

# UCUENCA Participatory approach for reforestation can also contribute to bioeconomy initiatives



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Degraded areas, Área Protegida Comunitaria Tambillo,  
Gualaquiza, 2022

In Ecuador, forest fires affected approximately **3501.08ha** in the first 6 months of 2024 (SNGRE, 2024)

Forest fires could be worsened, a global warming up of 2°C could increase in 35% forest fires occurrences (Pörtner et al., 2022)

In the Azuay province, Ecuador, state government has committed to plant 1 million trees

Cooperativa de Desarrollo Comunitario Jima Ltda, aimed to reforest degraded areas



Área Protegida Comunitaria Tambillo is the first communal protected area in Ecuador

According to farmers, in 1960 (+/-) fire was set for pasture establishment (2 weeks)

130ha are still under an state of arrested succession

**Which species should be used for reforestation/ restoration projects?**

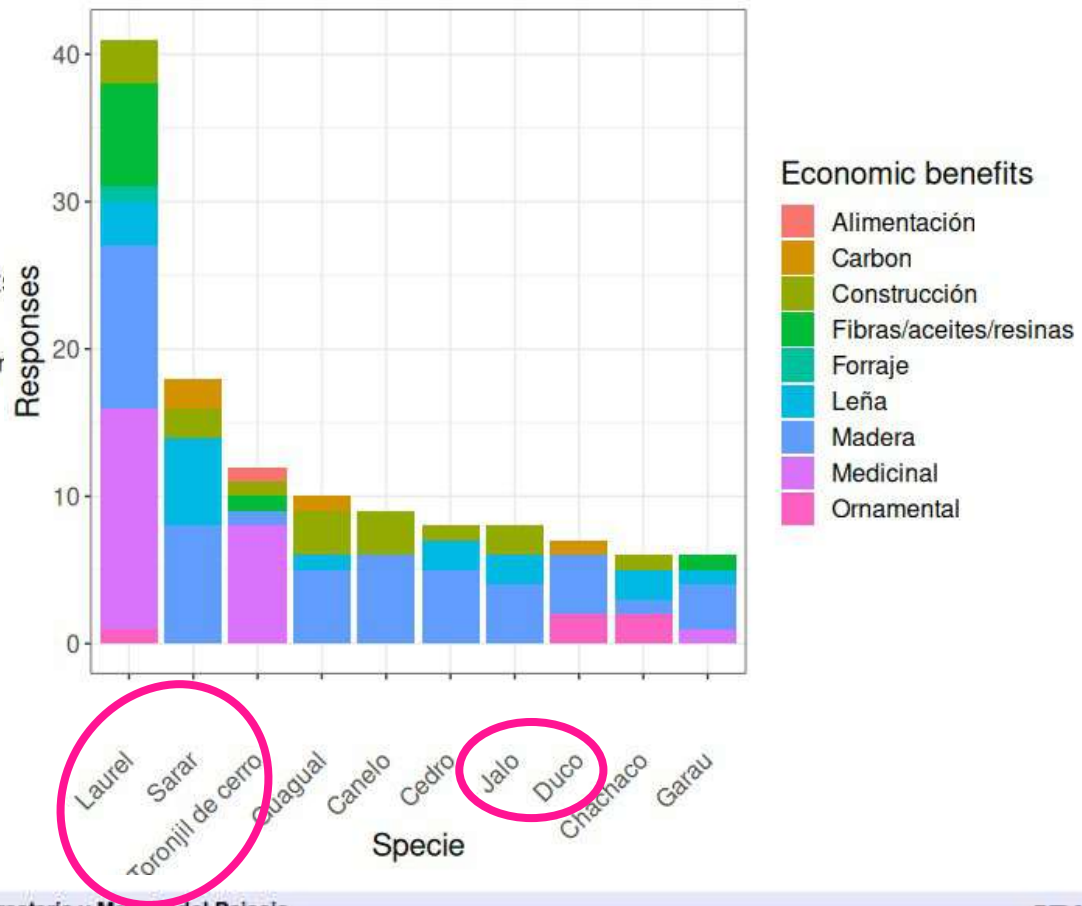
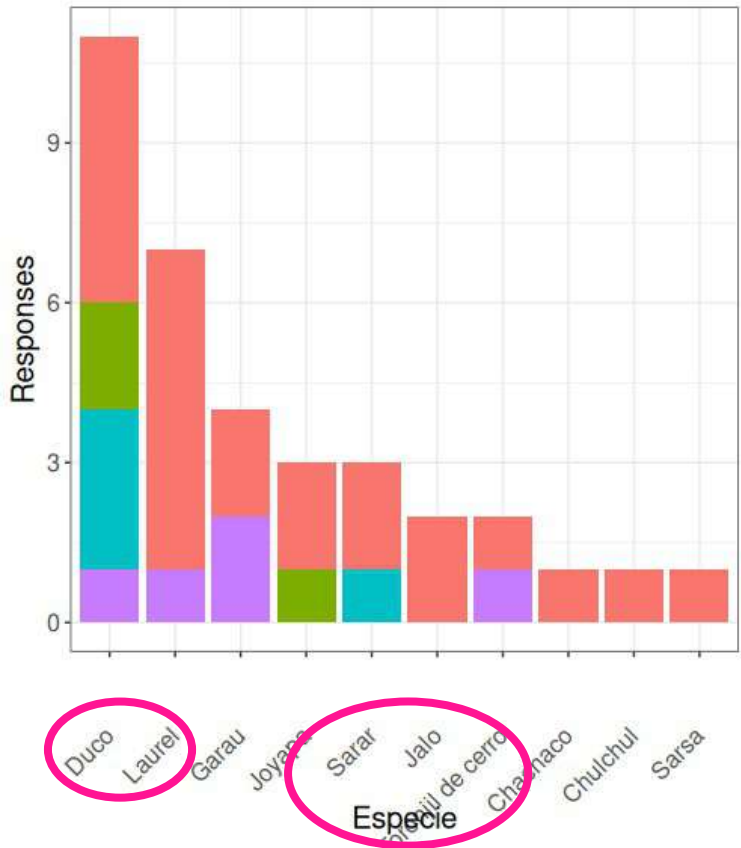
Participatory approach was used to identify tree species (local perception/knowledge)



- Ecological benefits
- Economic benefits



Tree species were ranked according to the reported benefits



Laurel de cera (*Morella Pubescens*) was identified as a prominent specie for reforestation

- Ecological benefits (birds)
- Economic benefits (traditional medicine, essential oils, firewood, construction)



Cooperativa de Desarrollo Comunitario Jima Ltda. is working towards bioeconomy initiatives, focused on essential oils from *Morella Pubescens*

Coop Jima acquired equipment for essential oil extraction

They were ready to start! (?)



Information gap on the parameters for essential oil extraction on *Morella Pubescens*



**Jéssica Sigua**



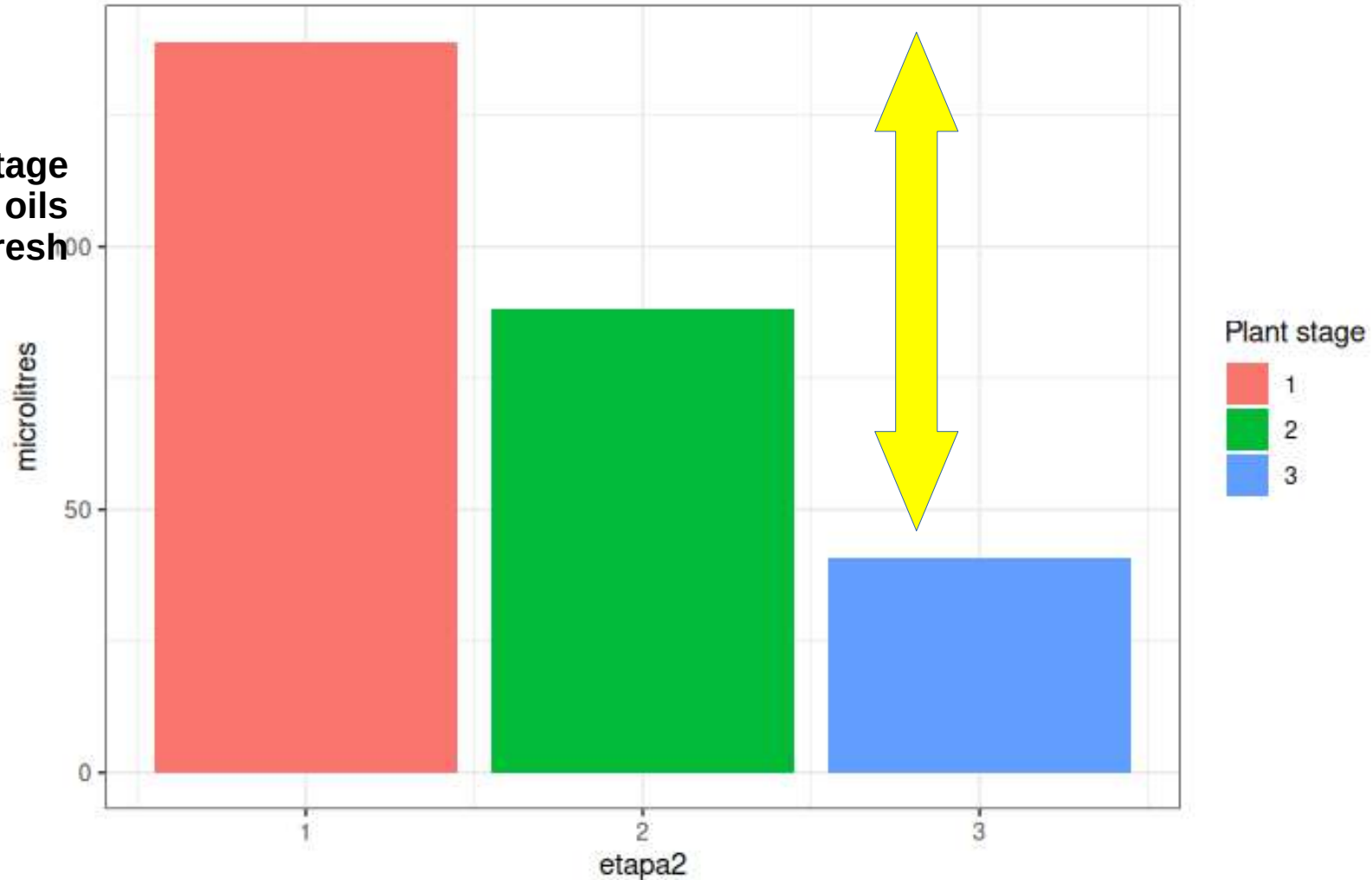
## Bachelor's project:

- Assess essential oils production on three plant development stages
- Assess the effects of harvested time on essential oils production

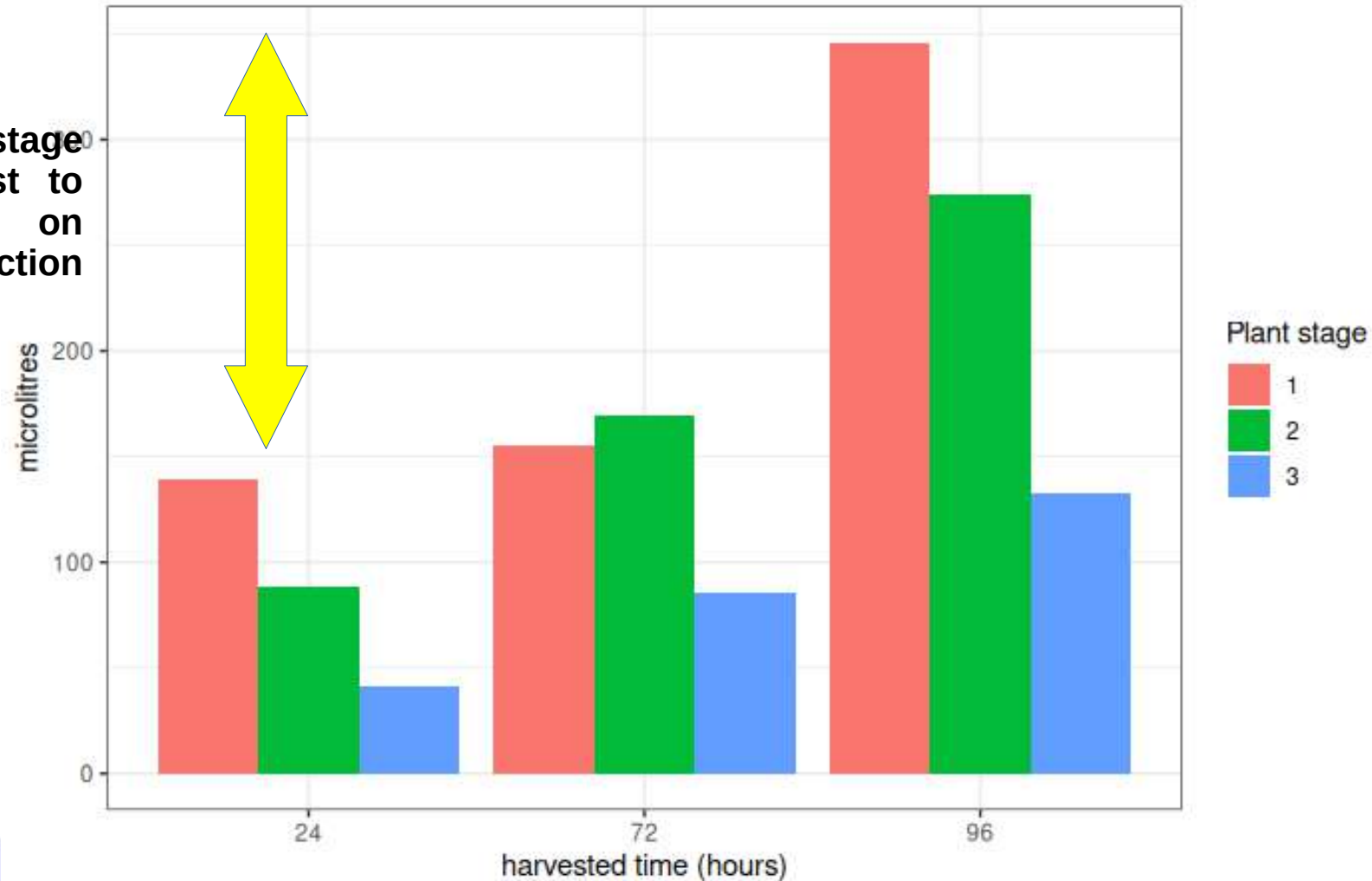
# Reforestation and bioeconomy



Plant development stage influence on essential oils production (100gr fresh leaves)

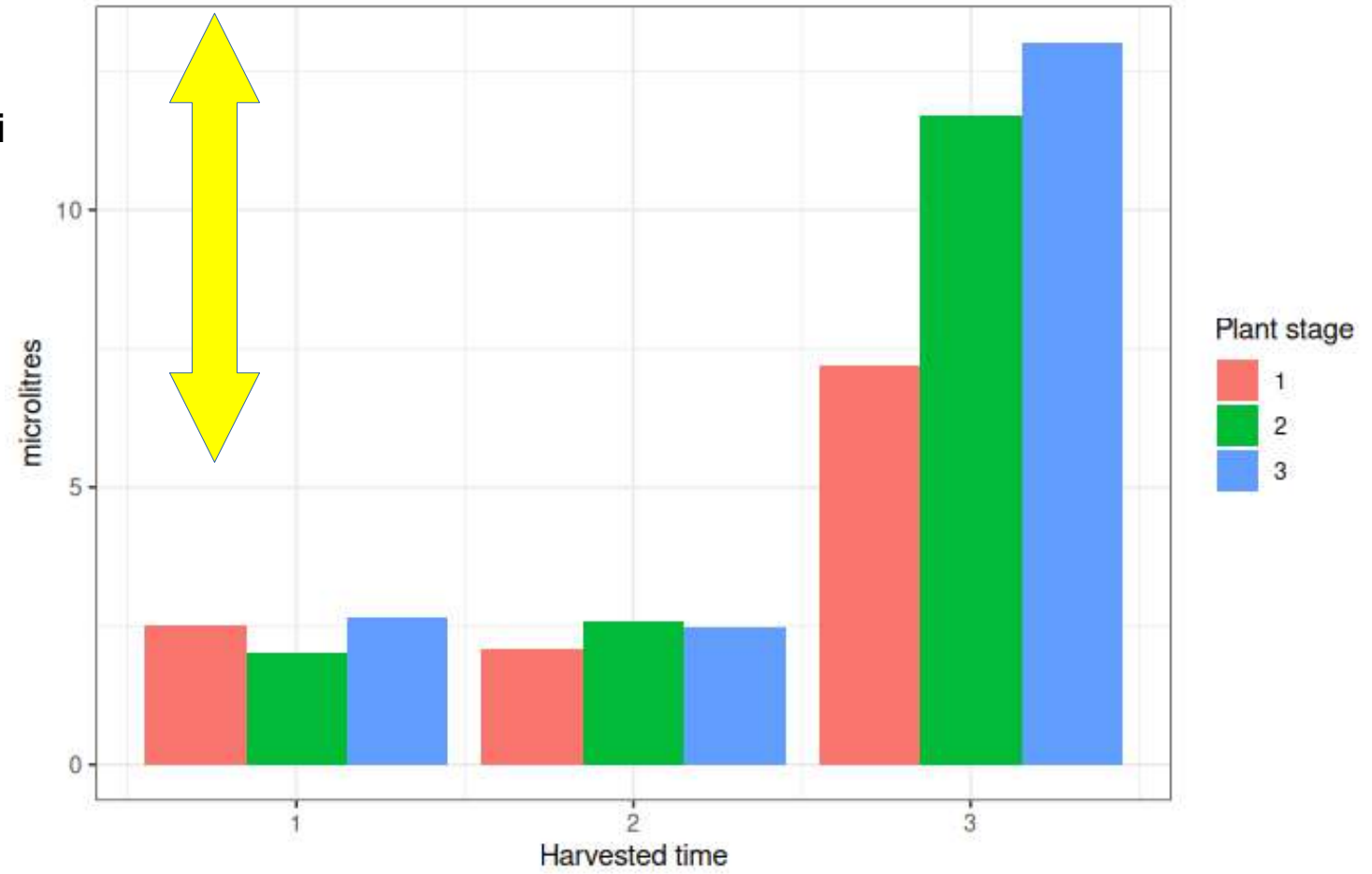


Plant development stage and time from harvest to extraction influence on essential oils production (100gr fresh leaves)



Potential essential production by plant

oi



## Preliminary results:

Young and early adult trees produce more essential oils than mature trees (139, 88 and 41ul/100gr respectively)

Essential oils production increases significantly after 96 hours of harvested

Potentially, essential oils production could be 1.22, 1.52 and 12.0583 ml/plant for young, early adult and mature trees respectively

There is no information for the tree management (harvest time, intensity, intervals between harvest, etc)

**Bachelor's project:**  
- Assess essential oils production on three plant development stages  
- Assess the effects of harvested time on essential oils production

## Next steps:

- Trials spatial arrangements
- Tree management
- Tree - crop interactions
- Tree – pasture interactions
- Income diversification



# Agroforestry and biodiversity



# Agroforestry and biodiversity



# Agroforestry and biodiversity



# How to implement/promote agroforestry systems in the Amazon region?

Policies?  
National level?  
Local level?

Silvopastoral options for climate change mitigation and connectivity in livestock landscapes

Topic	Constitution	Civil code <i>Hierarchy</i>	COOTAD	Environmental Code	Water resources bill
Nature rights	x	x	x	x	x
Conservation (ecosystems)	x	x	x	x	x
Agricultural activities	x		x		x
Water/catchment protection	x		x	x	x
Climate change	x			x	
Connectivity				x	
Restoration	x		x	x	x
Reforestation	x		x	x	
Agroforestry	x		x	x	x

Preliminary results

- 43 municipalities
- 222 policies related to climate change, conservation, water catchment protection
- 1 policy directly addressing climate change
- No direct policies for agroforestry/silvopastoral systems

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**¡Gracias!**

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