CHALLENGES IN COMMERCIALISATION OF SOUTH AFRICAN INDIGENOUS KNOWLEDGE-BASED TECHNOLOGIES: IMPLICATIONS OF BATTLING FOR DOMINANCE AND CONTROL

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Views expressed in this document represent those of the authors not the organisations they work for.

INTRODUCTION:

Africans have been innovators since pre-historic times. The environmental conditions and remoteness of some habitats called for unique intelligence and adaptive skills. These indigenous innovations range from climate prediction, sustainable agricultural practices and sustainable use of resource, engineering and to traditional medicine. There is a wealth of knowledge, practices, innovations and applied technologies that can take Africa to the next level on the global market if harnessed appropriately. The challenges in commercialising African indigenous knowledge (IK products and services) can be attributed to contamination of local systems for the purposes of domination and control under the guise of modernisation.

The challenge in commercializing the surplus of African indigenous knowledge systems along with the products and services is that it has been widely contaminated by Westernization. The rise of Westernization, disguised as modernisation, has ensured that African indigenous knowledge is subdued and undermined. The attempts to dismantle indigenous systems and repackage them into bizarre alternatives have created confusion and mistrust which has stalled progress.

There is a need to understand the local models, learn from them and then attempt to enhance them by integrating them with exotic knowledge in order to develop robustly competitive products/services at a global scale.

Africa has the potential to lead the world in innovation through localization. There is a dire need for indigenous people to acquaint themselves with local models of African indigenous knowledge systems and begin to adopt them as mainstream in order to develop products and service that can compete on a global scale.

This approach was corroborated by a convergence of thoughts expressed at the Indigenous Knowledge Systems Breakfast forum hosted by The Innovation Hub in Tshwane on (date). To further support the views expressed in this paper, we will define and characterise indigenous

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knowledge; present overlooked examples of advanced nature of IK and highlighting the potential of applying IK and considerations for a way forward. Selected pockets of excellence will be mentioned in the document. Rhetoric questions will be put forward to stimulate further discussions.

DEFINITIONS:

There is no single prescriptive definition of indigenous knowledge. There exists a variety of indigenous knowledge syatems in various contexts characterised by key aspects such as people, place and time, culture, language, knowledge, practices and dynamism[3]. Thus for the purposes of this document, the term "indigenous knowledge" will be used and defined as[4]:

- created (generated) by the indigenous people based on and relating to their lived experiences in interactions with their environment;
- embedded in indigenous peoples' **cultures** and embodied in the **practices**;
- transmitted through indigenous peoples' **languages**;
- **contextual** (spatio-temporally) thereby resulting not a single unified 'indigenous knowledge' but in **plurally definable heterogeneous bodies of knowledge** or 'indigenous knowledges';
- organised into interconnected/interrelated indigenous **knowledge systems** (such as indigenous medicine, indigenous agricultural systems, indigenous governance, etc.); and
- not static by **dynamic**, reflexive to changes over time in the lived environment and external influences, while remaining rooted in indigenous history.

The knowledges of indigenous people have been variably termed indigenous knowledges (IK), indigenous knowledge systems (IKS), endogenous knowledge[5], local knowledge, traditional knowledge (TK), traditional knowledge systems (TKS), traditional ecological knowledge (TEK)[6], traditional environmental knowledge, etc. Indigenous knowledge can be regarded as a decolonial manifestation of resistance to coloniality (the continuing forms of colonial hegemony in the present period, especially in knowledge systems) of western/euro-americentric/hegemonic epistemologies. Indigenous knowledges dismantle the epistemic privilege of western/euro-americentric knowledge and its mythical claim as universal, unlocated, disembodied, neutral knowledge by drawing attention to the non-hierarchical plurality of knowledges and their localised origins. While present day indigenous people continue to be

[3] Shava, S. (2013). The representation of Indigenous knowledges. In Stevenson R., Brody M., Dillon J. & Wals A. (Eds.), *International handbook of research on environmental education* (pp. 384-393). Routledge, New York:
[4] adapted from Shava, 2013
[5] Hountondji, P.(ed) (1997) *Endogenous knowledge: research trails*. CODESRIA, Dakar
[6] Inglis, J.T. (ed) (1993). *Traditional ecological knowledge: concepts and cases*. IDRC. Canada

urbanised and find themselves geographically distant from their place of origin, they carry their identity and attachment to the place and the knowledge and practices thereof.

The scope of IK is wide and complex. It can be found in various areas such as, Agriculture, Cuisine, Medicine, Spirituality, Governance, Culture, Philosophies. Indigenous knowledge exists as an interrelated continuum and breaking it to fit pre-designated disciplines of western/euro-americentric knowledge often creates more confusion than understanding, which makes wholesale adoption of exotic business models to commercialise IK technologies/innovations/products a challenge. This misunderstanding is aggravated by:

- **Crisis of representation** by western/euro-americentric discourses that leads to, subjugation, marginalisation, primitivisation, devaluation, decontextualisation invalidation, rejection, misrepresentation (by the other). This has seen IK being regarded as non-scientific, unauthentic, invalid, archaic, inferior and rural – processes. The latter leaves IK vulbarable to exclusion.
- **Appropriation** through processes of subversive extraction for economic benefit (cannibalisation) without due acknowledgment of the indigenous source and compensation of the indigenous originators of the knowledge such as theft, usually under the guise of labelling IKS as common and/or general knowledge.

Thanks to the South African and most African governments for taking initiatives to promote sustainable benefit sharing from IK while curbing its appropriation. Various South African government departments, notably Department of Science and Technology, have been actively involved in IK policy development, research and innovation work. The DST has developed the IKS policy, established chairs in IKS at various universities, funded research on IKS at various institutions, etc.

To illustrate how advanced IK is contrary to the common belief that education is formal school and tertiary qualification we present the following examples of IKS:

Strategy

The strong strategic thinking and moral lessons in story tales passed through oral tradition such as how tortoise outwitted rabbit, how the rabbit outwitted lions, relationships between baboon and rabbit, and how tortoise responded to lizard's greediness are intended to teach, chastise, caution the young. Messages from stories are appropriately change to suit the intended purposes. However, when it comes to the so called "formal education" introductory lessons on strategy, technology and other subjects in most South African teaching environments rarely point out to these tales. Instead looking inwards, references are made to Greek and other western philosophers due the exclusionary coloniality of modern/western epistemologies.

Art and technology

The symbolism and skills in arts and crafts in African villages are rarely, if ever, incorporated into the technology curriculum in South Africa[7].

Marketing

The use of local names in businesses drives a special message that boosts market share as they convey indigenous values more succinctly. Several (mainly western) product brands and franchises have capitalised on this strategy.

Cognitive development

Indigenous games that were played by local children made teaching of concepts easier (e.g. mathematical) as the students seamlessly relate practically. These made the transition from known to unknown (learning processes) easier[8].

Nature conservation

Indigenous communities have always considered themselves to be intimately related to and part of the lived environment. They had the inherent understanding that what affects nature also affects them and therefore made efforts to live sustainably through indigenous environmental governing systems characterised by restrictions and taboos such as the use of totems to restrict the eating of certain species by certain clans who then became custodians of these species. It is for this reason of leaving sustainably that most indigenous lands were considered *terra-nullius* by the colonisers. Indigenous meteorology has also been used in climate prediction, which has influences on agriculture and other livelihood practices, including indigenous peoples' climate migrations.

Preservation of community IP

The aspects of safeguarding intellectual property are not new to indigenous knowledge. Indigenous trade secrets and know-how have always been closely kept within families and clans but used to benefit the communities, including traditional medical practices and knowledge of indigenous medicinal plants. Even within families or clans, such information is passed on to individuals who would have undergone rigorous indigenous 'apprenticeship' and pass the testing to avoid community betrayal and malpractices.

Economics

Economic models amongst local populations are fascinating and linked to traditional community sustenance and sharing. Their lending systems and barter trading can provide a lesson or two to the current quandary of funding start-ups. The South African stokvel systems is a testimony to this. Operations of Somali spazza shops[9] and Pakistanis' start-up model are further examples of success in embracing IK.

Health

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[7] Gumbo, M.T. (2015) Indigenous technology in technology education curricula and teaching. In Williams, P.J., Alister, J. and Buntting, C. (Eds.), *The future of technology education* (pp 57 – 75). Springer, London

[8] Tatira, L. (2014). Traditional games of Shona children. *The journal of pan African studies.* **7**(4): 157 – 174.

[9] Liedeman, *et al.* (2013) http://www.econ3x3.org/article/why-are-foreign-run-spaza-shops-more-successful-rapidly-changing-spaza-sector-south-africa Accessed March 18 2015

There is overwhelming evidence of successful use of traditional medical practice and related traditional medicines to sustain the health of indigenous communities even in modern day contexts. The current consumer preferences are gravitating towards minimally processed foods, herbal and natural supplements (e.g. moringa products, *Aloe vera*) and organic foods that have been the mainstay of our forefathers. It is tempting to say we might have moved too fast and missed the usefulness of our own product/services, that we are now turning back to against the background of 'new diseases' (high blood pressure, diabetes, etc.) that are associated with the advent of the refined (high carbohydrate and high additives) modern diet.

CONCLUDING REMARKS

It is pertinent to note that in real IK practices the above categories are interlinked and work in synergy as a system. Thus, attempts to isolate each one along western disciplinary lines and Cartesian dualism usually leads to unintended undesirable results as the holistic concept espoused in IK practices is defeated.

Given the information above and the facts that South Africa is rich in plant diversity, 67 % of global pharmaceutical products are of plant origins and 80 % of South Africa's indigenous therapeutic products are yet to be commercialised: **Why do we find South Africa (and other African nations) battling with diseases that could have been addressed by inherent innovations of indigenous peoples?** There maybe various reasons for this as outlined below:

- The challenge in addressing local problems is a manifestation of neglecting solutions in our backyards. We labour strenuously to force external-derived solutions developed for different contexts to fit ours. For example, in the development of biopharmaceuticals, cognisance of environmental adaptation of local species should be kept in mind when looking for therapeutic value of medicinal plants. A plant may express specific molecules variably depending on geographical location and climate which are useful in combating microorganisms that are prevalent in their environments. Local populations are exposed to same species of the microorganisms, hence it makes sense to use such indigenous plants as first port of call for solutions.

- **Isolation and characterisation of** active compounds is a buzz phrase amongst 'educated' scientists exploring the development of plant derived products. There are obvious advantages that come with these processes such as gaining an insight with regards to mode of action, dose, potential for over-expression in other organisms for mass production, generating publishable data, contributing to the knowledge pool and increasing chances of patentability. But one question that is raised by system thinkers which is applicable to this scenario is: how sure are you that the isolated compound will perform effectively and efficiently on its own compared to when it was in consortium with other compounds from the source? Therefore we need to strike a balance on what steps to do when we translate knowledge from local populations or citizen scientists to our laboratories in search of information to take our therapeutics to the global market.

- Sheer individual and corporate greediness at times blocks us from realising the best out of our environments. We find the plants in use by communities, but once we embark on

the isolation and characterisation we want to own everything and protect it through disclosing what we are protecting so that we as individuals, research institutions or commercial entities become competitively advantaged, usually at the expense of local communities from which the plant uses are derived. Competitive advantage may be regarded as the cornerstone of business survival. However, looking back at the sophisticated and complex survival strategies existing within indigenous communities, business may have been driven by duty to serve the society and not to rip out profits for individual/private beneficiation. There are greater profits that come from performing to serving the society first which is the bedrock of Ubuntu. In most cases we find most scientists in the developing nations being unable to fund the patenting process and they may give up halfway in the process leading to them surrendering what they intended to patent, or trading the material for small research tokens. The material is then further developed by those with economic muscle and resold at usually unaffordable prices to local communities from which it originates. This reminds me of two questions that were paused during the IKS Breakfast discussions: Has the intellectual property law advantaged or disempowered citizen scientists? When such laws are being drafted what is used in their development where do we get the guiding information from?

Based from the above, a lesson can be drawn from an African proverb whose literal translation states that: *A water gourd can fit into the clay pot but the clay pot cannot fit into a water gourd*. Attempts to foist exotic research and development models on indigenous knowledge innovations and practices without a deeper understanding of the local indigenous systems is futile. However, one has to first understand the local indigenous system and then appropriately integrate/adapt the exotic system to complement or enhance the local systems. In this context one can then ask if we are applying appropriate business models. Do the local communities feel safe with entrusting their knowledge that has benefited them since time immemorial to individuals that have not undergone the rigorous community testing, trust and approval? Are the current westernised/capitalistic business models compatible with the prevailing social practices within local indigenous communities? Have we done enough to tap into our pool of solutions in our backyards? Are we adequately acknowledging, empowering and sharing benefits with local communities whose innovations we are tapping upon?

By now one could be asking:

1. What should we do to get it right?

2. In the view of globalisation how can we get into external markets if we stick to our local knowledge?

Question 1

We need not to trivialise and run away from IK, recognising the emerging benefits and potential it has to mankind. There is a greater need to mainstream IK into the formal education curriculum (from school to university level) in order to develop citizens that identify themselves with products and services from this knowledge and are comfortable in applying them.

Considering that a Bachelor of Indigenous Knowledge degree is now on offer in South Africa, through the efforts of the Department of Science and Technology, which offers a possibility for further specialisation in this field beyond undergraduate level, it would be necessary to have IK embedded and recognised in the various aspects of the curriculum right from primary to further education levels in order to prepare a healthy pipeline for establishment and development of the field of IK as recognised academic discipline. There is no doubt that IK is still threatened by extinction. Therefore creating an abundance of such knowledge will provide a platform to feed a commercialisation conduit for IK while also validating and supporting the sustenance if IK practices within local community contexts. We need to learn from the indigenous knowledge holders and custodians first in order not to commit a fundamental mistake of trying to teach them what they know that we do not understand. Hence, the development of humane/Ubuntu[10] business model by DST is something worth acknowledging. The process that should be adopted then is to understand the knowledge and technologies, research and write/author from these understandings in collaboration with the knowledge holders and add exotic flair where necessary to these practises that have been working since pre-historic times.

We would like to challenge the academics to come up with ideas of broader mainstreaming of IK into the curriculum from primary to tertiary level, produce IK graduates with a duty to society to perpetuate the gains of IK with the same manner the environmental sustainability that has been evident in indigenous communities. Local graduates in various fields should find ways of incorporating relevant IK into their practices. For instance, occupational therapists should look into developing culturally relevant tests and activities as 'one size fits all' western approaches may alienate some bright indigenous stars. Organisations such as the Innovation Hub in partnership with Department of Science and Technology, non-governmental organisations (e.g. Africa Bio) and private companies shall continue to catalyse dialogue and creating and enabling environment for the advancement of IK products and services for socio-economic benefits that accrue to the broader populace. Furthermore, assistance for entrepreneurs seeking to commercialise IK technologies will be given through instruments such as The innovation Hub's enterprise development initiatives.

Question 2

Entrance into the global markets can be achieved, particularly for bio-products, through developing and adapting techniques that help IK products to meet stipulated standards. The development of such techniques would require one to understand the IK practice and then develop/adapt relevant methods to preserve the products' viability. The Department of Science and Technology is leading an initiative of developing a manual on standard practices in producing some indigenous products. Science councils (e.g. ARC and CSIR) are avenues for

[10] Chababalala, H (Director: IK-based technology innovation) – Department of science and technology – Pers. Comm.

testing and implementing standardisation of production of IK-based products to meet market quality standards[11]. Universities are also playing a role in the space as well.

At this juncture, we can say there is a need for more dialogue around IKS. Such dialogue should be centralised on the indigenous knowledge holders. Furthermore, our fore-parents always say: *Its only the soil that knows that mouse pups are sick.* Similarly, it is the local population that understands its social ills and the solutions are within. The task is to find a sustainable and just way to unlock these solutions. Once they are developed and used successfully, the world will have confidence in purchasing and using them.

[11] http://www.csir.co.za/biosciences/Natural_Products/index.html Accessed 08 May 2015