they can do based on the knowledge, competences and skills that they have acquired.
5) The land sector is important and attractive as most of the graduates end up being employers by operating small and medium enterprises (SME). This promotes entrepreneurship and contributes to economic growth in the country.
6) Universities in Botswana have enough qualified staff, resources to train and have produced 1,290 land sector graduates at bachelor's degree level so far.
7) Most of the academic staff in Botswana universities have the requisite skills, are based in Gaborone, and have passed the youth stage.
8) Failure to adapt to new work environment by land sector graduates is one of the causes for underperformance.
9) There is a mismatch in terms of alignment of curricula to the level of intensity and complexity of the assigned work (Theory – practice gap).
10) Soft skills have been overlooked in some curricula as they just concentrate on subject specific topics.
11) Lack of professional mentorship, extended probationer periods, and licensing procedures are considered as stiff barriers to entry in the industry for socio-professional integration.
12) Though employers perceived the training offered by universities as adequate, they still believe that students need more industry exposure.
13) Employers also believe that the attitudes of some employees are not professional and finding a right employee for the job is not easy.
14) Most (-230) land sector graduates (Architects, Town Planners, and Surveyors), (-315) (Construction), are in oversupply except for real estate graduates (632) who according to HRDC is one of the top occupations still in demand.
15) A multiple regression analysis (MRA) model was developed to appreciate the influence that demand has on supply. It was noted that the independent variables that were used in the model had no significant impact on supply. However, there is a negative relationship between supply and demand.
16) Only 1% of the total graduates produced in Botswana universities are in the land sector over a period of 11 years (2013 –2022).
17) Majority of the graduates 682 (53%) out of 1,290 were still unemployed in 2016 within the land sector.

18) The universities have overproduced for a small job market. Government as a major employer no longer take graduates for permanent employment, hence the reluctance of private firms in employing more graduates. This has resulted in high unemployment rate in the land sector.
19) The skills that are possessed by land sector graduates are technical, cognitive, and soft skills. These are considered when hiring the employees in the land sector.
20) Most (70%) of the land sector graduates are geographically based in the eastern region of Botswana.
21) One of the shortcomings of the employees in their performance was attributed to lack of resources in the workplace.

Conclusions:

1. There exists a gap between what is taught and what is required in industry.
2. Much as there is a provision for industrial attachment, stakeholders still believe that this is not adequate to develop the skills that are required in industry.
3. Some curricula though relevant do not address the current needs of the industry. This could be attributed to the shallowness of some courses that are offered even though they are relevant.
4. This sector is known for the prospects and promotion of small and medium enterprises; however, the level of entrepreneurship is very low. This is attributed to the stringent requirements for one to become fully licensed professional.
5. There are several barriers that impinge on becoming a professional member of any professional association. Such barriers include lack of mentorship programmes, long probation periods, and probation only recognised once working.
6. There is misconception about land sector graduates regarding their competences, knowledge, and skills.
7. There is geographical imbalance in the distribution of land sector graduates as most of them are concentrated in the eastern block of Botswana.
8. The acquired skills are getting outdated, and this results in mismatch in terms of what is required in the industry and what one possesses.
9. Though the land sector is attractive and important, the youths are facing difficulties in finding sustainable permanent jobs.

Recommendations:

Strengthen industry-academia collaboration: In describing the profiles that are sought by employers, it is recommended that there should be regular dialogues, joint research projects, internships, and guest lectures. Such collaborations will ensure that the curricula align with industry needs and equip graduates with the skills and knowledge required for the job market.

Enhance practical exposure: In assessing the experiences and skills of land sector graduates, it is recommended that prior practical experience should be emphasised by increasing from a minimum of 2 months to 6 months for all programmes at the end of Year 2, and Year 3. Technical and soft skills were more emphasised than any other types of skills by the employers. Private universities should consider introducing soft skills in their curricula as it is the case with the University of Botswana which offers graduate employability skills as general education courses (GEC) for all academic programmes. These help graduates in developing soft skills that are required in the industry.

Update and diversify curricula: In identifying and assessing the mismatch in the labour market, it was established that the job profiles are addressed in most curricula. However, some respondents felt that engineering surveys, cartographic design and geographic information system were shallowly taught even though they appeared in the curriculum as options at advanced levels. Revise, update and make optional courses mandatory so that advanced technical skills are covered in detail at higher levels.

Reduce barriers to entry: In addressing obstacles to land sector graduate socio -professional integration, barriers such as licensing and certification requirements that limit graduates from entering the land sector job market should be evaluated and addressed. This will result in an increase in the number of professionals able to practice in the market thus creating more job opportunities.

Promote entrepreneurship and start-ups: In promoting socio-professional integration and job creation, established systems should encourage and support graduates to establish their own firms and

start-ups in the land sector. In fostering economic growth, entrepreneurship training, mentorship, and access to funding opportunities should be made available to help aspiring entrepreneurs establish and grow their businesses.

Improve perception and awareness: Launch targeted campaigns to raise awareness about the importance and attractiveness of the land sector and its usefulness to industry. Highlight the potential career opportunities, success stories of graduates, and the sector's contribution to the country's economy.

Encourage continuous professional development: This might minimise the barriers to socio-professional integration by ensuring that performance related challenges are addressed. Participation in professional associations, industry conferences, and workshops should be encouraged to enhance graduates' skills, expand their networks, and ensure that they stay updated with industry trends and best practices.

Proposed economic model: Currently, most of the programmes have over produced land sector graduates in Planning, Architecture, Construction and Surveying. In addressing the oversupply, universities should consider producing graduates only in programmes that are still in demand.

Promote geographic diversity: It was also noted that most of the land sector private professionals are along the eastern block of the country. Private sector should emulate government in terms geographical spread to address the geographic imbalance in employment opportunities within the land sector.

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1. Introduction

The purpose of this study was to respond to the call for a bid titled "Market study of youth employment in the land sector in Botswana" issued by the GIZ-AU programme "Strengthening Advisory Capacities for Land Governance in Africa". In response to GIZ's key areas of engagement, the aim was to establish the status of employment relating to land professionals in Botswana as part of their GIZ-AU initiative on land governance.

GIZ strives to support the AU mandate on strengthening advisory capacities for land governance in Africa by improving expertise in the land on the African continent. To achieve this, GIZ is cooperating with the African Land Policy Centre which is based in Ethiopia at the United Nations Economic Commission for Africa (UNECA). This centre oversaw the formation of the Network of Excellence on Land Governance in Africa (NELGA). Botswana is a member of the NELGA Southern Africa, a regional hub based in Namibia with 13 member countries. NELGA has partnered with the University of Botswana and BaIsago University to make sure that the mandate on strengthening capacity on land Governance is achieved.

In Botswana, there are about three (3) institutions of higher learning (IHL) offering land-related programmes at Bachelors' degree level. These are:

i. The University of Botswana, a publicly funded institution offering Bachelors of Architecture, Geomatics, Real Estate, and Urban and Regional Planning.
ii. BaIsago University, a private institution offering Bachelor of Commerce in Real Estate, and Bachelor of Science in Quantity Surveying.
iii. Gaborone University College, a private institution offering a Bachelor of Technology in Construction Engineering.

The statistics from when the first graduates were released in the labour market in 2013 up to date were used to establish the supply and demand of youth land sector graduates. The purpose was to determine the number of land sector graduates that have been absorbed in the labour market and those still not employed. According to the statistics from Human Resource Development Council (HRDC), it was noted that 602 were employed and 682 unemployed as at 2016 (Human Resource Development Council, 2019a). It further looked at the attractiveness of the land sector in absorbing graduates in Botswana. The scope of the study was to identify challenges related to the integration of young land sector graduates (Architects, Urban and Regional Planners, Real Estate Professionals, Geomatics and Quantity Surveyors) who graduated from universities offering such programmes into the labour market at the national level as well as come up with measures that can help improve their skills and professional integration. Lawyers were not included in this study though they deal with land-related functions such as conveyancing and registration of transfer documents.

1.1. Background of the study

Botswana is a landlocked country in Southern Africa bordered by South Africa, Namibia, Zambia, and Zimbabwe. It was one of the poorest countries at independence in 1966 and became one of the fastest-growing economies in the world upon the discovery of diamonds in 1967. Botswana is a middle-income country with a population of 2.4 million and its economy relies much on diamond production (World Bank, 2023; Statistics Botswana, 2022). Botswana is politically stable, and its macroeconomic policy framework is anchored around the prudent management of diamond revenue, which contributes about 90% of total exports and is a major source of revenue (World Bank, 2023). The economy of Botswana declined by 8.7% in 2020 due to COVID-19 but improved by 11.8% in 2021 due to global demand for diamonds (The Republic of Botswana, 2023a). However, income inequality is still high and the overall unemployment rate of 25.4% was noted at the end of 2022 (World Bank, 2023; The Republic of Botswana, 2023a). Unemployment was one of the four challenges (underperformance of GDP, unemployment, global inflation, and budget deficit) that were noted in the 2023/2024 budget speech that was presented by the Minister of Finance (The Republic of Botswana, 2023a) amidst the opportunities (improvement in export earnings, improved net cash inflows from diamond export and SACU receipts, and recovery in the government investment account) that were noted (The Republic of Botswana, 2023a; The Republic of Botswana, 2023b).

As much as Botswana is doing well economically, however, the unemployment rate of 25.4% is high by international standards for a smaller population just like its neighbouring countries 32.7% - South Africa (The Republic of South Africa, 2023); 22% - Namibia (World Bank, 2023); and 13% - Zambia (International Labour Organisation (ILO), 2017) except for Zimbabwe 5.30% (Zimbabwe National Statistics Agency, 2023). There is a need for the SADC countries to look at ways of lowering their unemployment rates as they are of concern by international standards. For a middle-income country like Botswana which is aspiring to become a high-income country (The Republic of Botswana, 2023a), the unemployment rate should be below the global average unemployment rate of 6.5% (International Labour Organisation (ILO), 2017). To further affirm the importance of graduate employment, McKinsey Global Institute (2012a) attests that there is a gap between the demand and supply of workers by educational attainment. They further noted that there were too few high-skilled workers and a lack of job opportunities for medium and low-skill workers (McKinsey Global Institute, 2012a). This is supported by an article from the International Labour Organization (2020) and African Development Bank Group (2016) in which they noted that youth unemployment is thrice more common than adults. In addition, McKinsey Global Institute (2012b) further noted that 48% of Africans have secondary or tertiary education but did not specify the actual percentage of Africans with tertiary education. African Development Bank Group (2016) identifies the consequences of youth unemployment in Africa as poor living conditions, promotes conflict, and fuels migration. They further noted that unemployment is a sign of the continent's failure to take advantage of its greatest asset for growth in terms of the large and growing population of talented young people (African Development Bank Group, 2016) who are more educated but less employed. It is also mentioned that Botswana and Tanzania were the only two countries out of those surveyed who believed their governments had done well in meeting the needs of the youth. Though Botswana is faced with the challenge of unemployment, this is not spared other upper-middle-income countries like Algeria and South Africa.

One of the eight key objectives of the Land Policy Initiative (LPI) that was established in 2006 now the African Land Policy Centre (ALPC) by the African Union Commission was to enhance knowledge generation and dissemination and build capacity and skills in support of land policy development in Africa (Strengthening Advisory Capacities for Land Governance in Africa (SLGA) Programme, 2018). This has been achieved through regional sector developments such as the Network of Excellence on Land Governance in Africa (NELGA) whose one of their key functions is to improve land-related curricula and facilitate academic education and training for African land professionals and practitioners (Mabakeng, Chigbu, De Villiers, Awala , & Christensen, 2021; Strengthening Advisory Capacities for Land Governance in Africa (SLGA) Programme, 2018). Much as these initiatives have been implemented, however, Kampamba, Nkwae, and Tembo (2015) noted one of the challenges that institutions face is the lack of standardisation of curricula which poses a big problem for the industry. For example, the guidelines for the development of curricula on land governance in Africa were developed by ALPC, AU, ECA, and NELGA (Africa Land Policy Center, 2022; Africa Land Policy Center, 2017) but these have not been shared with NELGA partner universities of which Botswana is part of it. These guidelines were developed by looking at regional assessment reports, the needs of industry, and curricula gaps as well as capacity development (Africa Land Policy Center, 2022). The idea behind the development of these guidelines was to bridge the gaps between academia and industry. However, Chigbu, Tenadu, and Mwasumbi (2017) examined land-related curricula in ten African countries and noted that higher education curricula in Africa are not adequately responding to Africa's needs in capacity development in the land. This was supported by Adam (2022) who further highlighted that African universities should consider the importance of incorporating topics on inclusive land governance and related issues in the curricula review process as a means to manage land in a just, conflict-free land sustainable manner.

This study is guided by the Stakeholder's theory (ST) which was developed by Freeman in 1984 and the Partnerships theory (Langrafe, Barakat, Stocker, & Boaventura, 2020; Kampamba, Tembo, & Nkwae, 2017; Freeman, 1984). According to the theory, stakeholders can be classified as internal and external (Freeman, 1984). Stakeholders theory has been used to explain the input of the industry (employers) and partners' professional association

s in the development of relevant and important curricula by universities in Botswana (Kampamba, Tembo, & Nkwae, 2017). Similarly, a study survey undertaken by Kampamba, Tembo, and Nkwae (2017) revealed that 36 out of 60 Employers and industry stakeholders were asked to rate the relevance of the real estate curricula that are offered by Universities in Botswana. It was established that these curricula were relevant and met the needs of the industry stakeholders. When universities are developing curricula in the land sector, stakeholders are invited and consulted for input in the design of the curriculum. Universities have industry programme advisory boards (IPAB) that ensures that the proposed contents of academic programmes are relevant and meet the needs of the industry. On the other hand, in registering qualifications and accrediting learning programmes (curricula) that are proposed by universities, Botswana Qualifications Authority also require that the curricula should be endorsed by their respective professional associations and that evidence of a market survey is also submitted before they are approved and registered. By making sure that a qualification passes through all these processes of consultation with the relevant stakeholders, BQA strives to register and accredit quality industry-relevant programmes in Botswana (Botswana Qualifications Authority, 2016).

1.2. Statement of the research problem

In 1996, the government of Botswana commissioned a Vision 2016 Committee (The Republic of Botswana, 2012). Amongst the tasks, was to develop a framework that would guide the country towards prosperity for all. Vision 2016 was conceptualised and implemented in 2000. One of the eight pillars was an educated nation by 2016. Until 2000, the government of Botswana was training some of its people abroad and it realised that it was expensive. The government then considered having its people trained in South Africa, but it was also not financially sustainable until it decided to train most of its people locally by introducing government sponsorship in local private institutions.

The government of Botswana has invested heavily in education by sponsoring students in local tertiary institutions to undertake studies from 2000 to date. The purpose of doing so was to achieve what was envisaged in Vision 2016 "Towards prosperity for all", Pillar 1 being "An educated and informed nation" (The Republic of Botswana, 2012; Adeyemi, 2009; Lekalake, 2016). In furthering its mandate, the Botswana government came up with Vision 2036 "Achieving prosperity for all" and Pillar 1 having a "Knowledge-based economy" (The Republic of Botswana, 2012; Leatame, et al., 2022; Musekiwa & Mandiyanike, 2017). Since the inception of the two Visions, Institutions of Higher Learning (IHL) in Botswana have produced 1,290 (1%) land sector graduates out of 117,544 graduates produced from 2013 to 2022 (Human Resource Development Council, 2015; Human Resource Development Council, 2016; Human Resource Development Council, 2019b; Human Resource Development Council, 2021). It has also developed structures such as Botswana Qualifications Authority (BQA) and Human Resource Development Council (HRDC) that have been put in place to ensure that quality and industry-relevant learning programmes are developed and offered to students (Botswana Qualifications Authority, 2021; Human Resource Development Council, 2021). Amongst interventions that have been put in place but are not effective were the formulation of the Revised National Policy on Youth in August 2010 and the internship programme that was implemented in August 2008 that ensures graduates are equipped with practical skills in the workplace (The Republic of Botswana, 2010a; Powell & Short, 2013). However, the government has not done enough in terms of absorbing graduates that are coming from these tertiary institutions permanently. Though the private sector, non-governmental organisations, and academic institutions are some of the employers of land sector graduates, the demand of 682 cannot match the supply of 1,290 (Human Resource Development Council, 2019a). The result is that a few graduates cannot find sustainable job placement in the labour market. This is evident by the high unemployment rate of 25.40% in the country, 49.55% for a tracer study of the employment outcomes of the vocational training graduates that was undertaken in 2010 (Bolaane, Chuma, Toteng, & Molwane, 2010), and 53% in the land sector as at 2016. This study looked at the status of graduate employment in the land sector and proposed recommendations that can be considered in eliminating the unemployment of land sector graduates.

1.2.1. Purpose of the study

The study looked at the problems that young land sector graduates are facing in finding jobs both in the public and private sectors. The general research objectives of the study were to:

a) Analyse land-related curricula and industrial needs at the national level by establishing profiles that are sought by employers in the land sector.
b) Analyse the personal gaps to be filled for the better professional integration of young land sector graduates by looking at the experience and skills acquired.
c) Identify obstacles to students' socio-professional integration in the land sector and possible areas for reframing land programmes for better integration of graduates; and
d) Propose an economic model for land-related programmes-based end-user needs by looking at causes of shortage or surplus of land agents; the skills that they possess; imbalances in their geographical distribution; shortcomings in performance; and measures to be put in place to address the identified challenges.

1.2.2. Specific research objectives

To achieve the aim of the study, the following specific objectives have been adopted as per the terms of reference:

a) To assess the importance and attractiveness of the land sector in terms of a particular time and over some time.
b) To identify and assess mismatches in the land labour market sector.
c) To assess the capacity of universities and (IHL) institutions of higher learning who produce land experts.
d) To assess the supply by distinguishing between the pool of available land agents, those employed in the land sector, those working outside the land sector, and those unemployed.
e) To analyse the main characteristics of land staff, density, age distribution, skill mix, geographical distribution, emigration distribution, and emigration.
f) To examine the different perspectives of employers and their implications in the land sector; and
g) To assess the demand for land agents

1.3. Study area

The study area is Botswana though most of these institutions of higher learning and employment opportunities are based in Gaborone. In this study, the following regions of Botswana were covered: (i) Southern East District (Gaborone, Tlokweng, Lobatse and Ramotswa) for both employers (47%) and employees; (ii) Southern District (Kanye, Goodhope, Moshupa and Jwaneng) for employers (9%) and employees; (iii) Kweneng District (Molepolole, Thamaga and Mogoditshane) for employers (3%); (iv) Central District (Serowe, Mahalapye, Palapye, Selibe Phikwe, Orapa and Tutume) for employers (15%); (v) North East District (Francistown, Totona and Masunga) for employers (9%); (vi) Ghanzi District (Ghanzi and Charles Hill) for employers (6%); (vii) Kgalagadi District (Tsabong, Hukuntsi, Kang and Werda) for employers (6%), and (viii) other Districts (North -West and Chobe) for employers (6%). The scope of the study covered the above-mentioned districts. We received responses from nine out of the ten the districts were surveyed.

2. Research design and methodology

The study used a combination of desktop research by searching documents that are available for review, and an online survey of employers and employees to come up with the report based on the specific objectives that have been captured above. Information in Table 1 was used in coming up with questions in the two online questionnaires that were created. A survey questionnaire was opted for because it is cheaper, and more information is collected within a shorter period. However, for an in-depth understanding of the problem of unemployment, an interview guide could have been ideal, but it is time-consuming and costly to administer.

2.1. Source of data

The sources of data for this study were based on the specific objectives that are stated above and are captured as follows in Table 1.

Table 1: Design matrix for sources of data

Specific objectives	Source of data	Variables	Indicators
To assess the importance and attractiveness of the land sector in terms of a particular time and over a period	Industry stakeholders (Employers)	Relevance Attractiveness	• Marketability
To identify and assess mismatches in the land labour market sector	Industry stakeholders (Employers)	Gaps	• Shortcomings • Underperformance • Difficulties in carrying out assigned tasks
To assess the capacity of universities and (IHL) institutes of higher learning to produce land experts	IHL and Universities	Competence	• Staff qualifications • Staff establishment • Available resources
To assess the supply by distinguishing between the pool of available land agents, those employed in the land sector, those working outside the land sector, those unemployed	IHL and Universities, and HRDC	Supply of land sector graduates	• Number of students who graduated from institutions from 2013 to date • Number of land sector graduates employed • Number of land sector graduates unemployed
To analyse the main characteristics of land staff, density, age distribution, skill mix, geographical distribution, emigration distribution, and emigration	IHL and Universities Industry Stakeholders (Public and Private)	Demographic attributes	• Number of staff in institutions • Age • Skills of staff • The location where they are based • Movement of staff
To examine the different perspectives of employers and their implications in the land sector	IHL and Universities, Industry stakeholders (Employers)	Views of employers Implications	• Perceptions of Employers about land sector graduates • The performance level of land sector graduates • Prospects of hiring land sector graduates
To assess the demand for land agents	Industry stakeholders (Employers)	Demand for land sector graduates	• Job opportunities available • The attractiveness of land sector graduates to employers

2.2. Study design and sampling methodology

In this study, we adopted the document review analysis by looking at available documents among the stakeholders in the land sector. The documents and open-end questions from the survey for employers and employees were reviewed using content analysis.

Study samples were picked through an online survey circulated to professional membership associations, 1,500 Real Estate, 253 Geomatics, 210 Architects, 150 Quantity Surveyors, 200 Town Planners, and 450 employers countrywide in both the private and public sectors. Purposive and random sampling techniques for stakeholders to determine the status of employment of land sector graduates in the labour market were used. The total population for this study was approximately 2,763 land sector participants. A probability sample of 350 was determined using an appropriate formula for calculating the sample size at a 95% confidence level with a 5% margin of error. This was determined considering the time frame and financial resources available. From the sample size of 350, we obtained 106 online responses from 37 employers and 69 employees representing a response rate of 30% which is within the acceptable range of (5% to 45%) for online surveys. The online survey was adopted as it was the cheapest and quickest way of collecting data across all regions in Botswana within the timeframe that was agreed upon in this research project.

2.3. Data collection

The two questionnaires that were developed were captured using Google online forms. The following two links were used to get the data from employees (Link) and employers (Link). The one for employees was created first and has been running for over three weeks now. Respondents were constantly reminded to fill out the online questionnaire. The one for employers was created after getting their contact details from registration boards and telephone directory for government and parastatals in Botswana dealing with land-related services and has been running for two weeks now. Secondary data was used to provide a context of what the challenges are, the status of curricula, staff skills, and supply and demand of graduates in the labour market of Botswana.

2.4. Data analysis techniques

Data was analysed using content analysis for the documents that were obtained from stakeholders within the land sector to determine the status of employment of graduates. Where appropriate, descriptive and inferential statistics were used where numerical data was obtained from stakeholders.

2.5. Limitations

The possible reliance on the use of a questionnaire could be one of the methodological weaknesses in this study. Mixed methods using face to face interviews would have been ideal though expensive and the fact that we did not have enough time, we were forced to rely on secondary data as well as online surveys for data collection.

3. Findings of the study

The purpose of this study was to analyse the land sector graduate youth unemployment in the labour market of Botswana. In Botswana, a youth is any person between the age of 12 and 35 years (The Republic of Botswana, 2010b; Lesetedi, 2018). This study looked at the challenges that land sector graduate youths have in gaining sustainable paid jobs in the labour market. The general objectives for this study were: (i) Analyse land-related curricula and industrial needs at the national level by establishing profiles that are sought by employers in the land sector; (ii) To analyse the personal gaps to be filled for the better professional integration of young land sector graduates by looking at the experience and skills acquired; (iii) Identify obstacles to students' socio-professional integration in the land sector and possible areas for reframing land programmes for better integration of graduates; and (iv) Propose an economic model for land-related programmes-based end-user needs. The results of the study are presented in the order of the general objectives. These are:

3.1. Analysis of the land-related curricula and industrial needs at the national level by establishing profiles that are sought by employers in the land sector.

Eight (8) land-related curricula were analysed, and it was established that five (5) of them were offered by the University of Botswana, two (2) by BaIsago University, and one (1) by Gaborone University College. It was also noted that eight (8) out of twelve (12) qualifications were degrees as captured in Annexures 1-12. The duration for degree programmes ranged from four (4) to five (5) years, and certificates and diplomas from one (1) to three (3) years. It was also established that most of these programmes have an industrial attachment in years two (2) and three (3) where students are expected to be exposed to industry needs. The durations for such attachment range from two (2) for the University of Botswana programmes to six (6) months for BaIsago University. The profiles that are sought after are fully described in the annexures for the respective curricula. Upon completion of the programme, graduates must be competent to undertake the following (.e.g. real estate programme); (i) Valuations for different purposes; (ii) Carry out feasibility and development appraisals; (iii) Manage investment properties and provide estate agency-related duties; (iv) Conduct market research and establish the target market; (v) Allocate and manage land or housing units in public institutions; and (vi) Apply real estate principles, to solve real estate-related problems.

However, one expects for example real estate graduates to be employed as (i) Property Managers; (ii) estate agents; (iii) Facilities Managers; **(**iv) Property Development Consultants; (v) Property Investment Analysts; (vi) Property Maintenance Managers; (vii) Housing Officers/Estate Officers; (viii) Research

Assistants; (ix) Mortgage Analysts; (x) Property Valuers (xi) Risk Managers; (xii) Portfolio Managers; and (xiii) Land Managers in Public Sectors. These are the different job opportunities that are available to industry needs.

The details of the purpose and employment opportunities are captured in Annexures 1 to 12.

3.1.1. Assessment of the importance and attractiveness of the land sector in terms of a particular time and over some time.

In establishing the importance and attractiveness of the land sector in comparison with other sectors, it was noted that most of these curricula are professional programmes where graduates end up forming their own firms to provide services to the country. Such entrepreneurship attributes are predominantly noticeable in the land sector graduates compared to other sectors. So far upon looking at various professional registration councils in Botswana that regulate land sector graduates, we noticed that there are 120 registered Real Estate firms in Botswana. There are also 101 registered Architectural firms, 57 registered Quantity Surveying firms, about 100 registered Land Surveying firms, 80 registered Town Planning firms, and over 100 registered construction companies. This is what makes the land sector important and attractive as it is also one of the major contributors to the gross domestic product (GDP) of the country. In 2019 the services sector contributed 62%, while 3% came from agriculture and 32% from the industry sector (Statistics Botswana, 2020). From the above figures, it shows that the land sector is actively involved in economic development as an employer as well as a service provider. This is another form of entrepreneurship that is meant to sustain the livelihood of the land sector graduates by operating their own firms. Respondents were also asked if the programmes that they graduated from were important and attractive. It was noted that the majority (70%) believed that the programmes were important and attractive, and the minority (30%) do not believe so. It might be attractive due to the fact that when one set up a small enterprise the amount of money one realises is the cause for choosing this profession. Furthermore, for those employed by the government are also paid 30% scarce skills allowance in addition to their salaries. The starting salary for those employed in government might range from P8,919 to P12,138 per month unlike the one in private sector ranging from P1,500 to P5000.00 per month. One of the reasons for those who believe the land sector not attractive could be the lower salaries that are offered in the private sector.

The importance of the land sector cannot go unnoticed as land is an essential good and a factor for production as well as an asset where to live. To promote good land governance, the input of all land sector professionals is very important. It is also important to note that most of the land sector professionals were attracted to pursue their careers in these programmes because of the advantages that they offer to individuals such as the provision of consultancy services as well as competitive salaries offered by government, parastatals, and non-governmental organisations. In assessing the importance of the programmes, the respondents were asked if there is demand for the programme in the industry and the majority (62%) of them said yes whereas the minority (38%) did not believe there is demand for the programme. This is in line with what has been stated in the 2019 HRDC report of top occupations in demand where these programmes have been captured (Human Resource Development Council, 2019a).

3.1.2. Assessment of the capacity of universities and (IHL) institutes of higher learning who produce land experts.

In establishing the capacity of universities, the following indicators were used. These were staff qualifications, their establishment, and available resources. It was also noted that in the case of universities, the qualifications of staff varied based on the type of institution public or private. In the case of the University of Botswana, a publicly owned institution the minimum qualification to teach an undergraduate course is a Doctorate degree even though there were very few members of staff with master's degrees. It was noted that across the five academic programmes that are offered at the University of Botswana, there are a total of 28 employees, and out of that 15 (54%) members of staff have doctorate degrees and 13 (46%) have master's degrees. On the other hand, the total number of members of staff in private institutions is 36, and out of this number 3 (8%) have doctorate degrees, 30 (84%) have master's degrees, and 3 (8%) have bachelor's degrees. It was also noted that out of the 15 with Doctorate degrees, three (3) of them were Full and Associate Professors at the University of

Botswana. From the above results, we conclude that the University of Botswana is highly resourced in terms of qualifications of staff teaching undergraduate courses compared to private institutions. This could be attributed to the fact that most of the land sector programmes that are offered are at honours degree level. This finding also relates well with what Leatame, et al. (2022) noted in their study that staff from the University of Botswana are much more experienced and have higher research output than their colleagues in private universities. The reason could be attributed to the quality assurance and management principles that are put in place. In terms of lecturer-student ratios, we noted an average student ratio of 22 for the University of Botswana and 46 for private institutions. This means that staff in private universities spend more of their time on teaching than on research. This could also be attributed to the level of qualifications which make it difficult for them to undertake research activities. The employee respondents were also asked to indicate if members of the academic staff were qualified to teach courses in their programmes. The majority (91%) of them believe staff are qualified to teach courses and the minority (9%) are of a different view. The reason for their disagreement could be those members of staff who are teaching in programmes that they do not qualify to teach.

In terms of their establishment, the University of Botswana has five (5) lecturers for Real Estate, six (6) lecturers each for both Geomatics and Urban and Regional Planning, eight (8) lecturers for Architecture, and three (3) Construction Engineering Management. On the other hand, BaIsago University has thirteen (13) for Quantity Surveying, and six (6) for Real Estate while Gaborone University College has eighteen (18) lecturers for the Technology in Construction Engineering. The majority (52%) of the respondents do not agree that the programmes have enough staff to teach the courses whereas the minority (48%) believe so.

In terms of resources, it was also noted that the University of Botswana has a complex of four buildings comprising the three-storey faculty staff offices and lecturer rooms (Building 248), a two-storey studios and computer laboratory (Building 249) for Architecture and Planning, two storey Mechanical Engineering workshops and computer laboratories (Building 250) and lastly, a two-storey building for Civil Engineering workshops and laboratories (Building 251). In terms of private institutions, programmes have not been assigned buildings and instead, they just use what is available within their premises. We thus noted that the University of Botswana is more highly resourced than its counterparts in the private sector. The principal reason is that the University of Botswana is funded by the government of Botswana whereas individuals fund private institutions. However, in terms of sponsorship for their students, both University of Botswana and Private Universities' students are sponsored by the government of Botswana. From the results of the survey, the majority (61%) believe universities have enough resources to run the programmes whereas (39%) do not think so.

3.1.3. To analyse the main characteristics of land staff, density, age distribution, skill mix, geographical distribution, emigration distribution, and emigration.

In terms of age, it was noted that the majority (80%) of the University of Botswana members of staff were 40 years and above and a minority of (20%) were below the age of 40 years. This was established by looking at their number of years in terms of work experience. As for the private universities, the opposite was the case. There were very few (20%) who were above the age of 40 and the majority (80%) of their lecturers were below the age of 40 years. This also implies that the University of Botswana's lecturers are more experienced in the field of the land sector than their counterparts in private universities. From the profiles (Annexures 1-12) that we looked at, it was also established that most of the academic staff were trained abroad. In terms of prior experience in teaching and research, some of them have taught and done research in foreign countries.

It was also noted that lecturers at the University of Botswana are more skilled than those in private universities. This is attributed to the highest level of qualifications that they have. It was noted majority (84%) of the lecturers at the University of Botswana have Doctorate degrees compared to (16%) of their counterparts in private universities. Most of the members of staff at the University of Botswana have qualifications relevant to the specific programmes that they teach unlike in private universities where some of the lecturers are teaching in programmes that they do not have qualifications in. This finding implies that the quality of programmes is compromised, and it affects the quality of graduates that are

produced for industry. It was also noted that looking at the student-staff ratio, private institutions are the leading producers of graduates.

We also noted that most of the members of staff for both the University of Botswana and private universities are in Gaborone. This is because Gaborone is the capital city of Botswana with a total student population of 56,666 in 2020 (Statistics Botswana, 2020) and the major economic activities take place in this city. This is in line with what Kampamba, Kachepa, and Seketeme (2022) noted in their study that 30% of the city's population in Gaborone are students.

The movement of members of staff is two-way. Of late some former employees of the University of Botswana have joined private universities and very few from private universities have been employed by the University of Botswana.

In terms of the number of employers, the survey revealed that minority of the respondents (44%) work in the private sector while the majority (56%) work in the public sector and parastatals. Most of the respondents (62%) were males and the minority (38%) were females. The survey also revealed that (65%) of the respondents possess bachelor's degree, (21%) have Master's degree, (12%) have Doctorate degrees and (2%) have diplomas. Most of the respondents (51%) are 36 years and above whilst the minority (49%) are youths. In terms of work experience, (76%) have 6 years and above and the remaining (24%) have less than 6 years. It was also noted that most respondents (47%) were in real estate field of practice, followed by (27%) in construction, (8%) Architecture as well as Quantity Surveying, (5%) Geomatics and (3%) Town Planning and Information, Communication and Technology (ICT). The results also revealed that the number of employees that were employed in small to medium organisations (1-50 employees) were 75% and those in large organisations (51-500) were 25%.

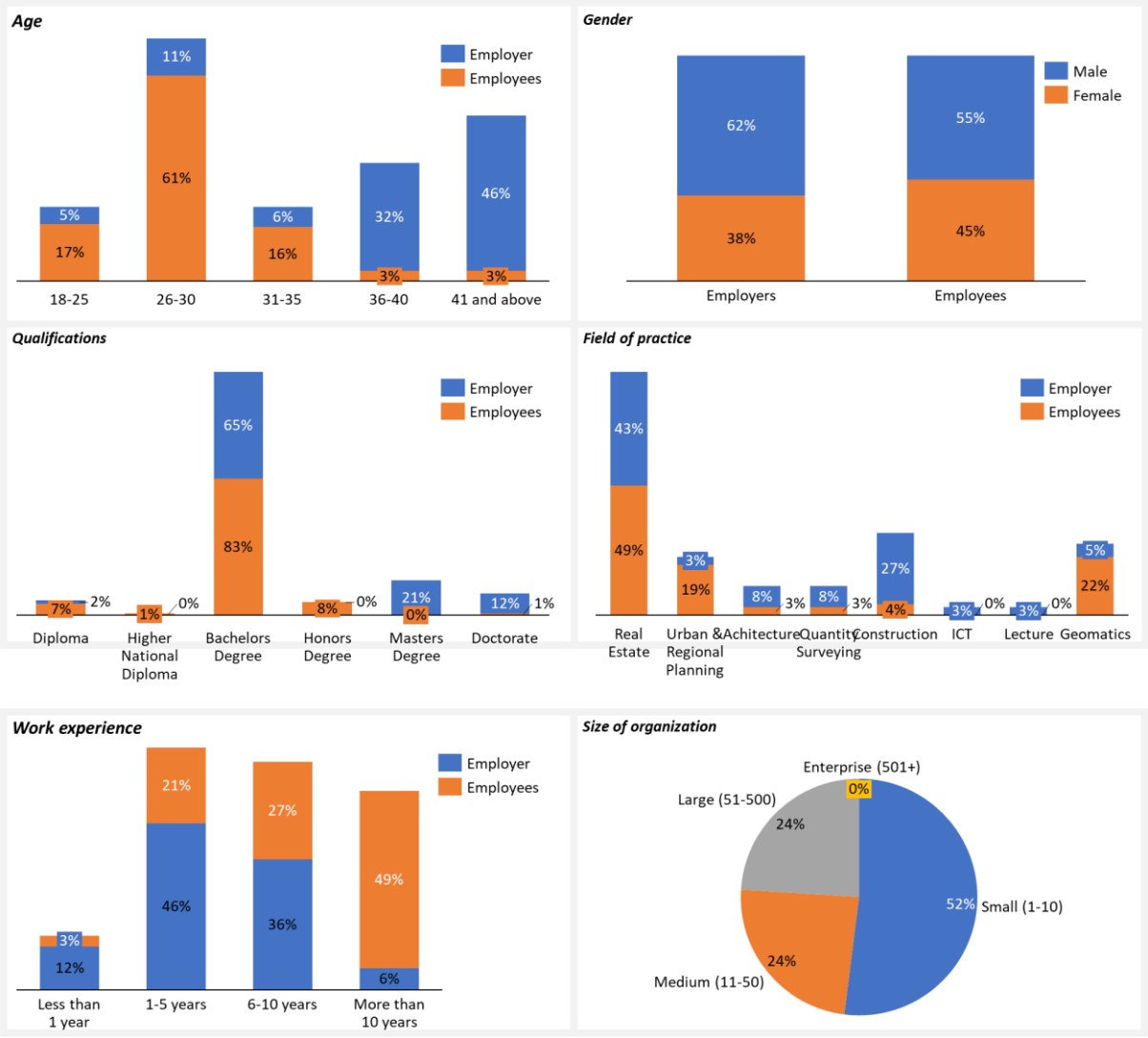
On the other hand, in terms of the number of employees that participated in the survey, it was established that most of the respondents (54%) work in the private sector while the minority (37%) work in the public sector and parastatals, and (9%) work in non-governmental organisations (NGOs). This result implies that the major employer for land sector graduates is the private sector even though the salaries that they are paying their employees are lower than those paid by government. Most of the respondents (55%) were males and the minority (45%) were females. The survey also found out that (83%) of the respondents possess bachelor's degree, (7%) have honours degree, (9%) have Diplomas and Higher National Diplomas and (1%) has a Doctorate degree. Most of the respondents (94%) are youths (18 -35 years old) whilst the minority (6%) are 36 years and above (baby boomers). In terms of work experience, (94%) have 1- 10 years and the remaining (6%) have more than 10 years' work experience. It was also noted that most respondents (39%) were in real estate field of practice, followed by (21%) Land Surveying, (19%) Architecture and Town Planning, (2%) Quantity Surveying, (6%) construction as well as others, and (3%) academia. The results also revealed that majority of the employees (74%) were trained from the University of Botswana, (25%) from BaIsago University and (1%) from Gaborone University College of Professional Studies.

If we look at the age profile of employers and employees in Table 2: Demographic characteristics of employers and employees, most employers are baby boomers while most of the employees are youths. Most of the surveyed youths are also employers which is in contrast with the youths who participated in the survey as employees. In terms of sector of operation, almost half of the employers that participated in the survey were from the private sector and most of the employees who participated in the survey were also employed in the private sector. It was also noted that there is gender inequality in the land sector as it is dominated by both male employers and employees ($df(1)_{0.05}$, X^2 =8.87>3.84; 0.003), and that most of them (employers and employees) were degree holders ($df(5)_{0.05}$, X^2 = 23.73>11.07; 0.0002). Most of the respondents who participated in this study were from the real estate field of practice ($df(6)_{0.05}$, X^2 = 21.97>12.59; 0.0001).

3.2. Analysis of the personal gaps to be filled for the better professional integration of young land sector graduates

In addressing this objective, two indicators were used which are experience and skills acquired during their training period at universities. For experience, the Botswana government internship programme is used to ensure that young graduates are attached to relevant organisations for two years. This meant for equipping young graduates with practical skills that are relevant to their field of specialisation as way of filling in the personal gaps that exist. In terms of skills, universities are tasked with the role of providing programmes that develop the skills of young land sector graduates. According to the results of the survey, the majority (74%) of the respondents were employed and the minority (26%) were unemployed. The results of this survey are also in agreement with the national unemployment rate of 26% for Botswana (World Bank, 2023; The Republic of Botswana, 2023a). The majority (83%) of the respondents also rated their performance at work as good and very good and the minority (17%) of them as fair and poor. The personal gap is noted in those who rated their performance as fair and poor as illustrated in Figure *1*. Though the results are impressive (41%), there are still some graduates (59%) that cannot perform at work due to personal gaps in what they were taught and what they are required to do at work.

Table 3: Demographic characteristics of employers and employees



Most (78%) of the respondents also believe that they are working in a relevant field that they were trained in at the university and (22%) believe that they are working in a field that is not relevant to their

training. This result is also perceived as a personal gap for those working in a field that they were not trained in, as there are chances that they will struggle in performing their assigned duties.

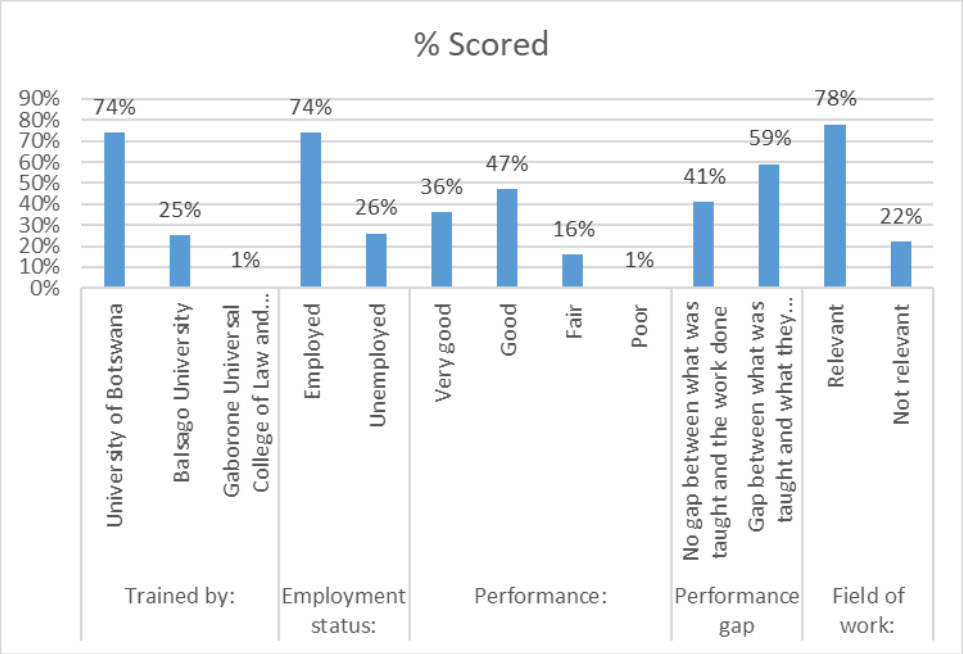


Figure 1: Details of personal gaps

3.2.1. Identification and assessment of mismatches in the land labour market sector.

The study has revealed a mismatch between the knowledge, skills, or competencies acquired through education or training and the practical application of those skills in a professional work environment. According to the study, the responses from employees in the land sector reveal that the majority (60%) of employees believe that their job responsibilities differ from what they were taught and the minority (40%) of the employees were of the view that there was no gap in their expertise. The implications of this finding are that their education and training acquired are not appropriate for the tasks they perform in their professional roles within the land sector while others believe that their formal education effectively prepared them for their jobs in the land sector. The analysis of employee responses shows that despite the existence of a perceived gap between what employees were taught and their job responsibilities in the land sector, most employees indicated that they were not disadvantaged by this gap. This implies that even while they are aware of the gap between their formal education and the actual duties of their jobs, they do not perceive it as hindering their performance in the workplace. However, it is still imperative to continually review and assess educational programmes to ensure their relevance to market demands.

Employees expressed a disparity between knowledge and skills learnt in universities and the level of intensity and complexity of the work they are assigned in the workplace. They highlighted that certain modules within the curriculum such as Engineering Survey, Map Making, GIS and AutoCAD were shallow and failed to adequately address the specific demands of the work environment. A Geomatics professional remarked, "*there is intense knowledge of engineering survey that wasn't part of the curriculum at university"*. Another respondent from the same profession emphasized that "*most of the courses offered prioritize Geomatics topics and overlook the essential business aspects of the profession such as business management and marketing of professional services*". This implies a lack of entrepreneurial focus within the teaching and learning system. Furthermore, two Real Estate professionals noted that the university curriculum lacked exposure to various sub-sectors within the land sector.

Employees in the land sector noted that there exists a theory-practice gap within the school curriculum. They highlighted that the school curriculum lacks practical training, which fails to prepare them for the demands of their actual job. The existence of a deficiency in professional development and support system also implies a gap within the land sector. One respondent from the Real Estate profession expressed a concern about the *"lack of proper mentorship"*. This suggests that employees in this field felt a lack of mentorship programmes that would allow them to learn from experienced professionals, which hinders their professional growth. Similarly, a Geomatics professional highlighted that "associations are not playing vital roles." This statement raises concerns about the level of involvement and contribution of professional bodies within the land sector.

Land sector employees identified a challenge in accessing and utilizing property data within their workplaces. They emphasized a lack of software that would enhance productivity and enable them to efficiently complete their assigned tasks. A professional in the field of Land Surveying stated that destroyed national reference marks impends their ability to carry out assigned tasks effectively. Furthermore, both public and private offices lack readily available data which worsens the challenges faced by employees in the land sector.

The analysis of the employers' questionnaire indicated that most employees are considered competent to perform the work assigned in their workplace. However, some employers were of the view that while employees are mostly competent, they require practical training and mentorship before fully assuming accountability for work activities. An employer in the field of construction stated, "*They need proper post graduate training at least two years before becoming fully accountable for their work activities*". This implies that employers believe that additional practical training and mentorship is necessary for employees to gain the experience and skills needed to take on full accountability in their work.

3.2.2. Relevance of curricula offered by institutions of higher learning (IHL)

Employers were asked to rate the relevance of core courses of the land sector programmes on a Likert scale of 1 (Not relevant) to 4 (Very relevant). In scoring the responses, a scoring criterion was developed as follows: (i) Not relevant for scores $X \leq 1.49$; (ii) Less relevant for scores between $1.5 \leq X \leq 2.49$; (iii) Relevant for scores between $2.5 \leq X \leq 3.49$; and (iv) Very relevant for scores $X \geq 3.5$. The competencies, knowledge, and skills of the land sector graduates in the professions were rated and scored as follows: The overall mean scores (OMS) for Architecture (3.5), Real Estate (3.4), Geomatics (3.4), Quantity Surveying (3.6), Construction Engineering Management (3.3), Urban and Town Planning (3.4), and soft skills (4.3) were relevant to very relevant. This implies that the curricula are relevant, and addresses needs of the industry as outlined in Table 3. For example, the attributes of knowledge, competences, and skills in the real estate industry that were rated and scored include the following: (i) Market research and analysis (3.4); (ii) Property valuation and appraisal (3.4); (iii) Negotiating and deal-making (3.4); (iv) Property management and leasing (3.4); (v) Real estate finance and investment analysis (3.1); (vi) Knowledge of local regulations and laws (3.3); and (vii) reporting writing (3.5). The results imply that the attributes of the real estate curriculum are relevant. It is also noted that the report writing attribute scored the highest. The reason is that real estate professionals spend most of their time preparing valuation reports, and other reports for different stakeholders.

As for quantity surveying, these were rated and scored as follows: (i) Cost estimation and budgeting (3.8); (ii) Tendering and procurement processes (3.7); (iii) Quantity take-off and measurement (3.8); (iv) Contract administration and management (3.6); (v) value engineering and cost control (3.4); (vi) knowledge of construction contracts and laws (3.6); and (vii) Report writing (3.6). In quantity surveying employers believe cost estimation and budget as well quantity taking off are very relevant based on the highest score and value engineering and cost control were lowly scored implying that much as it is relevant emphasis is placed on measurements and cost estimation.

Responses for Urban and Regional Planning were rated and scored as follows: (i) Land use planning and zoning regulations (3.7); (ii) Urban design principles and spatial analysis (3.7); (iii) Transportation planning and infrastructure development (2.8); (iv) Environmental Impact Assessment (3.3); (v)

Community engagement and stakeholder management (3.3); (vi) Policy development and implementation (3.0); and (vii) Report writing (3.7). Much as all the attributes are relevant, they still believe that land use planning and zoning regulations, urban design principles and report writing should be given much attention as they were scored very high.

In the field of construction, the attributes were rated and scored as follows: (i) Construction project management (3.4); (ii) Construction methods and techniques (3.4); (iii) Construction scheduling and resource allocation (3.2); (iv) Healthy and safety regulations and practices (3.2); and Report writing (3.4). As far as construction is concerned most of the attributes of knowledge and skills were rated highly. This implies that they are all relevant in the field of construction, however, emphasis is placed on construction methods and techniques, report writing as well as construction project management. This is reflected in the processes that they are involved in during the construction period.

As for Geomatics, the attributes were rated and scored as follows: (i) Geographic information systems (GIS) and remote sensing (3.5); (ii) Surveying and mapping techniques (3.3); (iii) Geospatial data analysis and interpretation (3.6); (iv) Cartography and Visualisation (3.1); (v) Spatial database management (3.6); and (vi) Report writing (3.3). Attributes and competencies for Geomatics were scored highly implying that they are all relevant in performing the tasks that are assigned. Much as engineering survey was one of the gaps that was noted by employees, strangely though relevant, it is not one of the key competences that are required in the field. They placed much emphasis on Geographic information systems (GIS) and remote sensing, geospatial data analysis and interpretation as well as spatial database management. This result implies that there is a move from the traditional land surveying practices to GIS and remote sensing.

Responses for soft skills which apply to all the professionals were rated and scored as follows: (i) Communication (3.6); (ii) Collaboration and teamwork (3.6); (iii) Problem solving (3.6); (iv) Adaptability (3.5); (v) Attention to detail (3.6); (vi) Professional ethics (3.6); and Teamwork (3.6). All the respondents agree that soft skills are very important and were scored very high meaning they are very relevant in the land sector for graduates.

Employers in the land sector further disclosed the specific skills they seek when hiring. They include a combination of soft skills, and technical skills. The study revealed that employers across all professions (Architecture, Real Estate, Quantity Surveying, Construction, Geomatics, and Urban and Regional Planning) considered all the skills to be relevant in their respective professions as their mean scores for each skill were above 2.5 out of 4, further supporting their significance in the land sector.

3.3. Identify obstacles to students' socio-professional integration in the land sector and possible areas for reframing land programmes for better integration of graduates

One of the obstacles to students'socio-professional integration is the stringent registration and licencing requirements by various professional associations where these young land sector graduates affiliate themselves. For example, for one to practice in the field of real estate, it is a requirement that such a graduate must spend two years of their work on probation with a mentor after having studied real estate at a university for four years. The purpose of this requirement is to ensure that such a graduate has acquired enough work experience to perform duties with minimal supervision. This is also applicable in other professional fields in Botswana. The challenge is that some young land sector graduates might not pass the professional examinations that are set to become full members of their professional associations because the failure rate is high. This was validated by a response from one of the respondents and he said that "*REIB professional examinations are irrelevant as they are given mathematics and accounting questions that are irrelevant to their programme and field hence high failure rates"*.

The other obstacle is that, if you are unemployed, you cannot become a probationer member of a professional association because this is meant for those who are working so that they learn the job whilst working. For those not working they are not likely to be integrated in their professional associations

though they are qualified. Even for those who are employed one of them noted that "*there are deficiencies in their professional development and support systems*". They believe that professional associations are not playing vital roles in as far as integration is concerned. To this challenge of licensing procedure, one respondent noted that "*registration…is frustrating as it takes a long time to be examined as well as graded*". This is frustrating as it affects progression as well. In addition to this concern, one respondent also noted that "*there are stiff barriers to entry in the industry".* On the other hand, one respondent said that *"The Real Estate Professionals Act of 2003 calls for real estate professionals particularly in management, valuation and auctioneering to be only degree holders and he believe this makes the industry less attractive and contributes to the influx of fly-by-nights unregistered professionals".*

There is a provision for integration of students into professional associations during their tenure at the university. Once they are done with their studies, they then cease to be student members of the professional associations. The other challenge is that students' membership fees are also unaffordable thus forcing most of the students not to apply for integration into the profession.

In reframing land sector programmes, some universities apply for group professional student membership just as a way of encouraging upcoming land sector graduates to be integrated into the system at an early stage. On the issue of probationer examinations, the South African Council for Property Valuers conduct work schools for the candidates just as a way of improving their pass rate and quick integration of their land sector graduates.

Table 4: Relevance of the curricula taught in different universities (see annexure 13)

Score criteria used in assessing relevance of skills	Decision
For scores $X \leq 1.49$	Not relevant
Fore scores between $1.5 \leq X \leq 2.49$	Less relevant
For scores $2.5 \leq X \leq 3.49$	Relevant
For scores $X \geq 3.5$	Very relevant

	Skills	Overall Mean Score
Architecture	• Architectural design principles and software proficiency • Building codes and regulations • Sustainable design and green building practices • Construction materials and techniques • Project management and coordination • Communication and presentation skills • Report writing	3.5 (Very relevant)
Construction	• Construction project management • Construction methods and techniques • Construction scheduling and resource allocation • Health and safety regulations and practices • Report writing	3.3 (relevant)
Geomatics	• Geographic Information Systems (GIS) and remote sensing • Surveying and mapping techniques • Geospatial data analysis and interpretation • Cartography and visualization • Spatial database management • Report writing	3.4 (Relevant)
Real Estate	• Market research and analysis • Property valuation and appraisal • Negotiation and deal-making • Property management and leasing • Real estate finance and investment analysis • Knowledge of local regulations and laws • Report writing	3.4 (Relevant)
Urban and Regional Planning	• Land use planning and zoning regulations • Urban design principles and spatial analysis • Transportation planning and infrastructure development • Environmental impact assessment • Community engagement and stakeholder management • Policy development and implementation • Report writing	3.4 (Relevant)
Soft Skills	• Communication • Collaboration and teamwork • Problem solving • Adaptability • Attention to detail • Professional ethics • Teamwork	3.6 (Very Relevant)

The other solution is to follow what South Africans have done. There is a separate institute for estate agents and another one for property valuers. A similar response from one respondent who suggested that "*decentralise the real estate programmes to stand on their own e.g., diploma in property management, diploma in property valuation etc to encourage integration of fly by nights to align themselves with industry standards and eventually become licensed professionals".* This helps upcoming land sector graduates to choose their professional pathway and developmental growth.

3.3.1. To examine the different perspectives of employers and their implications in the land sector

Employers were asked on their perceptions relating to land sector graduates. One aspect that they perceived was the theory-practice gap emanating from training institutions. Though most of them believe the institutions are providing sufficient training, others thought the "*students needed more practical exposure. They need to do more practice in valuations, and the different scenarios they need to be exposed to development projects and understand the different stages as well as the decision-*

making matrix". Another respondent pointed that *"fresh graduates need a lot of guidance to catch up with industry. It is doable".* The other respondent also noted that *"it is critical for the training institutions to work with companies/employers to secure proper post graduate training. He further noted that the institutions can also do follow up to see if the students are getting relevant training".* The point being raised is that there should be a provision for feedback from employers on industrial training.

Employers were also asked to indicate the skills and competences that some land sector graduates are lacking in the workplace as illustrated in Table 5. They categorised the skills into two being soft and technical. In terms of soft skills, most of them believed that land sector graduates lacked communication skills, interpersonal skills, problem solving skills, negotiation skills, lack of professional ethics, failure to adapt to new environments, lack of self-assertion and motivation, failure to deliver assigned work timely, lack of confidence and attention to detail. On the other hand, they also noted the following technical skills as lacking. These are selling skills, market research and analysis skills, survey computation skills and GIS software skills, analytical skills, report writing skills, cost estimation and budgeting skills, contract administration and management skills, construction scheduling and resource allocation skills. From the above, it is evident that employers perceive some land sector graduates as lacking in technical and soft skills. This has implications as they are unable to deliver the tasks that have been assigned to them on time. The result is that end users and customers are inconvenienced because of some land sector graduates who cannot deliver timely due to lack of technical and soft skills.

Table 5: Skills and competences that employers feel employees are lacking

Name of Programme	Technical skills lacking in employees	Soft skills lacking in employees
Architecture	• Knowledge of policies • Land zoning and regulations • GIS systems	• Communication skills • Problem solving skills • Collaboration and team works
Construction	• Contract administration and management • Construction scheduling and resource allocation • Report writing • Professional ethics	• Negotiation skills • Problem solving skills • Team work
Geomatics	• Professional ethics • Survey computations skills • GIS skills and software	• Adaptation to remote environment
Real Estate	• Selling skills • Research and analytical skills • Professional ethics	• Interpersonal skills • Problem solving skills • Team work • Communication skills • Professional etiquette • Analytical skills • Self motivation • Attention to detail
Quantity Surveying	• Professional ethics • Report writing • Cost estimation and budgeting • Producing interim valuation • Computer skills	• Problem solving skills • Adaptability
Urban and Regional Planning		• Timely delivery

Some employers perceive land sector graduates as incompetent. They believe that some graduates are not ready to take up employment and perform according to expectations. One of the employers had this to say "*graduates seem to be very dependent …… They are very entitled in the beginning, without measuring their own input they expect to be paid for learning instead of delivery or output".* The attitude of some land sector graduates in the workplace is not professional but that of entitlement hence unable to make it in the labour market. They also believe that it is very difficult to find the right employee with relevant work experience for the job as well as would be required by client tender requirements.

3.3.2. To assess the demand for land agents

According to Human Resource Development Council (2019), the forecasts for the demand for Real Estate professionals in 2019 were estimated to be 632 in 2019, indicating a significant demand for employees in this land sector. This suggests that there is a positive outlook for employment opportunities in the real estate industry even though on the ground it does not look like that. However, the demand for Architects, Planners, and Surveyors in 2019 was projected to be -230, indicating a negative demand meaning there is an oversupply of graduates in this category. This implies a potential surplus of professionals in these fields, meaning that the supply of individuals with these skills exceeds the demand from the industry. Similarly, the demand for construction workers in 2019 was estimated to be -315, which represents the lowest demand among professionals in the land sector. This negative demand indicates a potential oversupply of construction workers in Botswana during this period. These forecasts highlight a contrasting demand pattern within the land sector. While there is a significant demand for Real Estate professionals, there appears to be an imbalance in the supply and demand for Architects, Planners, Surveyors, and construction workers. It is this imbalance that drives the private sector growth. Because of the attractiveness of the land sector, professionals are forced to operate small and medium sized businesses for them to survive on if they are not engaged in formal employment.

3.4. An economic model for land-related programmes-based end-user needs

The economic model was developed based on the supply of graduates and the forecasted demand for top occupation in demand (Human Resource Development Council, 2019a). In this model it is believed that supply is influenced by demand for the professionals in the labour market. From the model, we note that the model is significant as 60% of the variation in the supply of land sector graduates is explained by the projected demand for professionals in the land sector. In this model, supply is regarded as a dependant variable and forecasted demand for professionals over 11 years as the independent variables. The model seeks to explain the perceived economic relationship between supply and demand of land sector graduates in the labour market. It has also been noted that all the independent variables have no significant impact on supply as their p-values are above 0.05. However, the implications of the results are that the cost of labour are now cheaper than before when the demand for land sector graduates was high. This could be the reason why private sector are paying so cheaply for the cost of labour due to the oversupply of graduates in the labour market.

The formula for the model equation is Y (supply of graduates in the land sector) = $a + b_1x_1 + b_2x_2 + b_3x_3$

Where:

a = intercept;
b_1-b_3 = regression coefficients;
x_1 = forecasted demand for real estate;
x_2 = forecasted demand for Architects, Town Planners and Surveyors; and
X_3 = forecasted demand for Land surveyors and earth Engineers at 95% confidence level.
From the results in Table 6, the model equation is as follows:

$Y = -115.01 - 0.19x_1 - 1.88x_2 + 1.76x_3$

Using the parameters in 2013, the supply for this model is 68 and not 62 as illustrated in Table 7. The discrepancy is attributed to the error term within the model as well as the 60% variation that is explained by the independent variables in the model.

Table 6: Economic multiple regression analysis model

SUMMARY OUTPUT							
Regression Statistics							
Multiple R	0.86						
R Square	0.73						
Adjusted R Square	0.60						
Standard Error	41.77						
Observations	10						
ANOVA							
	df	*SS*	*MS*	*F*	*Significance F*		
Regression	3	28,542.55	9,514.18	5.45	0.04		
Residual	6	10,467.45	1,744.58				
Total	9	39,010.00					
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Comments*
Intercept	- 115.01	1,023.59	- 0.11	0.91	- 2,619.64	2,389.63	
Total Demand forecasted for Real estate over 11 years	- 0.19	1.08	- 0.18	0.86	- 2.84	2.45	***Insignificant***
Total forecasted demand for Architects, Town Planners and Surveyors for 11 years	- 1.88	1.84	- 1.02	0.35	- 6.38	2.62	***Insignificant***
Total forecasted demand for Land Surveyors and Earth Scientists for 11 years	1.76	1.42	1.24	0.26	- 1.71	5.22	***Insignificant***

3.4.1. An assessment of the supply by distinguishing between the pool of available land agents, those employed in the land sector, those working outside the land sector, and those unemployed.

The supply and demand of land sector graduates over a period of 11 years is displayed in Table 7. The forecasted demand for the three groups is also captured in Table 7. It was important to note that the total supply of land sector graduates is about 1% of the total graduates that have been produced over a period of 11 years. So far, 1,290 land sector graduates have been produced by the three institutions out of 117,544 that were produced during this time. It is also noted that there is still forecasted demand for real estate graduates compared to other land sector graduates such as Architecture, Town Planning, and Surveyors. According to Human Resource Development Council (2019) there were 404 unemployed graduates in Architecture, Town Planning and Surveying in 2005/2006 and this number increased to 682 in 2015/2016. The reason for this could be that since the programmes have been in existence for more than 20 years unlike real estate which started in 2011, the market could be flooded as it is small. From the results of the survey, it was noted that 10% of the respondents were working outside the land sector and 26% were unemployed. We can also conclude that 682 out of 1290 were still recorded as unemployed as at 2016 (Human Resource Development Council, 2019a). This translates to 53% unemployment rate in the land sector particularly for Architects, Planners, and Surveyors.

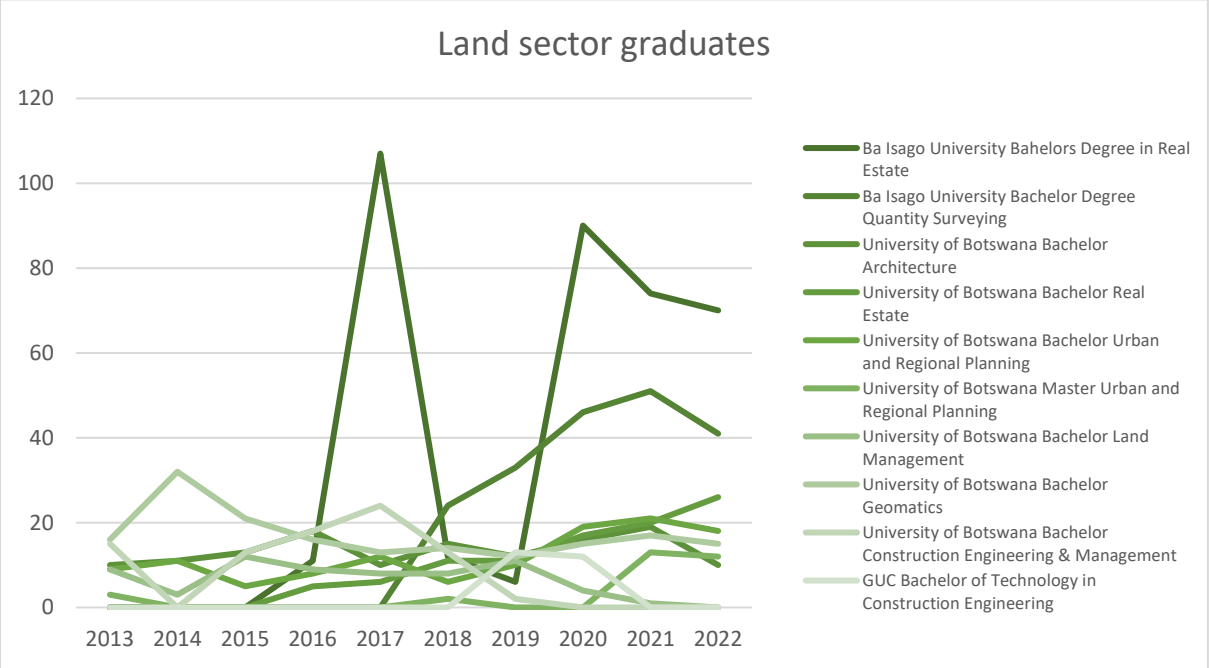
3.4.2. An analysis of the causes of shortage or surplus of land agents

The causes of shortages or surpluses of land agents in the sector can be attributed to various factors. According to analysis of responses from the employee questionnaire, the main cause for a surplus of land agents is the limited job opportunities available in the sector. A Physical Planner responded, stating, *"Government is the major recruiter and is currently closed for recruitment".*

This suggests that a lack of recruitment activities by the government, who is a major employer in the land sector, contributes to the surplus of land agents. Additionally, employees in the land sector perceive their profession to exist in a flooded market, resulting in a surplus of professionals. A real estate professional expressed that there is a lack of diversity in terms of opportunities the market provides. This implies that the industry may be saturated with a high number of professionals relative to the available job opportunities.

The oversupply of land agents in the land sector is because of the excessive production of graduates. When employees were asked about their perception of whether universities have produced an excessive number of graduates in the land sector, 54% of respondents agreed, indicating that they believe there has been an overproduction of graduates.

Table 7: Supply of land sector graduates



Source: (BaIsago University, 2023; Gaborone University College of Law & Professional Studies, 2023; The University of Botswana, 2022; Human Resource Development Council, 2019a; Human Resource Development Council, 2016; Human Resource Development Council, 2019b; Human Resource Development Council, 2021; Human Resource Development Council, 2015)

In contrast, 46% of respondents expressed a contrary opinion. A real estate professional remarked that there are *"Too many graduates from BaIsago University".* The presence of many graduates in the real estate sector indicates a mismatch between the supply of graduates and the demand for land agents in the sector. Moreover, the oversupply of graduates can be caused by the capacity of universities and staff members. This implies that many students were enrolled in private institutions, hence producing many graduates over a period of 11 years.

Furthermore, most employees have expressed their concerns regarding the unattractiveness of the land sector profession, mainly due to low remuneration. The prevalent issue of inadequate compensation may result in a potential shortage of professionals. This shortage of skilled workers has a direct impact on employee productivity and workload. A real estate professional highlighted the consequences of this shortage by stating, *"There are not enough employed hence one can be tasked to manage 800 properties."* The presence of strict barriers to entry into the land sector professions contributes to the shortage of professional land agents. The requirements and procedures involved in the registration process, entry examinations, and obtaining support from professional bodies often pose challenges for individuals aspiring to be licensed. An employee respondent from the Surveying profession stated, *"Registration is frustrating as it takes a long time to be examined"*. These barriers limit the number of professionals who can obtain the necessary licenses, leading to a shortage in the industry.

3.4.3. An assessment of the skills possessed by land sector graduates.

In assessing the skills possessed by land sector graduates, employers were asked, "What are the key skills employers look for when hiring in the land sector?" Employers in the land sector disclosed the specific skills they seek when hiring, which encompass a combination of soft skills, technical skills, and cognitive skills. This indicates that employers value a well-rounded skill set in graduates in the land sector. In the field of Architecture, employers seek land sector agents who possess technical skills such

as marketing, design, draughting (drafting), contract administration etc. This indicates that employers in Architecture value employees who have expertise in various aspects of architectural practice. Additionally, employers in the Geomatics profession require land agents who have a combination of soft skills, such as strong communication skills, and technical skills, including land surveying and GIS (Geographic Information System). Furthermore, the profession often requires employees who can work in remote areas. This suggests that in the Geomatics profession, adaptability, and the ability to work effectively in challenging environments are highly valued as illustrated in Table 8.

Table 8: List of skills considered when hiring employees

Name of Programme	Technical skills	Cognitive and soft skills
Architecture	• Architecture, marketing, design, draughting, contract administration, knowledge of policies and information technology	• Experience
Construction	• Construction technology, design skills, cost planning and administration, contract practices and administration, project management, claims administration, dispute resolution and knowledge of policies and laws	• Honesty, reliability, adaptability, communication and negotiation
Geomatics	• Land surveying and map reading	• Adaptability
Real Estate	• Land administration, selling, market analysis, report writing, valuation, and property management/development	• Reliability and agility, communication, experience, attitude, analytical, ability to work without supervision, problem solving and self-motivated
Quantity Surveying	• Measurements and estimation	• Reliability, hardworking, experience, competent and innovative
Urban and Regional Planning		• Multi-skilled

In the construction profession, both soft and technical skills are in demand. Employees in this industry need to possess strong communication skills, be team players, exhibit honesty, and be able to meet deadlines. Moreover, they are expected to have a solid understanding of construction technology, processes, cost planning and management, as well as design and technical construction skills. These requirements highlight the importance of a well-rounded skill set for success in the construction profession. Additionally, in the Land Surveying profession, prospective employees are expected to be competent, innovative, and have a solid understanding of surveying principles. Reliability and hard work are also highly valued skills in this field.

Employers in the Real Estate profession seek land sector graduates who possess a combination of soft, technical, and cognitive skills. Soft skills such as effective communication, a positive attitude, agility, time management, and attention to detail are in high demand. These skills help employees excel in client interactions, negotiations, and the overall management of real estate transactions. Technical skills related to selling, report writing, analytical skills, and a basic understanding of market assessment are also crucial for success in the Real Estate profession. Furthermore, cognitive skills, including problem-solving, adaptability, and analytical thinking are of great importance.

The Urban Planning profession requires employees who are proficient in various aspects related to land planning and management. One respondent in the profession stated, *"an individual who is multitalented".* A multi-skilled employee in the urban planning profession may be required to address the complex challenges associated with urban development.

3.4.4. An investigation of the imbalance in the geographical distribution

The geographical distribution of respondents (employers and employees) in the land sector was examined in the study, revealing a significant imbalance. The study revealed that most respondents primarily operate within the eastern corridor of the country. Specifically, the South-East District accounts for 47%, predominantly concentrated in the capital city, Gaborone. Additionally, the Central District comprises 14%, located in Mahalapye, Palapye, Serowe, and Orapa. Furthermore, the North-East District hosts 9%, centred around the city of Francistown. The eastern corridor in total hosts 70% of respondents in the land sector, compared to the 30% of the minority group based in other parts of the country being Kgalagadi and Ghanzi District each at 6%, Kweneng District at 3%, Southern District at 9% and 6% of employers operating across the country.

When asked about the current state of the land sector in terms of growth and development, one employer respondent answered, *"It's growing rapidly in some parts of the country especially along the eastern corridor".* This imbalance can be attributed to more lucrative economic opportunities that are high in the eastern region of the country compared to others. This could be due to factors such as higher population density, better infrastructure, and access to markets. Employers are likely to be drawn to these areas where they can maximize their business potential. Furthermore, the concentration of employers and employees in the eastern corridor, particularly in the capital city of Gaborone, can be attributed to the urbanization process and the availability of administrative facilities. Urban centres often provide a range of services, including government offices, financial institutions, and professional networks, making them attractive for businesses.

3.4.5. A description of the shortcomings in their performance

In analysing the shortcomings observed among employees in their workplace performance, five key issues emerged, and the responses were categorized accordingly into the following five themes: (i) disparity between knowledge and skills learnt in schools and the demands in the job market; (ii) insufficient training and inadequate compensation; (iii) deficiencies in professional development and support systems; (iv) challenges in the supply of adequate resources; and (v) adapting to the challenging job market. These responses are presented as per the above five themes.

Table 9 categorises the challenges that employees face in the workplace into technical skills, soft skills and other challenges. These are discussed below.

Table 9: Employees' challenges in the workplace

Name of Programme	Technical skills lacking in employees	Soft skills lacking in employees	Challenges faced by employees in the workplace
Architecture		• Adaptability	• Underpaid • Lack of training
Construction		• Negotiation skills • Problem solving skills • Team work	• Lack of understanding by the employers
Geomatics	• Map making • Business management • Marketing of professional services • Engineering survey		• Remuneration below market rate, poor or slow progression, destroyed national reference mark, associations not playing vital roles and lack of surveying resources
Real Estate	Property research and data analysis	• Adaptability • Time management	• Not relating well with what is being taught in school and at work (theory practice gap) • Underpaid • Lack of proper mentorship • Overwhelming tasks • Application of learned skills to work • My profession is nt higlhly rated enough • Inadequate access to comparable sales information at the Deeds Registry • Inaccuracies in the practice • Too many fly by night • Lack ofproper job description • Lack of exposure to other sectors if real estate
Quantity Surveying			• Underpaid • Lack of protection measures
Urban and Regional Planning	Advanced technical skills on GIS and AutoCAD Lack of knowledge of development codes and regulations	• Time management	• Limited employment opportunities from the private sector • Theory practice gap • Limited resources

3.4.5.1 Disparity between knowledge and skills learnt in schools and the demands in the job market

Most respondents (30%) indicated that the major challenge that they were experiencing pertains to the disparity between educational knowledge, skills, and job market demands. They expressed that what they have learnt in school does not align with the requirements of the industry. This indicates a gap between the theoretical knowledge gained in educational institutions and the practical skills needed in the job market, implying that the theoretical concepts taught in educational institutions do not adequately prepare individuals for the practical aspects of their work. To emphasise this, one respondent remarked "*what I have learnt at school is only merely applied in the industry*," and another "*there is a gap between what we were taught in school and the work force*."

3.4.5.2 Insufficient training and inadequate compensation

Twenty percent (20%) of the respondents highlighted the lack of extensive training and under-market remuneration as significant challenges affecting their performance. This suggests that employees do not have the necessary skills and knowledge to perform their jobs effectively, and they feel demotivated due to inadequate compensation. Lack of comprehensive training and low compensation can significantly impact employee performance and motivation. Insufficient training can leave employees feeling ill-equipped to handle their responsibilities, leading to decreased productivity and confidence. Additionally, inadequate compensation may result in dissatisfaction and reduced engagement. "*Lack of training and payment with benefits from the companies*," "*remuneration below market rates*" are some of the responses received from the respondents.

3.4.5.3 Deficiencies in professional development and support systems

The responses showed that 16% of the respondents pointed out a lack of proper mentorship and the limited role played by professional associations as having an impact on their workplace performance. The respondents commented, "*lack of proper mentorship*" and "*associations not playing vital roles."* This implies that the roles played by mentors and professional bodies in equipping the graduates for the industry are inadequate. Effective mentorship and robust professional associations play a vital role in supporting employees' growth and development. Mentors provide guidance, share industry insights, and help employees navigate in their professional careers. Professional associations on the other hand facilitate networking, knowledge exchange, and access to resources.

3.4.5.4 Challenges in the supply of adequate resources

Another 16% of the respondents cited challenges related to the availability and utilization of resources, such as relevant software and data. They emphasized the "*lack of software to fasten productivity*." Geomatics respondents also added, "*impediments in land surveying resources*" whilst an employee in real estate expressed an "*inadequate access to comparable sales information at the Deeds Registry*." This indicates that employees may not have access to the necessary tools and technologies required to perform their tasks efficiently. Inadequate resources can hinder productivity and hinder employees from delivering their best work.

3.4.5.5 Failure to adapt to the challenging job market

Eighteen percent (18%) of the respondents expressed difficulties in adapting to the demands of the job market, feeling overwhelmed with tasks, and struggling with time management. An employee in real estate shared that, "*there are not enough people employed, therefore they have to manage a portfolio of more than 800 properties*," singlehandedly. This suggests that the rapidly evolving job market can create challenges for employees in terms of task overload and time management. The increasing demands and expectations may lead to stress and burnout, negatively impacting performance. Furthermore, the respondents noted a struggle in "*fitting in*" within the work industry, which may imply challenges related to organizational culture, interpersonal relationships, or workplace dynamics. One respondent also stated that "*the work environment was not conducive, so he had to stop work".* Employees who feel like they do not belong to the organisation may face difficulties in being productive and engaged in their work hence leaving their jobs.

3.4.6. An assessment of the measures to be put in place to address the identified challenges.

In the assessment of the measures to be put in place to address the identified challenges faced by land sector agents, employees were asked, "if not, what improvements or changes do you believe can be made to enhance the quality of training provided by local institutions for graduates in the land sector?" The measures that were rated and scored include the following: i) Conduct continuous professional development (4.4); ii) Conduct induction (4.1); iii) Align curriculum with industry needs (4.3); iv) Foster industry partnerships (4.3); v) Practical field experience (4.6); and vi) Soft skills development (4.2). The results illustrate that employees strongly agree that all the listed measures can be used to enhance the quality of training offered by universities.

Employers should invest in regular training to enhance employee skills and provide opportunities for professional growth. This is to ensure that employees expand their knowledge and gain valuable experience in their respective fields. Professional bodies also have a responsibility to provide access to affordable valuable resources, workshops, and conferences and facilitate networking opportunities. It is equally important for employers to assess and address resource gaps in the workplace by providing necessary tools, software, and equipment to enable employees to effectively carry out their assigned duties. Addressing the issue of low salaries in the land sector is vital. Employers must strive to offer

competitive compensation packages that align with industry standards. This is to promote job satisfaction and hence increase productivity in the workplace.

3.5 Framework for understanding the causes and solutions of unemployment in Botswana

The study looked at factors affecting the employability of land sector graduates in Botswana. The independent variable for this study were factors and the dependent variable is the employability of land sector graduates in Botswana. Stakeholder theory was used in understanding the views and perceptions of employers about the employability of land sector graduates. The purpose was to establish if the curricula that are being offered by institutions of higher learning are relevant and address the needs of the industry. By so doing this study was able to find the root causes of unemployment in the land sector and the impact this is having on the economy. Figure *2* is the proposed model that was used in analysing the causes of unemployment and possible solutions to help resolve the problem.

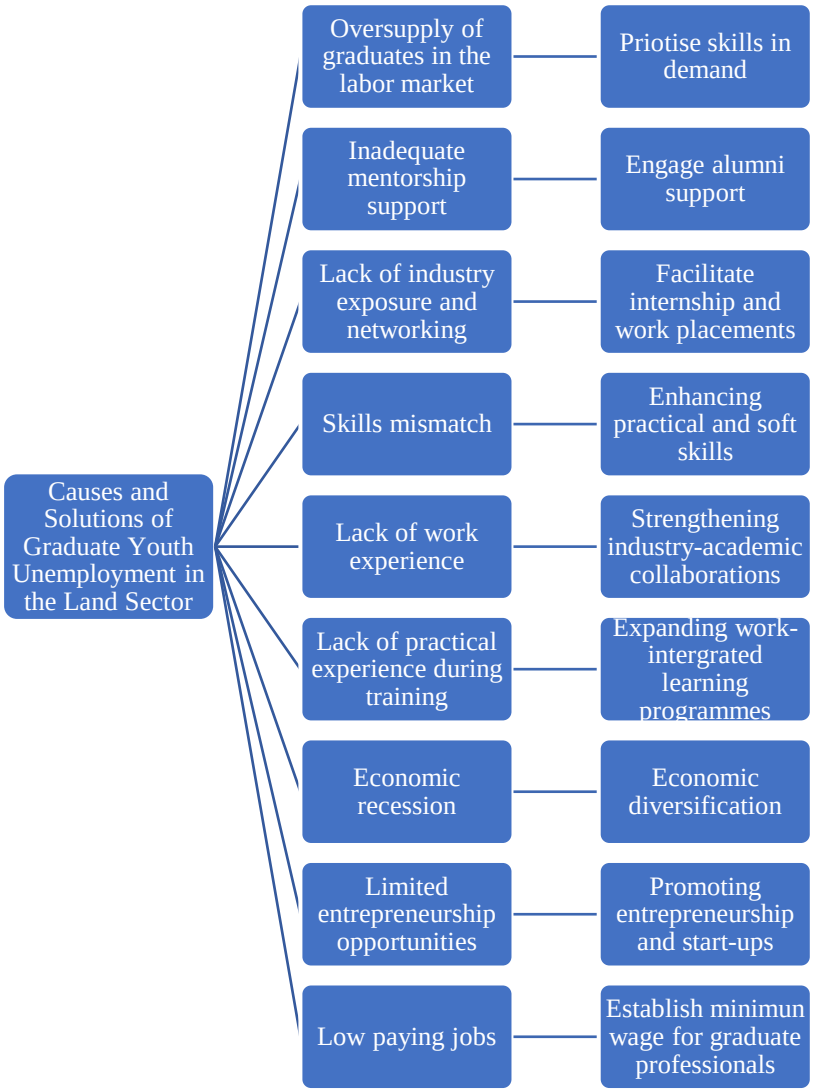


Figure 2: Framework for understanding the causes and solutions of unemployment

4. Conclusions and recommendations

This study is the first ever undertaken in the land sector looking at the supply and demand for land sector graduates in Botswana. It was established that there is a gap, and challenges that are being faced both from the universities as well as the employers. This helped in coming up with measures that can

be put in place so that the problem of youth unemployment in the land sector of Botswana can be resolved by stakeholders.

4.1. Summary of Findings

The purpose of this study was to assess the problems that young land sector graduates face in finding jobs both in public and private universities. There were four objectives that were formulated at the beginning of the study. The results of each objective are summarized below.

4.1.1. Findings addressing Objective 1

The first objective entailed analysing land related curricula and industrial needs at national level. The study analyzed eight land-related curricula offered by different universities in Botswana such as the University of Botswana, BaIsago University, and Gaborone University College. Most of the qualifications were degree programmes lasting four to five years, with certificates and diplomas ranging from one to three years. In terms of attractiveness of the sector, the survey revealed that the land sector stands out when compared to other sectors in terms of entrepreneurship. Majority of the respondents agreed that the land sector is attractive and important because there is a possibility of the professionals opening small and medium enterprises (SME) once they are fully registered to practice.

In terms staff capacity, most of the staff are qualified to teach undergraduate courses looking at their minimum qualifications of a relevant master's degree as per BQA requirements. However, it was noted that some have master's degrees which are not relevant in the field that they are teaching. It was also established that government funded universities are more resourced than privately funded institutions. The University of Botswana has a lower student to staff ratio than private institutions.

The staff for the University of Botswana are more experienced than their counterparts in private universities.

4.1.2. Findings addressing Objective 2

The second objective was to analyze the personal gaps to be filled for the better professional integration of young land sector graduates by looking at the experience and skills acquired. Two indicators, namely skills and experience, were used to address this objective. A personal gap was noted in terms of work performance for those who rated their performance as being poor and fair. This was attributed to the difference between what was taught and what they are required to do at work.

The study revealed that there is a mismatch between the knowledge, skills and competences acquired through education and practical application of these skills. However, employees stated that they are not disadvantaged by this gap. Employees also indicated that the school curriculum does not align with industry needs as some of the courses taught are shallow and fail to sufficiently address the demands of the work environment. Employees also noted that the theory-practice gap exists as the school curriculum lacks adequate practical training. Employers also stated that while employees are competent in their work, they require more practical training and mentorship before fully assuming their job roles.

The survey also revealed that curricula offered by higher learning institutions is relevant to the industry.

4.1.3. Findings addressing Objective 3

The third objective involved identifying obstacles to students' professional integration in the land sector and providing areas for reframing land programmes for better integration of students. The results reveal that there are stringent registration and licensing requirements by various professional associations were stated as one of the factors that affect their integration. The other obstacle that graduates face is that they are not allowed to become probationer members if they are unemployed, and this delays their professional development and that whilst they are on probation, they are not allowed to practice on their own.

There is a provision for integration of students into professional associations during their tenure at the university. However, once they are done with their studies, they then cease to be student members of the professional associations. The other challenge is that students' membership fees are also

unaffordable thus forcing most of the students not to apply for integration into the profession at an early stage.

Employers believe that students need more practical exposure because of the theory practice gap emanating from training institutions. Employers also categorised the skills that are considered when hiring graduates as soft and technical skills.

In assessing the demand for land agents, primary data from the Human Resource Development Council (2019), revealed that there was demand for real estate professionals and the other professionals (Architects, Planners, Construction and Surveying) were in oversupply.

4.1.4. Findings addressing Objective 4

An economic model was developed based on the supply of land sector graduates and the forecasted demand. In the model, supply is deemed to be influenced by the demand for professionals in the labour market. This model was significant as 60% of the variation in supply of land graduates is explained by the projected demand for professionals in the land sector. In terms of supply of land professionals, it was revealed that the number of graduates produced in the past 11 years (2013-2022) was 1,290 out of 117,544 translating into 1% of total land graduates produced. We can also conclude that 682 out of 1290 (53%) were still recorded as unemployed as of 2016, a number slightly higher than the national unemployment rate of 25.4%. The study further noted that the main cause of unemployment in the land sector is limited job opportunities due to a small labour market.

In terms of distinguishing between the pool of available land agents the results of the survey noted that 64% of respondents work in the land sector, 10% of the respondents work outside the land sector and 26% were unemployed. It was further revealed that most of the organisations are based along the eastern corridor of the country, showing an imbalance in the geographical distribution. This is because most economic activities take place in this region.

4.2. Conclusions and Implications of the Study

The study has identified the demand, supply, and unemployment levels of land sector graduates. The unemployment rate for land sector graduates who participated in the survey currently stands at 26%. It was also noted that universities have done more than enough in producing land sector graduates. Though the universities have done enough, there are still some challenges in equipping students with the relevant skills that are desired in the labour market. We also noted that though the private industry has done enough by employing the graduates, the professional associations are not doing enough to integrate these graduates into their field of practice. The implication is that the economy cannot grow as entrepreneurship through formation of small and medium enterprises is not encouraged. The geographical imbalance is evident in the high urbanisation rate (61%) as most of the people are in Gaborone and surrounding Villages because of the economic opportunities that are driven by the pull and push factors.

4.3. Recommendations

The following recommendations are developed based on the findings revealed by the study.

1. **Strengthen industry-academia collaboration:** There is a need to create stronger partnerships between industry stakeholders and universities offering land-related curricula. This can be achieved through regular dialogues, joint research projects, internships, and guest lectures. Such collaborations will ensure that the curricula align with industry needs and equip graduates with the skills and knowledge required for the job market.
2. **Enhance practical exposure:** Practical elements such as internships, industry attachments and job shadowing should be emphasised. The study recommends that the length of industrial attachments should be increased across universities as the 2- 6 months industrial training is not adequate for students to earn more practical experience. This will also enhance students' employability and readiness to contribute effectively to the job market upon graduation.

3. **Update and diversify curricula:** Land curricula should be continuously reviewed and updated to reflect the changing needs of the industry. New courses such as sustainable development, green practices, digital mapping, automated valuation, and property management systems should be introduced to address emerging trends and technology. Regulatory bodies such as Botswana Qualifications Authority (BQA) should ensure that all qualifications meet local and international standards. This will ensure graduates are equipped with the latest knowledge and skills required in the dynamic land sector.
4. **Promote entrepreneurship and start-ups:** Encourage and support graduates to establish their own firms and start-ups in the land sector. Entrepreneurship training, mentorship, and access to funding opportunities should be made available to help aspiring entrepreneurs establish and grow their businesses. This will not only create employment opportunities but also contribute to the overall economic growth and development of the country.
5. **Reduce barriers to entry:** Barriers that limit graduates from entering the land sector job market should be evaluated and addressed. Professional associations should collaborate with universities to ensure that curricula offered to students are adequate to enable them to pass licensing and certification requirements. This will result in an increase in number of professionals able to practice in the market. It will also encourage entrepreneurship and enable more graduates to establish their own firms and create employment opportunities.
6. **Improve perception and awareness:** Launch targeted campaigns to raise awareness about the importance and attractiveness of the land sector and its related curricula. Highlight the potential career opportunities, success stories of graduates, and the sector's contribution to the country's economy.
7. **Promote geographic diversity:** Steps should be taken to address the geographic imbalance in employment opportunities within the land sector. The government should establish economic activities and infrastructure in regions outside the eastern corridor of the country. This can be done through targeting investment, incentives, and policies to promote regional development and attract businesses to other areas.
8. **Encourage continuous professional development**: The importance of continuous learning and professional development for graduates in the land sector should be emphasized. Universities should offer short courses and provided seminar presentations for graduates. Participation in professional associations, industry conferences, and workshops should be encouraged to enhance graduates' skills, expand their networks, and ensure that they stay updated with industry trends and best practices.

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ANNEXURE 1: CURRICULUM FOR BACHELOR OF REAL ESTATE – UNIVERSITY OF BOTSWANA

Introduction

The Bachelor of Real Estate is one of the three programmes in the Built Environment offered in the Faculty of Engineering within the Department of Architecture and Planning for four (4) years. There is also industrial attachment at year two (2) and three (3) for eight (8) weeks starting on 1st June and ending on 31st July of each year. Since its inception in 2011 as a Bachelor of Science Real Estate, it was later merged with a Bachelor of Land Management in 2016. Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; The University of Botswana, 2022). The curriculum of the programme follows immediately after the employment opportunities and lastly, the profile of the respective five (5) academic staff is presented.

Purpose of the qualification

The purpose of this qualification is to produce graduates with knowledge, skills, and competencies to:

1. Undertake valuations for different purposes;
2. Carry out feasibility and development appraisals;
3. Manage investment properties and provide estate agency-related duties;
4. Conduct market research and establish the target market;
5. Allocate and manage land or housing units in public institutions; and
6. Apply real estate principles, to solve real estate-related problems.

Employment opportunities

Graduates of the Bachelor of Real Estate are likely to be employed as:

1. Property Valuers;
2. Property Managers;
3. Estate Agents;
4. Facilities Managers;
5. Property Development Consultants;
6. Property Investment Analysts;
7. Property Maintenance Managers;
8. Housing Officers/Estate Officers;
9. Research Assistants;
10. Mortgage Analysts;
11. Risk Managers;
12. Portfolio Managers; and
13) Land Managers in Public Sectors.

Curriculum for Bachelor of Real Estate at the University of Botswana
Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Introduction to Real Estate	Core		Introduction to Valuation	Core
Mathematics for Business and Social Sciences I	Core		Mathematics for Business and Social Sciences II	Core
Basic Micro-Economics	Core		Basic Macro-Economics	Core
Introduction to Law	Core		Building and Materials	Core
Computing and Information Skills I	GEC		Computing and Information Skills II	GEC
Communication and Academic Literacy Skills I	GEC		Communication and Academic Literacy Skills II	GEC

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Land Economics I	Core		Land Economics II	Core
Contract Law	Core		Principles and Methods of Valuation	Core
Architectural Drawing Techniques	Core		Introduction to Land Administration	Core
Introduction to Planning and Built Environment	Core		Introduction to Accounting	Core
Geomatics	Core		Introduction to Property Law	Core
				Elective

Internship I Core 8 Weeks

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Housing Economics and Policies	Core		Property Management	Core
Real Estate Marketing and Agency	Core		Property Investment and Appraisal	Core
Applied Valuation I	Core		Property Conveyance and Disposition	Core
Property Development and Finance	Core		Applied Valuation II	Core
Building Services I	Core		Project Planning and Implementation	Core
Building Maintenance	Core		Principles of GIS	Core

Internship II Core 8 Weeks

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Advanced Land Administration	Core		Dissertation	Core
Computer Application to Real Estate	Core		Business and Professional Ethics	Core
Research Methodology	Core		Tribal Land Management	Option
Alternative Dispute Resolution	Core		Risk and Value Management	Option
Remote Sensing for Land Management	Option		Facilities Planning and Management	Core
Property Taxation	Option		Business Planning and Entrepreneurship	Core

Capacity in terms of academic staff

The real estate programme has five (5) academic staff and one Demonstrator offering subject-specific courses and service courses are sourced from relevant subject-specific experts in various faculties within the University of Botswana. Below are the profiles for the five (5) academic staff and one (1) Demonstrator:

1. Professor Fidelis Emoh (Associate Professor)

He is a registered Estate Surveyor and Valuer and a Fellow of the Nigerian Institution of Estate Surveyors and Valuers and holds BSc, MSc, and Ph.D. Degrees in Estate Management & PGD (Post Graduate Diploma), MBA in Banking and Finance. He has varied professional experience having worked as a Senior Lands/Valuation Officer in Anambra State, Principal Consultant, at Ifeanyi Emoh & Co., and CEO (Chief Executive Officer), NIESV Ventures Ltd in Nigeria. He is a Professor of Real Estate & Valuation & HOD at Nnamdi Azikiwe University, Awka, Nigeria before coming to the University of Botswana. He has over 60 publications in referred journals, 3 standard real estate textbooks, and 3 book chapters. He has served variously as a Board Member of, the Estate Surveyors & Valuers Registration Board of Nigeria (ESVARBON), a National Council Member of the Nigerian Institution of Estate Surveyors & Valuers (NIESV) & Editor-In-Chief, NIESV Journal. He had also served as the Chair of, the Education Committee of ESVARBON as well as the Education Committee of NIESV. He has provided professional consultancy services to governments, agencies, and institutions in areas of property, plant, and machinery valuation, compulsory acquisition and compensation claims, and real estate & management consultancy. Prof. Emoh is a Fellow, of the Institute of Management Consultants (FIMC), a Certified Management Consultant (CMC), and a Member of the NIESV Faculty of Business Assets & Intellectual Property Valuation

His qualifications are as follows:

1. Ph.D. (Estate Management) Nnamdi Azikiwe University, Awka, Nigeria
2. MSc (Estate Mgt.) The University of Nigeria, Nsukka, Nigeria
3. BSc (Honours) (Estate Mgt.) The University of Nigeria, Nsukka, Nigeria
4. MBA (B & Fin)
5. PGD (B & Fin)

He teaches the following courses:

1. Real Estate and Valuation
2. Business and Professional Ethics
3. Business Planning and Entrepreneurship
4. Land Economics
5. Building Maintenance

His research interests are in the following areas:

1. Real Estate and Valuation
2. Plant and Machinery Valuation
3. Property Finance and Investments
4. Property, Facilities, and Project Management
5. Real Estate Entrepreneurship

2. Dr. Johnson Kampamba (Senior Lecturer)

Johnson Kampamba is a Chartered Valuation and Project Management Surveyor of the Royal Institution of Chartered Surveyors (MRICS) with over 23 years of work experience. He has more than 10 years of work experience in rating valuation projects in both local and central governments, 6 years in private practice dealing with property valuation, property development and appraisal, marketing/agency, and management, and 8 years as an Academic Staff at the University of Botswana. He is now a Senior Lecturer at the University of Botswana under the Department of Architecture and Planning.

His qualifications are as follows:

1. PhD (Built Environment) University of Botswana (2020)
2. MSc (Real Estate), University of Pretoria, (2006),
3. MSc (Construction Project Management), University of Pretoria, (2009), Republic of South Africa.

4. BSc (Land Economy), The Copperbelt University, Zambia (1997).

He teaches the following courses:

1. Introduction to Property Valuation,
2. Principles and Methods of Valuation,
3. Property Management,
4. Facilities Management,
5. Property Investment and Appraisal,
6. Property Development and Finance,
7. Property Marketing and Agency,
8. Project Planning and Implementation,
9. Property Conveyancing and Disposition,
10. Research Methodology and
11. Computer Applications in Real Estate.
12. Dissertation
13. Investment and Valuation Project
14. Research Project I

Dr. Kampamba has a book chapter, 28 journal publications, 26 conference proceedings, 31 conference presentations, 16 seminar presentations, and 2 technical reports. His research interests are in the following areas:

1. Property taxation,
2. Housing,
3. Facilities management,
4. Property markets,
5. Corporate real estate,
6. Investment and development

3. Dr. Njideka Maryclara Aguome (Lecturer)

She has seven (7) Years of teaching experience/ 20 years of field experience (real estate). She is also a Fellow of the Nigerian Institution of Estate Surveyors and Valuers (NIESV). Registered Surveyor and Valuer, Estate Surveyors and Valuers Registration Board of Nigeria. Right of Way Agent (RWA), International Right of Way Association (IRWA) International, USA. Member, International Right of Way Association (IRWA) Nigeria, Chapter 84.

Her qualifications are as follows:

1. Ph.D. in Facilities Management.,
2. M.Sc. in Estate Management,
3. B.Sc. in Estate Management

She teaches the following courses:

1. Real Estate Marketing and Agency
2. Property Taxation,
3. Property management
4. Project Planning and Implementation

She has 5 Journal articles and 3 conference papers. Her research interests are in the following areas:

1. Property management,
2. Facilities management,

4. Mr. Simon Kachepa (Lecturer)

He is a Chartered Valuation Surveyor with over 14 years of practical experience in property valuation, management, and development in Botswana. I graduated with a BSc degree in Land Economy from Copperbelt University in Zambia and an MSc. Real Estate from the University of Pretoria in South Africa.

His qualifications are as follows:

4. MSc Real Estate (University of Pretoria, RSA)
5. BSc Land Economy (Copperbelt University, Zambia), and

6. RICS (Royal Institution of Chartered Surveyors) Professional Member.

He teaches the following courses:

5. Applied Property Valuation I
6. Applied Valuation II,
7. Alternative Dispute Resolution
8. Property Conveyancing and Disposition
9. Research Methodology and
10. Value & Risk Management

His research interests are in the following areas:

3. Housing,
4. Land Tenure Systems,
5. Plant and Machinery
6. Valuation Practice in Developing Countries

5. Mr. Phenyo Mpolokang (Lecturer)

He is a real estate professional with over 10 years of practical experience in property valuation, management, and development in Botswana. He graduated with a BSc honours Degree in Estate Management from Oxford Brookes University in the United Kingdom and an MSc. Property Investment from the University of Reading.

His qualifications are as follows:

1. MSc Property Investment 2015
2. BSc (Hons) Estate Management 2011
3. Certificate in Sectional Title Scheme Management

He teaches the following courses:

1. Introduction to Real Estate
2. Land Economics II
3. Principles and Method of Valuation
4. Housing Economics and Policies
5. Tribal Land Management

His research interests are in the following areas:

1. Land markets,
2. Land administration,
3. Property markets

6. Kefilwe Omphemetse Seketeme (Demonstrator)

She is an ambitious individual pursuing an MSc degree in Real Estate Finance and Investment. Kefilwe has a solid educational foundation, holding a BSc degree in Real Estate. With four years of experience as a demonstrator and an additional two years as a property valuer, Kefilwe has developed expertise in various areas, including property development, property valuation, and real estate finance. In addition to her practical experience, Kefilwe is a registered estate agent with both the Real Estate Institute of Botswana and the Real Estate Advisory Council. This certification further validates her professional competence.

Kefilwe's profile encompasses a harmonious blend of academic excellence, practical expertise, and a commitment to staying updated with industry advancements. Her ultimate aim is to contribute to successful property development projects and offer strategic guidance in real estate investments. Her particular research focus is on housing provision, property valuation, and real estate education, highlighting their dedication to advancing knowledge in these specific areas.

ANNEXURE 2: CURRICULUM FOR BACHELOR OF GEOMATICS

Introduction

The Bachelor of Geomatics is one of the four programmes offered in the Faculty of Engineering within the Department of Civil Engineering for four (4) years. There is a survey camp at years one (1) and three (3) for two (2) weeks and an industrial attachment at years two (2) and three (3) for eight (8) weeks. Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; The University of Botswana, 2022). The curriculum of the programme follows immediately after the employment opportunities and lastly, the profile of the respective six (6) academic staff is presented.

Purpose of the qualification

The purpose of the qualification is to inform and expand knowledge, partly or mostly through research, on different technical and managerial issues of Geomatics activities in pursuit of sustainable development. Graduates of this qualification will be able to:

1. Apply survey techniques to establish geodetic networks for both vertical and horizontal control.

2. Apply knowledge and understanding of the principles of cadastral, topographical, deformation, and as-built surveys.

3. Plan, specify, and give reasoned advice on engineering surveys; define and assess accuracies and tolerances; manage the engineering surveying element in large projects; and understand the principles of good engineering practice.

4. Demonstrate knowledge and understanding of the principles of cartography, map design and production processes, remote sensing, and photogrammetry (both aerial and terrestrial), remote sensing techniques, scales, camera and satellite principles, and different data capture methods.

5. Demonstrate knowledge and understanding of the principles of geographic information science and systems. This includes industry-standard GIS, data structures, types, applications, and appropriate capture and output systems.

6. Apply knowledge of the principles of land registration, land management, administration, and legislation related to rights in real estate internationally and nationally.

7. Demonstrate knowledge and understanding of the techniques for conflict avoidance, conflict management, and dispute resolution procedures including for example adjudication and arbitration.

Employment opportunities

1. Land Surveyor
2. Cartographer
3. Photogrammetrist
4. Engineering Surveyor
5. GIS Specialist

Curriculum for Bachelor of Geomatics at the University of Botswana
Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Introductory Mathematics	Core		Introductory Mathematics II	Core
Geometrical Optics and Mechanics	Core		Electricity, Magnetism, and Elements of Modern Physics	Core
Geomatics I	Core		Geomatics II	Core
Communication and Academic Literacy Skills I	GEC		Communication and Academic Literacy Skills II	GEC
Computing and Information Skills I	GEC		Computing and Information Skills II	GEC

Survey Camp I Core 2 Weeks

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Engineering Mathematics I	Core		Engineering Mathematics II	Core
Programming Principles	Core		Digital Photogrammetry	Core
Principles of Cartography	Core		Introduction to Remote Sensing	Core
Elements of Photogrammetry	Core		Digital Cartography	Core
Introduction to Planning and the Built Environment	Core		Programming for Geomatics	Core

Internship I Core 8 Weeks

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Engineering Mathematics III	Core		Introduction to Land Administration	Core
Engineering Surveying	Core		Principles of GIS	Core
Geodesy	Core		Satellite Positioning Systems	Core
Land Law for Geomatics	Core		Geodesy II	Core
Survey Adjustment and Analysis	Core		Database Concepts	Core

Internship II Core 8 Weeks
Survey Camp II Core 2 Weeks

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Research Project I	Core		Engineering Ethics and Professional Conduct	Core
Spatial Data Modelling and Analysis	Core		Professional Ethics and Practice	Core
Advanced Land Administration	Core		Research Project II	Core
Remote Sensing Applications	Option		Cadastral Surveying Practice	Core
Advanced Cartographic Visualisation	Option		Geomatics for Mining	Core
GIS Design and Implementation	Option		Location-based Services	Option
Digital Image Processing	Option		GIS Applications	Option
Principles and Practice of SDI Development	Option		Special Studies in Land Administration	Option

Capacity in terms of academic staff

The Geomatics programme has six (6) academic staff offering subject-specific courses and service courses are sourced from relevant subject-specific experts in various faculties within the University of Botswana. Below are the profiles of the six (6) academic staff:

1. Professor Yashon O. Ouma (Professor)

He is a Professor of Geomatics, with more than 15 years of experience in research and teaching. Yashon is an Alexander von Humboldt (AvH) Experienced Research Fellow with research/work experience in South Africa, Germany, Kenya, Japan, and Botswana. Professionally, Professor Ouma is a member of the International Society of Photogrammetry and Remote Sensing (ISPRS) and is a registered Associate Member of the Institution of Surveyors of Kenya (AMISK). He serves in the International Cartographic Association (ICA) under the Commission on Sensor-driven Mapping.

His qualifications are as follows:

1. D.Eng Geosystems Engineering (Chiba University, Japan)
2. MSc (Eng) Geomatics (University of Cape Town, South Africa)
3. BSc (Hons) Surveying & Photogrammetry (University of Nairobi, Kenya)

He teaches the following courses:

1. Digital Image Processing
2. Digital Photogrammetry
3. Satellite Remote Sensing (Optical and Microwave)
4. Engineering Surveying
5. Geographic Information Systems & Science
6. Spatial Modelling for Hydro Informatics
7. Research Methods
8. Programming for Geomatics

His research interests are in the following areas:

1. Earth Observation Analytics: Integrated Sensor Systems, Artificial Intelligence & Machine Learning
2. Optical and Microwave Sensor Data Processing and Applications
3. Mobile Mapping Sensor Systems (MMSS): Development and Applications
4. Geographic Information Systems: GIS Theory and Applications

2. Dr. Boipuso Nkwae (Senior Lecturer)

He has 27 years of teaching and research experience besides another 2 years at the Department of Surveys and Lands as a land surveyor. In his teaching career, he has worked for 2 years as a lecturer at the former Botswana Polytechnic and about 25 years at the University of Botswana in the Department of Civil Engineering. He has worked on several local and internationally funded projects.

His qualifications are as follows:

1. Ph.D. in Geodesy and Geomatics Engineering (University of New Brunswick)
2. MSc in Urban Land Appraisal (University of Reading)
3. BSc (Hons) in Surveying Science (University of Newcastle upon Tyne)
4. Diploma in University Teaching (University of New Brunswick)

He teaches the following courses:

1. Introduction to Land Administration
2. Advanced Land Administration
3. Special Studies in Land Administration
4. Tribal Land Management
5. Alternative Dispute Resolution in Land Administration

6. Cadastral Surveying Practice
7. Engineering and Mining Surveying

His research interests are in the following areas:
1. Juridical Cadastres - land tenure and sustainability, indigenous tenure systems, peri-urban land issues, land reform, and post-settlement strategies
2. Fiscal Cadastres - CAMA systems
3. Land Management Information Systems in the Knowledge Economy
4. National Spatial Data Infrastructures

3. Dr Kealeboga Kaizer Moreri (Senior Lecturer)

His qualifications are as follows:
1. Executive Master in Entrepreneurship - Candidate (UB)
2. Ph.D. Geomatics Engineering, Newcastle University, UK
3. MSc. Geomatics Engineering (UNB) Canada
4. BSc. Geographic Information Systems (UNISA) Australia
5. Dipl. in Technology Management and Entrepreneurship (UNB)
6. Dipl. in University Teaching, Canada

He teaches the following courses:
1. Principles of Geographic Information Systems
2. Location Based Services
3. Spatial Data Modelling and Analysis
4. GIS Design and Implementation

His research interests are in the following areas:
1. Volunteered Geographic Information
2. Land Administration Systems
3. Unmanned Aerial Vehicle (UAV) Technology
4. GIS for Transportation
5. Latent Class Analysis in Crowd Sourcing
6. Geospatial Technologies for Sustainable Development
7. GIS for Health Services
8. Application of GIS in Precision Farming
9. GIS for Decision Support Systems
10. GIS for water resources management

4. Dr Lopang Maphale (Lecturer)
He is a professional with expertise in Land Surveying, geographical Information Systems (GIS), and Management. His knowledge of geospatial data collection, processing, and management is not only commendable but it must be utilised to the advantage of organisations. He has been involved with several projects' facilitation regarding the use of geospatial information and technologies in business operations to improve operational efficiency and create opportunities. He has played a leading role in organizing and associating Professional Land Surveyors and Geomatics practitioners in Botswana and as Chair of the Botswana Surveying and Mapping Association, he was instrumental in the government/private surveyors' collaboration in Botswana National Land Registration project (2016 - 2017) which saw a lot of villages surveyed. Dr. Maphale played a leading role in the collaboration of the University of Botswana and the Ministry of Health and Wellness in the production of a mapping dashboard for COVID-19. He is the Vice President of the Botswana Institute of Geomatics.

His qualifications are as follows:
1. Ph.D. in Geomatics – University of Cape Town (2019)
2. M.Sc. Geographic and Geodetic Information Systems, University of London (2010)
3. Master of Business Administration, University of Botswana (2005)

4. BSc (Hons) Surveying and Mapping Sciences. University of East London, (1994)

He teaches the following courses:
1. Spatial Data Infrastructures
2. Principles of Cartography
3. Digital Cartography
4. Geographical Information Systems
5. Survey Adjustments and Analysis

His research interests are in the following areas:
1. Spatial Data Infrastructures
2. Principles of Cartography
3. Digital Cartography
4. Geographical Information Systems
5. Survey Adjustments and Analysis

5. Mr Bagadzi Michael Manisa (Senior Lecturer)

6. Mr Mooketsi Segobye (Lecturer)

His qualifications are as follows:
1. Master of Engineering in Geodesy and Surveying Engineering
2. Bachelor of Surveying

He teaches the following courses:
1. Introduction to Geomatics
2. Geodesy
3. Surveying
4. CAD

His research interests are in the following areas:
1. Coordinate reference systems
2. Geoid modelling
3. Deformation monitoring
4. Equipment calibration

ANNEXURE 3: CURRICULUM FOR URBAN AND REGIONAL PLANNING- UNIVERSITY OF BOTSWANA

Introduction

The Bachelor of Urban and Regional Planning is offered in the Faculty of Engineering and Technology under the Department of Architecture and Planning. The programme runs for four (4) years. There is an industrial attachment at year two (2) and three (3) for eight (8) weeks. At the end of the 4 years, the department offers a Master's Degree spanning over a year, with options to specialize in (1) Urban Design, Environment, and Housing, (2) Planning Policy and Strategy (3) Planning Methods and Techniques.

Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; The University of Botswana, 2022). The curriculum of the programme follows immediately after the employment opportunities and lastly, the profile of the respective six (6) academic staff is presented.

Purpose of the qualification

On completion of the Bachelor of Science Urban and Regional Planning qualification, the graduates will have specialised knowledge, skills, and competence to:

1. Communicate ideas, policies, information, and spatial plans using appropriate oral, writing, and graphic presentation skills.

2. Demonstrate knowledge and understanding of the various social, economic, political, cultural, demographic, and, environmental (multidisciplinary) processes that shape and are shaped by urban and regional planning processes

3. Demonstrate an understanding of the foundational theoretical and philosophical thoughts that inform urban and regional planning practice.

4. Prepare high-quality comprehensive urban and regional plans.

5. Demonstrate a high degree of competency in the application of advanced design, planning methods, research methods, and techniques used in urban and regional planning.

Employment opportunities

1. Town Planner
2. Urban Planner
3. Physical Planner
4. Housing Officer
5. Land Acquisition and Development Manager
6. Traffic and Transport Planner
7. Environmental Planner
8. Land Use Planner
9. Urban Development Manager
10. City Manager
11. Regional Planner

Curriculum for Bachelor of Science in Urban and Regional Planning at the University of Botswana

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Introduction to Planning and Built Environment	Core		History of Planning	Core
Introduction to Environmental Science Physical	Core		Introduction to Environmental Science Human	Core
Mathematics for Social Sciences I	Core		Mathematics for Social Science II	Core

Basic Micro-Economics	Core		Basic Macro-Economics	Core
Communication and Academic Literacy Skills I	GEC		Communication and Academic Literacy Skills II	GEC
Computing Skills Fundamentals I	GEC		Computer Skills Fundamentals II	GEC

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Planning Theory I	Core		Site Planning and Design I	Core
Planning Graphics and Communication	Core		Planning Theory II	Core
Computer Aided Drafting	Core		GIS for Planners	Core
Principles Of Cartography	Core		Planning Methods & Techniques	Core
Introduction to Spatial Analysis	GEC		Introduction to Remote Sensing	GEC

Internship I Core 8 Weeks

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Planning Practice	Core		Public Facilities and Services Planning	Core
Transportation Planning & Management	Core		Urban & Regional Economics	Core
Environmental Land Use Planning	Core		Neighbourhood Planning and Design	Core
Site Planning and Design II	Core		Infrastructure Planning and Management	Core
Urban Sociology	Option		Rural Sociology	Option

Internship II Core 8 Weeks

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Planning Legislation	Core		Contracting and Planning Project Management	Core
Planning and Management for Climate Change	Core		Planning Implementation and Techniques	Core
Urban Regeneration and Renewal	Core		Planning Ethics	Core
Land and Property Development	Core		Urban Governance and Management	Core
Gender and Planning	Option		Property Management	Option
			Urban Agriculture	Option

Specialization Opportunities

Year 5: Urban Design, Environment, and Housing Specialization

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Research Methods and Techniques	Core		Supervised Dissertation/Research Project	Core
New Urbanism	Core			
Landscape Design	Core			
Integrated Housing Studies	Core			
Healthy City Planning	Option			
Environmental Impact Assessment	Option			

Year 5: Planning Policy and Strategy Specialization

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Research Methods and Techniques	Core		Supervised Dissertation/Research Project	Core
Integrated Development Planning	Core			
Regional and Rural Planning and Development	Core			
Comparative Planning	Core			
Administrative and Policy Planning	Option			
Smart Growth Planning	Option			

Year 5: Planning Methods and Techniques

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Research Methods and Techniques	Core		Supervised Dissertation/Research Project	Core
Planning Support Systems	Core			
Development Impacts Analysis	Core			
Public Participation and Negotiations Techniques	Core			
Community Planning Methods and Scenarios	Option			
Urban Ecological Footprint Methods	Option			

Capacity in terms of academic staff

The Urban and Regional Planning programme has six (6) academic staff offering subject-specific courses and service courses are sourced from relevant subject-specific experts in various faculties within the University of Botswana. Below are the profiles of the six (6) academic staff:

1. Dr. Keone Kelobonye (Senior Lecturer)

He is a Senior Lecturer of Urban Planning at the University of Botswana (UB) and is currently serving as a Guest Editor for the ISPRS International Journal of Geo-Information. He is a certified Urban and Transport Planner and researcher registered with the Department of Town and Country Planning in Botswana. His professional memberships also include the Pula Institute of Town Planners (BW) and the American Association of Geographers (USA). Having joined the University of Botswana as a Staff

Development Fellow in 2013, Dr. Kelobonye was appointed to the position of Lecturer in 2016 and promoted to Senior Lecturer as a high-flyer in 2021, after one year of teaching.

His qualifications are as follows:
1. PhD.| Spatial Sciences: Metropolitan Transport Planning (Curtin University, Australia)
2. MSc.| Geospatial Science (Curtin University, Australia)
3. M.A. (Prof) | Planning Policy and Strategy (University of Botswana)
4. BSc.| Urban and Regional Planning (University of Botswana)

He teaches the following courses:
1. Geographic Information Systems
2. Planning Support Systems
3. Urban & Regional Economics
4. Planning for Climate Change
5. Planning Policy & Administration
6. Digital Cartography
7. Spatial Modelling
8. Transportation research

His research interests are in the following areas:
1. Geospatial intelligence
2. Urban spatial structure
3. Urban geo-informatics
4. Metropolitan transport planning
5. Transport geography
6. Accessibility
7. Spatial equity
8. Travel efficiency
9. Transport policy
10. Travel behaviour
11. Travel mode choice

2. Dr Lapologang Magole (Senior Lecturer)
She is a Senior Lecturer at the University of Botswana's Department of Architecture and Planning and a Regional Development Planner by profession. She holds a Master of City Planning (MCP, Regional Development Planning Stream) (1995) from the University of Manitoba, Winnipeg, Canada. In her master, she specialised in Regional Development Planning, Rural Resources Management, and Stakeholder Participation in Planning. She received her Ph.D. in Development Studies (Environmental Policy Analysis) at the University of East Anglia, UK in 2003. Dr. Magole is an environmental policy analyst and policy planning process facilitator. She has vast experience in stakeholder participation management for development planning, meeting facilitation (mediation, negotiation, conflict resolution, and empowerment), project management, and strategic planning. She is also an experienced trainer in participatory planning and learning methods.

Her qualifications are as follows:
1. Ph.D. Development Studies (2003). University of East Anglia, Norwich, UK. Natural resources management and policy processes.
2. Master of City Planning (1995). University of Manitoba, Winnipeg, Canada. Regional Development Planning
3. BA (1991) UB Double Major, Economics & Environmental Science

She teaches the following courses:
1. Urban and regional economics
2. Regional and rural development planning
3. Urban planning and climate change management

4. Natural resources governance
5. Participatory planning research and learning methods
6. Research methods and techniques

Her research interests are in the following areas:
1. Natural resources planning and governance in general and water and land resources management in particular
2. Cities and communities, adaptation and resilience to climate variability and change
3. Integrated development planning and governance
4. SMART planning and building sustainable communities
5. Environmental policy and planning processes analysis
6. Stakeholder participation and involvement in the development and natural recourses planning

3. Dr. Chadzimula Otsetswe Molebatsi (Senior Lecturer)
He has published widely in the areas of settlement planning and the environment and is actively involved in community engagement initiatives. In addition to an academic vocation, Chadzimula is engaged in part-time subsistence farming with a keen interest in endogenous livestock and crop farming practices.

His qualifications are as follows:
1. Ph.D. Town and Country Planning
2. MA Environmental Planning
3. B A Humanities

He teaches the following courses:
1. Planning Theory
2. Research Methods
3. Urban and Regional Development Planning

His research interests are in the following areas:
1. Planning Pedagogy and Epistemologies
2. Participatory Development Planning
3. Production of Urban Spaces

4. Mr Horatius Gaogakwe Ikgopoleng (Senior Lecturer)
His teaching experience at UB spans over 20 years.
He is a registered Town Planner with the Department of Town and Country Planning.

His qualifications are as follows:
1. M.A. Town and Regional Planning, University of Sheffield
2. Bachelor of Arts (Social Sciences), University of Botswana

He teaches the following courses:
1. Planning Techniques
2. Environmental land use planning
3. Climate change
4. Housing studies

His research interests are in the following areas:
1. GIS
2. Climate change
3. Housing studies

5. Dr. Mutakela Ben-Kingsley Minyoi (Lecturer)
He is a Town Planner by profession, having started as a Trainee Planner in 1989 in the then Ministry of Local Government and Lands, Department of Town and Regional Planning, and as a Practitioner from 1994 to 1999. Then joined the academia (University of Botswana) in 1999 as a Staff Development Fellow and became a Lecturer in Urban and Regional Planning in 2002.

His qualifications are as follows:
1. Ph.D. Urban Planning and Management - University of Dar es Salaam, Tanzania
2. MSc. Housing Studies - Oxford Brookes University, United Kingdom.
3. BSc. Urban and Regional Planning - University of Botswana, Gaborone Botswana
4. Advanced Diploma Urban and Rural Planning - Ardhi Institute, Tanzania

He teaches the following courses:
1. Introductory courses to Planning and Planning Theory,
2. Planning History
3. Settlement Development Planning
4. Site Planning and Design
5. Urban Governance and Management
6. Integrated Development Planning
7. Housing Studies

His research interests are in the following areas:
1. Urban Planning Practices
2. Plan Implementation
3. Housing
4. Land Tenure
5. Urbanization
6. Climate Change
7. Informality

6. Mr. Nnyaladzi Lancelot Tema (Lecturer)
He is an Urban Design specialist and community-led urban planning protagonist. He has vast experience in local area planning and design, and strategic planning. He holds membership in the Pula Institute of Town Planners (currently serving as the Secretary-General) and the Commonwealth Association of Planners. Currently, Mr. Tema is part of the PITP team engaging the Botswana Government on Urban Planning Reforms, and the significance of Urban Planning as a critical profession to the country's transformative agenda.

His qualifications are as follows:
1. MA Sustainable Place Making & Urban Design (Kingston University, London)
2. BSc Urban & Regional Planning (University of Botswana, Gaborone)

He teaches the following courses:
1. Informal Settlement Upgrading
2. Urban Regeneration
3. Planning Ethics
4. Comparative Planning
5. Neighbourhood Planning and Design
6. Evolving Settlements
7. Public Realm Design

His research interests are in the following areas:
1. Public Realm Design
2. Sustainable Place Making

ANNEXURE 4: CURRICULUM FOR ARCHITECTURE – UNIVERSITY OF BOTSWANA

Introduction

The Bachelor of Architecture is one of the three programmes offered in the Faculty of Engineering under the Department of Architecture and Planning for five (5) years. There is an industrial attachment at year two (2), three (3), and four (4) for eight (8) weeks. Below is the purpose of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; The University of Botswana, 2022). The program curriculum is outlined after detailing the employment opportunities available to graduates. Additionally, the profiles of the eight (8) academic staff members are provided.

Purpose of the qualification

The purpose of an architecture qualification is to equip individuals with the necessary knowledge, skills, and competencies to pursue a professional career in architecture. Through a comprehensive and rigorous program, students gain a deep understanding of architectural principles, theories, history, and the built environment. The qualification aims to prepare students to design and create functional, aesthetically pleasing, and sustainable structures and spaces.

The specific objectives of an architecture qualification may include:

1. Developing a solid foundation of architectural principles and theories
2. Fostering creative and critical thinking skills
3. Developing technical and practical skills
4. Promoting an understanding of sustainability and environmental considerations
5. Encouraging collaboration and interdisciplinary thinking
6. Meeting professional standards and requirements

Employment Opportunities

1. Architect
2. Project Manager
3. Design Consultant
4. Project Coordinator
5. Computer Aided Designer
6. Architectural Drafter

Curriculum for Bachelor of Architecture at the University of Botswana

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Design & Communication I	Core		Design & Communication II	Core
Building Materials & Construction I	Core		Traditional African Architecture	Core
Geometrical optics, Mechanics, Vibrations, and Waves	Core		History of Art	Core
Basic Micro-Economics	Core		Environment and Comfort	Core
Design Mathematics I	Core		Design Mathematics II	Core
Communication and Academic Literacy Skills I	GEC		Communication and Academic Literacy Skills II	GEC
Computing Skills Fundamentals I	GEC		Computer Skills Fundamentals II	GEC

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Architectural Design I	Core		Architectural Design II	Core
Building Materials & Construction III	Core		Building Materials & Construction IV	Core
History of Architecture I	Core		History of Architecture II	Core
Computer Aided Drafting	Core		Energy Efficiency in Buildings	Core
Land Surveying and Cartography + Lab	Core		Theory of Structure II	Core
Theory of Structures 1	Core			

Internship I Core 8 Weeks

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Architectural Design III	Core		Architectural Design IV	Core
Building Services I	Core		Building Services II	Core
History of Architecture III	Core		History of Architecture IV	Core
Theory of Structures III	Core		Interior Design	Core
Introduction to Town Planning	Option		Foundation Of Engineering Law	Core
Infrastructure Planning & Management	Option			

Internship II Core 8 Weeks

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Architectural Design V	Core		Architectural Design VI	Core
Building Systems I	Core		Building Systems II	Core
Philosophy of Architecture I	Core		Philosophy of Architecture II	Core
Construction Law	Core		Professional Practice I	Core
Landscape Design	Core		Environmental Impact Assessment	Option
			Urbanisation & the Environment	Option

Internship III Core 8 Weeks

Year 5

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Design Project I	Core		Design Project II	Core
Building Economics	Core		Urban & Rural Design Practice	Core
The State & Society	Core		Project Management	Core
Land and Property Evaluation	Option		Law & Society in Botswana	Core

Land and Property Management	Option			
Project Practice II	Option			

Capacity in terms of academic staff
The Architecture programme is supported by eight (8) academic staff and four (4) demonstrators who specialize in subject-specific courses. Additionally, service courses are obtained from experts in relevant subjects from different faculties within the University of Botswana. Presented below are the profiles of the eight (8) academic staff members:

1. Dr. Kagiso Jobe (Lecturer)
He is a researcher, teacher, and practitioner in affordable housing, energy-efficient and sustainable building design. He is an accomplished scholar with research interest and expertise in developing collaborative design tools and methods (BIM), participatory and flexible design methods, developing affordable housing strategies and policies in developing countries, and low-energy design applications.

His qualifications are as follows:
1. PhD
2. Master of Architecture (MArch)
3. Bachelor of Environmental Design Studies (B.E.D.S)

He teaches the following courses:
1. Architectural Design
2. Energy efficiency in buildings and
3. Environment and Thermal Comfort

His research interests are in the following areas:
1. Affordable housing
2. Low and zero-energy buildings

2. Dr. Katlego Pleasure Mwale (Lecturer)
She is a qualified and registered architect with Architectural Registration Board in Botswana (ARC). She is also an accredited architectural historian and architectural heritage specialist. I am a researcher and scholar.

Her qualifications are as follows:
1. Ph.D. in Architecture
2. Master of Arts in Conservation and Regeneration
3. Bachelor of Architecture

She teaches the following courses:
1. Architectural Design
2. History and Theory
3. Courses in Heritage

3. Mr. Edward Ted Mazhani (Lecturer)

His qualifications are as follows:
1. Master of Design Science (Sustainable Design and Facilities Management)
2. Master of Architecture
3. Bachelor of Environmental Design Studies

He teaches the following courses:
1. Design

2. Building Systems
3. Building Services
4. Building Materials and Construction

His research interests are in the following areas:
1. Sustainability in the built environment
2. Building Materials
3. Facilities Management

4. Mr. Leago Setlhare Sebina (Lecturer)
He is a registered architect in Canada and Botswana and has experience in both practice and academia for over 15 years. His interest in practice, research, and teaching is in the infusion of appropriate sustainable technologies, indigenous knowledge, local resources, and skills in improving living conditions for low-income communities in Botswana. This has been explored through research and in the design of various types of projects, especially housing and others as well as in teaching practical courses such as design studio, building materials and construction, and Indigenous African Architecture.

His qualifications are as follows:
1. MArch (Master of Architecture - Arch. Design) University of New South Wales, Sydney, NSW, Australia. 2008
2. MArch (Master of Architecture -1st Prof.) Dalhousie University, Halifax, NS, Canada. 2004
3. BEDS (Bachelor of Environmental Design Studies), Dalhousie University, Halifax, NS, Canada. 2002

He teaches the following courses:
1. Design stream
2. Technology stream
3. History & Theory
4. Building Material and Construction
5. Traditional African Architecture
6. Final Year Design Thesis

His research interests are in the following areas:
1. Housing
2. Sustainability
3. Indigenous Knowledge Systems

5. Mr. Moemedi Gabana (Lecturer)

His qualifications are as follows:

He teaches the following courses:
1. Design
2. History and Theory of Architecture, and
3. Contemporary Philosophy of Architecture
4. Urbanism

6. Mrs. Seabo Botsile Morobolo (Lecturer)

Her qualifications are as follows:
1. PhD Candidate
2. Master of Urban and Regional Planning
3. Bachelor of Architecture (B.Arch.)
4. Bachelor of Applied Science (B.A.Sc.) Architectural Science

She teaches the following courses:
1. Architectural design studio
2. Drafting software
3. Final year Architectural design thesis supervisor

7. Ms. Petunia Gomotsang Gaoalafe (Lecturer)

Her qualifications are as follows:
1. Master of Science in Urban Design, 2017
2. Bachelor of Architecture, 2015

She teaches the following courses:
1. Architectural Design
2. Urban and Rural Design
3. Landscape Design

Her research interests are in the following areas:
1. The vitality of public spaces
2. The revitalization of decayed urban quarters

8. Ms. Lesego Daughter Rankwaila (Lecturer)
Registered Architect with the Architects Registration Council (Botswana) since 2018 with 11 years of industrial experience. She worked for the Ministry of Infrastructure and Housing Development from 2009 to 2018 (refurbishments, renovations, development projects, their management and contract administration as well as tendering) and joined the university in 2018. She's one of the founders of Botswana Women in Construction (BOWICO), formed in 2018, and currently holds the position of Treasurer as well as a member of the Strategy team.

Her qualifications are as follows:
1. Master of Science in Project Management (MSc.PM)
2. Bachelor of Architecture (B.Arch.)

She teaches the following courses:
1. Building Materials and Construction
2. Computer Aided Drafting
3. Professional Practice
4. Project Management

Her research interests are in the following areas:
1. Project management-related issues
2. Building Construction-related issues

ANNEXURE 5: CURRICULUM FOR CONSTRUCTION ENGINEERING AND MANAGEMENT – UNIVERSITY OF BOTSWANA

Introduction

The Bachelor of Construction Engineering is offered in the Faculty of Engineering under the Department of Civil Engineering for five (5) years. There is an industrial attachment at year four (4) for twenty (20) weeks. Below is the aim of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; The University of Botswana, 2022). Following an outline of the employment opportunities available to graduates, the program curriculum is presented. Furthermore, profiles of the three (3) academic staff members are provided.

Purpose of the qualification

The purpose of qualification in Construction Engineering and Management is to equip individuals with the knowledge and skills necessary to effectively manage construction projects. This field combines principles of engineering, project management, and construction techniques to ensure successful project execution.

Employment opportunities

1. Construction project manager
2. Construction consultant
3. Quality control manager

The curriculum of Construction Engineering Management

Year 1- BSc General

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
General Chemistry I	Core		General Chemistry II	Core
Introductory Mathematics I	Core		Introductory Mathematics I	Core
Geometrical Optics & Mechanics	Core		Electricity, Magnetism, and Elements	Core
Principles of Biology	Option		Introduction to Communications & Academic Literature II	GEC
Introduction to Communications & Academic Literature I	GEC		Computer Skills Fundamentals II	GEC
Computer Skills Fundamentals I	GEC			

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Material Science for Engineering	Core		Mechanics of Materials	Core
Engineering Mechanics I	Core		Electrical Fundamentals II	Core
Basic Microeconomics	Core		Workshop Technology	Core
Electrical Fundamentals I	Core		Engineering Mathematics II	Core
Engineering Mathematics I	Core		Dynamics of Particles	Core
Engineering and Computer-Aided Design	Core			Elective

Year 3

Semester 1			**Semester 2**	

Name of Module	Type of Module		Name of Module	Type of Module
Engineering Mathematics II	Core		Structural Analysis	Core
Surveying	Core		Construction Materials	Core
Construction Technology I	Core		Measurement and Specification	Core
Principles of Management	Core		Foundation of Engineering Law	Core
History of Building	Option		Construction Industry Economics	Option
CAD for Civil Engineers	Option		Information Technology in the Construction Industry	Option
Environmental Engineering	Option			
Basic Microeconomics	Option			

Year 4

Semester 1			Semester 2	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Construction Economics I	Core			
Construction Technology II	Core			
Measurement and Specification II	Core			
Building Services	Core			
Healthy and Safety Management in Construction	Core		Industrial Training II (20 weeks)	Core
Construction Law	Option			
Engineering Management	Option			

YEAR 5

Semester 1			Semester 2	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Project	Core		Project II	Core
Estimating and Tendering	Core		Construction Management II	Core
Construction Economics II	Core		Construction Technology II	Core
Constructions Management I	Core		Contract Administration	Core
Measurements and Specification-Civil Works	Option		Property Management and Valuation	Option
Public Health Engineering	Option		Facilities Management	Option
Construction Disputes Resolution	Option		Building and Factories Services	Option

Capacity in terms of academic staff

The Construction Engineering and Management programme is supported by three (3) academic staff who specialize in subject-specific courses. Additionally, service courses are obtained from experts in relevant subjects from different faculties within the University of Botswana. Presented below are the profiles of the three (3) academic staff members:

1. Prof. Joseph Ssegawa-Kaggwa Biography

Dr. Ssegawa is an associate professor at the Faculty of Engineering and Technology, University of Botswana. He has a Doctorate in Project Management and a post-graduate Diploma in Monitoring and Evaluation (M&E). He is a Director of the Master of Project Management Programme and teaches both

project and construction management at the undergraduate and graduate levels. Prof Ssegawa has supervised several Masters's and Doctoral students in Project Management. He has authored over 80 publications in journal and conference proceedings. Prof Ssegawa has experience of more than 15 years of consulting in construction development and has conducted studies on various topics in project management including project appraisal, planning, procurement, monitoring, and evaluation. Prof. Ssegawa has been engaged in high-level assignments in Botswana including the initiation of a construction development agency through the Ministry of Infrastructure Development. He has organised and facilitated over 50 continuous professional development (CPD) courses for practitioners in Botswana, Tanzania, Uganda, Mauritius, and South Africa.

His qualifications are as follows:
1. PhD
2. MBA
3. BSc
4. ACMA

He teaches the following courses:

1. Project Management (Planning, Finance, and M&E)
2. Construction Finance and Economics
3. Research Methodology

His research interests are in the following areas:
1. Project Management - PMOs, Project Leadership, Monitoring, and Evaluation
2. Construction Industry Development

2. Dr Keneilwe Ntshwene

Keneilwe Ntshwene is a Lecturer of Construction and Project Management in the Department of Civil Engineering, University of Botswana. He completed his Bachelor of Engineering in Construction Engineering and Management at the University of Botswana, MSc in Construction Management at, the University of Birmingham, UK, and Ph.D. in Construction Management and Engineering, University of Reading, UK. His research interests are in the field of sustainable construction, construction management, and project management. The focus of his work on sustainable construction is currently on the sector-level transition to sustainable construction. This includes an analysis of the effects and conditions of introducing new technologies/initiatives/policies in the construction industry. The other focus in the field of sustainable construction is the development and use of building assessment tools in the construction industry. In the areas of construction/project management, the focus is on management issues for the successful implementation of construction projects. This includes organisational aspects and the dynamics of construction project outcomes.

His qualifications are as follows:
1. Ph.D. Construction Management and Engineering
2. MSc Construction Management
3. BEng Construction Engineering and Management

He teaches the following courses:
1. Introduction to Project Management
2. Project Resources Procurement and Administration
3. Professional Ethics and Practice
4. Measurement and Specification of Civil Works
5. Estimating and Tendering for Civil Works

His research interests are in the following areas:
1. Sustainable Construction
2. Construction Management

3. Project Management

3. Mr. Babulayi Bister Wilson

He is a lecturer of Construction Engineering in the Department of Civil Engineering, University of Botswana. He completed his BEng in Building and Civil Engineering at the University of Botswana and his MSc in Construction and Project Management at the University of Birmingham, UK. His research interests are in the field of contract procedures, the resolution of construction disputes, and construction technology. He is an aspiring specialist in micro-climate adaptation through the use of alternative building materials and vegetation.

His qualifications are as follows:
1) MSc Construction and Project Management
2) BEng in Building and Civil Engineering

He teaches the following courses:
1) Construction Technology
2) Construction Management
3) Risk Management
4) Public-Private Partnership
5) Construction Disputes Resolution

His research interests are in the following areas:
1) Contract Procedures
2) Construction Technology
3) Resolution of Construction Technology
4) Micro-climate adaptation using alternative building materials and vegetation.

ANNEXURE 6: CURRICULUM FOR QUANTITY SURVEYING- BA ISAGO UNIVERSITY

Introduction

The Bachelor of Science in Quantity Surveying is offered in the Faculty of Built Environment, Arts and Science under the Department of Landscape Architecture and Quantity Surveying for a duration of four and a half (4.5) years. There is an industrial attachment at the end of year four (4) for six (6) months. Below is the aim of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; BaIsago University, 2023). Following an outline of the employment opportunities available to graduates, the program curriculum is presented. Furthermore, profiles of the thirteen (13) academic staff members are provided.

Purpose of the qualification

Quantity Surveyors operate in all sectors of the business environment and primarily focus on the financial management of construction projects. This QS qualification curriculum is designed to cover a whole range of skills and knowledge that modern quantity surveyors require to perform their work efficiently and effectively. The Bachelor of Science Degree in Quantity Surveying aims to equip the student with specialised skills and techniques which enable them to provide independent, objective, accurate, and reliable capital and operating cost assessment for investment funding, project administration, and control. The programme is designed to enable students to have skills in quantity surveying in commercial management of construction, quantification & costing of construction works, procurement & tendering, and construction technology.

Employment opportunities

Graduates of this programme are expected to gain employment in the public sector, consulting quantity surveying firms, construction companies, and other players in the construction industry as well as self-employment. They can work in areas of:

1. Building and engineering
2. Construction cost modelling
3. Quantity Surveying
4. Project management
5. Property development

The curriculum of the Bachelor of Science in Quantity Surveying

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Construction Quantities I	Core		Construction Materials and Techniques 1.2	Core
Quantity Surveying Practice I	Core		Construction Services and the Environment 1.2	Core
Computer Literacy	Fundamental		Commercial Law	Core
Basic Construction Surveying	Core			
Construction Materials and Techniques 1.1	Core			
Construction Services and the Environment 1.1	Core			
Construction Drawing	Core			
Principles of Economics	Core			

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Principles of Business Management	Fundamental		Information Technology I	Core
Construction Economics 1	Core		Construction Accounting	Core
Construction Quantities 2	Core		Construction Materials and Techniques 2.2	Core
Quantity Surveying Practice 2	Core		Construction Services and the Environment 2.2	Core
Construction Materials and Techniques 2.1	Core			
Construction Services and the Environment 2.1	Core			
Financial Accounting I	Core			

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Construction Economics 2	Core		Research Methods	Core
Construction Quantities 3	Core		Information Technology 2	Core
Quantity Surveying Practice 3	Core		Construction Materials and Techniques 3.2	Core
Construction Materials and Techniques 3.1	Core		Construction Services and the Environment 3.2	Core
Construction Services and the Environment 3.1	Core		Logistics and Purchasing Management	Core
Financial Mathematics	Core			
Principles of Marketing	Core			

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Construction Law 4.1	Core		Information Technology 3	Core
Construction Finance	Core		Construction Law 4.2	Core
Construction Economics 3	Core		Strategic Management	Core
Construction Quantities 4	Core			
Quantity Surveying Practise 4	Core			
Development Appraisal	Core			
Research Project	Core			

Industrial attachment Core 6 Months

Capacity in terms of academic staff

The Bachelor of Science in Quantity Surveying programme is supported by thirteen (13) academic staff who specialize in subject-specific courses. Presented below are the profiles of the thirteen (13) academic staff members:

1. Mr. Darlington Mugonderwa (Head of Department)

His qualifications are as follows:

1. MSc Construction Project Management
2. BSc (Hons) Quantity Surveying
3. Certificate in Vocational Education and Training (CVET)

2. Mr Alphonce Munhutu (Lecturer)

His qualifications are as follows:

1. MSc in Construction Project Management
2. BSc (Hons) Quantity Surveying

3. Mr. Loyd Sungirirai (Lecturer)

His qualifications are as follows:

1. MSc in Real Estate Finance and Investment
2. BA in Economics
3. Certificate in Vocational Education & Training

4. Ms. Sabello Sibanda (Lecturer)

Her qualifications are as follows:

1. Master of Landscape Architecture
2. Bachelor of Landscape Architecture
3. Bachelor of Science Landscape Architecture Honours
4. Bachelor of Science in Landscape Architecture
5. Certificate in Vocational Education & Training (CVET)

5. Mr. Victor Mwanyumeka (Lecturer)

Her qualifications are as follows:

1. MSc Construction Project Management
2. BSc (Hons) Quantity Surveying
3. Certificate in Vocational Education & Training (CVET)

6. Mrs. Mary Muthoga (Lecturer)

Her qualifications are as follows:

1. Master of Business Administration
2. BSc (Hons) Building Economics / Quantity Surveying
3. Certificate in Training of Trainers
4. Assessors Certificate

7. Mr Tshepiso Kapele (Lecturer)

His qualifications are as follows:

1. Master of Business Administration
2. BSc (Hons) Building Economics / Quantity Surveying
3. Certificate in Training of Trainers
4. Assessors Certificate

8. Mrs. Lorrin Manungo (Lecturer)

Her qualifications are as follows:

1. Master of Architecture
2. Bachelor of Architectural Studies

9. Mr. Oteng Lekoko (Lecturer)
His qualifications are as follows:

1. Master of Science in Environment Architecture
2. Bachelor of Applied Science in Architectural Science
3. Certificate in Architectural Technology
4. Certificate in Vocational Education and Training

10. Mr. Mabel Madzivire (Lecturer)
His qualifications are as follows:

1. MSc Construction Project Management
2. BSc (Hons) Quantity Surveying

11. Mr. Jacob Mhlanga (Lecturer)
His qualifications are as follows:

1. MSc Construction Project Management
2. Master of Business Administration
3. BSc (Hons) Quantity Surveying
4. Certificate in Vocational Education & Training

12. Mr. Moses Zhou (Lecturer)
His qualifications are as follows:

1. MSc Construction Project Management
2. BSc (Hons) Quantity Surveying
3. Certificate in Vocational Education & Training

13. Mrs Sesentle Pelotlhomogi (Lecturer)
His qualifications are as follows:

1. Master of Arts in Urban and Regional Planning
2. Bachelor of Science in Urban and Regional Planning

ANNEXURE 7: CURRICULUM FOR REAL ESTATE – BA ISAGO UNIVERSITY

Introduction

The Bachelor of Commerce in Real Estate is offered in the Faculty of Built Environment, Arts and Science under the Department of Real Estate for four (4) years. There is an industrial attachment in year three (3) Semester one (1) for six (6) months. Below is the aim of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; BaIsago University, 2023). Following an outline of the employment opportunities available to graduates, the program curriculum is presented. Furthermore, profiles of the six (6) academic staff members are provided.

Purpose of the qualification

The Bachelor of Commerce in Real Estate qualification is designed to fill the skills gap in the real estate industry by producing qualified property professionals with skills and competence to:

1. Conduct valuations and manage property assets.
2. Perform estate agency-related functions and lead multi-disciplinary teams by relevant legislation and established code of practice.
3. Provide solutions to the challenges faced by the built and construction sector.

Employment opportunities

1. Estates officer
2. Facilities manager
3. Valuer
4. Estate agent
5. Auctioneer
6. Property Manager
7. Real estate analyst

The curriculum of the Bachelor of Commerce in Real Estate

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Principles of Economics	Core		Law of Contract and Tort	Core
Business Communication	Core		Principles of Property Valuation	Core
Property Marketing	Core		Property Auctioneering	Core
Quantitative Methods	Core		Estate Agency	Core
Computing and Information Skills	GEC		Building Construction and Service	Core

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Property Management	Core		Applied Property Valuation	Core
Principles of Financial Accounting	Core		Land Policy and Administration	Core
Project Management	Core		Business Planning and Entrepreneurship	Core
Property Maintenance	Core		Cost Accounting	Core
Town and Country Planning	Core		Urban Land Economics	Core

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Internship (6 months)	Core		Global Business Environment	Core
			Development Economics	Core
			Business Strategy	Core
			Property Law	Core
			Real Estate Investment and Finance	Core

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Research Methods	Core		Housing Policy and Administration	Core
Organisational Psychology	Core		Research Project	Core
Property Development	Core		International Property Markets	Core
Geomatics	Core		Facilities Management	Core

Capacity in terms of academic staff

The Real Estate programme is supported by six (6) academic staff who specialize in subject-specific courses. Presented below are the profiles of the six (6) academic staff members:

1. Mrs. Godiramang Motlhagodi (Head of Department)

Her qualifications are as follows:

1. MSc in City and Regional Planning
2. BSc in Urban and Regional Planning
3. Certificate in Vocational Education and Training

2. Dr. Partson Paradza (Lecturer)

His qualifications are as follows:

1. Ph.D. in Real Estate
2. MSc in Real Estate
3. BSc in Urban and Rural Planning
4. Certificate in Vocational Education & Training

3. Mr. Loyd Sungirirai (Lecturer)

His qualifications are as follows:

1. MSc in Real Estate Finance and Investment
2. BA in Economics
3. Certificate in Vocational Education & Training

4. Ms. Winnet Ngarakana (Lecturer)

Her qualifications are as follows:

1. Master of Arts in Urban and Regional Planning
2. BSc in Urban and Rural Planning

5. Ms. Grace Gaolaolwe (Lecturer)
Her qualifications are as follows:
1. MSc Facilities Management
2. BA in Economics and Finance

6. Mr. Keitseng Z. Moitshubedi (Lecturer)
His qualifications are as follows:
1. Master of Business (Property)
2. BA in Business Administration

ANNEXURE 8: CURRICULUM FOR DIPLOMA IN REAL ESTATE MANAGEMENT

Introduction

The Diploma in Real Estate Management is offered in the Faculty of Built Environment, Arts and Science under the Department of Real Estate for two (2) years. There is an industrial attachment in year two (2) of Semester one (1) for six (6) months. Below is the aim of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; BaIsago University, 2023). Following an outline of the employment opportunities available to graduates, the program curriculum is presented. Furthermore, profiles of the six (6) academic staff members are provided.

Purpose of the qualification

A diploma in Real estate management is intended to provide learners with knowledge, skills, and competencies to:

1. Perform and prepare property valuation and appraisal reports of real estate assets.
2. Manage the marketing, selling, and leasing of commercial industrial business, agricultural, leisure, and residential properties
3. Conduct activities related to property management in both residential and commercial buildings including property analysis and maintenance plan.

Employment opportunities

1. Property valuer
2. Property auctioneer
3. Property developer
4. Property Manager
5. Facilities manager
6. Estate agent
7. Real estate consultant

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Principles of Economics	Fundamental		Project management	Fundamental
Computing and Information Skills	Fundamental		Quantitative methods	Fundamental
Principles of Financial Accounting	Fundamental		Building Maintenance	Core
Estate agency	Core		Property law	Core
Building Construction and Services	Core		Town and Country Planning	Core

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Industrial attachment	Core		Business planning and entrepreneurship	Core
			Real estate investment and finance	Core
			Geomatics	Core
			Property Auctioneering	Core

			Property Marketing	Core
			Property Management	Core

Capacity in terms of academic staff
The Real Estate programme is supported by six (6) academic staff who specialize in subject-specific courses. Presented below are the profiles of the six (6) academic staff members:

1. Mr Godiramang Motlhagodi (Head of Department)

His qualifications are as follows:
1. MSc in City and Regional Planning
2. BSc in Urban and Regional Planning
3. Certificate in Vocational Education and Training

2. Dr. Partson Paradza (Lecturer)
His qualifications are as follows:
1. Ph.D. in Real Estate
2. MSc in Real Estate
3. BSc in Urban and Rural Planning
4. Certificate in Vocational Education & Training

3. Mr. Loyd Sungirirai (Lecturer)
His qualifications are as follows:
1. MSc in Real Estate Finance and Investment
2. BA in Economics
3. Certificate in Vocational Education & Training

4. Ms. Winnet Ngarakana (Lecturer)
Her qualifications are as follows:
1. Master of Arts in Urban and Regional Planning
2. BSc in Urban and Rural Planning

5. Ms. Grace Gaolaolwe (Lecturer)
Her qualifications are as follows:
1. MSc Facilities Management
2. BA in Economics and Finance

6. Mr. Keitseng Z. Moitshubedi (Lecturer)
His qualifications are as follows:

1. Master of Business (Property)
2. BA in Business Administration

ANNEXURE 9: CURRICULUM OF CERTIFICATE IN REAL ESTATE

Introduction

The Certificate in Real Estate programme is offered in the Faculty of Built Environment, Arts and Science under the Department of Real Estate for one (1) year. Below is the aim of the qualification and specific career paths that can be pursued by graduates upon completion (Botswana Qualifications Authority, 2021; BaIsago University, 2023). Following an outline of the employment opportunities available to graduates, the program curriculum is presented. Furthermore, profiles of the six (6) academic staff members are provided.

Purpose of the qualification

The programme is designed to enhance the competencies and upgrade the knowledge of property managers, owners, consultants, and practitioners. Changes in the socioeconomic and political environment make it essential for Real Estate Practitioners to stay abreast with developments in the property industry, specifically relating to marketing, laws, social dynamics planning and development, property management, financing, and investments. At the end of this programme, participants will have an extensive overview of the real estate industry and be knowledgeable in real estate laws and regulations.

The purpose of this qualification is to give candidates broad technical knowledge, skills, and competencies to:

1. Determine property values and measure economic returns of real estate investments.
2. Guide buyers or sellers with the purchase or sale process, including identifying and articulating issues, ensuring compliance with relevant laws, coordinating inspections and appraisals, negotiating sales prices, and helping clients understand and select financing options.
3. Conduct real estate transactions, as licensed agents/brokers including property listing, rent, lease, and/or selling a property, and apply appropriate procedures and practices in residential real estate sales transactions according to the ethical and legal standards of the real estate industry.

Employment opportunities

1. Real estate investors
2. Residential and real estate brokers
3. Real estate agents
4. Property officer
5. Salesperson

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Communication skills	Fundamental		Introduction to Property Law	Core
Computer skills	Fundamental		Introduction to Estate Agency	Core
Customer service	Core		Introduction to Property Management	Core
Introduction to Building Technology	Core		Introduction to Property Valuation	Core
Introduction to Property Economics and Finance	Core		Introduction to Property Marketing	Core

Capacity in terms of academic staff

The Real Estate programme is supported by six (6) academic staff who specialize in subject-specific courses. Presented below are the profiles of the six (6) academic staff members:

1. Mr Godiramang Motlhagodi (Head of Department)

His qualifications are as follows:

1. MSc in City and Regional Planning
2. BSc in Urban and Regional Planning
3. Certificate in Vocational Education and Training

2. Dr. Partson Paradza (Lecturer)

His qualifications are as follows:

1. Ph.D. in Real Estate
2. MSc in Real Estate
3. BSc in Urban and Rural Planning
4. Certificate in Vocational Education & Training

3. Mr. Loyd Sungirirai (Lecturer)

His qualifications are as follows:

1. MSc in Real Estate Finance and Investment
2. BA in Economics
3. Certificate in Vocational Education & Training

4. Ms. Winnet Ngarakana (Lecturer)

Her qualifications are as follows:

1. Master of Arts in Urban and Regional Planning
2. BSc in Urban and Rural Planning

5. Ms. Grace Gaolaolwe (Lecturer)

Her qualifications are as follows:

1. MSc Facilities Management
2. BA in Economics and Finance

6. Mr. Keitseng Z. Moitshubedi (Lecturer)

His qualifications are as follows:

1. Master of Business (Property)
2. BA in Business Administration

ANNEXURE 10: CURRICULUM FOR ARCHITECTURAL TECHNOLOGY- LIMKOKWING UNIVERSITY

Introduction

The Associate degree of Architectural Technology is offered in the Faculty of Architecture & Built Environment. The programme is offered on a full-time basis for three (3) years. Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; Limkokwing University of Creative Technology, 2023). The curriculum of the programme follows immediately after the employment opportunities.

Purpose of the qualification

The architect as a practicing professional has the creative responsibility of designing buildings that shape the physical environment. To understand the diverse technological, humanistic, and economic nature of environmental problems, the architect must have a sound general education. More importantly, the knowledge learned must prepare him or her for a life of continuing changes in which problems to be solved will be large and small, for every sort of function, in every type of climate, and for every budget.

Employment opportunities

1. Architectural Assistant
2. Architectural Draftsperson or Technical Assistant
3. Site Supervisor
4. Project Executive/Coordinator
5. ACAD Draftsperson
6. Landscape Project Executive

The curriculum of the Bachelor of Technology in Architectural Technology

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Applied Mathematics	Core		Architecture Design & Theory 1	Core
Architectural Research and Communication	Core		Architecture Drawing 2	Core
Architectural Drawing 1	Core		Building Construction 1	Core
Building Material	Core		Introduction to Digital Imaging	Core
Introduction to Computer Skills	Core		Introduction to History & Culture	Core
Introduction to Creative Design	Core		Building Structures 1	Core

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Architectural Computing 1	Core		Architectural Computing 2	Core
Architectural Culture & History 2	Core		Architectural Design & Theory 3	Core
Architectural Design and Theory 2	Core		Architecture Drawing 4	Core
Architecture Drawing 3	Core		Building Construction 3	Core
Architecture Techniques	Core		Building Services 1	Core
Building Construction 2	Core		Site Surveying & Landscaping	Core
Building Structures 2	Core			

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Architecture Design	Core		Practical Internship	Core
Architecture Office Practise	Core		Project Report	Core
Architecture Science	Core			
Building Construction 4	Core			
Building Services 2	Core			
Entrepreneurship	Core			

ANNEXURE 11: CURRICULUM FOR TECHNOLOGY IN CONSTRUCTION ENGINEERING – GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES

Introduction

The Bachelor of Technology in Construction Engineering programme is offered under the Department of Engineering, Technical & Vocational Education. The programme is offered on a full-time basis for four (4) years. Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; Gaborone University College of Law & Professional Studies, 2023). The curriculum of the programme follows immediately after the employment opportunities and lastly, the profile of the respective sixteen (16) academic staff is presented.

Purpose of the qualification

The purpose of this qualification is to produce graduates with knowledge, skills, and competencies to:

1. Design and conduct experiments with appropriate techniques and tools and critically investigate, analyze, and interpret data.
2. Design a system, component, or process per given specifications and requirements in the areas of construction engineering and related disciplines.
3. Identify solutions to problems and projects by making use of diverse technical knowledge and skills acquired.
4. Conceptualize and assess constraints that may influence engineering problems, systems, and/or projects.
5. Follow development trends in construction engineering and related disciplines.
6. Act professionally and ethically and take responsibility for exercising judgment commensurate with knowledge and experience.
7. Communicate effectively via graphic, numeric, verbal, and written media with engineering audiences and the community at large.
8. Reason critically and develop alternative views and/or solutions.
9. Work effectively as an individual, in teams, and in multidisciplinary environments showing leadership and professional interpersonal skills.
10. Demonstrate knowledge and understanding of engineering management principles in society, industry, and physical environment and address the issues by analysis and evaluation.

Employment opportunities

Upon successful completion of this qualification, the graduate can be absorbed in the following disciplines at entry level as;

1. Site engineer
2. Resident engineer (Technologist)
3. Principal agent
4. Estimator
5. Site agent
6. Road engineer (Technologist)
7. Facilities manager
8. Materials testing engineer (Technologist)
9. Contracts manager
10. Cost manager

The curriculum of the Bachelor of Technology in Construction Engineering

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Engineering Mathematics I	Core		Engineering Mathematics II	Core
Introduction to Computers & Programming	Core		Computer-Aided Design I	Core
Engineering Materials I	Core		Engineering Materials II	Core
Descriptive Geometry	Core		Communication Skills II	Core
Workshop Practical Training I	Core		Workshop Practical Training II	Core
Communication Skills	Core		Engineering Surveying I	Core
			Field Practical Training I	Core

Year 2

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Building Construction I	Core		Building Construction II	Core
Computer-Aided Design II	Core		Theory of Structures	Core
Mechanics of Materials	Core		Engineering Drawings II	Core
Geotechnical Engineering I	Core		Fluid Mechanics	Core
Engineering Surveying II	Core		Fluid Practical Training II	Core
				Elective

Year 3

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Road Design and Construction I	Core		Road Design and Construction II	Core
Design of Reinforced Concrete Structures I	Core		Design of Reinforced Concrete Structures II	Core
Foundation Engineering I	Core		Foundation Engineering II	Core
Engineering Drawings III	Core		Engineering Drawings IV	Core
Water and Wastewater Engineering I	Core		Water and Wastewater Engineering II	Core
Measurement of Construction Works	Core		Field Practical Training III	Core
			Environmental Science	Elective
			Building Services	Elective

Year 4

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**

Construction Management	Core		Contract Procedures and Administration	Core
Design of Steel and Timber Structures	Core		Fundamentals of Infrastructure Management	Core
Construction Law and Law of Contracts	Core		Professional Practice & Ethics	Core
Project Planning Techniques I	Core		Final Project II	Core
Final Project I	Core		Environmental Science	Elective
Entrepreneurship	Elective		Building Services	Elective
Risk Management	Elective			

Capacity of academic staff

The Construction Engineering programme has sixteen (16) academic staff and two (2) technicians. Below are the profiles of the sixteen (16) academic staff:

1. Mr. Hope Mwakamui (Head of Department)
His qualifications are as follows:
1. Master in civil engineering (Construction Management)
2. Bachelor of Engineering in Construction Engineering and Management
3. First Aid Certificate
4. Trainer of Trainer Certificate
5. QMS Lead Auditor Certificate
6. Quality Management Systems Certificate

2. Dr Paul John Kinanawa Lyamuya (Lecturer)
His qualifications are as follows:
1) Doctor of Architectural Sciences (Ph.D.)
2) MPhil (Pre-Doctoral)
3) Bachelor of Architecture

3. Dr. Shodolapo Franklin (Lecturer)
His qualifications are as follows:

1) Ph.D. Engineering
2) MSc Structural Engineering
3) BSc Civil Engineering

4. Mr. Joseph Samman (Lecturer)
His qualifications are as follows:
1. MSc (Building)
2. BSc (Hons) Quantity Surveying/Building Economics

5. Mr. Justice M Nkile (Lecturer)
His qualifications are as follows:
1. MSc in Project Management
2. Bachelor of Art (Hons) in Interior Architecture
3. Construction Engineering Certificate

6. Mr. Mbwilo Silumbwe (Lecturer)
His qualifications are as follows:
1. MSc in Water and Environmental Engineering

2. Degree in Civil Engineering

7. Ms. Stella Chitiyo (Lecturer)

His qualifications are as follows:

1. Master of Engineering in Manufacturing Engineering & Operations Management
2. BSc (Hons) Mechanical Engineering

8. Mr Munyaradzi Mhlanga (Lecturer)

His qualifications are as follows:

1. MSc Technical Education in Building Design and Technology
2. Bachelor of Technical Education in Building Design and Technology
3. Diploma in Education Secondary (Building Studies and Mathematics)

9. Mr. Reuben C K Akormedie (Lecturer)

His qualifications are as follows:

1. Licentiateship Diploma in Building Services
2. Full Technician Certificate
3. Plumbing Technician Certificate
4. Vocational Training Instructors Techniques Certification

10. Mr. Lamong Duke Tshenyego (Lecturer)

His qualifications are as follows:

1. MSc Engineering (Agricultural Engineering)
2. MSc Civil Engineering (Water & Environment)
3. BSc Soil & Water Conservation Engineering

11. Mr Moloko (Lecturer)

His qualifications are as follows:

1) MSc Civil Engineering (Water Engineering and Environmental Engineering)
2) BSc in Soil and Water Conservation Engineering
3) Trainer of Trainee Certificate

12. Mr. Lamong Duke Tshenyego (Lecturer)

His qualifications are as follows:

1) MSc Master of Business Administration. (Finance and Marketing).
2) Post Graduate Diploma in Business Administration in Operations Management
3) BSc Bachelor of Technology, Mechanical Engineering,
4) Certificate in AutoCAD, Certificate in Product Design and Development (Solid Works and Ansys),
5) Fundamentals of Digital Marketing
6) Certificate in Understanding ISO 9001:2015, QMS.

13. Ms. Lista Gobodi (Lecturer)

Her qualifications are as follows:

1) MSc Electrical Engineering
2) BTech Ed. In Electrical and Electronics Engineering Honors Degree
3) National Diploma in Technical and Vocational Education
4. National Certificate in Electrical Power Engineering

14. Mr. Phyllis Kudzai Maphosa (Lecturer)

His qualifications are as follows:

1) MSc Information Technology Management
2) BSc (Hons) Business Information Technology (Final Year)
2) Specialist Advanced Diploma in Teaching, Training & Assessing Learning
3) Advanced Diploma in Teaching, Training & Assessing Learning
4) Higher National Diploma in Computer Studies
5) Certificate in Computer Studies

15. Mr. Derrick Robin Vuuren (Lecturer)
His qualifications are as follows:

1) BSc Degree in Agricultural Mechanization

16. Anitha Immaculate (Lecturer)
The qualifications are as follows:

1 Ph.D. in Chemistry (Pursing)
2) Master of Philosophy in Chemistry (M.Phil.)
3) Master of Education (Higher Education)
4) Master of Science in Chemistry
5) Bachelor of Education (B.Ed.)
6) Diploma in Medical Laboratory Technology (DMLT).

ANNEXURE 12: CURRICULUM FOR CERTIFICATE V IN REAL ESTATE MANAGEMENT – GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES

Introduction

The Certificate V in Real Estate Management programme is offered in the Department of Business. The programme is offered for one (1) year. Below is the aim of the qualification and what graduates of this programme are expected to do once they complete their studies (Botswana Qualifications Authority, 2021; Gaborone University College of Law & Professional Studies, 2023). The curriculum of the programme follows immediately after the employment opportunities and lastly, the profile of the respective three (3) academic staff is presented.

Purpose of the qualification

This qualification is intended to enhance the provision of entry-level service within the Property and Real Estate sector. It will provide the broad knowledge, skills, and values needed in the Property and Real Estate sector.

Employment opportunities

1. Real estate agent
2. Leasing Consultant
3. Real estate marketing specialist

The curriculum of the Certificate in Real Estate

Year 1

Semester 1			**Semester 2**	
Name of Module	**Type of Module**		**Name of Module**	**Type of Module**
Introduction to Business Communication	Core		Introduction to Building Technology	Core
Computer Skills	Core		Introduction to Real Estate Agency	Core
Customer Service	Core		Introduction to Property Law	Core
Introduction to Property Management	Core		Introduction to Property Marketing	Core
Property Economics & Finance	Core		Introduction to Property Valuation	Core

Capacity of academic staff

The Real estate programme has three (3) academic staff. Below are the profiles of the three (3) academic staff:

1. Mr Akim Nyakudya (Head of Department)

His qualifications are as follows:

1. BSc (Hons) in Urban Planning & Development
2. Certificate in Training of Trainers

He teaches the following courses:

1. Introduction to Business Communication
2. Computer Skills
3. Property Economics & Finance
4. Introduction to Building Technology
5. Introduction to Real Estate Agency
6. Introduction to Property Law
7. Introduction to Property Marketing
8. Introduction to Property Valuation

2. Mr. Joshua Pata (Lecturer)
His qualifications are as follows:
1. PhD in Counselling
2. Master of Business Administration
3. Bachelor in Accounting & Finance
4. Diploma in Human Resource Management
5. Diploma in Psychological Social Counselling

He teaches the following courses:
1. Cost Accounting
2. Financial Accounting

3. Mr Shandulo Gabobegwe (Lecturer)
His qualifications are as follows:
1. MSc in Strategic Management
2. Bachelor in Tourism
3. Certificate in Customer Service
4. Certificate in Vocational Education & Training

He teaches the following courses:
1. Customer Service

ANNEXURE 13: RELEVANCE OF THE CURRICULA TAUGHT IN DIFFERENT UNIVERSITIES

Score criteria used in assessing relevance of skills	Decision
For scores X≤1.49	Not relevant
Fore scores between 1.5≤X≤2.49	Less relevant
For scores 2.5≤X≤3.49	Relevant
For scores X≥3.5	Very relevant

Land sector graduates		Relevance						
	Competences and skills that employers look for in employees	Not relevant	Less relevant	Relevant	Very relevant	Total	Mean score	Comments
Architecture	Architectural design principles and software proficiency	0.08	0.08	0.17	0.67	1	3.4	Relevant
	Building codes and regulations	0	0.17	0.17	0.67	1	3.5	Very relevant
	Sustianable desgin and green building practices	0.08	0.08	0.33	0.5	1	3.3	Relevant
	Construction materials and techniques	0.08	0.08	0.08	0.75	1	3.5	Relevant
	Project management and coordination	0	0.08	0.17	0.75	1	3.7	Very relevant
	Communication and presentation skills	0	0.08	0.08	0.83	1	3.8	Very relevant
	Report writing	0	0.08	0.25	0.67	1	3.6	Very relevant
	Overall Mean Score (OMS)						3.542857143	Very relevant
Construction	Construction project management	0.09	0	0.36	0.55	1	3.4	Relevant
	Construction methods and techniques	0.09	0	0.36	0.55	1	3.4	Relevant
	Construction scheduling and resource allocation	0.09	0.09	0.36	0.45	1	3.2	Relevant
	Health and safety regulations and practices	0.09	0	0.55	0.36	1	3.2	Relevant
	Report writing	0	0.09	0.45	0.45	1	3.4	Relevant
	Overall Mean Score (OMS)						3.32	Relevant
Geomatics	Geographic Information Systems (GIS) and remot sensing	0.13	0	0.13	0.75	1	3.5	Very relevant
	Surveying and mapping techniques	0.13	0.13	0.13	0.63	1	3.3	Relevant
	Geospatial data analysis and interpretation	0	0.13	0.13	0.75	1	3.6	Very relevant
	Cartography and visualization	0.14	0.14	0.14	0.57	1	3.1	Relevant
	Spatial database management	0	0	0.43	0.57	1	3.6	Relevant
	Report writing	0.13	0	0.38	0.5	1	3.3	Relevant
	Overall Mean Score (OMS)						3.4	Relevant
Quantity Surveying	Cost estimation and budgeting	0.06	0	0.06	0.88	1	3.8	Very relevant
	Tendering and procurement processes	0	0.06	0.19	0.75	1	3.7	Very relevant
	Quanity take-off and measurement	0	0.06	0.06	0.88	1	3.8	Very relevant
	Contract administration and management	0	0.13	0.19	0.69	1	3.6	Very relevant
	Value engineering and cost control	0	0.13	0.31	0.56	1	3.4	Relevant
	Knowledge of construction contract and laws	0	0.06	0.25	0.69	1	3.6	Very relevant
	Report writing	0	0.19	0.25	0.56	1	3.4	Relevant
	Overall Mean Score (OMS)						3.614285714	Very relevant
Real Estate	Market research and analysis	0	0.06	0.47	0.47	1	3.4	Relevant
	Property valuation and appraisal	0	0	0.53	0.47	1	3.5	Relevant
	Negotiation and deal-making	0	0.06	0.53	0.41	1	3.4	Relevant
	Property management and leasing	0	0.06	0.53	0.41	1	3.4	Relevant
	Real estate finance and investment analysis	0	0.18	0.53	0.29	1	3.1	Relevant
	Knowledge of local regulations and laws	0	0.12	0.47	0.41	1	3.3	Relevant
	Report writing	0	0	0.53	0.47	1	3.5	Relevant
	Overall Mean Score (OMS)						3.371428571	Relevant
Urban & Regional Planing	Land use planning and zoning regulations	0	0.17	0	0.83	1	3.7	Very relevant
	Urban design principles and spatial analysis	0	0.17	0	0.83	1	3.7	Very relevant
	Transportation planning and infrastructure development	0	0.17	0.83	0	1	2.8	Relevant
	Environmental impact assessment	0	0	0.67	0.33	1	3.3	Relevant
	Community engagement and stakeholder management	0	0	0.67	0.33	1	3.3	Relevant
	Policy development and implementation	0	0.33	0.33	0.33	1	3	Relevant
	Report writing	0	0	0.33	0.67	1	3.7	Very relevant
	Overall Mean Score (OMS)						3.357142857	Relevant
Soft Skills	Communication	0	0	0.42	0.58	1	3.6	Very relevant
	Collaboration and teamwork	0	0	0.42	0.58	1	3.6	Very relevant
	Problem-solving	0	0	0.39	0.61	1	3.6	Very relevant
	Adaptability	0	0	0.52	0.48	1	3.5	Very relevant
	Attention to detail	0	0.03	0.35	0.61	1	3.6	Very relevant
	Professional ethics	0	0	0.35	0.65	1	3.6	Very relevant
	Team work	0	0	0.39	0.61	1	3.6	Very relevant
	Overall Mean Score (OMS)						3.585714286	Very relevant