Conservation & Sustainable Production of Vanilla in Costa Rica

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Flower *Vanilla trigonocarpa*

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INSTITUTO DE INVESTIGACION Y SERVICIOS FORESTALES INISEFOR UNIVERSIDAD NACIONAL HEREDIA, COSTA RICA

SINAC

osa CONSERVATION

LANKESTER jardín botánico

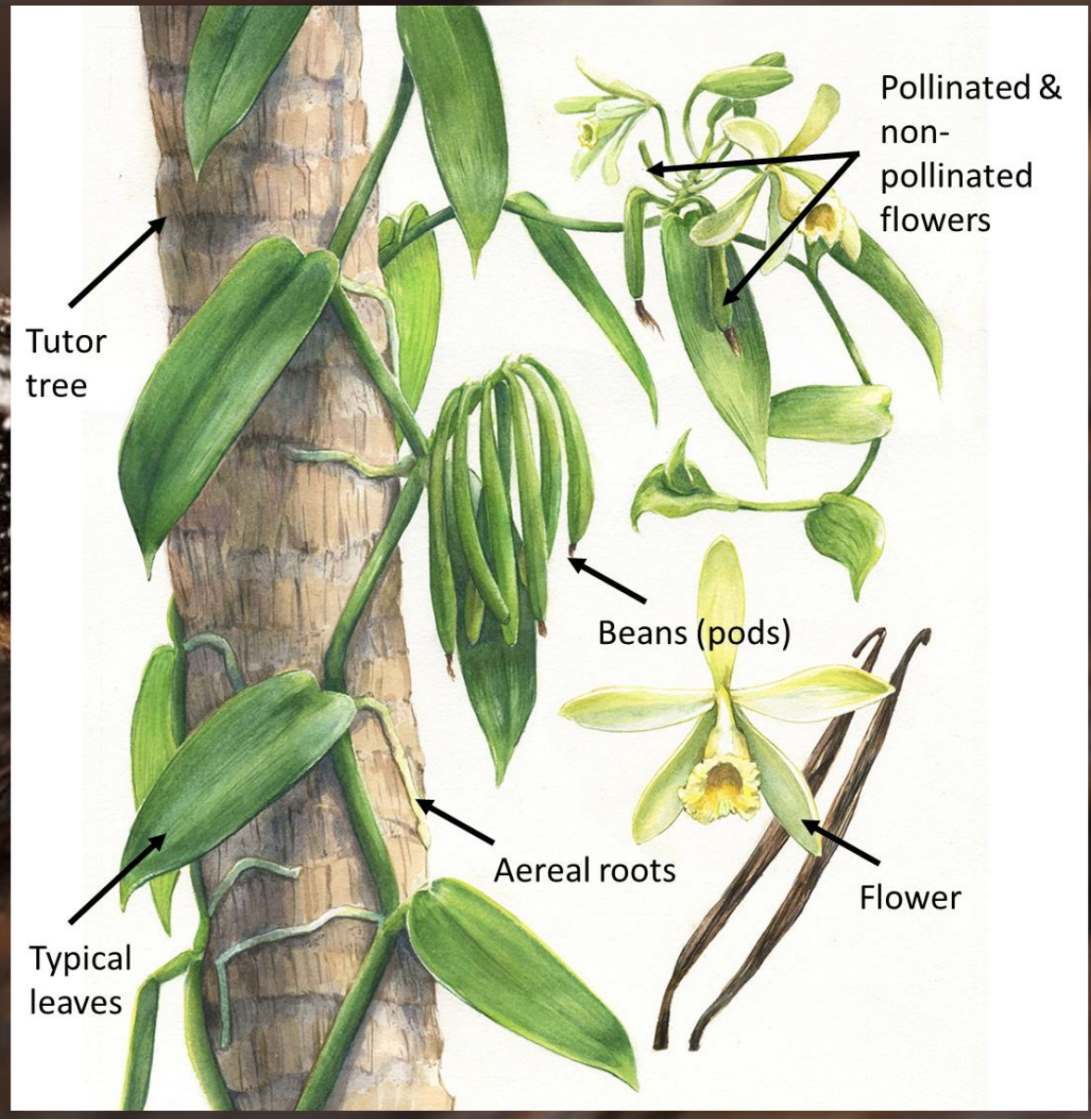
UNIVERSIDAD DE COSTA RICA

The Spice "Vanilla"

- Orchidaceae
  - Vanilloideae
    - Vanilla (genus)

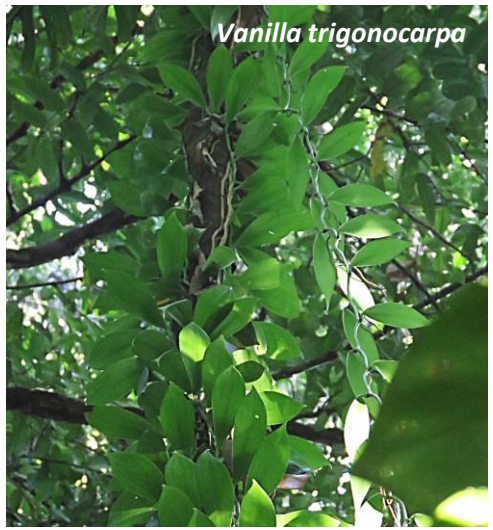
Non-aromatic species

Aromatic species (Xanata)



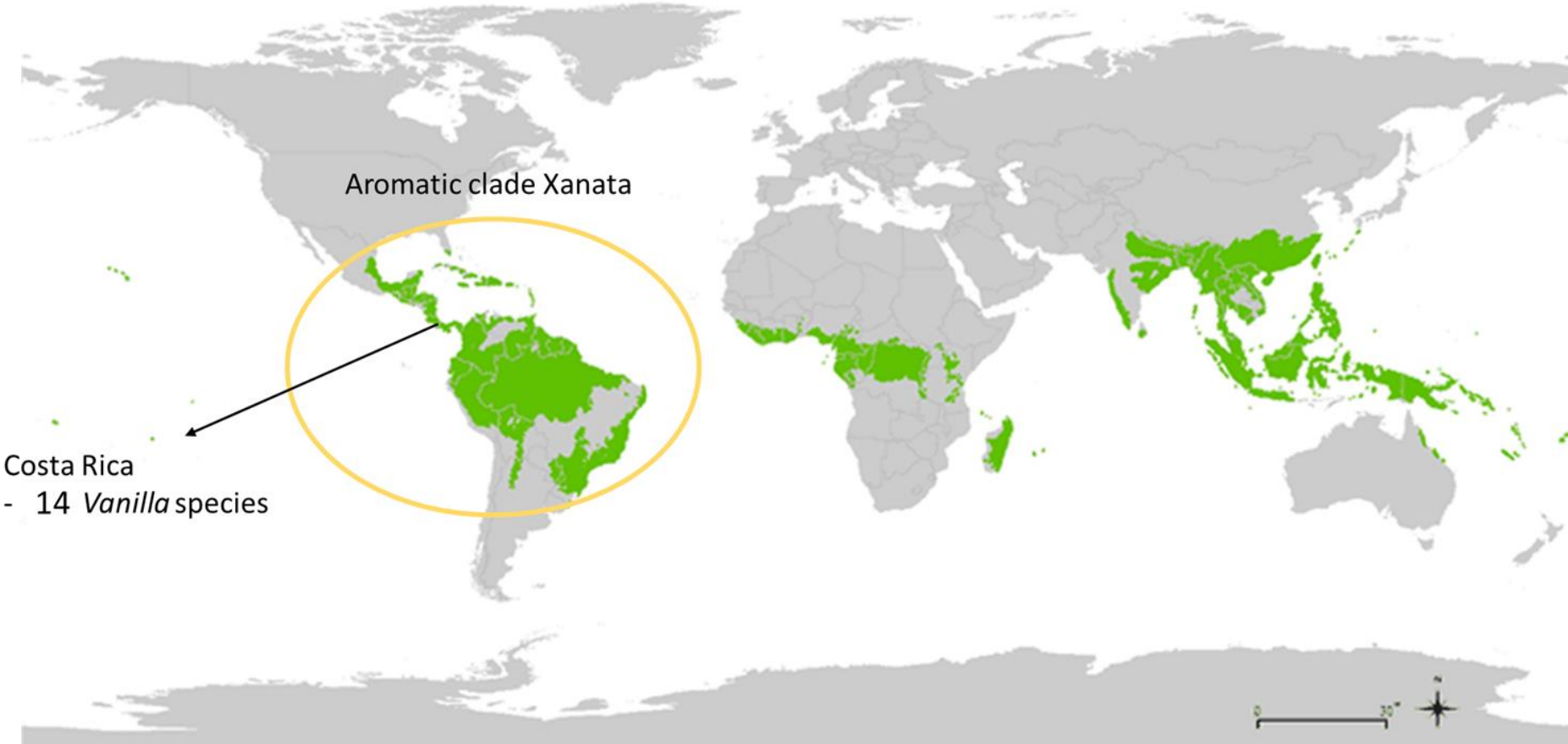
Genus *Vanilla* Plum. ex Mill.

- +/- 120 species
- Pantropic genus
- BUT aromatic species (Xanata): Neotropics
  - 33 aromatic species known so far
  - Still to be discovered



Vanilla species in Costa Rica

Vanilla costa rica	Fragrant
Vanilla dressleri	Fragrant
Vanilla hartii	Fragrant
Vanilla helleri	?
Vanilla inodora	Non-fragrant
Vanilla insignis	?
Vanilla karen-christianae (2018)	Fragrant
Vanilla odorata	Fragrant
Vanilla phaeantha	Fragrant
Vanilla pompona	Fragrant
Vanilla planifolia	Fragrant
Vanilla sarapiquensis	?
Vanilla sotoarenasi (2017)	Fragrant
Vanilla trigonocarpa	Fragrant



CURRENT SITUATION → **PROJECT GOAL**

Effect of High Prices

Global production goes up

Attracting bad actors in the chain

Opportunistic behaviour

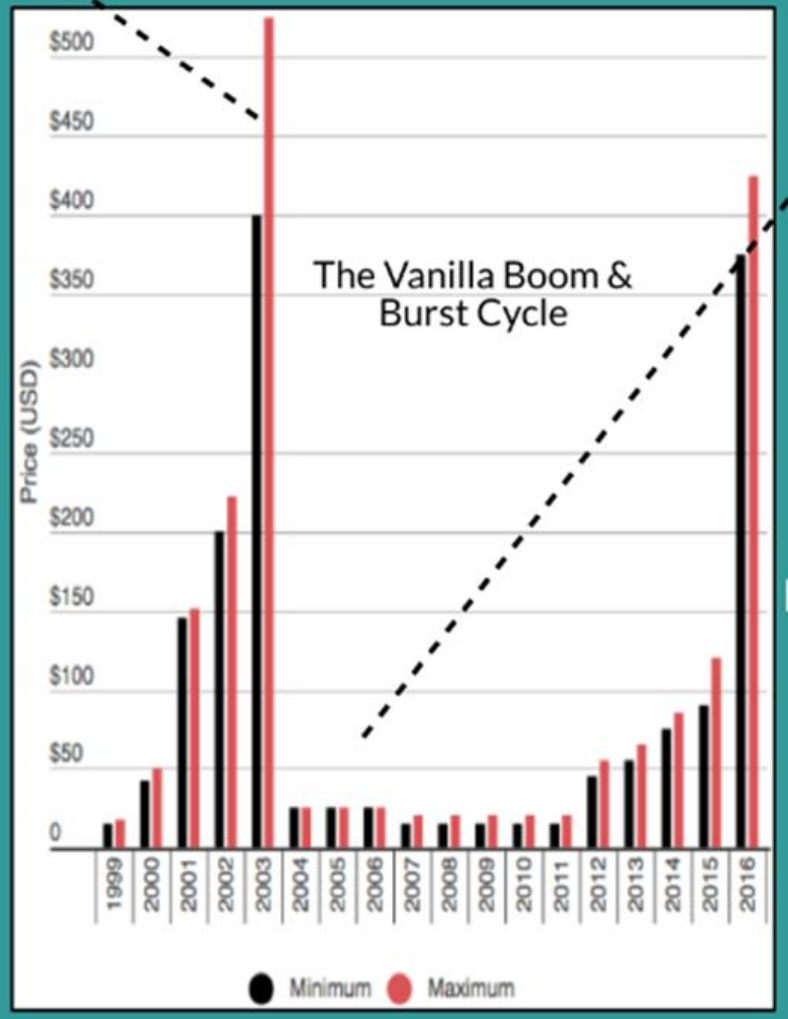
Little trust between actors in the value chain

Early picking & Theft

Quality goes down

Industry stops buying or switches to artificial vanillin

Demand Goes Down & Market is Flooded by New Production



Effect of Low Prices

Poverty increases in producing countries

Farmers switch to crops with better economic prospects

Production goes down

Quality goes up

Industry switches to natural

Consumption vanilla rises

Shortage in supply

Prices go up

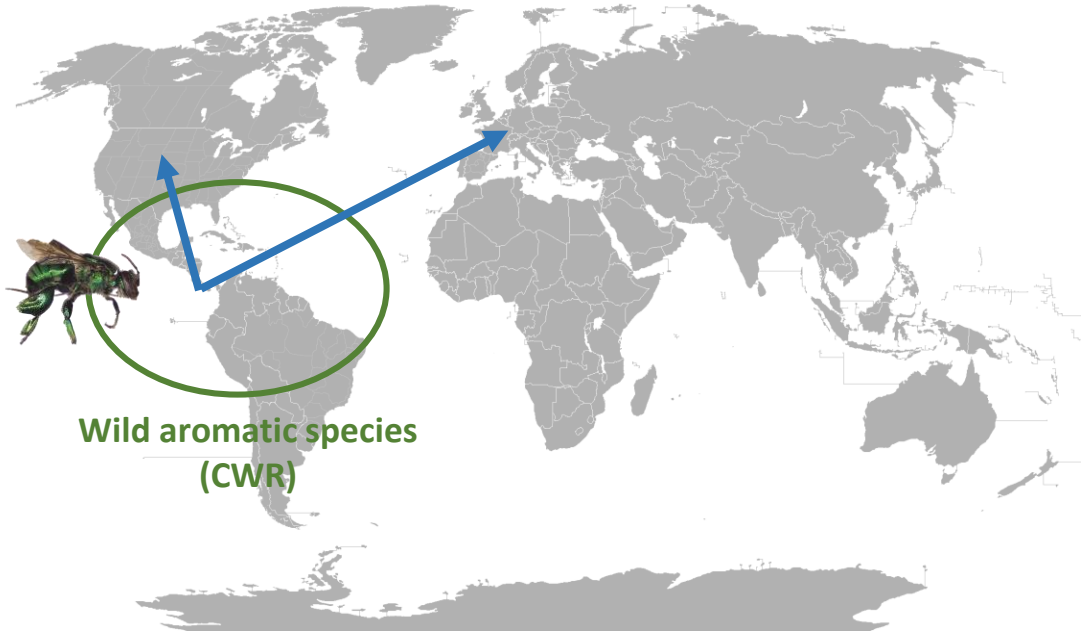
Demand Goes up & Farmers Start Planting Vanilla

CURRENT SITUATION

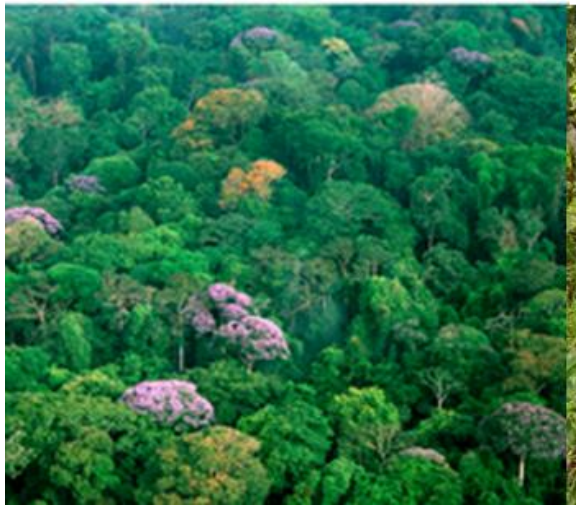
Project Goal

To contribute to a more sustainable vanilla provision by going back to its native growing range and using vanilla crop wild relatives in a concept of conservation and agroforestry

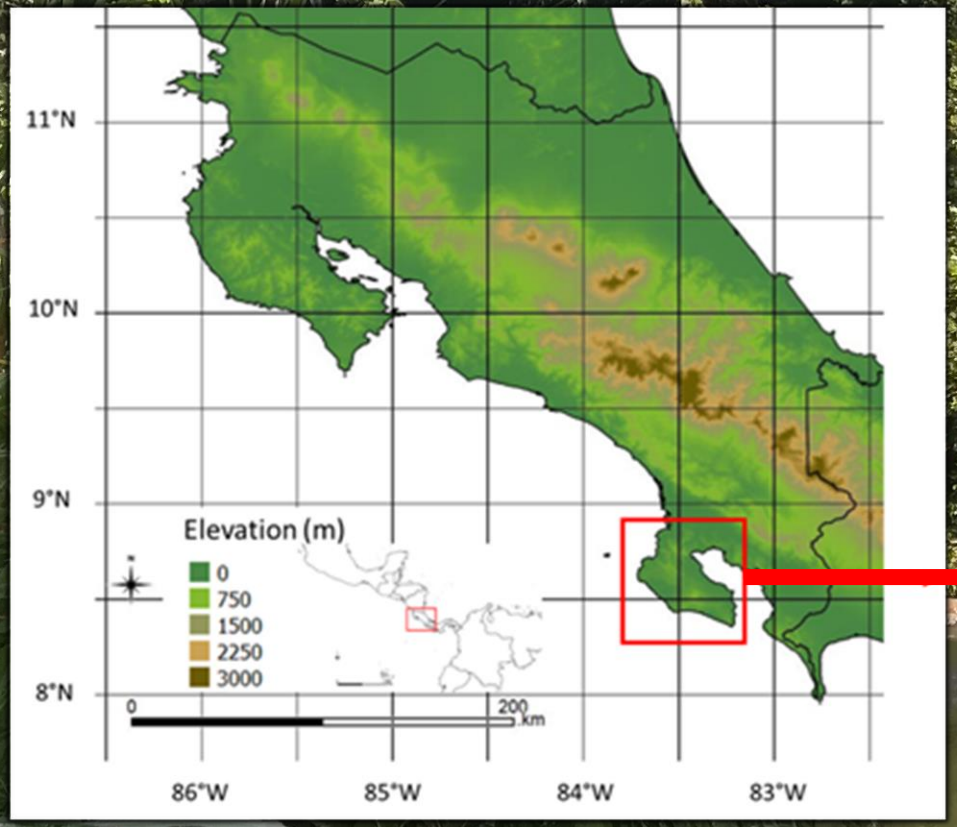
PROJECT GOAL

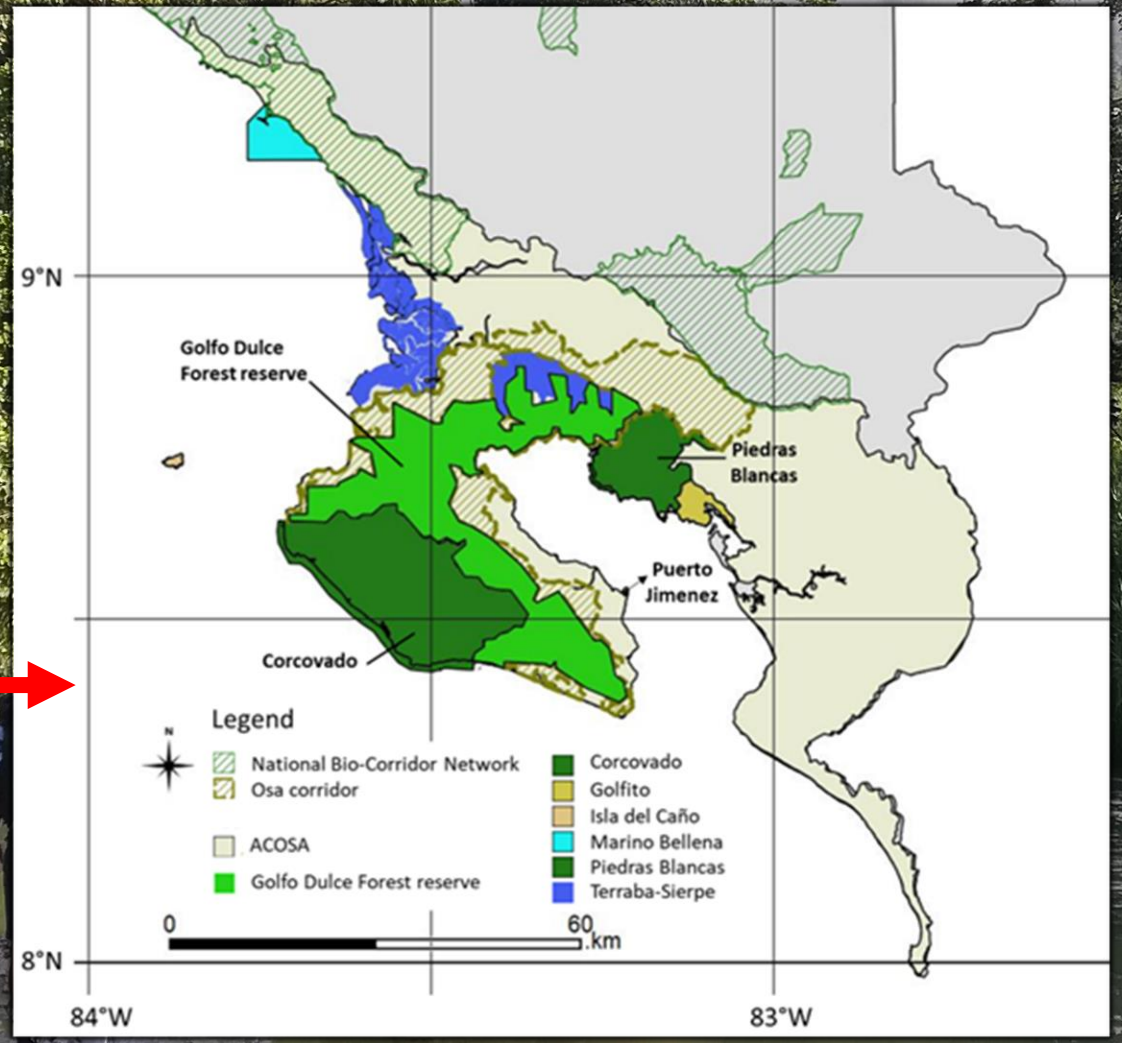


Direct supply chain between farmer and consumer



Study Area





Southwest Costa Rica
→ Area de Conservación Osa (ACCOSA)

Unsustainable Agriculture & Illegal Logging

→ monocultures
- Palm oil
- Pineapple
- Rice
- Banana

→cattle grazing

→ high-value timber

Joint Land Sparing / Land Sharing

Land sparing

Land sharing

Joint land sparing/sharing

4 Stages

(1) Species Distribution modelling of Vanilla CWR

(2) Natural pollination of Vanilla CWR

(3) Cultivation potential of CWR

(4) Interest of local communities in sustainable vanilla production

- Cultivation Potential of Vanilla CWR within AFS -

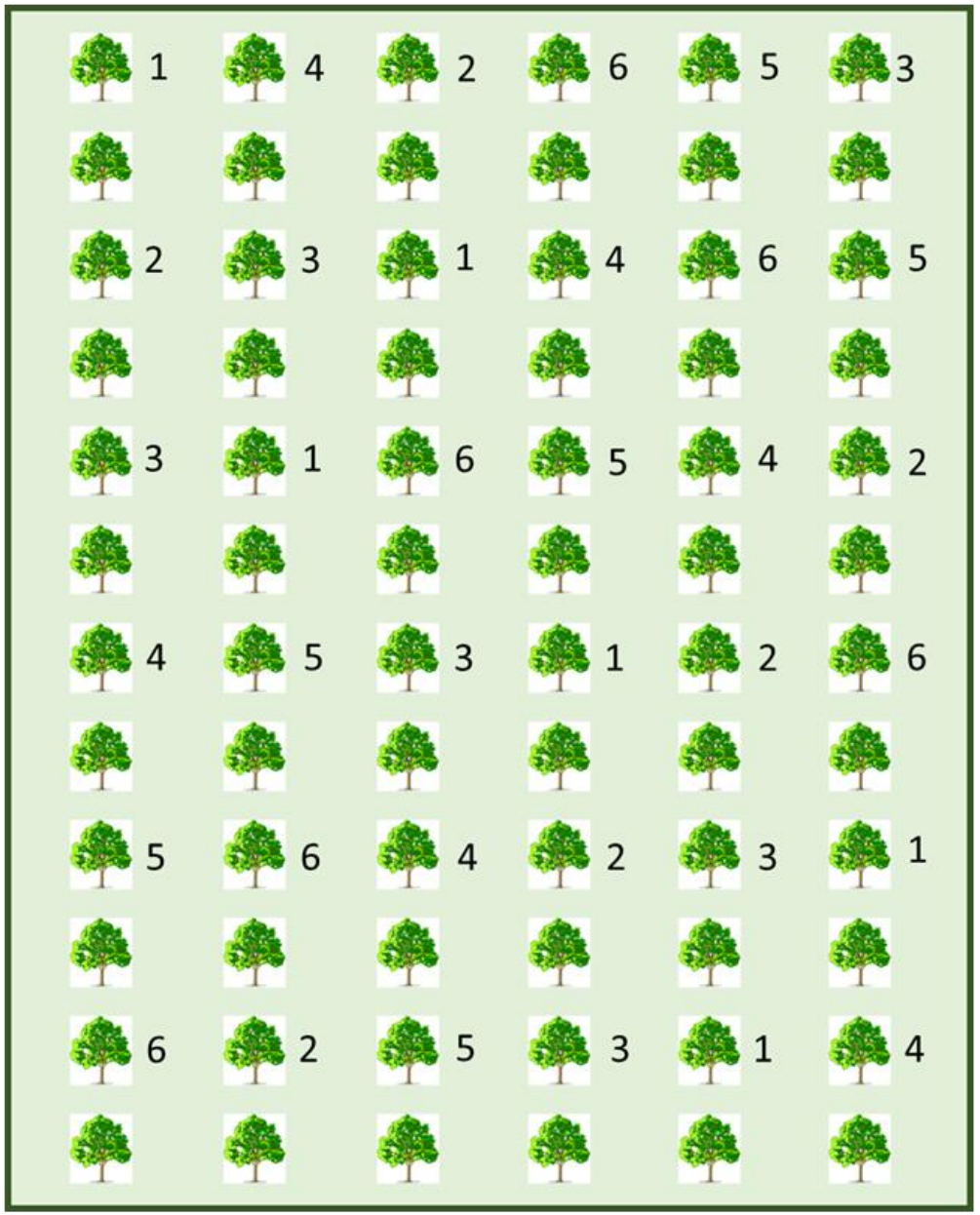
Goal

To define production success of native vanilla, by measuring variables of survival, growth, production, and quality of vanilla within two agroforestry systems (reforestation area and organic cacao plantation) at different distances from forests with natural populations, **and natural pollination success** by comparing different pollination treatments (hand pollination, animal pollination, mix of both).

Methodology

Secondary forests

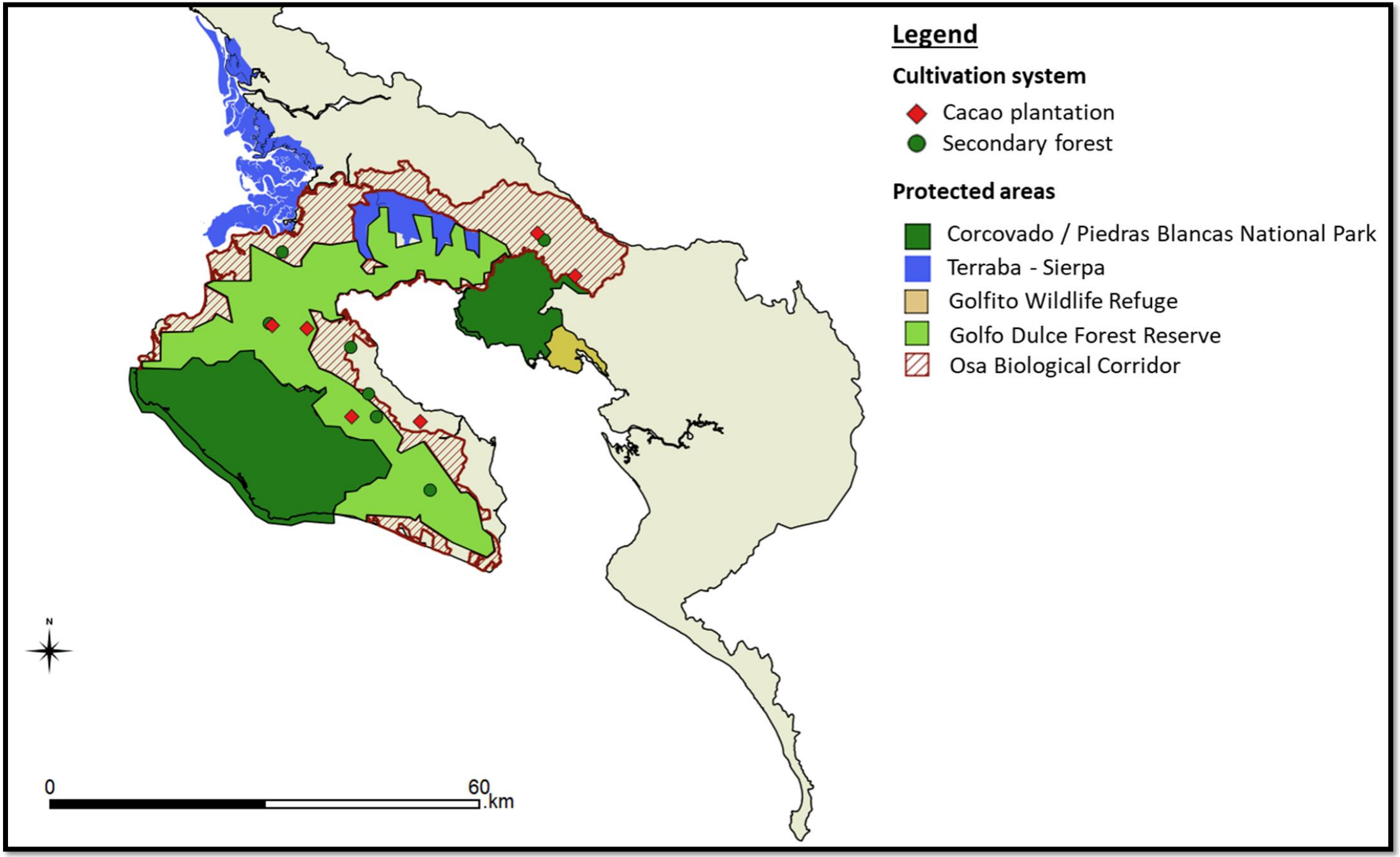
Cacao plantations



(a)

1 = *Vanilla odorata*
2 = *Vanilla hartii*
3 = *Vanilla pompona*
4 = *Vanilla trigonocarpa*
5 = *Vanilla planifolia*
6 = Vanilla hibrido

(b)


Legend
Cultivation system
Cacao plantation
Secondary forest
Protected areas
Corcovado / Piedras Blancas National Park
Terraba - Sierpa
Golfito Wildlife Refuge
Golfo Dulce Forest Reserve
Osa Biological Corridor
N
0
60
.km





Vanilla trigonocarpa


Vanilla odorata


Vanilla pompona


Vanilla planifolia

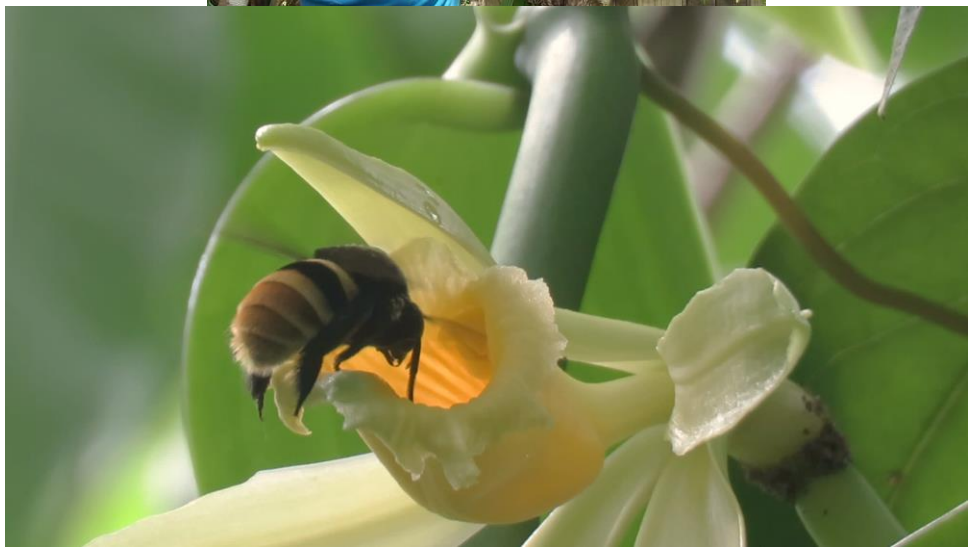

Vanilla hartii


Vanilla costa rica

Methodology

- Variables to be measured
  - Plant vitality and Plant growth
    - Sstart: November 2019
  - Yield and Quality of the vanilla pods
    - Start: first flowering season (after +/- 2 years)
    - Different pollination technique (manual versus natural)

Plant Vitality	Plant Growth	Yield	Quality
Foliation density (score protocol)	Relative growth rate for plant height	# buds / plant	Chemical analysis (Verstegen)
Foliation coloration (score protocol)	Relative growth rate for stem diameter	# flowers / plant	Organoleptic analysis (Verstegen)
Presence of diseases/herbivory	Leaf area	Kg green beans / plant Kg dry beans / plant	Genetic analysis (cross-pollination)



Interest of Local Communities & Market

Interviews with +/- 200 farmers in study region

Thank you very much!

Questions?