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Prophylactic land-use for wildfire risk reduction at South Africa's wildland-Urban interface: Knysna Case Study

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Spatial Planning & Vegetation Management as Solution?

Frequent mega wildfires = damage property & loss of lives

Garden Route wildfire: Seven killed in George, South Africa

30 October 2018



More than 400 firefighters have been battling the blaze 450 km (280 miles) east of Cape Town

At least seven people have been killed in a raging fire along South Africa's popular Garden Route in the Western Cape province, officials say.

Fig 1: (BBC 2018)

Unmanaged vegetation & urbanisation contribute significantly

'Born to burn': The alien trees that turned Cape Town fire into a disaster

Invasive aliens make fires burn hotter and spread faster

24 April 2021 - 09:54
BY CLAIRE KEETON



Claire Keeton
Senior features writer



Fig 2: (Times Live 2021)

Practicalities of vegetation management South Africa?



Fig 3: Mechanical firebreak construction (SCFPA 2023)



Fig 4: Prescribed burn firebreak construction (SCFPA 2023)

Case Study Sites and Methods

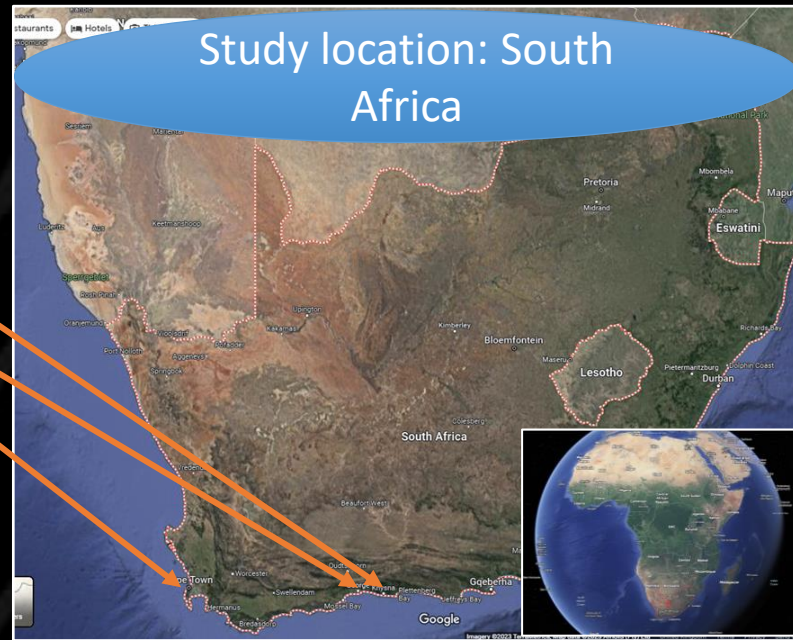


Fig 7: (Google 2023)

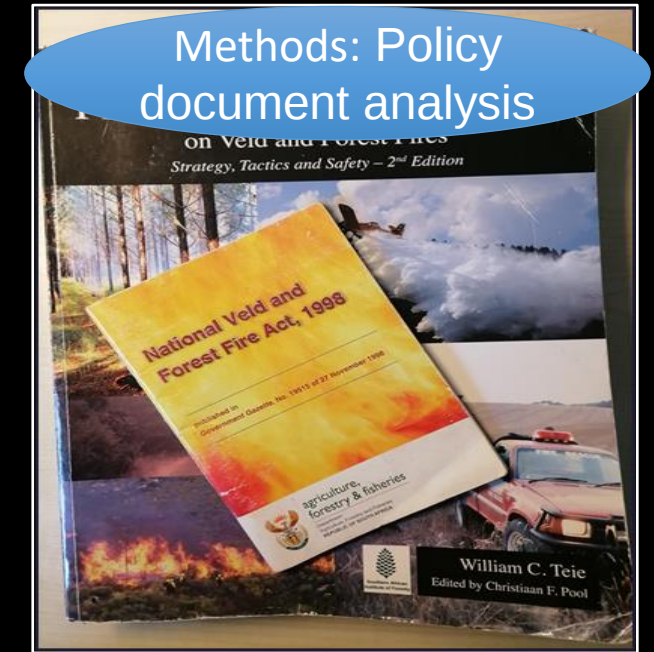


Fig 8: (NVFFA 1998)



Fig 5: (Goldsmith 2023)

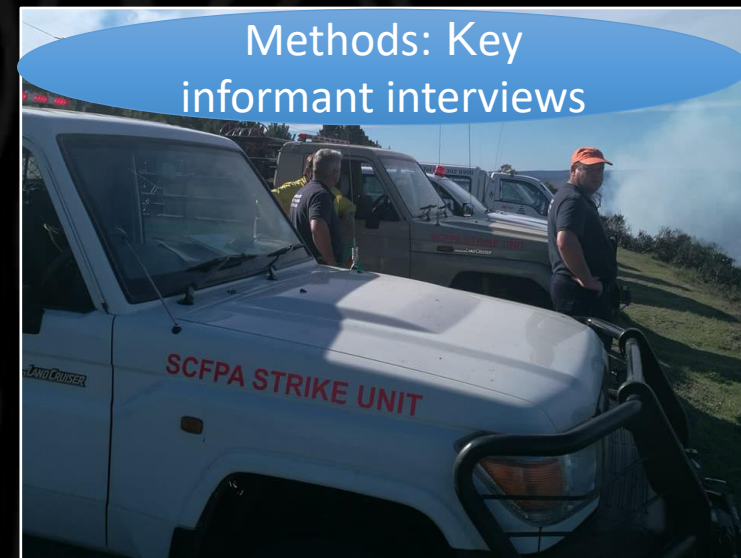
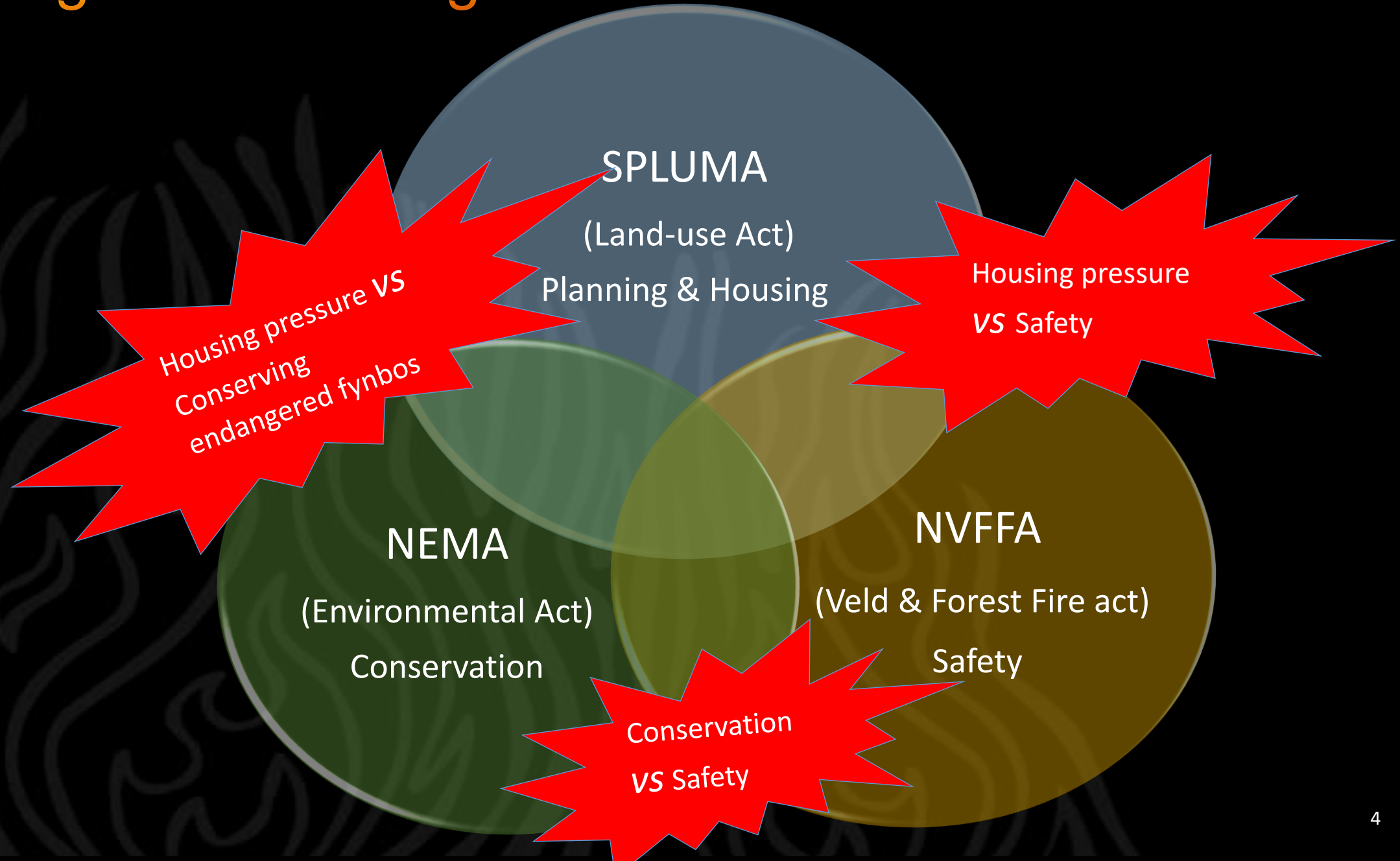


Fig 6: (SCFPA 2023)

Challenges: Conflicting Goals and Government Mandates



Settlement Forms: Informal Settlement

- Location
 - Sprawls on townships & city edges
 - Abandoned farms & firebreaks
- Origin & tenure
 - Illegal settlements
 - Former forestry migrant workers
- Socioeconomic Status
 - Extreme poverty & under resourced
 - *Umdywadi*



Fig 11: (Halu 2023)



Fig 12: (Google 2023)



Fig 10: (Goldsmith 2022)

Risk Perception, practicalities & challenges: Informal Settlement

- Developmental control & Planning
 - Unplanned clustered communities
 - No developmental control and no regulations
- Road layout & Infrastructure
 - No well-constructed road networks
 - No water networks and no electricity.
- Building material and Regulations
 - Highly highly igneous building material
 - Wood, hard cardboard, and dampcourse plastic sheets
 - Land desperation and housing pressure
- Vegetation and Fuel Management
 - No collective vegetation reduction efforts
 - Uninformed of vegetation management

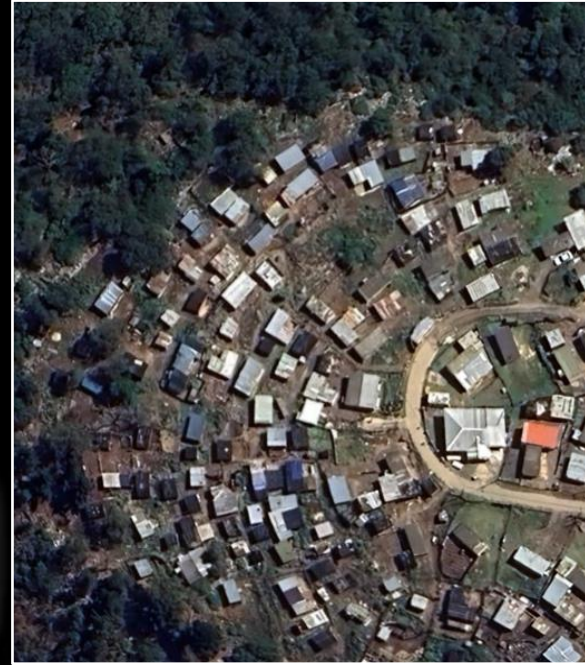


Fig 14: (Google 2023)



Fig 15: (Halu 2023)



Fig 13: (Goldsmith 2022)

Settlement Form: Township Settlement

- Location
 - Out of town
 - Apartheid segregation legacy
- Origin & tenure
 - Government mass-built settlements
 - In-situ upgrade formalization
- Socioeconomic Status
 - Moderate & better resourced



Fig 17: (Goldsmith 2022)

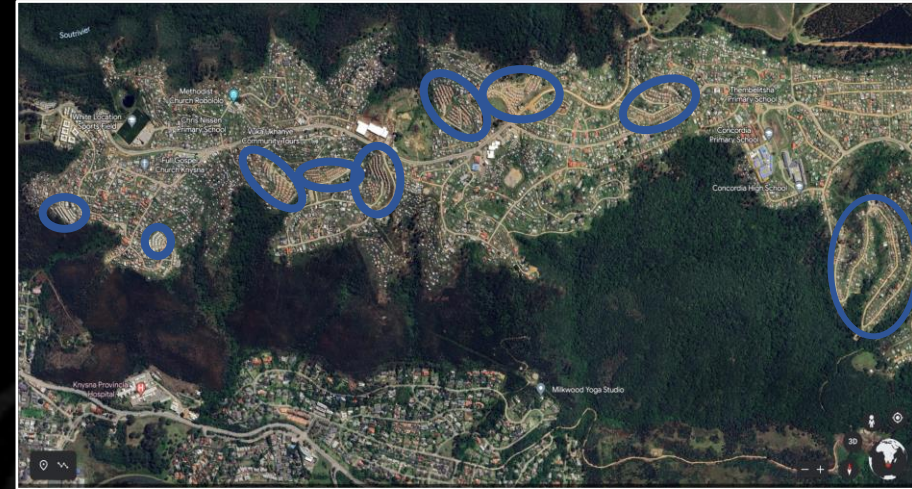


Fig 18: (Google 2023)



Fig 16: (Goldsmith 2022)

Risk Perception, practicalities & challenges: Township Settlement

- Developmental control & Planning
 - Formalised planning or through *in-situ* upgrade (poor planning)
 - Informal extension without approved and formal plans.
- Road layout & Infrastructure
 - Awkward location, poor road networks
 - Household water only & no functioning water hydrants
- Building material and Regulations
 - Bricks, concrete & metal roof at original form
 - EXTENSION: None compliance to developmental control and building regulations
- Vegetation and Fuel Management
 - No collective vegetation reduction efforts
 - Uninformed of vegetation management



Fig 20: (Google 2023)



Fig 21: (Halu 2023)



Fig 19: (Goldsmith 2022)

Settlement Form: Formal Settlement

- Location
 - City edges
 - Isolated eco-villages estates
- Origin & tenure
 - Formal suburban setting
 - Small private land holdings
- Socioeconomic Status
 - Affluent & high socioeconomic



Fig 23: (Goldsmith 2022)



Fig24: (Google 2023)



Fig 22: (SCFPA 2023)

Risk Perception, practicalities & challenges: Formal Settlement

- Developmental control & Planning
 - Formalized planning
 - Forecasted developments
- Road layout & Infrastructure
 - Good road network & excellent water supply
 - Functioning water hydrants in strategic locations
- Building material and Regulations
 - Bricks, concrete, treated wood, metal sheet and thatch
 - Private property rights prevail, no stringent building controls to counter WUI wildfire risk
- Vegetation and Fuel Management
 - Conformance
 - Members of Fire Protection Association
 - Eco-village English garden & scenery
 - Conserving the endangered fynbos



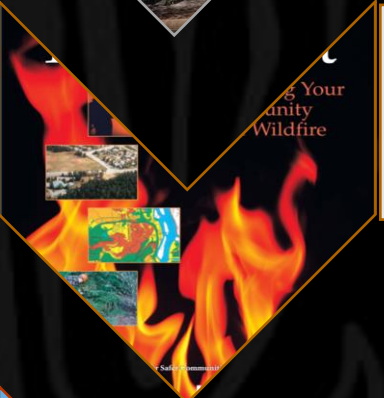
Fig 26: (Goldsmith 2023)



Fig 25: (Goldsmith 2022)

Conclusion

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- No evidence of coordination between the land management department and fire service department with respect to projected land developments

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- Urgent need to educate the public about the importance of prophylactic land-use and vegetation management in the WUI

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- Land desperation combined with housing pressure and uncontrolled development strains practicalities of prophylactic land-use in South Africa's WUI areas