NATIONAL WATER AND SANITATION SUMMIT **RAPPORTEUR FORM**	

Rapporteur Name: Harrison Pienaar

Breakaway session (highlight as appropriate):

		Breakaway 3: **Water Research,** **Technology and** **Innovation Choices** Chair: Mr. Dhesigen Naidoo, CEO, WRC Venue: Auditorium, International Centre		

Presentation title:	Keynote Presenter: Imraan Patel

1. **Reporting notes**
   - Need to get finer aggregate data around the Science related to several issues we face e.g. Climate Change.
   - Important to build the scientific base around water resource management.
   - Evaluation Science – e.g. M&E – need for tighter monitoring and evaluation to make more informed choices. Also need to understand capacities for planning and implementation.
   - Technology value chain – In SA we need to see ourselves as part of a global community of practice and move away from insular thinking and doing. Our NSI is not appropriately geared towards doing this.
   - SA must take a systems approach to get access to cutting edge solutions that we can customise and take forward.
   - Insufficient capacity to effectively understand what works in what environment. There is a need for more demonstrations in the context of water and sanitation.
- How do we take forward technologies where we have clear competitive advantage – opportunity for exports of our IP, technology etc.
- Accelerate the capacity we have at Masters and PHD level to get to the target of 100 PHDs per million by 2030? Will depend on funding. Not just about the numbers but about the quality as well – creating A-rated scientists.
- Integration into global knowledge networks

2. **Concluding remarks/summary (please only type in bullet points and maximum of 5 points)**

Comments:

- Water sector is a monopolised space – new players can't break in – same players seen in the RDI space. What is being done to include others? How do we create more competition?
- What about those people that are at the bottom of the pyramid - what assistance is there for them to get to the Masters and PHD space and make positive changes to the communities they come from.
- MSc and PHDs – perceptions that being over qualified limits your ability to find a job. The science sector is very bad at creating careers for PHD graduates. There is no career path for specialists. The options are to move into management.
- Disjuncture between what we are doing in terms of R&I and how we deliver water and sanitation at the ground level. Good research does not get to the rural areas. The rural scenario is not the same as the urban scenario and we have to take cognisance of these differences to enable us to effectively deliver to rural areas by building on the good research done.
- Need to understand the factors surrounding the retention of good, well-qualified researchers and scientists in the water sector.
- 5 years – make Science more exciting to make these careers more attractive.
- How can we improve cooperation between Government departments?
- How can we promote and get advice on correct technologies for specific areas etc?
- Social Innovation – innovation does not refer to technology only. There are other things that need to be done to make innovations/technologies accessible, relevant and useful.
- Synergies between individuals/organisations are important to help us speed up a lot of research and efforts in this space.
- Technologies implemented, especially in rural areas, must have a requirement for follow-up once the technology has been implemented.
- Communities can reject even the best technologies. Therefore it is essential that we involve them during the development and testing of technologies.
- Develop young researchers to advance in the business space etc. What support measures are there to assist with their research in remote areas etc. e.g. labs and other facilities.

Panel Discussion

1. Reporting notes

Dr May Hermans
- Reflection on problems that are amenable to technological solutions.
- Reflection of the role of policy or governance in the technology intervention space.
- Understanding the key tenants of policy landscape necessary to facilitate water RD&I development (planning, dynamics, capacity, impact, interactions).
- Paradigm shift- horrible hybrids, undo the horrible hybrids.
- Do we have the individual and institutional capacity to institute the rules/regulations? Is it about shifting actual practice?

Prof Tshilidzi Marwala
- The need to unpack key challenges, research questions.
- Research question: what maintenance paradigm to be adopted in South Africa, monitoring of infrastructure.
- Security of supply (offering a scientific solution).
- Efficiency of systems (distribution).
- Demand side management.
- Funding for the sector to be relooked at.

Mr Zama Qampi
- Youth empowerment in the water sector (five training areas prioritised).
- Artisan development
- Underutilised resources in the public sector (Transnet school of engineering, WESA, etc).

Dr Henry Roman
- How can RD&I act as a catalyst to solve current water challenges?
- Fragmented approach of the water research landscape.
- Alternative solutions to water management. Look at successful projects being run locally and transfer best practice to other relevant sites.
- Increase capacity at municipal level.
- Appropriate technology strategy (DST-DWS-WRC).

Comments
- Development of technological solutions for current challenges (e.g. AMD, rapid urbanization, governance support).
- National water youth summit.
- National youth service.
- Integrated planning required.

DAY 2

Addressing the HCD challenge
- Efforts on HCD should be interdisciplinary.
- Limited capacity of HEI to absorb new entrants.
- Development of support measures to encourage leaners to enter the water sector.
- Need to unpack the pre- and post-university dynamics to stimulate interest in the water sector.

Research uptake
- Inclusion of all research role players in the research space (NGO and non-main stream research).
- How do we turn the WRC into an academic hub, how do we make existing resources available to the broader sector?
- Knowledge production and usage (how do we bring knowledge producers and users together).
- Revisiting flagship programmes to facilitate cooperation and collaboration

amongst sector players.

Limited information on available technologies
- Linked to capacity, ability to use existing knowledge particularly with respect to mature technologies.

2. **Concluding remarks/summary (please only type in bullet points and maximum of 5 points)**

Discussion on key questions:

1. **The key challenges in the stream**
- Human capital ecosystem – need to create a virtuous cycle
    - Creating high level skills, nurturing a demand for these skills and having an industry that can absorb these skills
        - Quantity and quality (A-rated)
        - Limited funding to create a critical mass of MSc and PHD graduates for the sector
    - Career paths for scientists and researchers – need direction, prestige attached to the professions, etc.
    - Help advance/support the careers of young researchers – entrepreneurship, research-support facilities in/near rural areas
- Ineffective uptake of research results/technologies
    - Bring knowledge producers and knowledge users together
    - Community participation during the research and testing stages is crucial
    - Disjuncture between research and innovation and what is being done at the rural level – urban and rural challenges differ
    - Advance SA technologies with clear competitive advantage
- Limited/no information on available technologies
    - Inappropriate technologies, no maintenance
    - Difficulties with selecting technologies to implement
    - More demonstrations to prove technologies and increase uptake
- Need decision-support systems for evidence-based decision-making
- Technology lock-in
    - Insufficient capacity to understand the appropriateness of technologies in specific environments
    - Regulations, SCM, support industry etc. built around certain existing technologies – limit new technology consideration and uptake
- Capacity to make decisions
    - Inability to specify technology requirements and evaluate fit-for-purpose
- Inadequate integration with global knowledge networks and limited inter-departmental cooperation
    - Need to create and leverage synergies

- o Adopt a systems approach and smart partnering (locally and globally) to identify, customise and adopt relevant solutions quickly rather than replicate
- Inadequate/no monitoring and evaluation
  - o Relevant research to build up a knowledge base on our capacity to implement, monitor and evaluate
  - o Infrastructure monitoring– need different models/approaches/technologies to monitor effectively
  - o Regular follow-up after installation of technologies, especially in rural areas

2. The deficiencies in the enabling environment

- Lack of co-operation among Government departments and other institutions in the sector
- Governance and policy operating space
  - o Lack of a sector-wide strategy/plan on Water R&D
  - o Do we have the individual and institutional capacity to institute the rules/regulations?
  - o Councillors and Board members etc. who do not understand Governance
- Lack of relevant skills and capacity
- Inadequate funding for human capital development
- Poor attraction and retention of top-quality scientists and researchers
  - o Limited career progression/recognition of higher qualifications lead to qualified individuals moving into management positions rather than technical positions
- Monopolies in the sector – no room for new players dilutes technology options, ideas etc
- Limited consideration of social impacts of technology innovation (innovation does not only mean technology)
- Limited integration with global knowledge networks
- Sluggish systems (regulations, SCM, etc.) that collectively discourage rapid adoption of more appropriate technologies (increase performance and reduce costs)

3. Solutions to the challenges

Human Capital Development

- Build capacity at the artisanal level. FET colleges are important here.
- Understand what the virtuous cycle is.
  - Research on what excellence means in terms of taking people through the different career paths and what the training needs are?
- Dialogues on how higher education structure and orientate themselves to provide the right skills for the sectors.
- More school outreach activities to help inform career choices (not just engineers and scientists).
- Professional associations and other platforms to assist new recruits in the sector network and join a community of practice that supports and/or mentors them as they develop in their careers.
  - e.g. SA Young Water Professionals
- Mobile water labs – to help train unemployed youth in rural areas etc.

- Foster more PPP's for human capital development

Uptake of Research Results
- Create spaces where NGOs and researchers working on the fringes can be acknowledged and supported rather than marginalised because of their special or controversial research.
- WRC and other research institutions should play a stronger catalyst role to help ensure that the tools, guidelines etc coming out of research are made available in a manner that facilitates rapid application.
- Concentrated platforms/flagships that encourage cross-sectoral collaboration (business, government, academia and civil society).

Limited Information on Available Technologies
- More training on mature technologies.
- More demonstrations will increase exposure and understanding of available technologies.
    - Relaxation of certain demands (e.g. regulatory requirements) during the demonstration stage to allow us to accelerate testing and rapid adoption of suitable technologies.

4. The key elements of the solution tree in the 30-year timeframe
- Water RDI Roadmap (currently underway)
- Science informed by policy development and vice versa
- Multi-pronged human capital development programmes – schools, universities, artisans, early career support and mentoring
    - Clear and progressive career paths for qualified (Masters and PHD) young professionals in the water sector with a certain level of prestige attached to securing higher-level qualifications in the sector.
- Water Living Labs
    - Multi-sectoral collaboration to demonstrate technologies at scale
    - Relaxation of specific requirements to allow appropriate technology fast-tracking through demonstrations
    - Co-production and testing of knowledge/research
    - Active involvement of civil society
- Dedicated investment in Water RDI with a strong focus on compliance, monitoring and enforcement
- Clear benchmarks and targets for the sector in terms of governance, management, investment, research and innovation
- Alignment with key national plans/strategies

5. The key elements of the five-year plan
- Measure our ability to effectively leverage science, technology and innovation to make an impact – at scale, fast and in a prioritised way.
- Training – identification of actual needs, funding and implementation of priority training interventions
- Make Science more exciting to make the careers more attractive and make all water-related careers (technical, legal, administrative, financial etc.) attractive/prestigious

- Mapping of the South African National System of Water Innovation (role-players, alignments, linkages, roles and responsibilities)
  - Identify gaps, challenges and determine how to organise the sector for a coordinated response.
- Link to the Water RDI Roadmap
- Create an enabling environment for technology demonstrations
  - Relaxation of regulatory requirements etc. during demonstration stages to allow rapid technology testing and adoption.
- Develop a sector-wide monitoring and evaluation framework
- Establish a high-level intergovernmental Water Innovation forum (joint investment, collaborative decision-making, information sharing, etc.)
- Enhanced participation in global knowledge networks

Summary of key points:

Major issues of contention / consensus: