Environmental Technology Needs in Zimbabwe and the potential of WIPO Green in SupportingbInnovators International Symposium on Accelerating Dissemination of Japanese Environmentally Sound Technologies

WIPO Green Session: Technology Marketplace 2022

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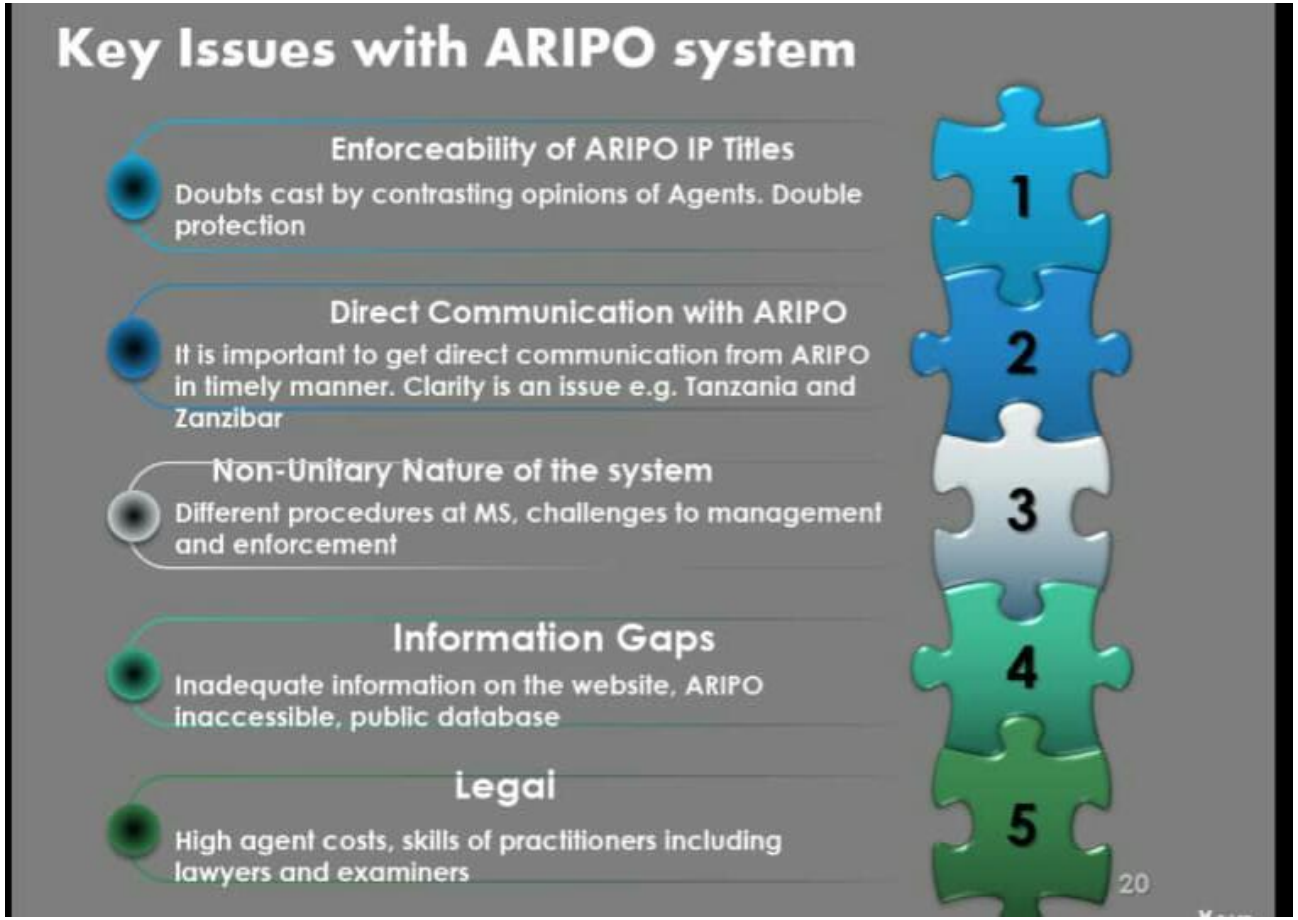
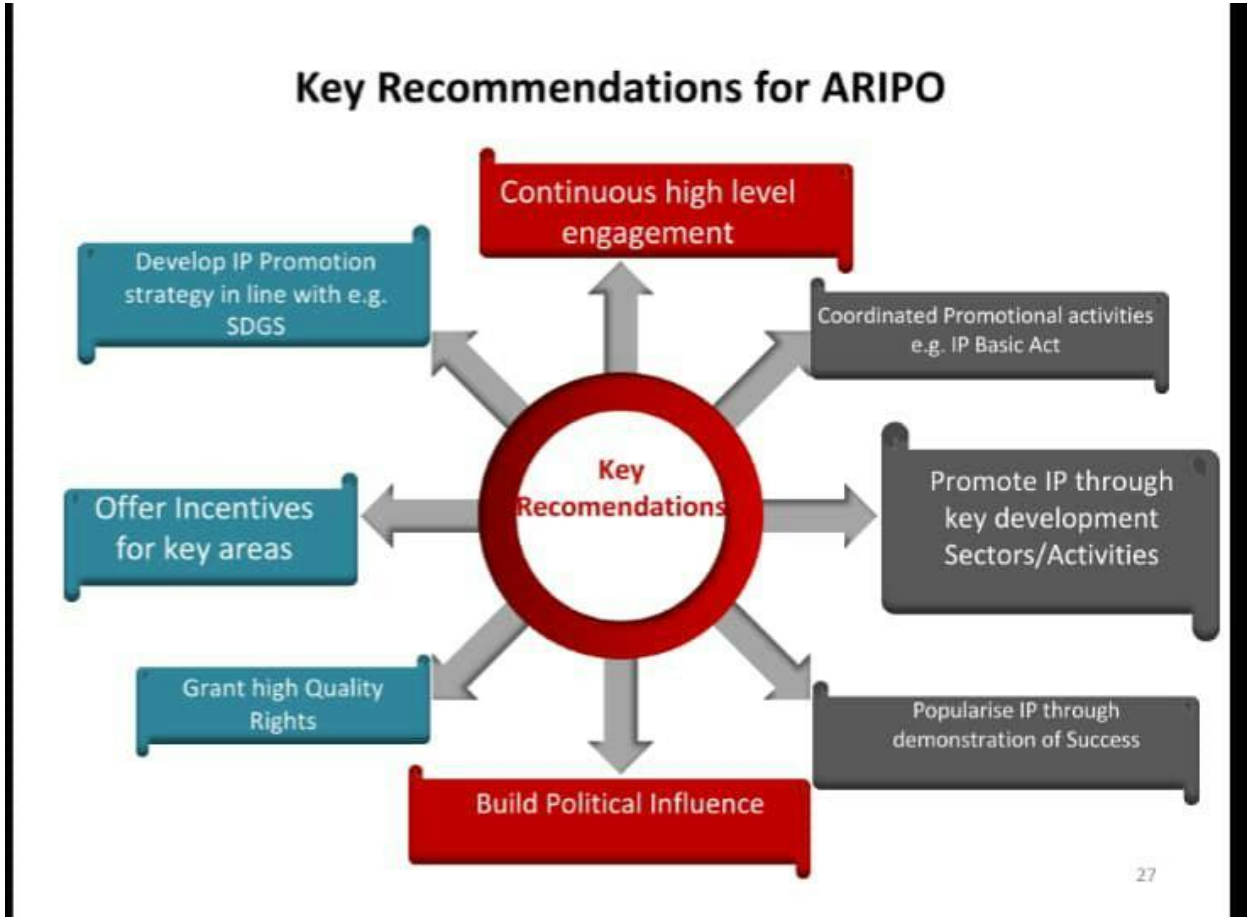
- University of Zimbabwe Council Member, Managing Partner Chemexon Africa Partners, Founder Techwomen Zimbabwe
- Past Roles
- Government of Zimbabwe, African Regional Intellectual Property Organization, Research Council of Zimbabwe, Palladium IP and Strategy Consultants
- Long Term Research Fellow of JPO

Insights from Japanese Stakeholders on ARIPO System



Key Recommendations from the Japanese Stakeholders



Overview of Zimbabwe

- Zimbabwe is located in Southern Africa,
- estimated population of nearly 15 million people.
- Around a third of the overall population lives in cities, a modest share compared to other countries.
- The most populated city is the capital, Harare, which is home to one and a half million people.

Country Profile Zimbabwe

- Natural Resources- abundant and not fully exploited, Gold, Diamonds, Lithium, Platinum, Chrome, wildlife and tourism
- The economy of Zimbabwe is agro-based contributing about 15% each year to the GDP
- Zimbabwe generates about 1200MW of electricity from thermal and hydro-power plants.
- In the rural areas, energy needs are met basically with firewood, candles, paraffin and in a few cases, electricity.

Environmental Rights in the Constitution

- The Constitution of Zimbabwe (2013) gives every person environmental rights that include the right:
  - a) to an environment that is not harmful to their health or well-being; and
  - b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that—
    - i. prevent pollution and ecological degradation;
    - ii. promote conservation; and
    - iii. secure ecologically sustainable development and use of natural resources while
    - promoting economic and social development.
- The Constitution further stipulates that the ‘State must take reasonable legislative and other measures, within the limits of the resources available to it, to achieve the progressive realisation of the rights set out in this section’.

Environmental Status of Zimbabwe

- In line with Article 4, paragraph 1(g) and 5 of the UNFCCC, Zimbabwe embarks on
- “Promoting and cooperating in scientific, technological, technical, socio economic and other research, systematic observation and developing data achives related to the climate system and intended further the understanding and to reduce or eliminate the remaining uncertainities regarding the causes effects, magnitude and timing of climate change and the economic and social consequences of various response strategies

This is done in collaboration with various government departments and research Institutions

Key Contributors to Green House Gases and Waste

- Agriculture, Forestry and other land use-Highestbsource of GHGs with 20.5 million tonnes of Carbon Dioxide equivalent in 2017
- Energy-12.41(Coal Fired Power Stations with inefficient technologies)
- Waste-1.76
- IPPU-1.76
- **Major Contributors to Waste**
- 1.9 million tonnes of waste in 2016
- 1.65 million tonnes in 2014
  - Residential waste-37.27%
  - Commercial-29.85%
  - Industrial-26.45%
  - Medical- 2.07%
  - Institutional-4.36

Mining Activities

- The Artisinal and Small Scale Gold Mining Sector (ASGM) contributes over 40% of mineral exports in Zimbabwe and employs over 25% of formal employment with over 300 000 people being employed
- Mecury emissions through largely open burning of amalgam during gold processing
- National level emissions were estimated to range between 7,729-83,765 kg (average of 24,285kg) in 2018
- Mininig Practices- equipment, drilling, milling

Needs

Mercury substitution

Efficient technologies for processing and mining for ASGM

Farming Activities and other land use

- Country is vulnerable due to the high reliance on rainfed agriculture and forestry

1. The sector employs nearly 70 % of the population
2. Farming of cash crops such as Tobacco leads to cutting down of trees

Needs

Efficient energy sources and technologies for curing Tobbaco and farming activities

Bio-fertilisers

Smart agriculture technologies

Major National Concerns

- 4 national power stations
- Hwange-920MW
- Munyati-100MW
- Bulawayo-90MW
- Harare-80MW
- There is need for cleaner production in the energy sector

Needs

Clean energy technologies including upgrades to existing facilities

Efficient technologies in various Industries to reduce electricity utilization

Need for technical know-how and facilities to process Lithium into batteries

Need to produce locally technologies such as solar and other bio-energy sources

Waste Management

- Waste management Challenges- No engineered landfill in the country
- Dumpsites e.g. Pomona have uncontrolled methane gas emmissions and frequent fires
- Medical waste incenerators- poorly built and operated resulting in excessive emmissions

Recycling

- No waste seperation at source- all waste is dumped in the same place
- Recycling infrastructure still at its infancy with Petreco Zim a consortium of PET companies being the largest in terms of recycling and various small scale players who are into plastics HDPE recycling but its still inadequate
- Only an estimated 11% of plastic is recycled in Zimbabwe

Transport Sector

- Old fleet of used vehicles mostly imported from Japan- vehicle population is around 1.5 million

Broad Technology Needs

- Monitoring of impact of climate change at appropriate spatial scale and density and frequency
- Profiling and monitoring of carbon stocks and fluxes particularly in soil, forests, cropland, wetlands, grasslands and plantations
- rising demand for electricity regionally, Zimbabwe has been working on expansion projects of the existing plants and also initiating new hydro-power generation projects particularly in the major rivers that border the country.
- Solar power and bio-energy projects are also being implemented.
- Stability in the energy sector, encompassing liquid fuels, and coal and electricity supplies is an indispensable pre-requisite for successful economic growth, as well as for household use.
- Rail electrification
- Road construction-In the year 2012 there was a total of
- approximately 18,601 km of road designated as state roads in Zimbabwe, of which 9,499km
- were gravel and earth.

Innovation Landscape

- - Government has instituted Education 5.0 which has seen Innovation, R&D and S& T being put at the forefront of Socio-economic development
- -Innovation hubs and Industrial parks have been established and have received significant funding
- However support is required in putting inplace functional innovation system supported by legislation including relevant support institutions
- Low levels of patent filings in the country indicate the low levels of high technical expertise required to transform R&D into applicable solutions

Innovations

- Support for innovators in terms of commercialisation and scale up has been relatively low more so for those outside the traditional institutions
- However Renewable energy has been a focus of many innovators including, biogas, solar, electric powered vehicles
- Waste management has also been a target with plastic recycling leading
- However technical expertise, knowledge exchange and technology transfer are required from contries like Japan instead of re-inventing the wheel
- All the areas highlighet as being of concern require technologies and innovation to mitigate them
- Policy and legislation is also required to support the drive for need for environmentally friendly practices and innovations

Case Study: Max Chikumbutso

- Zimbabwean Innovator
- Hybrid engine powered helicopter
- Electric Car
- Magnetic Converter
- Green power Generator
- Special drone

Innovations

Green Technology Businesses in Zimbabwe

- Recycling-Plastic for export, clothing industry e.g footwear
- Biotechnology- use of micro organisms in sanitation
- Energy- Solar technologies mostly resale, Biogas production, efficient coockers, Biofuels
- Agriculture- Smart systems, solar powered irrigation
- Power Generation- Hydropower, production of electricity from sun driven convection of lightly ionized air
- Bio-fertilisers

Examples of Green Technology Companies

LAHAMA TRADING (PVT) LTD

based in **ZIMBABWE**

Reliable Water Systems (Pvt) Ltd

based in **Harare, ZIMBABWE**

T.H Met tech

based in **Bulawayo, ZIMBABWE**

PCOMM Engineering

based in **Bulawayo, ZIMBABWE**

Coreworth Scrap Metal Dealears

based in **ZIMBABWE**

Case Study Chemexon Africa Partners

- Chemical Start-up focused on green technologies
- Major projects

1. Plastic Roads

2. Production of Crude oil from waste materials e.g plastic with long term goal of production of carbon nanotubes

3. Green chemicals and products

- **Challenges**
  - Technical Expertise
  - Equipment
  - Financial Resources

Opportunities through WIPO Green

- Technology transfer including know-how
- Partnerships between institutions including Universities
- Partnerships with Industry mordenising equipment and processes, appropriate technologies
- Support forCommercialisation and a specific technology market
- Establishment of a focal institution/committee/expert group to cordinate and implement initiatives and activities
- Promotion of success stories
- Support in the development of IP system as a tool for technology development
- Customized, localized training

Thank you

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