

# **WILLINGNESS TO PAY FOR POSTHARVEST TECHNOLOGIES AMONG SMALLHOLDER MANGO FARMERS IN KENYA**

Esther Mujuka<sup>1\*</sup>, John Mburu<sup>1</sup>, Ackello Ogutu<sup>1</sup> and Jane Ambuko<sup>2</sup>

<sup>1</sup>University of Nairobi, Department of Agricultural Economics, Kenya, <sup>2</sup>University of Nairobi, Department of Plant Science and Crop Protection, Kenya \*Presenting author; esthermujuka@gmail.com Tropentag 2020, September 9-11, 2020



**University of Nairobi** 

# Introduction

- It is estimated that 30% of food produced for human consumption is lost in the supply chain (HLPE, 2014). The losses are higher (40-50%) in perishables such as mango.
- Reducing food loss and waste (FLW) is an important target and a means to achieve the Sustainable Development Goals (FAO, 2019).
- Lack of on-farm cold storage and processing facilities is reported as one of the key drivers of FLW in horticultural value chain (HLPE, 2014).
- Innovative cold storage and small-scale processing technologies exist, and their effectiveness has been demonstrated (Ambuko et al.

# **Results and discussion**

- Results from Figure 2 show that PH technologies are acceptable.
- Most respondents in both Counties were willing to pay for charcoal coolers that are more affordable.



# Mean WTP and Market Price

### 2018)

- However, adoption of these technologies among smallholder farmers is limited due to lack of awareness, access and the cost
- This study therefore sought to establish the willingness to pay (WTP) for selected lowcost storage and small scale processing technologies



Fig 1: Wastage in the mango supply chain

Tunnel solar dryer

# **Materials and Methods**

- Study area: Embu & Machakos Counties.
- Postharvest (PH) technologies installed: Zero energy brick coolers, evaporative charcoal coolers and tunnel solar dryer.
- Household survey: 320 smallholder mango farmers.

### Fig 2: WTP for PH technologies

### Fig 3: Mean WTP for PH technologies

- Figure 3 reveals that mean WTP amount is lower than market prices.
- Producers' WTP has been demonstrated to be significantly lower than market prices (Channa, 2019).
- This is often the case when there is lack of prior awareness of the proposed technologies.
- The farmers' probability to pay for the PH technologies was positively influenced by marital status, initial bid, agricultural group membership, market access and income from mangoes (Table 1).

### Table 1: Factors influencing farmers' WTP for postharvest technologies

Variables	Probability of WTP	WTP Amount
Experience		-
Gender	+ -	
Marital Status	+	
Initial bid	+	+
Credit Access		_
AGM	+	+
Market access	+	-
Tenure		-
Age		_
Mango income	+	+



Zero energy brick cooler

**Evaporative Charcoal cooler** 

# Data Collected on;

- Awareness on PH technologies.
- WTP amount for PH technologies.
- Socio economic, demographic and institutional factors.

### Data analysis

- Descriptive methods.
- Double Hurdle Model.
- 1st Hurdle: Probability of WTP for zero energy brick coolers, evaporative charcoal coolers and tunnel solar dryer (Probit Model).
- 2nd Hurdle: WTP amount for zero energy brick coolers, evaporative charcoal coolers and tunnel solar dryer (Truncated regression model).

- Gender influenced probability to pay for PH technologies negatively and positively in Embu and Machakos, respectively.
- The WTP amount for PH technologies was positively influenced by the initial bid, agricultural group membership and income from mangoes.
- Experience, credit access, market access, land tenure and age significantly influenced WTP amount negatively.

# **Conclusions & policy implications**

- Awareness campaigns are necessary to raise awareness on postharvest technologies.
- Charcoal coolers that are cheaper than the more efficient zero energy brick coolers and solar driers were found acceptable
- The WTP amount for all the PH technologies suggested that most of the farmers would prefer the technologies at lower than the current market prices.
- Short term price subsidies and/or tax exemption on fabrication materials are recommended.
- Credit access negatively influenced WTP amount and there is need to invest in measures that would make credit work for value addition in horticulture.
- Informal land tenure systems discouraged WTP for PH technologies. The government needs to strengthen land tenure security to avert uncertainty.

# Acknowledgments

The research was supported by the Rockefeller Foundation, YieldWise Initiative, Grant number: 2016 YWS 328, to the University of Nairobi's Postharvest Project.

# Reference

Channa, H., Chen, A. Z., Pina, P., Gilbert, J. R., Stein, D. 2019. What drives smallholder farmers' WTP for a new farm technology? Evidence from an experimental auction in Kenya. Food Policy 85, 64-71. https://doi.org/10.1016/j.foodpol.2019.03.005

FAO. 2019. The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. Rome. Licence: CC BY-NC-SA 3.0 IGO

HLPE, 2014. Food losses and waste in the context of sustainable food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2014.

Ambuko Jane, Florence Wanjiru, Esther Karithi, Margaret Hutchinson, George Chemining'wa, Eliakim Mwachoni Britta Hansen, Lusike Wasilwa, Willis Owino and Ngoni Nenguwo (2018). Cold chain management in horticultural crops value chains: options for smallholder farmers in Africa. Acta Horticulturae 1225: 85-91

Mean WTP Embu
Mean WTP Machakos
Market Price