



# Input Value Chains Among the Horticultural Producers of Maputo

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## MSU-IFPRI Workshop

Transformation of Agri-food Systems and Commercialization of Smallholder  
Agriculture in Mozambique: Evidence, Challenges and Implications

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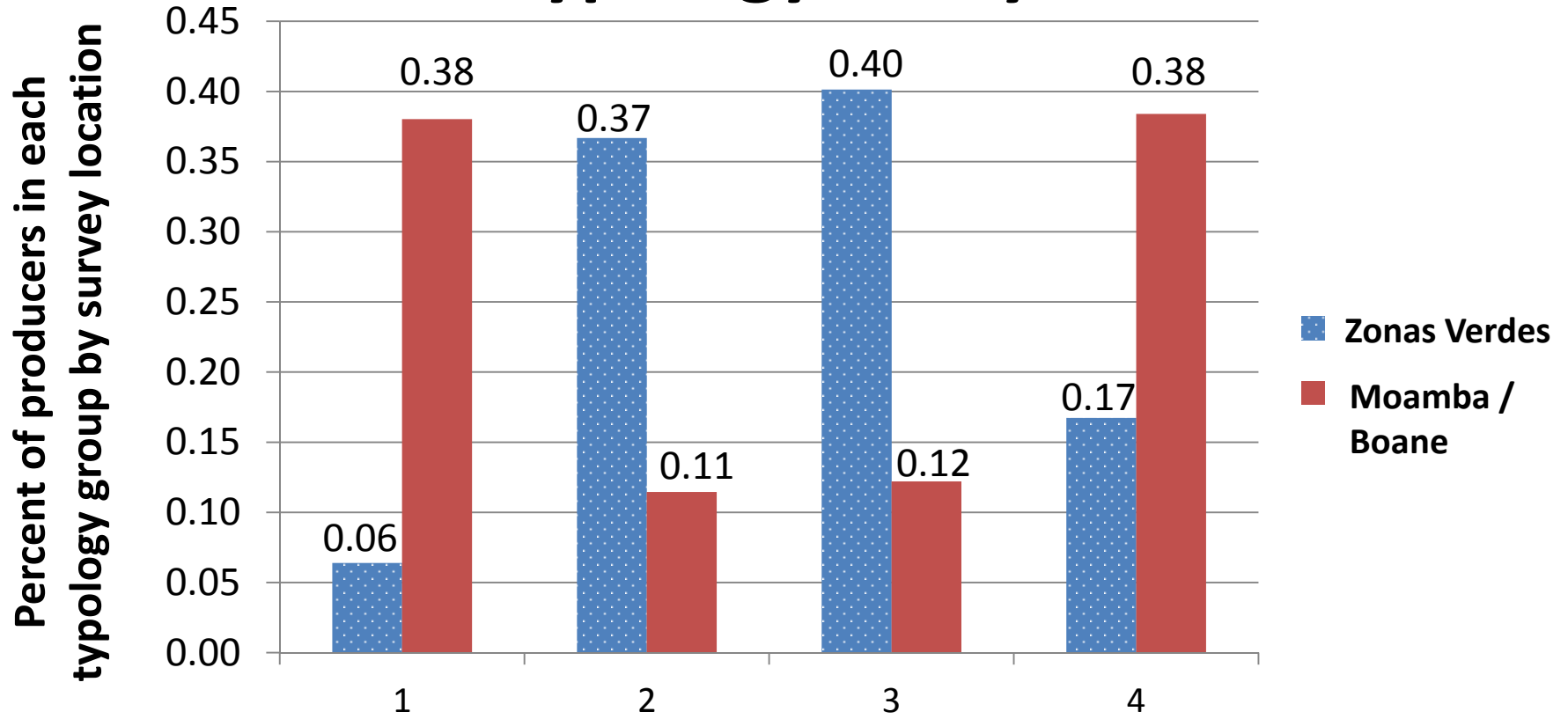
# Outline

Discuss results of Trilateral Baseline Survey in terms of:

1. A typology of the interviewed horticultural producers
2. Pesticide, Fertilizer and Seed Value Chains
  - Frequency
  - Value
  - Formality
  - Location
3. Irrigation technologies used



# 1. Typology Analysis



1  
 Low land endowment, access to extension or training advice, and horticultural crop sales diversity

2  
 Moderate land endowment, access to extension or training advice, and horticultural crop sales diversity

3  
 High land endowment, high education/literacy, and moderate horticultural crop sales diversity

4  
 High land endowment, access to extension or training advice, horticultural crop sales diversity and mechanized irrigation use



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<p><b>Least area cultivated with horticulture in the cool season</b></p> <ul style="list-style-type: none"> <li>- Median of 0.04 ha in ZV</li> <li>- Median of 0.17 ha in M/B</li> </ul>	<p><b>Moderate area cultivated with horticulture in cool season</b></p> <ul style="list-style-type: none"> <li>- Median of 0.05 ha in the ZV</li> <li>- Median of 0.50 ha in M/B</li> </ul>	<p><b>Most area cultivated with horticulture in cool season</b></p> <ul style="list-style-type: none"> <li>- Median of 0.11 ha in ZV</li> <li>- Median of 1.00 ha in M/B</li> </ul>	<p><b>Most area cultivated with horticulture in cool season</b></p> <ul style="list-style-type: none"> <li>- Median of 0.12 ha in ZV,</li> <li>- Median of 1.00 ha in M/B</li> </ul>
<p><b>Least counsel and training received</b></p> <ul style="list-style-type: none"> <li>- 12% of households had at least one member who received horticultural extension advice in ZV, 6% in M/B.</li> <li>- 0% received a training of over 3 months in agriculture in ZV, 3% in M/B</li> </ul>	<p><b>Moderate counsel and training received</b></p> <ul style="list-style-type: none"> <li>- 29% of households had at least one member who received horticultural extension advice in ZV, 13% in M/B.</li> <li>- 8% received a training of over 3 months in agriculture in ZV, 3% in M/B</li> </ul>	<p><b>Moderate counsel and training received</b></p> <ul style="list-style-type: none"> <li>- 30% of households had at least one member who received horticultural extension advice in ZV, 32% in M/B.</li> <li>- 12% received a training of over 3 months in agriculture in ZV, 10% in M/B</li> </ul>	<p><b>Most counsel and training received</b></p> <ul style="list-style-type: none"> <li>- 58% of households had at least one member who received horticultural extension advice in ZV, 45% in M/B</li> <li>- 15% received a training of over 3 months in agriculture in ZV, 21% in M/B</li> </ul>
<p><b>Least informed concerning hort prices</b></p> <ul style="list-style-type: none"> <li>- 14% had received hort price information in the last 12 months in ZV, 13% in M/B</li> </ul>	<p><b>Moderately informed concerning hort prices</b></p> <ul style="list-style-type: none"> <li>- 18% had received hort price information in the last 12 months in ZV, 13% in M/B</li> </ul>	<p><b>Moderately informed concerning hort prices</b></p> <ul style="list-style-type: none"> <li>- 19% had received hort price information in the last 12 months in ZV, 17% in M/B</li> </ul>	<p><b>Most informed concerning hort prices</b></p> <ul style="list-style-type: none"> <li>- 46% had received hort price information in the last 12 months in ZV, 34% in M/B</li> </ul>





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<p><b>Greatest hort crop production concentration</b></p> <p>- Frequency share of all crops produced in the cluster: Rape (33%), Lettuce (31%), Pumpkin Leaves (7%) in cool season.*</p>	<p><b>Moderate hort crop production concentration</b></p> <p>- Frequency share of all crops produced in the cluster: Rape (24%), Lettuce (22%), Onion (12%), Pumpkin Leaves (11%), Beets (10%) in cool season</p>	<p><b>Moderate hort crop production concentration</b></p> <p>- Frequency share of all crops produced in the cluster: Rape (25%), Lettuce (23%), Pumpkin Leaves (10%), Beets (10%), Onion (7%), Cabbage (7%) in cool season</p>	<p><b>Least hort crop production concentration</b></p> <p>- Frequency share of all crops produced in the cluster: Rape (14%), Lettuce (14%), Tomato (11%), Beets (9%), Onion (9%), Cabbage (7%) in cool season</p>
<p><b>Least number of crops sold</b></p> <p>- Range of 0-3, mean 2 and median 2 in ZV. - Range of 0-3, mean 1 and median 0 in M/B</p>	<p><b>Moderate numbers of crops sold</b></p> <p>- Range of 0-10, mean 4 and median 4 in ZV - Range of 0-9, means and medians of 4 in M/B</p>	<p><b>Moderate numbers of crops sold</b></p> <p>- Range of 0-10, mean 4 and median 4 in ZV - Range of 0-6, means and medians of 3 in M/B</p>	<p><b>Most number of crops sold</b></p> <p>- Range of 5-10, mean 7 and median 6 in ZV - Range of 2-13, mean 6 and median 5 in M/B</p>
<p><b>Moderately likely to use pump irrigation among producers of M/B</b></p> <p>- 33% of the producers in M/B used pump irrigation, 0% in ZV</p>	<p><b>Moderately likely to use pump irrigation among producers of M/B</b></p> <p>- 12% of the producers in M/B used pump irrigation, 1% in ZV</p>	<p><b>Moderately likely to use pump irrigation among producers of M/B</b></p> <p>- 70% of the producers in M/B used pump irrigation, 0% in ZV</p>	<p><b>Most likely to use pump irrigation</b></p> <p>- 93% of the producers in M/B used pump irrigation, 7% in ZV</p>



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<p><b>Greatest dependency ratio</b></p> <p>- 50% in ZV and 53% in M/B</p>	<p><b>Moderate Dependency Ratio</b></p> <p>- 46% in ZV and 55% in M/B</p>	<p><b>Lowest Dependency Ratio</b></p> <p>- 38% in ZV and 36% in M/B</p>	<p><b>Moderate Dependency Ratio</b></p> <p>- 43% in ZV and 44% in M/B</p>
<p><b>Lowest Adult Literacy Levels</b></p> <p>- 60% literate adults in the AF within ZV, and 47% in M/B</p>	<p><b>Moderate Adult Literacy</b></p> <p>- 67% literate adults in the AF within ZV, and 60% in M/B</p>	<p><b>Highest Adult Literacy Levels</b></p> <p>- 80% literate adults in the AF within ZV, and 71% in M/B</p>	<p><b>High Adult Literacy</b></p> <p>- 71% literate adults in the AF within ZV, and 69% in M/B</p>
<p><b>Poorest pesticide management</b></p> <p>- 27% of those applying the pesticides could read the label in ZV, 12% in M/B</p> <p>-29% of those applying the pesticides used protective clothing other than boots in ZV, 12% in M/B *</p> <p>- 49% applied at the right time of the day in ZV, only 15% in M/B</p>	<p><b>Average pesticide management</b></p> <p>- 44% of those applying the pesticides could read the label in ZV, 51% in M/B</p> <p>-49% of those applying the pesticides used protective clothing other than boots in ZV, 38% in M/B</p> <p>- 57% applied at the right time of the day in ZV, 51% in M/B</p>	<p><b>Outstanding pesticide management</b></p> <p>- 78% of those applying the pesticides could read the label in ZV, 81% in M/B</p> <p>-62% of those applying the pesticides used protective clothing other than boots in ZV, 67% in M/B</p> <p>- 62% applied at the right time of the day in ZV, 38% in M/B</p>	<p><b>Average to High pesticide management</b></p> <p>- 49% of those applying the pesticides could read the label in ZV, 69% in M/B</p> <p>-45% of those applying the pesticides used protective clothing other than boots in ZV, 49% in M/B</p> <p>- 67% applied at the right time of the day in ZV, 62% in M/B</p>
<p><b>Least likely to purchase, and spend the least on inputs</b></p>	<p><b>Moderately likely to purchase, and spend moderate amounts on inputs</b></p>	<p><b>Most likely to purchase, and spend the most on inputs, generally</b></p>	<p><b>Moderately likely to purchase, and spend moderate amounts on inputs</b></p>



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## 2. Input Channel Participation & Value by Cluster

	Percent of Farmers Purchasing Inputs					
	Seed		Pesticides		Fertilizer	
	ZV	M/B	ZV	M/B	ZV	M/B
Cluster 1	91%	73%	88%	29%	89%	36%
Cluster 2	100%	90%	90%	45%	94%	41%
Cluster 3	99%	100%	100%	100%	99%	94%
Cluster 4	100%	100%	96%	95%	91%	92%

	Median Input Purchase Value Spent (MTN)					
	Seed		Pesticide		Fertilizer	
	ZV	M/B	ZV	M/B	ZV	M/B
Cluster 1	670	225	500	0	270	0
Cluster 2	1,060	550	540	0	400	0
Cluster 3	7,670	11,100	2,860	4,050	1,410	105
Cluster 4	9,485	8,800	1,351	3,500	330	90

Producers in cluster 3 were those more likely to purchase inputs even than those in cluster 4.





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The amounts they spent on each category of input were also highest in this cluster, especially compared to the median values of 0 in purchases of fertilizer or pesticide in Moamba/Boane



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Seed is the most common and the most expensive input purchased in both the *zonas verdes* and Moamba/Boane.



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However, despite seed being their greatest cost, farmers generally show low knowledge concerning what varieties of seed they use.



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Second to seed, the costs of pesticides are consistently greater than the costs of fertilizer.



# Input Channel Formality by Cultivated Area

Quintiles of Area Cultivated with Horticultural Crops in the Cool Season	Mean ha cultivated in horticulture, cool season		Index of Input Purchase Source Formality					
			Horticulture Seed		Fertilizer for Hort Crops		Pesticide for Hort Crops	
	ZV	M/B	ZV	M/B	ZV	M/B	ZV	M/B
Least Area - 1	0.01	0.01	0.16	0.47	0.55	0.91	0.40	0.90
2	0.04	0.17	0.23	0.46	0.53	0.90	0.45	0.89
3	0.07	0.61	0.30	0.42	0.57	0.85	0.41	1.00
4	0.12	1.36	0.31	0.37	0.55	0.95	0.56	1.00
Greatest Area - 5	0.75	4.79	0.64	0.78	0.68	0.91	0.67	0.92





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- As area increases, the preference for formal vendors generally rises, in all three input categories.



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Greatest Area - 5	0.75	4.79	0.64	0.78	0.68	0.91	0.67	0.92

- As area increases, the preference for formal vendors generally rises, in all three input categories.
- Compared to fertilizer or pesticides, seed tends to consistently be purchased from less formal vendors.



# Pesticide Purchases

	Pesticide Value used on Horticultural Crops (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market	% AFs	Among buyers		Market	% AFs	Among buyers	
Outlet Type	Share	Buying	Median	Mean	Share	Buying	Median	Mean
Private store	41.3%	33.5%	788	2,419	79.5%	39.9%	975	5,577
Casa agrária	8.0%	10.2%	613	1,805	10.9%	14.4%	900	2,679
Informal comerciante ambulante	48.8%	47.7%	450	2,458	3.2%	6.8%	500	1,951
Formal comerciante ambulante	0.2%	1.2%	370	335	5.9%	2.3%	700	11,488
Other Family	1.6%	4.3%	330	900	0.3%	1.1%	600	803

- 63% of producers in Moamba/Boane purchase pesticides compared to 93% of those in the *zonas verdes*
- A little over a third of producers in both of these zones purchase at least one of their pesticides from a store.



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- Private stores have a market share of 80% of sales in Moamba and Boane and a 41% share in the *zonas verdes*.
- Correspondingly, the greatest annual median values for pesticides are also spent in stores.



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- After stores, 10-14% of producers across the survey purchased at least one pesticide from a *casa agrária*.
- The market share of these purchases is much lower, however, ranging from 8% to 11% between the two zones.





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- Nearly half of producers in the *zonas verdes* purchase at least one pesticide from an informal *comerciante ambulante*
- These sellers also compose the largest pesticide purchase channel for this area, with a 47.7% share.
- The annual median amount spent for the pesticides in this channel, in contrast, is less than either in the stores or *casas agrárias*



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Other Family	1.6%	4.3%	330	900	0.3%	1.1%	600	803

- Regardless of what channel the pesticide is bought from, producers in Moamba and Boane consistently spend more on pesticides than producers in the *zonas verdes*.



# Fertilizer Purchases

	Inorganic Fertilizer Value used on Horticultural Crops (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market	% AFs	Among buyers		Market	% AFs	Among buyers	
Outlet type	Share	Buying	Median	Mean	Share	Buying	Median	Mean
Private store	5.9%	15.3%	45	268	77.9%	34.4%	48	360
Casa agrária	1.2%	7.9%	45	95	3.1%	10.8%	15	49
Informal comerciante ambulante	89.8%	51.8%	270	1173	11.0%	11.0%	30	179
Formal comerciante ambulante	0.9%	2.0%	60	171	0.5%	2.9%	15	32
Other Family	0.5%	2.0%	473	518	3.5%	2.5%	15	343

	Organic Fertilizer Value used on Horticultural Crops (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market	% AFs	Among buyers		Market	% AFs	Among buyers	
Outlet type	Share	Buying	Median	Mean	Share	Buying	Median	Mean
Private store	0.3%	1.7%	45	124	4.1%	1.7%	197	165
Aviary	61.0%	52.6%	300	855	91.5%	4.0%	53	1615
Casa agrária	0.7%	1.5%	300	373	0.9%	0.7%	1	90
Informal comerciante ambulante	21.0%	21.7%	270	616	0.4%	0.8%	90	49
Formal comerciante ambulante	1.0%	1.2%	75	617	0.0%	0.3%	1	1
Other Family	16.0%	8.2%	180	1292	2.9%	1.4%	39	148



# Inorganic Fertilizer Purchases

Outlet type	Inorganic Fertilizer Value used on Horticultural Crops (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market Share	% AFs Buying	Among buyers Median	Mean	Market Share	% AFs Buying	Among buyers Median	Mean
Private store	5.9%	15.3%	45	268	77.9%	34.4%	48	360
Casa agrária	1.2%	7.9%	45	95	3.1%	10.8%	15	49
Informal comerciante ambulante	89.8%	51.8%	270	1173	11.0%	11.0%	30	179
Formal comerciante ambulante	0.9%	2.0%	60	171	0.5%	2.9%	15	32
Other Family	0.5%	2.0%	473	518	3.5%	2.5%	15	343

- Informal *comerciantes ambulantes* compose 90% of the market share of inorganic fertilizer purchases in the *zonas verdes*.
- 52% of producers in this area purchase at least one inorganic fertilizer within this channel and the greatest median values spent by producers on fertilizer in this area were, correspondingly, those made in the field
- Following *comerciantes ambulantes* in popularity are purchases made at stores where the median value spent is much lower



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- Producers in Moamba and Boane generally spend less money on inorganic fertilizers compared to producers in the *zonas verdes*, with the exception of purchases made in stores.

- 34% of producers in Moamba or Boane purchased from a store, and only 11% purchased from *comerciantes ambulantes* or a *casa agrária*, with shares of 78%, 12% and 3% respectively.



# Organic Fertilizer Purchases

- Organic fertilizer purchases are very common in *zonas verdes* but not at all common in Moamba and Boane.

Outlet type	Organic Fertilizer Value used on Horticultural Crops (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market Share	% AFs Buying	Among buyers Median	Mean	Market Share	% AFs Buying	Among buyers Median	Mean
Private store	0.3%	1.7%	45	124	4.1%	1.7%	197	165
Aviary	61.0%	52.6%	300	855	91.5%	4.0%	53	1615
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# Organic Fertilizer Purchases

- Organic fertilizer purchases are very common in *zonas verdes* but not at all common in Moamba and Boane
- The greatest value of organic fertilizers purchased were through aviaries.
- *Comerciantes ambulantes* also figure prominently in this market within the *zonas verdes*

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Other Family	16.0%	8.2%	180	1292	2.9%	1.4%	39	148



# Seed Purchases

	Seed Value (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market	% AFs	Among buyers		Market	% AFs	Among buyers	
Outlet type	Share	buying	Median	Mean	Share	buying	Median	Mean
Private store	16.5%	24%	875	4,889	15.3%	51%	600	7,721
Casa agrária	46.8%	16%	400	23,191	47.2%	23%	600	59,198
Informal comerciante ambulante	28.5%	65%	350	3,095	36.7%	24%	200	61,932
Formal comerciante ambulante	0.4%	6%	200	725	0.3%	8%	250	1,411
Other Family	6.6%	32%	225	1,591	0.3%	14%	150	998
Market	0.1%	4%	100	545	0.0%	2%	100	172
Association	0.2%	2%	900	1,265	0.0%	0.5%	620	635
Agriculturalists	0.0%	0%	.	.	0.0%	1%	158	211
Feira	0.0%	0%	.	.	0.0%	2%	150	354
Other District	0.9%	0.3%	28,812	24,108	0.0%	0.4%	800	800
Other Channel	0.0%	0.6%	50	625	0.1%	0.0%	3,600	4,271

Ranked by median seed expenditures, the crops for which producers spend the most money on seed, in order, are potato, green beans, lettuce, cabbage, and cucumber.



# Seed Purchases

	Seed Value (MZN)							
	Zonas Verdes				Moamba/Boane			
	Market Share	% AFs buying	Among buyers		Market Share	% AFs buying	Among buyers	
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The greatest market shares of seed purchases in both zones were *casas agrárias*, followed by *informal comerciantes ambulantes*, then private stores.





# Seed Purchases

	Seed Value (MZN)							
	Zonas Verdes				Moamba/Boane			
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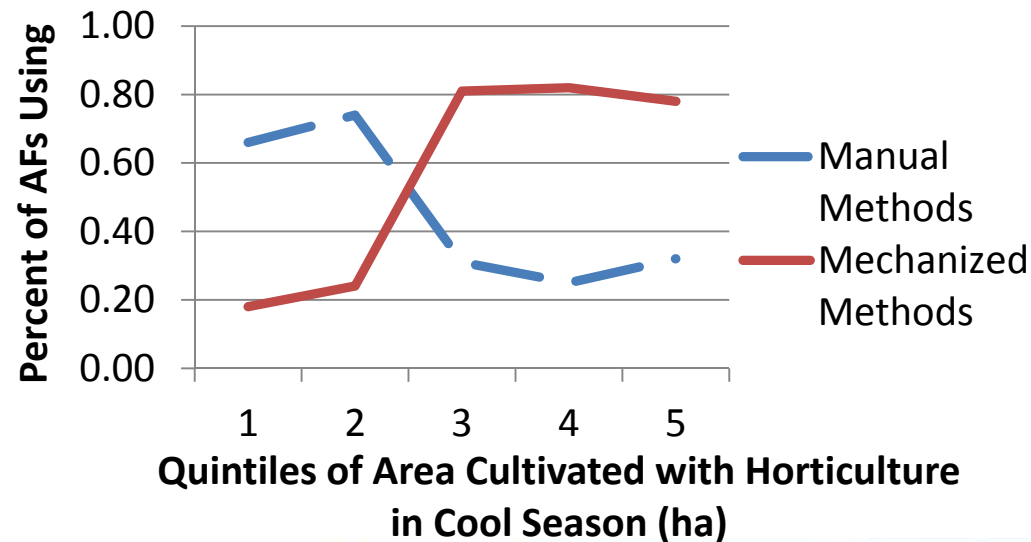
In both areas, the median value of sales spent on seed were lower for purchases made from *comerciantes ambulantes* than those made in the stores or *casas agrárias*.



### 3. Irrigation Methods

- 98% of producers in the *zonas verdes* of Maputo water their crops by hand with a sprinkling can. Pump irrigation is used by **less than 1%** of these producers.

- 58% of producers in Moamba/Boane water their crops with pump irrigation. Irrigation with sprinkling cans has in inverse negative relationship to irrigation using pump systems across increasing quintiles of land area cultivated with horticulture:



# Irrigation Methods Continued

- Of the 58% of farmers in Moamba and Boane using pump-irrigation, 89% of these use irrigation by gravity.
- Only producers in Moamba and Boane's top quintile of cultivated land area used irrigation systems employing sprinkler (2%) or drip (4%) irrigation methods.



# Conclusions

- Level of technological capacity does not correspond with specific geographic regions of our study: the dispersed producers of Moamba and Boane most commonly appear among the least technified farmers, as well as represent a large share of the most technified producers, while producers in the *zonas verdes* are generally more uniformly moderate in comparison.
- Among producers of the *zonas verdes* of Maputo, the most common source for purchases of seed, pesticide and inorganic fertilizer are informal *comerciantes ambulantes*,
- Seeds are farmers' largest input cost (compared to pesticides and fertilizer) but farmers generally have low levels of knowledge about the varieties of seeds they use or the benefits of these varieties compared to others



# Conclusions Continued

- Farmers with more land under cultivation and more technological capacity generally use more inputs and are more likely to purchase these inputs in a formal channel rather than an informal channel.
- Among users of water pumps in Moamba and Boane (58%), spray or drip irrigation is used by less than 6% of households, whereas irrigation with water pumps is nearly non-existent in the *zonas verdes* (0.7%).
- This leads to large labor demands in both of these areas for regular manual irrigation or trench-digging (in the case of gravity-fed irrigation methods).





**Thank You!**

