Assisted natural forest regeneration

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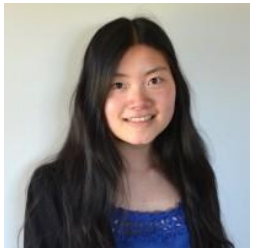

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Executive Summary

The Problem:

- Kalimantan has vast expanses of peat swamp forests, but failed top-down land management program (MRP) created difficulties
- There are a range of crops which locals are willing to grow, but economic returns are prioritised above environmental protection

The Solution:

- To be ecologically beneficial, vanilla farming requires agroforestry techniques
- There are economic and social benefits to incentivise stakeholders of the project

Implementation:

- A pilot project underway in Kalimantan with farmers seeing benefits

Risks and Mitigation:

- The risks of the project have become apparent through vanilla farming in Madagascar, but there are also unique risks in Indonesia
- The major risks apparent through Madagascan vanilla farming and unique risks arising in Indonesia can be mitigated.

Kalimantan has vast expanses of peat swamp forests, but failed top-down land management program (MRP) created difficulties

Peat swamp forests are some of the largest stores of carbon globally, and **36% worldwide are found in Indonesia**, mainly in Kalimantan and Sumatra.

So far, top-down government policy has been ineffective at protecting this huge carbon store, leading to Indonesia being the **5th largest contributor of greenhouse gases globally**, primarily due to the lack of proper enforcement of environmental regulations.

Mega Rice Project (MRP) aimed to convert the vast peat forests into productive agricultural land. It ended up being a huge failure, both environmentally and socially, leading to severe hydrological cycle changes that contributed to massive peat fires, emitting large amounts of greenhouse gases.

1970/80s

Human disturbance of forest since the 1970s has resulted in significant environmental change; deforestation & degradation from legal and illegal logging, mining, adaptation of land for oil palm plantations, etc.

1996-1998

Today

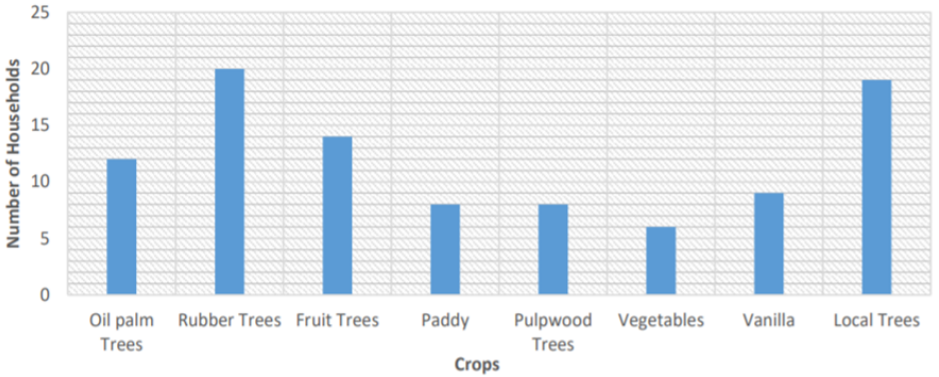
Local communities now forced to adapt and make land use decisions based on income potential rather than the holistic way which considers all stakeholders of the land, as done traditionally, furthering environmental damage.

Sources: Soubly & Khatun, 2020, Rao, 2018, Mongabay

There are a range of crops which locals are willing to grow, but economic returns are typically prioritised above environmental protection

Oil Palm Trees	• More profitable and shorter growing cycle than rubber trees
Rubber Trees	• Long-lasting but not popular for locals due to lack of immediate returns
Fruit Trees/ Vegetables	• Subsistence goods for local communities and nutritious for the soil • Not grown as a cash crop
Paddy	• Rice as a subsistence crop, but can attract bushfires in dry season
Vanilla	• Fast-growing in popularity as a cash crop • Supported by the government

Crops and Trees Grown in Anjir Kalampan, Kalimantan (Rao 2018)



A survey on local villagers (Soubly & Khatun, 2020) suggested farmers **significantly prefer current socio-economic conditions over those of their youth**, due to improved economic opportunities, but they also **overwhelmingly favour ecologically restoring the forest, peatland, and surrounding areas**. It shows farmers think beyond purely economic interests and are willing to reclaim areas near farms to regenerate forest.

But 12% of respondents to the survey also indicated they would use additional hypothetical land for non-timber forest (NTF); citing a preference for cash crops. When explaining the reasoning for excluding NTF from their response, villagers identified their immediate primary goal of economic returns due to limitations as subsistence-level and smallholder farmers

Sources: Soubly & Khatun 2020, Rao 2018

To be ecologically beneficial, vanilla farming requires agroforestry techniques

Vanilla agroforestry benefits

- Vanilla vines are **grown up trees** thus requiring the regrowth of forests which in turn **increases biodiversity**
    - Intensive vanilla monocultures have harsh negative impacts on biodiversity
- Vanilla is able to **thrive on highly disturbed land**, so the overall ecological benefits increase with vanilla farming as ecosystem services can return whilst providing financial income for farmers
    - Diversification also provides other benefits of natural pest management, improved soil quality, better water retention and enhanced interactions with mutualistic species
- Unlike other shade grown crops, **vanilla yield does not trade-off with canopy cover density** increase thus there is no danger of farmers periodically cutting down trees to reduce canopy density

Other ecological benefits of growing vanilla

- Vanilla can **grow quickly and produce pods within 3 years** and can continue producing pods for very many years as the vines can be looped back to the ground
- Reforesting rainforests has many benefits for **ameliorating climate change** (e.g. through carbon sequestration) and models predict that vanilla plants are resilient to climate change so are a safe investment in the face of change

Sources: Martin, et al. 2020, Martin, et al. 2019, Transforming African Agriculture 2019

There are economic and social benefits to incentivise stakeholders of the project

Economic incentives

Madagascan vanilla is unable to meet world demand and is selling at inflated prices, there's been a shift to the use of synthetic alternatives like vanillin.

Food and Beverage Industry

- Target lower and middle end brands who are price conscious
- Gives opportunity to use real vanilla in production of goods and market in branding
- Selling points include sustainability and benefit to Indonesian locals which aid in satisfying ESG goals/benchmarks
- Forest Vanilla can provide Grade-A vanilla beans with no difference in quality to Madagascan vanilla

Cosmetics

- Companies whose main selling point is natural products and also more concerned with fragrance over flavour can benefit from the unique profile of Indonesian vanilla in their marketing (said to have smokier aroma and taste than creamer/sweeter Madagascan variety)
- Lower quality (Grade-B and C) vanilla can be sold at cheaper prices than Madagascan Grade-A vanilla beans

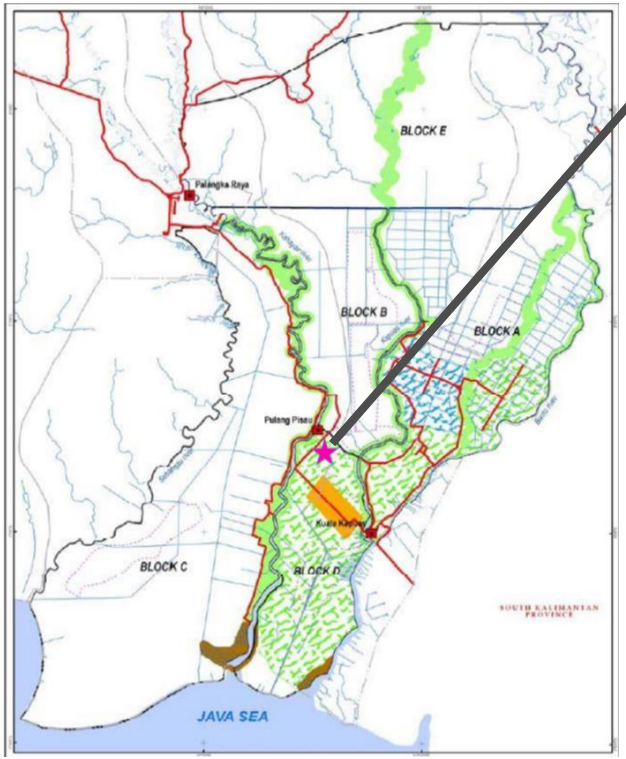
Social benefits

Indonesia is ranked 104/160 in the UN Gender Inequality Index with an estimated 75% percent of women having faced physical or sexual violence

- Vanilla crop has been shown to help with empowerment of women due to the pollination of vanilla crop typically carried out by females.
- Encouragement of this practice in the project via a community cooperative model will advance financial knowledge such as banking and managing money which has potential to give more independence to women in terms of control of family income.
- Vanilla production has already been shown to help shift paid labour division to give women more autonomy in the household with a study in Uganda on similar project reporting that 40% of of respondents thought women managed the profit from vanilla farming over men in the household

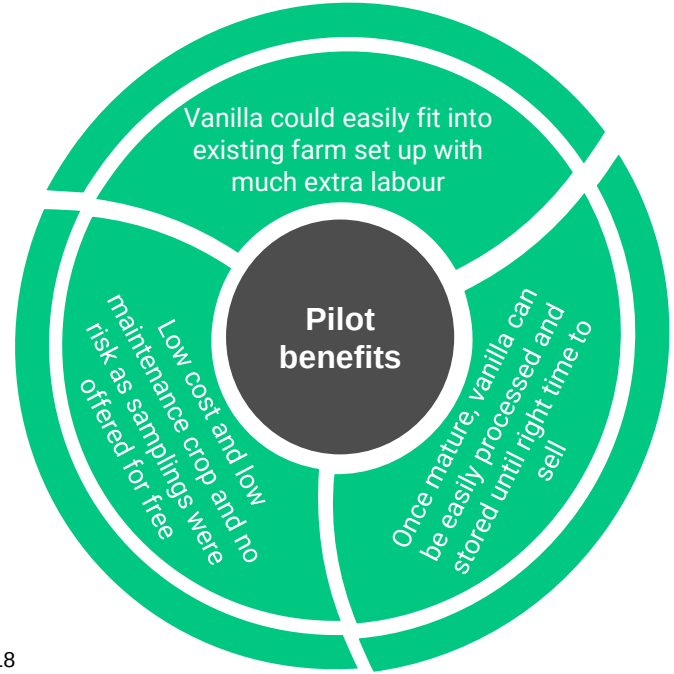
Sources: C&EN 2016, Department for Business Innovation and Skills 2011, UNDP 2018, Tarahita 2018

A pilot project underway in Kalimantan with farmers seeing benefits



A pilot project has already been underway since 2019, where 18,000 samplings were grown on 500 hectares of land leased by the government.

- Various programmes allow for expansion once successful, like the 'Perhutanan Sosial' (Social Forestry) programme launched in 2015 which aims to lease 12.7 million hectares of land to local farmers for 35 years, to be used productively.
- Vanilla has been included in the government's budget for non-timber forest projects so seedlings can be provided to farmers who request them.



Aim of project was to help provide farmers with additional income from their standing rubber trees, using them as anchors for vanilla.

- Rubber trees were most grown crop in study and can easily become anchors.
- Provide good anchor as long lasting (50 years) whilst offering low labour and maintenance costs.
- Price for rubber has dropped, but high vanilla prices can incentivise continued rubber tree growth.

Sources: Rao 2018, Asia Sentinal 2018, Saïd Business School 2018

Forest Vanilla connects, teaches and assists natural regeneration

Forest Vanilla will **connect** and work with local communities, linked through social networks

Farmers can receive **leased land and free seedling** from Indonesian government, as vanilla now recognised as an official non-timber forest product

Forest Vanilla works with and **teaches** local communities how to grow and cultivate vanilla

Local communities can then **incorporate** vanilla into their existing farm set up on deforested land

In the future, Forest Vanilla want to teach farmers how to **cure** vanilla to high standards - but this requires capital and is laborious

Aim is to **maximise social and environmental impacts:**

- Help regenerate deforested land through sustainable agroforestry practises
- Prevent monocultures and provide alternatives to palm oil cultivation
- Support women in gaining financial autonomy, stability and security via vanilla's higher profits
- Socialisation and spread of practises, as local communities heavily influence farming practises

Look to confirm what farmers already know and regive them autonomy and provide economical, social and environmental benefits whilst doing so.

Sources: Rao 2018, Madé 2021

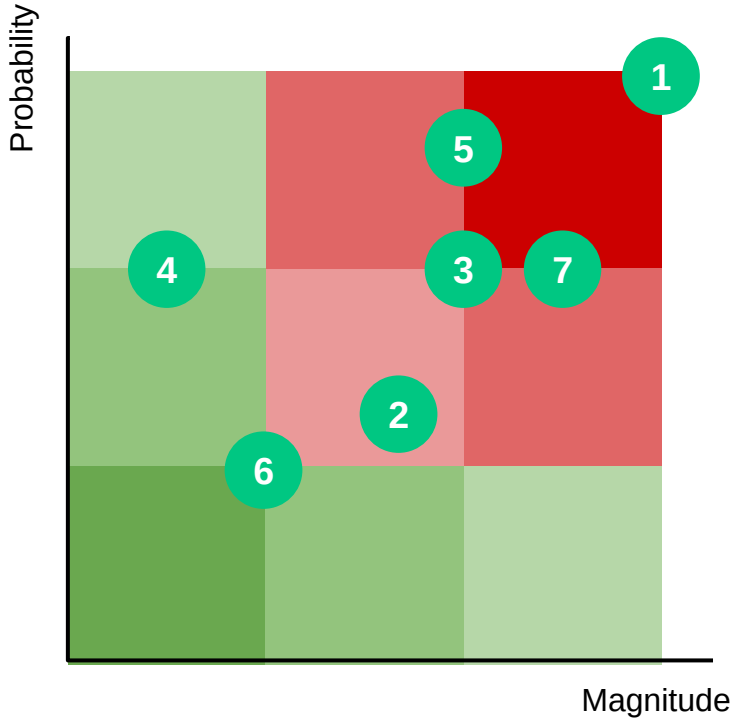
The risks of the project have become apparent through vanilla farming in Madagascar, but there are also unique risks in Indonesia

Madagascar

1. Decreased demand for vanilla
2. Crop theft
3. Price volatility
4. Child labour concerns
5. Severe weather conditions

Indonesia

6. Government and policy support
7. Unwillingness to participate by farmers



The major risks apparent through Madagascan vanilla farming and unique risks arising in Indonesia can be mitigated.

Risk	Description	Mitigation
Decreased demand	• Expensive Madagascan vanilla has driven commercial buyers to synthetic vanilla.	• **Food and Beverage:** Satisfy the continued demand for Grade-A vanilla beans without the inflated prices of Madagascan vanilla • **Cosmetics:** Focus on price competition through lower quality vanilla will allow the price to fall and thus encourage use of real vanilla • Appeal to commercial buyers through sustainability and social change lenses
Price volatility	• There has been extreme price volatility due to extreme weather, shortages, and demand fluctuations.	• A greater number of sellers makes the market more competitive and increases the supply of vanilla available for commercial buyers, making the price more stable as vanilla becomes an accessible crop

Unwillingness to participate	• There remains a desire to continue farming cash crops due to their profitability.
	• Desire to preserve and respect forest land.
		• Directly address both issues of land preservation and financial stability through the implementation of this project
		  • Shortening the supply chain so farmers make a larger portion of profits
		  • Restoration of forests and indigenous species

Severe weather conditions	• Unpredictable and extreme weather conditions puts at risk a consistent supply of vanilla.	• Madagascar is particularly vulnerable due to the monoculture. Shade grown vanilla alone is not resistant to weather conditions, but it is as resistant as the forest it is grown in. Extreme weather is unlikely to wipe out whole sections of the forest.

Sources: Terazono 2018, Six Degrees, Rao 2018, Hamilton, Said Business School 2018, Foster & Terborgh 1998, Aust & Hachmann 2019

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Appendix

Description and Mitigation of Risks Arising in Madagascar

Risk	Description	Mitigation
Child labour	• Children will work with mothers to farm vanilla, similar to systems in Madagascar. • Children will not receive education and reach further education, instead staying to work in the farms which does not provide a large income, job security, or other benefits.	• Less labour-intensive farming methods makes it unnecessary to have that many bodies working on the farm. Children will not be needed as there is less work to be completed on the farms. • Shortening the supply chain and allowing farmers to realize a greater proportion of the profits would make it less necessary for children to work as well since the extra harvest is not needed to survive.
Severe weather conditions	• Unpredictable and extreme weather conditions puts at risk a consistent supply of vanilla. It becomes more difficult to get contracts as there is no consistent supply.	• Madagascar is particularly vulnerable due to the monoculture of vanilla present. Shade grown vanilla alone is not resistant to weather conditions, but it is as resistant as the forest it is grown in. Extreme weather is unlikely to wipe out whole sections of the forest, so whilst some vanilla may be damaged, not all of it will be swept away.
Decreased demand for vanilla	• Expensive Madagascan vanilla has driven many vanilla buyers to switch to synthetic vanilla, decreasing the demand for real vanilla.	• **Food and Beverage:** Satisfy the continued demand for Grade-A vanilla beans without the inflated prices of Madagascan vanilla • **Cosmetics:** Focus on price competition through lower quality vanilla will allow the price to fall and thus encourage use of real vanilla • Research has shown than Indonesian Grade-A vanilla is indistinguishable from Madagascan vanilla beans. Supply will be increased for all grades of vanilla to target different segments of demand for vanilla • Our project will focus on social missions and environmental effects, making it attractive to commercial buyers looking to increase sustainability efforts.

Sources: Terazono 2018, Six Degrees, Rao 2018

Description and Mitigation of Risks Arising in Madagascar

Risk	Description	Mitigation
Crop theft	• The high price for Madagascan vanilla and the high labour usage in vanilla production makes it attractive for thieves to steal as there remains high demand for Madagascan vanilla in commercial markets.	• Indonesian vanilla will be marketed differently than Madagascan vanilla so it doesn't command the same high price which will thus decrease incentive for vanilla theft. Vanilla will be grown through low-involvement methods and be of lesser quality and thus result in greater supply and lesser desire to steal. • Seek government support to protect areas of forest regrowth as this project is implemented in areas supporting agro farming and biodiversity. They will be incentivized to do so in order to restore land destroyed by MRP and ex-MRP projects.
Price volatility	• Madagascan vanilla has experienced extreme price volatility following extreme weather conditions, supply shortages, and increased demand. • Farming methods heavily drives up the cost of Madagascan vanilla as it requires hand pollination and close guarding from theft.	• Price volatility largely arises from the extreme weather conditions and theft that threaten supply available to commercial buyers. Targeting those issues would be the most effective at controlling price volatility. • A greater number of sellers makes the market more competitive and increases the supply of vanilla available for commercial buyers, making the price more stable as vanilla becomes an accessible crop. • Non-intensive farming techniques and targeting a different niche (beauty and cosmetics) with lower quality, lower taste vanilla will drive down the cost of vanilla.

Sources: Hamilton, Said Business School 2018, Six Degrees, Foster & Terborgh 1998, Terazono 2018, Aust & Hachmann 2019

Description and Mitigation of Unique Risks in Indonesia

Risk	Description	Mitigation
Political support	● The government oftentimes signs contracts with palm oil producers to use already degraded forests. They are able to make a profit without damaging regenerated forests. ● Vanilla is already included in the government budget, but farmers aren't always aware.	● Development of a close relationship with local governments and maintaining consistent and clear communication. Must prioritise governmental actors in receiving information and remaining up-to-date on the status of the project. ● Demonstration of financial and environmental benefits of implementing the project through pilot programs. ● Make famers knowledgeable about vanilla farming techniques and profits as well as providing a method to acquire vanilla seedlings. ● Policy has already been implemented so the government will provide seedlings to those who ask, but do not prioritise its distribution.

Unwillingness to participate	● There remains a desire to continue farming cash crops (rubber, oil palm, paddy) despite their environmental damage due to their profitability.
	● Indigenous people feel as though they're disrespecting the land by destroying it with monoculture farming and cash cropping.
		● Directly address both issues of land preservation and financial stability through the implementation of this project.
		  ● Vanilla is an extremely profitable crop, and shortening the supply chain between farmers and commercial buyers will only serve to increase the profits seen by vanilla farmers.
		  ● Shade-grown vanilla will require the preservation of forests, both preventing a monoculture as well as continuous carbon capture. These forests will be maintained in order to continue growing vanilla.

Sources: Hamilton, Said Business School 2018, Six Degrees, Foster & Terborgh 1998, Rao 2018