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TRAINING NEEDS ANALYSIS AND FORESTRY CURRICULA EVALUATION IN PROFESSIONAL AND TECHNICAL INSTITUTIONS IN SUB-SAHARA ANGLOPHONE COUNTRIES

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Training needs analysis and forestry curricula evaluation in professional and technical institutions in sub-Sahara Anglophone countries

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Acronyms and abbreviations

FAO	Food and Agriculture Organization of the United Nations
FFF	Fibre Food and Fuels
GIS	Geographical Information System
IPCC	Intergovernmental Panel on Climate Change
IUFRO	International Union of Forest Research Organizations
NFP	National Forest Policy
PCD	Participatory Curriculum Development
TNA	Training Needs Assessment
UNFCC	United Nations Framework Convention on Climate Change
SSA	Sub Sahara Africa

Executive Summary

Current training needs and emerging trends in the forestry sector have prompted a number of forestry educational institutions to review their traditional curricula in order to produce well equipped graduates. Traditional forestry curricula, as evidenced by the competence profiles of most forestry graduates, comprise gaps between acquired knowledge and skills, on one hand and market needs, on the other hand.

A training needs assessment was undertaken in Sub Sahara African (SSA) Anglophone countries, with the aim of assessing the content of the forestry curricula in professional and technical training institutions in comparison with current market needs and emerging forestry related issues. Primary data and information were collected from employers, research and training institutions through questionnaires. Secondary data and information on historical and existing identified training needs were obtained from literature. Follow up telephone and face-to-face interviews with selected organisations were conducted to ascertain facts as well as filling information gaps.

Institution visits were done for were Bindura University of Science Education (Zimbabwe), National University of Science and Technology (Zimbabwe), Makerere University (Uganda), Sokoine University of Agriculture (Tanzania) and University of Energy and Natural Resources (Ghana). Also, information was obtained from other professional and technical institutions, including University of Stellenbosch (South Africa), University of Ibadan (Nigeria), Malawi College of Forestry and Wildlife (Malawi), Nyabyeya Forestry College (Uganda) and Zimbabwe College of Forestry (Zimbabwe). The target group of forest graduate employers was determined through internet web searches. Employing organisations were categorised as, research institutions, NGOs as well as public/private forestry companies. The survey was conducted on 56 training institutions: comprising 41 universities and 15 colleges, 15 research institutions, 26 forestry public/private organisations and 12 non-governmental organizations.

It was observed that societal expectations of the forest graduate are increasing; demanding that forestry becomes generalist than specialist discipline. It was observed that there is variation in curricula on the same subject area across countries; however, the core forestry courses were covered. Emerging issues found to be deficient in recent forest graduates are on climate change, forest certification, fibre-food-fuels (FFF) nexus, integration of forestry with NRM, and agroforestry. Training institutions have acute shortage of teaching materials especially equipment, current literature and field facilities; some institutions do not have specialised forestry laboratories; there is negligible government and donor support; and ICT facilities are not reliable. It was also observed that earlier established institutions which were supported by FAO/UNDP and donor communities have well developed infrastructure. Unfortunately, the institutions struggle to sustain themselves and the donated equipment at inception is obsolete. Collaborative relations established are still running but are dictated by the donor community or project proponent who may not address local needs. On the other hand, the institutions established by African governments after their independence were never fully equipped and capacitated right from inception and are ill equipped and insufficiently funded.

It is recommended that universities set up common interest region-specific satellite campuses as centres of excellence to address research and programmes that address challenges within that particular eco-region given that there are many issues which are of trans-boundary nature, as well as facilitate regional/sub regional economic integration that is fast taking place in Africa whilst the forestry sector lags behind. Training institutions are recommended to collaborate with relevant stakeholders for joint development and review of curricula. Countries may also adopt specialised curricula for women in social and/or community forestry to cover livelihoods and improvement of equal opportunities so as to expand societal potential.

1.0 INTRODUCTION

Education and training are critical in building Africa's capacity for sustainable forest management since forests constitute a natural endowment for present and future generations. Forests proffer economic, livelihood and environmental benefits, goods, services and development opportunities which are only guaranteed by relevant education that can guide their development, management and use in a sustainable manner. Forestry education world-over is evolving, prompting forestry institutions to review curricula in order to impart current knowledge and skills to future practitioners. Forestry curricula have had a protracted metamorphosis history from traditional forest management to inclusion of elements of natural resources management, environmental, and ecosystem services. According to Brown (2003), traditional forestry programmes prepared students with a strong foundation in a number of core academic disciplines whilst the classical forestry curricula emphasised more on biological and technological than social aspects, thereby creating a void between forestry objectives and dynamic societal needs. Employers' demands are transforming whilst traditional forestry training has remained stagnant and unable to produce appropriate graduates to manage forest resources in a changing world (Ratnasingam et al., 2013).

An appropriate forestry curriculum is objectively developed from the human quest to acquire innovative responses to challenges posed by civilisation, accumulated research knowledge and global change, thus demanding responsive and innovative teaching and learning. As such, a paradigm shift to an interdisciplinary and encompassing curriculum is required (Taylor, 2000) for forestry training institutions to meet the requisite skills and competencies of the 21st century graduate. Periodic curricula reviews are prerequisite to the development of programmes and professionals with an aptitude to make a difference towards more sustainable societies (Arevalo et al., 2014).

In developing the curricula, identifying and understanding the training needs of men and women in professional and technical forestry training institutions are powerful interventions to attaining forestry and natural resources societal developmental goals. An analysis of training needs and the success of the curriculum in delivery hinge on stakeholder participation for effective content development, testing and review since the entire process is multi-stakeholder and demands individual and collective views, knowledge, experiences and information about the desired learning objectives, processes and outcomes (De Coninck, 2008). In this regard, the SADC (FAO, 2001) model on curriculum development (Appendix 1) is one typical example of a training needs analysis (TNA) approach.

Among the stakeholders, special attention must be paid to vulnerable and marginalised social groups, youth and women to enhance their equal participation and representation since prevailing policies and institutions in most African countries are not sufficiently gender sensitive (Ardayfio-Schandor, 2007). Their representation and subsequent capacity building needs are seldom addressed by forestry curricula. It is therefore imperative that curriculum development and review avoid gender bias (Hay, 2010).

To contain the above shortcomings, a TNA was conducted primarily to ascertain organisational, group and individual needs in the African forestry sector in order to meet societal expectations, productivity and efficiency, as well as improve the attractiveness of the forestry discipline to women, youth and marginalised groups. The TNA will hopefully improve training capacity through curriculum development and periodic review during which emerging issues and novel scientific approaches are introduced. Resultant balanced curricula hold the potential to rectify unequal societal opportunities, generate success prospects and address gender equity and equality, thereby correcting existing gender role stereotypes, address the development of the forest resource base, good governance and poverty reduction.

In light of these factors, it was necessary to evaluate current content of forestry curricula in professional and technical institutions in relation to current needs and emerging issues in order to develop information that would facilitate the development of appropriate training curricula that is all-inclusive. This analysis was guided by the following specific objective and specific tasks:

1. **Objective:** To evaluate the content of forestry curricula in professional and technical institutions in relation to current needs and emerging trends in order to develop appropriate training curricula that will enhance an all-inclusive forest compatible development.
2. **Specific tasks:**

a) With respect to key stakeholders that depend on professional and technical training institutions in forestry in terms of human resources:
   - Identify and document the training and skills requirements/needs, disaggregated according to gender categories;
   - Identify and document the shortcomings from recently recruited graduates (based on male and female perception) of these institutions; and
   - Identify and analyse the factors and conditions contributing to and or inhibiting the full involvement and participation of women in particular, and other marginalised groups, in both professional and technical training institutions.

b) With respect to institutions that train professionals and technical staff in forestry:
   - Identify how they establish the knowledge and skills requirements of prospective employers; Identify and evaluate the adequacy and or inadequacy (including gender consideration) of the modalities used in developing their curricula;
   - Evaluate the content of the forestry curricula in professional and technical institutions in relation to the identified needs and emerging trends, and provide recommendations on how to bridge any gaps identified including gender differential considerations; and
   - Evaluate how African institutions for professional and technical training have mainstreamed climate change in their curricula in particular, and any other emerging issues like green economy, as they relate to forestry;

c) Identify and assess any other existing in-country capacity for professional and technical training related to forestry;

d) Analyse what in-country capacity for professional and technical training related to forestry are specific to women and men's priorities and needs;

e) Identify and evaluate policy and institutional challenges at all levels to enhance capacity building of training institutions;

f) Identify and evaluate the opportunities for policy support to enhance an enabling environment for capacity building at all levels and absorption capacity of trained graduates; and
g) Identify and evaluate opportunities for policy support that would accelerate the full participation of women and other less represented social/gender groups in forestry through in-country capacity building for professional and technical training.

2.0 METHODOLOGY

To achieve the aims of the study, a TNA was carried out to identify graduate performance gaps. The process involved collecting data and information on expressed and implied organisational needs which may not be achieved through training since training may sometimes not be the only solution to a performance problem (Brown, 2009) but also:
a) experience and skills deficiency;
b) scarcity of suitable equipment or resources;
c) unavailability of set and communicated standards or expectations and
d) unfavourable workplace environment.

Secondary information was sourced from literature on documented TNAs and curricula from earlier established institutions such as University of Stellenbosch (South Africa), Makerere University (Uganda), Sokoine University of Agriculture (Tanzania), University of Ibadan (Nigeria), Malawi College of Forestry and Wildlife (Malawi), Nyabyeya Forestry College (Uganda) and Zimbabwe College of Forestry (Zimbabwe); as well as upcoming universities: Bindura University of Science Education, the National University of Science and Technology (Zimbabwe); University of Energy and Natural Resources (Ghana). Their curricula were analysed to appreciate trends and changing forestry demands.

The target group of Sub Sahara African (SSA) Anglophone technical and professional training institutions and forest graduate employers was determined through internet web searches. Employing organisations were categorised as research institutions, NGOs as well as public/private forestry companies (Appendix 2). A stratified random sampling of respondents was done from the organisations. The survey was conducted for 56 training institutions, comprising 41 universities and 15 colleges, 15 research institutions, 26 forestry public/private organisations and 12 non-governmental organizations. Questionnaires (Appendix 3 and 4) for employing and training institutions with both open-ended and closed questions were prepared and sent through email in November 2015.

A total of 109 questionnaires were distributed to training institutions and another 63 to forest companies, NGOs, research institutions and government departments. The employer organisation questionnaire (Appendix 3) sought to elicit the knowledge and skills expected from forestry graduates, competencies considered from forestry graduates, emerging issues deficient in recent forestry graduates aggregated by gender where possible. The training institutions' questionnaire (Appendix 4) solicited information on how curricula content is developed and stakeholder consultation in curricula development and review processes, as well as the inclusion of emerging issues in curricula development and review. Gender considerations during the process of curricula development and review were also sought. Responses were returned by email at a rate of 58%.

Follow up telephone and face-to-face interviews with selected organisations were conducted to check on information supplied earlier by other means, as well as solicit additional information for example, on training subjects; importance of the training; time

requirements; current and potential target groups; frequency of training and required outputs of training. Visits to institutions in selected SSA Anglophone institutions were done in May 2016 to triangulate some of the information collected by other means. Visited institutions were the University of Energy and Natural Resources (Ghana), Makerere University (Uganda); Sokoine University of Agriculture (Tanzania); Bindura University of Science Education (Zimbabwe) and the National University of Science and Technology (Zimbabwe), the Zimbabwe College of Forestry and Forestry Industries Training Centre. Finally, an expert focus group met in Tanzania and came up with a consolidated training needs schedule with proposed modules. The data were subjected to descriptive statistical analyses using SPSS Version 14 and Microsoft Excel 2007

3.0 RESULTS

3.1 Training and skills requirements by employers from professional and technical institutions

A TNA requires an understanding of the expectations of the employers from the employees in terms of soft and hard skills and this informs adequacy, relevance and employability of the graduate. However, at technical and professional levels, some soft skills are not acquired but the graduate is expected to develop them at work through experience and exposure. The three categories of employers within the forestry sector (social, commercial and research) indicated their expectations of forestry technicians and professionals to have all the soft skills under consideration at various levels. Employer expectations did not vary between technical and professional levels as well as between male and female graduates, emphasizing that employees must be able to execute given work despite their level of education or gender.

Priority expectations from social forestry employers ranked as follows: broad knowledge of the field of forestry (96%), negotiation skills (88%), English language proficiency (84%), written communication skills (80%), originality and creativity (76%) and taking responsibility (64 %), (Fig 1). All the attributes were rated from somewhat important to very important.

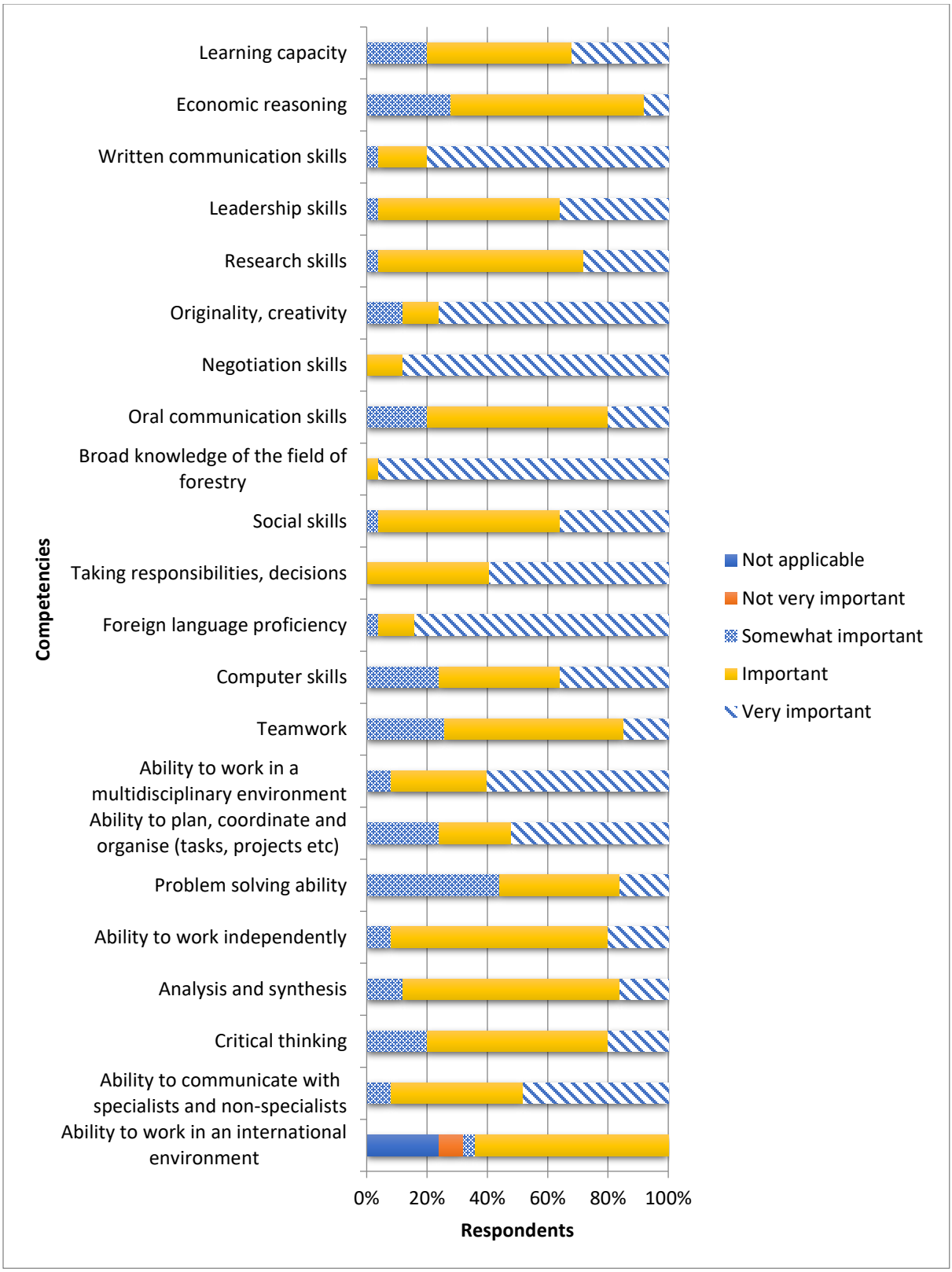


Figure 1: Competencies expected from forestry graduates by employers in social forestry

The social forestry sector (dealing with NGOs, government departments working with rural communities, mostly in forest conservation and tapping of NTFPs) employers did not consider the ability to work in an international environment important (12%). The reason was that social forestry practice may be taken up by non-forestry professionals e.g. graduates with knowledge of or a background of natural resources, social sciences and agriculture, and still produce the same result. This concurs with Leslie *et al*. (2006) who argued that though a professional forestry qualification is relevant, graduates from other disciplines can do the tasks of foresters. In this regard, forestry professionals and technicians are not necessary for management positions within the social forestry sector.

Employers in commercial forestry indicated that priority attributes expected from forestry graduates were: problem solving abilities (100%); critical thinking (100%), ability to communicate with specialists and non-specialists (93%) (Fig 2).

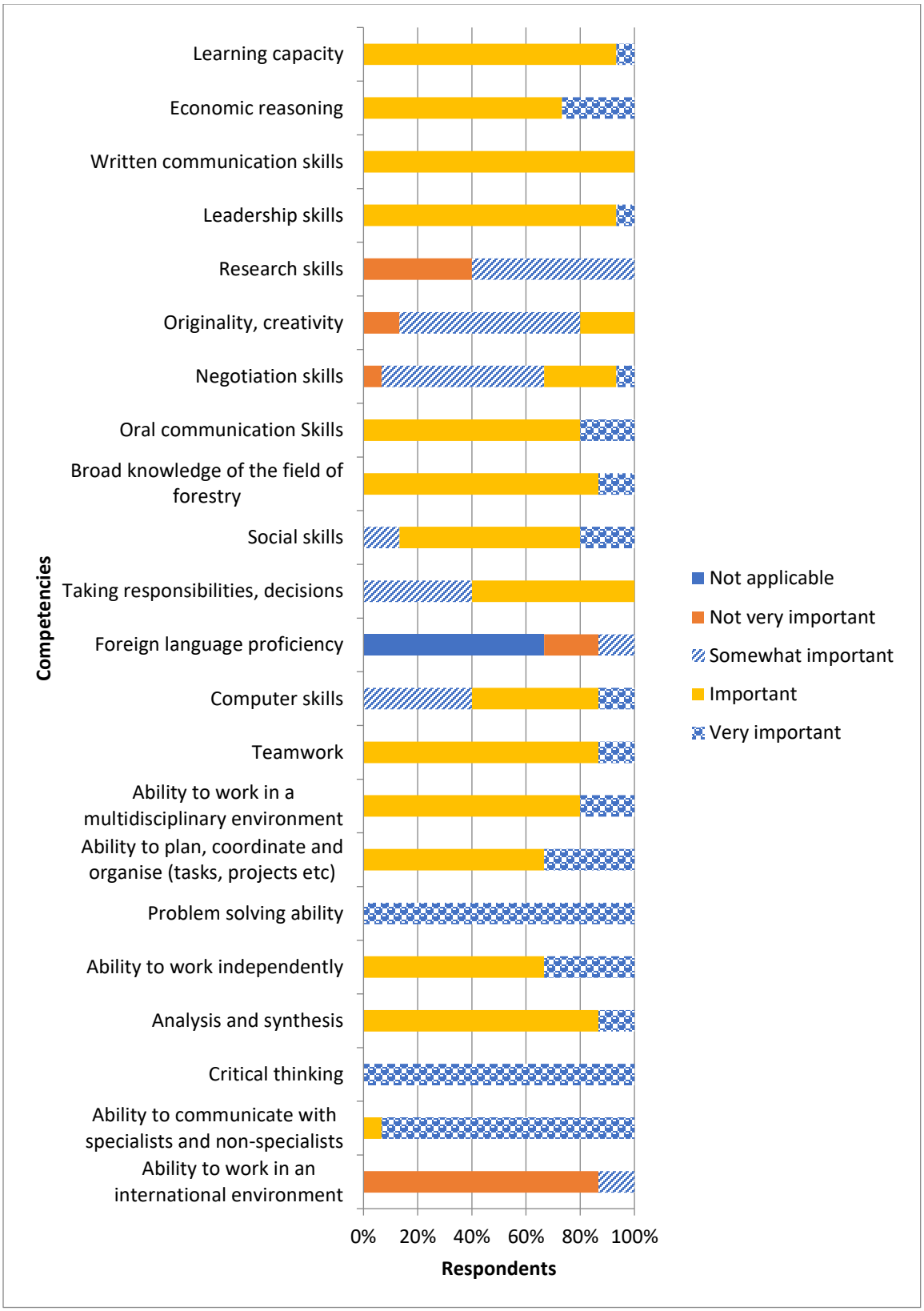


Figure 2: Competencies expected from forestry graduates by employers in commercial forestry

Generally, all the attributes under consideration were important in commercial forestry except the ability to work in an international environment because countries normally absorb their own graduates. The commercial sector is production, marketing and trade oriented hence the low rating of attributes like negotiation skills (8%), originality and creativity (15%), research skills (20%) and foreign language proficiency (37%).

Forestry research employers had much broader expectations of recent graduates compared to social and commercial employment sectors. The major traits were critical thinking and ability to work independently (100%), with problem solving ability, capacity learning, leadership skills and ability to communicate with specialists and non-specialists highly ranked (95%) as requisite competencies. The ability to plan, coordinate and organise tasks and projects as well as analysis and synthesis (80%) were also demanded attributes. The ability to work in a multidisciplinary environment was also considered an important competence (70%), (Fig 3).

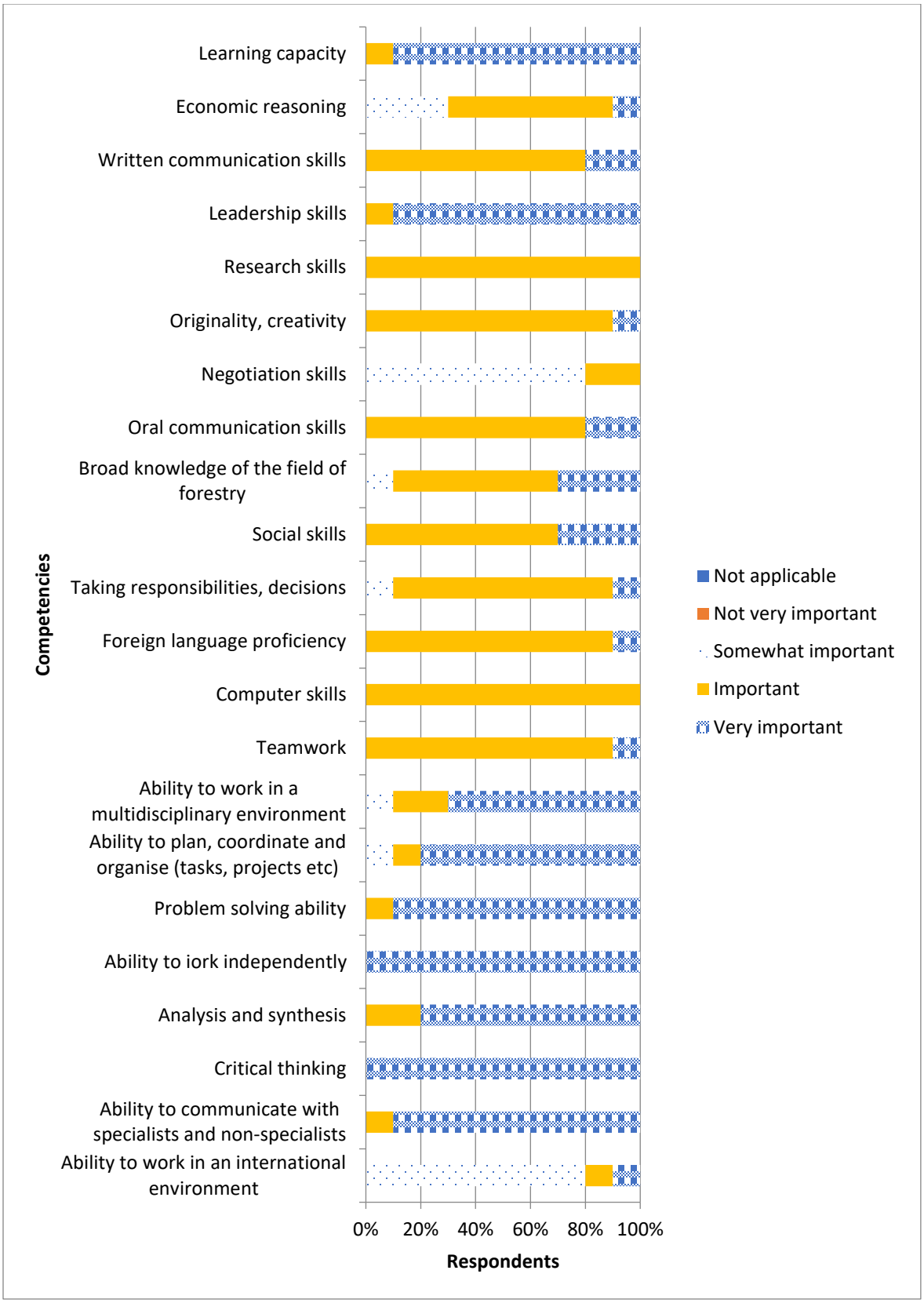


Figure 3: Competencies expected from forestry graduates by employers in forestry research

The importance of all the attributes under consideration affirmed that in the research category, recent graduates must be of an exceptional standard. Since research findings are adopted by all categories of forestry practitioners and because of globalisation and societal demands, the attributes are necessary for an effective provision of solutions to environmental, social and natural resource management issues.

With the evolution in the practice of forestry, often linked to changes in public perception of sustainability and developments in science, communication, global markets, forestry professionals and technicians are expected to perform multiple tasks ranging from teaching, research, community extension, administration and policy formulation. Multiple skills and competencies not adequately provided during the training period (Pulhin *et al.,* 2003) need to be learnt at work through lifelong learning. The other option is to significantly review existing curricula of most technical and professional forestry training to meet the skills and competencies required of the professional in the field because employers alter the requisite set of skills and competencies when hiring within changing times (Ringgold *et al.,* 1999). The second option has its own challenges of overloading the student with the mentioned attributes and making the forestry qualification generalist. The third option is one that introduces final year with specialisation in some areas if undergraduate professional training is the target. In addition, it is also necessary to create short courses on new and emerging issues for practitioners to update the requisite skills. In fact, most of these attributes may not be prioritised in the curriculum at the expense of biological and technical aspects.

3.2. Shortcomings from recently recruited graduates on male/female perceptions

Forestry employers remain the same even when global and societal demands and expectations change. Forestry employers' expectations of professionals and technicians emphasize broad approach to the understanding of core forestry courses and forest management, so as to include social aspects, energy, and climate change concerns. In addition, an understanding of the role of forests to communities, businesses and the environment is critical for today's foresters though a strong foundation in technical skills is still relevant in addition to strong interpersonal and communication skills, vision and creativity, and the capacity for collaboration (Pinchot, 1999).

Commercial forestry employers may slightly adjust their employee expectations by making a few business alterations e.g. environmental management, to the core business of timber production. Other aspects added to daily routine activities may include climate change or product certification. The same applies to social forestry where natural resources management and environmental management are added to livelihood issues such as energy, collection of NTFPs and watershed management. Forest research is more dynamic and captures the current agenda and is quick to search for new knowledge and solutions to upcoming challenges.

Employers in social forestry were concerned with gaps within recent graduates (Fig 4). Graduates showed deficiencies ranging from being very deficient to somewhat deficient in urban forestry and climate change, up to 50%. Climate change is an emerging

phenomenon in terms of emphasis and 50% of the respondents seem to have embraced it into their curricula; however, the graduates are not yet in employment. Forestry information systems was observed to be very deficient (76%) among graduates as a result of lack of access to recent modelling software such as *micro-forest* which institutions cannot afford but is widely used by forestry companies. Though forest hydrology is an area that has had prominence over decades, students are still found wanting as indicated by a response of 97% deficiency. Disaster management and survival skills seem to be completely out of the forestry study programmes (100%) and probably scanty in fire protection courses.

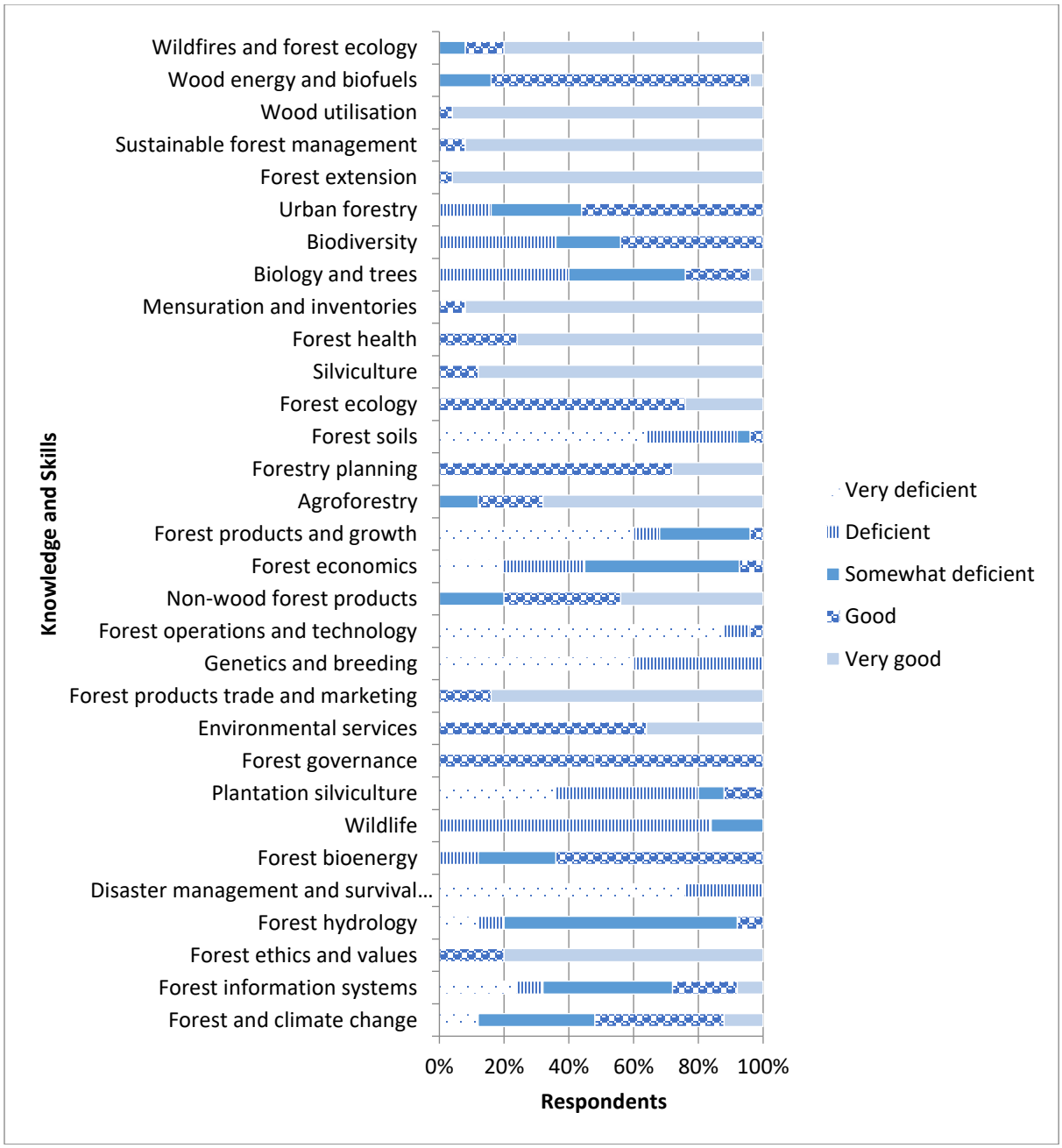


Figure 4: Rating of requisite forestry knowledge and skills by employers in social forestry

Forestry bio-energy, urban forestry and biodiversity courses are covered to a limited extent, whilst much more effort should be applied to biology of trees which stands at 78% level of deficiency. Biology of trees is limited to exotic tree species which have been studied and documented because of their commercial value whilst indigenous tree species have seriously been neglected as if they are of no value. Forestry products and development as well as forest economics are limited to plantation forestry which is a very small segment of sub-Saharan forestry. The economics of forests should go beyond timber resources to non-timber forest products on which most livelihoods depend. Two other areas which have indicated gross deficiency are forest operations and technology as well as genetics and breeding. These areas continue to be theoretical because sub-Saharan Africa does not have technology of its own but utilises borrowed European, American and Asian (predominantly Japanese and Chinese) technology in its operations. Genetics and breeding in forestry also continue to be theoretical knowledge with limited practical application, and especially for indigenous tree species. However, it has relevance on commercial exotic tree species, especially in South Africa.

Employees felt that some graduates, as evidenced by their transcripts, may be theoretically sound, but have serious application and implementation gaps; seemingly that they are half-baked. The curricula, to a large extent prepare them for passing examinations and not employability. According to employers, work environment deficiencies observed for disciplines assessed and covered in the study programmes, they indicate serious teaching and learning shortcomings, and this also includes assessment methods by training institutions. This has prompted the development of 'graduate learner-ship employment' conditions to assess employability after exposing graduates to the employment environment.

Commercial forestry employers considered the following essential knowledge and skills as deficient in recent graduates: forest extension, agroforestry, environmental services and wildlife studies as very deficient and deficient (Fig. 5). Forest extension was considered as ranging from very deficient to somewhat deficient because of lack of alternative approaches to curbing deforestation and land degradation in a practical manner and graduates are unable to proffer functional alternatives. Agroforestry is taught as a course at undergraduate level whilst its application is of great societal value and must actually be emphasized and promoted in forest extension to bring about societal impact. In some curricula, it either does not exist or is taken as an option. Forest environmental services and wildlife studies were not being offered to forestry graduates as they are considered to be separate disciplines altogether. Disciplines found to be somewhat deficient by commercial forestry employers were wood energy and biofuels, biodiversity, forest governance, forestry bioenergy as well as forest and climate change. Advancements in wood energy and biofuel usage have not been embraced fully in the curricula, except for few institutions such as the University of Energy and Natural Resources in Ghana. Energy is a key issue in Africa and wood is a major source of energy to the extent that its coverage in the curricula is of paramount importance. In terms of biodiversity, a number of institutions, as guided by the Convention on Biodiversity (CBD), have adopted the management of forests within an ecosystem whilst some curricula are still to adopt this approach. Forest governance, as well as forests and climate change,

are emerging issues whose content is still under development for most institutions and for this reason they are somewhat deficient to employees. It is important to note that these deficiencies are observed on subjects that already exist in the curriculum, yet employers show dissatisfaction basically because graduates on the revised curriculum have not graduated yet or the institutions have not yet fully incorporated the emerging issues. Graduates are not conversant with modern software related to forest planning since institutions cannot afford the software.

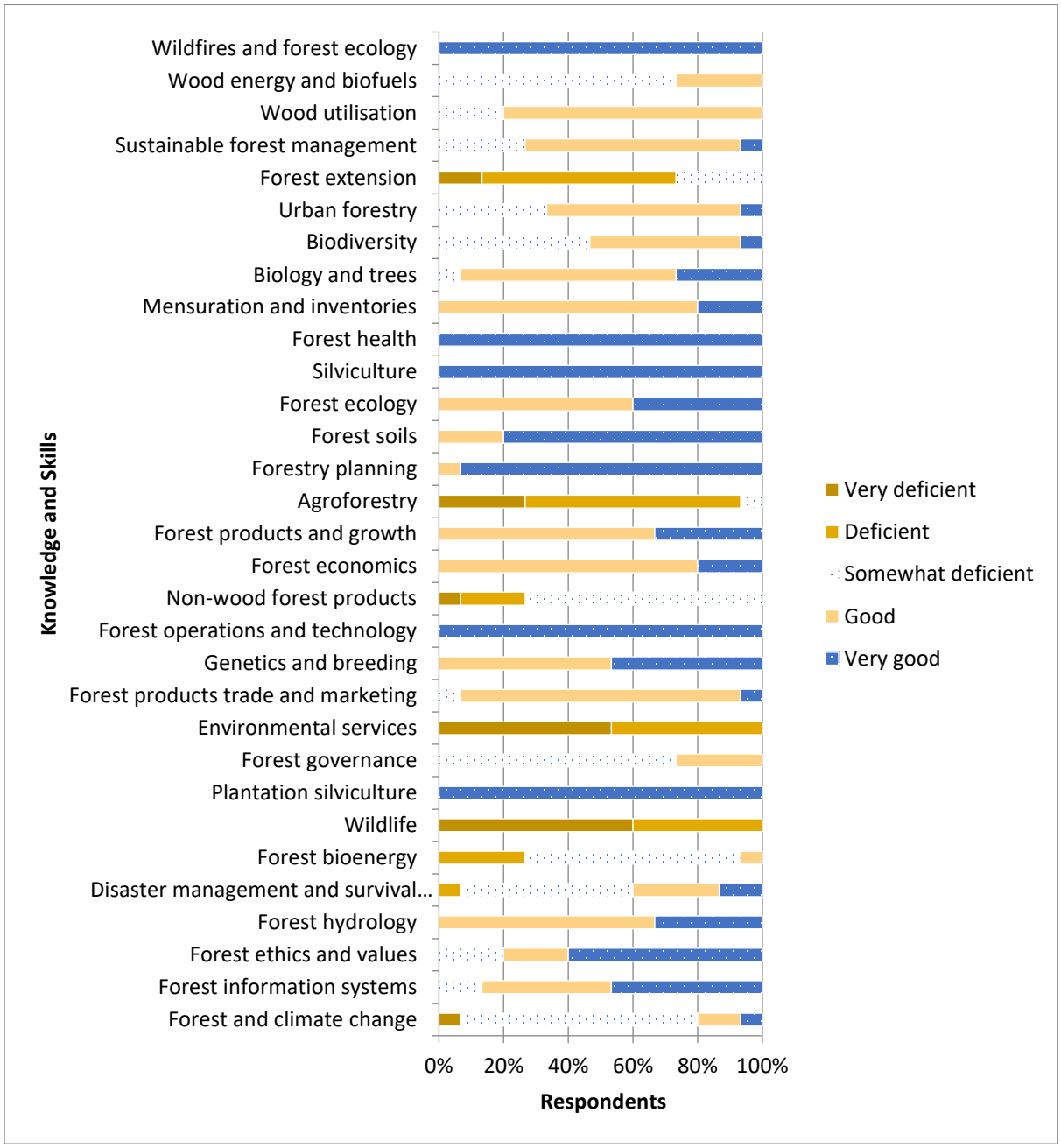


Figure 5: Rating of requisite forestry knowledge and skills by employers in commercial forestry

From forestry research employers, six disciplines were regarded as somewhat deficient within the recent forestry graduates (Fig 6).

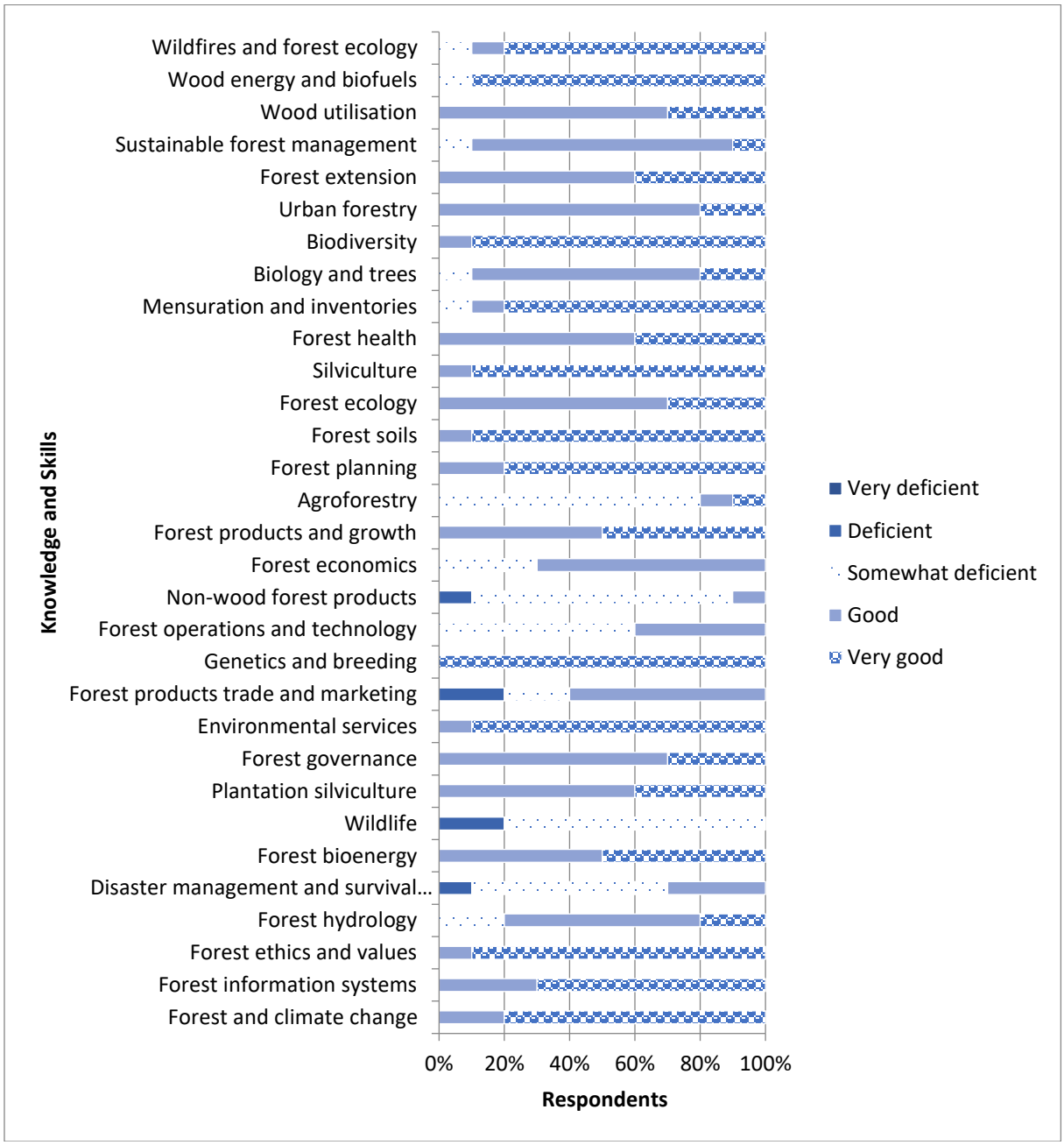


Figure 6: Rating of requisite forestry knowledge and skills by employers in forestry research

The disciplines were agroforestry, non-wood forest products, forest operations and technology, forest products, trade and marketing, wildlife studies, as well as disaster management and survival skills. No disciplines were observed to be grossly deficient among graduates, possibly because research institutions normally employ postgraduates for research work. However, disciplines found to be deficient on professional and technical graduates by commercial forestry employers are the same with those identified

by research institution employers. The implication is probably that programmes tend to be too theoretical and students' study to pass examinations. They get good grades on transcripts but are not prepared enough for the tasks in their employment. Employers therefore perceive that graduates do not have much to show for the good grades since such grades do not translate to practical preparedness for forestry work. Graduates are felt to only have some knowledge but not how to use it.

In response to the observed deficiencies, trainers in technical and professional institutions pointed to the lack of equipment, ICT infrastructure and inadequate practical sessions; and even for the well-established universities, students do not have access and exposure to simple gadgets such as compasses or GPS. Training institutions were, however, quick to note that some of the observed gaps are being addressed in their revised curricula, and that students subjected to the changes have not yet graduated.

With these knowledge and skills gaps among graduates, it may be argued that forestry programs have not been adequately funded and restructured to meet prevailing market and societal demands or are lagging behind global dynamics. Secondly, the programmes do not have the requisite resource support to run them effectively. Though employers rated most of the education disciplines as satisfactorily meeting employer expectations, they lack 21st Century skills: Collaboration and Teamwork, Creativity and Imagination, Critical Thinking and Problem Solving (Hey 2004, Michael and Dasmohapatra, 2001). Such shortcomings were also revealed by Arevalo *et al.,* (2010) in their survey in European Union universities, meaning that these problems are global.

Employers in commercial and social forestry require candidates with entrepreneurial and marketing knowledge and good public relations. These generic skills are in addition to courses in programmes that ensure theoretical competences which are often not reinforced by practical experience and contact with industry. Innes, (2005) observed that many forestry programmes lack sufficient integration of material, and he advocated for an inter-disciplinary approach. Such an approach would help to produce graduates better able to meet the challenges faced in forestry in the 21st century. Silviculture, biometrics, ecology, forest management, and basic sciences continue to be critical in forestry, but expertise in these areas does not provide the skillset needed to produce a successful forestry graduate. In addition, institutions should add ethics and collaborative planning principles to their curricula to remodel the graduate as a practitioner and manager.

Employers for the 3 categories: research, private and public forest sector, and NGOs rated skills gaps as one of their persistent concerns. Employers reported several gaps among recent forestry graduates which may be attributed to failure by institutions to review curricula in tandem with modern trends, as well as lack of consultation with stakeholders, both resulting in impulse and uninformed curricula changes.

Employers expect more graduates to understand the challenges facing society and providing solutions through research and community engagement. In addition, there is need for better communication or dissemination of research findings, and strong relationships between employers and training institutions in order to facilitate a better

understanding of each other's needs (Pinchort, 1998). To produce well baked graduates, there is need for strong, up-to-date curricula that meet the needs of the sector (Leslie *et al.,* 2006). This should emphasize the basic 'toolkit' of technical and scientific knowledge and skills expected of graduate forester (Zundel and Needham, 1996). Crucially, the curriculum should also consider citizenship skills such as communication, interpersonal relationships, an understanding of political processes, and engagement with wider environmental issues and the community. To remain vital and relevant, professional education must continuously evolve in response to emerging priorities (Leslie *et al.,* 2006). It also needs to strive for gender inclusion and reaching out to underrepresented groups. Leslie *et al*. (2006) noted that professional forestry education was dominated by male candidates, with one of the lowest proportions of women candidates among the science and technical professions.

3.3. Factors affecting the full involvement and participation of women and marginalised groups in forestry professional and technical training

Gender mainstreaming, even in forestry practice, is "a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally. Inequality is therefore not perpetuated. The ultimate goal is to achieve gender equality" (FAO, 2005). However, gender mainstreaming seems to follow cultural and societal norms. Responses indicated that in the employment of forestry graduates across sectors, gender and marginalised groups considerations are not very essential except that female and under-represented groups are encouraged to apply when jobs are advertised in most Sub Sahara Africa Anglophone countries. Countries have different policies pertaining to gender representation.

From the findings of this study, gender affirmative action quota is more commonly used to address social imbalances when recruiting employees in research, social and commercial forestry (64%, 42% and 36%, respectively), (Fig 7) unlike marginalised groups. In South Africa, formerly disadvantaged groups by the apartheid policy i.e. black Africans and Indians, have employment preference ahead of other groups. In Zimbabwe, the indigenisation policy gives preference to black Zimbabweans compared to white settlers. In addition, gender affirmative action quota and indigenous people's quota were the only methods applied in all the forestry sectors.

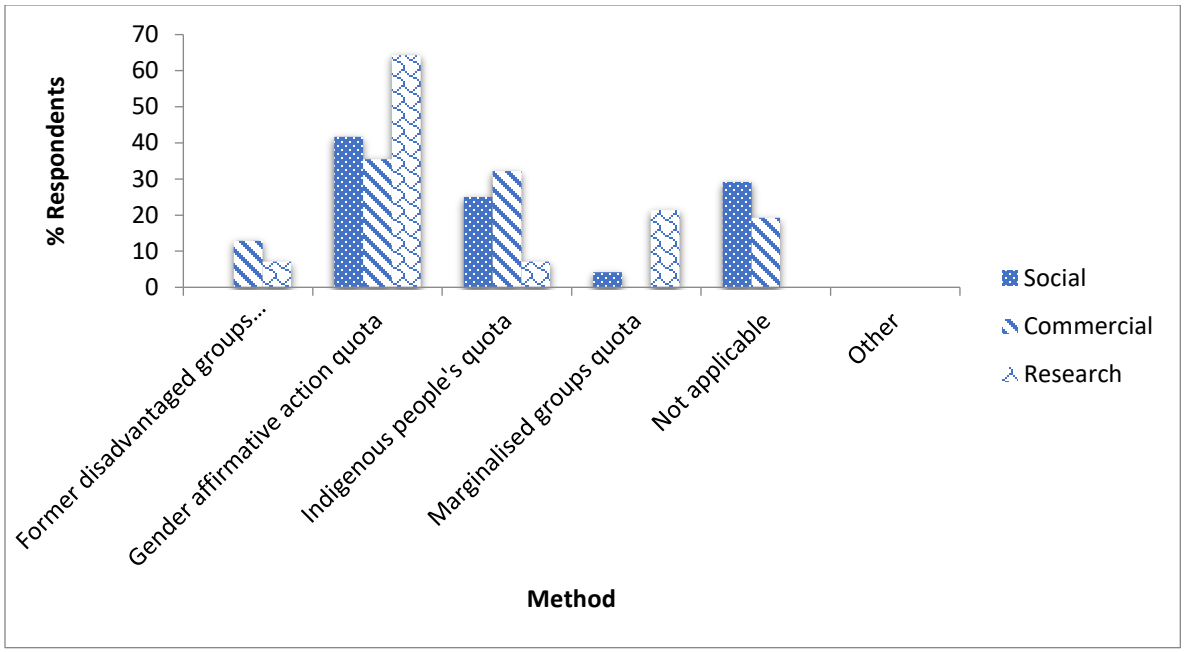


Figure 7: Methods used by employers to address social imbalances when recruiting forestry employees.

Some universities, on the other hand, have taken a proactive approach in enrolling female students. In Tanzania's Sokoine University of Agriculture, female student enrolment was raised to 50% through Norwegian donor funding and affirmative action whereby female students entered the University with lower points or were upgraded. Since 1998, female students start university two months before the official university opening. However, of late female student enrolment hovers around 38-40%. Makerere University in Uganda has also managed to raise female enrolment to 50%. This is unlike Ghana where there is great need for outreach programmes to encourage female candidates take up forestry e.g. the University of Energy and Natural Resources, which has a ratio of 1 female: 7 males studying social forestry. However, the other universities studied have female enrolments just below 40% including those from Zimbabwe, Botswana, South Africa and other SSA Anglophone countries.

Women constitute more than half of Africa's population, and any development strategy that is adopted to promote equitable, effective and sustainable development cannot ignore the critical role of gender. Forestry policies and institutions in most African countries are not sufficiently gender sensitive because they tend to make forestry professions male-dominated (Ardayfio-Schandor, 2007). With women playing key roles in agroforestry, social and community forestry, watershed management, forest protection and conservation, NTFP collection and trade, their roles need to be fully recognised as they constitute a substantial part of the labour force. Studies by Chakeredza *et al* (2012) and Drame *et al* (2015) on selected African universities indicate a gender gap of 6.6 times for academic staff with 43 females: 282 males and 3.6 times for students at 486 females: 1768 males in agroforestry and forestry for the period 2008 to 2010.

Factors which inhibit women from taking forestry result from the fact that fewer women

take sciences at high school and those who pass, because of the gender affirmative action which cuts across disciplines, choose other professions. Professional women are normally unavailable and non-tolerant to the remote working environments associated with forestry. Some professional women even switch professions after having trained as foresters in preference for office than field related work. Men, on the other hand, have traditionally been deep-rooted in the forestry profession (Unasylva, 1984). Even though female and male graduates have equal opportunities in finding initial employment in the forestry sector due to affirmative action policies, organisational culture and value systems set up in organizations appear to have less appreciation for women foresters. Women foresters have little chance of being appointed to higher positions or given more responsibilities, even though they may have the same qualifications and experiences as their male counterparts.

3.4. Knowledge and skills requirement assessment for prospective employers by training institutions.

An assessment of how the curriculum content is developed by training institutions revealed that both technical and professional training institutions involve relevant stakeholders. However, technical training institutions neither considered global trends nor analysed emerging issues, unlike professional training institutions (Fig 8). Curriculum review is either done after every cycle, depending on the duration of the programme or whenever necessary.

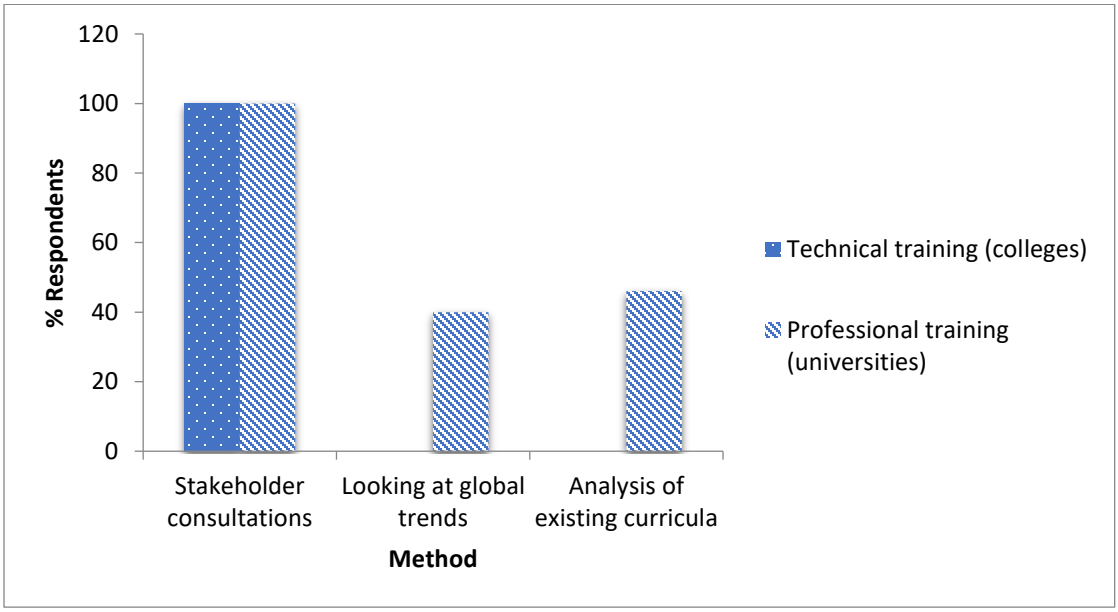


Figure 8: Determination of Curricula Content by Training Institutions

Both technical and professional training institutions involved departmental staff, employer representatives (who also sit on institutions' advisory boards), research and extension representatives and policy makers in the process of curriculum review (Fig 9).

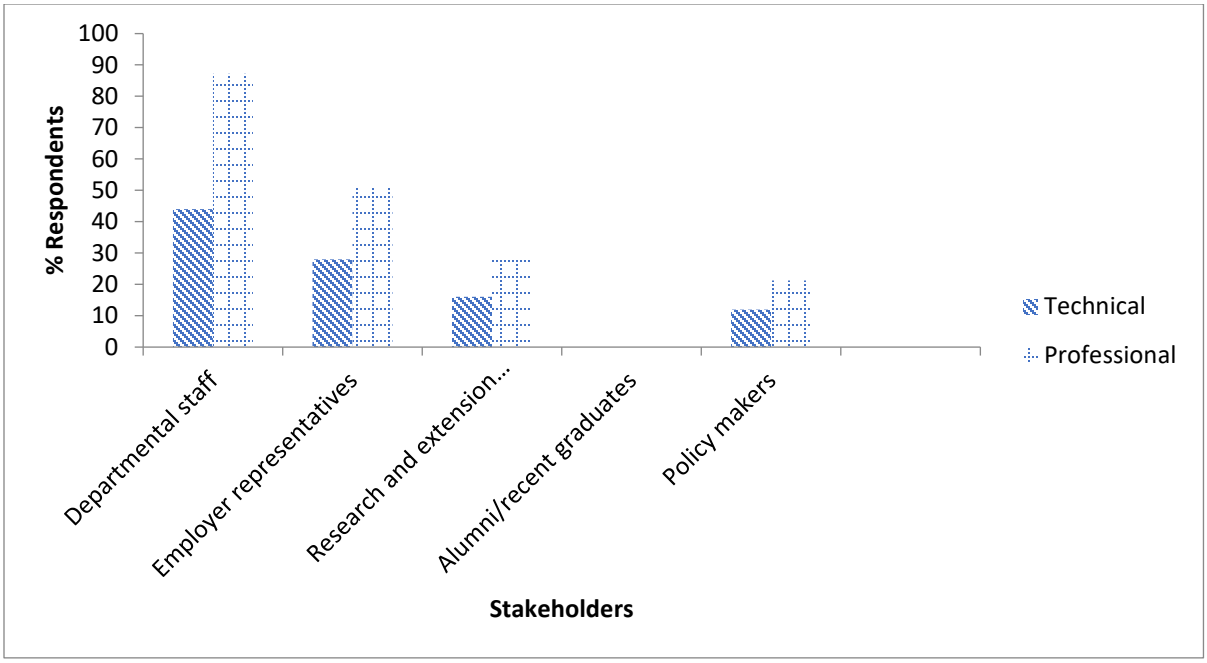


Figure 9: Stakeholders involved in the curriculum review process

Departmental staff (44% and 87%, respectively for technical and professional institutions) and employer representatives (28% and 51%, respectively for technical and professional institutions) were the key players involved in curricula review process of the training institutions and none of them involved their alumni. Course content was determined by involving stakeholders in curriculum review through the use of questionnaires, board meetings, interviews and workshops. Peer review through national councils for higher education also plays a very big role in curriculum review and standardization of curricula.

Forestry education programme content was largely variable; however, core forestry courses (forest engineering, silviculture, soil science, forest economics, forest mensuration and taxation) indicated a negligible variation within the minimum body of forestry knowledge. A greater number of institutions are attempting to revise their programmes, often integrating forestry into broader natural resource management or environmental sciences programmes. Institutions like Makerere University, Sokoine University Agriculture, University of Ibadan, Bindura University of Science Education are rebranding their departments and programmes from pure forestry to natural resources management due to low uptake of forestry while other universities with NRM like Moi University, Stellenbosch University, Kwame Nkrumah University of Technology and Mekelle University added more courses to address societal needs. Such approaches enhance the attractiveness to a program and emphasize its multidisciplinary nature, as pointed out by Arevalo (2014). It also helps to realign mismatches between competencies acquired during studies and market needs (Arevalo, 2011), hence, the need for enhanced knowledge, skills and attitudes within the training of future forest scientists and managers (Schmidt and Lewark, 2008).

Considering the challenges that forestry education faces, the improvement of curricula to address the changing needs of the society is imperative. In order to improve forestry education, curriculum development must be a continuous, flexible and context-dependent process (Pelkonen, 2012; McNab, 2005). Curriculum planning, implementation and evaluation involve a range of stakeholders whose interests are acknowledged and taken into consideration throughout the entire curriculum development process (Taylor, 1999).

3.5. Curricula development modality adequacy in relation to gender mainstreaming

Most of the training institutions are not sufficiently gender sensitive in curricula development (Fig 10). Both male and female students have the same curriculum. The argument being that the demands of forestry, like any other occupation, request that tasks be satisfactorily fulfilled be it by a female or male employee. Employers simply want the work done to the expected standard.

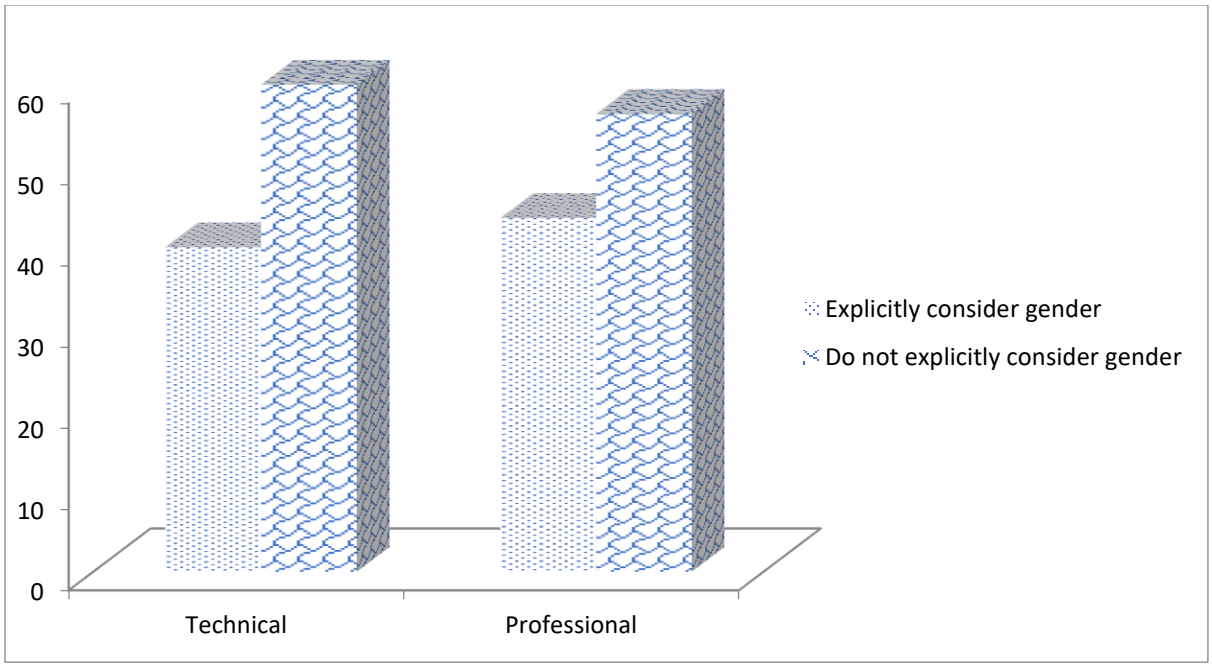


Figure 10: Gender considerations in curricula development

However, Hey (2010) reiterates the importance of gender-centred forestry curriculum development. At certain times it is not about affirmative action but females trying to venture into the male domain. When this happens, individual perceptions and behaviours are recognised, and the learning process is changed upon an understanding of the constantly shifting social context.

3.6. Streamlining forestry related emerging issues in training institutions

Most curricula at professional training level had a strong emphasis on classical forestry (95%) followed by NRM (36%) and environmental conservation (31%). At technical training level more emphasis was given to classical forestry (55%) followed by environmental conservation (20%) and NRM (15%). However, curricula at both

professional and technical training levels had little emphasis on social forestry, specifically livelihood issues (Fig 11) which are a major concern for forestry in rural Africa. The general observation is that social forestry is either funded from the fiscus, NGOs or donor agencies, therefore once there is inadequate funding, it is neglected, since it is perceived not to generate revenue but serves rural livelihoods. Classical forestry, however, generates income through production and timber products.

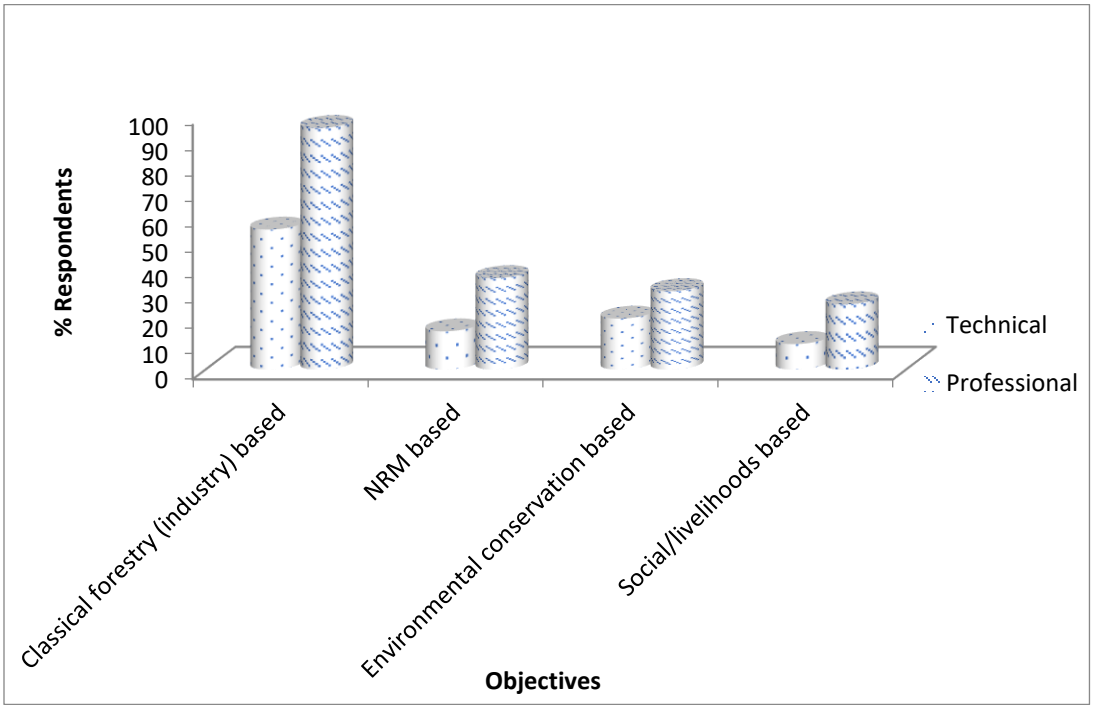


Figure 11: Current Forestry Curricula emphasis

The most significant attributes of the current forestry curricula at professional training institutions were: empowering the graduate to tackle forestry related disciplines (92%), enabling the graduate to pursue postgraduate education (74%) and enabling the graduate to manage and develop forest resources (49%). On the other hand, enabling the graduate to manage and develop forest resources (42%), enabling the graduate to pursue postgraduate education (29%) and ability to maintain and improve environmental quality and biodiversity were major attributes of current forestry curricula at technical training institutions (Fig 12).

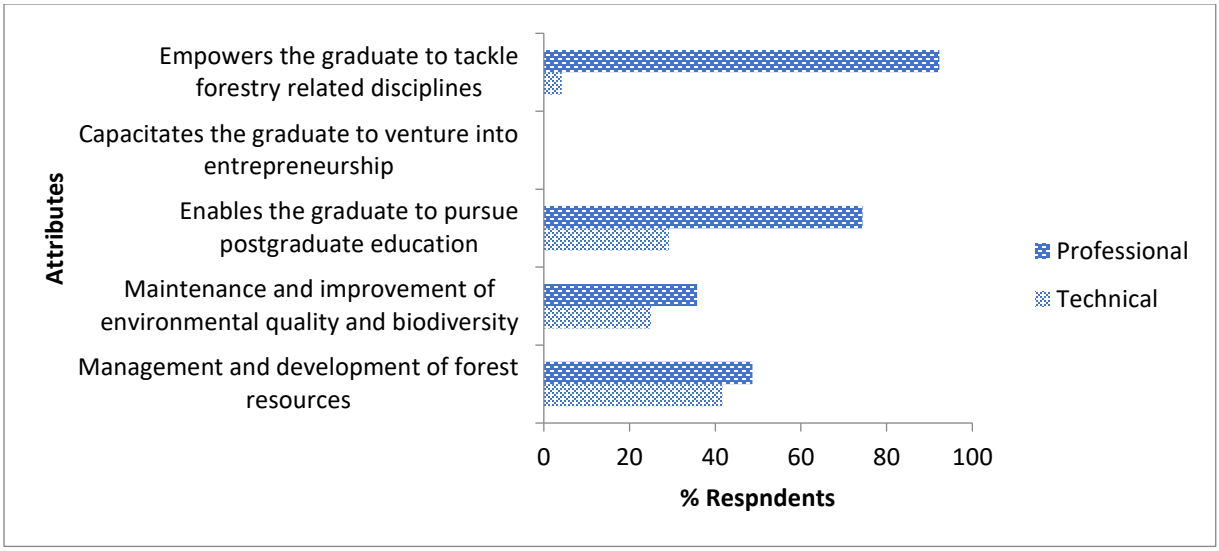


Figure 12: Attributes of the current forestry curricula

There is great need for entrepreneurship and self-employment in forestry hence high training demand can be in the areas of energy crops, fodder production and food trees for graduates to engage into their own businesses rather than seek employment. This agrees with Pulhin *et al.* (2003) who noted that developing the entrepreneurial capability of forestry students could also help widen employment options of graduates. Also, to note, is that rural development should be an explicit part of forestry curricula to foster an understanding of the role of forestry in poverty reduction, food security and sustainable livelihoods. Forestry education should address the interests and concerns of communities that use and/or live in forests, including issues of equity and forest users' responsibilities and rights in sustainable resource use and management (FAO, 2001). The Lilongwe University of Agriculture and Natural Resources (LUANAR) introduced enterprising courses such as beekeeping, community forestry and rural development, agroforestry, forest products marketing and forest policy and law so that graduates find it easy to use their scientific knowledge outside formal employment and as a form of self-employment.

An assessment of dissertation/thesis topics at professional training institutions indicated that most students carried out ecology and biodiversity (67%) and social sciences (33%) related research. However, most students at technical training institutions conducted forest science and management related projects (60%) followed by ecology and biodiversity research (40%). Project funded PhDs and MPhil/Sc degrees have topics dictated by the funding organisation that often do not respond to the needs of communities, thus research does not usually solve local challenges. Such research only leads to a good count of publications and promotion of researchers but with little economic or social impact. Of the availed recent projects, none of the students surveyed in both professional and technical institutions carried out technology and engineering as well as wood science related research projects (Fig 13). Such research requires equipment, which the institutions do not have and cannot afford, as such, hands-on training is insufficient. Practical sessions for technology and engineering subjects are limited by equipment, and research in such areas is rarely undertaken.

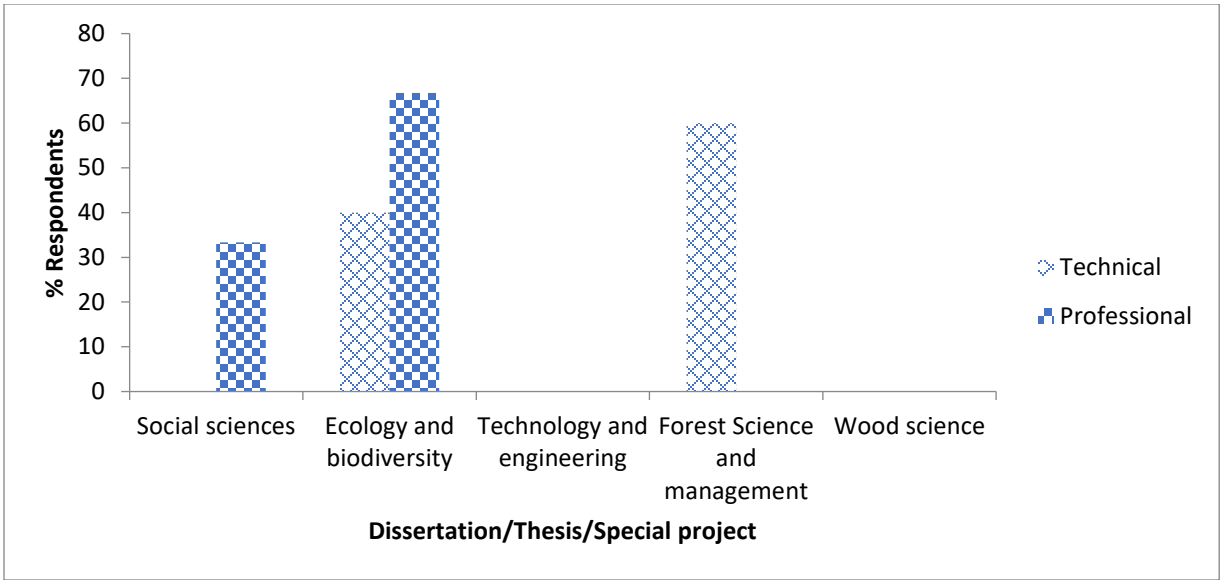


Figure 13: Dissertations/Thesis/ project topics conducted by forestry students

3.7. Forestry curricula content evaluation in relation to identified needs and emerging trends

Programmes in forest education have been challenged by changing societal demands and growing pressures such as climate change. Figure 14 shows levels of emphasis that employers in social forestry identified: climate change (47%), forest certification (36%) and the fibre-food-fuels nexus (FFF) (17%) as emerging issues not yet fully incorporated in the curricula. In commercial forestry, levels of emphasis were also identified and included those on, integration of forestry to solve environmental issues and climate change (25%), forest certification (23%), climate change (29%), integration of forestry with agriculture (26%), and integration of forestry with the environment (20%).

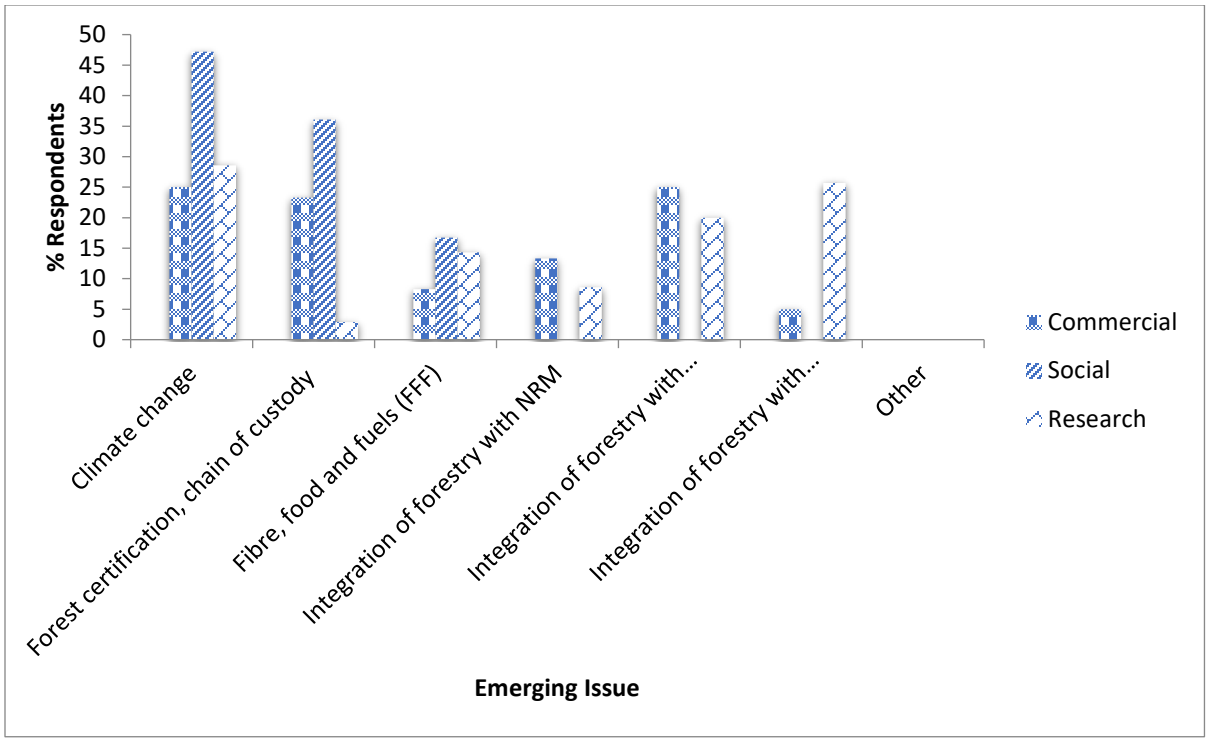


Figure 14: Emerging issues deficient in current forestry curricula

The levels of emphasis placed on most significant emerging issues that necessitate curricula review in professional training institutions were climate change (100 %), green economy (95%), and social forestry (77%). In technical training institutions the levels of emphasis were on, business and entrepreneurship (22%), climate change (20%) and social forestry and governance (18%) (Fig 15). This shows that graduates, at both technical and professional levels of training need adequate knowledge in climate change, though in most countries it has been mainstreamed in forest policies and forest codes of practice.

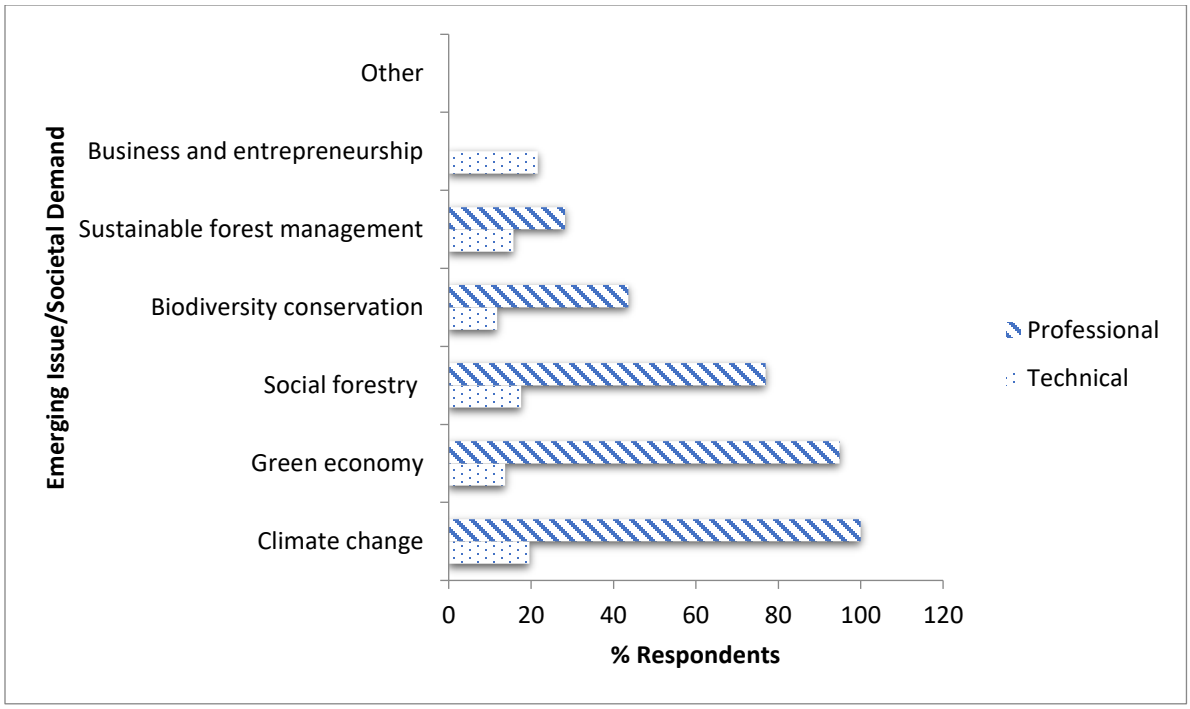


Figure 15: Emerging issues/societal demands which are needed in the curriculum.

The most widely applied methods by technical training institutions to incorporate emerging issues into curricula are continuous lifelong learning through short courses and learning on the job (32%), collaboration with private sector (29%) and collaboration with research institutions (24%). In professional training institutions, continuous lifelong learning for employed staff (100%), improving facility and resource adequacy (69%) and knowledge integration with other disciplines (64%) were the most widely applied approaches (Fig16).

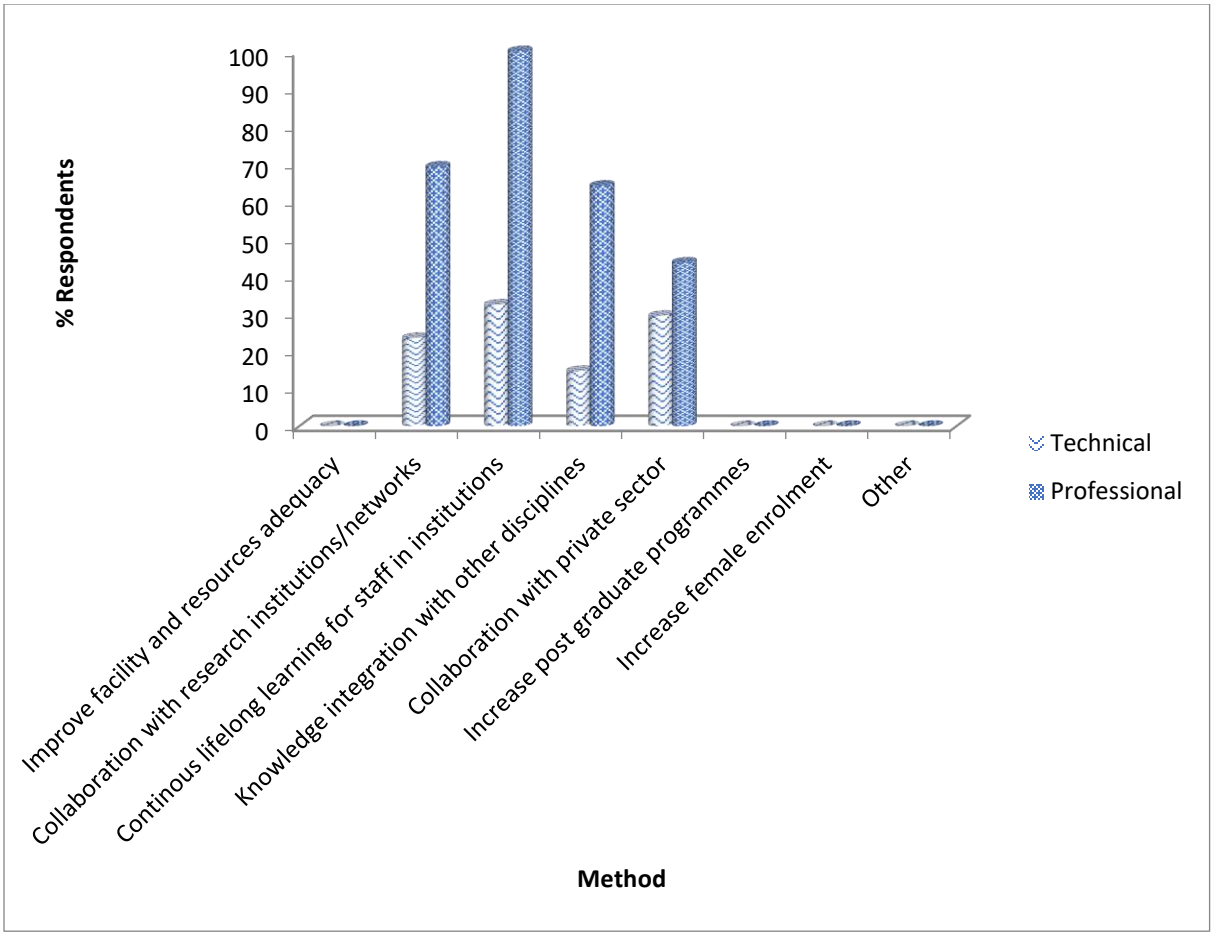


Figure 16: Method of incorporating emerging issues into curriculum

3.8. Expert focus group discussion on training needs

Finally, an expert focus group which met in Tanzania identified and consolidated a training needs schedule with proposed modules for professional, technical and in-service training (Table 1).

Table 1: Modules for professional, technical and in-service training in African forestry education

No	1 Forest and tree resources management	2 Biodiversity management	3 Forest administration and governance	4 Forest products processing, marketing and trade	5 Forest business and enterprise development	6 Forest research development & innovation
	Forest management	Biodiversity management and conservation	Forest administration and leadership	Bioenergy	Contract management	Research methods

No	1 Forest and tree resources management	2 Biodiversity management	3 Forest administration and governance	4 Forest products processing, marketing and trade	5 Forest business and enterprise development	6 Forest research development & innovation
	Urban and peri-urban forestry	Sustainable use of non-timber forest products (NTFPs)	Governance in forestry	Carbonization	Entrepreneurship	Biotechnology Bio-economy
	Integrated landscape management	Access and benefit sharing on genetic resources and other international conventions on biodiversity	Gender, youth and marginalized groups in forestry	Value addition	Forest business management	Innovation and product development
	Forest valuation	Invasive species and other biodiversity threats	Communication skills and knowledge management	Wood processing/ Wood technology	Private sector development in forestry Investment in forestry industry	Tree breeding and improvement
	Sustainable forest management in different forest types. Guidelines and standards for forest exploitation	Tools for biodiversity management	Monitoring and evaluation	NTFPs		Forestry research and development
	Indigenous knowledge. Systems in forestry			Gasification		Wood technology
	Forest pests and diseases			Forest products processing		Innovation and skill development
	Forest and product certification			Marketing of forest products		

No	1 Forest and tree resources management	2 Biodiversity management	3 Forest administration and governance	4 Forest products processing, marketing and trade	5 Forest business and enterprise development	6 Forest research development & innovation
	Agroforestry and Farmer managed natural regeneration (MNR)					
	Forest engineering					

3.9. In-country capacity for professional and technical forestry training

There exists satisfactory capacity within SSA Anglophone countries for professional and technical forestry training as well as for training forestry related graduates, the only problem could be the curricula to guide training (Appendix 5). While the technical forestry training curriculum requires much more of a hands-on approach and coverage of, and exposure to, contemporary issues, it also forms a link between the professional and vocational training levels. Unfortunately, in many countries there is an upgrading of technical institutions to universities, leaving a void of trained technicians; and this is not limited to forestry but extends to other areas as well. It could be largely driven by the proliferation of universities as avenues for profitable investment and in an environment that cannot secure the need and quality of education. The technical level graduate should be able to train people for many employment opportunities in the sector. Historically, technical level graduates managed forests before the entry of the professional foresters; and it is unfortunate that most developing countries are either phasing out or not paying sufficient attention and investment in the certificate and diploma level training that is critical at the SME level. In fact, there is need for correcting the imbalance between technician and professional education by increasing the former, largely because forestry business is mostly at the SME level that requires such skills.

The curricula are generally satisfactory on the technological and biological concepts but have remained non-current and biased towards classical forestry for Southern Africa, than conservation and with limited plantation forestry for West Africa. The drive towards industrial plantation forestry, complemented by its role in climate change mitigation, in a number of countries such as Uganda, Kenya, Tanzania and other non-SSA Anglophone countries by forestry companies such as Miro (Ghana and Sierra Leone), New Forests (Tanzania, Uganda, Rwanda), Green Resources (Tanzania), Forestry Development Trust (Tanzania), Kilombero Valley Teak company (Tanzania) and others is likely to increase the in-country capacity demand for more plantation forestry practitioners. Classical forestry, like agriculture, will still be in demand compared for fibre production.

Selected SSA Anglophone countries have enough institutions that train technical and professional foresters but their potential to produce the best is hindered by a myriad of

challenges ranging from inadequate infrastructure to insufficient or lack of teaching materials. For example, a number of countries have not extracted value from their indigenous tree species by domesticating and multiplying them. Negligible genetic, silvicultural, growth and yield prediction studies have been done in comparison to exotics. Very little knowledge has been created, or none at all, and even the indigenous knowledge systems for some of the tree species has been eroded. A number of African forestry departments have not grown to the expected levels because they have remained more as teaching institutions with limited research. Real country capacity should enable the country to solve local forestry challenges and be scaled up to regional and global levels.

Therefore, there should be a deliberate policy for the introduction of programmes when a basic minimum standard has been attained. Checklists could be used to gauge the availability of resources, training facilities and viability of the programmes before work commences. This will solve shortage of teaching materials, especially equipment, modern technology and current literature. Such shortages emanate from restrictive funding from constrained fiscus. Currently, there is limited support for most forestry training institutions, possibly due to changing global funding thrust, so no or minimal donor funding should be expected. Policies on staff capacity building through refresher/in-service courses on new technologies and emerging forestry trends need consideration to improve quality of graduates from the institutions. In fact, one general observation is that in most SSA Anglophone countries, institutions established during colonial times or with donor funding have better infrastructure compared to those established afterwards. The latter are both ill equipped and have incomplete infrastructure and suffer from resource competition with other institutional activities. It is therefore recommended, as a matter of policy, to identify collaborating partners for completion of such projects where high impact projects can be run.

3.10. Gender specific in-country professional and technical forestry related training

There has been raised awareness and opportunities for gender specific training in most SSA Anglophone countries through the introduction of gender ministries, ministries of small to medium enterprises, NGOs and religious organisations. This thrust has been cascaded from the UN level through UN Women (United Nations Entity for Gender Equality and the Empowerment of Women) with the campaign for inclusivity, gender equity and equality. Policies have been developed for targeted capacity building for women at all levels of employment or forest resource utilisation; vocational, technical or professional. Approaches such as Training of Trainers (ToT) programmes and on the job training have an opportunity to enhance women's capacity, and where applied, have raised resource management capacity. In a number of countries, sections for gender and marginalised groups consideration are embedded in some policies, e.g. in national forest policies. Due to the affirmative action thrust on women and marginalised groups, most of the employer organisations are expected to have a certain quota of such to sit on their boards to take care of their interests.

Gender mainstreaming therefore holds further promise for the advancement of women in

the forestry sector in SSA Anglophone by creating a critical mass of women in decision-making in forestry. Establishment of networks of women in forestry at community, national and inter-regional levels, and empowering women professionals by giving them a voice to influence and implement gender sensitive policies is a necessity.

3.11. Policy and institutional challenges at all levels to enhance capacity building of training institutions

The foremost challenges in capacity building in SSA Anglophone countries include;

(a) ***Inadequate national manpower planning:*** The establishment of forestry programmes in universities and colleges is not based on national skills audit and manpower planning. This in turn should be informed by the nation's forest resources and expectations. The size of the forest resource guides the establishment of a department or faculty at national or regional forestry institution, on the one hand; or training abroad, on the other hand. Where countries have little forest resources, the cost of infrastructural development could be foregone by training abroad or having a regional institution which could be adequately funded by beneficiary countries.

(b) ***Funding constraints*** continue to affect recently introduced forestry departments and faculties and they fail to meet the expectations of current forestry demands. Most earlier forestry training at universities such as the University of Ibadan, Makerere University and Sokoine University of Agriculture were established through donor funding and other collaborations. Departments and faculties are recommended to be self-sustaining or seek partners be fully established. Capable staff and students consult with government and industry to keep the nation informed thereby achieving global stakeholder expectations.

(c) ***Inadequate forestry teaching, research facilities and infrastructure*** are also major setbacks as departments and faculties cannot catch up with global trends. Most SSA Anglophone countries are in a dire need to improve libraries, computer laboratories and field practical exposure. As a way of producing well-equipped forestry graduates, there is great need for institutions to collaborate with stakeholders with requisite infrastructure.

(d) ***Course and programme stagnation*** is a challenge which calls for the upgrading of serving staff through refresher courses in current forestry trends, societal needs, livelihoods and the environment, modern teaching and learning methods and skills. Some institutions have problems with succession planning and are therefore forced to retain retired staff on contract basis which gives them problems with adequate speed to grow and catch up with modern forestry trends. As such, it becomes difficult to strengthen research and teaching.

(e) ***Internship exposure*** varies considerably among institutions. In terms of undergraduate education, the bachelor's degree programme needs a curriculum which gives the student enough internship exposure. The institutions in SSA Anglophone countries vary in internship duration ranging from merely field practicals, few weeks, a

month, a term, a semester, and for some, one academic year. The internship must be harmonised and regulated as a link with industry to give the student sufficient work-related experience. Student internship should assist the students, among other things, to appreciate the importance of work habits and ethics, and discharge responsibility in the work place.

(f) ***Postgraduate research and education scholarships*** are so limited for most programmes such that postgraduate students have to pay for themselves which affects the quality of SSA postgraduate training, and students end up carrying out research simply to fulfil study programme requirements. Research topics are not selected based on societal teething problems. Where funding is available, students develop research topics which fit in the funding organisations objectives. As a result, the findings do not always have immediate application and impact on local communities and may not address their challenges.

3.12. Policy support opportunities to enhance an enabling environment for capacity building at all levels and graduate employability

Policy support opportunities to enhance an enabling environment for capacity building at all levels and graduate employability are in the realm of effective manpower planning. Firstly, in terms of capacity building, most SSA Anglophone countries have established vocational and technical training centres with cross-cutting disciplines. In addition to that, policies have been put in place to establish forestry and natural resources management colleges as well as university departments and faculties to build technical and professional forestry capacity. However, due to policy shifts, there has been a trend in the upgrading of certificate and diploma awarding institutions (i.e. institutions for building technical capacity) to degree awarding institutions (i.e. building professional capacity), leaving a void at the technical level. Programmes have also been changing overtime as a result of over-subscription of some programmes earlier, leading to forestry employers lacking capacity to absorb the graduates. Various faculties have had to rebrand their programmes to increase enrolment but without re-tooling the teaching staff. Some forestry programmes are now running as natural resources management, environmental science programmes or related crosscutting and multi-disciplinary.

National forest policies or their drafts for SSA Anglophone countries also have several sections for capacity building, which is a positive response for forestry: examples are sections 1.2.16 of the 2003 Uganda Forestry and Tree Planting Act; section 3.3.25 of the 2006 Nigeria National Forest Policy; section 6 of the 2015 Kenya National Forest Policy; section 5.5 of the 2012 Ghana Forest and Wildlife Policy; section 2.3.14 of the 1996 National Forest Policy of Malawi and section 6 of the draft Zimbabwe National Forest Policy.

Policy opportunities are also available for increased vocational training centres establishment, as well as the resuscitation of forestry technical colleges to enhance training of user groups at grassroots levels. Together with forestry, programmes could be crafted to ensure landscape approaches are taken into account, for example through

training on natural resources management, environmental studies/sciences, rangeland ecology or agriculture at vocational or technical training levels.

Deliberate manpower planning policies need to be put in place for researchers, conservationists, extension staff, etc., as well as progression planning for postgraduate students so that requisite specialist positions are filled. This will reduce unemployment and expenditures on resources that may not be fully utilised.

Policy opportunities on technology adoption by universities and colleges are a prerequisite for future development. The world is now driven by technology and all programmes should have an element of technology studies so as to be current. Application of drones, GIS and ICTs need to be embedded into forestry studies as a matter of policy. Industries adopt technology much faster than faculties due to unaffordability of the latter, thus they trail behind and are found wanting by the employers. In actual fact, faculties should be seen to build industry capacity and transmit scientific and technical forestry knowledge or adapt it for domestic consumption. As such there are opportunities in SSA institutions to strengthen existing undergraduate programmes through public private partnerships.

3.13. Policy support opportunities to accelerate full participation of women and forestry marginalised groups through in-country capacity building

There are policy support opportunities within SSA Anglophone countries for the participation of women and other less privileged social groups through implementation of Affirmative Action Policies (AAP), Equal Opportunity Employment (EOE), and campaigns "*women candidates encouraged to apply*" as well as "*under-represented groups or communities encouraged to apply*"; the latter two feature in recruitment advertisements. These have been implemented in Technical Vocational Education Training (TVET) policies. These are important because female candidates and marginalised groups have been enrolled at this level for further upgrading. On gender issues, women have been found to be at the helm of community forestry projects, therefore policies should be put in place for them to embark on vocational training: community forestry, social forestry, agroforestry, community mobilisation, among others. Increase in female student enrolment in tertiary institutions and guarantee of employment quota for successful graduates should continue to be prioritised. In this regard, national forest policies of the SSA Anglophone countries have included support for women and vulnerable groups. For example, Sections 19 and 20 (page 45) for the 2008 Lesotho NFP; Section 2.5 of the 1996 Malawi NFP; Section 5.21 (a) of the Ghana Forest and Wildlife Policy Section 3.3.22 of the 2006 Nigeria NFP; section 4 of the 2003 Uganda Forestry and Tree Planting Act. Likewise, Kenya and Zimbabwe also have gender considerations in the national forest plans.

There is also a need for forestry institutions to offer diversified forestry-related degree programmes that are relevant to their environments; for example, BSc in community forestry, agroforestry, rural development, etc., that are biased towards women and with, for example, at least a 70% quota for women in order to create more opportunities for

female candidates in a dispersed job market environment. Gender equity, access to forest resource benefit sharing should also be emphasised in training. One of the ideal models on community forestry curricula where women can benefit is the PROSPER (People, Rules and Organisations Supporting the Protection of Ecosystem Resources) for the Liberia Forestry Training Institute funded by the USAID (pdf.usaid.gov/pdf_docs/PA00JM5X.pdf)

Whilst vocational forestry education is most relevant for communities and women, since they feature prominently in the utilisation of forest resources (like fuelwood and NTFPs), it appears that communities are void of basic forest resource management and utilisation knowledge and are not informed of global forestry trends. This has made the communities to go against what is current, especially in containing deforestation and land degradation.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Soft skills, observed by employers to be deficient in graduates, are central to the curriculum for graduate effective performance. Male and female graduates from technical and professional institutions must be subjected to soft skills. Such requisite skills include learning capacity, negotiation and communication skills, social and decision-making skills, problem solving ability, good analysis and synthesis, critical thinking, etc. Unfortunately, most of these soft skills are not obtained during student life but through lifelong learning post-graduation.

On core forestry disciplines, the diversity and dynamic nature of forestry requires a broad coverage of courses from societal demands and emerging environmental and economic issues. Emerging issues deficient in the curricula include; climate change, forest sustainability, forest certification, issues revolving around the fibre-food-fuel nexus, integration of forests with NRM and integration of forests with agriculture; entrepreneurship, biodiversity conservation, social forestry and the green and circular economies. A number of these issues could be incorporated in mainstream professional and technical curricula but other avenues like vocational, lifelong learning, on the job training are also available. There is variation in response to forestry emerging issues by research, commercial and social forestry sectors and recent graduates have not been proficient in tackling emerging forestry issues.

In terms of forest curricula rebranding, the integration of forestry with other disciplines like environmental science, agriculture and natural resources management is one such intervention that has potential to create good hybrids that might increase employability; though care should be exercised that this does not end up creating a generalist rather than a broad-based forester. This is however the trend observed in most forestry curricula. Such developments complicate the curricula as there is need to satisfy multiple requirements.

As for gender issues and marginalized groups, affirmative action has been used to address social imbalances of equity and equality. However, there are policy opportunities both at enrolment of female students and recruitment of female employees since the curricula and employment are not sufficiently gender sensitive. Proactive action taken by some tertiary institutions is commendable. Policy interventions by local organisations, networks, governments, regional blocs, such as the regional economic blocks and African Union have been explicit on gender; youth and marginalized groups and action towards addressing inequalities and imbalances are on course. Also, the curricula could be structured in ways that issues that are relevant or beneficial to women, youth and marginalized groups are given the required emphasis/weight.

4.2 Recommendations

a) It is imperative that core forestry and related emerging issues be incorporated into existing curricula in order to update programmes for relevance and currency. Soft skills should be embedded into lifelong learning or on the job training as contemporary forestry issues. This helps prevent overloading students with non-core forestry material.
b) A professional forestry association could be formed at regional/continental level and membership obtained upon attainment of a qualification of this professional body e.g. African Professional Foresters' Association responsible for skills updating.
c) For women, youth and marginalised groups who work closely with forests, a vocational or technical training programme is essential for social forestry training to enhance awareness at grassroots level.
d) Manpower planning policies at national and regional levels should inform forestry and natural resource manpower planning, as well as guide developing the course for forestry institutions or co-funded regional centres of excellence so as to enhance quality education and effective forestry learning experience and exposure.
e) Forestry training should seek partnerships in raising resources required and including in-kind contributions; and should also strengthen sustenance and entrepreneurship as an emerging topic across disciplines.
f) A reasonable number of SSA Anglophone countries now have national forest policies that could be taken advantage of to inform capacity building through targeted training at all levels and in collaboration with established institutions.

REFERENCES

Arevalo, J., Mola -Yudego, B., Pelkonen, P. and Qu, M. (2012). Students' view on forestry education: A cross-national comparison across three universities in Brazil, China and Finland. *Forest Policy Econ* 25:123-131.

Arevalo, J., Pitkanen, S. and Krongo, B. (2014). Developing Forestry Curricula: Experiences from Kenyan-Finnish Project. *International Forestry Review* 16(1):78-86.

Bourgeois, W., (2001). Requirements of a forestry education from an employer perspective. Meeting of International University Forest Education Leaders, 4 December 2001, University of British Columbia. Faculty of Forestry, Vancouver BC, Canada.

Brown J., (2009). Training needs assessment. A must for developing and effective training program. *Public Personnel Management:* Volume 31 No. 4 Winter 2002: 569-578.

Drame Yaye Aissetou, Oluwole Matthew Akinnagbe, Ochola Alfred, Chakeredza Sebastian, Hien Mipro (2015) Assessment of Gender Policy in Selected Tertiary Agricultural Education Institutions in Africa. *Agricultural Sciences*,06,1039-1047. doi: 10.4236/as.2015.69099

Deconnick, C. (2008). Core affairs: Flanders, Belgium: Case studies basic education in Europe. Enschede, Netherlands: SCO-Netherlands Institute for Curriculum Development.

FAO, (2001). Expert Consultation on forestry education. Food and Agriculture Organisation, Rome.

FAO, (2001). Forestry curriculum development and revision, case in developing countries. Africa (Morocco and Namibia), Asia (Vietnam), Europe (Ukraine), Latin America (Honduras and Uruguay).Rome.

FAO, (1998). Participating curriculum development in agricultural education. A training guide. By A. Rogers and P. Taylor. Food and Agriculture Organisation, Rome.

Guariguata, M.R. and Evans, J. (2010). Advancing tropical forestry curricula through non-timber forest products. *Internat for Review* 12(4):418-416.

Hey, B. (2010). Guidances on Gender Fair Curriculum Development. WUS Austria.

Innes, J.L. (2005). Multidisciplinarity, interdisciplinarity and training in forestry and forestry and forest research. *Forestry Chronicle* 81(3):324-329.

Leslie, A.D., Wilson, R.E. and Starr, B.C. (2006). The current state of professional forestry education in the United Kingdom. *International Forestry Review* 8(3):339-349.

Michael, H.J. and Dasmohapatra, S. (2001). Forestry students, employers, and the implied contract: expectations and obligations. *Journal of Forestry*, 99(9): 18–2

Miller, H. (1992). Trends in forestry education in Great Britain and Germany. *Unasylva* 55:29-32.

Nair, C.T.S. (2004). What does future hold for forestry education? *Unasylva* 55: 1-9.

Pelkonen, P. (2012). Summary of the group work discussions. International Symposium on Forestry Education, 9-12 October 2012.

Pinchot Institute for Conservation, (2000). Mainstreaming Sustainable forestry graduate education in forestry schools of the United States: a proposal of the Sustainable forestry partnerships in cooperation with the Pinchot Institute for Conservation, Washington DC.

Ratnasingam, J. and Ioras, F. (2006). Colonial British Forestry and the years thereafter. Kuala Lumpur: Tropical Resources Network Press.

Ratnasingam, J., Ioras, F., Vacalie, C.C. and Wenming, L. (2013). The future of professional forestry education: Trends and challenges from the Malaysian Perspective. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca* 41(1):12-20. DOI: 10.15835/nbha4119139

Taylor, P. (2000). Improving forestry education through participatory curriculum development: A case study from Vietnam. *Journal of Agricultural Education and Extension* 7(2):93-104

Taylor, P. 1998. Participatory curriculum development in forestry education and training: An Overview Paper presented at the National Workshop on Local Knowledge and Biodiversity in Forestry Practice and Education. October 19-22, 1998. Visayas State College of Agriculture.

Temu, A.B., Okali, D. and Bishaw, B. (2006). Forestry education, training and professional development in Africa. *Internat. For. Review* 8(1):118-125.

Temu, A.B., Rudebjer, P.G., Kiyiapi., J. and Lienop, P.V. (2005). Forestry Education in Sub-Saharan and Southeast Asia: Trends, Myths and Realities. FONP Working Paper No. 14.

Vanclay, J. (2007). Educating Austrian Foresters for the 21st Century. *Internat. For. Review* 9(4): 884-891.

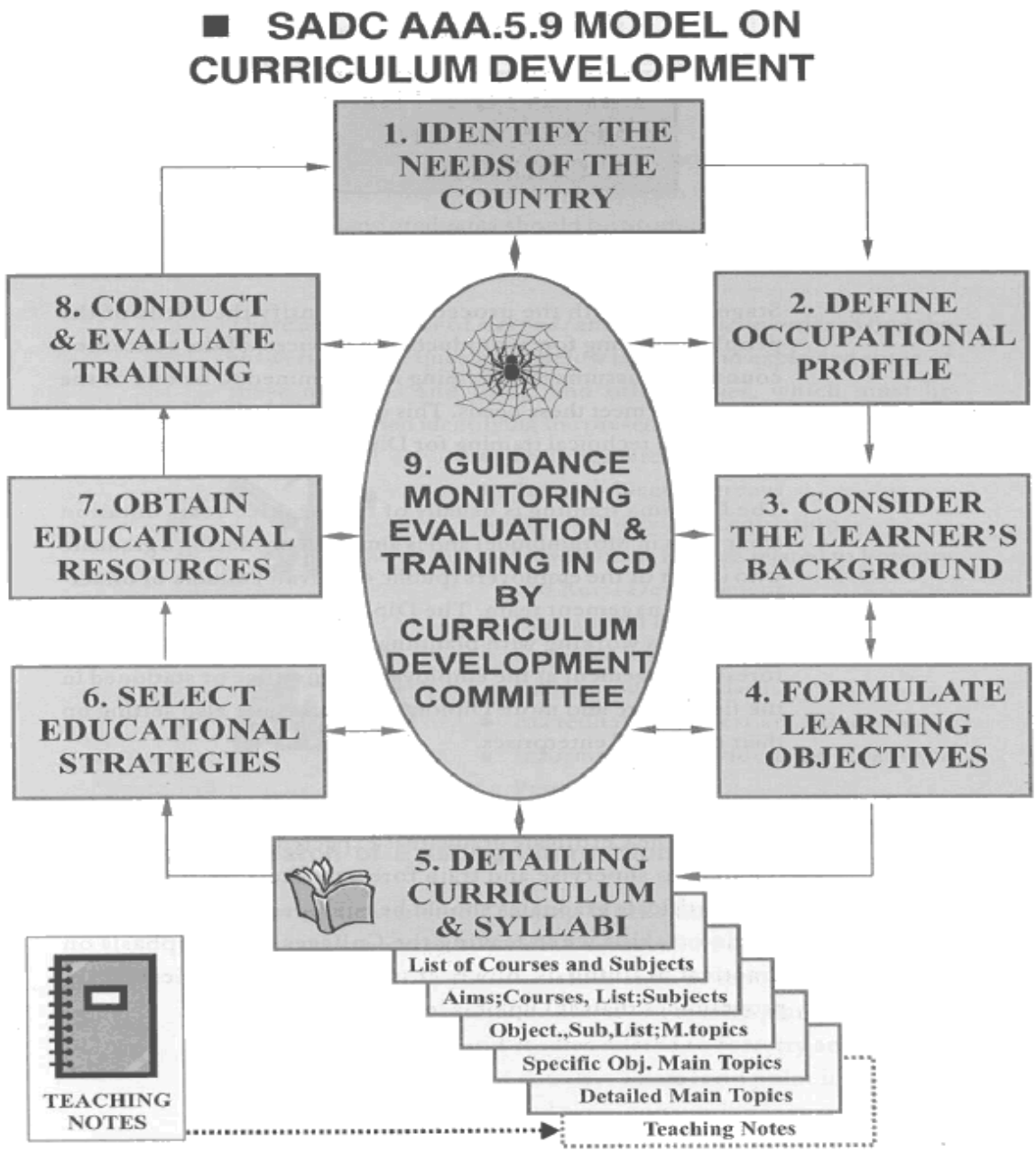
Wilson, R.E. (2013). Professional forestry education at the National School of Forestry,

Universities of Cumbria: submission to the strategic review (July 2013). SRI Discussion Paper SRI-2013-DP01. Silviculture Research International, Perinth. 6pp.

Zundel, P.E. and Needham, D.T. (1996). Abilities required by professional foresters in practice. *Forestry Chronicle* 72(5):491-499.

APPENDICES

Appendix 1: The SADC AAA 5.9 Model for Curriculum Development (FAO, 2001)



Appendix 2: List of contacts

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Logs and Lumber limited	info@lllghana.com
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Kwame Nkrumah University of Science and Technology	
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Institute for Commercial Forestry Research	sally.upfold@icfr.ukzn.ac.za
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Council for Scientific and Industrial Research	ole@csir.co.za
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Beekeeping Training Institute, Tabora	
Forestry Industries Training Institute	fiti@fiti.ac.tz , info@fiti.ac.tz Elinipa_sekiete@yahoo.com principal
Uganda	
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Institute of Tropical Forest Conservation	info@itfc.org
Zambia	

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Zambia Forestry College	
Zimbabwe	
Bindura University of Science Education	
National University of Science and Technology. Bulawayo	
Zimbabwe college of forestry	gombej@fitc.co.zw , gombe@mweb.co.zw
Lupane State University	

Appendix 3: Employer Questionnaire

AFF is conducting a forestry related Training Needs Assessment (TNA) for Anglophone and Francophone countries. The task will link training and educational institutions with employers of such trained human resources, through an evaluation of the content of the forestry based curricula in professional and technical institutions in relation to the current and emerging needs in the society. I have been invited to compile the necessary information for Anglophone countries and to evaluate the content of forestry curricula in professional and technical institutions in relation to current needs and emerging trends in order to develop appropriate training curricula that will enhance an all-inclusive forest compatible development.

To do this, I need information from employers, research, and training/education institutions. I have compiled a questionnaire which addresses the subject, and I kindly ask you to please complete the questionnaire and return it to me in 10 days. I thank you in advance for your co-operation and assistance.

QUESTIONNAIRE

Name of Respondent: ……..
Postal Address: ……
Email Address: …….

…….
Designation: …….

1. What level of forestry graduate do you recruit at your organisation? (*Can mark more than one box*)

Vocational	Certificate	Diploma	First Degree	Masters	PhD

2. Knowledge and skills you expect from forestry graduates you recruit in your organisation. (*Mark in appropriate box*)

Competencies	Not applicable	Not Very Important	Somewhat Important	Important	Very Important
Forest and climate change (including carbon sequestration)					
Forest Information Systems (including GIS and RS)					
Forest ethics and values					
Forest Hydrology					
Disaster management and survival skills					
Forest bioenergy					
Wildlife					
Plantation silviculture					

Forest governance (including policy and legislation)					
Environmental services					
Forest products trade and marketing					
Genetics and breeding					
Forest operations and technology					
Non-wood forest products					
Forest economics					
Forest product and growth					
Agroforestry					
Forestry planning					
Forest soils					
Forest ecology					
Silviculture					
Forest health					
Mensuration and inventories					
Biology of trees (including physiology					
Biodiversity					
Urban forestry					
Forest extension					
Sustainable forest management (natural forest silviculture)					
Wood utilisation					
Wood energy and biofuels					
Wildfires and forest ecology					

3. What shortcomings/gaps have you identified within recruited recent graduates at your organisation (*which knowledge and skills are lacking to execute their work properly*).

Please list the identified gaps…….....

…….....

……..

…….

4. What training do you suggest the graduates should receive to overcome the shortcomings?

……..

……..

…….....

…….....

5. What competencies do you consider important from a recent forestry graduate? (*Mark in appropriate box*)

Competencies	Not applicable	Not very important	Somewhat important	Important	Very important
Ability to work in an					

international environment					
Ability to communicate with specialists and non-specialists					
Critical thinking					
Analysis and synthesis					
Ability to work independently					
Problem solving ability					
Ability to plan, coordinate and organise (tasks, projects etc)					
Ability to work in a multidisciplinary environment					
Teamwork					
Computer skills					
Foreign language proficiency					
Taking responsibilities, decisions					
Social skills					
Broad knowledge of the field of forestry					
Oral communication skills					
Negotiation skills					
Originality, creativity					
Research skills					
Leadership skills					
Written communication skills					
Economic reasoning					
Capacity to learn					

6. Which emerging issues have you found deficient in recent forestry graduates? (*Tick and/or comment in appropriate sections*)

Issue	Comment
Climate change	
Forest certification, chain of custody tracking and product labelling	
Forests, food and fuels (FFF)	
Integration of forestry with NRM	
Integration of forestry with environment	
Integration of forestry with agriculture	
Other (specify)	

7. Indicate forest graduate employment trends for the past 5 years

	Certificate		Diploma		Undergraduate Degree		Master's Degree		PhD	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
2011										
2012										
2013										
2014										
2015										

8. How do you address social imbalances when recruiting forestry employees for your organisation? (*Can mark more than one box*)

Former disadvantaged groups quota	
Gender affirmative action quota	
Indigenous people's quota	
Marginalised groups quota	
Not applicable	
Other (specify)	

9. Are there any factors and conditions contributing to and/or inhibiting the full involvement and participation of women, disadvantaged and marginalised groups in your organisation?

……..

……..

……..

10. How have you mainstreamed climate change issues in your business operations?

……..

……..

11. What policy support is there to enhance an enabling environment for capacity building and absorption ability of technical/professional graduates? ……

……..

……..

……..

12. In what way does your organisation support forestry training institutions in your country?

……..

…….

……

……

13. Please give a general assessment of the suitability of forestry curriculum offered in your country (unsatisfactory, satisfactory, good, very good) by the various technical and professional institutions.

……..

……..

……..

Thank you for your time and support.

Appendix 4: Institutional Questionnaire

AFF is conducting a forestry related Training Needs Assessment (TNA) for Anglophone and Francophone countries. The task will link training and educational institutions with employers of such trained human resources, through an evaluation of the content of the forestry-based curricula in professional and technical institutions in relation to the current and emerging needs in the society. I have been invited to compile the necessary information for Anglophone countries and to evaluate the content of forestry curricula in professional and technical institutions in relation to current needs and emerging trends in order to develop appropriate training curricula that will enhance an all-inclusive forest compatible development.

To do this I need information from employers, research and training/education institutions. I have compiled a questionnaire which addresses the subject, and I kindly ask you to please complete the questionnaire and return it to me. I thank you in advance for your co-operation and assistance.

QUESTIONNAIRE

Name of Respondent: ……
Postal Address: …….

……..
Email Address: ..……..
Designation: …….

1. When was the forestry programme introduced at your institution? .....

2. At what level/s do you offer forestry? *(Can mark more than one box)*

Vocational	Certificate	Diploma	First Degree	Masters	PhD

3. Indicate enrolment trends for the past 5 years

	Certificate		Diploma		First Degree		Masters		PhD	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
2011										
2012										
2013										
2014										
2015										

4. How do you determine course content for your curriculum? ……

……

……..

……..

……..

5. Do you make gender considerations in developing your curricula? *(Mark in appropriate box)*

Yes		No	

If *Yes,* how……

……

……..

6. How often do you review your curriculum? *(Mark in appropriate box)*

Every cycle	
Whenever necessary	
Not at all	
Other (Specify)	

7. Who is involved in the process of curriculum review? (*You may tick more than one*)

Departmental staff	
Employer representatives	
Research and Extension representatives	
Alumni/Recent Graduates	
Policy makers	
Other (specify)	

8. Are there any emerging issues/societal demands relating to forestry that have necessitated curriculum review? *(Can mark more than one box)*

Climate change	
Green Economy	
Social forestry and governance	
Biodiversity conservation	
Sustainable Forest Management (chain of custody and forest certification)	
Business and entrepreneurship	

Other (Specify)	

9. How have you incorporated the above into the curriculum? *(Can mark more than one box)*

Improve facility and resources adequacy	
Collaboration with research institutions/networks	
Continuous lifelong learning for staff in institutions	
Knowledge integration with other disciplines	
Collaboration with private sector	
Increase post graduate programmes	
Increase female enrolment	
Other(specify)	

10. Which three global priority issues will you include when next you review your curriculum? a) ……

b) ……..

c)…….

11. The objectives of the current forestry curriculum within your institution are; (*Can mark more than one box*)

Classical forestry (industry) based	
NRM based	
Environmental conservation based	
Social/livelihoods based	

12. The current curriculum meets the following; *(Can mark more than one box)*

Management and development of forest resources for multiple benefits	
Maintenance and improvement of environmental quality and biodiversity	
Enables the graduate to pursue postgraduate education	
Capacitates the graduate to venture into entrepreneurship	
Empowers the graduate to tackle forestry related disciplines	

13. What is the weighting of practical to theory of the programme? ……%

14. How long is the internship/industrial attachment period? ……. months

15. Which are the most common thesis/dissertation topics done during the final year? (*Mark in appropriate boxes)*

Social sciences	
Ecology and biodiversity	
Technology and engineering	
Forest science and management	

Wood science	

16. Indicate 5 major organisations that absorb your graduates and the nature of their operations

Employer	Nature of operations e.g. (Industry, Social, Research, NGOs, Government etc)

17. State global events that have changed the role of foresters in the last decade in your country and indicate whether these have affected the forestry curricula

Global Event	Changing role of foresters	Effect on Curriculum

18. What policy support is in place to enable capacity building and enrolment potential of forestry students?.....

……..

…….

19. What support is in place to accelerate the full participation of women and other less represented social groups in forestry training…….....

……....

……....

……..

20. Please tick the challenges being faced by your institution

Aspect	Adequate/inadequate	Comments
Teaching staff		
Support staff		
Lecture rooms		
Library and teaching materials		
Current publications		
Laboratories and lab equipment		

Teaching aids (computers, projectors etc)		
Field training site		
Transport facilities for staff and students		
Financial support		
Donor support		
Communication facilities (email. Fax, phone)		
Access to modern technology		
Partnerships/collaborations		
Networks		
Other specify		

21. Do you justify the need for a forestry department in the institution or rather have forestry within Natural Resources or Environmental Sciences?

Yes		No	
Explain:			

22. What continuing/lifelong education do you recommend for serving forestry graduates for them to satisfy current global and societal demands?

.....

……..

Thank you for your time

Appendix 5: SSA Anglophone capacity for forestry training

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
Botswana	Botswana College of Agriculture (http://www.bca.bw) (Established 1991)		Higher Diploma (Forestry & Range Ecology)	Enough capacity at Technical level. Professional level adequate as supported by external training.
Eritrea	No Forestry Training Institution			
Ethiopia	Haramaya University (http://www.haramaya.edu.et) (Established 1985)	Master of science (Agroforestry)		Adequate country capacity at both Technical and Professional levels. Increases diversity through external training at professional levels. Country needs resourcing equipment and modern technology to strengthen depth of teaching and learning. More attention needs to be paid to gender and marginalised groups. Students need more field exposure. Equipment is obsolete.
	Wollo University (http://wollouniversity.education) (Established 2007)	Bachelor of Science (Forestry)		
	Hawassa University (http://www.hu.edu.et/hu/index.php/78-hu/icetabs/201-wondo-genet-college-of-forestry) (Established 2000)	Bachelor of Science (Forestry Economics & Business) Master of Science (Forestry Economics and Business) Doctor of Philosophy in (Forestry Economics & Business)	Diploma in (Forestry Economics & Business)	
	Debremarkos University (http://www.dmu.edu.et) (Established 1997)	Bachelor of Science (Agroforestry)		
	Mekelle University, (http://www.mu.edu.et) (Established in 1993)	Bachelor of Science (Dryland Forestry) Bachelor of Science (Forest & Nature Conservation)		
Ghana	Kwame Nkrumah University of Science and Technology (http://canr.knust.edu.gh) (Established 1952 Faculty of Forest Resources Technology	Bachelor of Science (Sustainable Forestry). The faculty offers degrees at BSc, MSc, MPhil and PhD.		There is satisfactory country capacity. However, there is need for building capacity in plantation silviculture since exploitation of natural timber resources may not continue.

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	started running BSc programme in 2006, Faculty of Renewable Natural Resources was established in 1982)			Institutions do not have enough teaching and learning materials and equipment. There are enough programmes, but attention needs to be paid to gender issues. Training diversity is met by overseas training.
	University of Energy and Natural Resources	Bachelor of Science in Natural Resources (wood science and Forestry Products) Bachelor of Science in Natural Resources (Social Forestry) Bachelor of Forestry Resources Management		
	University of Development Studies (Established 1992)	Bachelor of Science (Forestry & Forestry Resources)		
Kenya	Kabianga University (http://www.kabianga.ac.ke) (Established 2012)	Bachelor of Science in Agroforestry and Rural Development Bachelor of Science (Forestry) Master of Science (Agroforestry) Master of Science in Forestry (Tropical Forest Biology and Silviculture)		There is more than adequate capacity in terms of diversity of training at technical and professional levels. Programmes need to be strengthened and updated to cater emerging forestry issues. The country is one of those in SSAA with high levels of training and capacitation of students at all levels. It has captured issues on climate change, the green economy and entrepreneurship. Gender issues

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	Moi University (www.mu.ac.ke) (School of Agriculture and Natural Resources (re-established in 2014)	**Proposed programmes** Bachelor of Science (Forestry) Bachelor of Science (Agro-Forestry) Bachelor of Science (Climate change) Master of Science (Climate Change Master of Science (Forestry) Doctor of Philosophy in Forestry		have received enough attention though uptake of forestry by women is still below 50%.
	University of Nairobi (http://www.uonbi.ac.ke) (Established 1956)	Master of Science (Agroforestry) Doctor of Philosophy (Agroforestry)		
	Kenya Forestry College (www.kenyaforestservice.org) (Established 2005)		Certificate in forestry Diploma in Forestry	
Lesotho	Lesotho Agricultural College (http://www.africanadvice.com/1305739/Colleges/Lesotho/Lesotho_Agricultural_College) (Established 1986)		Diploma in Forestry	As a small country, it has enough capacity and can benefit from surrounding countries especially the SADC training centre in Zimbabwe
Liberia	University of Liberia (Liberia College of Agriculture and Forestry)	BSc. Forestry MPhil and DPhil	Diploma in Forestry	The country has adequate capacity, however it has benefited from external training. Country has been affected by civil unrest in the past.
	Liberia Forestry Training Institute		Certificate in Forestry & Forestry Products	
Malawi	Muzuzu University Programme established 2003 (www.mzuni.ac.mw)	Bachelor of Science (Forestry)		There is satisfactory capacity in terms of programmes. However, there are high levels of unemployment due to

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	(Established 1997)	Master of Science (Forestry)		oversubscription of foresters on the market. Resourcing and updating of equipment and technology are needed urgently. Training is affected by funding which is too low. Gender issues need attention as well.
	University of Malawi (http://www.unima.mw) (Established 1964)	Bachelor of Science (Forestry)		
	Malawi College of Forestry and Wildlife (https://sites.google.com/site/malawicollegeofforestrywildlif/home) (Established 1952)		Certificate in Forestry Diploma in Forestry	
Namibia	No forestry training institute, however, some research is carried out from the university of Namibia and the Namibian Polytechnic			
Nigeria	University of Agriculture Makurdi (uss@uam.edu.ng) (Established 1988)	Bachelor of Science (Forestry) Master of Science (Forestry) Postgraduate		Nigeria has a broad spectrum of forestry programmes from technical to professional training. The country has more than adequate capacity for forestry training and research. It also has managed to embrace emerging issues into the curricula and in practice. Climate change aspects, gender issues, green economy and technology are being covered in classes and in research. However, a number of institutions need adequate funding in order to be more relevant especially in areas of forest technology and engineering. In this area, even Africa's icon is deficient and needs to either collaborate with the developed world or build capacity.
	Ekiti State University, Ado-Ekiti (Established 1982)	Bachelor of Science (Forestry & Wildlife Management) Bachelor of Agriculture (Forestry Resources & Wildlife Management)	Certificate in Forestry (Nursery & Plantation Establishment) Diploma on Forestry resources & Range Management	
	University of Ibadan (http://ui.edu.ng) (Established 1948)	Bachelor of Science (Forestry Resources Management		
	University of Ilorin (www.unilorin.edu.ng) (Established 1975)	Bachelor of Science (Forestry and Wildlife management)		

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	Delta State University, Abraka (www.delsu.edu.ng) (Established 1924)	Bachelor of science (Forestry Production & Products) Bachelor of Science (Social & Environment Forestry)		
	Michael Okpara University of Agriculture, Umudike (www.mouau.edu.ng) (Established 1992)	Bachelor of Agriculture (Forestry)	National Diploma in Agriculture (Forestry and Environment Management)	
	University of Benin (http://www.uniben.edu) (Established 1970)	Bachelor of Agriculture (Forestry) Bachelor in Forestry &Wildlife		
	Federal University of Technology (http://www.futa.edu.ng) (Established 1981)	Bachelor of Agricultural Technology (Forestry & Wood Technology) Postgraduate Diploma (Forestry)		
	University of Uyo (http://www.uniuyo.edu.ng) (Established 1991)	Bachelor of Forestry & Wildlife Bachelor of Technology (Forestry and Environmental Management)		
	Uthman dan Fodiyo University, Sakoto (http://pg.udusok.edu.ng) (Established 1975)	Master of Science (Silviculture & Forest Biology) Master of Philosophy (Silviculture & Forest Biology)		

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
		Doctor of Philosophy (Forest Biology & Silviculture)		
	University of Calabar (www.**unical**.edu.ng) (Established 1975)	Postgraduate Diploma (Forestry Resources Management) Master of Science in Forestry (Silviculture & Forestry Biology) Master of Science in Forestry (Agroforestry) Doctor of Philosophy (Forest Biology & Silviculture) Doctor of Philosophy (Forestry Biometrics) Doctor of Philosophy (Forestry Economics & Management)		
	Cross River University of Technology (http://crutech.edu.ng) (Established 2001)	Bachelor of Forestry (Forestry & Wildlife)		
	University of Port Harcourt (www.**uniport**.edu.ng) (Established 1975)	Postgraduate Diploma (Forestry & Wildlife Management) Master of Science in Forestry (Silviculture & Forecast Biology). Master of Science in Forestry (Forest Economics & Management)		

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
		Master of Science in Forestry (Biometrics & Measurement) Master of Science in Forestry (Wood Science)		
	University of Agriculture, Abeokuta (www.**unaab**.edu.ng) (Established 1988)	Master of Forestry (Forestry Biometry) Master of Forestry (Forestry Economics & Management) Master of Forestry (Agroforestry) Doctor of Philosophy (Forestry Ecology & Conservation) Doctor of Philosophy (Forestry Biometry) Doctor of Philosophy (Forestry Economics & Management		
Sierra Leone	Njala University (http://njala.edu.sl) (Established 1964)	Bachelor of Science(Forestry) Master of Science (Forestry) Doctorate by Research	Certificate in Forestry Ordinary Diploma in Forestry Higher Diploma in Agriculture(Forestry)	The country has more than enough capacity and supported by External Training through scholarships. There is hoever need for programme strengthening to be current with global issues.
South Africa	Stellenbosch University (http://www.sun.ac.za) (Department of Forestry and Wood Science first established in 1912)	Bachelor of Science (Forestry & Wood Science) Bachelor of Science (Forestry & Natural Resources Science)		. Country capacity is more than adequate in terms of professional and technical levels. The country trains from Certificate to Doctoral levels in both Science and Technology. The Bachelor/Master/Doctor of Technology series is unique and powerful qualification for
	University of Venda (http://www.univen.ac.za)	Bachelor of Science in Agriculture (Forestry)		

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	(Established 1982)	BSc to Doctoral level in both sustainable natural resource management and classical forestry		practitioners. The country provides capacity to southern African countries and is well equipped technologically and has well established collaborations with the global community. Gender issues are well addressed especially at diploma and postgraduate levels. The institutions are old and mature to meet most of the current challenges and emerging issues. The curricula are best for classical forestry and agroforestry. Social forestry is still upcoming.
	University of Kwazulu Natal (www.ukzn.ac.za) (Established 2004)	Postgraduate		
	Fort Cox College of Agriculture and Forestry (http://www.fortcox.ac.za/)		Diploma in Forestry	
	University of Pretoria (www.up.ac.za)	Postgraduate		
	Nelson Mandela Metropolitan University (http://www.nmmu.ac.za) (Established 1908) Saasveld Forestry College (Established in 1932)	Bachelor of Technology(Forestry) Masers of Technology (Forestry) Trains personnel from Certificate to Doctoral level (Doctor of Technology)	Diploma in Forestry	
Sudan	University of Sudan (http://sustech.edu) (Established 1932)	Bachelor of Science (Forestry Science) Master of Science (Environmental Forestry) Master of Forestry (Forestry & Range Science) Doctor of Philosophy (Forestry & Range Science)		The country has adequate capacity to train forestry related cadres. The emphasis is on Forestry and Range Sciences. Training is at technical, graduate and post-graduate levels.
	University of Juba (http://www.euni.de) (Established 1977)	Bachelor of Science (Forestry)		

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	Upper Nile University (www.unu.edu.sd) (Established 1991)	Bachelor of Science (Forestry & Range Science)		
	University of Khartoum (http://www.uofk.edu) (Established 1902)	Diploma in Forestry & Range Science Bachelor of Science (Forestry & Range Science) Master of Science (Forestry & Range Science) Doctor of Philosophy (Forestry & Range Science)		
	Sudan University of Science and Technology (http://sustech.edu) (Established 1932)	Bachelor of Science (Forestry)	Diploma in Forestry	
Swaziland	No forestry training Institution, research takes place from UNISWA but technical staff is trained either in South Africa or SADC Training Centre in Zimbabwe. Country does not need to have own training centre as this is satisfactory.			
Tanzania	Sokoine University of Agriculture (http://www.euni.de/unidir_popup.php) (Established 1984)	Bachelor of Science (Forestry) Master of Science (Forestry) Master of Science (Agroforestry) Master of Science (Forestry Resources Assessment and Management) Master of Science (Forestry Products & Technology) Master of Science (Forestry Engineering) Doctoral Studies		The country has adequate capacity and has trained a lot of Forestry and Nature Conservation practitioners at technical and professional levels. Programmes are diverse but programmes are underfunded to keep pace with modern trends. There is acute shortage of equipment and literature, field practice. Curriculum has been reviewed several. Climate change issues and other emerging issues have been adopted with senior staff members being involved in government projects. Regional training at MSc and PhD levels have been done in several projects to build

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	Forestry Training Institute Elmotonyi (http://www.fti.ac.tz) (Established 1937)		Technician certificate in Forestry Diploma in Forestry	capacity for climate change mitigation. The institutions need to rejuvenate themselves by engaging junior staff than keeping a higher percentage of retirees in office.
	Forestry Industries Training Institution(http://www.fititz.org) (Established 1975)		Diploma in forestry Industries Technology Certificate in Forest Industries Technology	
The Gambia	No Forestry Training Institution			
Uganda	Makerere University (https://www.mak.ac.ug) (Established 1922)	Bachelor of Conservation Forestry and Products Technology Bachelor of Social & Entrepreneurial Forestry Master of Science (Forestry) Master of Science (Agroforestry) PhD studies		The country has adequate capacity and trains professional and technical staff at regional levels. The programmes have been rejuvenated through periodic reviews. Female student enrolments have been attended to. Deficiencies in plantation forestry have been noted since climate change issues are emphasizing of plantation forestry which was not in the programmes. Strengthening of programmes is a requisite to forestry teaching and learning.
	Nyabyeya Forestry College (www.btvet-uganda.org/training-provider/homepages/nyabyeya-forestry-college) (Established 1932)		Certificate in Forestry & Fishing Diploma in Forestry & Fishing Diploma in Agroforestry	
Zambia	Copperbelt University (http://www.cbu.edu.zm) (Established 1987)	Bachelor of Science (Agroforestry) Bachelor of Science (Forestry) BSc Wood Science and Technology		The country has adequate capacity for indigenous forestry. Zambia is one of the countries where much research on indigenous forests has been done. The country needs programme strengthening. Emerging issues on

COUNTRY	INSTITUTION	PROGRAMME		COMMENT
		PROFESSIONAL	TECHNICAL	
	Zambia Forestry College (www.mtenr.gov.zm) (School of Natural Resources was established in 2009)		Certificate in Forest Ranger Diploma in Agroforestry	climate change and energy have been attempted and are being included into the curricula. Technological issues in forestry training need attention,
Zimbabwe	Bindura University of Science Education (www.buse.ac.zw) (Established 2000)	Bachelor of Science (Forestry) Master of Science (Agroforestry) Master of Philosophy (Forestry) Doctor of Philosophy (Forestry)		The country has more than enough capacity for itself. It was servicing the SADC diploma training in forestry and wood technology. Currently it is producing foresters for the region. High unemployment of technical and professional graduates as a result of a non-performing economy, over supply of graduates against lack of employment capacity by the public sector.
	National University of Science and Technology (www.nust.ac.zw) (Established 1991)	Bachelor of Science (Forestry Resources and Wildlife Management)		
	Zimbabwe College of Forestry (http://www.agriuniverse.co.zw) (Established 1939)		Certificate in Forestry Diploma in Forestry	

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