
Introduction

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Introduction

This issue of the *World Review of Science, Technology and Sustainable Development* provides perspectives from which readers will begin to understand the multi-dimensional aspects of sustainable development. Sumner provides an empirical richness and analytic rigour in discussing various perspectives of 'sustainable development'. He teases our intellect by posing a thought-provoking question: what is meant by 'sustainable development' and how might it be measured? Flowing from this are two more questions: how broad should the definition of 'sustainable development' be and what exactly is to be sustained in 'sustainable development'? In reviewing some literature on the measurement of sustainability, he avers that the central concern in analysing sustainable development is the interaction of economic growth and the environment within which it takes place. How conceptually does one link economy and environment?

The issue of linkage and measurement as they refer to sustainability of development raises questions that would engage scholars for years to come. The debate on this issue is continuing. Sumner sees some opening in solving the problem of the measurement of sustainable development if there was the transposition of the analysis from that of poverty, which represents the relationship between 'consumption poverty' and economic growth. There is a dynamic conception when one analyses poverty. Future research should be concerned with, according to Sumner, a more dynamic analysis and with the transposition onto the environment of a poverty concept.

Continuing on this issue of poverty and measurement of sustainable development, Amuna, Zotor and Tewfik present living example of poverty in sub-Saharan Africa, where the gap between the rich and the poor is widening, with nine out of ten poorest countries in the world being in Africa. Just like Sumner, these three scholars see nutrition or nutrient intake as a good and visible measure of quality of life. Despite human and abundance of natural resources, malnutrition, poverty and slow economic development define the quotidian realities of life of many sub-Saharan Africans. Amuna, Zotor and Tewfik believe that this trend could be altered for the better if some simple intervention

were made. Through a process dubbed food multimix, sufficient nutrients in the daily composite diets of the poor, food insecure communities of sub-Saharan Africa. Food multimix is a process, which involves a blend of locally available, culturally acceptable and consumed foodstuffs mixed proportionately that optimises the nutrient value of the food. At the present time, chronic hunger and food inadequacy affect not only the growth and cognitive development of sub-Saharan African children, but also it affects the strength of the workforce. Micronutrients play important roles in maintaining strong immunity against illness. Amuna, Zotor and Tewfik recommend very strongly that to fight against micronutrient deficiencies, there must be strategies in place that promote dietary diversification in populations with limited economy and limited access to food as exemplified in most of sub-Saharan Africa. Innovative use of locally processed food within an appropriate cultural milieu and the employment of traditional processing methods is achievable and would meet the nutrient needs in poor communities. An integrated interventionist model is preferred because it would be community-based and community supported.

The nutrient value in life's sustenance is indisputable. As much of what people eat come from gardens and fields, soil contamination becomes an issue. What Amuna, Zotor and Tewfik suggest would be difficult to achieve if the environment in which food is to be grown and processed is degraded. There is a linkage between good food and healthy environment. Mrayyan and Battikhi raise very serious concern about organic chemicals that are being introduced into the environment in Jordan. These organic contaminants result from uncontrolled release from manufacturing and refining installations and spillages during transportation of petroleum products. Petroleum hydrocarbons are one of the examples of chemicals that infect the environment in large volumes. They are known to be toxic, mutagenic and carcinogenic. In effect they adversely impact the quality of health of those who live within such affected environment. Mrayyan and Battikhi show that biological treatment of organic pollutants is feasible and indeed a promising alternative to bioremediation whose main limitation is the difficulty of formulating treatment strategies that produce a specified outcome in terms of degradation rate and residual contaminant concentration remains. These authors show in their research and experiment that biological treatment of pollution has reliability. They demonstrated the ability of different bacterial consortia isolated from oil refinery treatment plant to metabolise petroleum hydrocarbons as a source of energy and carbon for growth under aerobic conditions such finding could assist policy makers to establish a benchmark for managing hydrocarbon-associated pollution.

Just as Mrayyan and Battikhi performed experiments to provide easy solution to toxic pollution of Jordanian environment by petroleum sludge effluents, Kupakuwana suggests solution to the socio-political pollution of Zimbabwean public service administration. Kupakuwana presents a taxonomy of public service ills of Zimbabwe: excessive delays in passport application, birth and death registrations, national identity registration, work and resident permit application, postal delivery and so on. Kupakuwana investigated best practice within public service systems in South Africa, Britain, the USA and Japan and compared what obtains in Zimbabwe to these. He examined innovations in development to see how the fragmented processes and lack of customer focus in Zimbabwe could be improved. Methodically, Kupakuwana cited examples of efficiency in the USA, Britain, Japan, and to some extent, South Africa. He notes that the USA came out with the shortest amount of time taken to process a passport. It takes seven months in Zimbabwe to process passports while in the USA it takes just three days In the UK it takes just about

ten days to process work permit. In Zimbabwe it takes six weeks. In South Africa it takes within 21 days to clear criminal records. In Zimbabwe it takes average of 30 days. In the UK, USA and Japan, it takes one day to register a company. In Zimbabwe it takes an average of 30 days. This paper is a wake up call to Zimbabwe to get her public service act together and learn from those countries that have the record of superior performance. Zimbabwe, in effect, must reform her public service sector if she is to develop and attract investments.

On this note of reform, Hossain and Kathuria cites India as a country that has benefited from foreign direct investment in the telecommunication sector, because, as early as the 1990s, India started economic and regulatory reforms. The Indian authorities realised that development of an effective and efficient telecommunications sector was the key to the growing international competitiveness. Along this line, the government-managed Department of Telecommunications was restructured in order to remove its monopoly as the service provider. The reform and restructuring of the Indian telecommunications continued through the end of the 1990s because the desired goal was not achieved until 1997. The Department of Telecommunication was slow to act and indeed demonstrated some measure of indifference. By 1999 a comprehensive programme of telecommunications policy reform in India was in place. This framework among other things suggested some of the following initiatives:

- availability of basic telephone services on demand by year 2002
- target of teledensity of 7% by year 2005 and 15% by year 2010
- completion of full rural telephone by year 2002
- target of rural teledensity of 4% by year 2010
- direct interconnectivity of telecom networks as far as possible
- identification of some areas as special thrust for the service deployment.

There is no doubt that the reform initiatives of India has paid off to the extent that cellular mobile market has begun to grow rapidly. The number of cellular subscribers in India exceeded 10 million at the end of 2002 compared to 0.2 million in 1996. In the year 2001, the compound annual growth rate of subscribers was in excess of 90%. What this growth indicates is that Indian market is responding very positively to the reform measures introduced in the early 1990s and to the policy framework of 1999 enunciated above. Hossain and Kathuria note that as a result of this growth necessitated by reforms one can now speak of the emergence of the 'new economy' sector in India. This new economy mainly comprises two elements of the information technology/software services and information technology enabled services. These elements have created more than 400,000 jobs for the Indian economy accumulating a wealth of US\$20 billion. Furthermore, in terms of total market share in value, the Indian companies hold three-fourths vis-à-vis one-fourth of the multinational corporations. Hossain and Kathuria credit the apparent success of India in the field of information technology to two factors, namely, the English language and the outsourcing of foreign businesses to India. The English language skill has given India a competitive and technological edge over other developing countries. The outsourcing pays much lower wage in India while it also helps India solve its unemployment problems. The authors are not unmindful of possible challenges that India's burgeoning economy on the IT front. Some of these challenges may come from

what the authors have called 'political spectre of European Union/United States job loss'; 'India's image problem worldwide in terms of social, religious and economic inequality and intolerance'; 'India's constant arms conflict with danger of escalating nuclear conflict with Pakistan' and many more. In spite of the possible challenges enumerated, Hossain and Kathuria maintain that given the market-based approach and the regulatory framework that has been put in place, telecommunications industry has contributed to the establishment of a 'new' economy sector that is IT driven. This economy within such a short time has not only reversed the age-old current account problem but has created hundred and thousands of jobs in the newly established domestic companies and in India-based major multinational companies.

While Hossain and Kathuria's contribution demonstrate the interplay between government regulatory indices and market as they relate to information technology, Adams and Antwi provide empirical insights into market and government's interventionist proclivity and regulatory transactions as it involves land purchase in Ghana. Adams and Antwi make it clear from the outset that what obtains in Ghana has its equivalents in other cities of sub-Saharan Africa. Land tenure systems were applied to regulate land ownership among mainly expatriate residents and the very few educated Africans on the one hand. On the other hand, land ownership among the indigenous population was organised through existing customary laws resulting in dual tenurial system. In a city like Accra, for example, the majority of the residents rely on customary tenurial sources to meet their residential land needs. Even though the transactions convey rights of access and occupation, various legislation and government policies render them officially unrecognisable until the documents are appropriately formalised by appropriate government departments. This tortuous mode of transaction has rendered land purchase problematic and expensive. Some would argue that government intervention would solve the problem. Adam and Antwi are not so sure and have in their contribution debunked myths surrounding land transaction and ownership in Ghana. They posited three serious questions: Are traditional landowners actually controlling the market the way they are reputed to be? Are land prices indeed escalating? What factors enable such a state of affairs to occur, if indeed it does? The authors quickly add that even monopolies could not control quantity and price at the same time. Adams and Antwi answered the questions by investigating the demand side, supply side and professionally qualified market intermediaries operating in the unrecorded residential land market in Accra. The result of their investigation provided useful insights into the operation of informal land markets in Accra. It showed that on the whole the residential market of Accra is that for perpetual *de facto* rights in bare lands on which households build houses to occupy; land prices appreciate at a rate just enough to keep up with inflation; 'illegally' traded compulsory acquired lands achieve similar prices and cannot be distinguished from the legally traded ones on any behavioural characteristic of players in the market other than on source of finance; that existing regimes of title documentation, planning and policies limiting choice of tradable interests are not having the intended impact in the market. Thus, the findings contradict many earlier assumptions concerning prices and the purchasing behaviour of the player in the market. Adams and Antwi recommend that the amount of resources consumed by the bureau responsible for land transactions be better utilised in efficiency-enhancing regulation.

On this positive note of resource utilisation, enhancement and management of Adams and Antwi, Cunningham writes in his editorial 'Back-to-Basics in Enterprise Resource Planning' as it relates to human resource implementation, the need for management to be

more educational in its application of business software and the need to maintain an ongoing enhancement to remain viable. There has to be a better employee and management education regarding the functionality of an enterprise resource planning system, and the business philosophy in a computer-based management environment. Such ongoing education should focus not only on transactional functionality, but also on the business benefits that can accrue from the system. For this reason, systems must simplify their implementation and customisation to generate interest and enhance value.

Like all modern technology, computer-based management systems must be easy to use, and easy to change. The value system of the information-age manager is grounded in a commodity-based economy where commodities are rapidly defined as out of date and easily disposable. So, whether one is defining and measuring *sustainable development*, grappling with solutions to dietary nutrients in Africa by employing the food multimix concept, analysing the biodegradation of total petroleum hydrocarbon in Jordan petroleum sludge, agonising over public service atrophy in Zimbabwe, benefiting from direct foreign investment in India due to the economic reform measures by the government and demystifying the land ownership transaction in Ghana or in Africa for that matter, all these endeavours must not only be sustained but must be maintained, otherwise the concept and reality of 'development' will remain a pipedream.