



BUILDING INDIGENOUS KNOWLEDGE CAPACITY FOR DEVELOPMENT

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Abstract: The aim of this paper is to highlight the importance of Indigenous Knowledge (IK) in development. The paper focuses on the role that IK and local cultural values play in the process of development. Currently, knowledge, information, science and technology used in development are produced in developed countries without heed being paid to their impact on the local environment. IK, although often short-shirted, establishes a harmonious relationship between the social system and the environment in any given developing countries. Access to global knowledge is vital for supporting IK as well as for sustaining development.

Keywords: indigenous knowledge; development; globalisation; technology; environment; poverty; capacity building.

INTRODUCTION

The aim of this paper is to highlight the importance of Indigenous Knowledge (IK) for fostering economic growth and sustaining development. The paper focuses on the role that traditional knowledge and local cultural values play in the process of development. Recent literature on development studies considers knowledge as a key resource that can alleviate poverty, promote innovations, enhance competitiveness and create wealth. The new economy driven by globalisation is a knowledge-based economy, which requires a country to build knowledge capacity with a view to increasing productivity and cultivating new opportunities offered by globalisation.

Sustaining development underscores the importance of cooperation among developing countries to share knowledge and disseminate information. Knowledge and information have the power to accelerate the process of development and stimulate economic growth by strengthening the foundation for building productive capacity through innovation and human capital development. In recent years, the rise of globalisation has given greater access to global knowledge and information, which can be used to alleviate poverty and close the knowledge gap. Development is a complex process of multidimensional factors involving both local and external forces. For instance, the IK-system based on local

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cultural values and environmental features employs IK to accelerate the developmental process. Under such circumstances, national economic policies in these countries must integrate new knowledge into the traditional knowledge system to increase linkages and promote development. Without making use of traditional knowledge, the process of development becomes dependent on technology transfer and Western scientific applications. Knowledge for development must be appropriate in relation to a country's environmental, social, cultural, spiritual and economic landscape.

This paper highlights the relationship between the traditional knowledge system and the modern knowledge system driven by globalisation. Benefiting from the global economy requires building capacity to ensure leapfrogging and sustained development. In this regard, traditional knowledge becomes vital for speeding up the process of transformation and reducing the knowledge gap. Currently, knowledge, information, science and technology used in development are produced in Western countries without heed being paid to the latter's adequacy in relation to the local environment. IK, although often short-shirted, establishes a harmonious relationship between the social system and the environment in any given developing country.

ECONOMIC DEVELOPMENT

During the last few decades, many developing countries adopted Western knowledge through technology transfer, educational programmes, international institutions, non-governmental organisations, industrialisation and training with local knowledge contributing little content. Mistakenly, industrialisation based on technology transfer and Western managerial and organisational skills has been considered as an important step for promoting social and economic development.

However, industrialisation just for the sake of development often results in undesirable consequences including environmental degradation and structural imbalances. Technology transfer and industrial development require specific managerial and organisational skills while often mandating a level of waste disposal and pollution control lacking in most developing countries. Economic development highlights the importance of creative knowledge and effective planning for utilisation of human and physical resources to increase productivity and sustain economic growth. Recent literature on development recognises knowledge as a necessary condition for promoting development and catching up with industrial countries. Beyond sound macroeconomic policies, an effective capacity for absorbing, acquiring and sharing knowledge is the *sine qua non* for building an overall strategy for development. Countries that fail to invest in building capabilities to utilise both local and global knowledge are more likely to suffer from slow economic growth and weak global linkages. The World Bank describes the role that knowledge plays in development this way:

"Knowledge is critical for development, because everything we do depends on knowledge. Simply to live, we must transform the resources we have into the things we need, and that takes knowledge. And if we want to live better tomorrow than today, if we want to raise living standards as a household or as a country-and improve our health, better educate our children, and preserve our common environment - we must do more than simply transform more resources, for resources are scarce. We must use those resources in ways that generate ever-higher returns to our efforts and investments. That, too, takes knowledge and ever-greater proportion to our resources." (World Bank, 1998a)¹

Modernisation theories have adopted western historical experience with development

as a yardstick for measuring economic progress in non-industrialised countries. Economically, such an approach may provide a roadmap for development but cannot be a substitute for the indigenous components of development. As a process of societal change, development is a multi-dimensional concept driven by several other components in addition to economics. Among others, for instance, the cultural, social, environmental, institutional and religious elements of a given society are equally important in impacting the process of transformation. In Latin America, some parts of Asia and Africa, experience with development has not been satisfactory to alleviate poverty, promote economic diversification, encourage industrialisation, improve human development and increase global access. Short-term economic and trade gains arising from the adaptation of Western scientific and technological programmes could produce negative results in the long run owing to pollution, higher prices, migration, health problems and inequalities. The free market economy, driven by capitalistic ideas, is biased towards those with financial capital whereas those with no access to capital suffer from isolation. Economic development, on the other hand, requires public participation by giving people equal opportunity to participate in economic activities. It is a broad-based concept that requires the involvement of all socio-economic groups in society. Economic development is a multi-dimensional concept, which includes social, economic, political, scientific, cultural and environmental forces. During the last several decades, experience with development has proven unsatisfactory due largely to incompatibility of theoretical models and inadequacy of macroeconomic policies. Recent literature on development studies has been greatly influenced by Western development trends and policies. These models imbed a fundamental flaw in terms of their being the basis for devising practical approaches

for tackling the problems of development: it is not possible to separate development from the local environment. Development involves processes of structural reform, which include all aspects of society. In other words, decisions to promote development must take into consideration all factors that impact human transformation, be they cultural, religious, social, environmental, technological, economic or political. Development involves building institutional capacity to facilitate implementation of decision-making and to foster change. To this end, development involves both indigenous and exogenous elements, which influence allocation of resources and determine future growth rates. In particular, the indigenous factors are vital for accelerating economic growth and sustaining development. Traditional knowledge and cultural values represent the core for building a strong foundation that will ensure sustained growth. In most developing countries, the failure of development policies to achieve satisfactory levels of development has been correctly attributed to the neglect of local ingredients in the potpourri of development.

Worldwide, there are about 1.5 billion people surviving on less than one dollar a day and most of them live in developing countries. They live below the poverty line without an ability to earn enough to meet basic requirements to sustain life. A substantial portion of these destitute masses are rural poor classified as being indigenous people. In rural areas, economic activities are limited to agricultural driven mostly by IK and traditional techniques deeply rooted in the cultural and natural forces characterising the community. These groups are also among the most vulnerable owing to the lack of external support and because of marginalisation stemming from living in isolated areas outside national development programmes. What makes life more difficult is the absence of adequate physical infrastructure, education and health

facilities. The opening up of national boundaries involving the introduction of economic globalisation has had very little impact on rural populations. Isolation of indigenous areas from the market economy impedes access to global knowledge and information required to supplement their local knowledge and enhance productivity.

Inasmuch as opportunities from globalisation are available only for those with adequate training and skills to make use of modern technologies to increase learning and enhance market activities, indigenous areas are further prejudiced. Development requires practical and applicable solutions capable of reducing environmental risk and enhancing productivity. However, the trained skill base in indigenous areas is tenuous at best. Establishing networking, partnership and informational exchange can facilitate use of external knowledge to the benefit of indigenous people, provided that there is at least a minimal absorption capacity, by giving them access to practical knowledge.

The concept of sustainable development should not be confined to the relation to the environment only. The United Nations stress the fact that communities must preserve their cultural, social and traditional heritages to bridge the present generations with those of the future. Knowledge of local people provides substantial incentives for creating new methods and creating new knowledge. As discussed by the United Nations:

"The tangible and intangible cultural capital of a community, a nation or a region of the world is something that must be preserved for future generations just as natural resources and ecosystems need to be safeguarded to ensure continuation of human life on the planet. Cultural sustainability implies a development process that

maintains all types of cultural assets, from minority languages and traditional rituals to artworks, artifacts and heritage buildings and sites. It is the creative industries that provide the services and the investments necessary for culturally sustainable development paths to be followed." (United Nations, 2008)²

In recent years, there has been a substantial criticism directed at globalisation. In the case of Thailand, for example, a group of economists who are also promoting the teachings of Buddhist economics have been critical of Thailand's experience with globalisation. As Promta explains:

"To dominate the East, the first step is to convince it that the West is the model of civilisation. Science and technology are other tools used in the process of the westernisation of the east. In an attempt to modernise Thailand over the past three decades, a number of its traditional sciences, such as medical science, and technology have been considered by the state to be irrational and unscientific. A number of traditional doctors in the distant villages, for instance, are prohibited to play the roles their predecessors have assumed for centuries. Traditional medicine has been replaced by modern medicine imported from the West. Who gains and who loses in this economic game? The answer is evident." (Promta, 2003)³

Strategies to close knowledge gaps should focus on three issues:

- 1 What policies foster the acquisition of knowledge?
- 2 What policies enhance a country's learning capacities?
- 3 What policies improve the effectiveness of communications and reduce the costs? (World Bank, 1998a, p.145)⁴

MEANING OF INDIGENOUS KNOWLEDGE

In many developing countries, IK has been viewed as inferior due largely to the adoption by local elites of the concept of Western modernisation. In view of many Western educated economists, development is about giving up traditional systems in favour of westernisation. Indigenous people practising traditional techniques were regarded as uncivilised and incapable of meeting the pace of realities driven by Western development. As Ocholla explains that IK was

“illegitimated, illegalised, suppressed and abandoned by some communities, and the countries and peoples practicing it were condemned and associated with out datedness, a characteristic most people find demeaning. This form of marginalisation produced a generation that for the most, does not understand, recognise, appreciate, value or use IK. Arguably, this situation has produced an intellectually colonised mindset.” (Ocholla, 2007)⁵

Such attitude towards IK by modern economists has encouraged policy-makers not to pay much attention to traditional knowledge in development. In turn, they began to draw on external knowledge without questioning its impact on long-term sustainability of the eco-system and allocation of resources. Mechanisation brought by technology transfer and scientific experiments could provide short-term solutions to alleviate poverty and increase productivity but in the longer term it may jeopardise sustainability by increasing the risk of environmental degradation. Most techniques used in development are alien to the local economy. Elites in developing countries favour a course of development driven by modern knowledge and advanced technology in place of IK of the local community. Yet, initiatives to sustain

development through balanced management of local resources are antithetical to economic development policies predicated solely on external explicit knowledge. To this end, it is the tacit knowledge that needs to be exploited and integrated into the modern knowledge system to ensure environmental control and reduce the risk of marginalisation.

The idea that knowledge plays a key role in development goes back to early literature on economics. Early economists including Adam Smith, Joseph Schumpeter and Hirschman have emphasised the importance of knowledge in development. For example, the concept of entrepreneurial spirit by Schumpeter highlights the importance of innovation and knowledge for facilitating rapid economic growth. In developing countries, the potential to speed up the development process also depends on the capability to learn new methods as well as on the acquisition of new skills. Modern production, including agriculture, requires handling, storing and distribution of information, which needs well-trained labour in computer skills, marketing, the internet and networking. Acquiring such competence leads to cost reduction and productivity growth by learning new techniques and enhancing the use of the traditional methods. Creativity is about exploiting ideas and transferring them into practical uses. Most of these ideas are in the form of tacit knowledge that exists in the mind of people, which can be further developed through the use of modern technology and the acquisition of global knowledge. In other words, indigenous ideas enable producers to join local knowledge with learning to create appropriate knowledge environmentally friendly and more applicable in production. As defined by Warren and Rajasekaran:

"Indigenous Knowledge (IK) is local knowledge that is unique to a given culture or society. It is the information base for a society, which facilitates communication and decision making. IK is the systematic body of knowledge acquired by local people through the accumulation of experiences informal experiments, and intimate understanding of the environment in a given culture." (Warren and Rajasekaran, 1993)⁶

Knowledge has become a powerful instrument in creating wealth and fostering economic growth. Recent literature on globalisation links the new economy to capacity to absorb, apply and create knowledge. Among nations, inequalities are no longer measured by the size of the income gap, rather, by the knowledge gap, which represents the main challenge facing nations, especially developing countries. Accordingly, investing in human capital, building sound infrastructure and strengthening the institutional structure must be given high priority in national development strategy. In industrial countries, for example, more than 50% of all goods and services produced are classified as knowledge-based products. Reflecting on the importance of knowledge, the World Bank states:

"Knowledge is like light. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere. Yet billions of people still live in the darkness of poverty-unnecessarily.... Poor countries-and poor people-differ from rich ones not only because they have less capital but because they have less knowledge. Knowledge is often costly to create, and that is why much of it is created in industrial countries." (World Bank, 1998a, p.1)⁷

Knowledge creation is vital for development in non-industrialised countries. Locally, knowledge creation increases economic potential by allowing producers to improve the quality of products as well as enhances

the development of new methods and invention of new techniques in production. In this age of global interdependencies, developing countries must compete in global markets on the basis of producing good quality products. In this respect, creativity becomes important for strengthening the knowledge economy and foster economic growth. Economic creativity is a

"dynamic process leading towards innovation in technology, business practices, marketing, etc, and is closely linked to gaining comparative advantages in the economy." (United Nations, 2008, p.9)⁸

However, creativity is a product of local environment in which IK and traditional heritage play a determining role. Thus, a creative economy must ensure that indigenous factors including the four forms of capital – social, cultural, human, and structural or institutional – will be considered in the developmental process (Gorjestani, 2000).

KNOWLEDGE TRANSFER

The new technology driven by modern Information and Communication Technologies (ICTs) have connected world markets into one trading area enabling nations to access to knowledge, skills, technology and information at a very low cost. Nations with adequate human and physical infrastructures will most likely be successful in taking advantage of the new markets. Such countries as Singapore, Finland, New Zealand, Australia and Ireland have recognised the economic potential of the knowledge-based economy and invested in research and development to create new techniques and invent new products (Al-Roubaie and Al-Zayer, 2007).

The internet provides a powerful tool for global access by connecting countries with each other. It enables users to acquire knowledge, information, ideas and skills, which

enhance the nation's capacity to apply, absorb and create knowledge. Developing countries, whose main exports are primary products, could learn lessons from the newly emerging knowledge-based economies to reorient their economies towards knowledge production. Governments should allocate large proportions of their total expenditures to induction of innovation and the creation of knowledge through education and learning, i.e., to build capacity that uses ICTs for acquiring and producing knowledge and disseminating information.

"The ability to take full advantage of the information economy for the benefit of all in a given country or jurisdiction requires vision, discipline, planning, and method ... The ICT vision and strategy should focus on people and not just on technology. For this to happen, it is important to develop both the ICT vision and strategy with people in mind and with the input of these very same people." (UNDP, 2005)⁹

Technological globalisation, driven by ICTs, could strengthen developing countries' capabilities to utilise IK through access to external knowledge. Building ICT capacity increases a society's potential to develop new techniques, invent new products and create new knowledge. Economic development is a process of change influenced largely by local factors. Although external forces are important for promoting development, the main decisions concerning allocation of resources and planning for development lie within the framework of the indigenous elements governing the society.

THE IMPORTANCE OF INDIGENOUS KNOWLEDGE

The local knowledge of a given society is created through a dynamic process driven by the local environment and its relation to productive activities of indigenous people.

These activities are influenced by the creativity of the local people to ensure their survival and meet their daily requirements. Internal knowledge also represents an integral element of the socio-cultural features that prevail in a given society or a given culture. Economic activities involve making decisions, which require information and communication among community members. Knowledge of local culture is deeply rooted in the skills, experiences, customs and spiritual ingredients that are attributed to any given society. Thus, introducing new knowledge without being integrated into the IK system could increase the risk of marginalisation of local communities. In learning about poor people from poor people, the World Bank explains that IK is the

"social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives."¹⁰

The United Nations describe the importance of the local knowledge this way:

"Indigenous Knowledge is the basis for local decision making and problem solving in areas including, but not limited to, agriculture, health care, food preparation, education and natural resource management. IK is tacit knowledge traditionally held by communities rather than individuals and is commonly embedded in community practices, institutions, relationships and rituals and therefore, difficult to codify." (Gilmore, 2003)¹¹

External knowledge is useful only if it is incorporated into the local system to supplement IK. Scientific information and technological innovation are widely practised and used in allocation of resources and environmental management including the alleviation of soil erosion and climatic changes. In developing countries, lack of information and inadequate skills could increase the risk of mismanagement and abuse of technology

transfer and external knowledge. Access to global knowledge and information allows indigenous people to minimise the risk of externalities by enhancing the capabilities of local knowledge system to function more efficiently. First and foremost, development is concerned with allocating local resources to reduce poverty and foster economic growth, which requires creating a balance between external and internal knowledge systems. IK entails the following features:

- 1 IK is the local knowledge that is unique to a given culture or society. It is the basis for agriculture, healthcare, food preparation, education, environmental conservation and a host of other activities.
- 2 Much of such knowledge is passed down from generation to generation, usually by word of mouth.
- 3 Indigenous people have a wide knowledge of the ecosystem they live in and ways to ensure that natural resources are used sustainably. Therefore, IK, which has been accumulated over centuries, has potential value for sustainable development.
- 4 It can also help other people learn how to live in harmony with nature and the environment in a sustainable fashion.
- 5 IK is largely experiential based on experience including trial and error than theoretical knowledge. It is inherited through time and, therefore, it is constantly changing (World Bank, 1998b).¹²

The usefulness of IK to the local community can be measured in several ways:

- 1 It is deeply rooted in various practices and skills related to the local community. Indigenous people inherent certain cultural, social, environmental and spiritual practices closely related to the natural environment. Economic activities

including production and consumption are influenced by local and traditional methods and customs. These characteristics usually influence the knowledge system of the local community by adopting indigenous methods and traditional techniques for conducting economic activities.

- 2 Modern development needs to incorporate local knowledge into the process by integrating traditional methods and indigenous practices in production into the national planning policies for development. Policy-makers must carefully evaluate modern techniques and scientific applications to ensure preserving the natural environment and minimise the risk of destroying bio-diversity.
- 3 Global knowledge that supplements local knowledge increases productivity and maintains environmental balance. Western methods in production and use of technology become useful if modified to suite local conditions. Decisions must be based on careful monitoring of modern techniques and scientific methods in relation to the process of development. In some countries, water management, climate change, cultural features and natural environment require local solutions for sustaining the use of resources and protecting the local system of production. However, developing countries can benefit from access to information and knowledge produced in countries with similar conditions. For instance, in Africa, several countries share similar or common cultural and environmental features. Shared knowledge in these countries reduces costs and enhances productivity. We need to move from applying knowledge to solve developmental problems to learning by focusing more on how we learn than spending so much time and resources on what we

learn. Economic development comprises practical solutions, which require learning as how to solve them. To this end, finding practical solutions must involve the IK of the community and adopt method as of how to build upon them to speed up the process of development.

- 4 "Gender will often need to be included as a critical variable in political ecology approaches". In some countries women are heavily involved in non-monetary economy, especially agricultural production and animal husbandry, which is important for food production and meeting the family basic needs (Pimbert, 2008).¹³

IK is important for a number of reasons:

- 1 It is more applicable in solving local problems. Across developing countries, development is largely influenced by local forces for which only a local solution is appropriate if development is to be sustained. In this regard, planning for development must integrate traditional knowledge into developmental strategy for increasing planning effectiveness.
- 2 Development is about socio-cultural transformation in which IK represents a driving force for change. Learning about the local community is vital for promoting development and sustaining growth.
- 3 Local knowledge strengthens the process of development because of their close relations to the traditional values held by the society.
- 4 IK facilitates the creation of new knowledge through rapid innovation. An effective technique must interact with the local environment.

Not engaging the poor or rural population in the process of development implies the exclusion of local knowledge from contributing to sustainable development. The

failure of external knowledge to understand and take into consideration the local practices could exclude a large number of local people to participate in development. Because modern knowledge is associated with Western modernisation and rapid economic transformation, IK and ideas are often regarded inferior to promote development. Policy-makers often make decisions under exclusionary 'Eurocentric frameworks' that exclude rural population and indigenous people from participating in the process of development. Under such circumstance, local knowledge is marginalised to the extent that the benefit from external knowledge has been limited to small, but technologically advanced sectors.

"Sustainable development ultimately depends on the day-to-day actions of local people pursuing a variety of strategies aimed at securing their livelihoods." (Brohman, 1996)¹⁴

In other words, local problems require local solutions including participation of indigenous people. Thus, promoting development through indigenous means require more attention to be paid to local social, cultural, spiritual, environmental and institutional factors. In this regard, external knowledge and technology must be accommodative to indigenous practices to become effective methods in development. Becoming creative and productive, local people must be given support through building suitable environment capable of transferring local ideas into creative techniques for development. Local people must be given an opportunity to contribute through better educational programmes and better communication services. It is the duty of the government to provide knowledge, information, skills and incentive to local people in a manner to increase their participation in the economy. Special programmes should be created to learn more about indigenous

people and earn their trust by giving them say in policy construction and decision-makings. Local knowledge helps communities to construct economic strategies capable of solving problems directly related to development process. As John Brohman explains:

"Increased use of IK may make development programs more appropriate, provide innovative solutions to certain problems, contribute to a sense of self-worth and collective self-esteem, and enhance popular participation and empowerment. To take advantage of these possibilities, development programs should start with the premise that local people, despite the constraints they often face, are knowledgeable and skillful managers of their own environment. If provided with adequate resources, their knowledge and skills place them in an ideal position to devise locally appropriate solutions to their own development." (Brohman, 1996)¹⁵

CREATIVITY AND KNOWLEDGE CREATION

Learning about new methods and alternative techniques in production enhances the country capabilities to innovate and create new knowledge. Learning is the act of acquiring and discovering new ways as well as mastering new skills to enable the process of development to continue. In developing countries, learning could advance the knowledge system by helping local enterprises improving the production process and enhancing competitiveness. This enables the country to adapt technologies and external knowledge to local conditions. Building indigenous capacity in developing countries will require investment in education and training, increasing access to global knowledge and technology transfer and labour market flexibility to catch up with the industrialised countries. As Cypher and Dietz point out:

"In the effort to close the technology gap, decision-makers need to keep firmly in mind that this can only be done by creating a national technology and a national technological learning capacity. This requires that there be substantial local control over the production and learning processes and that the emphasis be on forging genuine indigenous technological autonomy, in which it is domestic scientists, domestic entrepreneurs and domestic skilled workers who become the carriers and the agents of technological knowledge. This knowledge can then be passed on to the next generation of domestic students and workers who become the future R&D scientists and technicians, the future entrepreneurs, and the future skilled workers. This does not mean that each country must be independent of the rest of the world. Just the opposite is true. It means that each country must, however, develop the productive independence which comes with a domestic technological capacity which can permit the country to use the world pool of knowledge for local development needs." (Cypher and Dietz, 1997)¹⁶

It is important to acknowledge that creativity is about practising ideas to create new products or more efficient techniques. Most of these ideas are in the form of tacit knowledge stored in the mind of people who live in a given environment influenced by unique features related to their worldview. Some of these ideas have been in existence for thousands of years, which could further be developed in the light of the new knowledge and technologies. In this regard, access to global knowledge could enhance IK by producing new techniques for solving problems. Modern scientific research and technology provides useful learning methods, which allow local communities to gain comparative advantages and foster growth.

Agriculture is among the important industries in developing countries where the

majority of people derive their livelihood. Ensuring higher yields and promoting sustainable growth underscores the need for local inputs including technology and traditional knowledge to be taken into consideration for allowing creativity and innovation. For instance, agricultural activities, which are practised over the centuries in a given region, provide a learning experience for those are still carrying out the tradition. External knowledge becomes useful as a supplement but not as a replacement for traditional practices. In this regard, governments should invest in research and development for making better use of external knowledge in local economy. Learning about the weather, water management, disease control, soil erosion, drought and environmental protection increases productivity and minimises the risk of natural disasters and technological implications. For countries in the south including Thailand, such efforts will contribute to balancing development by reducing migratory workers and improve the standard of living, especially in rural areas.

BUILDING CAPACITY FOR INDIGENOUS KNOWLEDGE

Building capacity for development requires active participation of both public and private institutions and enterprises at local and global levels. In developing countries, the productive sector is greatly influenced by the public sector, i.e., the private sector plays a secondary role in decision-making regarding allocation of resources and management of the economic system. However, owing to market competitiveness in the new economy, knowledge creation requires the involvement of all sectors where various industries, enterprises and individuals contribute to the economy through innovation, research and development and creativity, i.e., part of their activities requires development of new

techniques and new products through investing in research and development, building database systems, producing new skills and inventing new techniques.

Most developing countries are still lacking adequate capacity for increasing access to global knowledge as well as for enhancing the capabilities to share knowledge. Building human and physical infrastructures strengthens the means for applying and eventually creating knowledge for development. In the new economy, access to global knowledge and information is important for both producers and consumers. Global competitiveness depends on production of knowledge-based products and, therefore, building capacity for absorbing knowledge facilitates leapfrogging and fosters economic growth. Access to global markets enhances the nation's capability to sustain development by allowing local producers to innovate as well as to gain comparative advantage in production of locally produced goods.

Exploiting tacit knowledge by increasing participation of individuals and private enterprises in the economy could have a substantial impact on the process of development. It creates a 'learning economy' in which knowledge absorption; information dissemination and skill acquisition becomes an important tool for sharing and creating knowledge. Through learning, the developing countries could increase communication and share innovation to facilitate local access to external knowledge. Private enterprises rely on their intellectual capital to increase competitiveness. In developing countries where competition in local markets is limited, opening up of new markets provide greater opportunities for local firms not only to compete, but also to acquire external knowledge. Local firms could develop comparative advantage in production of certain products, which allow them to gain from global trade. As explained by the United Nations:

"Developing productive capacities is the key to achieving sustained economic growth in the LDCs. It is through developing their productive capacities that the LDCs will be able to rely increasingly on domestic resource mobilisation to finance their economic growth, to reduce aid dependence and to attract private capital inflows of a type that can support their development process. It is also through developing their productive capacities that the LDCs will be able to compete in international markets in goods and services which go beyond primary commodities and which are not dependent on special market access preferences." (United Nations, 2006a)¹⁷

Building capacity for developing the traditional knowledge system in non-industrialised countries can become an effective means for meeting some of the challenges facing these countries. Investment in traditional knowledge increases output, reduces unemployment, alleviates poverty, strengthens environmental management and sustains development. Modern knowledge can be used to build capacity capable of solving some of the complex problems facing developing countries. Western technology has had a substantial impact on the process of development by forcing developing countries to specialise in production of goods and services for exports. In many countries, technology transfer and excessive use of modern knowledge has marginalised traditional knowledge by keeping rural areas and indigenous people in isolation from development in urban centres. As pointed out by the World Bank

"International research may produce knowledge useful for development, but the most important knowledge for development comes from developing countries themselves." (World Bank, 1998a)¹⁸

In the new economy, global knowledge is accessible, particularly to developing countries where knowledge is expensive to

produce or inadequate to meet development requirements. This requires building knowledge capacity capable of cultivating global knowledge through applying, absorbing, sharing, networking and creating knowledge. In this respect, global knowledge could enhance development by supplementing local knowledge. The knowledge system of a given nation is influenced by the socio-cultural and traditional methods used in allocation of resources as well as in enhancing people's capabilities to become creative and productive. IK is defined of being unique specifically related to a "given culture or society" (World Bank, 1998c, p.1).¹⁹ It is used intensively in local community decision-makings, especially in developing countries where most decisions are made by millions of small farmers and enterprises with little or no external knowledge and information.

Modern technologies, especially ICTs, could be used to enrich local knowledge through access to information and experiences of similar knowledge practised elsewhere. Greater access to external markets allows indigenous people to gain from external knowledge, especially in areas of environmental management involving issues of: soil erosion, water sharing, disease control, flood and other natural forces. As powerful tools, these technologies encourage sharing information and exchange knowledge to enhance productivity and sustain development. However, these technologies may not solve the fundamental problems facing people in different geographical areas, but they can be integrated into the local knowledge system to find solutions to the existing problems. For indigenous people living apart in several geographical areas worldwide, the use of ICTs increases the potential to acquire and use knowledge for their own benefits. To this end, ICTs reduce the cost of producing knowledge and this consequential cost reduction helps developing countries to accelerate the process of development.

Building domestic capacity for productive independence is vital for fostering economic growth and sustaining development. Domestic production depends largely on local markets for supplying inputs including labour, capital, skills, information and knowledge. These inputs become necessary for strengthening the country capabilities to build productive independence by utilising both local and global knowledge. IK could enrich productivity by facilitating the absorption of external knowledge to the local environment. It is most likely that the future prospect for sustaining development requires the integration of both local and external knowledge. In the new economy, rapid economic transformation depends on greater flexibility driven by capacity building to increase investment in human capital, infrastructure, innovation and research and development. Effective capacity will rest largely on the economy's capability to create knowledge and disseminate information. It is no longer traditional knowledge alone sufficient for promoting economic development and cultivating the benefit of globalisation.

THE KNOWLEDGE SYSTEMS

Currently, there are two knowledge systems that exist in developing countries: a knowledge system linked to modern science and technology and another driven by IK.²⁰ The former is largely linked to the industrial revolution and scientific discoveries in Western countries whereas the latter is a product of specific geographical locations attached to a specific culture and unique environment. This knowledge has been in existence throughout history and practised by indigenous people for supporting their livelihoods as well as in exchange for acquiring goods from other communities. Historically, Western technologies were introduced in Asia, Africa and Latin America during the Colonial Era, in which Western

powers extracted resources from non-Western subject-nations with a view to generating wealth in the 'mother' country in a process characterised as imperialism. Currently, the productive structure in most developing countries is largely oriented towards international trade reflecting the dependency of the economies of these countries on the production of primary products, with poor terms of trade, destined for developed markets. This trade has diminished the role of traditional knowledge in economic activities in developing countries.

In developing countries, nonetheless, IK is still utilised particularly by indigenous people. IK continues to have wide currency, especially in the agricultural sector of developing countries, in which a large segment of the population primarily engages in subsistence rather than market activity for supplying their daily requirements. As stated by the United Nations:

"The indigenous or traditional knowledge systems of the LDCs have great potential and represent a hidden reservoir of underutilised creativity and knowledge that could be harnessed, not only as a heritage from the past, but also as a means and process for articulating what local people know, and involving them in the creation of new knowledge required for development. IK is a resource that can be harnessed to help solve local problems, to help grow more and better food, to maintain healthy lives, to share wealth, and to contribute to global solutions." (United Nations, 2006b)²¹

It is important to note that the IK system alone is not sufficient to meet the challenges of modern development driven by new technologies. At the national level, governments should provide incentives to integrate IK into the global knowledge system. Global knowledge could provide short-term benefits to the local economy but in the longer

term introducing such knowledge will have undesirable consequences including environmental degradation and health hazards. Thus, without traditional knowledge, economic development will remain constrained by the lack of local contribution to the process of transformation. Unfortunately, in most developing countries, the modern knowledge system operates in isolation from the traditional one. The dual nature of the economic structure in these countries has isolated the indigenous sector, based on traditional knowledge, from the modern system. Production in the modern sector is mostly oriented towards export trade, which requires certain specifications driven by modern technology. For this reason, the contribution of the modern knowledge system and technology transfer to development cannot, in and of itself, strengthen local inputs. However, the IK system, standing aloof, lacks the wherewithal needed to enhance linkages and foster growth. Weaknesses of the traditional knowledge system include:

- 1 The indigenous system is not well connected among various sectors of the economy including universities, private enterprises, government agencies and grassroots innovators. Owing to the inadequacy of scientific and technological research, low investment expenditures and poorly trained labour, the linkage of the traditional knowledge system with the modern knowledge system is inadequate to generate high backward and forward linkages.
- 2 Because of duality of the economic structure, indigenous peoples have remained isolated from modern sectors of the economy in which most modern technologies are employed. Under such circumstances, building technological capacity to foster growth is limited by lack of skilled labour

capable of using, and access to training in, modern technology.

- 3 The modern knowledge system practised in developing countries is not well integrated into the global knowledge system. In these countries, inadequacy of international standards does not permit rapid improvement in the quality of technology and, therefore, engenders poor quality in products outputted in these countries.
- 4 The traditional knowledge system is disconnected from the educational and learning systems in developing countries. Accordingly, traditional knowledge systems to continue relying on traditional ideas and primitive practices with little input from modern knowledge. In isolation, the traditional knowledge system cannot promote global competitiveness. Only modern knowledge facilitates productivity through more efficient utilisation of IK.
- 5 It is not easy to codify and record IK and, therefore, sharing this kind of knowledge among communities and cultures becomes difficult (United Nations, 2006c; World Bank, 1998b).²²

External knowledge is essential but not sufficient for development. Knowledge must be appropriate or suitable for creating a balanced process that ensures equity, fairness and justice. To be useful, external knowledge must be modified to become appropriate for use under the existing conditions of the natural environment and local cultural practices. Under such circumstances, transfer of knowledge, while warranted, ought to be employed in a way that comports with differential environmental and human conditions manifesting in a particular developing country rather than being indiscriminately 'parachuted' in. Mathematical models underlying development programmes designed

to induce development in a particular country or region cannot be appropriated for wholesale adoption in other countries. Making these models applicable, if at all feasible, requires substantive modification to facilitate integration into particular local contexts. To facilitate the process of development and strengthen the foundation for knowledge, government should:

- 1 Build capacity for knowledge diffusion and information dissemination.
- 2 Invest in education to increase human capital capabilities through lifelong learning and training.
- 3 Provide incentives to engage students, academicians, professionals and researchers in R&D. Universities must be funded to undertake research in collaboration with industries and private enterprises.
- 4 Draw national strategy that integrates knowledge creation into the national planning policies.
- 5 Monitor and supervise the use of imported technology to ensure its appropriateness to the local market.

CONCLUSION

In the new economy, driven by globalisation, knowledge is given a special role to play in promoting economic growth and sustaining development. In addition to being a factor input, knowledge is also linked to wealth creation and global competitiveness. Knowledge provides society with the means to create new products as well as to enhance decision-making capabilities.

Meeting the challenges facing rapid socio-economic development, especially in developing countries, requires building indigenous capacity for knowledge creation and information dissemination. Building

indigenous capacity for knowledge creation, revolving around investment in human capital, physical infrastructure, ICTs and R&D, adds value to local economy by inducing creativity and innovation. However, building indigenous capacity requires efficient institutions.

To this end, the institutional structure of the society has a significant role to play in facilitating the integration of global knowledge into the local environment. Both public and private sectors should be involved to increase awareness, conduct research and development, disseminate information, provide financial support and build capacity for knowledge creation and dissemination. Indigenous capacity will enable developing countries not only to absorb knowledge into developing countries but also to transfer knowledge among developing countries and increase integration in the global economy. In particular, ICTs strengthen capacities to increase access to global knowledge.

IK is knowledge produced locally containing some cultural, social, religious, spirituals and environmental elements. Throughout history, this knowledge has been practised and adopted by the coming generations to form the main features of the community knowledge system. Because of the absence of local knowledge, economic development in developing countries would be hamstrung by inappropriate technological methods imported from Western countries, whose antecedent local cultural and environmental factors differ starkly with those of developing countries. Wholesale importation of inappropriate Western technologies has caused serious damage to indigenous culture and natural environment by suppressing traditional knowledge, increasing the risk of pollution, disrupting natural habitats and forcing migration. Remediating these dislocations

and restoring equilibria into development have been constrained by lack of financial resources, inadequate skills, inefficient institutions, weak incentives and unsound macroeconomic policies and programmes. Orientation of development towards production for export of primary products with inferior terms of trade has created a dual economic structure generating weak linkages to stimulate production in local markets for local markets with a view to balancing development. The scope of the traditional knowledge system has been marginalised by the hijacking of the productive system in developing countries on the part of avaricious multinational corporations in the guise of technology transfer in a process best labelled as the new imperialism. Denied any other recourse, indigenous people increasingly abandoned traditional economic activities diminishing the role that IK plays in development.

External knowledge can best be regarded as a modern economic Sword of Damocles. As a supplement buoying local knowledge, external knowledge plays a positive role in balanced development by enhancing the productive capability of a developing economy. If recklessly adopted, external knowledge can prove highly destabilising. Introducing inappropriate scientific and technological methods at best serves to complicate, at worst serves to stymie, the process of development by creating serious distortions in the economy and by damaging the environment.

BIOGRAPHY

Amer Al-Roubaie received his PhD in Economics from McGill University in Montreal, Canada. He taught economics in Canada, the USA and Malaysia. Currently he is the Dean of the College of Business and Finance, Ahlia University, Bahrain. He has written over 40 papers and currently he

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¹ World Bank (1998a), p.16.

² United Nations (2008), p.26.

³ Promta (2003), p.32.

⁴ For details see World Bank (1998a), p.145.

⁵ Ocholla (2007), p.3.

⁶ Warren and Rajasekaran (1993), p.8.

⁷ World Bank (1998a), p.1.

⁸ United Nations Development Programme (2008), p.9.

⁹ United Nations Development Programme (UNDP) (2005), p.3.

¹⁰ See www.worldbank.org/afr/ik/basic.htm

¹¹ See United Nations: Chronicle Online Edition at www.un.org/Pubs/chronicle/2003/webArticles/081303

¹² See World Bank (1998b)

¹³ For details about the role of gender in the overall development of the food systems (Pimbert, 2008) or www.grain.org/g/g02268.pdf

¹⁴ Brohman (1996), p.323.

¹⁵ Brohman (1996), p.338.

¹⁶ Cypher and Dietz (1997), p.421.

¹⁷ United Nations (2006a), p.I.

¹⁸ World Bank, (1998a), p.7.

¹⁹ See for details World Bank (1998c), p.1.

²⁰ The concept of a domestic knowledge system is defined as: "the national institutions, frameworks and infrastructures that can facilitate effective using, sharing, creation and renewal of knowledge for socio-economic growth." See United Nations (2006c), p.246.

²¹ United Nations (2006b), pp.249, 250.

²² See for details United Nations (1998c), pp.246–257 and World Bank (1998b).

