



Insights into
resilient
development –
*Linkages between
water, food &
energy*

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Understanding the FEW nexus in SA



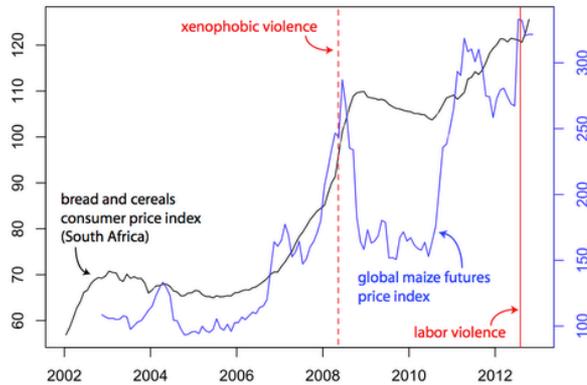


FEW nexus is key to resilient development

South Africa's Deepseated Economic and Social Crisis

Dissection: "South Africa Is An Angry And Frustrated Nation" And On The Brink

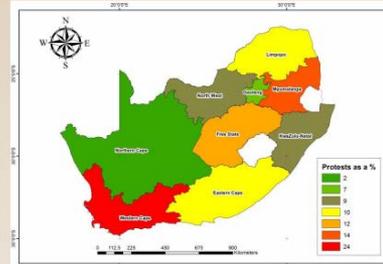
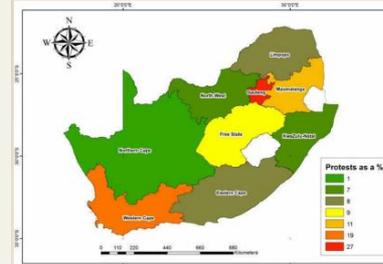
Are South African labour protests food riots?



Percentage frequency of water services related protest events by province

2005 to July 2013

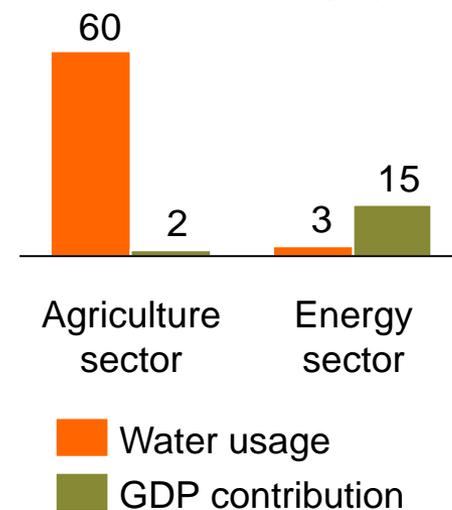
2011 to July 2013



Risks include job losses & food insecurity

- 1 **Agricultural sector goes into decline**, despite being 4-6x better at reducing poverty than other sectors. Smallholders & workers lose rural livelihoods – unemployment goes from 37% to... ?
- 2 **Biofuels opportunity** diverts land used for food production, causing food shortages
- 3 Food price hikes threaten **food security on staple items** like maize, affecting poor worst
- 4 Agricultural sector loses battle with energy sector for **access to water**... shrinking it.
- 5 Accessing new water resources will become prohibitive

Consumption of SA water vs GDP contribution (%)



Risks include export markets & devastating shortages

1 Declining water quality **cuts access to export agriculture markets** & drives up the cost and energy intensity of cleaning water
W Cape 2004/5 example: Possible loss of R570m

2 **Agro-industrial sector is stunted**

3 **Environmental degradation**, declining groundwater & unequal water distribution result, devastating water shortages, landscape changes

4 **Policy shifts to protect food security** at expense of water

5 Challenges to **energy security** & **decarbonization** of electricity infrastructure

Water reliance of SA's food production

- 90% of fruit & wine produced under irrigation
- 90% of vegetables produced under irrigation
- 12% of total area planted to wheat is under irrigation, irrigated wheat contributes 30% of national production



Integrated planning will be key

What we know

- Shortage & price volatility in one resource can rapidly impact other resources
- Water quality will become a serious constraint on food security
- Food production is most water & energy intense at the production stage.
- Waste-water recycling, desalination and interbasin transfers will become the norm
- There will be increased competition for water and land between sectors
- Energy is a major element for farm sector competitiveness & sustainability

What we need to know

- Impact on resource intensity, price dynamics, & social welfare
- Extent of loss in production & exports
- Full life-cycle use of energy & water for the vast majority of food that we consume
- Energy use & costs associated with these options.
- Possible need to transfer land & water out of agriculture, particularly for energy production.
- Risks & manner in which agricultural holdings can adapt to probable energy futures



Increasing resilience will require

Reliable information & data

Planning, policy & enforcement

- | | |
|---|---|
| <ul style="list-style-type: none">• Economics of food production & supply | <ul style="list-style-type: none">• Integrated & aligned planning, assessing trade-offs using economic and resource-mapping tools |
| <ul style="list-style-type: none">• Food waste and loss flows | <ul style="list-style-type: none">• Supportive policy: sustainable agriculture, waste, water quality, waste to energy |
| <ul style="list-style-type: none">• Synergies between bioenergy & food security + rural development | <ul style="list-style-type: none">• Better enforcement of legislations and policies |
| <ul style="list-style-type: none">• Water risk data | <ul style="list-style-type: none">• Addressing spatial dimension of development |
| <ul style="list-style-type: none">• Decoupling agriculture from fossil fuel-derived energy | <ul style="list-style-type: none">• Increased renewables capacity to derisk energy security from water related constraints & help farmers |
| <ul style="list-style-type: none">• Energy & water dynamics | <ul style="list-style-type: none">• Co-planning energy & water systems |