Tropentag 2018
"Global food security and food safety: The role of universities"
September 17 – 19, in Ghent, Belgium

KU LEUVEN

Adoption of improved quinoa varieties among smallholder farmers in the Peruvian Andes

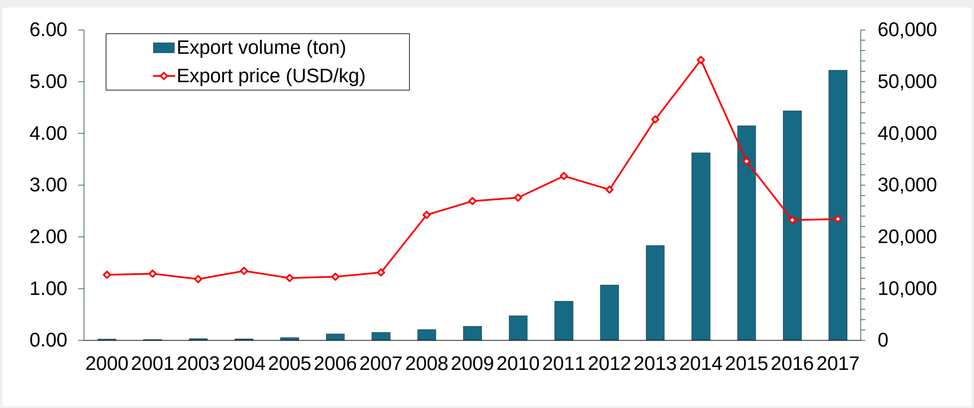
Cindybell Gamboa[1], Goedele Van den Broeck, and Miet Maertens

Division of Bioeconomics, Department of Earth and Environmental Sciences, KU Leuven, Belgium.

1 Introduction

Quinoa

- Grain crop from the Andean region
- Superfood: Nutritional quality (protein)



Opportunities

↑ Income

↑ Food security

Challenges

↓ Productivity (**Mildew**)

Objective

- To provide ex-ante insights on quinoa farmers' preferences and willingness to pay for improved quinoa varieties in the Junin region in Peru.

2 Data and methods

Research area

- Junin region
- Traditional quinoa producers
- One of the five sub-centers of genetic diversity

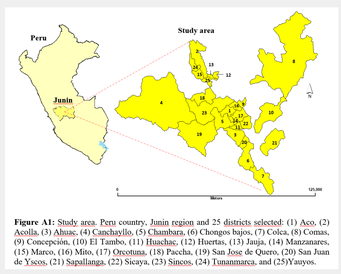


Figure A1: Study area. Peru country, Junin region and 25 districts selected: (1) Aco, (2) Acolla, (3) Ahuac, (4) Canchayllo, (5) Chambara, (6) Chongos bajos, (7) Colca, (8) Comas, (9) Concepción, (10) El Tambo, (11) Huachac, (12) Huertas, (13) Janja, (14) Manzanares, (15) Marco, (16) Mito, (17) Orcotuna, (18) Paccha, (19) San Jose de Quero, (20) San Juan de Yscos, (21) Sapallanga, (22) Sicaya, (23) Sincos, (24) Tunanmarca, and (25)Yauyos.

Data collection

Data were collected in two phases

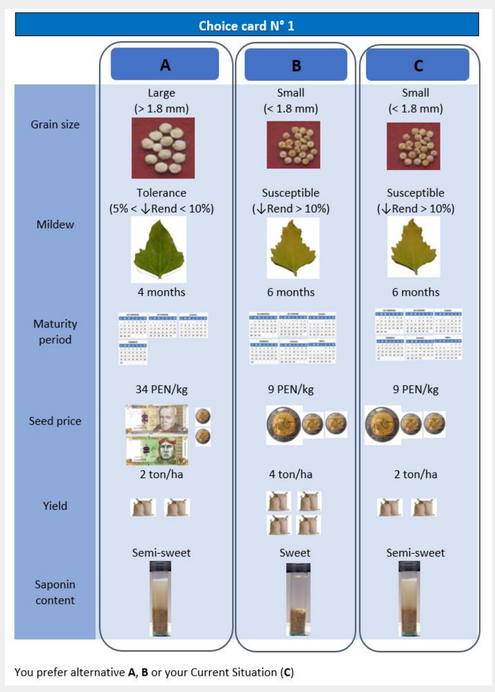
- Baseline survey data: March 2015
- Choice experiment: Nov-Dec 2016

A three-stage sampling design

Choice experiment

Attributes and their attributes levels

- Focus group discussions and interviews



Choice cards

- Unlabeled choice experiment
- Two hypothetical seed varieties options
- One opt-out option
- D-efficient design
- 12 choice cards per respondent

Econometric model

Generalized multinomial logit model (GMNL)

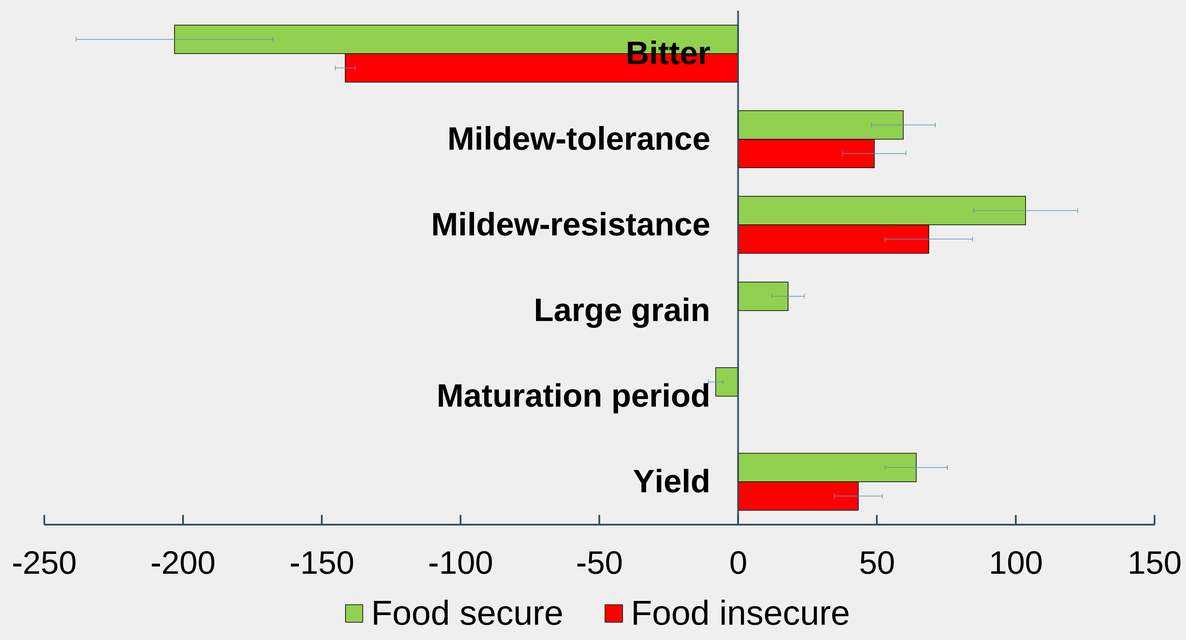
- To control for preference and scale heterogeneity

3 Result and discussion

Household and farm characteristics by food security status

Description	Food insecure farmers 30% (n=138) Mean	SD	Food secure farmers 70% (n=320) Mean	SD	
Household head characteristics					
Age (year)	49.71	12.79	50.72	13.45	
Education level (Technical and university)	14		25		***
Female head (dummy)	11		14		
Household characteristics					
Household size (Adults and children)	4.03	1.50	3.62	1.51	***
Farmer organization member (dummy)	0.12		0.22		**
Net income per adult equivalent (PEN)	4,042	7,048	12,690	25,079	***
Poor household MPI (dummy)	0.15		0.03		***
An off-farm employment (dummy)	0.05	0.00	0.13	0.00	***
Farm characteristics					
Farm size (ha)	2.56	2.57	5.56	6.84	***
Quinoa area (ha)	1.02	1.19	2.20	3.30	***
Quinoa price (PEN/kg)	6.49	2.45	7.02	2.07	***
Quinoa yield (kg/ha)	2,126	1,016	2,022	975	
Quinoa production (kg)	2,149	3,178	5,064	9,063	***
Self-consumption (%)	11		6		***
Sell (%)	75		76		
Training on quinoa production (dummy)	0.18		0.29		***

Willingness to pay estimates (PEN/kg)



4 Conclusions

Farmers generally prefer improved varieties over traditional varieties

- Mildew-resistance as most important crop trait

Preference explained by food security

- Food insecure farmers: Small plots for self-consumption
  → Mildew-resistance, yield, low saponin content
- Food secure farmers: Large farmers
  → Mildew-resistance, yield, large grain, early maturity, low saponin content

Importance: developing improved varieties for local food supply chain.

The authors are grateful to VLIR-UOS for their financial support.

[1] Corresponding author: cindybell.gamboa@kuleuven.be (C.Gamboa)