SynecO

Introduction of Synecoculture™ and its potential in cocoa farm in Ghana

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SynecO, Inc.

Agenda

- About us
- Environmental issue at various scale
- Introduction of Synecoculture
- Application of Synecoculture to the cocoa farm

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SynecO

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About us

About SynecO, Inc.

Establishment	April 1, 2021
Start of Business	June 1, 2021
Share Capital	41 million yen
Shareholders	Sony Group Corporation （100%）
President and Representative Director	Masatoshi Funabashi

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Purpose of Establishment ;

- Commercialize the research on ecosystem-enhancing technologies such as "Augmented Ecosystems" and "Synecoculture™" at Sony Computer Science Laboratories, Inc.
- Aim to create multifaceted value for biodiversity through social implementation
- The first project of the Sony Innovation Fund: Environment, a corporate venture capital fund of Sony Group Corporation

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Improvement of biodiversity and ecosystem function
Values of ecosystem
Economic activity and food production

1. Environmental issue at various scale

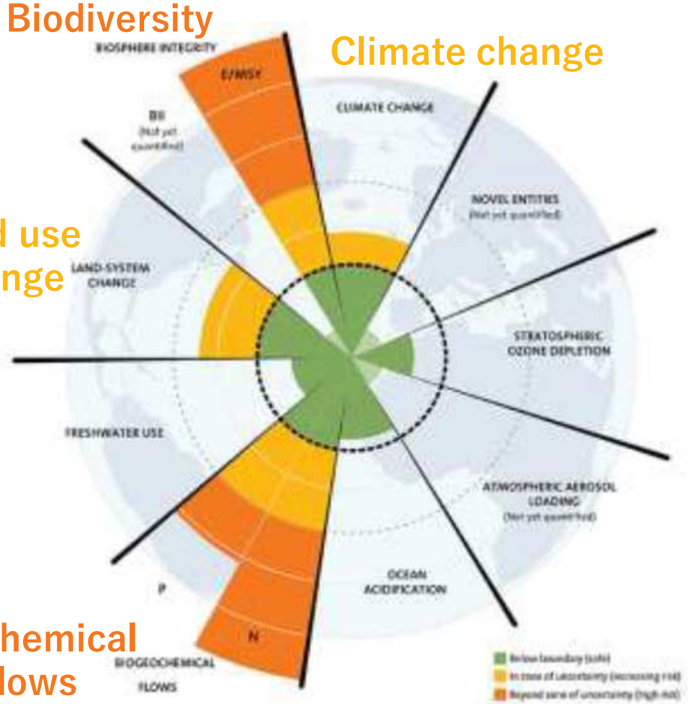
What happens on our planet?

Planetary boundaries: showing the limit to the impact of human activity in the Earth system.

Biodiversity

Climate change

Land use change



Biochemical flows (N, P)

(Steffen et al. 2015)

<u>Biodiversity</u>, **<u>biochemical flows</u>**, **<u>climate change</u>**, and **<u>land use change</u>** have already exceeded the limitation.

Attention is paid to how we can improve those situation.

SUSTAINABLE DEVELOPMENT GOALS

TNFD

Cocoa & Forests Initiative

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Deforestation
Image: Earth.org


Agrochemicals
Image: Arjun MJ on Unsplash

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Extreme weather
Image: Mike Erskine on Unsplash

Nature-related risks in Ghana

Tree cover loss is one of the biggest problems in Ghana

Climate change
Increase of CO2 emissions

Global scale

Tree cover loss/Deforestation

Local scale

Biodiversity loss

Data: Global Forest Watch

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Global perspective against deforestation

EU adopts new rules for deforestation-free products

Alert

19 May 2023

7 min read

Genevra Forwood | Clare Connellan | Sara Nordin

The European Union has adopted a new regulation to curb the EU market's impact on global deforestation and forest degradation around the world, as well as protecting the rights of indigenous peoples.[1] The EU Deforestation Regulation ("EUDR") mandates extensive due diligence on the value chain for all operators and traders dealing with certain products derived from cattle, cocoa, coffee, oil palm, rubber, soya and wood.

Targeted products must be deforestation-free

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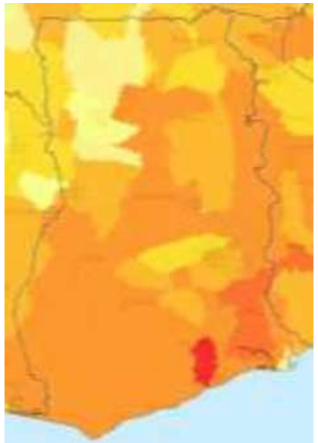
Nature-related risks in Ghana

Biodiversity loss in Southern Ghana

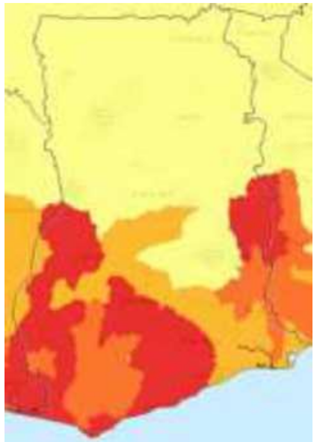
1442 species on IUCN Red List

Nearly 100 endangered species

Forest as a biodiversity hotspot



Pressure on biodiversity



Range rarity
(uniqueness of biodiversity)

Biodiversity Risk Filter

Biodiversity and Ecosystem services

Well-established ecosystem provides many services to us

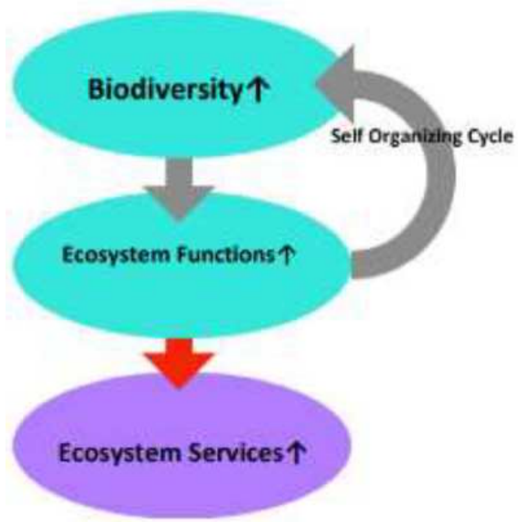


Image:Synecoculture manual

Image: TEEB Europe

Conversely, it is possible that **<u>you cannot continue some activities in the future because of biodiversity loss and ecosystem collapse</u>**.

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Nature-related risks in Ghana

Extreme heat

Biodiversity Risk Filter

Extreme heat will affect negatively on the root growth of cocoa tree.
The risk of extreme heat expected to be more severe in the future.

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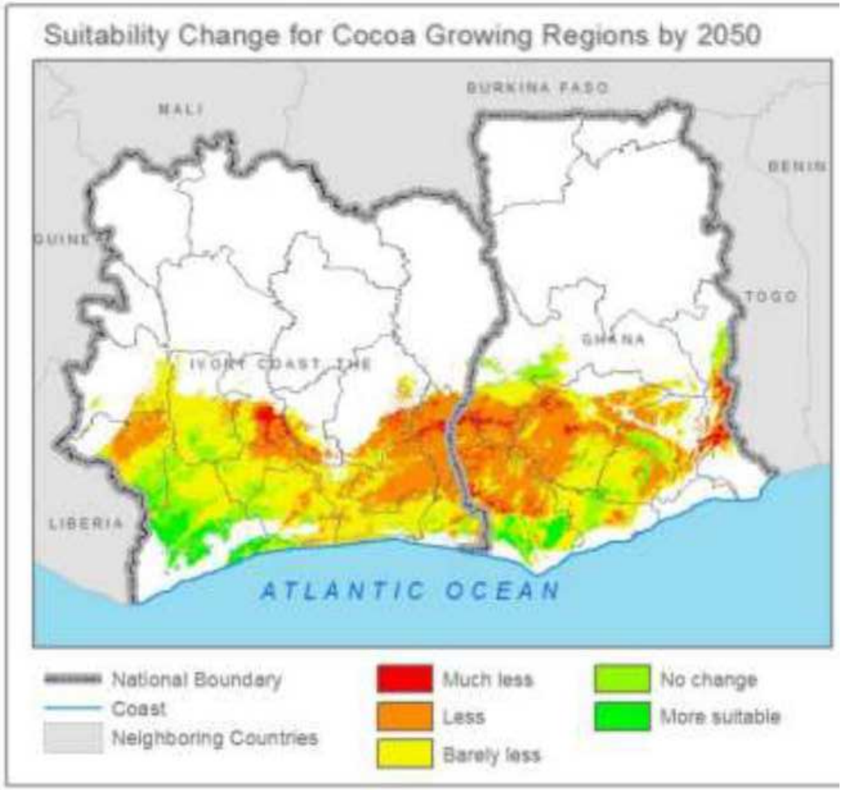
Prediction of suitability change for cocoa



(Laderach, 2011)

How to adapt and deal with this situation?

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Type of cocoa farm

Cocoa Forest Initiative (CFI) proposes three type of cocoa production system.

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Monoculture **Intercropping** **Multi-strata**

Cocoa yield (in theory)

Shade level

Biodiversity

Despite the theoretical high productivity of monoculture, the average cocoa yield is around 500-700 kg/ha, which is lower than the theoretical value

Monoculture and Agroforestry

Monoculture

Cocoa monoculture is based on the hybrid variety and fertilizer

Characteristics of monoculture

With right amount of fertilizer, sunlight, and water, it can produce high yield (but it's difficult)

Difficult to deal with the risks such as climate uncertainty

Soil gets degraded faster

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Monoculture and Agroforestry

Agroforestry (Multi-strata system)

Cocoa is cultivated with shade tree and understory plants

Characteristics of agroforestry

Soil is less likely to be degraded

Diverse plants result in higher **resilience - toughness**

Lower cocoa yield compared to that in monoculture because of the competition

Cocoa production in Cameroon

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Cocoa monoculture and deforestation

Cocoa monoculture over years

Initially cocoa is well grown in monoculture

Soil fertility is gradually getting lower


EU adopts new rules for deforestation-free products

Targeted products must be deforestation-free

Original farm is degraded, and create new farm in another area

Global environmental issues made deforestation-free policy, which may restrict farmers to keep expanding new farm land in restriction areas.

To overcome this restriction, what we can do?

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We come here not to say “just use same land and you should accept yield decrease for biodiversity and forests.”

Our message is:

Biodiversity and forest will give you certain benefit, so it is not only global issue but also local issue
We would like to suggest how to improve profit from the farm without land expansion

Wrap-up; What is needed in cocoa farms?

Sustainable land use

It is required to utilize the same land for the longer period

Resilient farm

Suitability for cocoa production will change in the near future

Cocoa farm is surrounded by uncertain factors such as climate change, price volatility, extreme weather

Consider environmental factors

Biodiversity, ecosystem, and preventing tree-cover loss

Most importantly, improving farmers' economic situation is fundamental

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