# Sustainable smallholder dairy development

## Market quality and farming system characteristics

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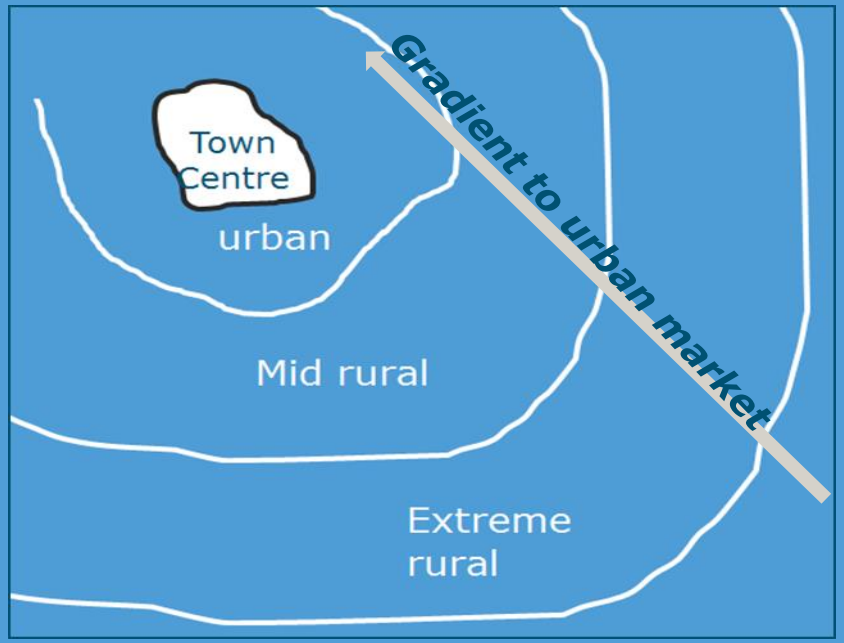
# Introduction: Smallholder dairy farming in the Kenyan Highlands

Spatially distributed farms




***Gradient***

affects → ***"market quality"***

***"Market quality"***

determines → **FS characteristics**

**Hypothesis**

# Introduction: FS characteristics

*"**market quality**""*

*The attractiveness and reliability of inputs and output channels and chains*

*(adapted from Duncan et al., 2013)*

Production resources

Production outcomes

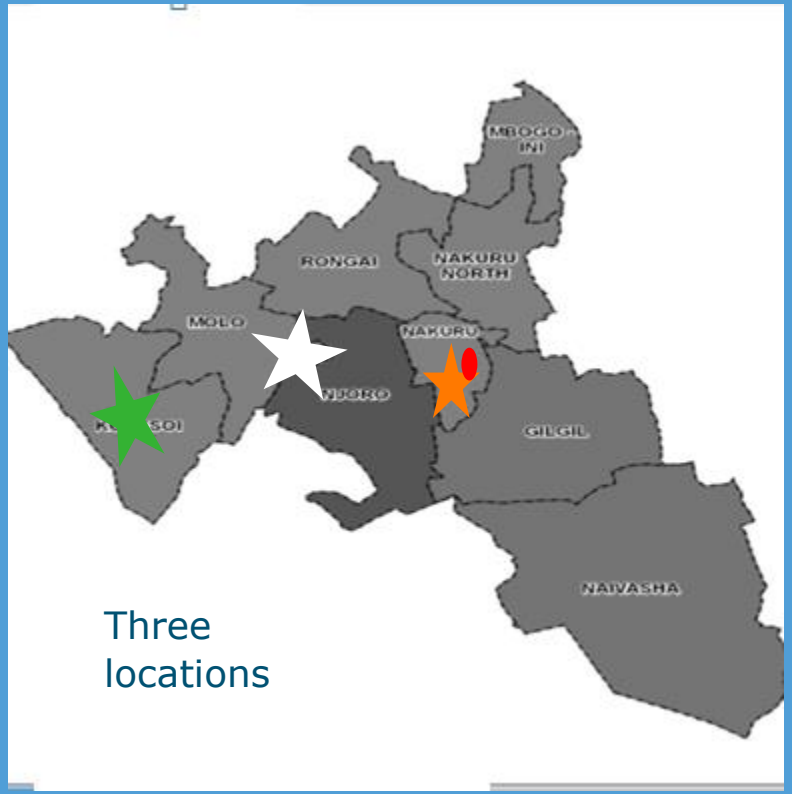
# Introduction: Objectives

- **Determine the effect of market quality on smallholder dairy farming systems**

  - Describe markets, production resources and outcomes
  - Relate production outcomes to markets and resources

# Methodology: Locations

- Urban market
- Urban (UL, n=15)
- Mid rural (MRL, n=15)
- Extreme rural (ERL, n=14)



# Methodology: Data

- In-depth interviews


- Focus group discussions


# Results – Dairy markets

## Prices of inputs and outputs

| Price | | UL | MRL | ERL |
|---|---|---|---|---|
| Input | Concentrate ($/100kg) | 33[a] | 30[a] | 24[b] |
| | Artificial Insemination ($/straw) | 11[a] | 11[a] | 13[b] |
| | Labour ($/8 hour working day) | 5[a] | 4[ab] | 4[b] |
| Output | Milk ($/100kg) | **45[a]** | 34[b] | 32[b] |

Good accessibility, **feed quality???**

# Results - Production resources

## Values of land and livestock holding

| Resources | | UL | MRL | ERL |
|---|---|---|---|---|
| Land (ha) | Total | 1.0[a] | 2.9[b] | 2.6[ab] |
| | Cultivated fodder | 0.1[a] | 0.6[b] | 0.2[a] |
| | Grazing | 0.1 | 0.5 | 0.8 |
| | Crops | 0.6 | 1.4 | 1.3 |
| Livestock (TLU) | Total | 2.4 | 4.7 | 2.7 |

# Results – Production outcomes

## Input use, herd output and herd economics

| Outcomes | | UL | MRL | ERL |
|---|---|---|---|---|
| Input use | Concentrate (kg/year) | 672 | 643 | 853 |
| Output | Milk (kg/herd/year) | 8359 | 7366 | 6246 |
| Economics | Cash Income ($/herd/year) | 3027 | 2067 | 1151 |
| | Total Cost ($/herd/year) | 1234 | 893 | 468 |
| | Gross Margin ($/herd/year) | 1793 | 1175 | 683 |

# Results-Production intensity

## Milk yield and concentrate use

| Parameters | UL | MRL | ERL |
|---|---|---|---|
| Milk yield (kg/cow/day) | 7.5 | 5.7 | 8.1 |
| Concentrate (g/kg milk) | 245 | 309 | 289 |

**High concentrate in RL but of low quality**

# Discussion - Hypothesis vs results UL

- High prices milk, labour, land, forage
- Low prices concentrate

→
- high concentrate use
- high milk production per cow

- **High milk, concentrate price**

→
- **Low concentrate use**
- **Low milk production per cow**

# Discussion: Low production intensity (UL)

- **Forage limitation**
- **High cost of forage and concentrate**
- **Low cash availability**
  - (income, credit, capital)
- **Livelihood functions of dairy**

# Conclusion

- Proximity to urban market alone did not result to increased yields

- Forage limitation was a major barrier to sustainable dairy development in UL






# Thank you

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