**Keynote Address to the conference on Post Ebola Consequences for Sierra Leone and its development**

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**By**

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Mr. Chairman, Your Excellency, High Commissioner for Sierra Leone, Distinguished Guests, Ladies and Gentlemen

It is a wonderful feeling to be here today to join my former students and colleagues at this launching ceremony and seminar. Incorporating a seminar in this launch event, indicates the keenness and urgency felt by the organizer to address the consequences for Sierra Leone of the Ebola epidemic. I must commend the trustees of Engineers for Change for establishing an organization, to redress the damage done to the country’s engineering sector and its stock of professional engineers. I commend also the Commonwealth Engineers Council, for its partnership with EfCSL in organizing this seminar. They know that without the engineering capacity required to advance the country’s development, the road to freedom from hunger, disease and tyranny will remain bared. The state of its under-development will be worsened and its image in the world community of nations, once respected, will plunge to the depth of indignity.

The story of the devastation caused by the Ebola epidemic is now well known around the world. Friendly nations sent sympathies and assistance to help eradicate the dreaded virus. Others watched our progressive economic deterioration with horror and act only to keep the intransigent bug from ever crossing our borders into theirs. Even with help, there were worries that the frightening cycle of infection-death-transmission-infection, would never be broken, so countries banned flights into our country and our citizens for entering theirs. Speaking euphemistically, no one wanted to touch us. The impact on an economy that was successfully recovering from a long civil war, triggered from outside its borders, was calamitous. Key mining industries and once thriving businesses became bankrupt, thousands of workers were laid off and skilled professionals fled the country. The loss to the professions was grave. Engineering was among the worst losers. Even before this calamity, there were gross shortages of engineering manpower in many development sectors. The Ebola outbreak and the flood damage of 16th September, this year, not only exposed these inadequacies, but also the paucity of the quality of the training some of our engineers had received. Standards had dropped in the depression that followed the war years because training institutions lacked the funds to recruit adequate numbers of capable staff in the various disciplines. As a consequence, the country has had to deal with a situation where many vacancies for highly skilled engineers in many industries were filled by foreign nationals at great cost, rather than risk the consequences of progressive system collapse by plugging in unsuitable local staff.

The task before us therefore, involves educating and training more and better engineers as part of the drive to bring about the change that EfCSL intends to promote. But there is another part to change, which in the context of sustainability requires it to be fundamental, not cosmetic, like papering over the cracks in a broken glass. Engineering change should be all embracing, raising awareness at grassroots level, that the deprivation communities at level were experiencing do not have to be permanent, and that everyone can contribute to the change they deserve. While engineers do play their role in providing equipment and services to enhance the quality of life of their people, the people too must in turn understand how to secure the continuing usefulness of these products. And this has a bearing on the training given to engineers. It should provide not just world class technical skills, but beyond that, impart skills which will enable them to work with communities, and help them assume ownership of the investments and facilities provided for their improved livelihoods and be proudly protective of them.

Let me take you now through some ideas that can provide direction for delivering this. Speaking metaphorically, getting things to change is a journey. It starts by deciding how far you want to go. Then you make sure you know where you are now. Next, you find out the distance between where you are and where you want to go, then you chose your mode of travel. Not all journeys are smooth sailing, so you anticipate obstacles you are likely to encounter. When the picture is clear about your direction, you then estimate the cost of the journey and finally, the time you require to get there.

We know already where we want to go. Simply put, we want to replenish and increase the pool of high quality engineers. But where are we now. We find the answer in the UN’s Human Development Report of 2014. It gives the country’s expenditure on education as a percentage of GDP as 2.72. And for higher education as, not available. Viewing this situation with the most optimistic eye, it is easy to see that the investment on engineering education was so small that year that it was not worth measuring. The consequence of that poor investment is reflected in the percentage of the population in poverty. At 72.68%, it compares badly with Ghana 30.46, Nigeria 43.29%, Ivory Coast, 59.33% and The Gambia, 60.77%. These are countries with which Sierra Leone compared favorably, before the scourge. Although these figures do not merit accolades for excellent performances, we can see how alarmingly high poverty in Sierra Leone had become. The cause of this human tragedy is clearly traceable to the ravages of the Ebola epidemic, which made ineffectual, the engineering infrastructure that drives the country’s development.

Next, we want to know the distance between where we are and where we want to go. When we look at our present position, we see that we are far away from the goal we want to reach. But we need to find out from manpower surveys, or other means, the extent of the gap we wish to close, for example, in the quantity of qualified engineers, as a percentage of the population. What we know in that sector is that the total enrollment of students at the four institutions offering engineering in the country in 2014 was 913. Of these 463 were degree students spread over the four undergraduate years. It is estimated that the world’s average of the number of engineers per 1000 of the global population was 7 in 1990, and may be more today. To join that league, Sierra Leone, a country of 5 million people should presently have, a least 3,500 engineers. Just look at the graduating rate in some advanced countries. According to research conducted by [the World Economic Forum](http://reports.weforum.org/human-capital-report-2015/) the annual graduate output from Russia is 454,000, the United States 237,826, Iran 233,695, Indonesia, 140,000 and Vietnam 100,000. We need also to know the extent of the gaps in the number of institutions needed to train engineers needed; in equipment, lecturers and researchers; in the number of undergraduates and post graduate students, in the enabling environment, such as, ready absorption into the job markets for products from training institutions and in the regulation of engineering practice. All of these will constitute the distance we plan to cover in our journey for improvement and change.

The next stage of planning this journey is to choose our mode of travel. That is, the method of getting to our destination. This is what often puzzles must of us, partly because we have no prior experience of doing this, or because what has to be done, is so huge and complex that we do not know where to start. The responsibility for devising and implementing any method to get to our destination, should therefore be assigned to visionaries who see the attainment of engineering quality as a progression of competences from one stage to another, and can plan for that build-up of skills with the view to have immediate and long-term impact on the economy and consequently on the lives of every citizen. Often, the reason why we want change, mostly dies in the exhaustion that overcomes us, when we try to implement what is required, and find that we have to face the reality of what is possible. I suggest that to advance to any goal we set, optimistic or not, we will need two vehicles to get there. Namely promoters, and a plan of action.

Sensitize stakeholders and donors on the necessity for change.

The most important vehicle for this journey will be the promoters, a body of stakeholders and donors. Many of them will be external institutions, namely, friendly foreign government bodies, foundations and charities. However, each should be given a consistent message to sensitize them on the need for change, the impact it will create and the scale of the adjustments required. Through this process, individuals and institutions will be assembled, who would have expressed willingness to support a drive to act. They would provide the assistance required, to carry out the improvements necessary, according to an approved action plan.

Plan of Action

This plan should spell out the work to be done. This would essentially be a wish list and it should be understood that these actions, short and long term, should be prioritized; classed in order of urgency and cost. A body should be set up to fully develop and execute the plan, and establish relationships with Change Promoters Short term action may include, bringing graduate output, research activities, staff and facilitates back to pre-disaster level. Long term action would focus on pitching standards high enough to make products competitive in a fast changing world, dominated by spiraling technological advances. Some disciplines may not seem as important as they did before, so these would be replaced by new disciplines and in some cases, new courses within existing disciplines. These improvements cannot be made without more and well trained lecturers. An aggressive staffing programme should be developed to achieve this. This should include, annual contributions from industry, of senior engineers on periodic release to teach special courses; include endowed chairs and endowed lectureships. External institutions should be identified for twinning with local institutions. This had been done successfully before for post-graduate training of junior lecturers and should be tried again. It should be extended to include staff exchanges and joint research projects. Furthermore courses in teaching and learning should be re-introduced for newly recruited lecturers, as was the practice at the University of Sierra Leone, before it was phased out in 1994.

As students will be the recipients of these improvements, account should be taken of their expectations from the courses they take, such as good job prospects and societal recognition. Learning theories should therefore be balanced with practice and supported by relevant books and equipment. Most graduates would go into industry would meet employers, unforgiving of incompetence. They would go out to work in communities, which would hold them in high regard for their skills. They should be prepared to face these situations. The training they should have, should equip them to take on these challenges and the curriculum should reflect this objective, developing skills in design, creativity, problem solving, modelling and assessing and making economic choices. There should be a new approach to delivering courses, including phasing, duration of programmes and distance learning. These ideas should be properly formulated, in association with industry. Courses on entrepreneurship should be introduced and policy should be in place to ensure that the products of such training enter an investment sector that is strengthened by monetary incentives and secured and unsecured loans.

Another imperative is to include in the early years of a student’s training, courses in the humanities and social studies. The engineer must learn that as a member of the society in which he lives, he or she is as affected by the infrastructure he creates and maintains, as other members of the society. It becomes the engineer’s duty to promote the quality of life in his community, be integrated into it, not isolated from it and above all, be answerable to it. The student does not stay forever at universities and colleges; they come out into the world to be a part of it. Therefore they ought to be made awareness of problems of the society and their role in it; aware of other young people who have to struggle simply to survive in often squalid conditions. They must come out into the society not to be an appendage to the lengthening chain of government’s responsibilities, but be part of an independent structure that creates employment; not seek it. Ways should be found to teach these things also.

Obstacles to be Encountered.

In this journey, obstacles will be encountered. The planners of this change ought to be aware of these and determine how to overcome them. Firstly, there is the human tendency to resist change by those practicing what the planners wish to change, because they fear what might result from that change. They might lose their jobs or be down degraded in status. They would rather do what they have always done. With that attitude, of course, they will get what they have always got –stagnation. Other obstacles to consider are, higher levels of attrition of graduates after qualification, fewer opportunities for post-graduate practical training locally, migration of qualified engineers to other countries where salaries and conditions of life are more attractive than at home and loss of graduates who retrain to enter more lucrative professions, or move into non-engineering positions in government.

Estimating Cost and Time of reaching Goals Set

Finally, we come to the delicate matter of costing and timing the journey. It must be realized that the full cost of undertaking this journey may not be mobilized in an instant. Support in cash and kind may trickle into the dispensing bucket from various sources with limits to their capacity to give. Each activity in the action plan should therefore be priced and timed in a way that will allow funds to be deployed as they become available, according to the priority order specified in the plan of action.

Many of our country’s leaders have been slow to realize that there are scales of education and training that must be reached, if a country is to attain levels of skills attainment that are sufficiently high, to attract meaningful investment and secure the future prosperity of a country. To reach those levels, the government must take the lead in funding it. Other donors can only follow with bridging aid. Certain investments for the prosperity of the nation cannot be dismissed with the age old excuse that the country cannot afford it. For if we cannot afford to fund this improvement, we cannot improve the quality of our lives; we cannot on our own exploit our national resources, effectively protect our environment and live a legacy upon which future generations can build. We cannot also provide direction for invigorating our existing indigenous technologies, or bring reputable scholarship to bear upon the proper functioning of traditional practices which have scientific and technological relevance to development; and most disheartening of all, it will mean that we cannot join in the exciting pursuits of discovery or of innovation, nor accept the challenges of our time to participate in the quickening race to master and manipulate the new technologies for own good. If we cannot rise above the present poor level of our scientific and engineering manpower and infrastructure, then our dependence on others for our future must surely grow, and our resignation to ultimate social and cultural decay must be complete.

Let this conference bring home, that realization more forcefully and let there be more than this launching, to do it. I hope that the change this conference will initiate, will end the nation’s slide into greater poverty and impact in a positive way, the lives of the many in our county, to whom the science and engineering of which we speak is presently of no consequence.

I thank you for your attention.