

# ASSESSMENT OF CURRENT STATUS OF TECHNICAL AND HIGHER EDUCATION SECTOR IN LIBERIA

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## ACRONYMS

BMC	Bong Mining Company
BCTC	Bong County Technical College
BWI	Booker Washington Institute
CARI	Central Agricultural Research Institute
EU	European Union
GBCCC	Grand Bassa County Community College
GOL	Government of Liberia
GPRS	Ghana Poverty Reduction Strategy
HND	Higher National Diploma
ICT	Information and Communication Technology
LAMCO	Liberia-America-Swedish Mining Company
LCCC	Lofa County Community College
LITCOM	Liberia TVET Commission
LMC	Liberia Mining Company
EMIS	Education Management Information System
MOE	Ministry of Education
MYS	Ministry of Youth and Sports
MVTC	Monrovia Vocational Training Center
NCCC	Nimba County Community College
NCHE	National Commission on Higher Education
NIOC	National Iron Ore Company
NUC	Nigeria University Commission

PADP	Pro-Poor Agenda for Prosperity and Development
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
STEM	Science, Technology, Engineering and Mathematics
TOR	Term of Reference
TU	Tubman University
TVET	Technical and Vocational Education and Training
UNIDO	United Nations Industrial Development Organization
UL	University of Liberia

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## EXECUTIVE SUMMARY

Liberia is among the countries with the lowest human development. It is ranked 181 out of 189 countries in the world in 2017. The education sector is a reflection of the political and economic fragility of the country. The sector is generally weak and fragmented. The status of the sector suggests that education has experienced public neglect and inadequate support for many years.

The delivery of quality higher and technical and vocational education and training (TVET) in Liberia has numerous constraints ranging from over-crowded classrooms to poorly equipped libraries and laboratories and inadequate qualified faculty. Available facilities do not match with the constant growth in student population. The constraints of public institutions are underpinned by underfunding of the sector by the Government of Liberia's low budgetary allocations and actual disbursements to institutions as well as insufficient complementary financial support from external sources. Higher education has not been a high priority for donors' support to the country over the past decade, and public resource investments in the sector have primarily targeted payroll. The TVET Bureau of the Ministry of Education (MOE), which provides oversight of secondary and non-degree granting TVET institutions not governed by NCHE, is also experiencing funding challenges.

Appointment of Directors and Deputies at the National Commission on Higher education (NCHE) which has oversight responsibility of higher education is politicized and disregards clauses in the Act that created the Commission in 1989 as a professional autonomous agency. The resulting lack of continuity in vision has led to ineffectiveness of NCHE and proliferation of higher education institutions across the country without thorough assessment of required standards such as the academic qualification and experience of the faculty, adequacy of infrastructure facilities and the alignment of proposed programs with Liberia's workforce development priorities. The Government's new flagship development agenda – the Pro-Poor Agenda for Prosperity and Development (PAPD) clearly underscores this by admitting that disciplines being pursued by students do not match the current and future demands for skills in the economy.

Other factors contributing to weakness in the education system include the lack of interest of qualified Liberians with graduate and postgraduate degrees to enter the teaching profession because of the comparative lower income and incentives in this sector. Universities and colleges requiring graduate or postgraduate level faculties have the greatest challenge attracting and retaining highly trained faculty. For example, only 13% of the teaching staff of the undergraduate College of Agriculture and Forestry of the UL hold Ph.D.'s; 82% have a master's degree. The remaining 5% are bachelor's degree holders who serve

as Teaching Assistants for introductory courses. A significant percent of instructors work as part-timers in two or more institutions. Part-time instructors of UL's College of Agriculture and Forestry in various specialized disciplines make up nearly 40 percent, while the UL's College of Engineering is about 30 percent. Quality education cannot be achieved through huge part-time instructors.

Aging of instructors further exacerbates the weakness of TVET and higher education institutions. Eleven (11) percent of the teaching staff in higher education and TVET institutions surveyed have either reached, or surpassed, Liberia's official 60-year retirement age and additional 3-4 percent will reach retirement age in the next 5 – 10 years. Data from the institutions surveyed show a disproportionate gender representation on both Higher Education and TVET faculty and staff as female faculty and staff in three major TVET and Higher Education institutions is 9 percent while male share is 91 percent. Female role models are lacking to motivate girls and young women to become lecturers.

The scale and scope of research and scholarly activities in Liberia's higher education is almost negligible compared to other universities in the region. Although the UL and Cuttington University (CU) have demonstrated some level of research activities, neither of these two institutions has published significant research results in recent years. The 2016 Central Agricultural Research Institute (CARI), the only and largest public funded agricultural research institute, developed its Research Strategy that underscores adaptive research and the promotion of knowledge, information and technologies that respond to clients' demands. However, CARI has been grossly unfunded and available funds are mainly for salaries of staff. The assessment did not find concrete linkages between CARI and Higher Education unlike other regional countries where research institutions and Higher Education institutions regularly collaborate for their mutual scholarly benefits.

Key recommendations for improving Liberia's education sector are, but not limited to, the investment of significant public resources (financing) in faculty and staff development, improvement of demonstration laboratories, libraries and infrastructural facilities, and payments of commensurate salaries and benefits to enhance the recruitment and retention of qualify teaching staff. Regulatory bodies, including the National Commission on Higher Education, need to be adequately funded and depoliticized. If donors' and public investments are not increased in higher and TVET education, it is unlikely that the broader development goals enshrined in the government's Pro-poor Agenda for Prosperity and Development (PAPD) will be achieved.

## **1 OBJECTIVE OF THE ASSESSMENT**

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) was established in 2004, and currently has 144 African universities in 38 countries across the African continent. RUFORUM has a mandate to strengthen the quality and relevance of postgraduate training and research in African universities, especially in agriculture, science, technology, and innovation.

RUFORUM commissioned the assessment of technical and higher education institutions in Liberia. The overall objective of the assessment is to identify challenges and gaps and develop specific recommendations towards improving the performances and contributions of technical and higher education institutions to agriculture, science, technology and innovation in Liberia. This assessment built on notes from papers presented during the Liberian Higher Education Day held on 26th April 2019 in Monrovia, Liberia during the 17<sup>th</sup> RUFORUM Executive Board meeting. The key deliverable of this assessment is a report that will include all aspects outlined in the Terms of Reference (TOR) for the assignment and a presentation of the draft report to stakeholders in Liberia for validation. See Annex 2 for the TOR.

## **2 METHODOLOGY AND LIMITATIONS**

The focus of this assessment was primarily TVET and higher education institutions with agriculture and science programs. This report is informed by qualitative and quantitative data collected from existing national policy documents, reports and higher and TVET education regulatory and policy frameworks in Liberia. Primary data were collected from key informants' interviews with leaders of TVET and higher institutions and regulatory agencies in the education sector. The assessment reviewed two World Bank Policy Review documents and several other resource documents relating to experiences of Ghana, Nigeria and Sierra Leone that have more advanced TVET and higher education programs and more robust regulatory frameworks than Liberia. RUFORUM edited the draft report and followed by validation by key stakeholders in the education sector of Liberia.

The assessment had two (2) limitations: (i) four of the seven institutions (both public and private) purposively selected for the assessment did not respond to the questionnaires; and (ii) there were also varied levels of restrictions on information that institutions could release for public consumption, especially when related to finances. These reasons are responsible for the limited data presented in this report regarding institutions' funding trends, faculty qualities in terms of academic levels and ranks, students' enrolment in colleges and courses. These trends are necessary to inform the design and

relevance of future capacity development programmes for TVET and higher education. However, the findings in this report adequately represent the true status of TVET and higher education in Liberia. The recommendations are tailored to remove the major challenges and constraints hindering the delivery of quality TVET and higher education in Liberia.

### **3 CONTEXT AND REGULATORY FRAMEWORK OF LIBERIA’S HIGHER EDUCATION AND TVET**

#### **3.1 Context of Higher Education**

Tertiary education and higher education are used interchangeably in this report. Both terms refer to any level of academic or professional studies above secondary school education leading to associate which is the equivalent of National Diploma in Agriculture (NDA), undergraduate, graduate and post graduate degree. Tertiary education in Liberia began in 1862 with the establishment of the public-funded Liberia College. Liberia College became a full University in 1951, now the University of Liberia and is the oldest degree-granting school in West Africa. The UL is accredited by the Liberia’s Commission on Higher Education. Undergraduate students earn bachelor's degrees after four years of instruction, while the graduate programs offer master's degrees after two years of additional academic work.[https://en.wikipedia.org/wiki/University\\_of\\_Liberia\\_-\\_cite\\_note-about-2](https://en.wikipedia.org/wiki/University_of_Liberia_-_cite_note-about-2) Doctorates in medicine are conferred after the completion of a seven-year program.[https://en.wikipedia.org/wiki/University\\_of\\_Liberia\\_-\\_cite\\_note-about-2](https://en.wikipedia.org/wiki/University_of_Liberia_-_cite_note-about-2) UL is divided into six colleges, three graduate programs, and three professional schools. Colleges at the UL include the Liberia College of Social Sciences and Humanities, the College of Business and Public Administration, the College of General Studies, and the T. J. R. Faulkner College of Science and Technology. Additionally, there is the William V. S. Tubman Teachers College and the William R. Tolbert College of Agriculture and Forestry, both named after former presidents of the nation.

Louis Arthur Grimes School of Law, the only law school in Liberia, was added into the university in 1951. The A. M. Dogliotti College of Medicine was opened in a partnership between Italy's A. M. Dogliotti Foundation and the government of Liberia. The School of Pharmacy is the third professional school, while graduate programs include the Ibrahim B. Babangida Graduate Program in International Relations, the Graduate Program in Regional Science, and the Graduate Program in Education Administration. In addition to the schools and departments of study, UL houses five institutes.[https://en.wikipedia.org/wiki/University\\_of\\_Liberia\\_-\\_cite\\_note-about-2](https://en.wikipedia.org/wiki/University_of_Liberia_-_cite_note-about-2) These are the Institute for Research, Institute for Population Studies, Kofi A. Annan Center for Conflict Transformation, Center for

Millennium Development Goals, and the Confucius Institute. UL is a member of the Association of African Universities.

William V. S. Tubman University, previously Tubman College (TC), was established in southeast Liberia because of the absence of a viable higher education institution in that region of Liberia. TC began in August 1978, with an enrollment of 87 students and thrived in producing 50% -60% of Liberia's technocrats in the fields of architectural, civil, electrical, electronic, and mechanical engineering. The NCHE accredited TC in 1990 to offer a 5-year Bachelor of Science degree in the aforesaid fields in engineering.

The first private (faith-based) higher education institution, Cuttington College (CC), now Cuttington University (CU), was established in 1889 by the Episcopal Church of the United States. CU was first established in Monrovia for teaching Liberian children about industry and agriculture. Among the first private colleges in the West African region, CC was seen as an elite school. In 1948, the college moved to Suakoko in Bong County, 120 miles north of Liberia's capital of Monrovia. CU offers courses and programs leading to pre-bachelor, bachelor and master degrees in arts and humanities, business education and medicine. There are currently 20 universities offering both baccalaureate and master's degrees, and 18 higher education institutions offering associate degrees in various disciplines<sup>1</sup>. No higher education institution offers Ph.D. degree in Liberia. The list of accredited institutions of higher education in Liberia are shown in Annex 1.

Secondary school graduates enroll in universities and colleges in pursuit of associate in the first two years and do additional two years in pursuit of undergraduate degrees. For more clarity, the purpose of establishing community colleges in the rural counties was to provide a two-year associate degree TVET programme aimed at addressing the specific workforce needs of businesses and industries in each county. These community colleges have transformed themselves into tertiary institutions and now granting associate degrees in disciplines that were not specifically targeted. For example, Nimba County Community College was established to train geologists and mining engineers because of iron ore mining activities on Nimba Mountain. NCCC has included nursing, agriculture and other disciplines in its programme.

### **3.2 Regulatory Framework of Higher Education**

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<sup>1</sup>National Commission on Higher Education (NCHE) (2019). Recognized and Accredited Higher Education Institutions (HEIs) in Liberia, 2018/2019.

The National Commission on Higher Education (NCHE) is the regulatory body for all degree-granting higher education institutions in Liberia. It was established by an Act of National Legislature in 1989. It oversees implementation of the 2015 Revised Policy on Higher Education in Liberia. The NCHE has drafted policies that set minimum standards for the accreditation of Higher Education institution. The draft standards have not yet been validated by stakeholders for use as tool for evaluating and accrediting higher education institutions. Additionally, the NCHE has not been able to facilitate the establishment of the proposed autonomous National Accreditation Center (NAC) enshrined in its mandate to take responsibility for evaluating and accrediting higher institutions of learning in Liberia.

The NCHE has two major challenges: (1) underfunding, and (2) politicization. Budgetary allocations to NCHE have been limited in the last few years and have largely targeted payrolls with limited funds for operations. Moreover, development partners have focused on funding basic and childhood education. Although the NCHE was established by an Act of National Legislature as an independent regulatory body for higher education, the appointment of its Executive Director and deputies, which is technically the responsibility of the Board of Directors, have been made politically by the Executive Branch of Government. The Commission has experienced three (3) leadership turnover in the last ten (10) years as a result of political appointments. This has led to the lack of continuity in national vision about higher education and ineffectiveness in the delivery of the Commission's mandates, which are crucial to the delivery of quality higher education in Liberia. The Commission acknowledges the proliferation of higher education institutions across the country as a challenge, but lacks the requisite resources to assess their integrities for accreditation.

### **3.3 Context of TVET Education**

Prior to the establishment of Booker Washington Institute in Liberia in 1929, TVET was literally an informal learning or apprenticeship program. The establishment of BWI was primarily tied to the US based Firestone Natural Rubber Plantation established in 1926 to produce middle level technicians in agriculture, business education, building trades, and electrical trades for the Firestone Natural Rubber Plantation and emerging companies in the mining sector. Up to the decade of the 60s, most Liberians perceived TVET as education for school dropouts who lack academic potential for formal education. Studies by Oketchi (2014)<sup>2</sup> and Rima and Akhuemonkhan (2014)<sup>3</sup> support this perception that general

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<sup>2</sup>Oketch; M., (2014) : Education policy, vocational training, and the youth in Sub-Saharan Africa, WIDER Working Paper, No. 2014/069, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki

<sup>3</sup> Rima, L. & Akhuemonkhan, I.A. (2014). Has TVET imparted on employment and national development? The Macrotheme Review 3(2) Spring 2014.

education has the promise of better career mobility and higher wages than TVET. Experience from Ethiopia by Tamrat (2019)<sup>4</sup> also indicates that in spite of potential of TVET to address the challenges of skill gaps and reduce unemployment in Ethiopia, students, parents and the larger community appear to show little interest towards TVET as compared to university degrees. It is widely considered as inferior to the academically-oriented degrees offered by higher education institutions and as a training route suitable for those with poor academic abilities.

The turning point of TVET in Liberia was the emergence of large mining companies/concessions and businesses during the 1960s and 1970s (e.g. Liberian-American-Swedish Mining Company (LAMCO), Bong Mining Company (BMC), Liberian Mining Company (LMC), and National Iron Ore Company (NIOC). Each of these companies set up their own TVET centers to train technical and administrative staff that required specific skills sets for efficient operation of their companies. The emergence of these companies and concessions was when Liberia realized that TVET is the most practical means for acquiring readily employable skills for the world of work.

The Government of Liberia acknowledges that TVET holds the key to technological progress, rapid industrialization, wealth creation and poverty reduction in the country. Section 2.2 (Building Human Capacity for Knowledge Economy) of Pillar II (Power to the People) of the Government's Pro-Poor Agenda for Prosperity and Development (PADP), places emphases on TVET. TVET programs will provide training opportunities for the youth (both men and women) to acquire the needed skills for the emerging job opportunities in agriculture value chains from production to marketing encompassing processing, manufacturing and other light industries. The Ministry of Education forecasts a potential demand for 620,000 skilled workers to fulfill demands of industry by 2030.<sup>5</sup> Training in Science, Technology, Engineering and Mathematics (STEM) will be critical for preparing youth to meet the demands for these huge job opportunities. However, the PADP classifies STEM education and TVET programs in Liberia as underdeveloped and that no national qualification framework or competence-driven curriculum exists. The PADP further states that there is a severe mismatch between disciplines pursued by students and the current and future demands for skills in the economy<sup>6</sup>.

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<sup>4</sup> Tamrat, W. (20 March 2019). Universities vs TVET – Are attitudes the problem? University World News: Africa Edition.

<sup>5</sup> Government of Liberia (2018). Pro-poor Agenda for Prosperity and Development (PADP) – 2018 – 2023.

<sup>6</sup> *ibid.*

Key challenges to TVET delivery, include among other things: (i) fragmented data on TVET supply and ad-hoc labor market information collection; (ii) weak linkages between TVET curricula and the productive sectors of the economy limit relevance; (iii) poorly equipped demonstration facilities, (iv) inadequate trained technical faculty; (v) absence of state-of-the-art in-country training opportunity for training TVET teachers; (vi) lack of adequate gender-sensitive activities to address the obstacles girls and young women face in TVET; (vii) damaged infrastructure as a result of 14 years of civil conflict, (viii) training tools and equipment are inadequate and in most instances obsolete; and (ix) inadequate funding to efficiently run the institutions. In addition to these challenges, the diminishing level of large businesses and industrial activities since the civil conflict of the 90s has limited opportunities for internships or experiential learning opportunities that previously enforced TVET delivery. The employment windows have also shrunk significantly due to closure of many large businesses, concessions and industries and the thriving ones are said to not be making enough profits to accommodate TVET students and graduates. Moreover, the sophistication of surviving business and industries requires skill sets that TVET and higher education institutions are not prepared to deliver due to obsolete laboratory equipment and inadequate specialized faculty. This situation is exacerbated by the lack of employment opportunity in country, which has given rise to Liberians that have studied out of the country and developed the needed skill sets to seek employment elsewhere instead of returning to Liberia.

The Government is planning to pass into law the establishment of the Liberia TVET Commission (LiTCom) that will govern, regulate, harmonize skills development, and guide all aspects of TVET delivery across Liberia. The responsibility of LiTCOM will also include ensuring quality and accreditation, and setting up occupational standards and system for monitoring and evaluation. LiTCOM is to also establish a national database for TVET graduates across the country. Other African countries have established similar commissions that have helped to improve the quality of their TVET programs. Examples the Council for TVET (COTVET) in Ghana<sup>7</sup>, and the Workforce Development Authority (WDA) in Rwanda<sup>8</sup>.

Sound political will, structural adjustments and policy implementation support put higher education and TVET in other regional countries like Nigeria, Ghana and Sierra Leone ahead of Liberia. As example, the Federal Government of Nigeria acknowledgement of the critical role of TVET in national development and recognition as integral part of technological development has been paying off by apportioning a greater

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<sup>7</sup> <https://cotvet.gov.gh/about-cotvet/>

<sup>8</sup><http://www.wda.gov.rw>

proportion of education expenditure to TVET at both Federal and State levels. Unlike Liberia, Sierra Leone has a TVET Coalition composed of members from a variety of stakeholders both in private and public sectors who are eager to foster the development of TVET. Beyond recognition, President Akufo Addo demonstrated the Ghanaian Government's seriousness by constructing and equipping 20 modern TVET institutions and rehabilitated 35 existing ones (GhanaWeb.com/NewsArchive). Unless there is dramatic improvement in the economy and increased government investments in TVET programs, setting up LiTCOM will not solve the huge challenges of TVET in Liberia.

### **3.4 Regulatory Framework of TVET**

The Ministry of Education (MOE) has a TVET Bureau that provides oversight for non-degree granting TVET institutions which are not governed by the NCHE. The Bureau is responsible for monitoring, management and coordination of TVET programs in Liberia. TVET provision is divided between public, private, faith-based and community providers. The Education Management Information System (EMIS) data reported that 148 TVET institutions were formally registered in the country with MoE and Ministry of Youth and Sports (MYS) in 2015/2016. However, only 65 institutions were active where the majority were private (63%) followed by public (20%), faith-based (11%) and community-owned (6%).<sup>9</sup>

## **4 SUMMARY OF KEY FINDINGS**

### **4.1 Higher Education Programs and Level of Academic Achievement**

Liberia has two public higher education institutions - the University of Liberia (UL) and Tubman University (TU). These two universities and a host of private universities and colleges (Annex 1) provide a wide array of academic and technical training programs at various degree levels, including Associate, Bachelor and Master. Associate degree programs are two-year programs that precede and serve as entry level for four-year undergraduate degree programs. Successful undergraduates can enroll in master degree programmes in available courses. The major higher education programs include, but not limited to agriculture and forestry, applied sciences, environmental science, mathematics, engineering and technology, social studies, and business studies. The majority of these programs are at the Bachelor degree level. Few higher education institutions, including UL and CU do offer Master's Degrees in selected

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<sup>9</sup> Ministry of Education, Liberia (2017). *Getting to Best Education Sector Plan (2017-2021)*.

fields such as Business Management, Accounting, Urban and Regional Planning, Public Health, and Environmental Science. No Ph.D. degrees are offered in Liberia.

Relating to policy development over the last two decades to improve higher education and to increase employment opportunities, Liberia has made significant stride. As examples, the National Industrial Policy/Industry for Liberia's Future established in 2011 provides a framework for accelerating the development of a thriving and competitive industrial sector in Liberia with the goal of Liberia becoming a middle-income country by 2030. Liberia also operates few specialized institutions. One is the Liberia Institute for Biomedical Research (LIBR) which was established is to develop programs of applied and operational research geared toward developing technology for the control of diseases prevalent in Liberia; to assist in providing community health services; to develop the capability for providing specialized diagnostic services; to train individuals in priority research procedures and techniques. LIBR was offering opportunities to Liberian University and medical college students for advancement in molecular biology diagnostic techniques and the field of endemic tropical diseases in Liberia and clinical research methodologies. In 2012, UL commissioned the T.J.R. Faulkner College of Science and Technology in addition to the College of Agriculture and Forestry, Dogliotti College of Medicine and the Engineering College. The missing piece is the lack of political will to invest public resources into policy implementation.

The Central Agriculture Research Institute (CARI). CARI is the nation's only agriculture research institution and was once known regionally for its contributions to agriculture development in the region. The Government of Liberia has also enacted into law other specialized agencies such as the Renewable Energy Agency (REA), Forestry Development Authority (FDA) and the Environmental Protection Agency EPA, among others to improve the investment climate in Liberia. However, Liberia's problem is the implementation of policies designed to improve the education and other sectors of the economy.

Amidst these developments, the general status of higher education from the perspective of poor status of demonstration laboratories and acute shortage of qualified higher education faculty tends to suggest that Liberia still lags behind some of its regional counterparts in Science, Technology, Engineering and Mathematics (STEM) programs. Enrolment data of three (3) higher education institutions surveyed show 65 percent of students in the business and social studies courses compared to 35 percent in all STEM courses comprising agriculture, math and the sciences. This is an indication that the contribution of STEM education to production of a competitive workforce for businesses and industries requiring science and high tech skill sets will remain a challenge in the foreseeable future. Be it as it may, STEM programs have three key constraints in Liberia which are: (i) lack of equipped laboratories, (ii) inadequate qualified

faculty and laboratory technicians in specialized science courses and, (iii) inadequate infrastructure in terms of classroom space to conveniently accommodate high student enrolments so that each student has a work station for science demonstration. In addition, local source for science materials is unavailable and if found, the cost of materials can be quite exorbitant. Assumption is that perhaps enrolment in STEM programs will increase if these key constraints are removed or significantly minimized to improve quality of the programs.

Emerging demands for new skills sets in the current Liberia workforce has led to inclusion of Information and Communication Technology (ICT). Although it is difficult to attached figures, the nature of internal and external transactions by businesses and industries have given rise to ICT technicians to address employers' current demand for ICT labor force. ICT has been primarily introduced by private institutions and is gradually taking roots as a major technology program in the education system though there are institutional accreditation problems. The introduction of environmental science by several higher education institutions adds another course of relevance to workforce development in Liberia.

#### **4.2 Enrolments and Faculty-Student Ratios in Higher Education Institutions**

Higher education enrolment has increased rapidly over the last decade while the number qualified faculty has increased slowly and led to high students to faculty ratios, especially in public universities and colleges. Total enrolment in higher in 1994/95 was around 4,000 and increased to over 15,000 by 2007. The 1,400 pre-civil conflict teaching, research and administrative staff dissipated to 307 by 2007 as a result of brain drain (2010 Education Sector Strategy). During the 2018/2019 academic year which ended in August 2019, student-faculty ratio in the College of Agriculture and Forestry at UL was 38:1 (2,900 students and 76 faculty members). The overall enrolment pressure on the UL in particular is due to its more ideal location and accessibility by students from 10 of Liberia's 15 counties and very low tuition and fees as compared to the private universities in the same locality. As of 2019, UL enrolment was 18,753 students in all departments, (12,278 male and 6,422 female) and its 331 faculty members comprised 304 male and 27 female.

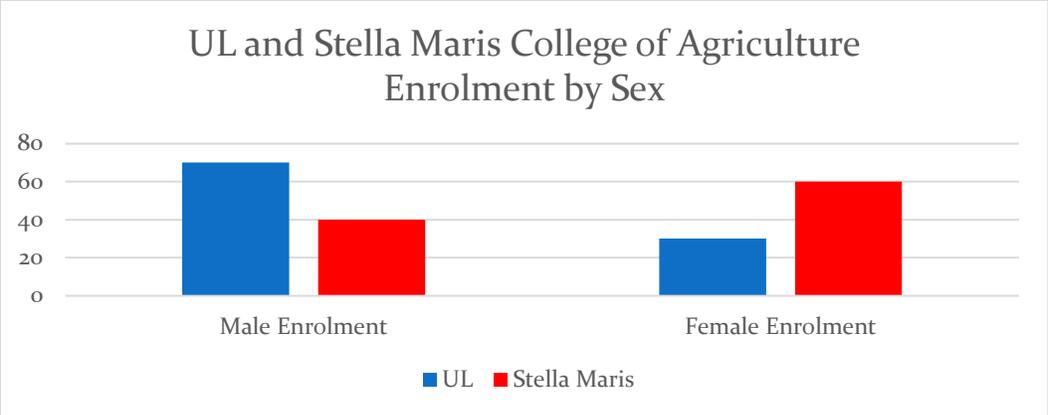
TU, the second public higher education institution is located remotely in the southeast of Liberia which is about 403 Km from Monrovia, the nation's capital. Southeast Liberia is hardly accessible during the rainy season from the greater part of Liberia. The region hosts five (5) of the fifteen counties of Liberia. From three (3) tertiary education institutions in the entire country in the 1980s (Sirleaf, 2012), there are now 2 Master's degree-granting institutions, 9 Bachelor's degree and 19 Associate degree granting colleges and

universities in Liberia with an estimated enrollment of 43,843 (National Commission on Higher Education}

Student numbers in higher education roughly doubled from 27,954 to 55,000 between 2008 and 2015 (Ministry of Education 2016b). The main public university, the University of Liberia, enrolls about half of all tertiary education students. New universities are constantly entering the education market. Faith-based and private universities, in particular, are expanding to meet new demands. Out of the 33 higher education institutions that were licensed as of 2014, 9 institutions were public, five (5) were private, and 19 were faith-based (NCHE 2014). Unfortunately, little information is available to track the tertiary education market in more detail. Students make arbitrary career choices because of the lack of career counseling to help shape their mindset towards opportunities in the job market after education. This is a weak spot in the delivery of higher education and TVET in Liberia and one of the main root causes for diminishing the employability of college and TVET graduates. There hasn't also been an assessment of the actual skills needs of Liberia's workforce over a protracted period; the latest was the Labour Force Survey of 2010 by the Ministry of Labor. The disciplines most affected by high student population are business studies and social science and humanities and one can logically allude this situation to the lack of career counseling programs in higher education and TVET institutions as well and high failure rates demonstrated in the regional WAEC exam results over the last ten (10) years.

Stella Maris University, one of the private higher education institutions surveyed has made some strategic gains in attracting students in science, engineering and agriculture courses. According to administration, the fairly equipped science laboratory and demonstration site for agriculture and counseling has attracted female students' enrolment which is peculiarly higher than male enrolment in the agriculture disciplines (see Figure 1). Stella Maris University's medium term goal is to train entrepreneurs who will pursue as agriculture as a business and job creation. However, its service learning/internship programs are facing some challenges due to limited opportunities in the private business sector.

Figure 1. Male and Female Enrollment in the Colleges of Agriculture at UL and Stella Maris



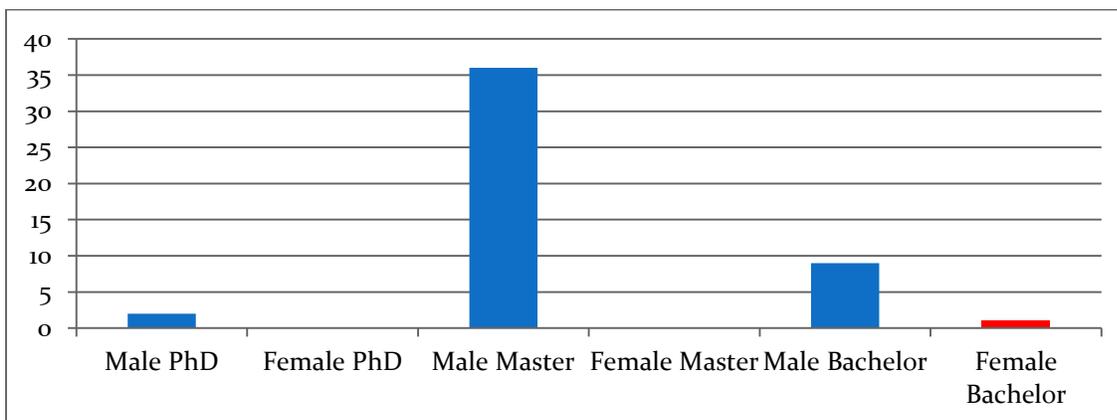
Source: Based on data from the survey

### 4.3 Higher Education Faculty by Academic Level and Gender Inclusiveness

The total number of faculties with Ph.D.'s and master's degree in Liberia's Higher Education institutions is not representative of an ideal faculty for institutions granting undergraduate and graduate degrees. Considering the case of UL College of Agriculture and Forestry with huge annual enrollment of students (2,900 in the 2018/2019 academic year) only 13% of the total teaching staff hold Ph.D.'s, 82% hold Master's degrees while the remaining 5% are Bachelor Degree holders. The shortage of qualified faculty underpins why some institutions are allowing faculty members with bachelor degrees to teach undergraduate courses and holders of master's degrees teaching graduate courses. The sooner the better for GoL and partners to invest substantial resources in higher education faculty development programs to ensure that Liberia's future workforce is competitive enough to meet the contemporary needs of employers especially the private sector.

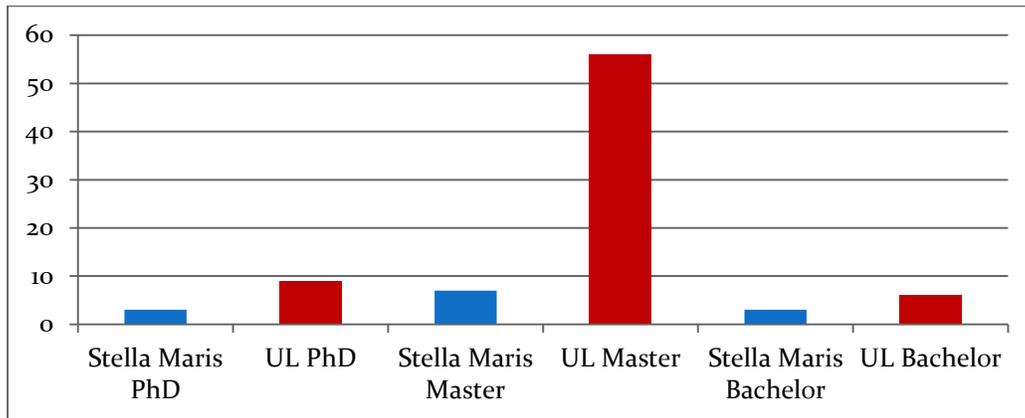
In addition, gender inclusiveness on higher education faculty is quite disproportionate and more pronounced in the UL College of Engineering. Female share of the Engineering College faculty is as low as 3% compared to male 97%. Also, female share of the Agriculture College is as low as 9% to 91% male share. This disproportionate representation of male and female is not intentional because there aren't motivational factors nor incentives such as scholarships and job assurances to encourage the enrolment of women as well as men in math, science and other technical courses.

Figure 2. Academic Level of Faculty of the College of Engineering at UL



Source: Based on data from the survey

Figure 3. Academic Levels of Faculties of Stella Maris and UL Colleges of Agriculture



Source: Based on data from the survey

#### 4.4 Funding of Higher Education Institutions

Funding is a unique challenge across all development sectors and the education sector is no exception. The NCHER Revised Education Reform Act of 2015 makes higher education a national priority and provides for the allocation of at least 20 percent of national budget to education. This policy statement has never materialized as actual GoL budgetary allocations to education has ranged from 10-13 percent in 2014-2017 to 6-7 percent as its lowest in 2018 and 2019. In the last two years, over 50 percent of national budget has been allocated for personnel services alone. Public Higher Education institutions are experiencing their share of this economic problem, which has been further exacerbated by the recent tuition-free pronouncement for all public Higher Education by the Government under its PAPD policy.

The current poor state of Liberia’s education sector including higher education and TVET and donors’ funding level is a mismatch between training programs and the demands of the labor market. Investments over the last decade by USAID, EU, World Bank and other donors, have fallen short of improving higher education especially STEM and ICT that are much more powerful tools for responding to Liberia’s emerging labor market demands and new economic growth opportunities. Higher Education has not also been a high priority for donors' funding in the past decade; their focus is on the lower echelon of the education system especially early childhood to primary education.

Agriculture and education which are two key sectors for economic growth have and continue to experience low public spending (agriculture -less than 5% of GDP and education - 2.38% of GDP). Although Liberia has achieved universal primary education, less than half of pupils attend secondary school (Liberia 2018 Education Sector Strategy). In addition, university enrolment has stagnated: almost

the exact same number of students (33,000) were enrolled in degree courses in both 2000 and 2012. At the other extreme, Liberia shares the distinction with Sierra Leone of devoting more of GDP to health (15%) than any other country in sub-Saharan Africa. According to the UNESCO 2015 Science Report, GDP to higher education in Liberia is about 0.3%. The Government of Liberia and development partners' priority is to achieve universal primary education. This has resulted to low investment in higher education and a surge in the contribution of private universities to the education sector especially in business, management and social science courses and the introduction of ICT that emerged over the last four years. The assessment did not identify any private institution with strong STEM programme except the introduction of ICT courses at associate and bachelor levels. The NCHE has not been able to reach out to many of these institutions for accreditation due to resource limitations.

Public schools would have been overwhelmed with student enrolment if the private sector had not intervened by building many educational institutions ranging from nursery schools to colleges and universities across the country. Private schools however rely primarily on tuitions and fees and occasional external grants. The GoL previously provided varied amounts of subsidies on annual basis to selected private institutions to keep tuitions and fees in some reasonable range for students. In 2017, these subsidies were abolished owing to economic constraints. This underpins the higher cost of education in private higher education institutions and the probable proliferation of private institutions to cater to the growing number of secondary school graduates for higher education although there are certification challenges.

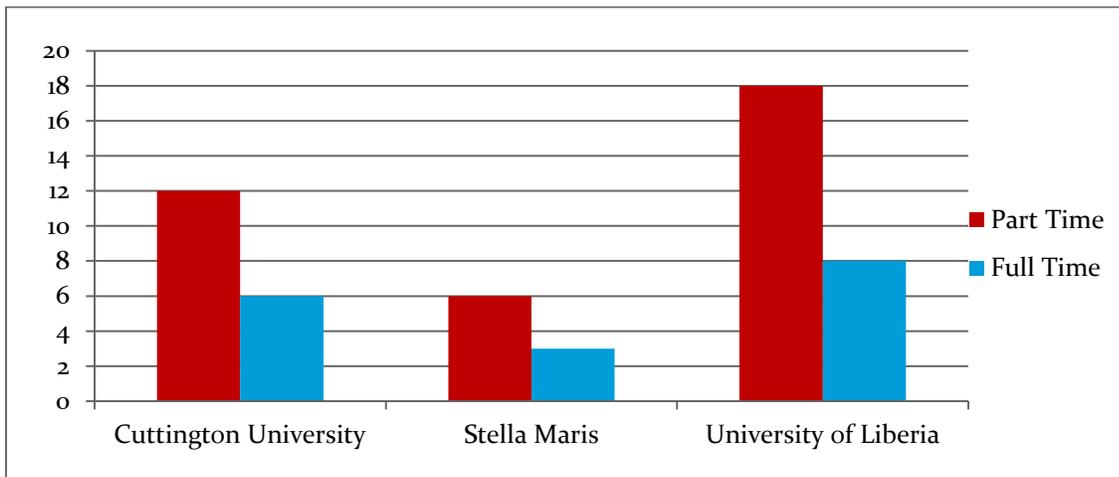
#### **4.5 Higher Education Faculty Retention Challenges**

The retention of qualified faculty or the least to circumvent their full-time instructional commitment to single institutions has been a challenge to universities and colleges. Remunerations and benefits are not commensurate with faculty qualifications. As a result, faculties commute from one institution to another to improve their monthly incomes. This is noticeable to the extent that some instructors are commuting from institution in Monrovia to institutions located far distances outside of Monrovia to provide instructions. The commuting of faculties between institutions is exacerbated by the acute shortage of graduate and postgraduate degree holders in Liberia with enthusiasm for teaching occupation. The Liberia's highest average economic growth (11%) in West Africa between 2005 and 2013 did not spill over into the education and STI sectors to have stimulated support for faculty development program for TVET and higher education (UNESCO 2015 Science Report). Consequently, shortage of qualified faculty has situated higher education institutions in desperate positions to have full-time instructors in their classrooms. School administrators blame the brain drain that emerged as a result of the 14-year civil

conflicts (1989–2003) for Liberia lingering behind other regional countries in the quality of faculty and staff at higher and TVET institutions. Figure 4 below illustrates the proportion of full time and part time instructors at the three higher education institutions surveyed. Sumaworo 2015 states that as the demand for faculty members surpasses the supply universities are not able to hold professors to account for lack of standards thus raising concerns about the general quality of university teaching in the country (Gbollie & David 2014) as well as about the potential for abuse and unethical behavior (USAID 2014).

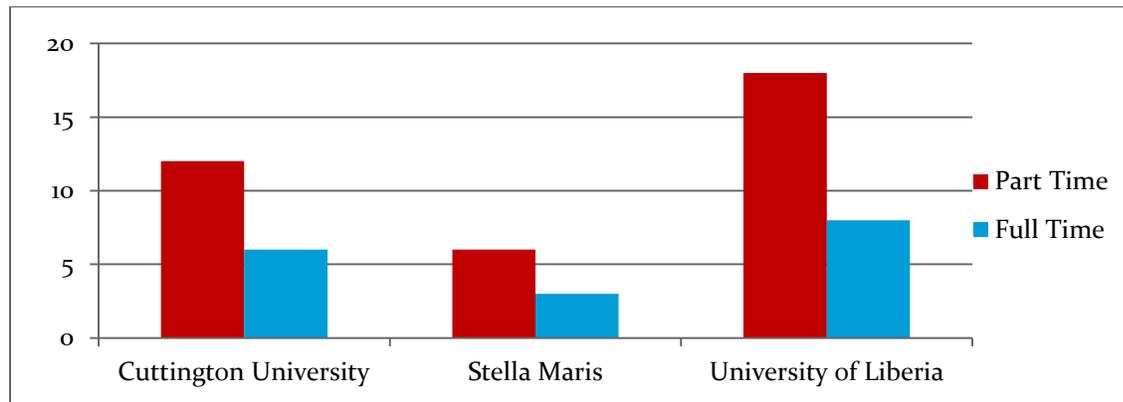
According to the SABER Country 2017, Liberia is currently ranked 177 out of 188 on the Human Development Index (2016 data) and recovering from a long civil war and the 2014 Ebola outbreak (Hettinger et al 2017). The civil war caused severe brain drain and severely affected the country’s human capital stock. The latest available sources of data show that, in the academic year 2011/2012 only 40 out of the 428 full-time academic faculty members in Liberia’s master’s granting institutions held a PhD, while 124 full-time faculty members had only a bachelor’s degree (NCHE 2012a).

Figure 4. Post Conflict (2018/19) Full and Part Time Instructors of Colleges of Agriculture –UL and Stella Maris and CU



Source: Based on data from the survey

Figure 5. Pre Conflict (1988/89) Full and Part Time Instructors of Colleges of Agriculture – UL and Stella Maris and CU



Source: Based on data from the survey

#### 4.6 Aging of Faculty and Retirement Scenarios

Aging faculty is a major challenge to the implementation of retirement plans by both private and public universities and colleges. As examples, 25 percent and 4 percent of the instructors at the UL College of Agriculture and Stella Maris, respectively, have either reached or surpassed retirement age; an average of 4 percent will reach retirement age within 5 -10 years. By comparison, the aging problem is also more severe in the UL College of Agriculture where 25 percent of the faculty are 60 years or above, compared to the College of Engineering where it is 6 percent. The primary hindrance to identifying qualified replacements for aged faculties is the lack of options that is preventing institutions from rigorously implementing their retirement plans.

This situation, coupled with existing faculty gaps, poses serious challenge to the improvement of higher education and should be a concern to the Government of Liberia as well as university administrators.

Figure 5. Aging of Faculties of the Colleges of Agriculture and College of Engineering at UL

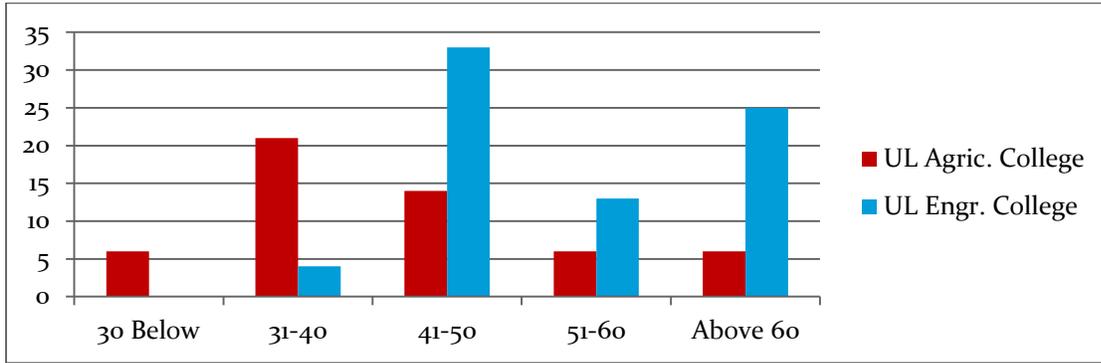
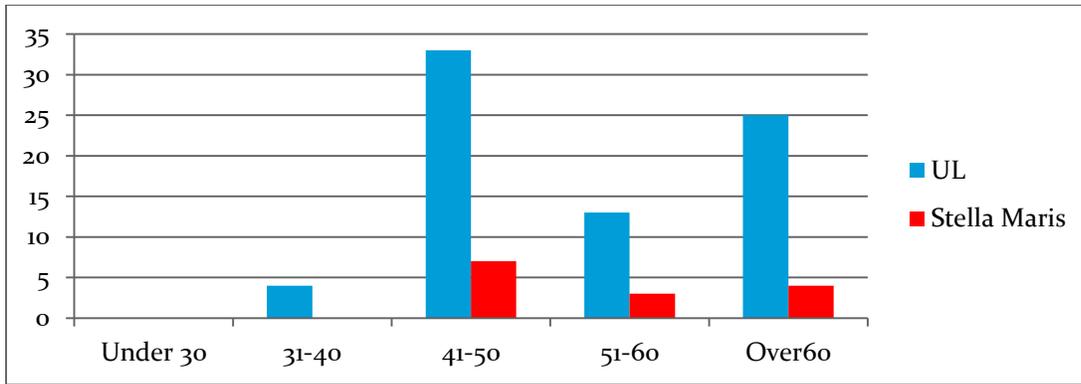


Figure 6. Aging of Faculties of the Colleges of Agriculture at UL and Stella Maris University



Source: Based on data from the survey

## 5 TVET INSTITUTIONS PROGRAMS AND LEVEL OF ACHIEVEMENT

There are two categories of TVET education in Liberia: (i) Associate degree granting programs at Community Colleges (see Table 1), and (ii) non-degree granting programs (See Table 2). The Non-degree granting TVET institutions offer diploma and certificate of proficiency in agriculture technology, electrical technology, and mechanical technology, building construction technology and business education courses (see Table 6 for the list of TVET institutions in Liberia). Non-degree granting TVET courses are designed to produce proficient middle level technicians for Liberia's workforce.

The associate degree granting TVET programs are mainly at the community colleges spread in several counties in Liberia. Community colleges were established in Liberia to address the assessed workforce needs of their respective counties. However, this arrangement is no longer the case and alludes to the socioeconomic theory of TVET delivery. The community colleges offer two-year courses and award associate degrees in various careers such as agriculture, businesses education (accounting and office assistant/secretarial science), social studies, management and geology, among others. Graduates of the community colleges have the option of enrolling in universities to complete undergraduate studies. However, universities are largely theory-based with limited hands-on activities due to lack of properly equipped demonstration facilities for specialized courses.

Table 1. List of Public Community Colleges in Liberia

Community Colleges	Locations
Lofa County Community College	Voinjama, Lofa County
Grand Bassa County Community College	Buchanan, Grand Bassa County
Nimba County Community College	Sanniquellie, Nimba County
Bomi County Community College	Sinje, Bomi County
Bong County Technical College	Gbarnga, Bong County
Harbel Community College	Harbel, Margibi County

Table 2. List of Major Non-degree Granting Public TVET Institutions in Liberia

TVET Institution	Status	Location
Booker Washington Institute (BWI)	Formal/Secondary level	Kakata
Monrovia Vocational Training Center (MVTC)	Informal/Apprenticeship	Monrovia
Liberia Opportunity Industrialization Center (LOIC)	Informal/ Apprenticeship	Monrovia
William V.S. Tubman High School Accelerated Vocational Training Program (AVTP)	Formal/Post-Secondary	Monrovia

Opportunities for internships or service learning for both TVET and higher education are not readily available due to the closure of many large businesses and concessions and industries that provided such opportunities in the past. In place of labor market assessment to propel TVET curricula review, students returning from internships bring back appraisals from collaborating industries and businesses.

Such feedbacks form the basis for TVET institutions in updating their curriculum. As a result, the governing bodies which are the Ministry of Education and school boards have lost insight of TVET curriculum content because their approval which is policy mandate is no longer the case.

### **5.1 TVET Enrolment and Faculty-Students Ratio**

The emergence of large industries and concessions in the 70s changed perceptions that TVET was for academically challenged youth. The removal of this false notion about TVET has not only led to steady increase in enrolment but also to a proliferation of private TVET institutions. It has also contributed to achievement of TVET purpose to produce proficient middle level technicians by encouraging reasonable student-teacher ratios so that teachers can be able to properly evaluate learners' skills development outcomes. The establishment of community colleges in Liberia was based on the assumption of taking education to the rural people while reducing enrolment burdens on the UL as well as other universities clustered in Monrovia. Data show a range of 25 – 38 students per faculty in the TVET institutions surveyed.

### **5.2 TVET Funding Trends**

TVET has consistently been pivotal in discussions by politicians, policy makers, stakeholders as well as technocrats at educational forums and events. TVET is viewed in nearly all educational policy documents as the way forward for socioeconomic development and the constructive engagement of youth for national security. However, the consolidated funding trends from the 2015 - 2017 academic years for two

leading TVET institutions (BWI and Nimba County Community College) do not indicate that TVET is considered as a vital tool for developing a competitive and robust workforce of Liberia. Gaps between these two major TVET institutions' funding request to GoL and actual disbursements ranged from 15 – 20 percent from 2015 - 2017 to 38 percent in 2018/2019.

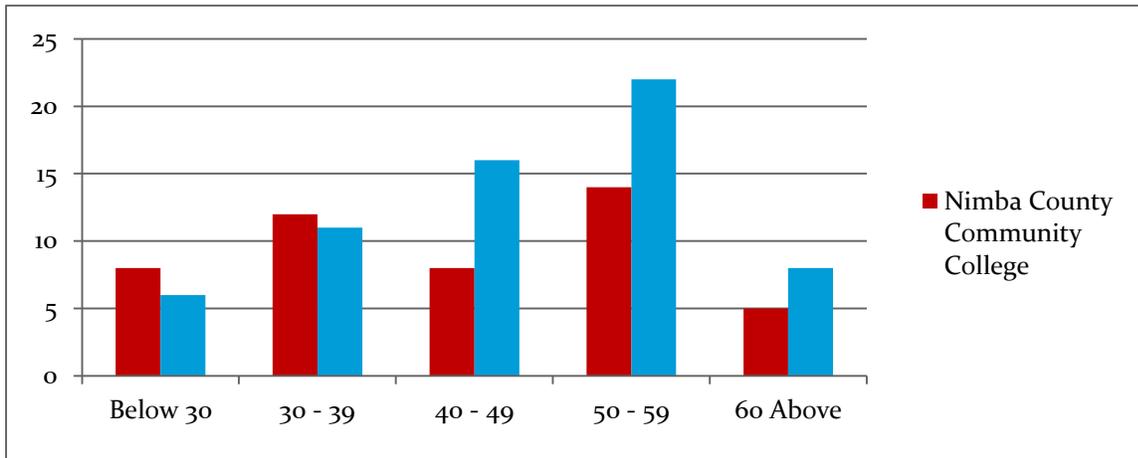
In 2018, the European Union (EU) committed €20 million grant to support TVET programs in Liberia for a period of six years. These grants are intended to improve the delivery of quality TVET by equipping demonstration laboratories and improving faculty qualities and infrastructure so that graduates are to the task of meeting the skills expectations of their employers. The intent of these grants is to make TVET courses such as agriculture, building trades, auto mechanic, electricity and electronics relevant to responding to the job market. The recent EU 20 million Euro grant for TVET in Liberia is significant if applied wisely for the intended purposes.

The United Nations Industrial Development Organization (UNIDO) will implement the EU grant in close collaboration with the Ministry of Education (MOE) and institutions to assess and improve their infrastructures, demonstration laboratories including modern training equipment, and to improve the quality of the faculty. The grant will also send a number of vocational instructors abroad for training and practice to enable them to serve upon their return as instructors in TVET institutions and as master trainers in the Centre of Excellence for Training of Vocational Instructor that will be established with support from the program. The institutions that will initially be supported by the grant are BWI, Monrovia Vocational Training Center (MVTC), Greenville Multilateral High School; Cape Palmas High School and Zwedru Multilateral High School.

### **5.3 Age Implications in Faculty Gaps and Retirement Plans**

This alludes to an urgent need for TVET teacher training facility in Liberia to train new instructors as well as provide refresher training for existing staff to cope with contemporary technological advancements. From 1978 to 1999, Tubman College (now Tubman University) trained TVET instructors in the STEM disciplines. TU was transformed into a university in early 2000. Its transformation has created a vacuum in the supply of trainers for community colleges and non-degree granting TVET institutions in the STEM disciplines. Consequently, many graduates from Higher Education institutions with degrees in civil, electrical and mechanical engineering are those currently providing instructions in technical areas such as building construction, electronics, electricity and mechanical technologies.

Figure 7. Ages of Faculties of Two TVET Institutions

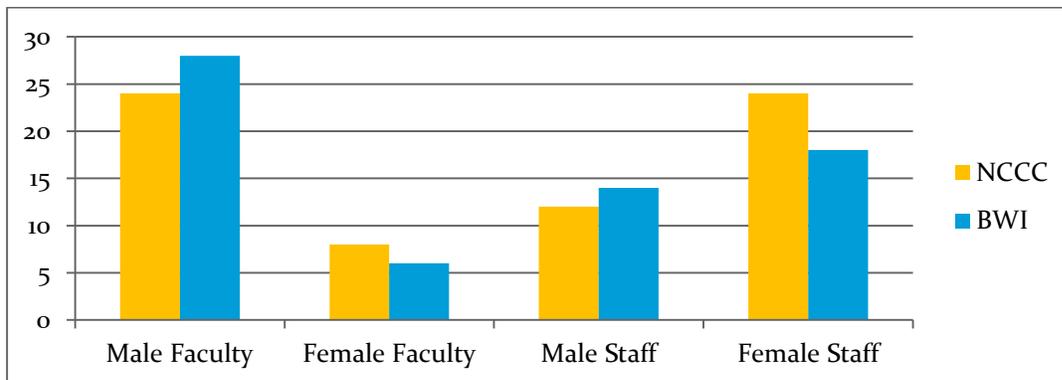


Source: Based on data from the survey

#### 5.4 Gender Inclusiveness on TVET Faculty

As the aim of achieving gender equality is relatively a new development phenomena in Liberia, the disproportionate representation of women and men on both Higher Education and TVET faculty should be closely examined. The ascendancy of Madam Ellen Johnson-Sirleaf as the first female Liberian and African President seemingly increased attention to inclusion of an agenda for gender equality in development programs from the side of the Government of Liberia and development partners. While so true that this development has laid some foundation for inclusivity, it is however not an end in itself to proportionate men and women on the faculties of learning institutions so abruptly nor even over a short period of time. There are other important factor such as commensurate salaries and incentives, and scholarship, among others for motivating women as well as men to develop passion for teaching.

Figure 8. Gender representation in the Faculty and Staff of Two Major TVET Institutions



Source: Based on data from the survey

## **6 STATUS OF EDUCATIONAL INFRASTRUCTURE**

The UL was founded in 1862 and established on Capitol Hill in central Monrovia when the entire population of Liberia was far less than 1,000,000. The population of Liberia, according to the 2005 National Population Census, was over 4 million; an increase of over 400 percent. Students' enrolment at the UL increased to 27,000 in 2018. Despite this huge increase in enrolment, there has been very minimum expansion in the UL physical infrastructure including classrooms. The relocation of many of the colleges from the UL main campus on Capitol Hill in Monrovia to Fendell brought significant relief to the UL overcrowding problems. However, being the only public Higher Education institution accessible to majority of the student population in two thirds of the nation. UL is already experiencing serious overcrowding.

This is due to the steady increase in student population which underpins the inadequacy of infrastructure especially classrooms and demonstration facilities. The need for expansion of its infrastructural capacity to accommodate the steadily growing student population is therefore eminent.

Unlike UL, TU, the second public university, is located remotely in the southeast of Liberia. Southeast Liberia, comprising five of the fifteen counties, is not accessible during the rainy season from the greater part of Liberia. It is foreseeable that enrolment will increase sharply in subsequent academic years if at these two public institutions of higher learning if the GoL maintains its tuition free policy for Higher Education. This will further deteriorate the quality of higher education in Liberia.

Most of the private universities and colleges are located in the center of Monrovia and surroundings where there are very limited opportunities for the expansion of infrastructure in the future. These private institutions are also experiencing increase from students who cannot be accommodated by the UL. According to some of the administrators interviewed, this challenge was anticipated years back and they have already acquired land outside of Monrovia for relocation and expansion of their institutions.

## **7 AGRICULTURE EDUCATION**

Agriculture provides livelihood for approximately 70 percent of the population of Liberia. The country is lush in rich soil and agro climatic conditions including fallow land, rain and sunshine. However, Liberia has yet to be food secured despite huge investments in the agriculture sector by government and donor agencies. Agriculture education is integral to the achievement of food security; thus integral to both Higher Education and TVET programmes.

Five (5) out of eight (8) institutions responded to the survey –BWI, NCCC, UL, CU and Stella Maris. BWI is a public secondary vocational school offering diploma in Agriculture, Building Trades, Electricity, Electronics, Mechanical Trade and Business Education. The NCCC is one of the public community colleges offering associate degree in Agriculture, Geology and Mining, and Nursing. The UL is the largest public university in Liberia offering bachelor degree in multiple careers including agriculture. The two private universities that responded to the survey were Stella Maris and Cuttington University. All five (5) institutions surveyed have multi-faceted agriculture activities for demonstration and income generation purpose. These institutions variably produce crops such as vegetables and rubber and raise poultry, cattle, goat, pigs and pond fish.

Unfortunately however, graduates from TVET programs and agriculture colleges seek employment opportunities with government and large concessions and businesses rather than engaging in farm enterprises to be self-employed and to create jobs. Hence, one could assume that something is fundamentally wrong with the design and delivery of agriculture education in Liberia.

Higher education and TVET agriculture curricula are currently focused primarily on the production phase of agriculture value chain development. Though value addition (processing, packaging and marketing) is relatively a new phenomenon in Liberia's agriculture, its inclusion in the curricula of Higher Education and TVET programs has several economic and social advantages. It offers opportunities for food processing and preservation and improved food security; b) creates marketing and manufacturing jobs for youth and women; and, c) provides supplementary income for institutions to reduce their dependence on external resources. This will require a paradigm shift in agriculture education delivery from training agriculturist to training farmers and “agripreneurs” who will engage in farming as a business to create jobs. Recruitment processes, which are currently academic and primarily based on results of entrances and placement exams, will have to be diversified by including others requirements like applicants' previous farming backgrounds, land holdings and personal vision about the application of acquired knowledge and skills in agriculture from training. A contributing factor is the lack of career counselling to enlighten the path to employability in the various agriculture value chains.

## **8 STATUS OF RESEARCH ACTIVITIES**

### **8.1 Higher Education Research**

There is no significant research output or activity being undertaken at the universities and other higher education institutions. The University of Liberia which is the nation's largest Higher Education institution

and Cuttington University (CU), a private university, are the only two with some aspiration for research. However, none has produced any significant stand-alone research data or publication in recent years. Liberia, in collaboration with UNESCO, implemented a \$1.3M Rehabilitation Support to the Education Sector project to strengthen Liberia's national capacity in planning, supervising, monitoring, and evaluating. The project was to also enhance training opportunities for educational personnel; and to produce new curricular materials. Assumption was that by developing personnel who can plan more appropriate educational programs and carry out their projects with efficiency and understanding, fortified with the necessary teaching materials to properly implement the programs, the project could have lasting effects. Unfortunately 14 years of civil war devastated the social fabrics of Liberia including the education sector. Liberia could prosper again if sufficient attention and resources are directed toward finding the ways and means to develop an educational system.

## **8.2 Research at THE CENTRAL AGRICULTURAL RESEARCH INSTITUTE (CARI)**

CARI, Liberia's main agriculture research institute was first established in 1980 and contributed immensely to research in the West Africa region until the 1990 civil conflict. Since the end of the civil conflict in 2002, lack of funding has hampered the rebuilding of CARI research capacity and infrastructure. Despite the country's need for agricultural development, its investment in agricultural research as a share of AGGDP (research intensity ratio) was only 0.40 in 2011. The number of Liberian researchers more than doubled in 2009-2011 although the majority were only qualify to bachelor and master degrees. As of 2005, only 5 FTE researchers were qualified to the PhD. Level and half of all researchers hold bachelor's degree.

The new CARI vision is "A commercially-oriented agriculture sector propelled by research, technology transfer, innovation, knowledge and approaches that will contribute to increased productivity, commercialization, and competitiveness of the agriculture sector through adaptive research and promotion of knowledge, information, and technologies that respond to clients demands and opportunities toward the attainment of food security, poverty alleviation, income generation and job creation. However, limited funding has concentrated CARI's efforts and resources on building junior research capacity, rehabilitating infrastructure, improving local crop varieties and sourcing new crops and livestock varieties through international partners. Although research activities have expanded in the past decade, CARI is unable to address the research needs of the whole country.

The only functional laboratory at CARI currently is the Seed Testing Lab which is even minimally equipped. Unfortunately, CARI has had very limited budgetary support and funding especially over the last two

years. According to CARI's 2011 data, spending allocation for salaries 20%, 40% for operating and program costs, 40% for capital investments 40%. By source, GoL provided 64% while donors provided 35% and 0.4% for sales of goods and services. CARI is somehow hopeful of prospects for securing funding from external partners to elevate its research activities.

## **9 CONCLUSIONS**

The findings of the assessment revealed that TVET's effectiveness on employability and national development has been hindered by a number of factors such as funding, policy, expertise and synergy with industry and public perception of TVET.

Professional autonomous entities established by Act of Legislature have experienced high turnover rates in leaderships from political appointments of their heads. To name a few, the NCHE, Liberia Extractive and Transparency International (LEITI) and even universities as recently experienced at the UL by removal of its Presidents. As a result, significant institutional memories have been lost and led to lack of continuity in public institutions' visions and functionalities. Until the Government of Liberia depoliticizes regulatory agencies to function as a professional entity and increase public resource investment in the education sector, Liberia's chance of being on par with other regional countries in developing a competitive workforce is highly unlikely in the foreseeable future from TVET and Higher Education perspectives. Moreover, developing a competitive workforce for Liberia's economic growth and overall development will remain in jeopardy if the weak state of STEM education is not improved. This should claim the attention of the Government of Liberia and development partners for their urgent intervention.

Improving training in STEM disciplines will increase Liberia's share of its professional workforce to take charge of own economy. Achieving this objective requires a strong political will to put Liberia on track for effective policy implementation and prioritization of its meager resources for the general good of building the human resource capacity of the country.

Constructive engagements between the Government of Liberia and its development partners on aligning assistance packages with the priorities of national development agenda including education, which is in a very poor state, cannot be over emphasized. Any further deterioration of the education sector beyond its current state will be tantamount to virtual non-existence of a serious competitive workforce development programmes in Liberia from TVET and Higher Education perspectives. Improving transparency and

accountability for meager public resources to address development priorities will adversely create some opportunity for increased funding for much needed basic social services including education.

The proposal advanced in Pillar One of the PADP for improving the quality of TVET delivery is a step in the right direction for developing a competitive workforce for Liberia. As overly ambitious as it may sound with respect to the current state of the economy, the compelling reasons for supporting Pillar One has to do with regulating and standardizing TVET. These are among the major problems currently associated with the poor quality of TVET delivery in Liberia. Based on the successes, a lesson for Liberia to learn from other countries research experiences is the potential benefits of linkages between research institutions and the academia. Research development in Liberia will be enhanced if CARI and Higher Education institutions concert their efforts on identifying funding institutions and agencies with interest in research and developing joint proposals for funding consideration.

This includes capacity building encompassing research proposal and report writing, equipping research laboratories as well as strengthening the human resource base for research.

The inclusion of value addition and marketing in agriculture education will increase technical skills and knowledge base for achieving food security and provide opportunities for increasing the inclusion of women and youth in the agriculture sector. Curricula revision in the future should therefore include value addition and marketing courses.

## 10 RECOMMENDATIONS AND WAY FORWARD

Based on the findings, the study recommends that for TVET to stimulate employability and promote national development there is need for the policymakers to improve on the level of funding, perception, expertise, policy implementation and curriculum harmonization. First, the need to create a national TVET enabling environment, including conducive policy framework and quality assurance mechanisms for TVET to effectively contribute to their economic and industrial transformation. Second, TVET institutions, particularly the flagship institutes, need to institutionalize their linkages with industries; to be forward-looking and adjust their programs to respond to the changing skill needs; use technology in the delivery of training; train their instructors to upgrade their technical knowledge and practical skills and to promote student-centered teaching approach.

Consequently, this study recommends the following way forward:

1. Government of Liberia should increase funding for the education sector to the minimum 20 percent of National Budget proposed in the Revised Education Act of 2011. Current budgetary allocation to the education sector is approximately 15 percent.
2. The appointments of Executive Directors and deputies of the National Commission on Higher Education (NCHE) be guided by the Act that created the Commission to ensure competencies.
3. NCHE should institutionalize credible accreditation system to standardize all current and future higher education institutions in Liberia to ensure the quality of the training programs.
4. Provide resources for implementation of the draft TVET policy to ensure the certification and standardization of TVET education which are critical to developing a competitive workforce for Liberia.
5. GOL and partners should incentivize STEM education in Liberia with scholarships to develop its human resource base in specialized courses and to improve math, science and technical education.
6. Proactively provide training opportunities to female Instructors for TVET and higher education institutions, especially in male-dominated STEM occupations disciplines.
7. Pay commensurate salaries and benefits (housing as an example of benefits) for attracting and retaining qualify faculty and staff.

8. Invest in infrastructure improvement and expansion to make classroom spaces conducive for instruction and learning.
9. Furnish libraries with internet facilities for access to e-book and other materials for instruction and learning.
10. Establish and support in-service training for TVET instructors to cope with emerging technologies
11. Establish TVET trainers training institution in Liberia.
12. Strengthen public-private partnership in the education sector as means of attracting funding and support.
13. Research and scholarly activities should be supported in higher education.

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