

# Optimising water use along the value chain for cabbages produced by emerging farmers from Zanyokwe Irrigation Scheme

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# OUTLINE

- Introduction
  - Background
  - Problem statement
  - Objectives
- Data and Procedures
- Results
- Conclusions and recommendations

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# INTRODUCTION

- Agriculture features well in government strategic and policy documents as a means to alleviate rural poverty since 1994, and even more so since 2009.
  - Comprehensive Rural Development Plan (2009, 2010)
  - National Development Plan (NPC, 2011)
- Emerging farmers has major role to play to reduce food insecurity (Molewa and Doidge, 2010)
  - Not only food production, but also through opportunities for earning income all along the value chain (Backeberg and Sanewe, 2010)
- National Water Act (No.36 of 1998) promote efficient, sustainable and beneficial water use in the public interest
  - Problem: Agriculture is inefficient user of water (Nieuwoudt, Backeberg, and Du Plessis, 2004)

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# INTRODUCTION (CONT...)

- Ample research attention on improving water use efficiency
  - Irrigation scheduling (Annandale *et al.*, 2011)
    - 39 reports on irrigation scheduling
  - Improving efficiency of irrigation methods (Reinders, 2011)
    - Layouts, design, selection and management of irrigation system
  - Whole-farm economic modelling of irrigation farming (Grove, 2011)
    - Optimising water use between multiple crops

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# INTRODUCTION (CONT...)

- Problem:
  - Studies on water use efficiency focus on water use at farm level
  - No study has attempted to optimise water use along whole value chain
- Objectives:
  - Optimise water use along value chain for cabbages produced by emerging irrigation farmers from ZIS
    - Map flow of product along value chain
    - Analyse distribution of value and (blue) water use along value chain
    - Calculate the value of water at each stage along value chain

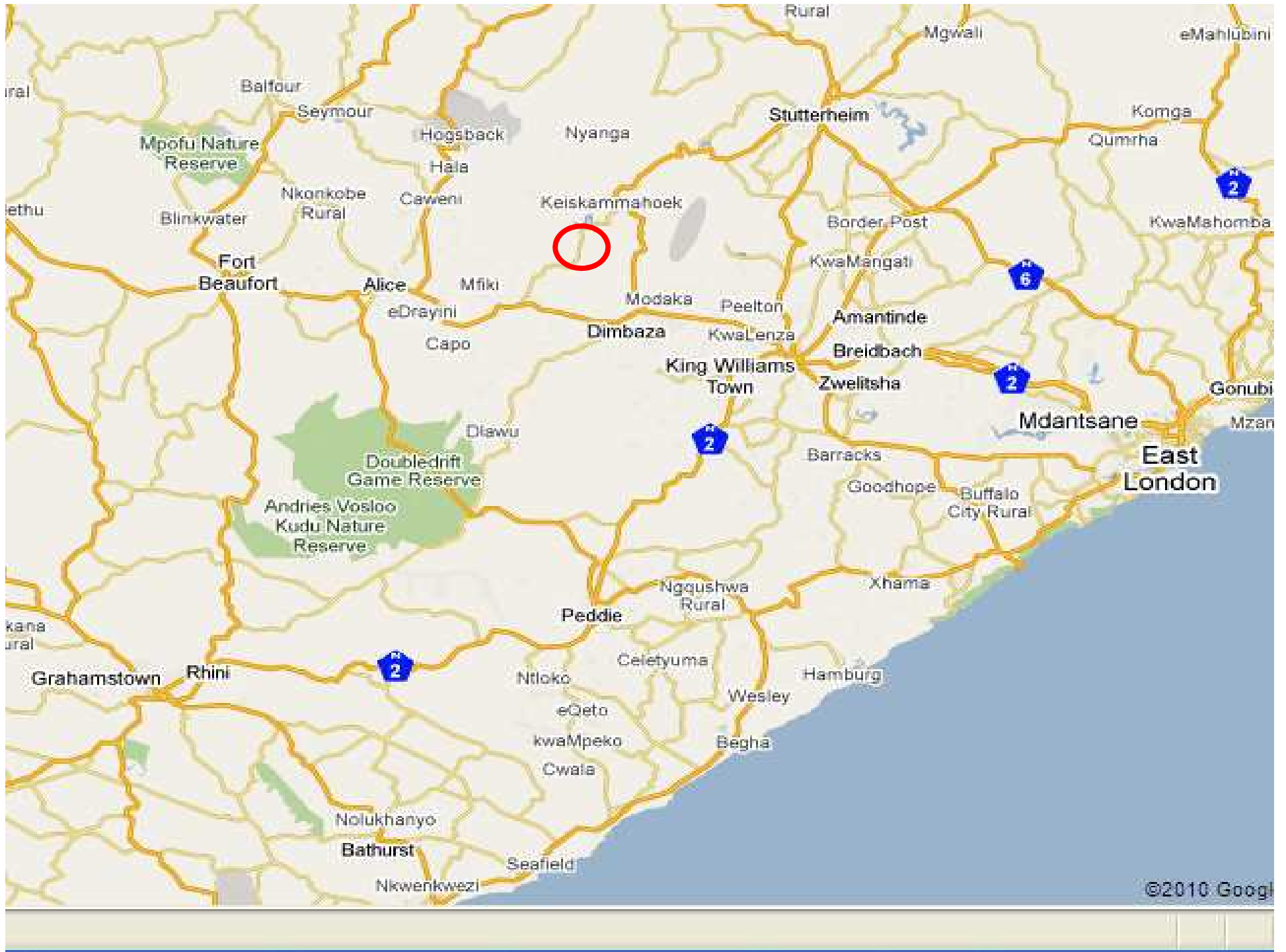
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# DATA

- Discussions with key role-players along value chain
  - Extension officer; farmers; buyers
- Questionnaire survey
  - Personal interviews
  - All farmers invited to participate in survey
  - 23 vegetable producers from 3 villages were interviewed
    - Kamma Furrow, Burnshill and Lenye

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# DATA (CONT...)

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<b>Crop</b>	<b>Number of respondents</b>	<b>% of respondents</b>
Cabbage	18	78.3%
Carrots	11	47.8%
Beetroot	5	21.7%
Onion	2	8.7%
Spinage	2	8.7%
Tomatoes	1	4.3%
Butternuts	5	21.7%
Maize	4	17.4%
Potatoes	3	13.0%

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# PROCEDURES

- Mapping distribution of value along value chain
  - Product flow map
    - Flow of product
      - ID value adding nodes
  - Distribution of value along value chain
    - Gross margin (farm level)
    - Value added (value adding nodes)

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# PROCEDURES

- Mapping distribution of water use along the chain
  - Volume of water (Blue water footprint)
    - Farm
      - Crop water requirement (SAPWAT)
      - **PLUS** water used to dilute chemicals
    - Value adding nodes (excluding consumption)
      - No water is used
- Quantifying value of water
  - Farm level
    - Gross margin / volume of blue water use at farm
  - Value adding levels
    - Cumulative value added / cumulative volume of blue water used

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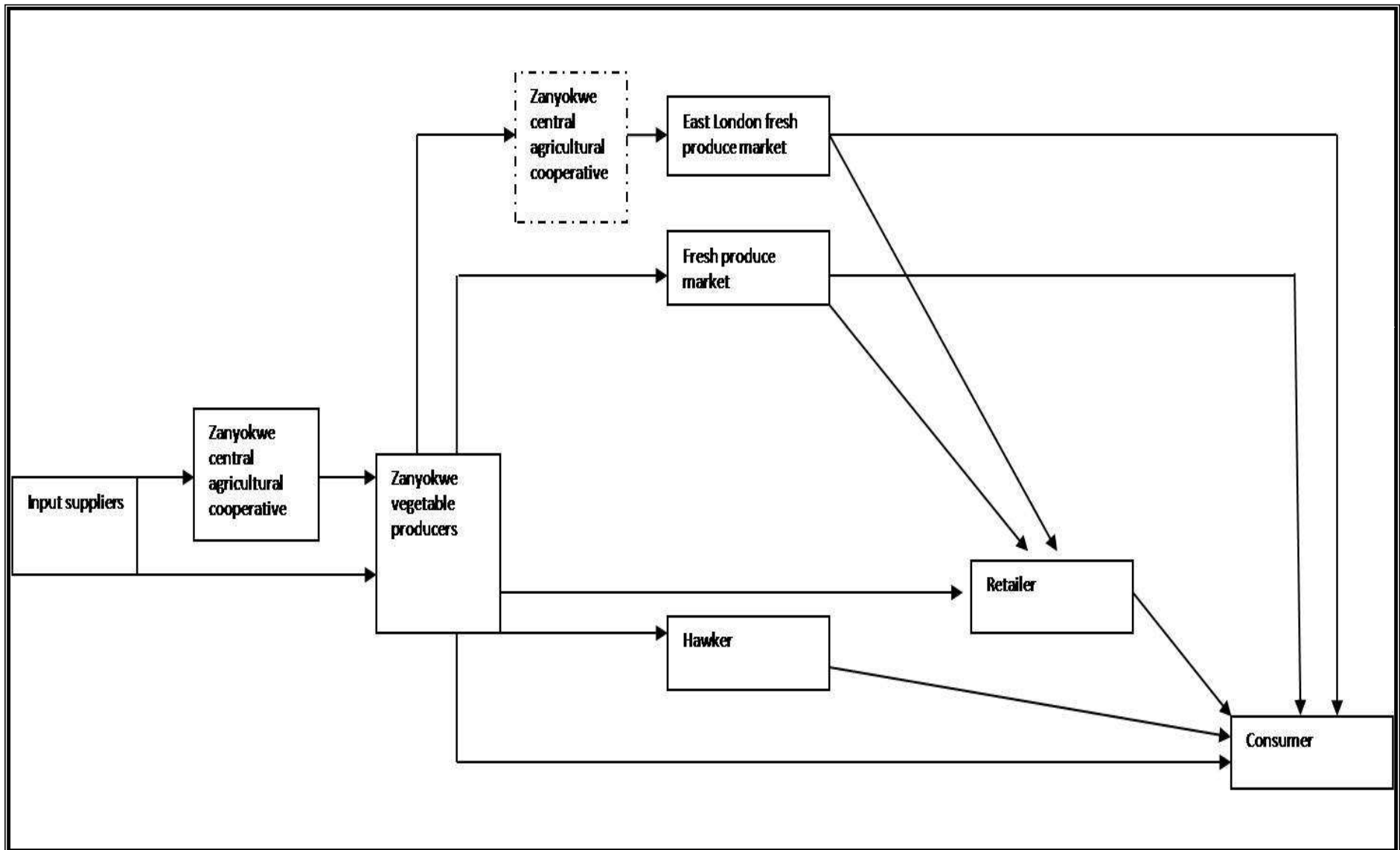
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# RESULTS – MAPPING PRODUCT FLOW



# RESULTS – DISTRIBUTION OF VALUE

Marketing channel		Cabbage	
<b>Farm gate</b>		Gross revenue	Gross margin
		(R/tonne)	(R/tonne)
	EL FPM <sup>1</sup>	2 518	1 002
	FPM <sup>2</sup>	2 518	1 082
	Retailer	2 665	1 526
	Hawker	2 665	1 587
Consumer	2 518	1 441	
<b>Final link</b>		Gross Revenue	Value added
		(R/tonne)	(R/tonne)
	EL FPM <sup>1</sup>	2 896	378
	FPM <sup>2</sup>	2 896	378
	Retailer	2 958	293
	Hawker	5 330	2 665
Consumer	2 518	0	

# RESULTS – DISTRIBUTION OF VALUE (CONT...)

Marketing channel	Cabbage
	Total value added (R/tonne)
EL FPM <sup>1</sup>	1 380
FPM <sup>2</sup>	1 460
Retailer	1 819
Hawker	4 252
Consumer	1 441

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# RESULTS – VALUE OF WATER

Water req: 5370m<sup>3</sup>/ha  
Ave yeild:7t/ha

- Water is only used at farm level
  - To produce one ton of cabbages requires 765 m<sup>3</sup> fresh water
    - 763 m<sup>3</sup> irrigation water
    - 2 m<sup>3</sup> water to dilute chemicals

Marketing channel	Farm gate	End consumer
	Gross margin per cubic meter of water (R/m <sup>3</sup> )	Cumulative value added per cubic meter of water used along whole value chain (R/m <sup>3</sup> )
EL FPM <sup>1</sup>	1.31	1.80
FPM <sup>2</sup>	1.42	1.91
Retailer	2.00	2.38
Hawker	2.08	5.56
Consumer	1.89	1.89

# CONCLUSIONS AND RECOMMENDATIONS

- Objective – To optimise water use along the value chain for cabbages produced by emerging irrigation farmers from ZIS
- Main conclusion
  - Advising emerging farmers wrt optimal use of fresh water is complex
    - Quality and volume of produce determines access to high value marketing channels
    - Marketing channel associated with low value of water may be optimal water use for emerging farmers
    - Farmers need support to improve quality and volumes of produce to allow them to increase the value of the water that they use

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# Thank You

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