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Research Paper

A CASE FOR THE PROMOTION OF INDIGENOUS KNOWLEDGE FOR ENTREPRENEURSHIP DEVELOPMENT IN DEVELOPING COUNTRIES: THE CASE OF BOTSWANA

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ABSTRACT **The past decade has experienced economic recession which has manifested itself in higher unemployment figures, especially among the youth including university graduates. For those**

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KEYWORDS :Self-employment; indigenous knowledge; economic diversification;

INTRODUCTION

The past decade has experienced economic recession which has manifested itself in higher unemployment figures, especially among the youth including university graduates. For those countries endowed with indigenous knowledge and biodiversities that can be tapped for food, medicines and other commercializable uses the exploitation, and beneficiation of such resources present opportunities for creating sustainable jobs outside the framework of conventional stateled employment.

The development debate is currently at the intersection of two most critical themes; namely, sustainability and inclusivity. What this means is that development needs to be sustainable and inclusive in order for it to be meaningful to its beneficiaries. Sustainable development has been the buzz word for some time now, but inclusive development, a concept that brings together the formal and the non-formal sectors has just entered the development literature.

Two reasons can be advanced for this situation. Firstly, evidence suggests that the rich are getting richer while the poor are getting poorer in spite of the development programmes that they are engaged in. Secondly, the non-formal sector, which involves the low income and marginalized communities, is growing in size, both in the developing and the developed world. The informal economy provides between 50% and 75% of employment in developing countries (Chen, 2004) and around 18% in developed countries (Schneider, 2002). Clearly, this calls for a change in the development planning systems so that inclusive development can now be foregrounded in the national development agendas of countries, instead of it being merely an appendix, as has been the case.

The non-formal economy is defined as those economic activities which fall outside government regulation, including both the non-formal sector and the non-formal employment within the formal sector. Indigenous knowledge systems (IKS) and their activities form the core of the non-formal sector. The few examples in this paper will demonstrate that IKS empowers local communities and integrates them into development processes in ways that the government regulated formal sector is unable to. The cases will further show that the integration of appropriate IK systems into development programmes can contribute to efficiency, effectiveness, and sustainable development. This paper attempts to show how the nation can build on that synergy to enhance the employment opportunities for its citizens. Embracing indigenous knowledge therefore constitutes is extending the borders of inclusivity.

'Indigenous knowledge provides the basis for problem-solving strategies for local communities, especially the poor. Indigenous Knowledge is an underutilized resource in the development process. Learning from IK, by investigating first what local communities know and have, can improve the understanding of local conditions, and provide a context for activities designed to help the communities' (World Bank, 1998:21).

'Indigenous institutions, indigenous appropriate technology, and low-cost approaches to development can increase the efficiency of development programmes because IK is a locally owned and locally managed resource. Therefore, building on IK can be effective in helping to reach the poor since IK is often the only asset they control, and one with which they are familiar. Utilizing IK helps to increase the sustainability of development programmes because the IK integration process provides for mutual learning and adaptation, which in turn contributes to the empowerment of local communities. Since efficiency, effectiveness, and sustainability are key determinants of the quality of development work, harnessing indigenous knowledge has a clear development business case' (Gorjestani, 2006:3).

Another concept that is related to IK is social innovation. Social innovation is a mapping of the factors and the environment that enable poor people to overcome social, legal and technological barriers. It is therefore a critical aspect of IK which highlights the reasons for the success of IK systems in mobilising communities for development purposes (Gorjestani op cit.).

The systems of IK function optimally within a socially well structured environment which also has a clearly defined and well managed support system. In order for it to attain this level, it has to be institutionalized. Hence, in a bid to facilitate the integration of IK into development and other socio-economic operations of communities, the Africa Department of the World Bank launched the Indigenous Knowledge for Development Programme (IKDP) in 1998. The overarching goal of this World Bank Programme was to assist in the institutionalization of IK in the development planning process of Africa's developing countries.

The establishment of the World Bank Indigenous Knowledge for Development

Programme was a sequel to the first Global Knowledge Conference that had been held in June 1997 in Toronto, Canada, attended by government leaders and members of civil society. At that conference, it was noted that local communities had a lot of relevant knowledge that could be used for their development. It was therefore agreed that the World Bank would support a global knowledge partnership that would be realized only when the poor participate as both users of and contributors to knowledge. The African Department of the World Bank responded to these challenges by launching, in 1998, the Indigenous Knowledge for Development Programme in partnership with over a dozen organizations.

The programme focused upon mechanisms for institutionalizing IK systems and their actions in member countries. It did that in many ways, including helping IK Resource Centres in eight countries to improve their national and regional networking capacity. For example, through this arrangement, Uganda received advisory and financial support to help draft a national strategy for the integration of IK into its national Poverty Eradication Action Programme and some grant funding to build capacity for the implementation of that national strategy. Botswana and other developing countries could use this opportunity to develop operational structures for delivering their locally designed development programmes for the lower social classes, something that would be equivalent to Botswana's Poverty Eradication Programme. Other countries have undertaken various activities to build on IK in agriculture, healthcare, and education with the assistance of the IK Programme (World Bank, 1998).

The world over, the promotion of entrepreneurship is driving globalization currently. Entrepreneurship is no longer solely a feature of business studies. It has penetrated many levels of the academic world, especially in the developed world. Academic institutions are busy linking closely with technology parks and then weaving entrepreneurship into their curricula. For example, a number of universities in the United Kingdom have been expanding their curricula to include technology or knowledge parks in the past decade and are running knowledge transfer programmes through which they have been arming their academics with entrepreneurial skills. These skills, applied mainly but not solely within the framework of the knowledge parks, now assist academics to commercialise not only intellectual property, but also knowledge more broadly and more effectively than in the past when intellectual property activities were limited to patenting (Mazonde, 2007).

Even in the developing world, universities are enhancing business studies and streamlining the subject to be taught as a compulsory general course so that all students are exposed to business principles in order to be better able to initiate self employment activities upon completion of their studies in the higher education institutions, given the intensifying scarcity of jobs in the job market (Tabulawa 2009).

In the globalized world of today, information exchange is critical for entrepreneurship. Establishing regional and international networks is a key way of facilitating such information exchange. The Indigenous Knowledge for Development Programme has worked in cooperation with other agencies to support local communities in sharing their IK through community-to- community (C2C) exchanges. It has also brokered partnerships between scientists, legal experts, and IK practitioners to support scientific validation of IK practices, and has supported IK practitioners to form national or regional traditional knowledge networks (World Bank, 1998).

The outcomes of the Indigenous Knowledge for Development Programme are quite a few. They include an increase in the recognition of indigenous knowledge itself as a part of the development agenda in the member countries of the Programme, the national initiatives and policies that have since emerged, the civil society groups that are forming a broad base of support, and the increasing number of development projects and programmes integrating IK (World Bank 1998).

No form of knowledge is static. Consequently, IK, needs to be subjected to constant review for relevance and for the purpose of improving its efficacy. That review includes analyzing the circumstances under which IK works more optimally. Some cases below show that IK needs to be applied jointly with modern technology for optimal results, just as Emory noted that both systems have strengths that can help the other system when they are invited to work together (Emery, 2000).

The convergence of indigenous knowledge and modern business practices

Indigenous knowledge is collective. It operates within the context of the community and, to a lesser extent, on individual basis. Consequently, it fits more within the idea of cooperatives and less within that of individual enterprise. The advantage of its structure is that it focuses on the entire community, and has the potential to improve the livelihoods of the whole community, thereby bringing about greater equity in development as opposed to individual enterprise which creates inequities that result in skewed income distribution. This phenomenon is illustrated by the cases below, taken from Botswana and outside the country.

The Community Based Natural Resource Management Programme (CBNRMP) is a classic example of the intersection between an indigenous knowledge system and modern business entrepreneurship. In this programme, communities use their indigenous knowledge of managing wildlife to generate income through tourism. In the CBNRMP model of development, the economic benefit goes to all members of the community as a collective; that is, they share it as a group. On a positive note, the CBNRM Programme has benefitted its target population in that the economic welfare of the people concerned has generally improved and the programme has also succeeded in integrating its concepts into the tertiary education system of Botswana (Mosimanegape 2010:4).

However, a few cases have been reported where people who were not targeted by the programme have benefitted more than the intended beneficiaries. In some cases, more economically powerful people give their guns to members of the scheme, who kill animals and then give the animals to the owners of the guns (see Bolaane et al 2015). These are criminal practices which result from the unequal power relations between the targets of the CBNRMP and the socio-economically powerful people outside the CBNRMP sites. The cases are also a reflection of weak management and oversight of the CBNRMP by the state, which set it up as a community development programme. This negative aspect of the programme does not justify its discontinuation; it calls for closer monitoring and a more effective management of the scheme.

In the villages of Maun and Shorobe in Ngamiland, communities have for a long time subsisted on their indigenous knowledge through making baskets for sale to tourists who pass through these villages on their visits to various destinations inside the Okavango delta. The baskets are usually made of palm reeds that grow around the marshes of the Okavango delta. Before, the baskets were sold by individual entrepreneurs, but this proved problematic because most basket weavers did not have marketing skills. The few who did were the ones who profited more. Another problem was due to the seasonal nature of the tourism industry. During those periods when the volume of tourists was low, the basket weavers were unable to make enough money to feed their families.

The NGOs then intervened to solve the two problems by helping the entrepreneurs to form cooperatives that would handle the marketing of the baskets through agents that accessed both the local and the external market. While such cooperatives have improved the basket industry in Ngamiland, the basket industry still faces hurdles which often leave the entrepreneurs without sufficient funds to sustain their the businesses. My argument in this paper is that the failure of this industry is an outcome of lack of institutionalization of IK at the national and regional levels. The cooperatives lack the support of the state in that there are no appropriate cooperative structures and external networks that would ensure a reliable and strong framework for continuous marketing of the baskets. Such a framework could be supported by the state, the private sector or the NGOs.

The case of *Dibapalwanageng* in Gabane, and two other initiatives discussed below demonstrate that IK is more efficient when combined with modern technology. The *Dibapalwanageng* is a group of women who have come together to process various products from the *morula* fruit. From the nectar of the morula fruit, they produce sweets and jam. Initially, the output of the jam was low as the process was done manually. But by collaboration with the University of Botswana and with funding from the UNDP, members of *Dibapalwanageng* have been able to secure a machine which peels the fruit so that the nectar is produced in larger quantities (Bolaane *et al* 2015:48).

The problems of lack of institutionalization on the one hand and effective networking on the other also face *Dibapalwanageng*. Because they are under-resourced and do not have a reliable market, the women have been taken advantage of by some unscrupulous entrepreneurs who have forced them to their product(s) at very low prices. This means that their business experiences very low profit margins, a situation that has driven the younger women in the organization out of this venture. Only the older women who are unable to work as fast as the younger ones remain. In Lerala, three hundred kilometres away from Gabane, another indigenous knowledge group by the name of *Kgetse Ya Tsie* produces morula fruit products, among other natural products. These two groups could have benefitted from each other by pooling their resources and exchanging ideas and skills, but because they do not network, they have lost out on this opportunity for collaboration and mutual support (Bolaane *et al* 2015:47).

Examples of the intersection between IK and modern businesses extend far beyond Botswana and cover different economic sectors. The case from South Africa discussed below demonstrates how institutionalization and networking have enabled IK groups that are involved

in the same product development to increase the scale of growth of their enterprise through working jointly and pooling their resources.

The Rooibos tea-growing farmers of Wupperthal in South Africa's Western Cape Province were satisfied with the scale and volume of their tea exports to Europe. An NGO, EMG, thought that other tea-growing communities could benefit from the activity of these farmers. Subsequently, in June 2000, EMG arranged a for the Wupperthal tea growing farmers to visit their neighbours who were also growing Rooibos tea in Suid Bokkeveld. During their visit, the two groups of farmers held discussions on crop quality, processing and marketing. The outcome was amazing by all accounts. It positively impacted both farming communities. As a result they agreed to set up a farmers' co-operative. The cooperative resulted in improved output from the farms as well as better and more efficient processing of the crop following the harvest. Networking also paid high dividends. A certain European dealer put in an order for tea amounting to a staggering $15,000 (Gorjestani 2006:5).

The next example is from the health sector. Health delivery is yet another key sector in which indigenous knowledge has always been active. HIV/AIDS is known to come with a number of opportunistic diseases. Scheinman, reports that in Pangani District, Tanzania, traditional healers have been able to successfully treat the opportunistic diseases of over 2000 HIV/AIDS patients, using medicinal plants from the wild. Some terminally ill patients have reportedly lived longer by five years as a result of using the medicine from these traditional healers (Scheinman, 2000). Consequently, Tanzania seems to be taking the route followed by China, a country that has institutionalized traditional medicine. 'The Pangani regional hospital in Tanzania has dedicated a ward to these healers who to treat and counsel patients. The IK programme supported an exchange of experiences between healers, people living with AIDS and staff working with patients with similar groups across the country' (Scheinman 2000). In this case, it had become evident that the critical challenge was to leverage local and global knowledge systems to effectively resolve this health challenge. To facilitate such a process, the IK Programme expanded outside the continent. It brokered a partnership between the TANGA AIDS Working Group of Pangani, Tanzania, and the US National Institutes of Health to work jointly to scientifically validate the strength and quality of the treatments that use traditional medicine (Scheinman, 2000). The Tanzania case demonstrates the fact that the efficacy of the traditional or indigenous knowledge is improved when such knowledge is complemented by modern or western technology. This is consistent with the observation made by Emery that there is an increasing appreciation of the advantages of using science and technology together with traditional knowledge to find mutually beneficial results from development projects (Emery 200).

The engagement between the Botswana University of Agriculture and Applied Natural Sciences (BUAN) and its farmers provides the last example of how mutual interaction between indigenous knowledge and scientific technology improves the quality of both systems. BCA runs practical short courses for traditional farmers. During these courses, the university teaches the farmers new farming technologies. The courses are held either at the College or on the field of any farmer whose field has the easiest accessibility. But the university also learns from these farmers the indigenous knowledge systems and techniques that they use. The result is that the university has infused some of the IK technologies into its curriculum thereby increasing the relevance of its mission to its stakeholders while also facilitating the empowerment of the farmers through involvement and participation in their own development (Bolaane et al 2015).

Intellectual property and indigenous knowledge

Intellectual property works most effectively in cases where protection is possible. That is not easy in the case of indigenous knowledge. The South African government lamented the social and economic disadvantage suffered by its traditional knowledge holders. It noted that that disadvantage is eventually suffered by the state itself as the encumbrance of these people negatively affects the national economic output (Government of the Republic of South Africa

2004:13). Putting traditional knowledge holders at a disadvantage is not perpetrated by foreigners only. The South African experience shows that private companies and local research institutions commonly 'poach' indigenous knowledge because the concerned knowledge creators do not protect their traditional knowledge (South Africa's Department of Trade and Industry opcit).

For many years, the greatest setback to indigenous knowledge has been lack of legal protected through patents because it does not conform to standard requirements for IP protection through the conventional instruments that protect intellectual property rights. Most forms of indigenous knowledge are held but not owned by communities and not by individuals. There is virtually no novelty or newness about them. However, they do have industrial application, as shall be demonstrated in this paper, although such industrial application is at the community level. It was for these reasons that the intellectual property systems did not find them patentable. This lack of Intellectual Property Rights (IPR) protection in turn discouraged the business sector from investing in the commercial exploitation of indigenous knowledge. The outcome was massive exploitation of traditional communities as researchers from the developed world mined information and specimens from these communities without giving anything back in return. Nor could the communities subsisting on indigenous knowledge do any trading with their IK. As a result,

these communities have lost great potential to create wealth out of their very valuable IK.

It is not that there have no efforts to assist traditional knowledge holders. The United Nations and other international organizations have worked hard to assist, mainly by coming up with mechanism for protecting indigenous knowledge systems without necessarily patenting them. As far back as 2000, the Sub-Commission on the Prevention of Discrimination and Protection of Minorities of the Commission on Human Rights, Economic and Social Council of the United Nations came up with what was referred to as the *Principles and Guidelines* for the *Protection of the Heritage of Indigenous People*. This document attempted to end the unequal relationship between traditional knowledge holders on the one hand and the industry, a situation whereby industry virtually took the intellectual property of these people for nothing.

The Guidelines tried to put a moratorium on the contracts that industry was making with traditional knowledge holders until such time as there were arrangements for a more equitable sharing of proceeds from such knowledge. The Guidelines additionally made it harder for further exploitation of IK through a provision that 'No further contracts should be negotiated until indigenous peoples and communities themselves are capable of supervising and collaborating in the research process and further that business and industry should refrain from offering incentives to any individuals to claim traditional rights of ownership or leadership within an indigenous community, in violation of their trust within the community and the laws of the indigenous peoples concerned ' (United Nations (E/CN.4/Sub.2/1995/26, GE. 95-12808 (E), 21 June 1995). As a last measure, the Guidelines legally forbade business and industry to hire scientists or scholars for acquiring and recording traditional knowledge or other forms of heritage that originated from traditional communities (United Nations op cit).

All this effort culminated in The African Department of the World Bank launching the Indigenous Knowledge for Development Programme in partnership with a dozen organizations in 1998. It was clear that the protection of IK would not take the form of patenting but would utilise lower utility models whereby emphasis would be commercialization of concepts leading to 'fair and equitable benefit sharing between users and custodians of traditional knowledge and, in some cases, Material Transfer Agreements (MTA) as a form of provision of material resources or information in exchange for monetary or non monetary benefits' (Gorjestani, 2006:9).

In Botswana, the breakthrough for the commercialization of indigenous knowledge came with the Industrial Property Act of 2010. This Act, which followed debates across the nation on the need to protect IK, carried a full section on traditional knowledge and handicrafts. That section provides for the registration and commercialization of traditional knowledge through licensing agreements negotiated by local communities (Part XII Sections 115 and 125).

Embracing indigenous knowledge to venture into business enterprise

The previous section has looked at IPR within the context of indigenous knowledge, but as indicated under the introduction, a critical issue in IK across the developing countries generally is the actual mechanism for commercializing it. In other words, the issue is what is required to successfully commercialize IK. This section attempts to answer that question by presenting such requirements.

First of all, it is necessary to underscore the importance, viability and virtues of communal projects; that is, those projects that benefit all and result in a sustainable socio-economic and natural environment (Emery, 2000). Emery suggests that cooperation and mutual understanding between parties can bring benefit to all, even without legislation that protects the traditional knowledge holders (Emery, 2000).

However, there is need to recognise that most traditional societies are currently caught up in the contradictions inherent in the transition from original traditional ways of life and the more modern life-styles. The transition is seldom easy for them; it threatens their very livelihoods, and most of them experience a decline in their standard of living even when they choose to live modern lifestyles. The communities lose access to basic necessities such as food, housing and health, resulting in the overall loss of their cultural identity (Mazonde 2002). They are unable to control their lives because of the dependency that comes with transitioning from their traditional lifestyles to more modern one as they lose their livelihoods, which forces them to survive on welfare. To the extent that traditional communities in this state are unable to live the lives they know, they usually during this transitional period also lose the ability to exploit their traditional knowledge.

It is against this background that institutionalization of the legal and the socio-economic framework that facilitates their economic production is needed. Because most traditional communities in Botswana are undergoing this transition, institutionalization is needed in order for IK to succeed in Botswana country and in other developing countries. Institutionalization means creating a strong support base for IK in the form of national and regional organizational structures such as government departments, foundations, research centres, and by having dedicated financial resources, providing training facilities and putting in place a well organized market system for IK products and processes through an elaborate networking system that connects Botswana IK communities with the outside world.

It was in this context of facilitating the integration of IK into real economic operations, that the African Department of the World Bank launched the Indigenous Knowledge for Development Programme in 1998 with the priorities of :-

- encouraging more countries to formulate and implement strategies for IK integration;
- enhancing the capacity of national and regional IK networks;
- promoting the local exchange and adaptation of indigenous knowledge;
- identifying innovative mechanisms to protect IK in a way that fosters its further development, promotion, validation, and exchange.

In the following year, 1999, Uganda became one of the first African countries to implement the first priority when it started working towards the development of its National IK Strategy. Through its National Council for Science and Technology (UNCST), it initiated a study supported by the World Bank, to explore the potential of utilizing IK in the agriculture and health sectors. The results of the study were debated in a workshop involving policy makers, scientists, development practitioners, NGO and CBO representatives, traditional healers, and farmers. The outcome was the Kampala Declaration on Indigenous Knowledge for Sustainable

Development, which eventually gave birth to the National IK Strategy, an instrument that ensures that IK is included in all sectors of the national planning process, including poverty eradication programmes (Gorjestani 2006:8). In 2004, South Africa adopted its Indigenous Knowledge Systems (IKS) Policy, which institutionalized IK and integrated it into the national education, research and

development systems, proposed administration of IK systems, funding and legislative imperatives (Government of the Republic of South Africa 2004:5).

CONCLUSION

This paper commenced its argument by nestling IK within the inclusive development debate that has become a buzz word in the development discourse. It underscored the need for foregrounding IK by first locating it within the non-formal sector, and then highlighting the expansion of the non-formal sector universally, in the developing as well as in the developed world. Emphasis was placed on embracing indigenous knowledge system as one of the most effective ways of ensuring inclusive development. Furthermore, the cases that were presented and analysed demonstrated that the integration of appropriate IK systems into development programmes has indeed contributed to efficiency, effectiveness, and sustainable development.

Following that, the paper gave an account of the role played by the World Bank in facilitating the institutionalization of IK organizational structures in developing countries, as a way of placing IK at the core of national development in these countries. Examples were provided of the successes that the World Bank, through its Indigenous Knowledge for Development Programme has achieved in this endeavour through the development of Uganda's Indigenous Knowledge Strategy in 1999 and the development of the IKS Policy in South Africa in 2004. It was pointed out that the Bank is still ready to assist more countries to set up organizational structures for systematically exploiting their IK.

There are indications that Botswana has a legal framework for protecting IK since the approval of the Industrial Property Act of 2010. What is clear from the cases of other countries discussed above is that Botswana needs to institutionalize its indigenous knowledge, following the enactment of the Industrial Property Act of 2010. A major advantage of institutionalizing IK is that the country could take advantage of the World Bank Indigenous Knowledge for Development Programme which seeks to leverage global and local knowledge systems to adapt the design of Bank-supported projects and programmes to local conditions. The programme has supported Uganda in developing its IK Strategy, and has financially assisted in the setting up of IK Resource Centres in seven other countries in order to improve their national and regional networking capacity.

Mohamedbhai (2013) has suggested two levels at which IK can be institutionalized. The first is the university level, through research centres dedicated to IKS such as the Centre for Scientific Research Indigenous Knowledge and Innovation (CESRIKI) at the University of Botswana and the Centre of Excellence in Indigenous Knowledge Studies (CEIKS) which is a joint venture between the universities of North West, Limpopo and Venda in South Africa. University research centres conduct research into IKS, provide service to the communities by engaging with them and disseminate knowledge from the research through teaching and workshops, including policy advocacy at the national level. The second level that Mohamedbhai (op.cit.) proposes is the national research centre level. A national research centre would have a mandate similar to that of a university research centre, but broader in scope and heavily tilted in favour of engagement with the stakeholders; namely the IK communities whose activities it helps implement. The mandate of a national IKS centre is broader because the facility is financially funded by the government, hence especially the stronger engagement with IK communities.

Mohamedbhai (2013) argues that university based IK research centres should be the focal points of IK institutionalization. However, my experience is that because university research centres are generally under-funded and not strongly supported by university management, they tend to be less effective and do not achieve what they intended to achieve. In contrast, national IK research centres, because they are state funded with regular budgets and some level of infrastructure, would have greater capacity to empower IK communities, arrange funding for various activities and organize marketing of the IK outputs. An ideal situation would be for the two types of research centres to collaborate so that the university based one can focus on research and networking with external partners for knowledge exchange. For example, it could focus on collecting information on how China has succeeded in commercialising its IK systems especially in the area of health and technology, seeing that modern technology can improve the efficacy of indigenous knowledge. The public IK centres can concentrate on empowering communities through coordinating the different IK units and implementing policy.

Botswana needs to devolve its IK activities across its sectors like South Africa has done. The national IK centre, because of its autonomy, is better suited to coordinate the sectoral IK programmes more effectively than a government department. Policy issues, funding for the IK programmes, Intellectual Property Rights and their arrangements, and training would be more optimally and more effectively handled at the national level, through the national IK research centres. For example, Botswana has the Local Enterprise Development Authority (LEA), which has the mandate for training. LEA training needs to embrace the training that will be needed in the IK sector across the economy. However, LEA would need to collaborate with the university IK research centre in order to provide the social innovation training that is required in inclusive development.

IK themes should be left to the IK communities to work them out, as they are based on different environmental, historical and social factors. However, the coordination level should ensure that there is capacity to monitor IK activities in order to capture, flag and support newly emerging opportunities, especially for the youth whose major strength lies in ICT. This is one area in which synergy would be created by universities collaborating with the government through the centres. Currently, the University of Botswana has come up with the matwetwe system in which patients in the rural areas are able to seek medical attention from a health information gadget that is queried according to specific health complaints.

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