



Constructive Connection Using Integrated Knowledge Beneficially

We live in an age of ever-growing, increasingly precious information. Significantly, such information about diverse knowledge domains can often be productively interconnected. Accordingly, adolescent learners, whatever their field: Science, Social Sciences, or Management, must necessarily be acutely *aware* of this valuable interconnectivity with its evident practical implications for their education, careers, and lives. An understanding of ergonomic solutions, to cite an example, could lead to less stressful lifestyles with increased efficiency for students.

Integrated knowledge is a welcome boon for improving our daily lives and a powerful tool for problem-solving. Admittedly, difficulties do exist in our personal, academic, or social lives, but there are clear signs of optimistic answers through constructive application. For instance, this year we have seen that positive intention, departmental collaboration, and pragmatic management by the government have largely eradicated the electric power shortage that had plagued Kathmandu Valley for long. Similarly, the right direction generally taken by Nepalese citizens for rebuilding damaged public areas and agreeing to new housing is also praiseworthy.

All students need to realize this useful interconnectedness of knowledge. Their interest in and grasp of this truth can lead them out of difficulties towards efficiency, comfort, and gain - hence, progress! Issues related to the global environment, and obvious climate change in our country such as more forest fires in the Himalayan hills or the lowered groundwater table of the Valley alongside this year's relatively dry winter, need the attention of our educated youth who should look for proactive, preventative, or curative remedies for right action. Once aware, we need to change our habits to save our habitat as we search for sustainable solutions.

The Trinity SciTech-&Mgmt Expo is an open platform for high school students to connect, explore, share, and apply learned concepts & acquired practical skills. Outstanding exhibits that need mention included a *wind power generator* and a *vehicle using drone technology*. Additionally, the Expo creates an engaging atmosphere for collaboration amongst students and academic institutions. The event is definitely a step forward in the true education of these scholars. Surely, modern educational institutions demand flexible yet interlaced learning systems that unfailingly embrace the interconnectedness of people, places, and things. Our Expo is a venture towards this end.

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Who Prosecutes Writers?

Prof. Dr Abhi Subedi

In this short essay I want to remember a Nigerian writer who became a martyr for the cause of preserving nature and defending human rights. I want to present the narrative of my meeting this writer and other associations here. It will be important for students and academics to be reminded of questions like this. Ken Saro-Wiwa keeps returning to my memory whenever I think of how a writer living in any part of the world fights for a writer's freedom, and the freedom of the people who seek justice. Dictators prosecute them. The Nigerian dictator Sani Abacha supported by a corrupt military junta imprisoned and killed this writer of great integrity and courage Ken-Saro-Wiwa in 1995 for his stand against the brutal regime and their attack on the ecology and the very verve of life. He campaigned against oil pollution and repression on the Niger Delta. The world condemned this killing. Saro-Wiwa became a symbol of writer's courage, sensitivity and ability to achieve something other than producing written texts.

I could not believe my ears when I first heard this name on the BBC radio. It was the same writer whom I had met at the Cambridge literary seminar organised by the British Council in July 1988. I checked his photo that I had taken over the green of Cambridge. It was the same writer brimming with life, love, energy, courage and creative power. I had exchanged a few letters and cards with him while he was still in London. He had a small press and an apartment in London. He had invited me over to visit him in London, but I could never make it. I had some other programmes fixed for me by the British Council at that time.

Ken called the Nigerian variety of English that he used in his novel corrupt English, a term he loved to use by way of joking perhaps. But later I realised how he was satirically echoing the expressions of the English language critics for the kind of language used by the non-Anglo-American writers.

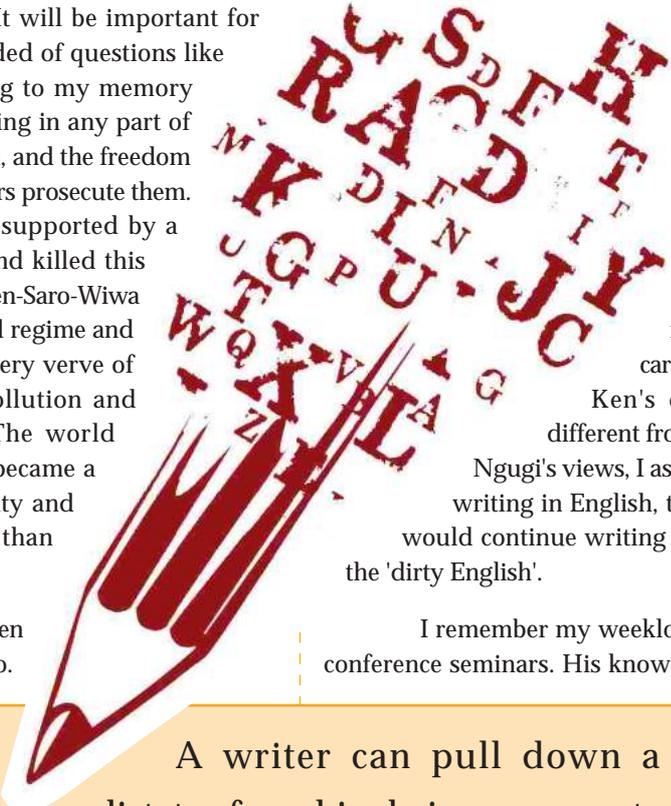
As regards the use of English language he did not agree with some eminent African writers like Ngugi of Nigeria who

was calling for the abolition of the English Departments. Incidentally, Ngugi had been visiting Edinburgh a few weeks earlier and had given a seminar on the abolition of English departments. The professors who he had met and discussed, especially Prof. Alan Davies who had also been the Head of the Central Department of English, Kirtipur in 1969-71, asked my opinion about it as a non-native teacher who made his career at the department of English. Ken's opinion about English was different from those of Ngugi. Referring to Ngugi's views, I asked Ken if he was going to stop writing in English, too. He said he would not, but would continue writing in his own variety of English, the 'dirty English'.

I remember my weeklong friendship with him at the conference seminars. His knowledge about Nepal was nearly the same as that of some of my Western and Nigerian friends. To him Nepal was an exotic land, a pristine sphere that needed to be saved. Making announcements at the closing of the Cambridge Seminar, he spoke what he called his 'thrill' about meeting me. He called me a man from a land where 'a woman keeps more than one husband

simultaneously'. He did not bother to ask me how widespread the practice was until later when I told him that it was a matter of the past. He said, 'no, it can't be possible, you must be one of the several husbands of a woman', and laughed. He had that tremendous sense of exuberance, humour and vivacity that I have always found with my African friends who I made friends with some twenty years ago at Edinburgh University itself.

When I read about the islands to save the ecology of which he died, they came to my imagination as exotic and beautiful. The



A writer can pull down a dictator from his chair; can recreate the ecological diversity in human and linguistic terms; can create a surrogate universe and leave it for the readers who relive those experiences intensely lived and felt by the writer.

pristine islands with their shores and beaches washed by the sea waves, birds rising above the sand beaches below the sun that is rising at the far offing, haunt my imagination as the exotic Himal and the pristine life in Nepal would have haunted Ken's imagination.

But since Ken was executed the question that has occupied my mind is writer's courage and power and the power-holders' hostilities towards them. A dictator always wants to kill a writer because he or she does threaten his regime. A writer can pull down a dictator from his chair; can recreate the ecological diversity in human and linguistic terms; can create a surrogate universe and leave it for the readers who relive those experiences intensely lived and felt by the writer. Non-democratic forms of governments have always been against the writers because they have questioned the very basis of their power, the destruction of all the life giving sources--ecology and women and those who uphold their cause.



Writers have challenged basically two aspects of dictatorship--creation of a fanaticism of any sort and political control over the freedom of expression. The control mechanism of the dictators extends to the persecution of people who speak and write freely. Very importantly, the dictators and fanatics attack the very verve of life, represented by the ecological atmosphere and women. Even individuals who have such streaks of feelings tend to destroy the ecology and suppress women's voice and use violence against them. In a land with a great deal of natural diversity like Nigeria, the destruction of the ecology thus had a symbiotic relationship with the destruction of a writer. Nature's rebellion is expressed through the writings and sacrifice of a writer just as the freedom of expression becomes articulate in a literary writer's works.

But some writers accept the hegemony espoused by the dictators by accepting the cultural construct created by them by granting writers a limited degree of autonomy. Nepal has been such a case. Through the entire Rana regime (1846-1950) and the Panchayat non-party system (1960-1990), Nepali writers have always made tacit agreements with the regimes and expressed

their voice.

Ken Saro Wiwa's martyrdom did wake up the world to the very sensitive question of freedom that is more complex than realised earlier. The dictators operate with a great deal of subtlety than realised earlier. Their operations have always been dismissed as the acts of brutal philistines and their decisions are always casual. But that is not the case. The dictators are more sensitive to the question of the sources of power of the writers. They systematically destroy those resources of creativity. They also do so by creating intelligentsia that operates quietly against the freedom of writers. Even intellectuals who are very nice and sensible might fall into such traps. The intricate working of the hegemony itself creates a situation where the writers are persecuted.

Ken Saro-Wiwa had links with the wider world through the medium of his writing and his wide contacts with writers in Africa and the West. But writers who are not known to the world outside, are being persecuted by dictators in different places.

What does it mean to defend a writer's freedom?

Does it only mean to speak for one individual who did not receive a chance to speak in his or her 'eccentric' ways? I think to defend a writer's freedom and his or her life means to defend two things. One is our inner power that each one of us uses to defend the freedom. A writer evokes this creative power. When many individuals come together they evoke this very inner sense of power and create organisations and forces in opposition to the dictatorships, discriminations and ecological destruction. The second thing is that the writers evoke through their writings the creative myth that we need at every meaningful turn of our lives. Therefore, those who defend the freedom of expression always defend the writers' freedom. But I do not want to confuse here those writers who are created by the dictators and are anti-democratic in their sensibilities. I have in mind the writers who defend human freedom in the above sense. Ken Saro-Wiwa was one. I pay tribute to him. ■

Biological Invasion

An Emerging Threat to Biodiversity and Environment

Bharat Babu Shrestha, PhD

What is biological invasion?

Physical environment such as soil and climate vary from one continent to another on the earth surface. These environmental factors and evolutionary history of the continents also affect the origin and distribution of living organisms. According to Darwin's Theory of Organic Evolution, new species evolve over the time which differs from one place to another. This has resulted into the difference in species composition from one continent to another. For example, kangaroo is found only in Australia while one-horned rhino is found only in Asia. Sal tree (*Shorea robusta*) is found only in South Asia. A species is said to be native for the region where it evolved and naturally found. Geographic barriers such as ocean and high mountains prevent natural dispersal of species across continents. For example, movement of terrestrial animals from Asia to Australia or America is not possible due to presence of ocean between them. However, human civilization and technological development have made possible the movement of organisms from one continent to another. Some of the species were introduced outside their native range of distribution by human due to their use value. Potato, maize and tomato are native to South America but they were introduced to Europe, Africa, Asia and Australia as food. Lantana (*Lantana camara*), a native of South America, was introduced to other continents for floriculture purpose due to its attractive flower (Figure 1). However, some species were introduced accidentally when ships moved from one place to another. Rat is native of Asia but it was introduced accidentally to Australia and New Zealand. Parthenium (*Parthenium hysterophorus*) is native of Central and South America but introduced accidentally to Asia when wheat lots containing seeds of parthenium was imported from Mexico. All species introduced intentionally or accidentally outside of their native range by human are considered

Biological invasion is an unintended outcome of human movement and trade across continents. This has emerged as one of the major causes of the biodiversity loss.



Figure 1. *Lantana camara* is one of the worst invasive alien plant species in the world

'alien' (or 'exotic') to the introduced range. Therefore, rat is alien for Australia but native for Asia; lantana is native for South America but alien for Asia; potato is native for South America and alien for Asia.

Some of the alien species are valuable in the introduced regions. Potato and maize are among the major agriculture crops in Asia and Europe where the species are alien. However, some other alien species have been causing devastating ecological and economic damage in the introduced region. Annual economic loss due to alien rat in USA is about nineteen billion US dollar (Pimentel *et al.* 2005). Alien species were responsible for extinction of 30 species belonging to amphibian, reptiles, birds, mammals and plants in Australia and New Zealand (Bellard *et al.* 2016). These harmful alien species are considered as 'invasive'. According to the Convention on Biological Diversity (www.cbd.int) "Invasive alien species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health". Therefore, the process of introduction of organisms (by human whether intentionally or accidentally) outside of their natural (or native) distribution range, their establishment, and subsequent rapid spread in introduced range with negative impacts on environment and health is called biological invasion.

Why does a species become invasive?

All alien species are not invasive and thus not harmful. Rather, many of the alien species are important resources for humanity. A large number of species in agriculture, forestry, horticulture, floriculture and aquaculture are alien. These species seldom spread beyond the area of their cultivation or introduction. Maize and potato have been cultivated in Asia since long but these plants have never spread out of the agriculture land. No one has seen maize population growing in the forest or grassland in Asia. However, there are some other species which have escaped out from cultivation and spread their population rapidly in natural ecosystems. Lantana was introduced as ornamental plant in Asia but unfortunately it has spread to nature and become a serious weed in forest and pasture. Then the question is why some alien species become invasive and others not? Scientists are trying hard to answer this question and a number of hypotheses have been proposed but universal rule has not been discovered yet. A classic among them is 'enemy release hypothesis'. According to this hypothesis, in species' native distribution range, their population is controlled by co-evolved pathogen, predators, etc. These species are introduced alone into new region leaving back their pathogen and predators at home. Therefore, these species remain free from natural enemies in the introduced region and thus become more competitive than native species whose population is controlled by co-evolved natural enemies. Another argument is that the invasive

alien plants produce secondary metabolites and release into the environment which are toxic to the native species and prevent their growth. This phenomenon is called allelopathy. There are also some characters common to most of the invasive plants and animals. Invasive plants 1) produce large number of small seeds which can survive for several years in dormancy, 2) have short juvenile (vegetative) and long reproductive stage in life cycle, 3) can survive under wide environmental conditions (e.g. temperature, moisture, soil pH, etc), 4) can tolerate disturbances, 5) have high leaf nitrogen content and thus high rate of photosynthesis, and 6) synthesize toxic secondary metabolites to repel herbivores and prevent growth of other plants. Invasive animals generally have high reproductive output and wide foraging behavior. However, presence of any of the above characters does not ensure invasiveness of the alien species.

Impacts of Invasive Species

Invasive species, as mentioned above, have negative impacts on biodiversity, ecosystems, agriculture production, infrastructure, health, etc. In human history, the rate of species extinction is currently the highest and the biological invasion has been considered as the second major factor for biodiversity loss next to the habitat destruction and degradation. In agriculture, invasive species increase labor for weeding and reduce farm productivity. Global economic loss due to biological invasion has not been estimated precisely but efforts have been made to estimate economic loss due to this process in some countries. Annual economic damage has been estimated to be US \$ 120 billion for USA (Pimentel *et al.* 2005) and UK Sterling Pound 1.7 billion (Williams *et al.* 2010). Between December 2001 and October 2003, the economic loss due to invasive species was US\$ 14.45 billion (Xu *et al.* 2006). During financial year 2011/2012, the economic cost of invasive species for Australia was estimated to be AUS \$ 13.6 billion (Hoffmann and Broadhurst 2016). Unfortunately, similar estimation for most of the other countries including Nepal has been lacking. Invasive pathogen is also threatening health of wildlife as well as human. Spread of invasive chytrid fungus has been responsible for worldwide decline of frog population. Avian malaria is considered responsible for extinction of at least ten native bird species of Hawaii, USA. Invasive plants like parthenium can cause severe skin allergy to human.

Negative impact of invasive alien species is already massive both in developed and developing countries. Unfortunately, the impact is likely to further increase in future with increasing movement of people across the continents and globalization of trade. Climate change is also likely to have positive impact on the process of biological invasion, thus making the situation worse. Invasive species are spreading even in arctic region recently due to increasing number of research and adventure expeditions.

Management of Invasive Species

Management of invasive species is highly challenging in the context of globalized trade and human movement. As a rule, prevention of the introduction of potentially invasive species is the most cost effective way of management. However, this appears to be nearly impossible in this globalized world. Live organisms and agriculture produces have been transported from one continent to another taking only a few days. This has increased the chances of hitch-hiking the unintended weeds and pests. Quarantine inspection for the entry of unintended organisms is not effective in many countries. The other steps of management are eradication and control. Eradication involves

complete destruction of the population and individuals of the invasive alien species. This can be effective if invasive species is identified at the early stage of colonization. If invasive species establishes its populations at multiple locations covering large areas, eradication would not be practically possible and in that situation 'control' is the only option left. The main objectives of control of the invasive species is to prevent or slow down the further spread of the species to new habitats, and reduce abundance in previously invaded areas. Control can be done by physical, chemical and biological methods. Physical method involves removal and use of the biomass of the invasive plants and animals so as to reduce the abundance and reproductive output of the species. The practice of removing biomass of water hyacinth from Phewa lake of Pokhara valley is a physical method of control. This method is labor intensive and not practical in the region where laborers are expensive and invasion is widespread in natural habitats. In chemical method, selected pesticides are used to destroy the population of invasive species. Due to environmental pollution and negative side effects, chemical method is generally not recommended. Biological control method is considered the most sustainable way of the control of invasive species. In this method, specific natural enemies such as pathogen and pests of the invasive species from their native region are carefully selected and released into the introduced range of the invasive species. These natural enemies are called biological control agents. Before these agents are released, there is a need of quarantine assessment to make sure that the biological control agent of a particular invasive species does not harm any native species. For example, leaf feeding beetle *Zygogramma bicolorata* (Figure 2) is a biological control agent of invasive weed



Parthenium hysterophorus, and the beetle collected from Mexico has been released into Australia, Africa and Asia to control this weed. The beetle selectively feeds on the leaves and young flower buds of *P. hysterophorus* thereby reducing growth vigor and seed output of the plant. This beetle does not feed on any of the native species of Australia, Africa and Asia.

Figure 2. Leaves of *Parthenium hysterophorus* damaged by larvae and adults (inset) of *Zygogramma bicolorata*.

Invasive Species in Nepal

In Nepal about 200 alien species of plants have established their self-sustaining population and 25 of them have been reported as invasive. [Note that many of the alien crops such as maize, potato, etc. have not established their self-sustaining population and thus have not been included in this number]. Most problematic invasive alien plants of Nepal are Crofton weed (*Ageratina adenophora*), Siam weed (*Chromolaena odorata*), lantana (*Lantana camara*), Mile-a-minute (*Mikania*

micrantha), water hyacinth (*Eichhornia crassipes*), parthenium (*Parthenium hysterophorus*), Blue Billy goat (*Ageratum houstonianum*),

biological invasion (Paini *et al.* 2016).



Ageratina adenophora



Chromolaena odorata



Mikania micrantha



Ageratum houstonianum



Eichhornia crassipes



Parthenium hysterophorus

Figure 3. Major invasive alien plant species of Nepal

etc (Figure 3).

There are 65 species of alien animals in Nepal but their invasiveness has not been assessed. However, a few species like African giant snail (*Achatina fulica*), tilapia fish (*Oreochromis mossambicus*) and tomato leaf miner (*Tuta absoluta*) are clearly invasive with significant negative impacts on native species and agriculture (Figure 4). Due to weak quarantine inspection and lack of management, the number of invasive species and the areas infested by them have been continuously increasing in Nepal. Currently Nepal is importing huge amount of food grains, vegetables and fruits from different continents of the world. This has increased the vulnerability of Nepal to biological invasion. A recent global assessment of agriculture sector has ranked Nepal to the third position among the countries with high risk of



African Giant snail



Tilapia fish in Begnas lake, Pokhara

Figure 4. Two of the invasive animals in Nepal

Conclusions

Biological invasion is an unintended outcome of human movement and trade across continents. This has emerged as one of the major causes of the biodiversity loss. In addition, annual economic loss due to biological invasion is billions of dollars in agriculture, forestry, health, etc. In the context of climate change, the extent and impact of biological invasion is likely to increase further in the future.

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Green Economy

Ecology in Business and Management

KP Upadhayay

Introduction

For a business unit, an environment refers to surroundings which impact business whereas ecology focuses on the interaction of business stakeholders with other organisms including abiotic factors in that environment. An ecosystem is the basic unit of ecology. A business ecosystem is connected with the abiotic factors of the environment. Abiotic factors can include water, light, radiation, temperature, humidity, atmosphere, climate, and soil. The nature of business differs due to such factors. A wool business cannot be sustainably set up in a hot and humid climate as animals like sheep may not be comfortable enough to survive. An apple industry can be profitably sustained in places like Jumla or Mustang having a favorable climate. Mountaineering is successfully handled by Sherpas because of their hardiness, expertise, and experience at very high altitudes. For any business to be sustainable there needs to be a natural balance between the interaction of people, climate, and availability of resources. Figure 1 shows how factors of ecology

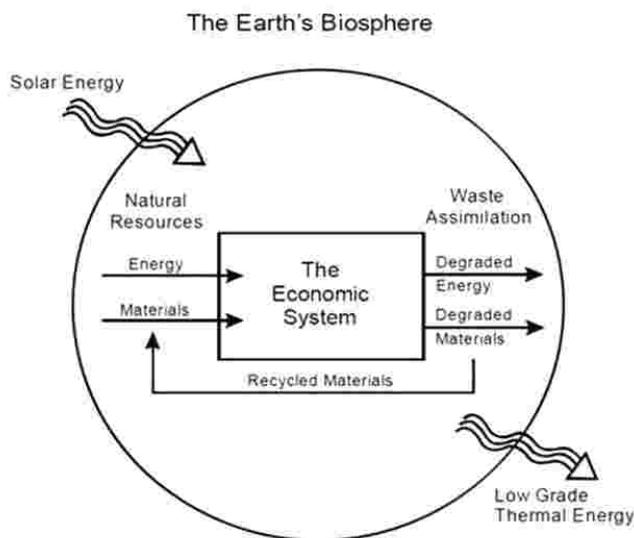


Fig.1 Ecology and Economy

are used as a means of production in an economy alongside the release of wastes beyond the absorption capacity of the environment. This article focuses on the connection of business and management with ecological factors, its impact, and recent developments about the responsibilities of business units towards ecology including the environment.

Environmental and Ecological Issues

Business houses might have maximized wealth but have made so many wounds in nature. Some of these wounds are climate change, global warming, the green house effect, ozone layer depletion,

pollution, and floods. Climate change has environmental, social, political, and economic repercussions. Extreme and unpredictable weather conditions, floods, droughts, rapid snowmelt, and rising sea levels are among the major climate change challenges for business operations, and have direct implications for commerce globally. Drought has been seen as a major risk for farmers in agricultural countries. Unplanned industrialization, haphazard disposal of industrial wastes, and carbon emission have degraded industrial ecology. If this continues to happen for some more years, the situation is sure to worsen. New Age business and management practices involve sustainable measures to mitigate problems arising out of the current situation. Researchers now advocate that the quality of human life and good ecology, in addition to economic prosperity, are the real wealth of nations. Since a few decades the world has faced serious ecological and environmental consequences of profit-centered economies. The time has come to move towards a green economy.

Green Economy

The UNEP has defined a green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient and socially inclusive" (UNEP, 2011). The Green Economy aims at sustainable development, poverty eradication, and a better quality of life within the ecological limits of our planet. It is being practiced all over the world. The Oro Verde Scheme in Chocó region of Colombia uses traditional panning techniques to separate alluvia from gold by using a plant mixture. Profits made from 'green gold' are used to fund community development. Jordan has signed a Memorandum of Understanding (MOU) on Green Economy Strategy with the UNEP for increased investments in green sectors. Kenya and Tanzania prepared a Renewable Energy Policy supported by the UNEP to mitigate diesel-based energy consumption by developing micro-hydro plants. Least Developed Countries (LDCs), like Nepal which has low carbon emission and abundant natural resources, are presently in a better position than developed countries insofar as adopting a green economy. The pathway towards the UNEP's Green Economy for Nepal can be possible through a constructive interconnectedness of agro-ecological farming, hydroelectricity, eco-tourism, forestry, and information technology. Carbon emission resulting from hydropower development is very little or negligible here. Water needed is ours: It depends on our commitment to do what is necessary. Agro-ecological farming includes the practices of applying ecological techniques to the designing and management of sustainable farms as against the current use of health-harming pesticides and other chemical inputs. Aligning green economic policies in the forests of hills and mountains of Nepal can be helpful. Our journey towards a green economy

could begin by initiating eco-friendly economic policies and effective mechanisms to control the finance sector in public interest, commitment to reduction of income inequality, creating *green jobs*, shifting towards electric transportation, and investing in technologies to combat ecological imbalances. It may take time to reach a comparable position but commitment is what matters the most. The Government of Nepal conducted a workshop to discuss how to protect natural resources while improving the livelihood of the rural poor and presented its report entitled, "Environments of the Poor in the context of Climate Change and the Green Economy - Government of Nepal". In days to come, we can expect tangible steps to be taken by stakeholders regarding the essence of the Green Economy. Green economic growth is possible through green technological transformation which includes green energy, green chemistry, green buildings, and green nanotechnology in addition to green management and office practices by business units.

Green Management and Green Office Practices:

An eco-friendly business follows green management and green office practices. Business houses are required to develop low carbon products and supply chains, engage with stakeholders for joint action against ecological challenges, and improve energy efficiency by an increased use of low carbon energy. They can systematically renew natural resources and minimize waste and pollution. A number of variables have been used to identify and assess environmental responsibility, including the existence of pollution abatement programs, the extent to which an organization conserves natural resources, involvement in voluntary environmental restoration, eco-design practices, and the systematic reduction of waste and emissions from operations. Business units can get certification concerning environmental standards, conduct environmental or energy audits, report on energy savings & sustainable smart green industrial and factory premises, and show their commitment to climate changes initiatives. They can contribute to socially responsible projects like the Bagmati Clean Campaign, comply with the legislation for sustainable practices, engage in green banking regulations, and support forest governance. This is how a company or corporation can turn out to be beneficial by sharing its profit for the betterment of society and the environment instead of being merely profit-centered. For instance, Facebook has recently opened a data center in Texas, which is powered entirely by wind energy.

Green offices stipulate that owners and managers should be responsible towards the environment and society. They can use recycled, eco-friendly, and sustainable business products including paper. They can incorporate design, construction, and operation practices that significantly reduce, or eliminate, negative impacts on the environment and its occupants. Green offices can adopt a whole host of measures or practices like the purchase and activation of "Energy Star" energy-saving electronic equipment, give preference to locally manufactured supplies, store electronic reports rather than paper reports, ask their employees to bike, walk, or take public transportation or share carpools, have indoor plantations in office spaces as these act as filters that suck pollutants created by computer equipment while also cooling the air in offices, work with executives to implement a recycling system, encourage green meetings, agree to green purchasing habits, and use online tools for video-conferencing. All these measures save considerable money and

greatly lower the carbon footprint associated with traveling to meet persons or to do business. Business units can contribute towards the upkeep of the environment through eco-friendly measures by incorporating such green practices and through the means & measures comprising *corporate social responsibility*.

Corporate Social Responsibility

Corporate social responsibility (CSR) refers to business practices involving initiatives that benefit society and the environment. The primary focus of corporate social responsibility is the environment. Any steps they can take to reduce carbon footprints are considered both good for the company and society as a whole. It has been a part of implementation and disclosure requirement in most countries. Ecologically-responsible companies have begun activities towards environmental preservation. Consumers have begun to be aware of contributions made by companies through CSR mechanisms which will impact all business ventures in the long run. CSR is not mandatory in Nepal and its practices are still voluntary though recommended. Regrettably, very few of the banks and big business houses have reported CSR activities. We have a long way to go before we implement CSR practically.

Conclusion

We are still in the whirlpool of political transition and a green economy is a distant dream . . . Ecological imbalances can seriously impact business activities. Climate change is bound to have a negative impact on agricultural and production operations. It is vital to set up support funds to encourage social- and environmental-oriented small- and medium-sized enterprises. Meeting green economy targets requires a large-scale shift from the ongoing spending on fossil fuels to going in for capital investments in clean energy technologies. Businesses can accelerate this transition by aligning their investments with eco-friendly equipment, green management, and green office practices. Business cannot be sustainable unless they are aligned with the basic motive of a green economy to preserve ecology and the environment.

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Information & Communication Technology

Satya Bahadur Maharjan

Information and Communication Technology (ICT) is the combination of communication devices and computer-related tools like software, middleware, storage, and audio-visual systems through which users can easily access, store, transmit, and manipulate information.

ICT has brought significant changes in the world economy and has greatly helped to improve knowledge, boost productivity, and save the time, energy, or money of people. ICT tools like audio visual conferences, teleconferences, or TV applications are used extensively.

- = 1971: Introduction of computers in the country for censuses (IBM 1401)
- = 1974: Establishment of an electronic data pricing center
- = 1985: Distribution of personal computers in Nepal
- = 1990: Liberalization of the import of equipment
- = 1992: Establishment of the Computer Association of Nepal
- = 1996: Establishment of Ministry of Science & Technology
- = 1998: Establishment of Nepal Telecom Authority
- = 2000: Announcement of its first IT policy: "IT policy 2000"
- = 2001: Establishment of the National Information Technology Center (NCIT)
- = 2003: Launching high-level information technology communication
- = 2004: Electronic Transaction Ordinance 2004
- = 2006: Electronic Transaction Act Oct, 2006
- = 2010: Announcement of IT policy, BS 2067

Notably, ICT can be implemented through integrated knowledge in diverse fields such as education, science, research, commerce, management, government, health, agriculture, or tourism

ICT in Education

ICT in education is not simply about teaching and learning to operate the technology available but also knowing and building a digitized and networked society. To this end, the National Centre for Educational Development (NCED) has been providing training to teachers through National Radio and FM stations. The Master Plan (2013-2017) of the Ministry of Education (MoE), Government of Nepal, covers five major sub-sectors of education, namely: School Education, Higher Education, Teacher Education & Training, Continuing Education, and Life-Long Learning. The MoE has implemented some of the programs related to ICT in education. They include: one Laptop per Child (OLPC) pilot project in 26 selected schools of six districts; Lab model in the computer sharing mechanism project in some schools, internet connectivity of District Education Offices and schools, and computer labs with internet connections to local ISPs.

ICT in Health

Health care problem-solving uses information and communication technology. Telemedicine, e-Hospitals, online registration, online doctor's appointments, and tele-presentations are some significant ICT applications in the health sector. The Health Service department, Ministry of Health, has launched telemedicine in 30 districts of Nepal. The SAARC Telemedicine Centre in Nepal was established at Patan Hospital on 21 January, 2011, with assistance from the Government of India under the SAARC Telemedicine Network Project.

ICT in Agriculture

ICT in agriculture can be implemented for key updates about market rates, weather forecasts, crop insurance, use of pesticides, seed quality, improved tools, and methods of farming through mobiles and the Internet. E-learning sessions can also be conducted to bridge the gap between farmers, research officers, markets and the Government.

ICT in Governance

The process of delivering the functions of governance, and achieving results, has been made easier through the utilization of ICT inputs. Likewise, several e-government initiatives have begun, for example: the Integrated Voters' Registration System, Document Management System, Financial Management System, District Expenditure Control System, Automated System for Customs Data, PAN Registration System, VAT Assessment / Collection System, Income Tax Assessment / Collection System, and Revenue Accounting System to name a few. In Nepal, we do need to speed up the implementation of ICT in governmental functioning.

Challenges

In spite of national commitment, we face many challenges. These include:

- = Lack of interactive and hardware facilities
- = Lack of policies, strategies, schemes, monitoring, and control
- = Lack of awareness about ICT usage and services offered
- = Illiteracy among people
- = Few ICT-based courses / skills taught to school students
- = Lack of skilled ICT manpower
- = Community-based participation not being fully encouraged
- = Content development to be more participatory and situation-relevant
- = Bandwidth constraints

Conclusion

Today, ICT encompasses both the width and depth of knowledge needed for human benefit and is an absolutely essential technology to integrate ideas or facts, unearth insights, and even make predictions because of its powerful digital tools that are swift, accurate, and easy to handle. ICT integrates, interconnects, and utilizes such ever-evolving valuable modern knowledge for the common good.

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Ripple Effect

Since the Nepali rupee is pegged to the Indian rupee, the note ban could affect Nepal

CA. Surya Bhakta Pokharel and CA. Bishnu Bhandari

When a currency unit is demonetised, it stops being legal tender. The policy causes immense restriction and discomfort to the economy and people. On November 8, Indian Prime Minister Modi announced that 500- and 1,000-rupee notes were being pulled out of circulation. People were given 50 days to deposit them in their bank accounts or exchange them for new notes at banks and post offices. The main objective, the government said, was to eradicate black money, combat corruption, counter tax evasion and destroy counterfeit bills. India has demonetised its banknotes twice in the past, in 1946 and 1978. But there was little disruption then as the scale of the economy was small unlike today.

Banknotes of 500- and 1,000-rupee denominations make up 86 percent of the cash in circulation in India. Most transactions are cash-based and only half of the Indian population has bank accounts. The formal and informal economies are not isolated from one another but form a seamless value chain. The informal economy accounts for 45 percent of the GDP and 80 percent of the workforce.

The good and the bad

Against this backdrop, the government's demonetisation move has a tremendous impact on the Indian economy. A lot of cash-based consumer transactions have ground to a halt. Sales of consumer goods have plunged one-third. The ATM network has been hit by total chaos while the central bank struggles to print replacement currency. The construction industry has suffered with significant wage implications for its workforce. People are scrambling to pay for goods and services, which means the cash shortage will likely take a big toll on the country's growth and output. Consumption makes up for around 59 percent of India's GDP, hence, a drop in spending will pull down growth.

The good news is that demonetisation has eliminated fake money in circulation, black money has been entered in the account books or destroyed, the GDP has received a boost with IRs12.44 trillion being deposited as of December 13 according to the Reserve Bank of India (RBI) and economic activity has speeded up due to a drop in lending rates. Moreover, all that money entering the economy will help to reduce the fiscal deficit. Advances in technology have allowed economic transactions to be conducted digitally, paving the way towards a paperless economy. The move is likely to lead to better tax compliance, raise the tax-to-GDP ratio and improve tax collection, leading to lower borrowing and better fiscal management.

Unique relationship

Nepal has a peculiar relationship with India. The Nepali rupee is pegged to the India rupee, and even a slight movement in the Indian economy affects Nepal's economy. An open border, large-scale business partnering and informal transactions in the border areas are some of the major factors causing a direct impact on the Nepali economy. Also, millions of Nepalis working in India play a vital role in the economy. Informal transactions between Nepal and India have been greatly impacted resulting in fewer transactions. Millions of Indian



rupees in cash earned by Nepali workers in India may be stored in rural areas, especially in the far western parts of Nepal. If India's economic growth rate drops, there will be an impact on Nepal's economy too as a lot of migrant workers employed in India might lose their jobs and their earnings might shrink. There will be an impact on the banking sector too, though not directly, as many Indian businesspersons

operating in Nepal who have borrowed from banks may delay repayment or default on their loans. Further, there are a lot of Nepali students pursuing studies in India, and many Nepalis go to India for medical treatment and religious purposes. Nepal Rastra Bank (NRB) buys Rs6 billion worth of Indian currency notes by selling US dollars to be able to provide cash to Nepalis travelling to India for education and pilgrimage.

Lessons for Nepal

Will the world's fastest growing big economy show resilience and regeneration from deep shock therapy or will demonetisation cure the disease? It's a time to wait and see. Positive sentiments injected by government-led by tax cuts could be one of the initiatives. If demonetisation is considered to be a short-term pain and long-term gain for the economy, it will definitely meet the objective.

For Nepalis, this is the time to learn a few lessons. Priority should be given to our own currency. Informal transactions in the border areas should be reduced and passed through banking channels. Cash transactions need to be curtailed, and the country should move towards a paperless digital solution. A self-reliant economy should be developed. As for a short-term solution, it's time for NRB to liaise with the RBI for the exchange of IRs500 and IRs1,000 currency notes lying in the pockets of the Nepali people. If needed, coordination should be conducted at the government-level as the Bhutanese government has done. ■

Trinity SciTech-&MgmtEXPO

Exhibitions-cum-Competitions *Getting Things Done*

January 30, 2016, (Magh 16, 2072) Kathmandu



REVIEW

Joining the Dots

Reinforcing curricular knowledge acquired through text books through experiential learning is the need of modern interconnected education. Expos and competitions provide excellent opportunities for integrated learning and team work because of multi-disciplinary projects jointly prepared by students. This, in turn, greatly enriches their academic experience and practical knowledge.

The *Fifth* Trinity SciTech-&-Management Expo 2016 (January 30, 2016 - Magh 16, 2072 BS), inaugurated by Prof Dr Jiba Raj Pokhrel, Vice-Chancellor, Nepal Academy of Science & Technology (NAST), enhanced student cooperation, team spirit, and healthy competition among different + 2 and A Level colleges in Kathmandu valley. Prizes and certificates were awarded by Dr Bhawani Shankar Subedi, National Programme Manager, SKILLS Programme, MOE, Govt. of Nepal, & UNDP.

The fine projects exhibited in this Expo were about various pertinent issues relating to energy (renewable & green), information technology, health, and the environment among others. This Expo attracted 17 competing projects from 13 colleges in the Inter-College SciTech Competition, 6 science projects in the Intra-College SciTech Competition, and 22 projects in the Intra-College Management Exhibition-cum-Competition.

Above all, our Expos provide a dynamic and interesting atmosphere for participants, students from varied academic institutions, and visitors. They invariably focus on key themes, and also emphasize the effective use of intra-disciplinary as well as inter-disciplinary knowledge.

We welcome all to the Expo 2017!



Participating Colleges in the Trinity Inter-College SciTech Exhibition-cum-Competition 2012-2017

- Budhanilkantha School *2012, 15*
- Campion Academy *2013, 14*
- Canvas International College *2012, 15*
- GEMS Institute of Higher Education *2014, 16*
- Golden Gate International College *2013, 14, 15, 16, 17*
- Grammer Public H S School *2013, 17*
- Guinness International College *2012*
- Himalayan WhiteHouse International College *2012, 14*
- Kanjirowa National School *2012, 15, 17*
- Kathmandu BernHardt College *2014*
- Kathmandu Model H S School *2012, 13, 14, 15, 16, 17*
- KIST College *2016, 17*
- Liverpool International College *2014*
- NASA International College *2013, 14, 17*
- Nepal Mega College *2013*
- Nobel Academy *2012, 13, 16*
- Pentagon International College *2013, 16, 17*
- Sainik Awasiya Mahabidhyalaya *2015, 17*
- Saipal Academy *2012*
- SOS Hermann Gmeiner H S School *2013, 16*
- Southwestern State College *2012, 13, 14, 15, 16, 17*
- St. Lawrence College *2015, 17*
- St. Xavier's College *2012, 13, 14, 15, 16, 17*
- St. Xavier's School *2015, 16*
- Times International College *2017*
- Trinity International College *2012, 13, 14, 15, 16, 17*
- Uniglobe HSS/College *2016*
- Universal College *2012, 13*
- VS Niketan College *2014, 15*
- Xavier International College *2013*