

# Water – Energy – Food Security nexus: towards policy convergence in South Africa



**S. Mpandeli, G. Backeberg, T. Mabhaudi & A.T Modi**








**South African National Committee on Irrigation and  
Drainage Symposium on Water, Food & Energy  
in the 21<sup>st</sup> Century**








**Glenburn Lodge, 18 – 20 November 2014**



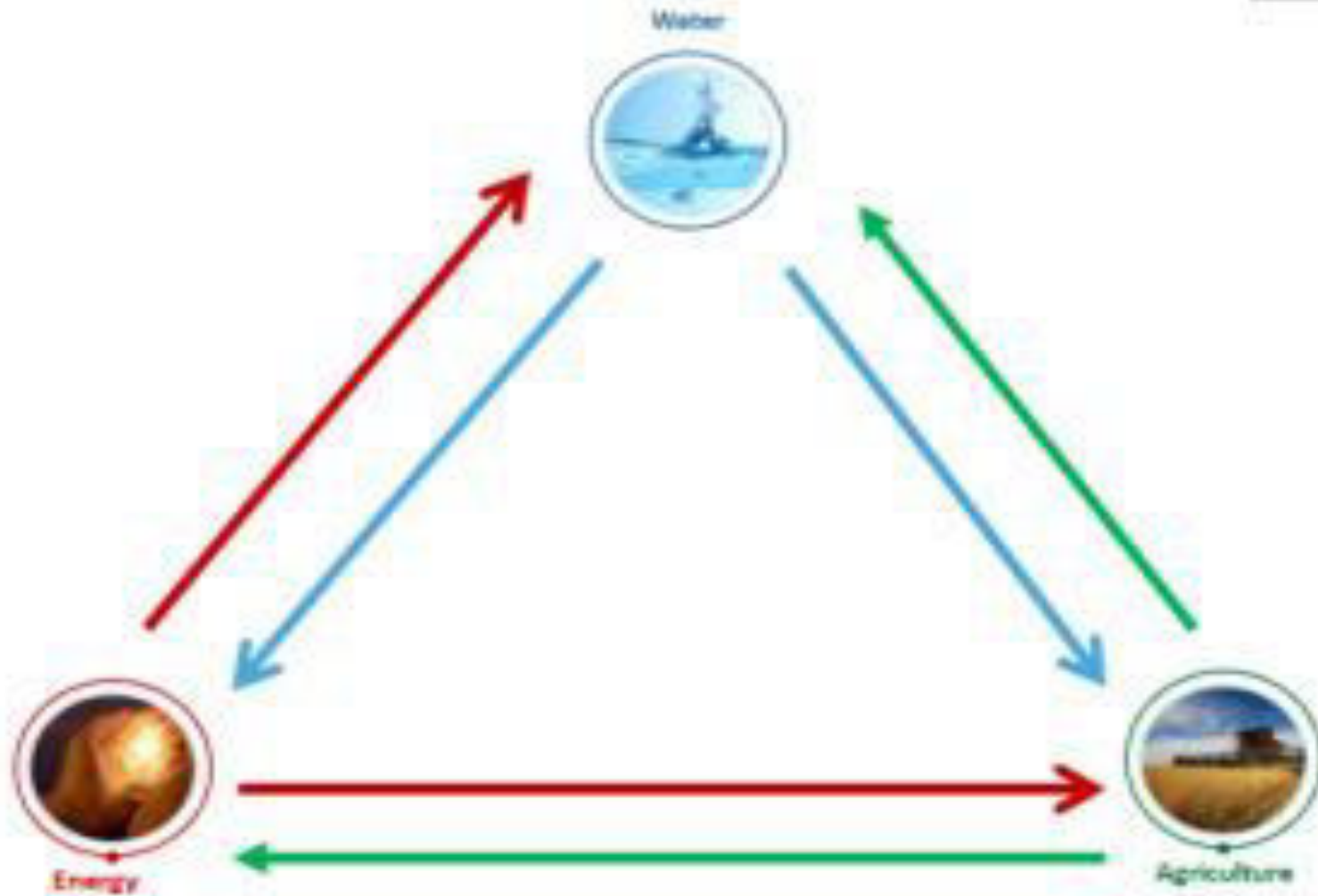
# Presentation outline

- ✓ Introduction
- ✓ Define Water – Energy – Food Nexus? 
- ✓ Interdependency between Water – Energy – Agric 
- ✓ Constitution of the Republic of South Africa
- ✓ Current act, policies, strategies under the water sector
- ✓ South Africa's water sector challenges 
- ✓ Current act, policies, strategies under the energy sector
- ✓ South Africa's energy sector challenges 
- ✓ Current act, policies, strategies under the agric sector
- ✓ South Africa's agric sector challenges 
- ✓ Conclusions and recommendations






# Introduction

- ✓ What is Water – Energy – Food Security Nexus?. It is a concept to describe and address the complex and interrelated nature of our global resource systems on which we depend to achieve different social, economic and environmental goals (FAO, 2014).
- ✓ The Water – Energy – Food Security nexus was first brought to the attention of global leaders at the Davos World Economic Forum.
- ✓ The Water – Energy – Food Security nexus largely remains an isolated issue due to lack of understanding and complexities of the relations between its components.

# Interdependency between W-E- Agric



# Constitution of the Republic of South Africa of 1996

- ✓ The constitution of the Republic of South Africa (RSA 1996) is the overarching document that guides all other legislative and policy instruments adopted by the government. 
- ✓ Within this constitution several policies, strategies and plans from sectors such as *Water, Energy, Agriculture & Environment* are accommodated. 
- ✓ It is therefore necessary that all sector laws and policies should be properly aligned with the constitution for synergy (RSA, 1996, Madhlopa, 2014). 

# Current act, policies, strategies under the water sector

- ✓ In this country, the right to water is enriched in the constitution and implemented by the work of ordinary status as highlighted by the constitution of 1996 (RSA, 1996, Madhlopa, 2014).
- ✓ Section 27(b) of Chapter 2 states that everybody has the right of access to sufficient water (RSA, 1996).



# National Water Act 36 of 1998

✓ Since, 1998, the National Water Act has been championed as the blue print within the water sector.






✓ It provides the legal framework for the effective and sustainable management of South Africa's water resources (RSA, 1998a).

✓ The Act aims to protect, use, develop, conserve, manage and control water resources as a whole.

*✓ Chapter 4 of the National Water Act provides for use of water by various stakeholders*



# National Environmental Management Act 107 of 1998

- ✓ It provides a legal framework for integrating good environmental management into all development activities (RSA, 1998b). 
- ✓ Part 1 of chapter 7 of the act provides for the prevention of environmental pollution or degradation and this encompasses the pollution of water resources by various stakeholders.   

- ✓ *It takes cognisance of the role played by various sectors.*   




# National Water Resource Strategy 2 (2013)

✓ This strategy takes on board a range options for balancing the supply and demand of water.



✓ It has been noted that these options have implications for energy demand.








□ The National Water Resource Strategy the following issues:

*(a) As the availability of fresh water sources becomes fully utilised, the energy sector shifted to the implementation of dry cooling tech. (b) The energy sector is continuously improving the efficient use of water, for example, the handling & management of ash and waste. (c) There are some challenges in implementing water allocations and water use authorisations across sectors.*



# White paper on a National Water Policy for South Africa






- ✓ This White paper was aimed at guiding the management of water in the country. 
- ✓ The White paper on National Water policy emphasized on efficiency, effectiveness and demand-side management in water utilisation in order to promote water conservation. 
- ✓ According to DWA, 2013 & Madhlopa, 2014, a recent review of water – related policies was conducted, the review outlined several issues:  
(a) Authorisation to use water for productive purposes is aligned with demographics realities.   
  


# White paper on a National Water Policy for South Africa Cont...






- (b) Minimum of 25 litres per person per day provided free of charge to all indigent households.
- (c) Indirect benefits of water from healthy river systems are protected and maintained.
- (d) Allocation and use of water supports the reduction of poverty and equality across the country.



# Water for growth and Development framework

- ✓ This is one of frameworks that partially highlights the nexus approach, although to a limited extent. 
- ✓ It takes cognisance that there is a close working relationship with large water users in the energy sector to ensure that current and future power plants are included in the DWA water resource planning initiatives (DWA, 2009). 
- ✓ *This was a recognition of the water – energy linkages. It is reported that 2% of the available water is allocated to the energy sector.* 

# South Africa's water sector challenges






- ✓ According to Schulze, 2000, the adverse impact of climate change will worsen the existing problem of systemic water shortages. 
- ✓ The need to ensure access to water for the country's population. 
- ✓ With the exception of Water for Growth Development Framework (DWA, 2009), existing water policies neither explicitly nor adequately highlight linkages that exist between water, energy and agric sectors.   
  


# Current act, policies, strategies under the energy sector

- ✓ The mandate for the energy sector is provided through the ministry of Energy which has the constitutional mandate to administer legislation related to the energy sector.
- ✓ Statistics from the Department of Water and Sanitation (DWS) 2013, and other bodies indicate that power generation uses between 6 – 8% of South Africa's water reserves, a strikingly low number compared to 60 – 62% that is used in Agric sector.



# White paper on energy policy (1998)

- ✓ South Africa's Constitution (Act No.108 of 1996) stipulates that the government should have a national energy policy. 
- ✓ The White paper (DME, 1998) recognised the fact that South Africa is endowed with a broad spectrum of renewable and non renewable energy resources. 
- ✓ The White paper on energy recognised the existence of cross cutting issues and the fact that agric formed part of demand and water formed part of the supply matrix but does not recognise linkages between three components. 

# White paper on energy policy (1998)






## Cont...

- ✓ The White Paper (DME, 1998), did however recognise the need for improved coordination between government departments, policies and spheres of government so as to improve policy cohesion.










# White paper on renewable energy (2003)

- ✓ It identifies that South Africa's rich renewable energy base. 
- ✓ The white paper on energy policy's position on renewable energy was based on integrated resource planning and stipulated clearly the need to invest national resources into development and exploitation of energy sources.   

- ✓ The White paper on renewable energy essentially supplemented the white policy which pledged 'government support for the development, demonstration and implementation of renewable energy sources.   


# White paper on renewable energy (2003) Cont...






- ✓ The White paper on renewable energy also recognised the need for greater cohesion between government departments and spheres of government. 
- ✓ There are no linkages established with the Department of Water and Sanitation (DWS) whose consent would be required for construction of dams and how this would compete with other water users. While the use of biofuels was first mentioned in this policy, the linkage with Agriculture was not clearly expounded on.   
  
  


# Integrated energy plan (IEP 2003 and 2005)






- ✓ The IEP stem from the white paper on energy policy (DME, 1998) which advocated for integrated resource planning.
- ✓ The criteria that was set out by the white paper on energy policy (DME, 1998) for integrated energy planning entailed:
  - (a) Interpreting the requirements of national economic, social and environmental policies for the energy sector.
  - (b) Evaluating the effects of legislative, institutional and industry structure arrangements on energy supply & demand.



# Integrated Resource Plan (IRP, 2011)

- ✓ The IRP recognised the need to have ‘an appropriate balance between expectations of different stakeholders’ and risks. 
  - ✓ Water use was identified as one of the key stakeholders. 
  - ✓ The IRP also recommended accelerated roll out of renewable energy options. 
  - ✓ It also recommended, based on government policy, construction of nuclear fleet and the acceleration of coal –based options. 
- 

# Biofuels (2014)






- ✓ The drive for energy and need to diversify the supply side of the sector has led to the development of policy on biofuels. 
- ✓ Recently, the Department of Energy (DoE) published a draft position paper on 'the South African Biofuels Regulatory framework (SABRF) (DoE, 2014).   

- ✓ The development of a biofuels position was because the government had identified opportunities.   


# Biofuels (2014) Cont...

- The draft position on Biofuels proposes a framework for:
  - (a) The implementation of the Biofuel Industry Strategy;
  - (b) Mandatory blending regulations;
  - (c) Licencing of manufacturers of Biofuels; and
  - (d) A framework for pricing of Biofuels feedstock and reference crops among other issues identified.



# South Africa's energy sector challenges

- ✓ Currently, South Africa is faced with ongoing energy shortages. More recently, this has even been reported to have contributed to the country's credit status being downgraded. 
- ✓ The 'crises' in the energy sector has also led to the signing of nuclear power deals with Russia and China as well as an 'explosion' of new coal mines with new prospecting licences being issued in areas like Mpumalanga. 
- ✓ This has raised renewed fears of acid mine drainage in the Vaal River; the mushroom of new mines is set to clash with water and agriculture sectors. 

# South Africa's energy sector challenges

## Cont...

- ✓ In addition, water, energy and food security are all central to South Africa's independence vision of delivering a better quality of life to its citizens.
- ✓ This highlights the need for better convergence of policy between the three sectors and a movement from the 'silo' approach.










# Agriculture and Food Security

- ✓ In South Africa, the agriculture sector's administration falls under the Department of Agriculture, Forestry and Fisheries (DAFF), with the Forestry and Fisheries departments previously being under other national departments. Here we review some key policy documents within the agriculture sector in terms of their alignment to the water-energy-food security nexus.



# Agriculture and Food Security Cont...

- ✓ Local reports indicate that agriculture accounts for 60–62% of total water use (CSIR, 2010; DWA, 2013). This makes agriculture, by sector, the largest user of water in the country. 
- ✓ Agriculture, by nature of its mechanisation and subsequent processing of products is also energy consumptive. Therefore, linkages between the water– energy–agricultural sectors should be clearly established in government policy if agriculture is to meaningfully contribute towards eradication of poverty and hunger. 

# The following Agric policies were reviewed

- ✓ White Paper on Agriculture, 1995.
- ✓ Livelihoods Development Support Programme.
- ✓ Integrated Growth and Development Plan (IGDP) for Agriculture, Forestry and Fisheries.



# South Africa's agriculture challenges

- ✓ Energy inputs have increased significantly, in particular for land preparation, fertilizer (primarily nitrogen), irrigation and other inputs.
- ✓ Lack of policy implementation & coordination.
- ✓ Threats posed by high climatic variability and change.



# Conclusions

- ✓ Currently the Water – Energy – Food nexus provides a very good platform for creating policies convergence and also enhance the integrated resource management mentality.
- ✓ Government needs to start championing the nexus approach and do away with the silo mentality, there is a need to harmonise policy activities across all three spheres of government.








# Conclusions Cont...






- ✓ Since 2009, an opportunity has been created through the National Planning Commission to integrate policies, strategies and plans together in order for government departments to collaborate, manage their resources in efficient and effective ways, and enforce policies and legislation.
- ✓ It is important to note that the energy sector has been identified as one of the key strategic sectors by the National Water Act 36 of 1998 and it has been given priority together with the agricultural sector.



# Conclusions Cont...






- ✓ The Water for Growth and Development Framework takes cognisance the intersectoral linkages with the energy sector in order to make sure that current and future power plans are incorporated into the water resource planning initiatives.
- ✓ This shows that the water sector takes cognisance of the role played by the energy sector in terms of water use, water allocation and water use efficiency.

# Conclusions Cont...

- ✓ The Water – Energy – Food nexus is not clearly defined in all the acts, policies, strategies and plans analysed and reviewed so far. 
- ✓ However, there is a clear understanding of the roles played by sectors such as Water, Energy, Agriculture, and Environment etc. It was noted that there are still policies, strategies and plans which are still pursuing the sectoral mentality than the nexus approach. 
- ✓ For example, although the National Climate Change response policy takes cognisance of other sectors such as Agriculture, Water, Energy etc. this policy is still pursuing the sectoral behaviour than the nexus approach. 



# Recommendations

- ✓ The NDP should make sure that it safeguards against sectors operating in silos than aligning their activities in an integrated way. 
- ✓ The government needs to pursue the nexus approach in order to improve efficient use of water, energy, and agricultural resources in a sustainable manner. 
- ✓ If government does not follow the nexus approach chances of these sectors duplicating their activities are very high and there would be more collusion of sectors than convergence of policies, strategies, plans and acts. 

**Thank you for your attention**

