Engineering for Poverty Eradication in Cameroon

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by

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I must begin by expressing my most profound gratitude to the highly esteemed executive committee of the Cameroon Society of Engineers (CSE) and others who worked fervently to make this convention a reality. I am honoured to have been selected as the convention's keynote speaker from what I conjecture was incontestably a rich pool of aspirants.

Pardon my presumptuousness, but I surmise we, as participants of the convention, will be remiss if we failed to extend our hearty appreciation to the organizers for their sagacious choice of a timely theme—'Engineering for Poverty Eradication'—for the convention. We, as hardly anyone needs to be reminded, are at the eve of the twenty-first century—a period that is unique particularly because it is coincidental with unprecedented strides in technological advancements. What are the implications of these gigantic strides for less developed countries (LDCs) such as Cameroon? Pessimists perceive the developments as an obvious source for consternation. In fact, some have opined that rapid developments on the frontiers of technology promise to further compound, rather than ameliorate, conditions for residents of LDCs.[2]

Is there indeed a need to be concerned? Of course not! It is my impassioned belief that LDCs stand to gain tremendously from the technological achievements of contemporary developed nations. Some qualification of my stance is in order. The success of North-South technology transfer (TT) intimated by my position is unlikely to register any significantly positive results unless engineers, scientists and others involved in the TT process are able and willing to adapt borrowed technology and artefacts to their host environment. The immediate task facing the Cameroonian engineer is therefore to selectively borrow, manipulate, and employ technology from the North to address urgent problems in Cameroon. The most urgent of these problems is related to the country's poverty levels that are growing increasingly worrisome by the day.

The remainder of my talk will be richly punctuated with cautiously prescriptive recommendations regarding what meaningful 'engineering for poverty eradication' efforts in Cameroon will entail. The need to be cautious cannot be overstated. The problem of poverty is rooted in seemingly intractable sources that tend to vary from one country to another and not unusually, amongst different regions within a single country. Thus, it will be foolhardy to adopt a 'one-size-fits-all' approach or worse yet, assume adequate comprehension of the problem. If anything, we are aware that poverty stems from a plethora of complex factors. The complexity notwithstanding, I venture to identify the following as five of the leading sources of poverty in Cameroon:

- use of inappropriate technology;
- high levels of unemployment;
- high cost of necessary goods and services;
- poor nutrition; and
- lack of concern for women-specific needs.

I will discuss each of these inextricably intertwined sources or causes of poverty in the country in turn.

Inappropriate Technology. The converse of the concept of 'inappropriate technology' is 'appropriate technology.' During the late-1950s and early-1960s, when decolonization became a ubiquitous trend in sub-Saharan Africa, it was widely believed that to develop, the emerging countries of the South would need to do no more than simply borrow technology from the advanced nations of the North. This sense of optimism and euphoria was matched by wanton efforts on the part of LDCs to indiscriminately transplant technology from their developed counterparts. However, by the late-1960s, signs indicative of the negative implications of employing in LDCs technology developed for advanced countries, were beginning to surface. These signs had hardly made their imprint on the international development scene, when an ardent advocate of appropriate technology by the name, E.F. Schumacher released his now classic work, "Small is Beautiful."[3] Schumacher exhorted LDCs to refrain from employing technology that was never developed for them. Such technology, he contended, is likely to be antithetical to development efforts, particularly efforts directed at poverty eradication in these countries.

His melodramatic tone aside, Schumacher might well have had Cameroon in mind when he advanced the foregoing argument. Cases in which an adopted technology has helped to compound, rather than alleviate, the problem of poverty abound in all sectors of the country's economy. In the passenger transportation sector for instance, there has historically been a proclivity towards encouraging the importation of the latest models of sophisticated transportation vehicles designed for the well-surfaced and adequately maintained roads of developed countries. Of course, we know that such roads are almost non-existent in Cameroon. The implications of this for efforts to eradicate poverty are far-reaching. For instance, the vehicles tend to not only suffer from excessively rapid wear and tear but are constantly in need of spare parts and repairs. The fact that such vehicles are by design technologically sophisticated means both spare parts and the skilled labour necessary for their maintenance must be imported. The case of the now defunct *Société de Transports Urbaines du Cameroun's* (SOTUC), which was well-known for its large pool of expatriate mechanics and managers is illustrative. The importation of labour, an abundant resource in Cameroon, and the exportation of hard earned cash to defray the cost of spare parts is anything but a viable strategy for eradicating poverty.

The Cameroonian engineer must therefore seek to reverse this situation through technological creativity. As I discussed in my recent article, "Technology Transfer and Transportation Functioning in Less Developed Countries" in the *Journal of Third World Studies*, any "technology that creates the need to train many local nationals in its application particularly in terms of modifications, bears the capacity to induce such creativity."[4] This conjures the notion of adaptation to which I alluded earlier. The Cameroonian engineer will do well to emulate the example of his/her counterparts in other African countries such as Ghana and Nigeria, where it is customary to mount the chassis of heavy duty vehicles (e.g. Mercedez Benz trucks) and all-terrain (4-wheel drive) medium weight vehicles (e.g. Toyota pick-ups) with locally manufactured bus bodies. Such creativity is capable not only of generating employment opportunities, but also significantly decreasing the cost of transportation and guaranteeing especially market accessibility to impoverished Cameroonians, whose participation in the national economy would otherwise be diminished.

Another instance of inappropriate technology is aptly dramatized by the country's building industry, which depends exceedingly on imported building materials. Attempts on the part of authorities to set up facilities capable of producing building materials with Western origins such as cement, ceramic tiles, and aluminum roofing sheets often entail prohibitively costly inputs, including foreign exchange and imported raw materials. Furthermore, such "industrialization" ventures rely heavily on the regular supply of imported spare parts for equipment in the production facilities. One consequence of this is highly expensive building materials, hence housing whose cost is beyond the reach of most members of the population. Again, this is one nagging situation whose reversal the Cameroonian engineer is capable of effectuating. Here, the role of South-South technology transfer—that is, TT between developing countries—may well be indispensable. Engineers at the Central Building Research Institute in Roorkee, India have covered considerable ground in their efforts to improve the performance of local low-cost building materials. For instance, they have demonstrated the viability of materials that are easily available in LDCs such as Cameroon. Examples of these materials include, but are not limited to,

- rice husk-lime pozzolana, an inexpensive substitute for cement that can be obtained by simply burning rice husks and waste lime sludge, which are by-products of sugar and paper industries;
- an admixture of asphalt and kerosene that can be used to water-proof clay walls;
- bamboo as a substitute for steel in reinforced concrete and scaffolding;
- wood-cement building boards made of rice husks or groundnut hulls as an inexpensive substitute for conventional wood particle boards.

These advancements notwithstanding, a lot is yet to be accomplished along the lines of improving the performance of local building materials. For instance, there is an urgent need to device a viable means of fire-proofing roofs of local materials such as thatch and grass, as well as rendering wood and bamboo less susceptible to damage from insects. This is where the ingenuity of the Cameroonian engineer and scientist becomes indispensable. The importance of such savvy in efforts to eradicate poverty in Cameroon can hardly be exaggerated. For one thing, the use of local materials as opposed to imported varieties will result in making housing more affordable thereby guaranteeing every member of society (including the poor), a decent living environment. For another thing, the use of such materials will result in the generation of employment opportunities in the building materials, construction and related industries.

Reducing Levels of Unemployment. I have already alluded to some of the more obvious and orthodox poverty eradication strategies. Less obvious, however, is the promise for poverty eradication held by the 'hi-tech' sector. In a recent article under the caption, "International Science Cooperation" in the Journal, *Issues in Science and Technology*,[5] the authors argue that engineers and scientists can meet the challenges posed by shrinking per capita arable land, scarce irrigation water resources, and expanding biotic and abiotic stresses by simply mobilizing frontier science and technology in the areas of "biotechnology, information, space, and renewable energy technology and blending them with traditional technologies and ecological prudence."[6] Furthermore, there is also the possibility of taking advantage of recent advances in genomics and molecular breeding, which promise to open up limitless opportunities for producing novel genetic combinations that are capable of, amongst other things, resisting the dangers posed by pests and diseases. The potential benefits of this for farmers are obvious and include significant increases in yields occasioned by the acquired resistence on the part of crops to pests and diseases.

Another hi-tech area with immense promise as a strategy for poverty eradication falls within the orbit of computers. Yes, I really do mean computers. To gain an appreciation of the area of computers as a potentially fruitful source of employment, one needs to first understand that Cameroon currently boasts a large and proliferating pool of unemployed university graduates armed with the skills for a viable peripheral hi-tech sector. What these graduates lack are avenues in which they can gainfully employ their skills and talents. The role of the Cameroonian engineer in this case will simply be to put his/her entrepreneurial expertise to work by assembling the necessary resources and setting up local hi-tech shops capable of maximizing the utility of these hitherto untapped resources.

Lessons of experience in such ventures abound especially in Asia. In his piece, "Jobs for all in the Global Market" in *People Management*, Steve Crabb paints a vivid picture of the emerging boom industry of computer software development in India.[7] He begins by noting that :"The revolution in information technology now makes it possible for skilled staff in developing countries to do work that was formerly the preserve of white-coated technicians in the West."[8] While the exact figures are elusive, it is estimated that in 1995 far more than 150,000 highly educated people were employed in the software and electronic data processing sector in India. The facilities harbouring computer and computer-related activities in that country, as Crabb observed, "ranged from state-of-the-art premises within modern science and technology parks, such as the Santacruz complex in Bombay, to environment-controlled rooms in crumbling turn-of-the-century buildings in city centres."[9] The lesson for the Cameroonian engineer here is that he or she does not have to wait until a state-of-the-art facility is ready. An extra room in the family compound will do just fine with one caveat: it must be fitted with environment-control devices. Humidity, which is commonplace throughout Cameroon can be very cruel to computer soft- and hardware.

Where will the jobs come from for these computer enterprises? As in the case of similar ventures in Asian countries such as India, the lion's share of the demand for computer products developed in Cameroon is expected to originate in the West. Western firms are increasingly outsourcing part of their information technology (IT) operations to developing countries as a means of circumventing the high cost of undertaking such operations in their own countries. For instance, at the beginning of this decade, London Underground was interested in fitting its railway lines with a new computer system to monitor train schedules, control signals and generate timetables. It advertised for bids and several came from companies based in Britain and abroad. The government-owned software company of India won the contract and was able to complete the project in 18 months at a price far less than that quoted by British and other European bidders. The potential contribution of investments in computer and related ventures cannot be overstated.

Witness, for instance, the case of India. In 1986-87 revenue from the country's software exports were estimated to be $39 million and by 1993-94, the figure had skyrocketed to $14,200 million.[10]

Poor Nutrition. One of the leading factors accounting for poverty within certain segments of the Cameroonian population is related to inadequate nutrition. It takes little imagination to appreciate the fact that the genre of work necessary for securing a decent income cannot be performed by a hungry and under-nourished person. According to a World Bank study on poverty in the country, most poor Cameroonians eat only one meal of low nutritional value a day.[11] Sources of protein such as meat and fish, the study notes, are absent from the poor Cameroonian's diet. Apart from the lack of protein in the diet of poor Cameroonians, the quantity of food consumed by this segment of the population has diminished significantly since the mid-1980s, when the country's economic woes began. The same World Bank study also noted that the major impediments to increasing agricultural productivity include, amongst other things, low levels of available technology, lack of access to information, the absence of improved seed varieties and other inputs as well as inaccessibility to markets resulting from lack of, or poor, farm-to-market roads. Addressing these multiple problems will entail the involvement of engineers and scientists drawn from multiple fields such as agricultural engineering, information technology, and civil and transportation engineering.

High Cost of Necessary Goods and Services. A defining characteristic of the poor is their general lack of savings, particularly funds set aside for "the rainy day." The reason for this has to do with the fact that basic goods and services such as sanitary supplies, housing and food, cost so much that they tend to consume all of whatever meagre income the poor have. As I have already suggested, most of the goods (including basic goods) consumed in Cameroon are imported and when efforts have been made in the past to locally produce clones of these goods, the cost always tends to be astronomical. This exorbitant cost is a function of the fact that the country's production facilities depend on imported inputs. It is therefore incumbent upon the Cameroonian engineer to device innovative means to locally and more efficiently produce basic goods and services. This will, *inter alia*, result in significant reductions in the cost of goods and services that are necessary for everyday use, and in some cases, survival. Success in this vein ultimately translates into enormous gains for efforts addressed to combating poverty in the country.

Women Specific Needs. Development programmes have traditionally been gender-neutral. For instance, the promotion of labour-intensive growth in developing countries as advocated by the 1990 World Development Report, ignores the fact that women in these countries already expend most of their energy in executing labour-intensive tasks. The gender-based division of responsibilities in Cameroon, for example, assigns almost all domestic and related functions to women. Domestic work in this case is not limited to chores around the house. Rather, included under the rubric of these functions are such activities as traveling long distances to fetch water, firewood, and food for household consumption. While exact statistics on these activities aggregated by gender for Cameroon are hard to come by, data from other sub-Saharan African countries are enlightening. Take the case of Tanzania, where women and girls are responsible for transporting 90 percent of the total volume of necessary household goods and where, on the average, each woman spends 1,648 hours completing household chores compared to only 531 hours that an average man spends on similar tasks.[12] In Burkina Faso, the amount of time that girls between the ages of 11 and 17 spend on household chores is three times higher than that of boys in the same age-group.[13]

Among the many implications of this gender-based division of labour is the fact that women tend to spend most of their time performing household tasks and are thus left with very little time to indulge in financially remunerating activities. Little wonder then, that the majority of ultra-poor people in Cameroon and other developing countries are women. The role of the engineer in efforts to reverse this nightmarish state of affairs is obvious. For starters, serious efforts are in order to craft tools capable of significantly reducing the burden associated with such chores. Cameroonian women, especially those in rural areas, still depend on crude agricultural implements such as hoes, and have to manually draw water from deep wells, as well as haul goods on their heads. Not only can more appropriate and technologically advanced tools reduce the burden associated with women's tasks, they can free up time for women to indulge in more leisure and especially economically rewarding. If nothing else, this will reduce the high incidence of poverty amongst women as a group. The ingenuity of engineers and scientists is necessary in yet another area of specific interest to the Cameroonian woman—the area of food/grain storage and preservation. The absence of facilities in this area has contributed in no small way to impoverishing the Cameroonian woman.

To be sure, what I have done here is nothing more than scratching on the surface of an admittedly complex puzzle. The remedies I have proffered must therefore be evaluated in this context. In my humble opinion, the essence of my talk is manifested not in terms of the specific cautious prescriptions I have dared to make, but in terms of my attempt to accentuate the role of the engineer in poverty eradication efforts in Cameroon.

Thanks for your undivided attention. With your permission, I will once more like to acknowledge my debt of gratitude to the organizing committee for extending me the invitation to be here.

Notes

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[6] Swaminathan, M.S.; Tandon, P.N.; and Yongxiang, L. (1998) op. cit.

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[8] Crabb, S. (1995), op. cit.

[9] Crabb, S. (1995), op. cit.

[10] Crabb, S. (1995), op. cit.

[11] World Bank (1995). Cameroon: Diversity, Growth, and Poverty Reduction. (Washington, DC: Population and Human Resources Division, Central and Indian Ocean Department, Africa Regional Office. Report No. 13167-CM).

[12] Njoh, A. J. (1999b). "Gender-Biased Transportation Planning in sub-Saharan Africa with Special Reference to Cameroon." (Forthcoming) *Journal of Asian and African Studies*.

[13] Njoh, A.J. (1999b), op. cit.