

# Science and Technology: A Call for Action

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*Editorial Commentary*

## Our role

The ISTJN is dedicated to the sharing of empirical S&T knowledge knowing fully well that knowledge is the currency for development and the most crucial resource, raw material and basic building block to be relied upon in achieving sustainable socio-economic livelihoods in Namibia and beyond.

We at the journal are cognisant of the fact that the empires of the future are empires of the mind. We are also aware that knowledge—not financial capital, is the most important resource for sustainable development.

Sustainable utilisation of and value-addition to our raw resources such as minerals, crops, and livestock will require transformative knowledge. So, the development of technology must be enhanced so that our people are able to convert abundant raw materials into finished products.

Africa is poor because our science is poor.

Correct national economic planning that guarantees the achievement of sustainable livelihoods and ecologically sustainable development will not take place in a knowledge vacuum. We also need to foster knowledge for future survival and competition so that we can favourably participate in this global village and information age.

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These are the commitments we have set for ourselves and for our readership: to engage critically with S&T, starting from basic and theoretical concepts, and moving to more operational and applied real life situations.

Science is not static. Science is not knowledge one hides in the bushel. Educated by these principles, the ISTJN provides a platform to engage with the ever-changing faces of national, region and international science. To keep pace with the ever-changing trends requires a platform to communicate and share information. That is the critical niche of the ISTJN.

In performing this role, we are committed to rigour, both in terms of scientific methodology and precision as well as accuracy of research findings. But we cannot boast of regional and international rigour without being local in appeal. Thus, our primary focus is to give a maiden chance to local and younger science practitioners to showcase their findings to national and international audiences.

This is not an easy undertaking given that many local journals have failed and died a natural death. Yet, out of respect, the ISTJN is not here to compete with the 'dead'.

One of the main causes of death for local S&T journals is the sad reality that the local S&T enterprise is often plagued by the lack of resources, funding, and obsolete equipment. Many local academics are struggling to keep their research careers afloat. Consequently, our local scientists fail to conduct rigorous research which can produce desirable publication outputs.

We hope that the coming of the National Commission on Research Science and Technology can transform the Namibian S&T landscape through sustainable and meaningful funding of researchers and support for state-of-the-art equipment in order to concomitantly increase the quality and quantity of publications outputs.

Suffice to state that the journal continues to receive tangible support from the Faculty of Science and the University of Namibia in general. Through this third issue, we reaffirm the Faculty of Science and the University of Namibia's commitment to the journal. However, we cannot go further into the future if we cannot look deeper into the past.

## **History is on our side**

Since the 1960s, science has been embraced as the tool for modernization of the new independent African states. Corollary, three international conferences were held: the International Conference on Science in Advancement of New States, held in August 1960, at the Weizmann Institute of Science, Rehovoth, Israel; the United Nations Conference on the Ap-

plication of S and T for the Benefit of the Less Developed Areas, held in February 1963 in Geneva; and the International Conference on the Organization of Research and Training in Africa in Relation to the Study, Conservation, and Utilization of Natural Resources held in July 1964 in Lagos, Nigeria (Odhiambo, 1967). All these conferences underlined the need to use science as a tool to dissolve Africa's economic and social problems.

Later, the urgency for S&T was embraced by African Heads of State and Government through the 1979 "Monrovia Declaration of Commitment" and the 1980 "Lagos Plan of Action" (Chinsembu and Kasanda, 2012).

The Lagos Plan of Action states as follows: "The importance of scientific and technical skills and know-how for modern development cannot be over-emphasized. It is in this area that Member States are over-dependent on imported technical and scientific manpower. It is therefore very cardinal, and in accordance with the principle of self-reliance, that Member States should give special priority to the development of scientific and technical manpower at all levels, including the training of science and technical teachers and instructors."

According to the Lagos Plan of Action: "Top priority should be given to the development of human resources for the creation of S and T infrastructure of manpower, knowledge-skills, innovation and productive capacities to absorb and adapt imported technology, on the one hand and, on the other, to develop technology locally for the identification, exploration and exploitation of natural resources, and the conversion of raw materials into semi-finished and finished goods and products".

The Lagos Plan of Action also implored that "Member States should take steps to improve existing and create new funding mechanisms to provide funds on a predictable and continuous basis at the national level, with a view to substantially increasing the resources available for the development of their scientific and technological capabilities and to the implementation of the Programme of Action. Member States are urged, within the coming decade, to aim at gradually reaching the target of mobilizing, at the domestic level, 1 per cent of their GDP [Gross Domestic Product] for the development of their scientific and technological capabilities".

Sadly, to this day, many sub-Saharan African states have failed to fund S&T to the level of 1 per cent of their GDP. We therefore urge all Member States of the African Union to respect their commitments to the Lagos Plan of Action and henceforth start disbursing 1 per cent or more to their national S&T operations.

Under the New Partnership for Africa's Development (NEPAD), an economic programme of the African Union, S&T have been acknowledged as the main drivers of economic growth and development (Mugabe, 2006). The ability of countries to create, distribute and utilize scientific and technological knowledge is now accepted as a major determinant of their com-

petitiveness in the global economy. Countries with a greater ability to use S&T are more likely to improve their people's quality of life.

Going forward, African scientists must wake up and work harder, and African governments must invest in their own scientific research if the continent is to leap forward on the path to genuine sustainable economic development. And African presidents must have scientific advisors, just as they have political and economic advisors (Chinsembu, 2006). Without engaging our own scientists, how will our political leadership face threats such as climate change, drought, natural disasters, terrorism, and Ebola? If we do not take our sciences seriously, Africa risks being enslaved by technology it does not own (Chinsembu, 2006).

## **Current issue**

Infertility is defined as the inability to achieve a pregnancy after at least 12 months of regular unprotected coitus. Up to 15% of couples experience difficulties in conceiving, and several recent studies now speak to an increase in the cases of infertility. Infertility gives way to psychological trauma. For many couples, it is often cited as the most stressful event in their lives. In addition to the psychological shocks of infertility, the treatments mount enormous physical, economical, and emotional burdens on couples.

In-vitro fertilization (IVF) treatment is the most frequently used method to treat infertility, with an average success rate of 23%. One of the most stressful times of the experience is the waiting for pregnancy test results after the embryo transfer. Stress can in fact hamper the successful outcome of in-vitro fertilisation.

The efforts associated with trying to conceive, the uncertainty regarding the likely effectiveness of the treatment, and the physical pain and discomfort of the various invasive procedures in the treatment of infertility all contribute to increased psychological agony.

In infertile couples, women resort to proportionately greater amounts of confrontational coping strategies, in addition to accepting responsibility, seeking social support, and engaging in escape or avoidance mechanisms. Infertile men, on the other hand, use consistently greater amounts of distancing, self-control, and painful problem-solving.

Infertility takes a heavy toll of one's quality of life. It is a social stigma. Infertile women have more feelings of distress, anxiety, loss of control, social isolation, and a sense of shame. Infertile women trying hard to get pregnant can become highly distressed and totally emotionally-absorbed in the process of trying to become pregnant.

In men, infertility can be caused by abnormal sperm production and function, premature ejaculation, sperm delivery problems, poor lifestyles such as obesity and alcohol drinking, over-exposure to environmental factors like pesticides, cancer and its treatment, low testosterone levels, stress, and probably old age.

In women, infertility may be due to fallopian tube damage or blockage, endometriosis, ovulation disorders, elevated prolactin, polycystic ovary syndrome, early menopause, uterine fibroids, use of certain medications, thyroid disorders, and old age. Hydroquinone in skin lightening creams is believed to cause infertility.

Abnormal cervix and cervical mucus defects are responsible for infertility in 5–10% of women. Still, Chlamydia trachomatis bacterial infection is the most important preventable cause of infertility. In some 25–30% of infertility cases, a cause is not known. Infertility is a warning alarm for cancer. Men who do not make sperms may be at a higher risk of cancers such as brain, prostate and testicular cancers as well as melanoma and lymphoma.

But, what really causes infertility in African men, and what measures should be taken to circumvent this problem?

Well, this is the question Mause, Mabota, and Bugalho attempt to answer this question in their paper 'Assessment of male infertility causes in Mozambique: A Case study of working class patients by IVF at *Medicos Associados Clinica Cruz Azul* Laboratory, Maputo'. Their results show that most of the cases of infertility were caused by oligospermia and high semen specimen viscosity (HSSV). The authors arrive at very interesting conclusions and recommendations. For example, since Oligospermia constitutes a significant factor causing human infertility regardless of its category, they recommend an introduction of intra-cytoplasmic sperm injection techniques in the IVF Laboratory by the *Medicos Associados Clinica Cruz Azul*.

Also, given the fact that HSSV exerts negative influence over human fertility, care of reproductive organs should be observed in order maintain high quality of semen. In addition to alcohol avoidance, the authors also recommend a proper timing of intercourse so as to achieve fertilization by couples with normal semen quality.

### **Other papers in this issue**

*Nantanga & Others:*

Their contribution entitled "Structures of Salivary and Pancreatic Amylase Hydrolysates from processed Starches" are as follows:

1. Towards understanding the management and control of Type 2 diabetes, the natures of

products during starch digestion from the mouth up until their conversion to glucose in the small intestine have impact on the rate of glucose delivery into the blood.

2. That is, it not just the amount of glucose produced but which structures produced along the digestion process and how different depending on, inter alia the methods of processing and the source of the starch such as mahangu (pearl millet) or wheat or potato or corn can have huge impact on the management of type 2 diabetes.

3. This is a new way of looking at the factors/stategies in the management of type 2 diabetes as opposed to the current way of just determining the end product (primarily glucose) without necessarily looking at the structures produced during the long process of digestion until their ultimate conversion to glucose.

*Oyedele & Gardner-Lubbe:*

One of the cores of Science and Technology is the investigation of the relationships between different sets of variables. Oyedele & Gardner-Lubbe (2014) showed how these relationships can be explored using the covariance biplot. Advantages of this biplot include, but are not limited to, showing the relationships between these sets of variables, as well as within each set of variables.

*Kopij:*

In 4 towns (Ondangwa, Ongwediva, Oshakati, Outapi) and 12 larger villages in Ovamboland, north-central Namibia, a total of 59 residential bird species were recorded. The group of dominant species comprised 68.1% of all pairs recorded ( $n = 2105$ ) and was represented by *Passer domesticus* (33%), *Uraeginthus angolensis*, *Cypsiurus parvus*, *Corvus albus*, *Streptopelia senegalensis* and *Urocolius indicus*. Latitudinal trends have been shown for the proportion between *Pycnonotis tricolor* and *P. nigricans* and *Passer diffusus* and *P. domesticus* species; *P. domesticus* almost totally replaced *P. diffusus*, while *S. senegalensis* almost totally replaced *S. capicola*.

*Kahler:*

The review gives a cross-section of what has been explored and achieved in the vast field of natural zeolite mineral research and application. Several options are addressed where and how zeolite mineral could be integrated into existing concepts of this country, particularly in both the domains of human and veterinary medicine, as well as in pharmacy and environmental protection. Some proposals are made for the participation of Namibian educational institutions to contribute to research, exploration and exploitation of this topic.

*Ogedengbe:*

The research work focused on determining the hydraulic characteristics of pipes, made from a Nigerian grown bamboo (*Bambusa vulgaris*), such as the head loss, the friction factor and the flow type at the nodes and the internodes. In the study three different types of drilling bits to remove the diaphragms at the nodes were considered and the hole-saw drilling bit was found to be the most effective. It was established in this study that the hydraulic characteristics of the bamboo pipe were close to those of some polyvinyl chloride (PVC) pipes.

*Ligonmah:*

In the world of classification and finite group theory, the author delves into the characterization of  $A_n$  for  $n = 5, 6$  by 3-centralizers.

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