Insights from the Ecuadorian highlands

What can we learn by implementing farmers' research networks to investigate on-farm management practices?

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Introduction

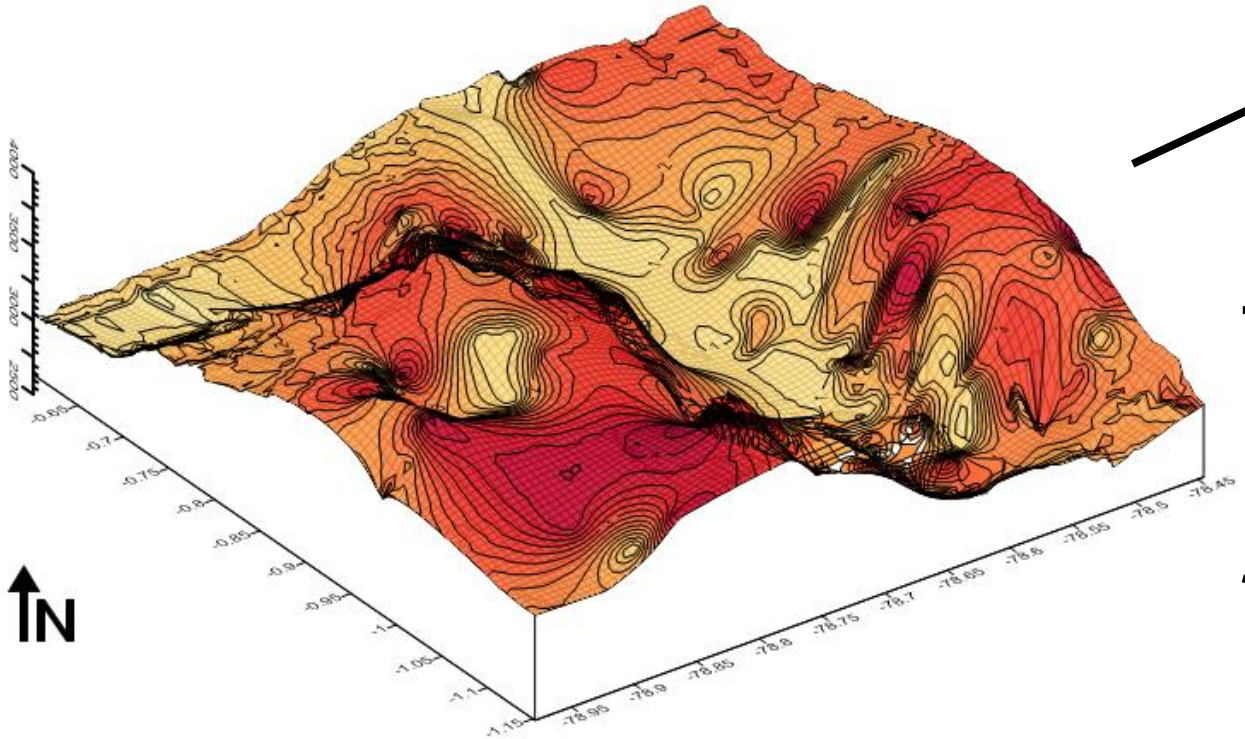
- Aim of the PhD project: Understand how biophysical and social factors of the potato seed systems affect potato seed degeneration in the tropical highlands

Characterized the potato seed systems

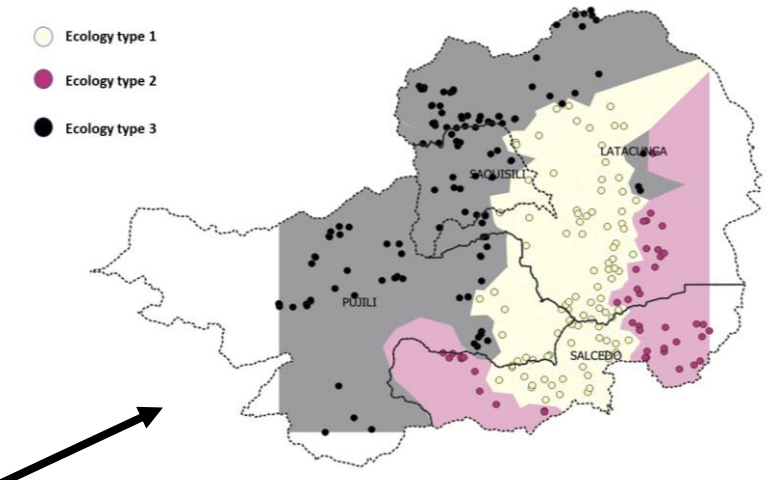
Mapped seed-borne pests and diseases in farmers' seed lots

Identified seed on-farm management practices

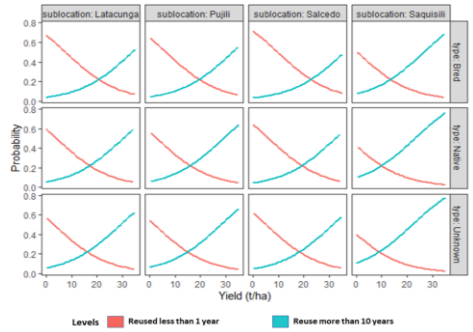
Introduction



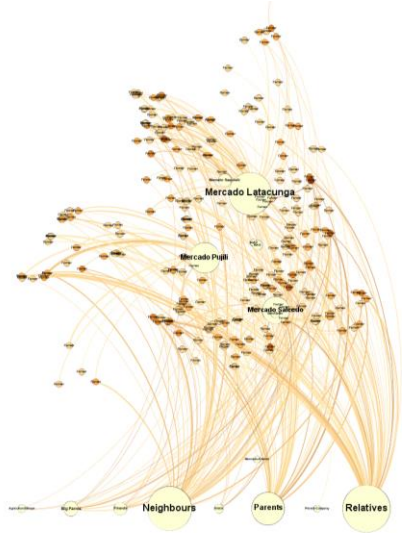
Biodiversity



Weather



Seed Management

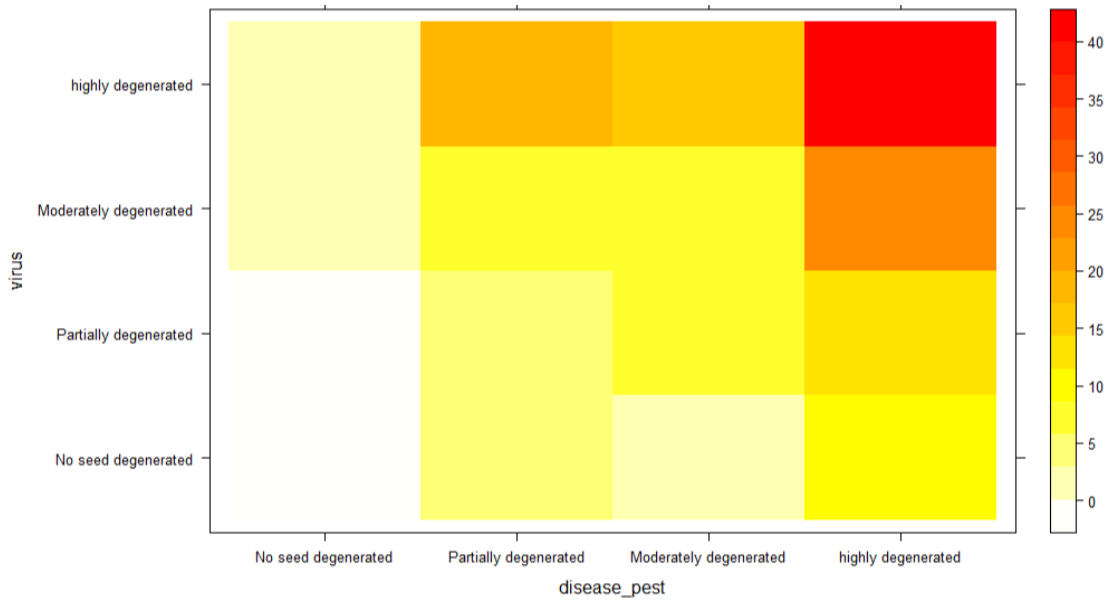


Seed exchange networks

Introduction

	Incidence (percentage of seed lots damaged / infected)	Median percentage of infected/infested tubers within a seed lot
Seed-borne pests		
Potato tuber moth complex	89.5	63.0
Seed-borne pathogens (Fungi)		
Black scurf	72.0	40.0
Seed-borne pathogens (Virus)		
PVX	57.6	33.3
PVS	45.6	33.3
PVS*PVX	32.7	28.6
PVY	11.1	23.6

So, there is room to improve farmers´ seed quality?



New potato pests: Potato purple top

Introduction

Positive selection is poorly performed
Seed selection takes place at harvest

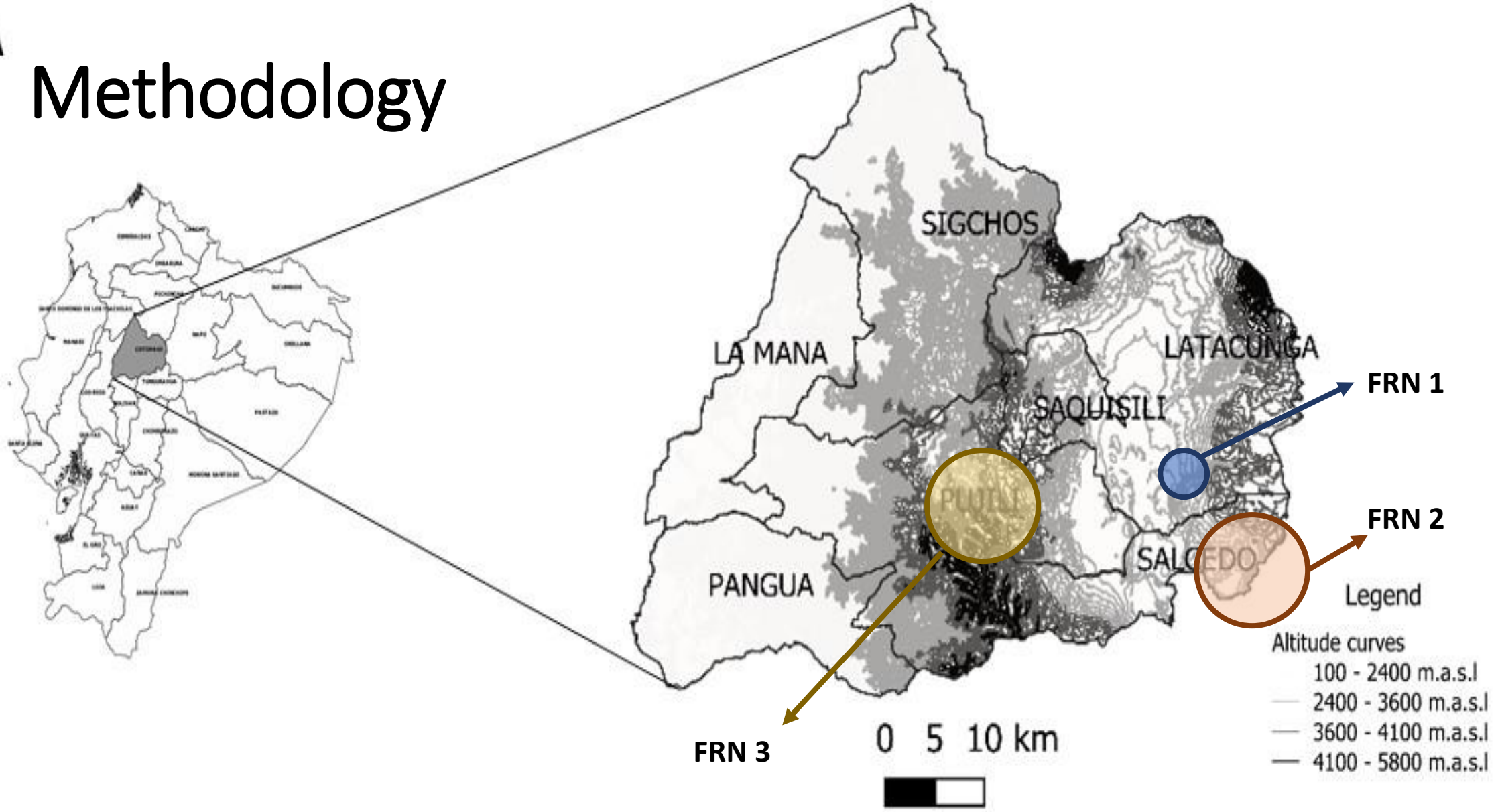
Storage methods				
Bags	93.2	80.6	87.5	89.5
Others	6.8	19.4	12.5	10.5
Storage places				
Holes with straw (Yatas)	2.5	7.5	0	0
Diffuse light storage	8.5	4.5	10.7	5.3
Dark places	78.0	80.6	55.4	94.7
Leave it on the ground	1.7	1.5	5.4	0
Other	9.3	10.4	26.8	10.5
Sprouting methods				
Wait	96.6	100	92.9	94.7
Keep the tubers in a warm place in the house	0	0	5.4	0

Research questions

- Are FRNs a good option to identify on-farm seed management practices?
- What are the lessons we can draw from our experiences in the Andes?

A

Methodology



Lessons were obtained adapting the innovation journey

Methodology – FRN1

Methodology – FRN2

Methodology – FRN3

Methodology

Farmer group	FRN 1	FRN 2	FRN 3
Local seed system type	1	2	3
Location	Latacunga	Salcedo	Pujilí
Number of people	5	25[1]	20[1]
Effective meetings	5	2	5
Research question	What is the effect of "cementina"[2] and garlic extract on the presence of tuber moth in storage?	What are the potato varieties that have a good performance locally?	What are the pest and diseases present in the potato fields planted in our community?
Treatment	Bags sprayed with cementina and garlic extract and bags without spraying (control)	Varieties provided: Super chola, Uvilla, Fripapa, Chaucha amarilla	Exploration of pests and diseases in potato fields
Response Variable	Presence or absence of potato tuber moth in bags in the storage	Yield	Presence and absence of insects and diseases in potato fields in their community
Number of replicates	1	1	1
Number of observations	One bag without cementina and garlic extract and 20 bags of 45.45kg of seed with the treatment	Information not available[2]	8 potato fields
Next steps	Design a new study comparing seed produced by the group with seed from other places	Information not available[2]	Learning agrochemical strategies to manage pests and diseases

Experiences and lessons in the research process

Research question

The identification of the research question: 1 and 3 meetings

Each group has its own research process: FRN1 by consensus and fast. In FRN 2, farmers did not feel they were heard. In FRN 3, they wanted something different

Not underestimate the time for negotiation. It includes time for listening and multiple methodologies

Manage personal expectations. It was expected that all the groups would select similar research questions, but they selected their priorities

Experiences and lessons in the research process

Identification of the study or experimental design

Problems with the replications/number of observations of the study.

For instance, FRN 1 decided to assess the effect of "cementina" (calcium hydroxide used in construction) and garlic extract on the presence of tuber moths in storage, but including just a single replicate and a single observation.

Complex study-experiment

Limited time and resources

Farmers experimentation approach is different than the "researcher" approach:

Number of replicates

Simple vs complex experiments

Utility in the farm: One problem vs multiple problems

Experiences and lessons in the research process

Discussion of results

In FRN 1, farmers were able to identify the relationship between temperature in the kitchen and presence of tuber moth.

Similarly, in FRN 3 farmers described the influence of temperature on presence of insects in their area.

Distribution of heat in the potato bags..new concept!!

Farmers some times are shy

Farmers showed their abilities of observation. However, we realized that we need to identify better approaches to strengthen farmers' abilities to participate in discussions.

Experiences and lessons in the research process

Next steps in the research

Farmers in FRNs 1 and 3 mentioned that did not want to repeat the experiments, but to move on with other type of studies or experiments. Farmers in FRN 1 replied that they wanted to compare the effect of seed they tested

A better understanding on how farmers do research is very important and should be considered in future implementations of the FRN approach.

Main stakeholders

MINISTERIO DE AGRICULTURA Y GANADERÍA

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