MAURITIUS ACADEMY OF SCIENCE & TECHNOLOGY

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Mauritius Academy of Science & Technology (MAST)

## EDITORIAL

## Science advice: assisting policy makers in time of crisis

The world continuing crisis after the COVID-19 pandemic, with the war in Ukraine, climate change, food security and inflation, amongst others, is causing repercussions that are being sorely felt upon every spheres of society and the environment. Global events such as these have highlighted the importance of science advice to link scientists and policymakers. Science advice is the process, structures, and institutions through which governments and policy-makers receive advice and apply the knowledge for public policy development. Science offers an objective, logical and fact-based viewpoint and when correctly applied, this approach offers a transparent foundation for the policy decision making process. Science advice is thus critical in informing and directing decisions and actions. It is understood that the information presented at any one point is on current knowledge and is progressive, as new evidence presents itself. It happens that information based on prior knowledge becomes redundant or new knowledge generated is in contradiction with previous findings. Such circumstances can be the cause of mistrust between the parties and requires clear line of communication.

In time of crisis, procedures should be in place to collect evidence quickly and the information has to be sound and unbiased, impartial and practical. It is also accepted that science advice is restricted to evidence provision and there is no interference in the policy response options that follow. Issues of global nature, such as those mentioned above, cannot be solved by one country alone and collaborative efforts among governments, academies, academia and institutions have to be developed. The International Network for Government Science Advice (www.ingsa.org) provides for a collaborative platform for policy exchange, capacity building and research across diverse global science advisory organisations and national systems. It aims at enhancing the global science-policy interface to improve the potential for evidence-informed policy formation at sub-national, national and transnational levels.

National academies, such as MAST, that have interdisciplinary knowledge, can play a significant role in such science advisory ecosystem by gathering the evidence. The interface with the policy makers remains the link to be strengthen, requiring the establishment of a mechanism to continue the conversation between those who provide the evidence and those who will be using it. We need to ponder on such a structure for Mauritius for effective instillation of science advice.

**Salem Saumtally**

**President, Mauritius Academy of Science and Technology.**

# The PASET Regional Scholarship and Innovation Fund: Boosting Doctoral Education, Research and Innovation in Africa

*Goolam Mohamedbhai*

In 2013, in response to the critical need to strengthen the scientific and technological capacity of Sub-Saharan African countries in order to promote their development and achieve economic transformation, an initiative known as the *Partnership for Skills in Applied Sciences, Engineering and Technology* (PASET) was launched by the World Bank. A notable aspect of PASET is that it is managed and funded mainly by African governments and is also supported by the private sector, development partners and partner countries in Asia, such as Korea. Initially, the initiative was promoted by five African countries – Cote d'Ivoire, Ethiopia, Kenya, Rwanda and Senegal –but several others have since joined PASET and are actively supporting it.

In 2016, PASET launched its flagship initiative, the *Regional Scholarship and Innovation Fund* (RSIF), with the objective of establishing a Pan-African science fund, the first of its kind in Africa, to boost doctoral training in African universities and to strengthen their institutional capacity for undertaking quality, sustainable and innovative research in transformative technologies in Africa. The medium-term objective of RSIF is to train 10,000 PhDs in five identified critical thematic areas: climate change; energy, including renewables; food security and agri-business; ICT, including big data and artificial intelligence; and minerals, mining and material engineering.

The strategy is to select brilliant African candidates, many of whom are full-time academics at African universities and provide them with scholarships to undertake their doctoral training in selected African host universities with the collaboration of renowned international partner institutions where the scholars spend one year of their studies under a sandwich agreement. At present, there are 15 universities in 11 African countries hosting RSIF doctoral scholars, most of which already host a World Bank-supported African Centre of Excellence (ACE) in a relevant science and technology field. The 11 international partner institutions are in Korea, Japan, the USA, Europe, Brazil, Israel, Morocco and South Africa. In 2022, there were 258 PhD scholars enrolled. The first batch was enrolled in 2018 and several of them would be graduating this year.

RSIF also awards competitive research and innovation grants to those African universities hosting PhD scholars by supporting research that promotes scientific excellence and use of knowledge for development impact. So far, RSIF funding has resulted in the publication of 85 research papers in international refereed journals. There is equally provision under RSIF to award postdoctoral research grants to those RSIF scholars who have completed their PhD.

The RSIF is being coordinated by the International Centre of Insect Physiology and Ecology (*icipe*), a world-renowned insect science research centre established in 1970 in Nairobi, Kenya, and which was competitively selected for RSIF coordination following an international call by the World Bank.

At present, RSIF activities are funded through a General Fund to which each African country supporting the initiative contributes about USD 2 million. The Korean government has also contributed towards the Fund and the World Bank has provided a grant to *icipe* to administer RSIF. However, for RSIF to be sustainable in the long-term and in order to meet the medium-term objectives of training PhD scholars and funding research and innovation in African universities, RSIF needs to set up a Permanent or Endowment Fund which will seek to create a pool of permanent capital that will be invested to generate returns to fund RSIF needs.

That is the challenge currently facing RSIF, especially as the World Bank support is likely to end in 2024. A feasibility study on the establishment of an Endowment Fund undertaken in May 2020 by a consultancy firm, showed that a sum of the order of USD 348 million would need to be raised over 20 years to meet the desired outflows of PhD scholars and research grants under RSIF. Who could be the potential funders of that Fund? Which organisation will manage that Fund? Where will the Fund be domiciled? Interestingly, the feasibility report, while considering potential domiciles for the Endowment Fund, recommended that it be established under Mauritian law as a charitable foundation.

All these challenging questions are currently being addressed by the PASET governance, under whose responsibility RSIF operates, the World Bank and *icipe*. If a satisfactory outcome can be found to ensure the sustainability of RSIF, there is no doubt that it will revolutionise the landscape of doctoral education, research and innovation in Africa.

*25 August 2022*

Enrolment of the first cohort of 15 RSIF PhD scholars in 2018
L to R: Prof Goolam Mohamedbhai, Adviser to PASET;
Dr Sajitha Bashir, World Bank Manager;
Dr SegenetKelemu, *icipe* Director-General;
Mr Xavier Botero Alvarez, World Bank Manager.

# Canada and Science and Technology.
## Pr.S.Jugessur

Canada has contributed enormously to the development and promotion of Science and Technology for years. Were it not for their R&D, the whole area of communication would have lagged far behind, and to-day we would neither have radio and TV nor our mobile internet with IPhone! We usually refer to USA or Europe for most technological developments, forgetting that it all started way back over 150 years ago in Canada, as examples below will show. Even now Canadians are spending millions of dollars in educating their kids to adopt IT facilities.

In terms of early education, kids even six years old have a host of games that enable them to navigate their tablets, play games, looking at films made specifically for them. They learn how to search and look for what game they want. As they grow up their sense of novelty goads them towards higher level research and publication in the forefront of science and technology. Thus at universities research goes on and laboratories are provided with the best of equipments required as in most parts of the developed world. A few highlights of their achievements are mentioned below.

The various areas of food, energy, health, telecommunications, environment and sustainable development have all been dealt with in their research and development, and publicized in international journals. The most important breakthrough has started in telecommunications. Though an Italian invented the basic phone in 1849, Graham Bell won the first international patent for his device in 1876, and started his company, the Bell Telephone Company in 1877. Within a century major developments took place with international telecommunications. It is noteworthy that during the 2nd World War instant communication by phone took place between John F Kennedy and Mikhail Gorbachev without letters and displacement.

Thanks to their achievements every aspect of development has improved. In health for example, the heart surgery and pacemaker implants have come up. In diabetes control, cancer treatment with radiation therapy, they have been in the forefront. Similarly in many aspects of engineering like

*(Canada was **ranked 16th in the Global Innovation Index in 2021 and 17th in 2019 and 2020**. As of 2020, the country has produced fifteen Nobel laureates in physics, chemistry, and medicine, and was ranked fourth worldwide for scientific research quality in a major 2012 survey of international scientists)*

## CANADA SCIENCE and TECHNOLOGY MUSEUM

# A LAND MARK VOTE FOR THE ENVIRONMENT. UN/UNEP, 28 JUL 2022

***In historic move, UN declares healthy environment a human right. United Nations General Assembly declared today that everyone on the planet has a right to a healthy environment, a move backers say is an important step in countering the alarming decline of the natural world.***

In a resolution passed Thursday morning at UN headquarters in New York City, the General Assembly said climate change and environmental degradation were some of the most pressing threats to humanity's future. It called on states to step up efforts to ensure their people have access to a "clean, healthy and sustainable environment." The resolution is not legally binding on the 193 UN Member States. But advocates are hopeful it will have a trickle-down effect, prompting countries to enshrine the right to a healthy environment in national constitutions and regional treaties, and encouraging states to implement those laws. Supporters say that would give environmental campaigners more ammunition to challenge ecologically destructive policies and projects.

## *General Assembly Meets on Peacebuilding and Human Rights.*

*"This resolution sends a message that nobody can take nature, clean air and water, or a stable climate away from us – at least, not without a fight," said Inger Andersen, Executive Director of the UN Environment Programme (UNEP).*
The resolution comes as the planet grapples with what Andersen called a triple planetary crisis of **climate change, nature and biodiversity loss, and pollution and waste.** Left unchecked, the new resolution said those problems could have disastrous consequences for people around the world, especially the poor, and women and girls.
The General Assembly resolution follows a flurry of similar legal reforms at the international and national levels. In April, the UN Human Rights Council declared access to a **"clean, healthy and sustainable environment"** a human right.
Virtually all countries have national laws designed to limit pollution, protect plants and animals, and counter climate change. But those rules are not always fully implemented and when they are violated, citizens often struggle to hold governments and companies accountable.
At the national level, declaring a healthy environment a human right would allow people to challenge environmentally destructive policies under human rights legislation, which is well-defined in many countries.
In the days before the General Assembly resolution was passed, Andersen pointed to a similar decree from 2010 that recognized the right to sanitation and clean water. That, she said, spurred countries across the globe to add drinking water protections to their constitutions.
She said the latest resolution has the same historic potential.
*"The resolution will trigger environmental action and provide necessary safeguards to people all over the world," said Andersen. "It will help people stand up for their right to breathe clean air, to access safe and sufficient water, healthy food, healthy ecosystems, and non-toxic environments to live, work, study, and play."*

**Michael Atchia**
**(Past Programme Director, UNEP)**

See note on next page

## Social and Scientific Research into the planet's current difficulties have yielded this list of 12 major challenges for our children (2022-2030)

**(1) Saving the Earth –** A change in our capability to manage the Earth. We have gathered vast amounts of information about the planet. This can help us learn to live in harmony with nature, but we need the political and individual will to do it. In simple words to SURVIVE. The planet's climate is changing and we have to learn to control these changes and live with them. Since we have ONLY ONE EARTH (no alternative planet!!) we need to be sure we do not go beyond the point at which global warming cannot be reversed, earth system science must be meticulously modelled and monitoring must be precise.

**(2) Reversing Poverty –** While rich nations and rich individuals get richer, billions of people live in poverty or even extreme poverty, lacking basic resources for a decent life which we all have the right to.

**(3) Steadying Population Growth** – Extreme poverty can be tied to population problems. There are now ways to lower the birth rate. At the opposite end of the spectrum, populations declines in countries where women are educated, work and when **GDP rises; in such countries there is need for re-population.**

**(4) Achieving Sustainable Lifestyles –** All of the people on the planet cannot have affluent lifestyles of the rich in rich countries, on the limited resources of the Earth. We can fulfil the need high-quality lifestyles for all that does not strain the environment. But sharing resources and producing food and other life-items are essential. As Gandhi said "**the world has enough for everyone's needs, but not everyone's greed**,"

**(5) Preventing War** – All-out war in the 21st century could end everything. Nuclear and biological weapons are a threat. This century contains more threats from more weapons of mass destruction than ever before. Strengthening the UN is essential here, as is peace education for all.

**(6) Dealing Effectively with Globalism –** We must allow local cultures to survive and thrive. The right balance between global and local should be achieved..

**(7) Protecting the Biosphere** – We are losing biodiversity of life on Earth; species of plants and animals are fast becoming extinct. Protecting endangered species is crucial.

**(8) Controlling Terrorism –** The age of terrorism is rising with the availability of weapons of mass destruction that are becoming increasingly less expensive and easier to access.

**(9) Cultivating Creativity –** A major aim of educational systems. Exciting jobs will be developed and more and more young people around the planet will become entrepreneurs.

**(10) Conquering Disease** – We must control the rapid spread of infectious diseases that could kill many millions of people, as has happened already many times in history and in the recent COVID 19 pandemic. We now can detect the existence of a dangerous virus in the air and we are creating medical procedures to prevent such illnesses from spreading. Controlling other pandemics require preparation, and we must do more to be ready for them. And redirect more resources of medicine towards healthy living and well-being for all.

**(11) Expanding Human Potential** – ***No one left behind*** by all educational systems. Most people today fall outrageously short of their potential. A goal of the 21st century should be to develop the capability latent in everybody by harnessing powerful technologies that accelerate learning potential.

**(12) Bridging the Skill and Wisdom Gap – A serious problem right now is the gap between our skill and our wisdom. Science and technology are accelerating furiously, but wisdom is not.** Today, deep reflection about our future circumstances is eclipsed by the rush to build faster, cheaper, smarter, more-efficient gadgets that will increase corporate profits. Society's best brains are saturated with immediate issues that become ever more complex, rather than reflecting on why we are doing this and what the long-term consequences will be.

# National Academies of Science in Africa

**Academies of Science** support the implementation of a nation's science policy through their dual mandate: promoting and honouring scientific excellence and providing evidence -based science advice to their nations. Since 2008, ASSAf has engaged in collaborative and academy development work with various national science academies. There are over 110 academies of science across the globe, some of which are over 350 years old such as the Royal Society (United Kingdom). In Africa, there are **twenty-nine (29) national academies of science** namely:

Algeria – Académie Algérienne des Sciences et Technologies (AAST)
Benin – Académie Nationale des Sciences, Arts et Lettres du Benin (ANSALB)
Botswana – Botswana Academy of Sciences (BAS)
Burkina Faso – Académie Nationale des Sciences du Burkina (ANSB)
Burundi – Academie Burundaise Des Sciences Et Technologie (ABST)
Cameroon – Cameroon Academy of Sciences (CAS)
Congo – Académie Nationale des Sciences et Technologies du Congo (ANSTC)
Cote d'Ivoire – National Academy for Cote d'Ivoire
Egypt – Academy of Scientific Research and Technology (ASRT)
eSwatini – Kingdom of eSwatini Academy of Sciences
Ethiopia – Ethiopian Academy of Science (EAS)
Ghana – Ghana Academy of Arts and Sciences (GAAS)
Kenya – Kenya National Academy of Sciences (KNAS)
Madagascar – Madagascar's National Academy of Arts, Letters and Sciences
Malawi – Academy of Sciences in Malawi
Mauritius – Mauritius Academy of Science and Technology (MAST)*
Morocco – Hassan II Academy of Science and Technology in Morocco
Mozambique – Academy of Sciences of Mozambique (ASM)
Nigeria – The Nigerian Academy of Science (NAS)
Rwanda – Rwanda Academy of Sciences
Senegal – Académie des Sciences et Techniques du Sénégal (ANSTS)
South Africa – Academy of Science of South Africa (ASSAf)
Sudan – Sudanese National Academy of Science (SNAS)
Tanzania – Tanzania Academy of Sciences (TAS)
Togo – Académie Nationale Des Sciences, Arts Et Lettres Du Togo (ANSALT)
Tunisia – Tunisian Academy of Arts and Letters
Uganda – The Uganda National Academy of Sciences (UNAS)
Zambia – Zambia Academy of Sciences (ZaAS)
Zimbabwe – Zimbabwe Academy of Sciences (ZAS)

The oldest academy is Madagascar's National Academy of Arts, Letters and Sciences, which was established in 1902, while the youngest academy is the **Academy of Sciences in Malawi** which was established in 2021. In addition to the national academies, there is an individual member-based academy, the African Academy of Sciences (AAS) that draws its membership from across Africa.

# STATEMENT
# SCIENTISTS AGAINST WAR
## Solving conflicts through rational dialogue

*President Kennedy*: "*Mankind must put an end to war or war will put an end to mankind.*"
*Martin Luther King*: "It is no longer a choice, my friends, between violence and nonviolence. It is either nonviolence or nonexistence"
*Mahatma Gandhi*: "War is not a morally legitimate means of achieving anything permanent".

**Statement:** We scientists, members of the Mauritius Academy of Science and Technology (MAST) are **AGAINST and CONDEMN ALL FORMS OF WAR**, such as what is happening at present in Eastern Europe. The world must use **peaceful and rational dialogue** to solve any existing conflicts.
The cost of warfare, even a limited war, in terms of human lives, destruction of resources and pollution of the environment, is extremely high. We can never forget that 100 million humans (half of them, civilians) were killed during two World Wars and numerous other conflicts, in the last century, the 20th.
Most modern weapons release pollutants, which in no time spread around the world and is obnoxious to the ENTIRE PLANET. Nuclear weapons are a prime example of such weapons, so is biochemical warfare. In an era where humanity as a whole is struggling against a pandemic and is engaged in the long-term struggle to prevent global warming with all its negative consequences for life on the planet, no one has the legal, moral, ethical right to use and unleash ANY weapons as means of 'solving' conflicts.

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*Dr Michael Atchia, Dr Yashwant Ramma, Dr Salem Saumtally for MAST*
*Mauritius, 24 February 2022*

# Future Foods: Food for thought

***By Asha Dookun-Saumtally***
***MAST Fellow***

By 2050 the world population will reach some 9 billion and India will overtake China in 2023 with over 1.4 billion people. More food would be required to feed this growing population and new farmlands will need to be cultivated.

Do we have more lands for growing our food?

It is forecast that we shall need additional arable lands greater than the size of Brazil i.e. 850 million hectares to feed the earth's population, by growing more crops and rearing more animals.

Do we have such lands to ensure our food security? The answer is NO.

Therefore, we are faced with major challenges to address the future of food security at a time where we need to address emerging agricultural problems such as climate change, degradation of soils due to over exploitation, application of synthetic fertilizers and pesticides, drought, water shortage for irrigation and biodiversity conservation.

Scientists are coming up with bright ideas to secure our food security from other sources. Some examples are given below:
We do not need to depend on animal proteins to obtain our proteins. In 2020, the world consumed nearly 470 million metric tonnes of animal proteins, i.e. nearly 45 kg per human on earth. Alternates are plant-based proteins, insect proteins, or cultivated proteins.
Insects can be reared for food and the advantages are that they require less feedstuff and emit very little greenhouse gases and also require less water. In Asia, Africa and Latin America, insects such as grasshoppers, locusts, crickets, maggots and ants have long been the food on the plates of indigenous people that provide a major protein source. Some 2000 insect species are known to be eaten and the market is expected to increase globally. The global insect protein market is forecast to account for some 3.3 billion US dollars by 2027.

Plant based proteins to replace beef, chicken or seafood are also reaching the market. Besides soybean, wheat and peas are the major sources of plant-based proteins entering the market and

are used for producing meat-free burgers, sausages, etc. Other sources of pulses taking importance are chickpeas, lentils and beans. The market for plant-based proteins is expected to rise from 12.2 billion USD in 2022 to 17.4 billion in 2027.

New enabling technologies allow for cultivating proteins by growing animal cells in a laboratory. In 2013, the first lab grown burger was produced at Maastricht University in the Netherlands by culturing stem cells of a cow. Although the production cost is high, the environment impact could be very low as cultured meat has the potential to reduce water consumption by 82-96%, while greenhouse gas emission can be reduced by 78-96%. Other benefits are that they are no added antibiotics or any ingredients associated with feeding animals.

In 2020, the Singapore Food Agency, in Singapore , approved cultured meat production through cell culture of chicken in a bioreactor instead of chicken slaughter. The bite-sized chicken is produced by Asco Aster (photo).

*Photo source: ecowatch.com*

Algae is also taking importance as food substitutes. They have been used for thousands of years in some parts of the world. In the food industry macro algae are used to provide hydrocolloids such as agar-agar and carrageenan. In Chad, microalgae such as the blue green algae and spirulina have traditionally been eaten, while in Japan spirulina is important for a healthy diet as they provide protein, omega-3 fatty acids, vitamins, minerals such as calcium and potassium and also carotenoids. Spirulina can contain a protein content of up to 70% and therefore well considered as an alternative and sustainable source of protein.

New technologies such as genetic transformation and gene editing are also to contribute to our food security. High yielding varieties of various crops adapted to both biotic and abiotic stresses are being produced using these technologies. Moreover, additional characteristics for growth on poor soils, decreased applications of pesticides and synthetic fertilizers, adaptation to climate change and environmental stress are also being targeted. Plants will be able to fix their own nitrogen, while diseases and pests-tolerant crops would require less inputs in terms of fertilizers and pesticides. Various elite varieties of crops including banana, maize, potato, rice, wheat are currently being genetically edited to improve them. However, there is a need to address regulatory frameworks in various countries in order that the products from genetically modified or gene edited crops will meet consumer acceptance.

*Information sources:*

*Top Markets Reports by Markets and Markets Research Private Ltd, USA*

*Pixey et al. (2022). Genome-edited crops for improved food security of small farmers. Nature Genetics 54, 364-367.*

*Ecowatch.com*

# Monkeypox-an emerging public health challenge!

*Introduction and epidemiological situation.* Monkeypox (MPX) is a zoonotic disease caused by the *orthopoxvirus*, a member of the pox family of viruses that includes smallpox. Smallpox is notorious for scarification and deaths of millions of people round the world before being eradicated in the 1970s. MPXV predominantly infects rodents like field rats which can in turn infect monkeys in tropical forests. Hence the name monkeypox is really a misnomer. Sporadic cases of human infections caused by monkeypox had been observed in Central and West Africa since 1970 during the tail-end of global smallpox eradication campaign. At that time, it was feared that monkeypox could have served as an animal reservoir for human smallpox and undermine the eradication initiative. Luckily, the stable DNA genome of the pox virus has not undergone drastic mutation. However, the number of human cases of monkeypox has been steadily rising starting with Nigerian outbreaks of the years 2017/2018 and currently close to 5500 cases have been observed globally, spanning all continents. In view of the recent upsurge in human cases, it is logical to enquire why the number of cases keep increasing and naturally, what does this all represent epidemiologically being given that we are just bouncing back from a trailing covid pandemic.

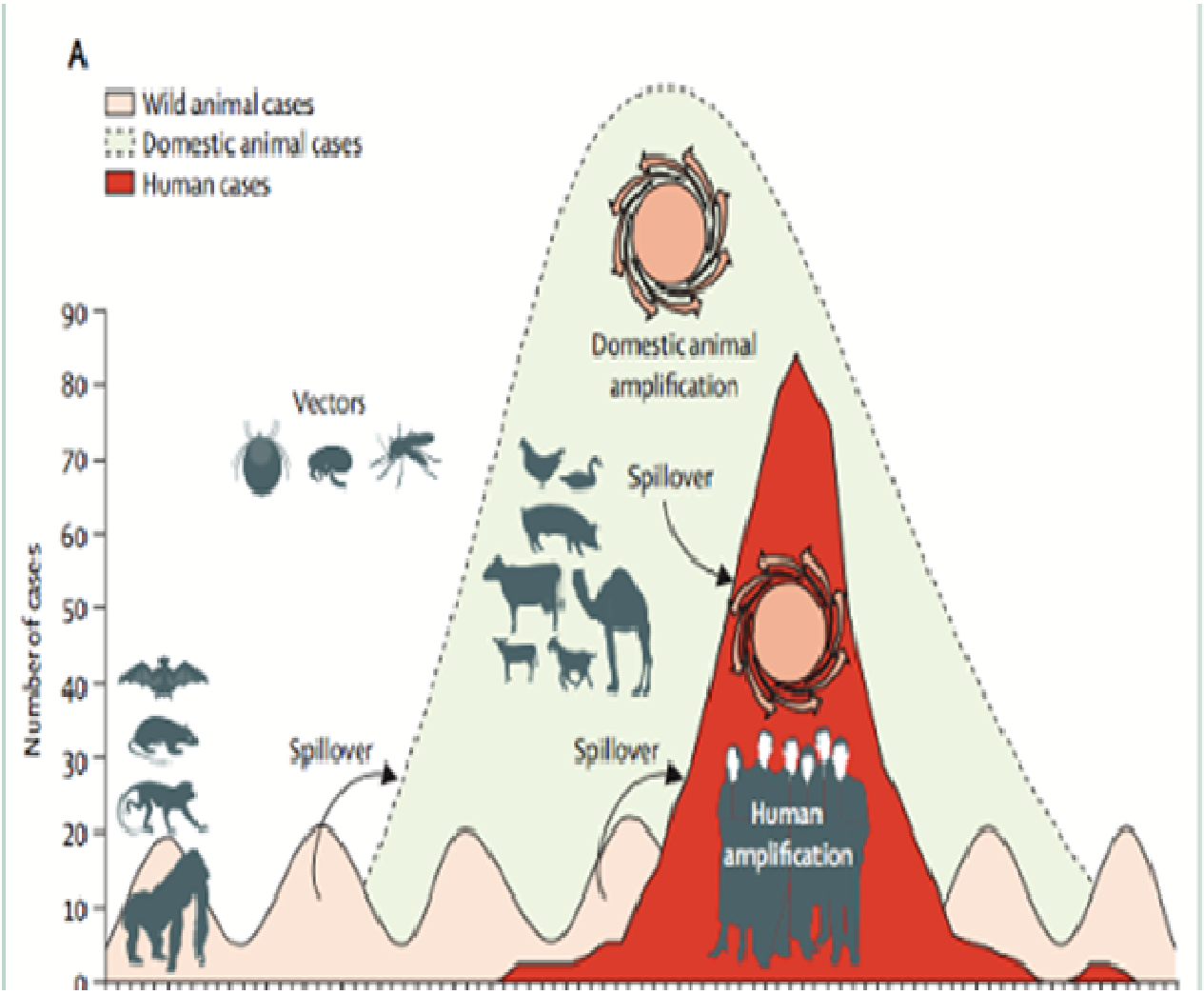
*A novel Transmission mode.* Initially, human cases of MPX were associated with travel to an endemic country and was transmitted by close respiration and close skin -to-skin contact from active lesions and bodily fluids, but no definite recorded cases of transmission by sexual routes. However, in the current outbreak most reported cases have no travel link to an endemic country, and occur among gay and bisexual men, raising the possibility of sexual transmission. Furthermore, the initial lesions in the current outbreak are located on or near the genitalia or anus, an observation that further leads credence to sexual transmission. However, although sexual transmission is the predominant route of transmission, it must be emphasized that it is not the exclusive route of transmission; it could equally be confounding the observation, in an analogous manner that was observed in the initial phase of HIV transmission: In close contact other forms of transmission equally occur including breathing and contacts with infected objects such as towels, bedding, and paraphernalia. In conclusion, the epidemiology of the diseases is shifting from endemic to non-endemic zones and has now been extended to include sexual transmission.

*Treatment and prevention*. Immunocompromised and other at-risk persons should be considered for antiviral treatment using either tecovirimat or brincidofovir which were initially approved for treatment of smallpox. However, these drugs are not currently available in most countries. In view of these limitations, we must resort to classical public health pillars that were interestingly developed and fine-tuned during smallpox eradication: these are comprised of active case-search, surveillance and breaking the chain of transmission by vaccination. Vaccination against classical

smallpox is thought to provide up to 85% cross-protection against monkeypox, though the duration of immunity is unknown. After eradication of smallpox and destruction of all laboratory stocks of the virus, most of the world population have not been vaccinated against smallpox and the first-generation smallpox vaccine is not widely available, except in the stock pile of some countries. Second generation smallpox vaccines, with higher safety record used in US and Canada, include the Imvamune and Imvanex out of which only Imvanex is currently approved to prevent monkeypox.

*Challenges and road ahead.* The current monkeypox outbreak provides a new set of challenges to patients as well as to the medical, biomedical research and academic communities. First, the upsurge in the number of human infections globally, can partly be attributed to globalization and human behavior of post covid-pandemic relaxation. Second, we are witnessing the birth of a pandemic: many viral epidemics and pandemics are characterized by an animal virus crossing the species barriers and causing sporadic human infection. As the virus adapts, human behaviour amplifies the new virus that progresses into clusters and outbreaks, as illustrated in the Figure. This figure also illustrates that these epidemics can be anticipated and averted by taking public health measures at source. We have documented this phenomenon with the evolutions of pandemic influenza, Middle East Respiratory Syndrome, SARS,HIV, Ebola and now with Monkeypox virus. Third, it highlights that there is an ecological balance in human diseases; eradication of one disease may lead to flare up of an unsuspecting new disease. Thus, it is possible that MPX is filling the epidemiological niche left after smallpox eradication especially in a population with waning immunity to smallpox virus. Further corroboration of this tenet is provided by the appearance of hitherto undocumented vaccine-derived poliomyelitis in Europe, after the global eradication of wild poliovirus. Fourth, the emergence of MPX poses a real challenge to the clinical diagnosis and confirmation of the disease especially in developing countries where viral hemorrhagic fevers like Ebola, Lassa fever, yellow fever, and others that manifest with a skin lesion are invariably present at some stages, thus complicating the task of differentiating MPX from these diseases. Fifth, the situation complicates the simultaneous management of multiple outbreaks on top of an ongoing covid pandemic whose grips have eroded and weakened an already overburdened health system. But the biggest challenge remains in developing or scaling up second generation smallpox vaccine capable of conferring strong protection against MPX in low resource setting. Beset by this constellation of challenges, it is no wonder that WHO has officially declared MPX a public health emergency of international concerns, the highest level of alert issued by WHO to member states. Everyone has a part to play in solving this new challenge including Academies that may set the agenda for scientific debates and provide timely and valid scientific evidence for policy formulation.

**Dr DEORAJ CAUSSY**


A
Wild animal cases
Domestic animal cases
Human cases
Number of cases
90
80
70
60
50
40
30
20
10
0
Vectors
Domestic animal amplification
Spillover
Spillover
Spillover
Human amplification

**REPORT**

## Global Health Inequalities: Research for a fairer future, *September 2022*

## *Academy of Medical Sciences, UK*

**The COVID-19 pandemic** has had a particularly severe impact on disadvantaged and marginalised populations. Typically, they have experienced higher levels of SARS-CoV-2 infection, at least in the early stages of the pandemic, and worse health outcomes. They have also been more impacted by the indirect effects of the pandemic, such as reduced access to other health services and disrupted education.

These trends have been overlaid on existing health inequalities, with disadvantaged groups within countries already experiencing shorter life expectancies, a greater burden of ill-health and less access to quality health services. Reducing health inequalities will depend critically on the drive towards universal health coverage (UHC), embedded within Sustainable Development Goal 3.8, which seeks to ensure that all people, whatever their circumstances, have access to quality healthcare without facing the risk of financial impoverishment.

During March–June 2022, the UK Academy of Medical Sciences and the InterAcademy Partnership organised a series of workshops, at which participants from a broad range of countries shared their experience of the COVID-19 pandemic's impact on health inequalities, with a specific focus on the role of Universal Health Coverage. The aim of the workshops was to identify priority areas for research into such inequalities as the world recovers from the acute phase of the pandemic.

Presentations and discussions at the workshops noted that different populations have been disproportionately affected by the COVID-19 pandemic in different ways. Typically, these have included ethnic minority populations, migrants and mobile populations, internally displaced people, and people who are socioeconomically disadvantaged or socially marginalised.

Furthermore, there have been multiple contributory factors underlying this selective vulnerability, affecting risk of exposure, access to services, take up of vaccination and underlying health risks.

Most of these vulnerabilities are not specific to COVID-19 but reflect an increased risk of multiple poor
health outcomes. COVID-19 has shone light on, and often exacerbated, existing health inequalities affecting disadvantaged and marginalised communities.

These vulnerabilities typically reflect the impact of social determinants of health. Factors linked to socioeconomic disadvantage and unhealthy physical and social environments affect multiple aspects of disease exposure, risk of physical and mental health co-morbidities, and access to care. As countries recover from the acute phase of the pandemic, there are opportunities to learn the lessons from the response to the COVID-19 pandemic and leverage such learnings to accelerate the drive towards UHC and mitigate health inequalities. There is a need to better understand the nature and causes of health inequalities in different settings, to develop new interventions to address them, and to promote health emergency preparedness with an explicit focus on equity. The research community therefore has a critical role to play in generating the evidence to shape the path to recovery and a future where good health is more equally shared.

Although each country faces a unique combination of health inequality challenges, international comparisons and collaborations provide opportunities for sharing of experience and evidence, so countries can jointly address common challenges and evaluate potential solutions, sharing knowledge among themselves and with others.

***The InterAcademy Partnership (IAP)***

# Virtual Island Summit 2021

***Education for sustainable development*** *(ESD or SDE)**

**Education** is recognized as having one of the highest long-term returns on investment of all development goals and **supports the overall achievement of every SDG**. ***Education for sustainable development*** *(ESD or SDE)** allows every human being to acquire the knowledge, skills, attitudes, and values necessary to shape a sustainable future.

Through education, we improve agricultural productivity, enhance the status of women, reduce population growth rates, enhance environmental protection, and generally **raise the standard of living** everywhere. But simply increasing basic literacy will not support a sustainable society. Institutional reform, curriculum reform, and development of **locally relevant** materials incorporating sustainable development issues, such as climate change, disaster risk reduction, biodiversity, and sustainable consumption, are priorities.

We all want **children and young people who grow up on islands** to build the knowledge and skills they need for the future. Today, our newsletter highlights the session "Developing a Broad and Sustainable Island Curriculum - sponsored by The Edge Foundation", which explores different examples and approaches for schools and colleges on islands to develop a broad and sustainable curriculum rooted in the geography, history, and heritage of their island setting.

We all want children and young people growing up on islands to build the knowledge and skills they need for the future. In this session, we will explore different examples and approaches for schools and colleges on islands to develop a broad and sustainable curriculum rooted in the geography, history and heritage of their island setting.

***Note:** ***Education for sustainable development*** *(ESD or SDE)** *was first proposed by Michael Atchia then Chief of EETU, UNEP in 1993 and was adopted by UNESCO which then organized a Decade for ESD to bring the subject to all countries.*

**"This isn't global warming anymore. It's global SCORCHING"**
*(Newspaper headline, June 2021)*

Our world is warmer now than at any time in recorded history, unleashing heat waves, burning forests, mega droughts, flood rains, intense hurricanes and sea-level rise. We are shattering the temple of life, with a million species on the edge of extinction. Remember some time ago, some of the coldest areas of our planet (Northern Canada and Siberia) registered close to 50 degrees (49.3$^{o}$C); many older people died as a result, not in any way prepared to fight such scorching heat!

Within 50 years, **1.5 billion people could be forced to flee such high temperatures-** already 20 million are forced to run every year.

It's one of the greatest upheavals of life on earth, and it's caused by a global rise of just 1°C. We're on track for 3°C rise. **Just imagine the hostile and desolate planet our children could inherit**.

**But here's the most important bit**: We CAN still turn this around -- we may be the last generation who can. The next few months will witness World Leaders preparing to hold major UN summit, where momentous decisions on the climate and extinction crisis must be made. It could change everything - or nothing!

There is only ONE planet Earth! 'Earth can't wait anymore. **This is one of the most important times to be alive on this fragile planet**, because it all hangs in the balance' *(AVAAZ, 7.7.2021)*

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"MAKE PEACE WITH NATURE by tackling the triple emergencies of **climate, biodiversity and pollution** of the Planet" **(UNEP 2021)**

**Michael Atchia**

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***Time has come to learn from nature :***
***billions of years of innovation and testing, failures are fossils,***
***and what surrounds us is the secret to thriving on earth.***

# A BRIEF OVERVIEW OF RADIATION SAFETY AND NUCLEAR SECURITY IN MAURITIUS.


## *Dr. Yousuf Maudarbocus*

***Regional Programme Manager, IAEA, 1990 – 2001***
***Chairman, Radiation Protection/RSNS Board, 2006 – 2021***
***President, MAST, 2012 – 2015***
***Vice-President, NASAC, 2013 -2019***


## Applications of Nuclear Techniques

To many, the word "nuclear" conjures up visions of mushroom-shaped clouds covering the cities of Nagasaki and Hiroshima following the release of atomic bombs on these two cities towards the end of World War II or the nuclear disasters at Chernobyl and Fukushima leading to the harmful exposure to nuclear radiation of hundreds of thousands of people.
Yet, nuclear techniques are used throughout the world in food production, medicine, industry, hydrology and pest control amongst others. Thus, nuclear imaging applications range from inexpensive dental X-ray machines to sites with their own accelerators to produce radioisotopes for positron emission tomography (PET) scans. Radiotherapy is widely used to treat cancer with over 5000 treatment centres worldwide treating millions of patients annually.
Major nuclear applications in food and agriculture are mutation breeding, pest control and food irradiation. Mutation breeding led to the development of new crop varieties with higher yield or increased resistance to environmental stresses such as drought, salinity and pests. Pest control using a method called the "sterile insect technique" (SIT) is also well-established. It is being used effectively for the Mediterranean fruit fly to protect orchards and vineyards, for the screwworm to protect cattle and for the tsetse fly which threatens both animal and human health. The latter technique led to Zanzibar being tsetse-free resulting in a substantial increase in milk and meat production. Food irradiation is gradually replacing chemical fumigation for food preservation and has been declared safe by the FAO/WHO Codex Alimentarius, the international food safety body.
Today, a broad and diverse array of nuclear techniques finds routine industrial use. These include measurement gauges, humidity/density meters, oil well logging tools, smoke detectors, radiation processing such as sterilisation of medical supplies, plastic and rubber curing, and non-destructing testing of metal structures.
Nuclear techniques in isotope hydrology have become a basic tool to understand and manage groundwater resources in a sustainable way.

## The Use of Nuclear Techniques in Mauritius

Mauritius has been using ionizing radiation sources for decades for most of the above-mentioned applications.
In the medical field, Cobalt-60 sources have been used for radiotherapy at Victoria Hospital since 1980, followed by a linear accelerator as from about 1995. In nuclear medicine, a gamma camera purchased with IAEA's assistance in the 1990's and located at Nehru Hospital provides dynamic imaging facilities for patients; the required nuclear material, technicium-99m, is purchased from South Africa on a fortnightly basis. The radiotherapy facilities at the New Cancer Hospital in Solferino, which will be operational very soon, is equipped with state-of-the-art technology, including a PET CT scan unit. Moreover, three new privately-owned cancer hospitals are under construction and should all be operational within a couple of years.

The Ministry of Agro Industry and Food Security has been actively involved in the eradication of fruit flies using nuclear techniques and in mutation breeding activities. In 2019, the Food and Agricultural Research and Extension Institute (FAREI) of the Ministry used mutation breeding techniques to develop a heat stress tolerant tomato variety which has a good potential for commercialization. The old Caesium-137 radiation source has recently been replaced by a Co-60 source.
With the assistance of the IAEA, the charge and recharge mechanisms of our aquifers, as well as the linkages between them, have been studied using isotopes.
In the industrial sectors, non-destructive techniques using gamma rays and X-rays have been used by the Mauritius Standards Bureau.The use of neutron probes and other small radiation sources is expanding at a fast rate in the construction industry.

## Regulatory Mechanisms for the Safe Use of Ionising Radiation in Mauritius

Although nuclear techniques have distinct advantages over conventional ones for many applications, their use can involve major risks if not carefully monitored and controlled.
In the 1990's, it was a matter of grave concern that Mauritius did not have any legislation and enforcement mechanisms to control the use of radioactive sources, in spite of the fact that the country had been using radioactive sources, including two strong Co-60 sources, for several years. The IAEA sent a "Radiation Protection Advisory Team" (RAPAT) mission in 1995 to assist the government to draft an appropriate legislation. I had the privilege to form part of this mission.
However, several subsequent IAEA missions were required to finalizethe Radiation Protection Legislation which was finally enacted in 2003 and promulgated in 2005. The enforcement authority, namely, the Radiation Protection Authority (RPA), was established in 2006. As a result, all users of radiation sources have to meet certain criteria established by the RPA to be properly licensed to operate. The same applies to importers and exporters of such sources. The RPA has an established programme to inspect all radiation facilities in the country and is playing this role in a most efficient manner.

Currently, there are more than 1300 radiation workers in the country in the private and public sectors. All these workers have to be monitored to ensure that they are not overexposed to radiation. In the absence of an independent service provider for this task, the RPA has also undertaken this responsibility. It is mandatory for radiation workers to wear radiation monitoring devices whenever they are handling radioactive sources or are likely to be exposed to radiation. These devices, such as the widely-used thermo-luminescent dosimeters (TLD) badges or the Optimally Stimulated Luminescence (OSL) badges, are assessed on a monthly or two-monthly basis by the RPA to ensure that there is no over-exposure.

Another important aspect related to the safe use of radioactive materials is their disposal. Cobalt-60 sources have a half-life of 5.3 years, meaning that they lose 50% of their radioactivity by decay in that time. Hence the Co-60 teletherapy machines have to be replaced every 12 to 15 years. Most countries, including Mauritius, always ensure that there is a contractual commitment by the supplier to take back the old source upon delivery of the new one. Some other sources with very short half-lives, such as Tc-99m with a half-life of 6 hours, become totally harmless within a week or so. However, a number of radioactive sources used in Mauritius do not fall in these two categories and have to be properly processed and securely stored. A rather rudimentary radioactive waste storage facility was set up adjacent to Nehru Hospital in Rose Belle for that purpose. However, with the assistance of the US Government, a proper storage facility has recently been constructed within the compound of the new headquarters of the Regulatory Authority in Helvetia.

## Nuclear Security

Whereas radiation safety ensures that radiation workers and the public are not overexposed to radiation, nuclear security addresses the problem related to the use of radioactive materials for non-peaceful purposes, including theft and trafficking of these materials. Following major concerns related to nuclear security worldwide, the Radiation Protection Act of 2003 was replaced by the Radiation Safety and Nuclear Security Act 2018, again with the unflinching assistance of the IAEA. At the same time, the appellation of the Radiation Protection Authority (RPA) has been changed to "Radiation Safety and Nuclear Security Authority" (RSNSA).

## Conclusion

With an up-to-date legislation and a performing regulatory authority, the country is well-equipped to deal with radiation safety and nuclear security, provided the RSNSA is given sufficient autonomy to perform its task.

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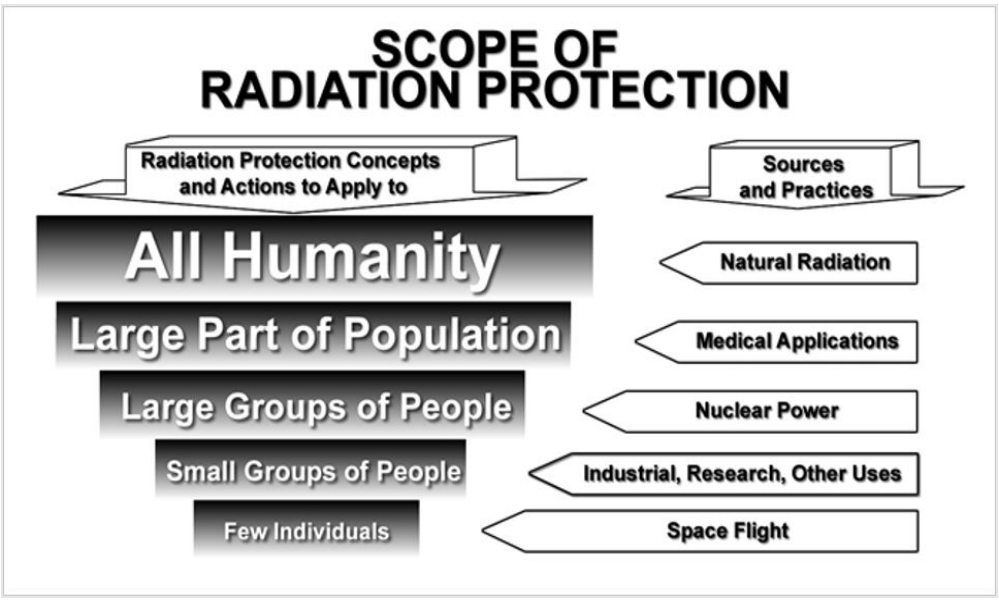
**" Acting DG, Cornel Feruta, greets the panel of the "Legislative Assistance Programme" at the 63rd IAEA General Conference – September 2019".**



# BOOK REVIEW

## Roehrlich, Elisabeth (2022). Inspectors for Peace: A History of the International Atomic Energy Agency. Baltimore, MD: Johns Hopkins University Press. ISBN: 978-1-421-44333-1

"The International Atomic Energy Agency, which sends inspectors around the world to prevent states from secretly developing nuclear bombs, has one of the most important jobs in international security. At the same time, the IAEA is a global hub for the exchange of nuclear science and technology for peaceful purposes. Yet spreading nuclear materials and know-how around the world bears the unwanted risk of helping what the agency aims to halt: the emergence of new nuclear weapon states. In Inspectors for Peace, Elisabeth Roehrlich unravels the IAEA's paradoxical mission of sharing nuclear knowledge and technology while seeking to deter nuclear weapon programs. "Founded in 1957 in an act of unprecedented cooperation between the Cold War superpowers, the agency developed from a small technical bureaucracy in war-torn Vienna to a key organization in the global nuclear order. Roehrlich argues that the IAEA's dual mandate, though apparently contradictory, was pivotal in ensuring the organization's legitimacy, acceptance, and success. For its first decade of existence, the IAEA was primarily a scientific and technical organization; it was not until the Treaty on the Non-Proliferation of Nuclear Weapons entered into force in 1970 that the agency took on the far-reaching verification and inspection role for which it is now most widely known. While the Fukushima nuclear disaster and the Iran negotiations made the IAEA's name famous, the organization's remarkable history remains strikingly absent from public knowledge.

## Baghramian, Maria, & Martini, Carlo (Eds.) (2022). Questioning Experts and Expertise. Abingdon: Routledge. ISBN: 978-0-367-75285-9

"The role of experts and their expertise, in our personal and social lives, has taken centre stage in the debates about our post-COVID-19 world. Scientific disinformation is rife, and expertise is badly needed to tackle highly complex social problems. "This book brings together philosophers, sociologists and policy experts to discuss the nature, scope and limitations of expert advice in policy decisions. The chapters collected here address some of the most fundamental questions in the debate on the role of experts. They explore, among others, the definitions of expertise, the role of experts in modern democracies, the dilemma of choosing between equally competent and qualified experts who cannot agree, the objectivity of expert judgements, the relationship between experts and novices in polarised social settings and the conditions on the trustworthiness of experts. These explorations, by some of the best- known academics working in the field, highlight the complexities of the questions they address but also lay down a road map for addressing them.

# NITISH MONEBHURRUN

## Face au tableau noir

Nitish Monebhurrun Face au 65 Cybercity, Ebene, Mauritius | (230) 403 7200 | info@ninetysixhotels.com | hennessyhotel.com Labourdonnais Waterfront Hotel Le Suffren Hotel & Marina Hennessy Park Hotel The Address Boutique Hotel ninetysixhotels.com tableau noir Mercredi 5 octobre à 18h30 RSVP au 403 7238 ou guestrelation@hennessyhotel.com Petrusmok, notre librairie mauricienne qui œuvre à la valorisation de nos auteurs, a le plaisir de vous inviter au lancement de Face au tableau noir de Nitish Monebhurrun le mercredi 5 octobre à 18h30. Ce lancement sera suivi d'une table-ronde autour du thème « Lire pour construire sa conscience citoyenne. » L'auteur débattra avec ses invités : Michael Atchia, Gillian Geneviève et Cristèle de Spéville. Cette table-ronde sera modérée par Finlay Salesse. Cet événement est rendu possible grâce au soutien de la maison d'édition Vizavi.

Face au tableau noir est le récit autobiographique des années d'école et de collège de Nitish Monebhurrun à Maurice. Dans son ouvrage, l'auteur mauricien jette un regard sans complaisance sur le système éducatif mauricien. De la petite école jusqu'à l'examen du HSC, il passe en revue tous les écueils d'un système basé sur l'enseignement mécanique et la crainte du maître dans lequel l'élève peine à s'épanouir, à développer sa pensée propre, son raisonnement, sa créativité et sa confiance en lui-même. Un réquisitoire sévère qui se lit comme un vibrant plaidoyer pour une « autre école », celle du plaisir d'apprendre, de l'envie de découvrir et de s'exprimer, loin des ânonnements, des humiliations, des punitions corporelles et de la tyrannie des leçons particulières. L'auteur appelle de tous ses vœux une pédagogie qui s'inscrit dans l'écoute, le partage, l'encouragement et l'ouverture sur le monde. Il préconise la mise en œuvre d'un nouveau système dans lequel l'élève pourrait pleinement développer ses capacités et ses compétences et recevoir les outils qui lui permettront de s'épanouir et se construire en toute confiance.

**TWO PUBLIC FORUM/DEBATES held in 2021/2022 , organised by MAST**

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## FORUM / DEBATE ON CLIMATE CHANGE

### Speakers

**The Chair (Dr M. Atchia, ex-UNEP): Introduction to the planet's climate crisis.**

- **Dr Deoraj Caussy (ex-WHO): Climate change and health**
- **Her Excellency Mrs Charlotte Pierre, British High Commissioner:**
- **Preparation for COP 26 in November 21, what it aims to achieve.**
- **Mr Satish Koonjah, MSIRI, MCIA: Climate Change, the Mauritius**
- **situation.**
- **Mr Oh Seng , representative of Ministry of Environment and Climate Change :the Mauritius responses.**

**The debate.**

**Held on THURSDAY 16th September 2021, 2.00 to 3.30 pm at Bonâme Hall, MSIRI, MCIA, Réduit, Mauritius.**

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## MAST FORUM/DEBATE ON ACHIEVING LONG-TERM FOOD SECURITY FOR MAURITIUS.

*( Securité Alimentaire pour la République de Maurice)*

**MAST organised a Forum on 5th May 2022 on the above theme, at Bonâme Hall, MSIRI, MCIA, Réduit, Mauritius.**

The United Nations Development Programme reported that over the past 20 years the number of undernourished people had dropped by almost half thank to rapid economic growth and increased agricultural productivity.
The COVID-19 pandemic and now the Ukraine war have adversely affected both availability and price of food.
Enhancing food security, improving nutrition and tackling agricultural challenges related to, for example, climate change and harmful pests, are pivotal to ending hunger, eradicating poverty and achieving many of the 17 UN SDGs. What is the crucial role of science in this endeavour?

**Speakers :** Food security : Global issues and relevance to Mauritius *(J-C Autrey, S. Saumtally, A. Dookun-Saumtally );* Current situation with regard to food security in Mauritius: Government's plan for the future of our food security ; The role of R&D for achieving long-term food security for Mauritius*( Micheline Seenevassen Pillay, Ag. CEO, FAREI);* Trends in the local production of fresh vegetables & fruits in Mauritius *(Pamela Leste De Perindorge );* Food loss/waste reduction – Paving the way to food security*(Dayawatee Goburdhun, Faculty of Agriculture, University of Mauritius).*

***Questions and interventions from the floor and possible resolution(s).***
***Chair: M.Atchia; Rapporteur: Y.Ramma; Conclusion and vote of thanks: Y.Maudarbocus.***

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**The deliberations of the scientists present at this MAST FORUM led to the following Resolution, hence this press release.**

*"In the present WORLD-WIDE crisis regarding food production, access and availability (due to insufficient production, war, climate change and reduced trade) and being given that we in Mauritius (a small island developing state, a SIDS) import over 75% of all our food needs (including all of staples such as rice and flour), a combined effort by all in Mauritius is called for to support the transformation of our food systems for less dependency on importation and to enhance local production. A combined effort by all in Mauritius is called for to locally produce and market fruit, vegetable, livestock and other items.*
*We recommend that a* ***Food security for Mauritius Action Committee*** *be set up urgently by Government, comprising of key stakeholders (Government, the private sector, both small planters and large sectors, research institutes, importers, traders and distributors, local authorities, NGOs and trade unions) to address the challenges of our food systems so as to achieve long-term food security for Mauritius.*

Dr Michael Atchia; Prof Y. Ramma; Dr S. Saumtally.

## AFRICA NEWS

# AMASA 2022

The Network of African Science Academies (NASAC) in collaboration with the Kenya National Academy of Sciences (KNAS) are pleased to announce that this year's Annual Meeting of African Science Academies (AMASA) 2022 will be held in Nairobi, Kenya, on 28 – 30 November 2022 under the theme **"Strengthening Capacity for Sustainable Agriculture and Food Systems in Africa"**.

## IPAM

The International Platform for Adaptation (IPAM) invites you to register within the IPAM platform for the committees (Water, Agriculture, Cities, Techniques and Tools).

Adaptation is the real problem in Africa not mitigation as we are not the polluters. We have AMME framework which is a nice flagship project and we are looking right now for funding (see details in the website).

Please connect to www.adaptationmetrics.org for further details

## African leaders are 'pro fossil fuels for Africa'

The voice of Africa should be heard. We must exploit our resources," said Sophie Gladima, Senegal's minister of petroleum and energies, in remarks at the MSGBC Oil, Gas & Power conference and exhibition held last week in Dakar, Senegal. "Yes, we must think of protecting the planet. But we must think of humankind on this continent," Gladima added.

Africa's annual natural gas production is expected to grow to 292 billion cubic meters (bcm) by 2025, with global demand estimated to reach 4,243 bcm, according to the **International Energy Agency (IEA)**.

Referencing pressure from Western leaders to pursue green energy in light of climate change, Dr. Omar Farouk Ibrahim, the secretary general of African Petroleum Producers Organization, said, "We must not be forced to do what will destroy our future and our children. We need energy to sustain our future generation."

"

“Developed nations enjoyed the resource, they contaminated the world, they should be the ones who change their lifestyle,” the minister of mines and hydrocarbons of Equatorial Guinea, Gabriel Mbaga Obiang Lima, said. “I am not pro fossil fuel; I am pro fossil fuel for Africa,” he added.

According to the **IEA Africa Energy Outlook Report 2022**, released in June, natural gas discoveries equivalent to 5,000 billion cubic meters (bcm) have been found on the continent. According to the same report, between 2010 and 2020, 40% of all gas discoveries worldwide came from Africa.

“Gas has the opportunity to provide fertilizer to feed Africa, should we say no to it?” said Senegal’s Gladima.

The remarks were part of a joint statement dubbed the “Dakar Declaration” that seeks to align all African nations on energy and climate matters ahead of the next G-7 and G-20 summits. The declaration will also be presented at the 2022 United Nations Climate Change Conference (COP27), which will run from November 6 to 18 in Egypt.

“We have to work hand in hand so as to exploit our resources. For COP27, the voice of Africa should be heard. Where decisions are made, Africa must be there,” said Gladima.

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## Royal Society
## Dorothy Hodgkin Fellowship

This scheme enables postdoctoral scientists who require a flexible working pattern and offers a recognised first step into an independent research career. Now, applicants will have the opportunity to submit a research proposal and costs for an eight-year fellowship of up to UKPOUNDS 90,000.

Deadline: 1 November 2022, 3pm The Royal Society [grants@royalsociety.org]

d.

**The NASAC Secretariat**
**P. O. Box 201-00502**
**Miotoni Lane,**
**Karen**
**Nairobi,**
**Kenya**

**NASAC NEWS**

***NASAC : Networking Science for Prosperity***

The NASAC Science Education Programme (SEP) aims to improve quality of science education in Africa. It guarantees a continuous supply of scientists to academies in Africa. Given the significance of education in the development of Africa, NASAC established SEP Focal Points from among its membership constituting of individuals who are actively involved in formulating science policies in their countries.The focal-points served as the advisory body to the NASAC Board on Science Education matters. The Focal Points worked towards providing country-specific science education case-studies with the aim of making a case for Inquiry Based Science Education (IBSE) considerations in the science curriculum in Africa.

**NASAC SCIENCE EDUCATION PROGRAMME (SEP) SELECTION COMMITTEE MEETING**

**18 August 2022 Held via Zoom**

**MEMBERS PRESENT**
Dr. Michael Atchia (Vice Chair) – Mauritius Academy of Science and Technology
Prof. Jean-Pierre OnvêhounEzin – National Academy of Sciences, Arts and Letters of Benin

**NASAC BOARD**
Prof. Norbert Hounkonnou – President
Prof. Irvy (Igle) Gledhill – Vice President for International Relations and Scientific Affairs

**NASAC SECRETARIAT**
Jackie Kado – Executive Director
Fatuma Achieng – Programme Assistant
Benard Magudha – Communications Assistant

**MEETING AGENDA**
Opening remarks by the Selection Committee Chair and NASAC President – Prof. Hounkonnou
Adoption of the Agenda and approval the minutes of the previous Working Group meeting
Discussion and approval of the draft Concept note
Discussion and approval of the working group's Terms of Reference (ToR's)
Review of the SEP Working Group nominees and recommendations to member academies
Any other business and way forward
Closing remarks by the NASAC Executive Director – Jackie Kado

**Opening remarks by the Selection Committee Chair and NASAC President – Prof. Hounkonnou**

Prof. Hounkonnou begun by welcoming the members of the SEP Selection committee to the meeting. He stated that the meeting would review how member academies responded to the call by providing nominees to the Working Group. During the meeting, the SEP Selection Committee would also review and amend the Working Group Terms of Reference.

## Discussion and approval of the draft Concept note on SCIENCE EDUCATION

Prof. Atchia begun the discussion saying that for Africa to get rid of poverty and ensure sustainable development, it is necessary that all member countries invest in science and technology education. According to the results of the conducted SEP Survey, it was clear that many countries are not yet applying the modern pedagogy in teaching science and are stuck in old methods which is more on "chalk and talk," and less on innovation.

NASAC can advance Science and Technology Education in Africa by calling upon member academies to apply a series of roles, namely :

(i) to identify and list the resources available nationally;

(ii) to get in touch with policymakers in order to advance the cause and practice of science education. The Science and Technology Education agenda should be pushed at the national political level because science is the cornerstone of sustainable development.

Some essential key themes to consider in drafting the concept note for Science and Technology Education included:

(i) Food security;

(ii) Energy self-sufficiency;

(iii) Control of climate change; and

(iv) Control of pandemics.

Further amendments on the concept note by the SEP Selection Committee Members include the expansion of its term of reference to now include:
**“SCIENCE, TECHNOLOGY AND INNOVATION”**

Technology Education is a crucial tool for life in the modern world.

A new concept is that of Innovation Education, an attempt to stimulate and trigger inventiveness and originality in youth.

Volume 2 Issue 2 September 2022

# COUNCIL of MAST, 2022-24

## MAST Membership

### About MAST

**The Mauritius Academy of Science and Technology (MAST)** is a non-profit, non-governmental organization created by a group of high-level concerned scientists to bring together some of the best brains in the country and the diaspora, under one association, willing to reflect on some of the burning issues of **Science, Technology and Innovation** and offer independent and studied opinion on them and to promote our development. It strives to promote excellence in all areas concerned by its mission.

The Academy, in collaboration with existing institutions, promotes the popularization and understanding of **Science and Technology** in the population, while encouraging creativity and innovation that can make the service and production sectors competitive on the world market. In partnership with relevant organizations, local and foreign, the Academy enhances cooperation and dissemination of scientific and technological knowledge for a knowledge-based economy.
The Academy addresses current national problems where Science and Technology can contribute answers and solutions.

## *List of Office Bearers for 2022-2024.*

**President**: Dr Salem Saumtally
**1st Vice President**: Prof Goolam Mohamedbhai
**2nd Vice President**: Prof Yashwant Ramma
**Immediate Past President**: Dr Michael Atchia
**Founder President**: Prof Soodursun Jugessur
**Secretary**: Dr Ravhee Bholah
**Assistant Secretary**: Dr Asha Dookun-Saumtally
**Treasurer**: Dr Ranjeet Bhagooli
**Assistant Treasurer**: Past President Dr Yusuf Maudarbaccus
**Member**: Past President Dr Jean Claude Autrey
**Member**: Dr Deoraj Caussy
**Public Relations Officer/Editor**: Dr Michael Atchia

1. **Honorary Fellows**
2. **Fellows:** *very senior scientists with many years of experience*
3. **Members:** *scientists with minimum of ten years post PhD*
4. **Associate Members:** *Scientists with basic science qualifications and still ready to promote Science and Technology in Mauritius*

# Picture Gallery

## FORUM/DEBATE ON
## " CLIMATE CHANGE"
## Thursday 16th September 2021 at MSIRI


# FORUM/DEBATE ON
## " Achieving long-term, Food Security for Mauritius"
## 5th May 2022 at MSIRI

# MAURITIUS ACADEMY OF SCIENCE & TECHNOLOGY (MAST)

**MAST has its HQ in REDUIT,MAURITIUS.**
For further info. on the Academy contact the The Secretary Associate Professor **Ravhee Bholah.**

***Email us at:***
*r.bholah@mie.ac.mu*

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**Appeal**

**Willing to join MAST and put your expertise at the service of the country?**

Send us a short resumé on yourself, and tell us how you can assist.

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***Newsletter & Journal Editor:***
***Dr. Michael Atchia***
*mklatchia@intnet.mu*

Mauritius Academy of Science and Technology

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