

Challenges and Opportunities of University and Industry Nexus in Ethiopia: A Systematic Review

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Abstract

University and Industry Linkage [UIL] has been practised, with differing magnitude, as universities have long been recognised as rich sources of knowledge generation, innovation, and technological advancements. Strengthening the nexus between these two sectors and amassing the benefits arising has become a hot policy issue. Nevertheless, the progress of functional links between the two actors has been curtailed by many impediments. In the Ethiopian context, there is a paucity of researches that address the issue of UIL in general and those delineating the major challenges and opportunities about that in particular. Accordingly, this systematic review was conducted to pinpoint the main challenges that have been deterring the progress of the desired level of UIL and identifying the opportunities that can be seized to enhance the progress of the link. The study employed a systematic review method to collate all relevant evidence that meets pre-specified eligibility criteria to achieve a given research objective or answer a specific research question. This systematic review was based on document analysis made on highly relevant and carefully selected documents, including journal articles, policies, strategies, plans, proclamations and books. The study revealed that despite the attempts of the government to strengthen and sustain a fruitful interconnection between the two sectors, UIL is at its infant stage, and numerous backlogs are waiting to be accomplished. The major challenges hindering the growth of UIL in Ethiopia include the presence of limited budget to research universities; mismatch between graduates' knowledge and skills and industries' demand; lack of sufficient skills and knowledge on the part of the staff of both sectors; absence of sound policy implementation strategies and plans; lack of ownership on the part of officials to implement policies, strategies and plans and cultural divide between the two parties.

On the other hand, the main opportunities identified include a supportive policy environment, the proliferation of industries, issuance of intellectual property right protection laws, growing economy, the establishment of science and technology universities, construction of industrial parks, and relative improvements in infrastructure. Concerted government, universities, industries and other pertinent stakeholders need to be implemented to overcome the challenges mentioned above and reinvigorate UIL. Moreover, emerging opportunities delineated above need to be capitalised on, and creating an enabling environment for UIL to flourish ought to be reinforced with greater momentum.

Keywords: University and industry nexus, Challenges and opportunities of UIL, University and industry linkage, Government policy interventions

Background and Rationale

Universities have long been recognised as sources of knowledge creation, innovation, and technological advances (Ssebuwufu, Ludwick & Béland, 2012). Traditionally, universities were regarded as ivory towers of knowledge where knowledge is generated either just to pursue knowledge without apparent economic usefulness or solve some problems that would result in economic advancement (Adeoti, 2008).

To this effect, collaborations and partnerships between universities and industries are rapidly becoming a common practice worldwide (Tumuti, Wanderi & Thoruwa, 2013). Furthermore, the interactions between academia and industry are rapidly moving towards science and technology policymaking, planning and management (Abraham, 2016). Owing to this, in recent years, there has been growing interest among scholars, the private sector and policymakers on the importance of the University and Industry and government relationship in fostering regional growth.

Nevertheless, such a tradition of considering universities as a centre of knowledge production has been replaced by the view that universities should produce knowledge demanded by the industries (Yüksel & Cevher, 2014). Of course, the collaboration between universities and industries is not entirely new since such practices have been in place for over a century in informal ways. However, the emergence of a global knowledge economy has reinvigorated the need for strategic partnerships that transcend the traditional funding of discrete research projects by industries (Edmondson, Valigra, Kenward, Hudson & Belfield, 2012). In this vein, universities are acknowledged as innovative actors in regional innovation systems, and their interactions with local industry often create innovation and endogenous development (Sohn, Kimô, & Lee, 2009).

Guimón (2013) affirms that a functional collaboration between universities and industries plays a pivotal role in skills development (education and training), the generation, acquisition, and adoption of knowledge (innovation and technology transfer), and the promotion of entrepreneurship (start-ups and spin-offs). Adeoti (2008) adds that knowledge resources immensely determine the pace of growth in the modern economy. Consequently, economies that lag are characterised by relatively low capacity for generating and using relevant knowledge. Therefore, universities are economic engines that can positively contribute to a country's growth in addition to their primary role as a centre of knowledge (Tumuti et al., 2013). Furthermore, it is often stated that establishing a well-functioning association between universities and industries results in mutual benefits. This holds because the

two groups are highly interdependent since the former feeds the latter via skilled, knowledgeable, and competent workforce. The latter needs human capital to run its business (Othman, 2011).

Moreover, a synergy between higher education institutions and industries plays a critical role in securing and leveraging additional resources for higher education, promoting innovation and technology transfer, and ensuring that graduates have the skills and knowledge required to effectively contribute to the workforce (Ssebuwufu et al. 2012). Hence, active university-industry linkages [henceforth UIL] can lead to enormous benefits. In this vein, Guimón (2013) maintains that the benefits of UIL are wide-reaching in that they can help coordinate R&D agendas, avoid duplications, stimulate additional private R&D investment, and exploit synergies and complementarities of scientific and technological capabilities. Cognizant of such benefits stemming from a working nexus between the two actors, world-class research universities are currently aggressively establishing active links (Edmondson et al., 2012).

Despite the myriads mentioned above of benefits that can be amassed from a well-designed and functional UIL, developing countries cannot enjoy such benefits due to several factors that curtail the link between the two actors. In this line, Crull and Schnitzer (2010) contend that there are challenging innovation problems in the developing countries emanating from such factors as poor quality of the relationship between the private and the public sector, the poor linkage between industry and academia, poor matching between available skills and those needed by industry and lack of capability on the part of enterprises to recruit, manage and develop human resources in a modern and systematic way. Unlike the case in developed and newly industrialising countries where there are ample shreds of evidence of interaction between universities and industries, developing countries have universities that function, for the most part, independent of industries and industries that depend on foreign sources of knowledge to sustain production and possibly meet competitive challenges (Oluwadare, 2015). It is further stated that the problems originate from both actors as the industries are in most instances

unable to articulate their needs. The universities, in turn, cannot supply the industry with graduates who are equipped with problem-solving skills (Crull & Schnitzer, 2010). Most university curricula are designed so that the courses offered focus on ‘teaching about’ instead of ‘teaching for’ or ‘teaching through’ (Mudde, Dugassa & Alemfrie, 2015). To this effect, ‘teaching about’ focuses on a content-laden and theoretical approach to impart a general understanding of the phenomenon rather than equipping students with specific competence. The traditional education system that teaches students to obey reproduce facts and engage in salary employment after graduation inhibits entrepreneurial aptitudes (Kuip & Verheul, 2003). Almost all Ethiopian universities are adopting this type of teaching. Thus, to produce students with practical knowledge, a glaring need to revise the curriculum so that the teaching is accompanied by practical experience. Accomplishing such an objective again calls for establishing a functional linkage with industries beyond signing the usual MoUs and bears desired amounts of fruits. Furthermore, there is a need to promote the formation of a functional linkage between the two actors via policy that stipulates the role of universities in national innovation systems as knowledge providers for local industrial innovation (Sohn et al., 2009).

Similar to the case in other developing countries, it is stated that there is a weak link between universities and industries in African countries. It is noted that partnership between local industries and universities is not common in most African countries (Bogoro, 2015). Similarly, Ssebuwufu et al. (2012) assert that even there is a lack of data to provide a comprehensive and informed picture of what steps African higher education institutions have already taken so far and what is needed to provide a strengthened, more comprehensive platform for building partnerships with the productive sector/industry. Furthermore, the rise in graduate unemployment experienced in most African countries is ascribed to weak linkages of universities with the productive sector at every level, from big industry to agricultural producers, to medium-and-small scale enterprises (Adepoju & Adedeji, 2016). Concerning the situation of universities in Ethiopia in light of technology

learning, it is acknowledged that universities are not taking the leading role and are lagging behind the industries (FDRE, 2012). Despite some efforts on the part of universities to strengthen the nexus with industries, the current status of UIL is found to be weak and even nonexistent in extreme cases (e.g. Abraham, 2016; Hiwote, 2014). Against the backdrop mentioned above, the purpose of this study was to investigate why UIL is weak in Ethiopia, with special emphasis on identifying the hurdles that deter the progress and pinpointing the available opportunities that ought to be seized to boost UIL.

The Objective of the Study

This study aimed to pinpoint the major challenges that deter effective UIL and demarcate the opportunities to be seized and thereby help revitalise the link’s functionality.

Materials and Methods

The study employed a systematic review method that attempts to collate all relevant evidence that meets pre-specified eligibility criteria to achieve a given research objective or answer a specific research question proposed by Guyatt and Oxman (1993). In addition, efforts were exerted to identify and synthesise available research shreds of evidence of sufficient quality concerning the issue at hand. Accordingly, scientific journals, analytical reports, statistical publications, official records, research reports, policy documents and strategies and books were searched, predominantly, by employing Google as the search engine. On top of this, Addis Ababa universities’ post-graduate library located on the main campus was also used as the source of required data. The key terms used include UIL, UIL in Africa, UIL in Ethiopia and challenges and opportunities of UIL.

Consequently, 32 journals, 25 research and official reports, 22 policy-related documents and 8 books were sorted. Then, the review adopted a systematic review methodology that included analysis of title, abstract and full text. The close relationship of the document’s content to the systematic review’s objective was primarily used as the inclusion criteria. Journal articles were selected based on publication apart from their direct relationship to the review

objective. Only those journal articles published after 2005 were included in the systematic review. The major exclusion criteria for documents other than journal articles was their lack of direct relationship to the review objective.

In contrast, journal articles were excluded if their publication date was before 2005 and their content was not directly related to the review objective. Finally, 14 journal articles, 15 research and official reports, 15 policy-related documents and three books were found to be satisfying the inclusion criteria and selected. Hence, this systematic review was done by making an intensive and systematic analysis of these documents. Furthermore, the review and synthesis of the selected documents were made transparently and rigorously to enhance the validity and reliability of the findings. This review was conducted from September to December 2020.

Literature Review

Overview of University and Industry Linkage

University and Industry engagement covers broad categories of strategic integration between the two parties: teaching and research activities, consultancy, curriculum development, community outreach, mutual visits, jointly organised meetings, conferences, seminars, joint publications, joint exhibitions and fairs (Othman, 2011). Collaboration between academia and industry is considered a critical component of efficient national innovation systems (Guimón, 2013). Universities are widely viewed as economic engines that can positively contribute to a country's growth in addition to their primary role as a centre for knowledge generation (Tumuti et al., 2013). When industries and universities work collaboratively to push the frontiers of knowledge, they become powerful innovation and economic growth (Edmondson et al., 2012). To facilitate such collaborative integration between the two actors, initiatives that help strengthen existing knowledge flows between universities and firms must be developed. In addition, policies that encourage new URLs must be enacted and implemented (Bramwell et al., 2012). The benefits arising from a functional UIL have long been recognised. For example, symbiotic UIL aid to get substantial streams of external funding, to enhance opportunities for professors and

graduates to work on groundbreaking research, to secure inputs to keep teaching and learning on the cutting edge of a discipline and to impact delivering solutions for pressing global challenges (Edmondson et al., 2012).

Approaches to University and Industry Linkages

Although there is no single systematic process describing how academia–industry–government could be organised, Ssebuwufu et al. (2012) argue that three models are widely used as the theoretical framework for understanding academia–industry–government linkages. These are the triple helix model, the national innovation system model and the knowledge production model, often called model two (Mpehongwa, 2013).

The Triple Helix Model, developed by Etzkowitz and Leydesdorff in 1997, views innovation as a product of interaction between three main actors: academia, industry and government (Ssebuwufu et al., 2012). Accordingly, University, industry, and government are recognised as relatively equal interdependent and interacting institutional spheres, forming a triple helix society (Etzkowitz, Dzisah, Ranga & Zhou, 2007). This approach maintains that the potential for innovation and economic development in a knowledge society lies in a more prominent role of the University and in the hybridisation of elements from University, industry and government to generate new institutional and social formats for the production, transfer and application of knowledge (Rangaa & Etzkowitz, 2013). Furthermore, the inclusion of government as another essential pillar in prompting UIL besides University and industry is informed by the obvious role government can play in this respect. This holds because the government can play crucial roles in promoting the link via crafting policies that increase the propensity of firms to collaborate with universities (Guimón, 2013). Thus, the triple helix model can be comprehended as a shift from a dominating industry–government dyad in the industrial society to a growing triadic relationship between university–industry–government in the knowledge society (Rangaa & Etzkowitz, 2013).

This model focuses on creating a stable regulatory framework, transforming universities from teaching to research and hence to an entrepreneurial institution

and encouraging industries that call for collaboration among the three actors (Etzkowitz et al., 2007). Moreover, this model emphasises that interaction among universities, industry and government is the source of the origination and the development of incubator movements, interdisciplinary research centres and venture capital, whether private, public or social (Etzkowitz et al., 2007). To this effect, the government can enhance the development of UIL through a direct role in providing funds to universities and R&D projects and a regulatory role that influences the rule sets of public universities and shapes intellectual property rights (Guimón, 2013).

The National System of Innovation (NSI) has been around for more than 20 years, and today it has become widely spread among policymakers and scholars worldwide (Lundvall, 2005). This approach stresses that the flows of technology and information among people, enterprises and institutions are key to the innovative process (OECD, 1997). In this model, innovation is considered a collective process. Firms do not innovate in isolation but within a larger system involving firms, universities, research centres, government agencies and other actors (Goransson and Brundenius, 2011). Unlike the above model, this model considers all aspects of a country's economic and institutional structure that influence the development, diffusion, and innovations (Mphongwa, 2013). The model was originated when Christopher Freeman and Bengt-Åke Lundvall analysed the historical account of the rise of Japan in the late 1980s (Goransson and Brundenius, 2011). The model underscores that innovation and technology development results from a complex set of relationships among actors in the system, including enterprises, universities, and government research institutes. Understanding this is regarded as crucial for enhancing innovative performance and overall competitiveness (OECD, 1997).

The third approach, often called Mode II Knowledge Production, views innovation as context-driven, problem-focused, and interdisciplinary. Michael Gibbons developed the model in the 1990s, and he distinguished it from the traditional research, which he labelled mode I. While mode I knowledge production is investigator-initiated and

discipline-based, mode II is problem-focused and interdisciplinary (Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow, 1994). This model puts knowledge production as a function of five attributes. In this context, Goransson and Brundenius (2011) contend that knowledge is produced in the application, quality control, social accountability, reflexivity, heterogeneity and organisational diversity. To this effect, transdisciplinarity, knowledge produced in the application context, quality control, social accountability and reflexivity, and heterogeneity and organisational diversity are delineated as the core of this model (Gibbons et al., 1994).

This study was conducted by taking the triple helix model as its overarching theoretical underpinning. Accordingly, the study emphasises the importance of synergetic linkage among universities, industries, and government to strengthen the feeble UIL currently in the country. These three actors come at the forefront of revitalising the symbiotic status linkage between academia and industries by ameliorating the deterrents that stifle the desired level of progress.

Different modalities ranging from simple student placement as apprenticeship or internship to incubating viable businesses can be adopted concerning UIL. To this end, Hernes & Martin (2000) contend that UIL covers diverse realities in both teaching and research from the more traditional such as student placement schemes, staff exchanges, consultancy services, continuing professional development, joint R&D to recent areas like small enterprise development—the creation of spin-offs for joint commercialisation of R&D products and the development of consortia for collaborative R&D at international level. Furthermore, Sohn et al. (2009) add that industries for solutions can consult universities to have quick access to information concerning technologies, research trends, and marketing and solve core technical problems. Moreover, universities can also create and manage innovative networks and serve as nodes of knowledge diffusion and transfer connecting different innovative actors. Indeed, higher education institutions have been acknowledged as strategic actors in national and regional economic developments in the current context of knowledge-intensive economies,

globalisation and an ever rapidly developing scientific and technological knowledge base (Hernes & Martin, 2000).

Results and Discussions

The Status of University and Industry Nexus in Ethiopia

Ethiopia's Higher Education Proclamation No. 650/2009 stipulates that universities are entrusted with three core mandates: teaching-learning, research and community service. The third mandate involves integrating or connecting university activities to society and the economy (FDRE-Proclamation No. 650/2009). Indeed, University-industry linkages have significantly become one of the most important agendas of higher education policymaking and the economic environment at both national and institutional levels (Tumuti et al., 2013). Universities in Ethiopia must also establish cooperation and relations with industries and other institutions to pursue their mission (FDRE-Proclamation No. 650/2009). The science, technology and innovation (STI) policy of Ethiopia also underscores the need to establish a functional link among universities, research institutes, TVET institutions and industry. To this effect, universities, research institutes, TVET institutions and industry are designated as core actors in the national innovation system (FDRE-STI policy, 2012, p. 13). Furthermore, the above proclamation also bestows the president of a public institution with the responsibility of ensuring that the institution in the pursuit of its mission is perpetually connected internationally as well as with federal and state institutions, relevant agencies and business and industry, and associations (FDRE-proclamation No., 650/2009). To this end, defining the national science and technology landscape and strengthening linkages among the different actors in the national innovation system are singled out as one of the key objectives of the policy (FDRE, 2012). Few universities, primarily oriented to enhancing the development of science and technology, are formed in the country. However, critics claim that these universities are marginally different from the other universities in their organisation, delivering courses and other aspects.

Following the above policy directions, universities attempt to create links with industries as this task is stated on almost all universities' mission statements. Thus, the need to intensify University-industry linkage is recognised by the Ethiopian universities though numerous backlogs are to be addressed. To this effect, the links being formed are confined to technology and engineering fields instead of covering other fields such as management, accounting, economics and the like. This enables industries to have easy access to properly managing their human, financial and materials resources and improving efficiency. Besides, the community service or outreach mandate is being discharged by Ethiopian universities through such modalities as continuing education and training.

In addition to the above policy endeavours, the need to establish linkages with Technical and Vocational Education and Training (TVET) institutions and industries is addressed in the Education Sector Development Program V (ESDP V) to be implemented from 2015/16–2019/20. In this document, it is noted that 'during the ESDP V period, it is expected that industry will take a stronger leadership role in TVET, guiding revisions to occupational standards, calling for adjustments and improvements when the sector needs change' (FDRE-Ministry of Education, 2015, p. 94). However, when it comes to implementation, it is acknowledged that efforts made so far to build trust with the industry by educational institutions have been minimal (FDRE-Ministry of Education, 2006). Therefore, a national forum co-chaired by the Ministry of Science and Technology and the MoE was formed to enable institutions to collaborate with industries and mega-project implementers in their respective development corridors (FDRE- Ministry of Education, 2015).

Nowadays, creating technology transfer offices (TTO) in universities has become a commonplace institutional mechanism to assist researchers in patenting their findings and obtaining license fees and royalties (Guimón, 2013). There are endeavours on the part of universities in Ethiopia to build UIL though how much success has been achieved so far remains an area yet to be investigated. For instance, Addis Ababa University has a separate office under

the Vice President for Research and Technology Transfer office to enhance the link. The UIL and technology transfer office is chaired by a director accountable to the research and technology transfer vice president. Moreover, the University has also prepared a document that details the major activities to be undertaken in this regard, and implementation has been underway since 2013.

Similarly, Addis Ababa Science and Technology university [ASTU], one of the new public universities mainly established to play a leading role in the technological transformation of Ethiopia by creating a strong linkage with industries, has established a UIL & technology transfer (UILTT) office chaired by the directorate. In addition, Arba Minch University's Institute of Technology has also started UILTT activities as of 2008. Generally, the same trend is existent in other universities of Ethiopia as well.

Major Challenges of University and Industry Linkages in Ethiopia

It is noted that many countries in Africa lack an enabling environment for reorienting and aligning universities and other higher education institutions (HEIs) towards a more entrepreneurial role (Ssebuwufu et al., 2012). Hence, the importance of pinpointing and tackling impediments that hinder the progress of functional UIL is manifold if there is a real need to amass the benefits arising thereof. Enabling a university to interact closely and harmoniously with industry and the productive sectors represent one avenue to enhance the relevance of universities to the economic development of their countries (Ssebuwufu et al., 2012). Nevertheless, universities in Africa in general and in Ethiopia, in particular, are not able to establish a functional link that results in significant gains to both actors due to several formidable challenges. Accordingly, the major challenges being experienced by Ethiopian universities are discussed below.

Limited budget to conduct research

The Ministry of Education report reveals that financial support to research in universities is low. It was found that in 2011/12, the research allocation of all universities accounted for only 1% of their total budget (FDRE – Ministry of Education, 2015).

This is in sharp contrast to what has been stated in policy initiatives and other endeavours claimed to be exerted to enhance UIL through research. Contrary to Ethiopia's situation, Goransson and Brundenius (2011) underscore that expenditures on university R&D as a percentage of Gross Expenditure on Research and Development (GERD) in several developing countries, including Latvia, Brazil, Cuba, and Uruguay, exceed that of developed countries. This shortage of budget allocated for conducting research and the weak culture of researching Ethiopian universities can worsen if remedial measures are not implemented.

The Mismatch between Graduates' Skills and Knowledge and industries' Demand

According to Ssebuwufu et al. (2012), the skills, knowledge and training that students receive at many African universities do not prepare them adequately to meet the requirements of industry and the job market. In a similar vein, Daniel (2008) attests that there exists critical misalignment between the research output from a research institute, the type of curricula and skill endowments of graduates from universities versus the immediate skill needs of industries. In line with this, in India, higher educational institutions were recently made to change the curricula and introduce 'add-on- courses' to equip the graduates with practical industry knowledge than the mere theoretical focus by entering into formal collaborations with the industries (Gandhi, 2014). The mismatch between what students learn and what industry needs to be coupled with undertraining in the critical skills of problem-solving, analytical thinking and communication are conceived as the causes for the emerging high graduate unemployment and underemployment being experienced by many African countries (Ssebuwufu et al., 2012). The same trend was observed in India as there was an ever-increasing number of graduate unemployment. It triggered the need to change the curricula to enhance skill development and make the educated youth self-employed by improving their employability (Gandhi, 2014). According to Ssebuwufu et al. (2012), African universities have been criticised as ivory towers that churn out graduates and research that are irrelevant to the needs of employers and the social, economic,

and technical challenges facing African economies. More or less, the same thing is happening in Ethiopia. Thus there is a need to revisit the curriculum to get appropriate education and training with high demand in the job market and industries.

Staff Issues

The staff who run UIL offices in many universities do not have appropriate skills and knowledge. In a similar vein, Ssebuwufu et al. (2012) contend that most UIL offices are not staffed with sufficient expertise in entrepreneurialism, intellectual property rights management, and marketing strategies. Besides, the report of MoE uncovers that there are limited personnel available to conduct high-quality research and higher education research is conducted predominantly by postgraduate students (FDRE – Ministry of Education, 2015). As a result, research outputs are limited due to the low percentage of academic staff who hold doctoral degrees. Even those researches being conducted are not up to the standard and innovative. In this regard, universities themselves have highlighted the relevance of university research as one of the most pressing issues to be mitigated (Goransson and Brundenius, 2011).

Besides, it is stated that the overcrowdedness, impoverishment, dilapidated infrastructure, and poor status of the rewards and morale of the academic staff seem to lead to a crisis in university education and research (Daniel, 2008). UIL offices in many universities are being chaired and run by academic staff busy accomplishing the teaching and research duties. Hence, there is a need to hire full-time employees who devote their entire time and effort to this particular task than entrusting it to the academic staff as an extra activity.

Lack of Strategies to Facilitate Implementation of Enacted Policies

while most institutions have highlighted industry linkages in their mission statements and strategic plans, many lack complementary and supportive strategies and mechanisms for regulating interactions with the productive sector (Ssebuwufu et al., 2012). Implementing broader policies requires preparing specific guidelines that detail the nitty-gritty, and such detailed guidelines are non-existent in most

cases. Policies formulated by investing a significant amount of resources may end up as a mere rhetorical statement if not followed by appropriate policy implementation instruments and corresponding capacity on the implementers to put them into practice. To this effect, Etzkowitz & Roest (2008) note that policy instruments that comprise the means used to put a given policy into practice are the vehicles through which those in charge of formulating and implementing policies use their capability to orient different decision-making by others.

Lack of Dedication to Implementing Policies

The report of MoE indicates that lack of ownership and meaningful coordination of UIL activities are the main bottlenecks impeding the desired progress (FDRE–Ministry of Education, 2015). This lack of ownership can be attributed to assigning academic staff busy with other duties to undertake the activities. Besides, the observed gap between sound policy intentions and poor coordination may also be due to weak institutional capacity to implement reforms at the national and regional levels (FDRE–Ministry of Education, 2015). Most universities mention the number of MoUs signed with various stakeholders as indicators of the UIL’s strength, but if the MoU is not properly implemented, merely signing such documents may not result in any desirable result.

Mainly because in academia, an investigator sets research priorities, whereas management sets these same priorities in industry. Academia seeks grants, while industry seeks profits. In academia, patenting is driven by publications, whereas patenting is driven by business decisions in the industry. These are just some of the differences between the two.

The Cultural Divide between Universities and Industries

There is a cultural divide associated with conducting R&D in the two organisations. In most instances, universities set their thematic areas that often do not align with industries’ priorities. Hence, to reinvigorate strategic UIL, both sides should overcome the communications and cultural divide that impair university-industry relationships of all categories and weaken their potential (Bogoro, 2015). The cultural divide between the two actors

generates a lack of confidence and thus dwindles strategic collaborations between the two actors. To this end, Daniel (2008) stresses that many higher education institutions, research institutions and industries are working in isolation. As a result, their efforts fail to result in improved tools, equipment and services reaching the community in volumes that could make a real impact on productivity. Other factors that divide wide include lack of information about potential partners, difficulties finding contact persons, and transaction costs of finding the right partner. The traditional form of organisation characterized by rigid borders between disciplines and isolation from society and industry is prevalent in Ethiopian universities, which could stifle the progress of UIL.

Moreover, universities often pursue basic research and laboratory work on a small scale in projects that are a long way from commercialisation, whilst the industries are interested in applied research that leads to new or improved goods and services that can subsequently be produced on a large scale (Hiwote, 2014). Firms usually perceive that universities do not have a thorough understanding of their line of business as they are concerned only with big and hard science, and they lack practical knowledge. This belief discourages them from forming synergies with universities (Abraham, 2016). Besides, there is a lack of confidence on the part of industries as to the capacity of university staff to engage in innovative endeavours and develop something that is of great practical relevance.

The Inexperience of Universities to Build UIL

The relatively young ages of most universities coupled with the scarcity of basic infrastructures is why the majority have remained to teach University rather than research and technology outreach centres (Mpehongwa, 2013). Another factor that worsens the situation is the weakness of the research infrastructure, which inevitably leads to a scarcity of scientific research of economic value (Mihyo, 2013). Even the few pieces of research conducted in universities are questioned regarding issues of relevance and quality (Bogoro, 2015). Ethiopian universities are also characterised by a lack of experience, poor leadership, and many students, which constrain

academic staff to undertake any other activity apart from teaching. Moreover, since career advancement in universities is based on the “publish or perish” syndrome and given research in these institutions are financed by the government, there is usually a tendency to distribute funds in an equitable manner that gives every researcher a chance to publish and enhance their career. This hinders researchers from involving in activities that require huge financial outlays and longer periods to complete but may result in breakthrough and innovative outputs that can be applied in industries and bring changes. On this account, most of the research works are irrelevant or contribute marginally to the country’s industrial development (Bogoro, 2015). Given the results of such research that cannot be commercialised, local entrepreneurs and industries have no desire to forge a partnership with universities operating under such a policy to award research grants. Owing to such weak link, the transformation of even a few promising research results to products/technologies is not facilitated by institutional frameworks; rather, the task is usually left to the individual who may afford to get the idea published in journals at best and at worst scenarios the idea may end up without being disseminated in any form (Bogoro, 2015). Hence, to obtain research outputs that can be commercialised and relevant to industries, there is a need to revisit the corresponding financing strategy that resembles the mere rationing of funds among competing staff.

Immaturity of Industries

It is noted that most of the local industries are somewhat infant factories of the parent company normally located in developed countries (Mihyo, 2013). In this connection, these factories tend to do all their technology development activities through their foreign parents and hence have no reason to develop partnerships with local institutions. In this light, Mpehongwa (2013) stresses that foreign firms operating in developing country markets are not often interested in establishing an R&D entity in the local affiliate as their main motive behind engaging in such activities is to exploit cheap labour and raw materials and also to enjoy some privileges imparted by governments such as tax exemption, duty-free import and export, possibility of getting loans,

working spaces and others. Though the manufacturing industry began to appear as of the 1950s in Ethiopia to substitute imports, it could not thrive owing to unfriendly political ideologies held by the preceding governments (FDRE–Ministry of Industry, 2013). To this end, Altenburg (2010) attests that while Haileselassie’s regime was characterised by reliance on an autocratic rule and feudal land ownership, the Dregue had nationalised private enterprises and reorganised them into state-owned corporations, and this action significantly stifled industrial growth. In 2002, the current government had crafted industry policy and tried to identify priority sectors that deserve attention to build the platform for the industry to take its key leading role in the economy (FDRE – Ministry of Industry, 2013). It is acknowledged that the narrow base of the industrial sector in Ethiopia is a challenge with significant implications on the country’s capacity to generate foreign exchange and create job opportunities for its growing labour force (MoFed, 2010). Following some policy incentives to attract investors from home and abroad, there is a sheer increase of industries in the country. However, the sector is not yet matured enough. Cognizant of this, the government underlined the importance of enhancing the sector’s development to realise the country’s long-term vision with the stronger commitment of the leadership in the years to come (FDRE–National Planning Commission, 2016). Due to the small size and immaturity, industries may not have sufficient funds earmarked for innovations and collaborations with universities.

Other Hurdles

The shortage of important facilities including laboratories, science parks, technology incubation centres, and testing facilities that could attract productive sector in seeking partnership with universities is another factor that impedes the synergy growth between the two actors. Another factor worth mentioning is the turnover of experienced staff who could engage in innovative research and facilitate UIL due to higher salaries and other incentives. The presence of young faculty who may lack sufficient experience to conduct innovative researches in most Ethiopian universities can be cited as yet another factor that partly thwarts the UIL. This holds because

UIL is enhanced when breakthrough research outputs are produced and commercialised, which greatly requires experience. The problems related to insufficient availability of infrastructures such as electricity, road and logistics are commonplace matters that obstruct the smooth operation of industries. Particularly, power interruption is mentioned as the number one challenge faced by industries and owing to this, there are instances where industries are forced to halt their operation. Indeed, this issue is acknowledged by the relevant government bodies, and remedies are underway.

Opportunities of University and Industry Linkages in Ethiopia

To build a thriving UIL, paving ways and thereby creating an enabling environment is crucial. As mentioned above, UIL in Ethiopia faces formidable challenges that impede its progress. Despite the prevalence of these challenges, there are some opportunities in the Ethiopian context is discussed below.

Presence of Supportive Policy Environment

Public policy greatly influences the propensity of firms to collaborate with universities, and such collaborations can take different forms. For instance, creating linkage among universities, TVETs, research institutions, and the industries is one of the 11 highly important issues identified in Ethiopia’s science, technology, and innovation policy (FDRE, 2012). In this context, Guimón (2013) contends that governments can encourage UIL through a direct role in providing funds to universities and R&D projects, through regulations that shape the rule of the game, by protecting intellectual property rights, by establishing the necessary infrastructure and intermediate offices such as technology transfer offices, science parks, and business incubation centres. To this effect, the issue of strengthening UIL has been the agendum of almost all major policies and plans, including ADLI, SDPRP, PASDEP, GTP I, GTP II, and other sectoral policies and strategies like education policy, industrial policy, science, technology and innovation policy, Micro and Small Enterprises (MSEs) development strategy and in recently issued federal small and medium

manufacturing industries development regulation and many others. Besides, during the GTP I period, 2010/11–2014/15, it was planned to exert concerted efforts to encourage export-based and import-substituting industries (MoFED, 2010).

Similarly, in GTP II, it is also planned to give special emphasis to the development of export-oriented manufacturing industry, to transform the structure of the economy and hence to enable the country to achieve the vision of becoming lower middle-income country by 2025 (FDRE – National Planning Commission, 2016). However, whether the industrial sector has got the promised supports and achieved the envisaged growth is yet to be investigated. To this end, Mihyo (2013) underlines that policies that seek to support science education and a linkage between science faculties at universities and productive sectors of the economy, especially between agriculture and industry, are being adopted in most African countries. Indeed, the task of enhancing UIL is a catchphrase among other African governments too.

Proliferation of Industries

The number of small scales manufacturing industries has been increasing over the past years. To this end, the Central Statistics Agency (CSA) report indicated 39,027 small scale manufacturing industries all over the country. In contrast, in 2013/14 their number has reached 116,604 (CSA, 2015). Despite their current small size, which may curb their capacity to establish collaborative relations with universities, there are hopes as these firms will grow in the future and become capable of engaging in symbiotic linkages with universities. Unlike Ethiopia, universities in advanced, and even some African, countries are surrounded by industrial complexes, farms, or production and service centres that actively seek knowledge to enhance their competence, competitiveness, productivity, and efficiency (Mihyo, 2013). Moreover, attracted by favourable policies, many foreign investors are opening industrial complexes in Ethiopia. However, they are less likely to establish linkages with local universities given that their technological and innovation tasks are performed in their headquarters located elsewhere.

Issuance of Property Right Protection Laws

The need to assure intellectual property rights comes at the forefront of enhancing innovations and technological advances. To this effect, the government has established intellectual property protection office by proclamation No. 320/2003. The major objectives of the office include facilitating the provision of adequate legal protection for and exploitation of intellectual property in the country; collecting, organising and disseminating technical information contained in patent documents and encouraging its utilisation; studying, analysing and recommending policies and legislation on intellectual property to the government; promoting knowledge and understanding of intellectual property among the general public (FDRE, 2003). Furthermore, encouraging those involved in innovative activities that may lead to technological advancements by protecting their intellectual properties through granting patents has been pinpointed as one of the key strategies to pursue the country’s science, technology, and innovation policy (FDRE-STI policy, 2012, p. 5). Therefore, given such a legal environment that guards innovative intellectual properties against being expropriated by irresponsible individuals, it is expected that academicians and practitioners in industries will be motivated to actively involve in innovative activities that enhance knowledge and technology transfer and thereby strengthen the link between the two actors.

The Growing Economy

In Ethiopia, there is the continuous growth of the economy over the last two decades. In this line, it is stated that Ethiopia has experienced strong economic growth in recent years, with real GDP growth at or near double-digit levels since 2003/04. As a result, the country has consistently outperformed most other African countries (Mwanakatwe & Barrow, 2010). Hence, the growing economy is expected to bring about an industrial boost that will strengthen competition. To withstand the competition, industries should be innovative and deploy new technologies, which calls for forming linkages with universities.

Establishment of Science and Technology Universities

The conception of Addis Ababa Science and Technology and Adama Science and Technology universities directly connects with GTP I, which was already implemented from 2010/11–2014/15. As it was vividly underlined in the plan, well institutionalised and strong science and technology universities and institutes of technology had been envisioned to aid as a cornerstone to build an economically developed and industrialised Ethiopia. Consequently, Addis Ababa Science and Technology University (AASTU) was founded in 2011. The then Adama university was also renamed by the Council of Ministers as Adama Science and Technology University in May 2011. Since 2011, the two universities have become a centre of excellence in science and technology, thereby allowing for realising goals set in the GTP I. This is an obvious indicator that the government has established universities predominantly dedicated to enhancing the proliferation of innovation and technology in the country. These universities are supposed to involve in more technology development and innovation endeavours than the other universities which undertake teaching, research and community service in diversified fields. Moreover, due to their concerted effort to develop technologies and innovation, these universities are envisioned aggressively engaging in mutually beneficial relationships with industries.

Construction of Industrial Parks

Recently, the government has identified potential areas where industrial clusters specialising in specific areas are opened, and few are embarking on initial activities. To this end, the government has invested a huge amount of money in developing industrial parks that will be transferred to the private investors involved in the prioritised activities (FDRE, National Planning Commission, 2016). The government has initiated the need for developing industrial parks to bring about a big push in the export-oriented medium and large scale manufacturing industry by fully implementing existing strategies articulated in the plan. Thus, the construction of industrial parks is deemed crucial to address the constraints faced by domestic and foreign investors related to production

and logistics, which impede their productivity and competitiveness (FDRE, National Planning Commission, 2016). The construction of industrial parks is envisaged to mitigate the constraints of working premises, infrastructure and energy, trade and customs facilitation, trade logistics, and others. Thus, the construction of such parks is supposed to create an opportunity for both universities and industries to establish symbiotic links and enjoy the benefits arising. Universities will have easy access to industries since the industrial park constitutes clusters of industries placed together.

Relative Improvements in Infrastructure

The country has been undertaking massive roads, power generating centres, telecommunication and other facilities, which are important to boost industrial growth. As mentioned above, the major objective of constructing industrial parks is to alleviate the problems associated with infrastructure. Such infrastructure improvements are expected to intensify the industrial development endeavour of the country to a greater extent. When industries are well developed, creating links with universities becomes imperative as the industries seek better technologies and are innovative to be competitive and profitable. Growth in the industrial sector is also thought to motivate universities to be more engaged in high-level research endeavours that could result in highly demanded and commercialised outputs.

Conclusion and the Way Forward

Despite the endeavours of government, universities and industries to create a functional UIL, satisfactory results are not yet achieved. Manifold challenges are dwindling the progress of mutually beneficial links between universities and industries. To this end, the most important challenges hindering the progress of UIL in Ethiopia are found to be, presence of a limited budget to conduct researches in universities, a mismatch between graduates' knowledge and skills and the demand of industries, lack of sufficient skills and knowledge on the part of the staff of both sectors, absence of sound policy implementation strategies and plans, lack of ownership on the part of those who are supposed to implement the policies, strategies and plans, the cultural divide between the

two parties and others. Thus alleviating these issues is imperative to realise sound UIL in the country. However, despite the challenges identified so far, some opportunities can enhance the progress of UIL. The essential opportunities that are envired to contribute towards the growth of UIL in Ethiopia positively include the presence of a supportive policy environment, the proliferation of industries, issuance of intellectual property right protection laws, growing economy, the establishment of science and technology universities, construction of industrial parks and relative improvements in infrastructure. Owing to these opportunities, the UIL is anticipated to flourish in the country. Nevertheless, putting rigorous efforts to realise the policies, strategies, and plans is of paramount importance.

Furthermore, the following are delineated as major issues to be underscored to strengthen UIL in the country.

Revision of universities' existing research funding schemes encourages academicians to be involved in rigorous research activities that can bring about breakthrough results highly demanded by industries and can be commercialised.

Revision of university curricula so that more emphasis is given to practical aspects besides the currently theoretical ones.

Encouraging universities to actively engage in collaborative links with universities and other public-private sectors transcends the usual signing of MoUs and imparts education in the weekend, evening, summer and distance modalities, and provision of short term pieces of training to the surrounding communities. To this effect, universities' performance measures like the number of consulting or R&D contracts entered with industries, income from patent licensing, and others may be introduced besides those currently in use.

The need to intensify policy implementation aptitude of the pertinent officials. Instated of mentioning ill policy implementation as an excuse for poor performance, it is essential to find and rectify the root causes of such poor performances. In this respect, poor performance may arise due to lack of skill, knowledge, attitude, or other impediments such as highly bureaucratic procedures, shortage of necessary inputs, and infrastructure.

The need to strengthen the cooperation and thus bridge the cultural divide between the two actors. Both parties ought to be encouraged to unlearn their somewhat suspicious attitude towards each other and establish systems that help them commence building mutually beneficial relationships. This can be achieved by intensifying the already started national forum co-chaired by the Ministry of Science and Technology. The MoE was formed to enable institutions to collaborate with industries and mega-project implementers in their respective development corridors. Such regular meetings among the three stakeholders can open the door for intensifying the envisaged link by bringing several anomalies on each party's side to light, and remedies can also be sought in a highly cooperative manner.

References

- Abraham, Abebe Assefa. "University-Industry Linkage Practices, Determinants and Challenges Theoretical and Empirical Article Review: Lessons for Effective and Successful Collaboration." *International Journal of Research in Management, Economics and Commerce*, vol. 6, no. 3, 2016.
- Adeoti, John O. "University-Industry Linkage and the Challenge of Creating Developmental Universities in Nigeria." *Journal of Towards Quality in African Higher Education*, 2008, pp. 375-387.
- Adepoju, O., and A.O. Adedeji. "University-Industry Collaboration and Graduate Unemployment in Nigeria: A Case Study of Ondo State, Nigeria." *Journal of Management and Technology*, 2016.
- Altenburg, Tilmann. "Industrial Policy in Ethiopia." *Discussion Paper No. 2/2010*, 2010.
- Bogoro, S.E. *Enhancing the Relevance of Research and Industry Partnership in Nigeria: A Case for New Strategies*. Federal University of Technology, 2015.
- Bramwell, Alison, et al. *Growing Innovation Ecosystems: University-Industry Knowledge Transfer and Regional Economic Development in Canada*. University of Toronto, 2012.
- Crul, Marcel, and Hans Schnitzer. "Promoting Academia-Industry Cooperation for

- Innovation.” *Knowledge Collaboration & Learning for Sustainable Innovation Conference*, 2010.
- Edmondson, Gail, et al. *Making Industry-University Partnerships Work: Lessons from Successful Collaborations*. Business Innovation Board, 2012.
- Etzkowitz, Henry, et al. “The Triple Helix Model for Innovation: The University–industry–Government Interaction.” *Asia–Pacific Tech Monitor*, vol. 24, no. 1, 2007, pp. 14-23.
- Etzkowitz, Henry, and Matthieu Roest. *Transforming University-Industry - Government Relations in Ethiopia*. International Organization for Knowledge Economy and Enterprise Development, 2008.
- Ethiopian Intellectual Property Office Establishment Proclamation No. 320/2003*. Federal Negarit Gazeta, Federal Democratic Republic of Ethiopia, 2003.
- Education Sector Development Programme V (ESDP V)*. Ministry of Education, Federal Democratic Republic of Ethiopia, 2015.
- Five Year Education Sector Capacity Development Strategic Plan (Main Report: Complete Version)*. Ministry of Education, Federal Democratic Republic of Ethiopia, 2006.
- Growth and Transformation Plan (GTP I) 2010/11-2014/15*. Ministry of Finance and Economic Development (MoFED), Federal Democratic Republic of Ethiopia, 2010.
- Growth and Transformation Plan II (GTP II) (2015/16–2019 /20) - Volume II: Policy Matrix*. National Planning Commission, Federal Democratic Republic of Ethiopia, 2016.
- Gandhi, M.M. “Industry-Academia Collaboration in India: Recent Initiatives, Issues, Challenges, Opportunities and Strategies.” *The Business & Management Review*, vol. 5, no. 2, 2014, pp. 45-67.
- Gibbons, Michael, et al. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. Sage Publications, 1994.
- Goransson, B., and Claes Brundenious. *Universities in Transition: The Changing Role and Challenges for Academic Institutions*. Springer, 2011.
- Guimón, Jose. *Promoting University-Industry Collaboration in Developing Countries*. Policy Brief: The World Bank, 2013.
- Higher Education Proclamation No. 650/2009*. Federal Negarit Gazeta, Federal Democratic Republic of Ethiopia, 2009.
- Hernes, Gudmund, and Michaela Martin. *Management of University-Industry Linkage: Results from the Policy Forum held at IIEP*, 2000.
- Hiwote, Molla. *University Industry Linkage in terms of Research: The Case of Addis Ababa University*. Addis Ababa University, 2014.
- Kitaw, Daniel. “Higher Education - Industry Resource Integration Centre - Towards Solving Existing Industrial Problems.” *Transforming University-Industry - Government Relations in Ethiopia*, edited by Henry Etzkowitz and Matthieu Roest, International Organization for Knowledge Economy and Enterprise Development, 2008, pp. 86-101.
- Lundvall, Bengt-Åke. “National Innovation Systems - Analytical Concept and Development Tools.” *DRUID Conference*, 2005.
- Mihyo, Paschal B. “University-Industry Linkages and Knowledge Creation in Eastern and Southern Africa: Some Prospects and Challenges.” *Africa Review*, vol. 5, no. 1, 2013, pp. 43-60.
- Mpehongwa, Gasper. “Academia–Industry–Government Linkages in Tanzania: Trends, Challenges and Prospects.” *Educational Research and Reviews*, vol. 8, 2013.
- Mudde, Huub L.M., et al. “Entrepreneurship Education in Ethiopian Universities: Institutional Assessment.” *Working paper No. 2015/01*, 2015.
- Mwanakatwe, Peter, and Lamin Barrow. “Ethiopia’s Economic Growth Performance: Current Situation and Challenges.” *Economic Brief*, vol. 1, no. 5, 2010.
- National Innovation Systems*. Organization for Economic Cooperation and Development (OECD), 1997.
- Othman, Normah Binti. “An Assessment of

- a University-Industry Partnership in a Malaysian University.” *International Journal of Business and Social Science*, vol. 2, no. 8, 2011, pp. 94-103.
- Oxman, Andrew D., and Gordon H. Guyatt. “The Science of Reviewing Research.” *Annals of The New York Academy of Sciences*, vol. 703, no. 1, 1993, pp. 125-134.
- Rangaa, Marina, and Henry Etzkowitz. “Triple Helix Systems: An Analytical Framework for Innovation Policy and Practice in the Knowledge Society.” *Industry and Higher Education*, vol. 27, no. 4, 2013, pp. 237-262.
- Report on Small Scale Manufacturing Industry Survey*. Central Statistics Agency, Federal Democratic Republic of Ethiopia, 2015.
- Science, Technology and Innovation Policy*. Federal Democratic Republic of Ethiopia, 2012.
- Ssebuwufu, John, et al. *Strengthening University-Industry Linkages in Africa: A Study on Institutional Capacities and Gaps*. Association of African Universities, 2012.
- Sohn, Dong-Won, et al. “Policy-driven University-Industry Linkages and Regional Innovation Networks in Korea.” *Journal of Government and Policy*, vol. 27, no. 4, 2009, pp. 647-664.
- Tumuti, Dinah W., et al. “Benefits of University-Industry Partnerships: The Case of Kenyatta University and Equity Bank.” *International Journal of Business and Social Science*, vol. 4, no. 7, 2013, pp. 26-33.
- van der Kuip, Isobel, and Ingrid Verheul. “Early Development of Entrepreneurial Qualities: The Role of Initial Education.” *SCALES - Paper No. 11*, 2003.
- Yüksel, Hasan, and Ezgi Cevher. “Questioning the Collaboration between Universities and Industry: The Case of Turkey.” *International Journal of Humanities and Social Science*, vol. 4, no. 7, 2014, pp. 232-243.

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