



Earthleigh

The earthly way to sustainability.



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**Marginalized families
don't have access to food
while food wastage is still
rampant.**



We produce a lot of food.

In fact, we are producing more and more of them.

9.4B
tons

of primary crops
produced in 2019

Source: FAO

53%

food produced
compared to 2000

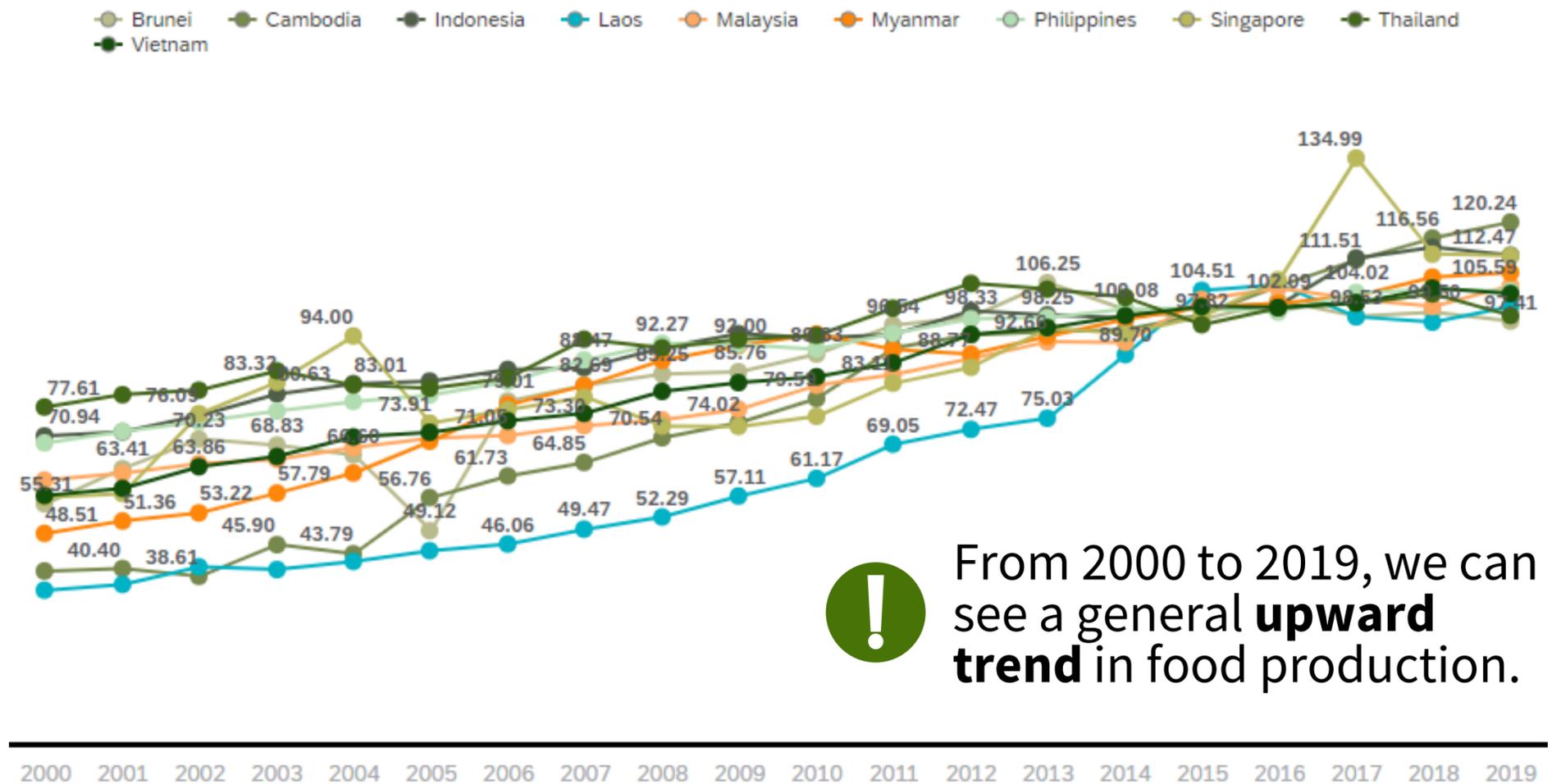
Source: FAO

>1.5x

of the world
population
could be fed

Source: Holt-Giménez et al.

Food production index of ASEAN Countries from 2000 to 2019

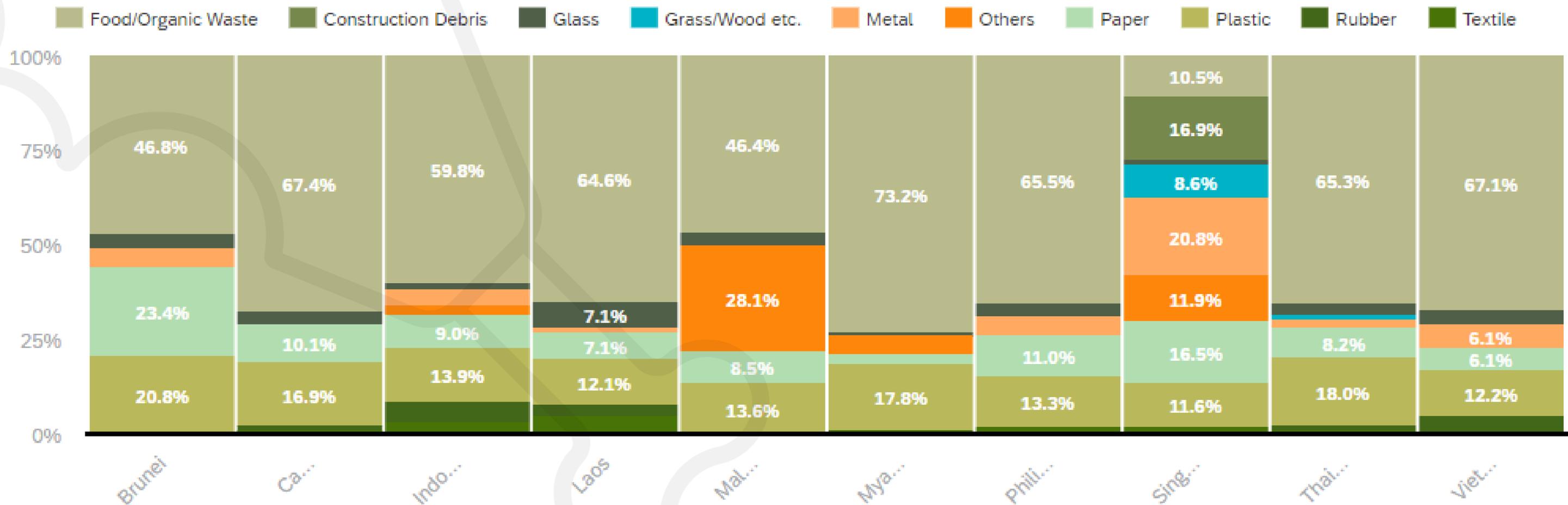


From 2000 to 2019, we can see a general **upward trend** in food production.

Source: The World Bank

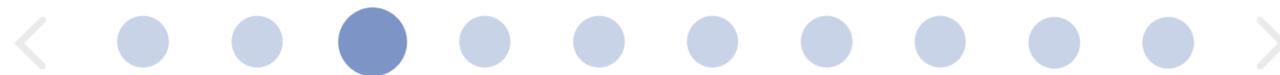
If only all those food end up in our stomachs.

Municipal Solid Waste (MSW) Composition (%) in ASEAN countries



! MSW in ASEAN is mostly comprised of **food or organic waste**.

Source: UN Environment Programme (UNEP)

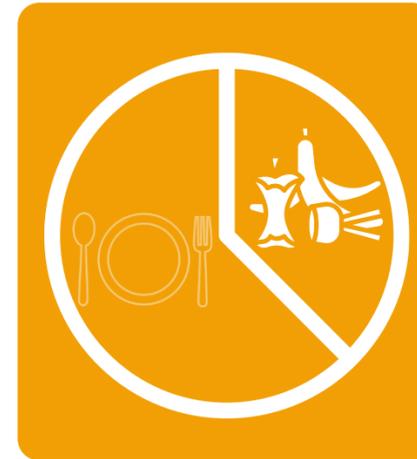


A lot of these food are wasted.



~490 grams
of food wasted per day
by the average
Southeast Asian

Derived from calculations



26-36%
of food per capita in
SEA is wasted each year

Source: Fifth State of the Environment Report



25%
of the global food waste
comes from South and
Southeast Asia

Source: Future Directions International (FDI)



1.6B tons
of food are wasted
globally each year

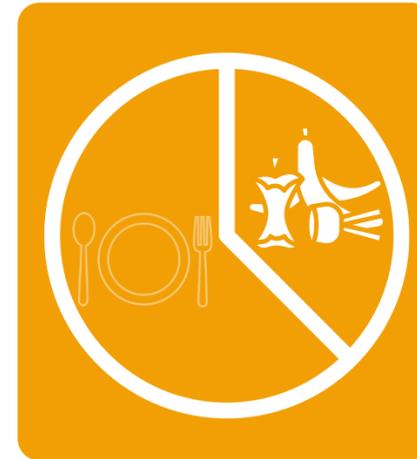
Source: Boston Consultant Group's (BCG)

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2.1B tons
of food will be annually
wasted by 2030

Source: Boston Consultant Group's (BCG)



We aren't very efficient with managing such waste, either.

Technology Profile for MSW in ASEAN Countries

| Composting | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✗ | ✓ | ✓ |
|--------------|---|---|---|---|---|---|---|---|---|---|
| Incineration | ✗ | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✓ | ✗ |
| Landfill | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| Open Dump | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Open Burning | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |

Source: UN Environment Programme (UNEP)



Open dumping **easily pollutes air and groundwater.**

Source: UNEP



Methane, 21x more damaging to Earth than carbon dioxide, is produced by burning waste or decomposing them in landfills.

Source: The ASEAN Post



ASEAN has **limited experience** in the most eco-friendly method: composting.

Source: UNEP



Meanwhile, many are still starving.

As expected, the pandemic made things worse.

375M
people

from Asia and the Pacific were hungry in 2020

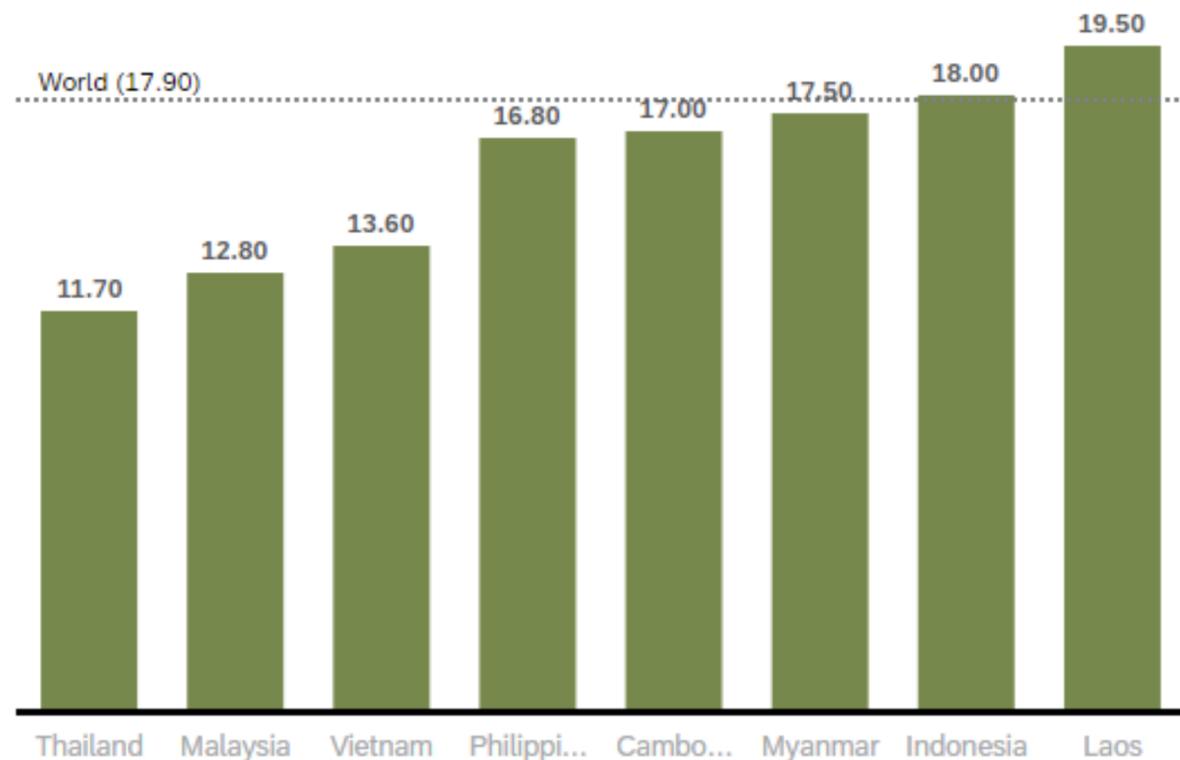
Source: UNICEF

54M
people

compared to the previous year, 2019

Source: UNICEF

Global Hunger Index (GHI) of ASEAN* in 2021



Indonesia and Myanmar have GHIs larger than the world average (17.90).



All ASEAN countries included in the figure are classified as **moderate** under the GHI severity scale.

*Other countries are excluded due to insufficient data

Source: von Grebmer et al.

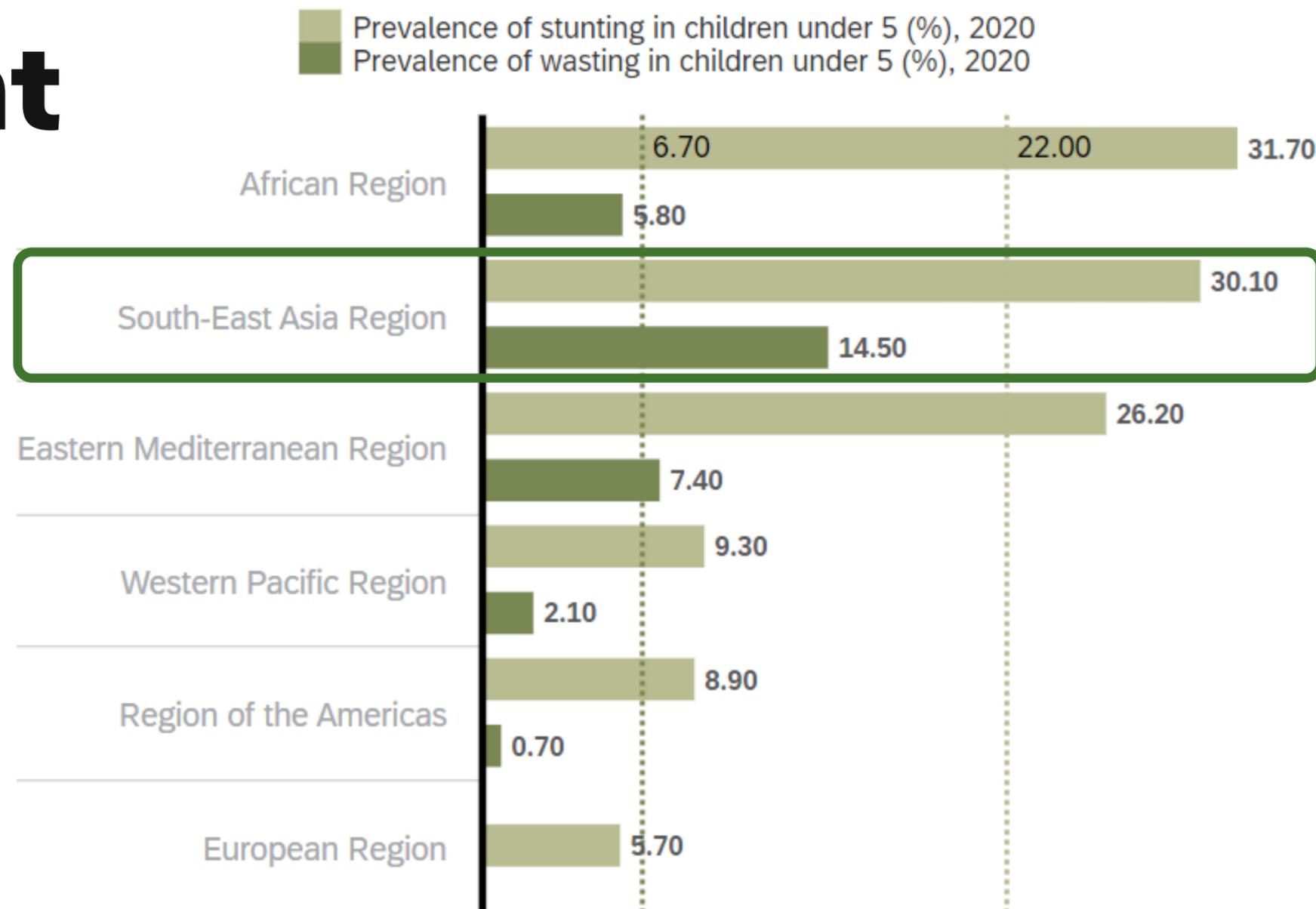


Moreover, undernourishment is still prevalent.



Southeast Asia has the **second highest prevalence of stunting** and the **highest prevalence of wasting**.

Prevalence of stunting and wasting in children under 5 y.o. (%) per region in 2020



Source: WHO

Why can't people feed themselves?

Food insecurity is the root problem.

>1B
people

from Asia and the Pacific
do not have adequate
access to food in 2020

Source: UNICEF

↑↑↑ 150M
people

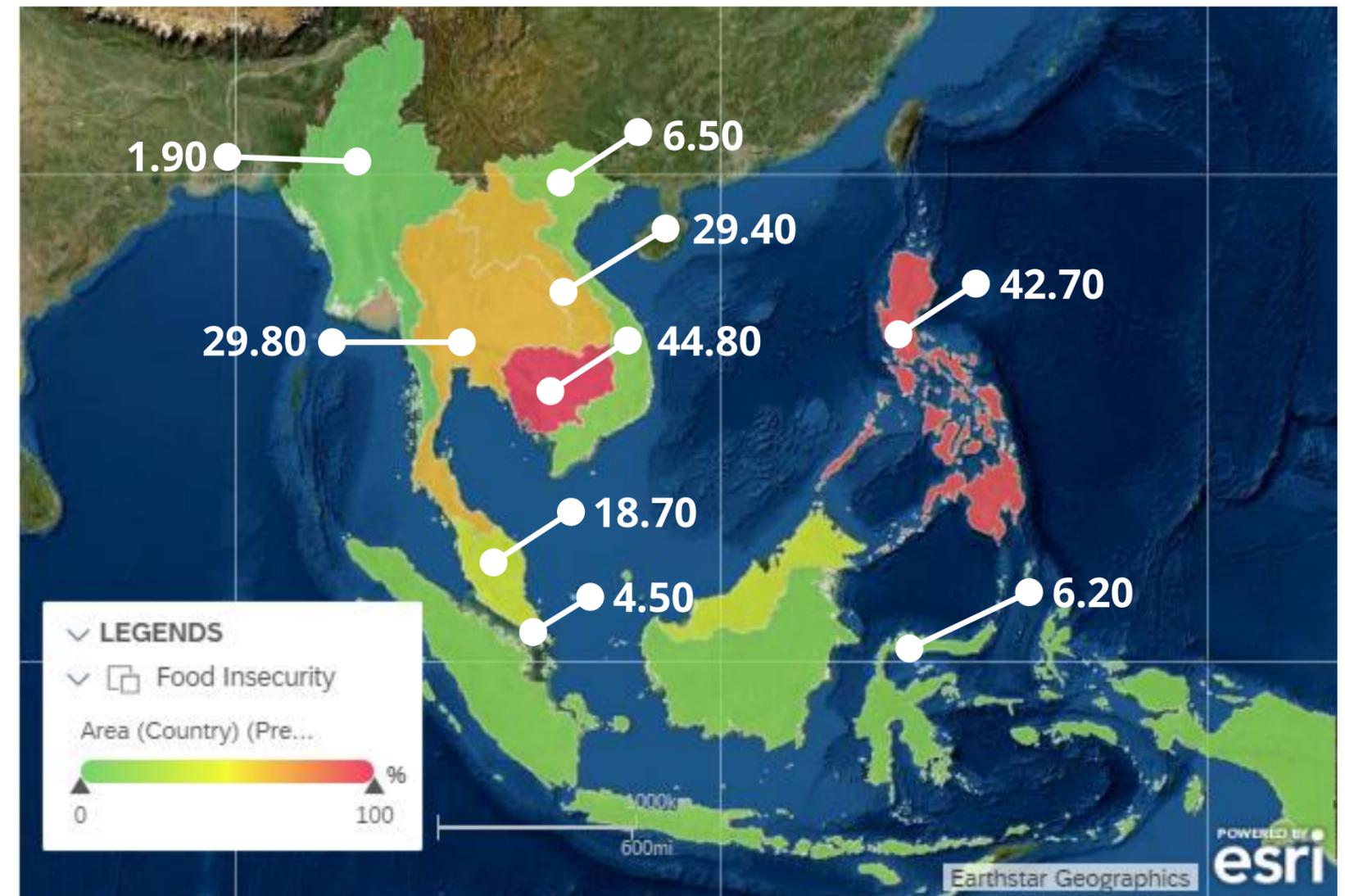
compared to the
previous year, 2019

Source: UNICEF



Nearly half of the populations of Cambodia (44.80%) and the Philippines (42.70%) experienced food insecurity in 2019.

Prevalence of moderate or severe food insecurity in the population (%) in ASEAN countries in 2019



Source: The World Bank

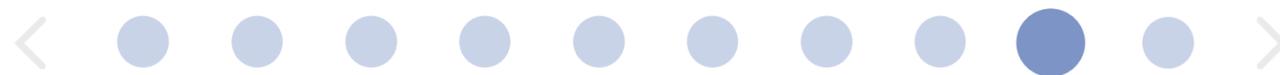
Because food price keeps increasing.

Food price is a huge problem for many families.

FAO Food Price Index (FPI) from January 2000 to August 2022



Since the onset of the **pandemic** in 2020, FPI has been on an **upward trend**.





**But what if we
could eat food
and upcycle all
the waste
sustainably?**





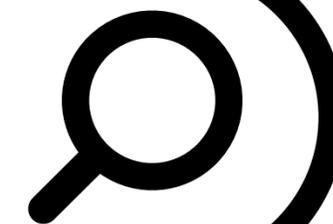
The Earthleigh Plan

The earthy way to sustainability.



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The Earthleigh Plan



News



Maps



Earthleigh Mobile

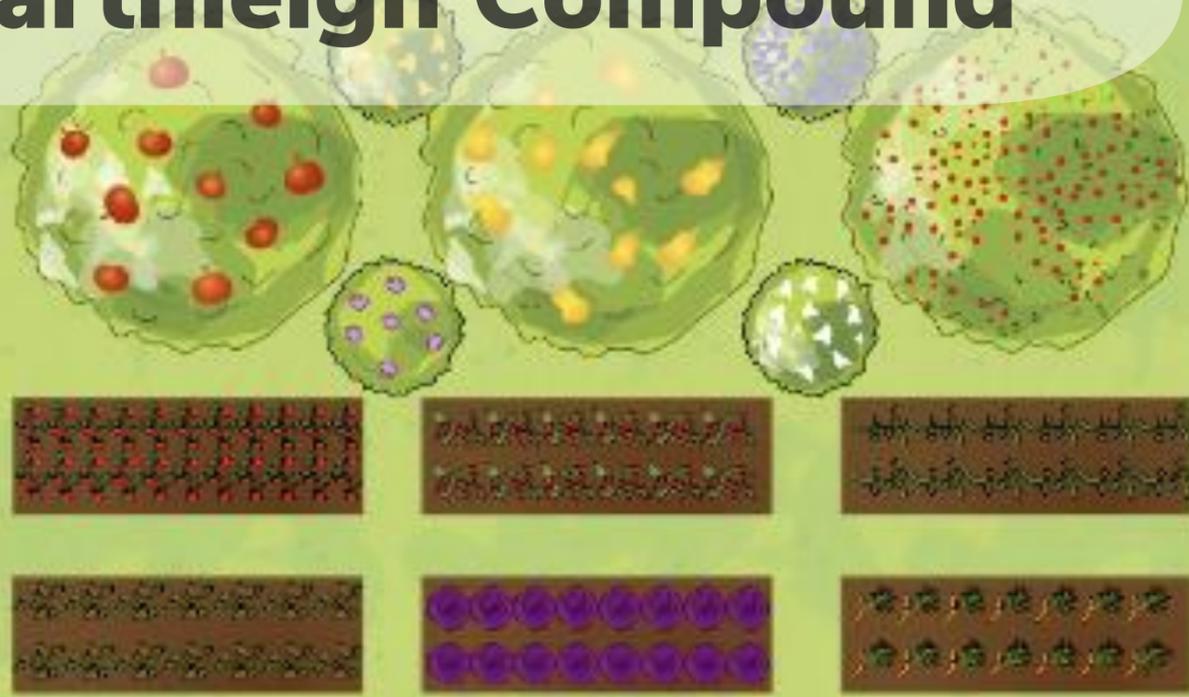


Impact





The Earthleigh Compound



1m



The Earthleigh Compound



Visit Earthleigh in ACNH!
DA-9805-9941-6666



Community Garden

Phase 1 of the Earthleigh Plan.



- Teaches the community about the basics of urban gardening
- Cultivates crops for the local community to share
- Allows green space for peace and relaxation



The Greenplot

Plots dedicated for growing crops.





The Greenhouse

Nursery for seedlings and out-of-season crops.





The Greenspot

Reserved as relaxation spot for peace and quiet.





Community Garden

With food such as...



Rapid Harvests

7 - 40 days

- | | |
|----------------|----------------|
| Cress (7d) | Turnip (30d) |
| Lettuce (21d) | Arugula (30d) |
| Scallion (21d) | Beet (35d) |
| Radish (25d) | Zucchini (40d) |
| Spinach (30d) | Broccoli (40d) |



Regular Crops

50 - 90 days

- | | |
|----------------|------------------|
| Carrot (50d) | Tomato (70d) |
| Cucumber (50d) | Eggplant (75d) |
| Okra (50d) | Watermelon (80d) |
| Pea (55d) | Pumpkin (85d) |
| Corn (70d) | Potato (90d) |



Resident Trees

1 - 8 years

- | | |
|--------------|----------------|
| Banana (1y) | Peach (3y) |
| Papaya (1y) | Tangerine (4y) |
| Moringa (1y) | Guava (4y) |
| Apple (3y) | Mango (8y) |
| Lemon (3y) | Durian (8y) |



Vermiculture Hub

Phase 2 of the Earthleigh Plan.



- Provides an avenue for processing leftover food
- Yields vermicasts used as fertilizer for local crops
- Supplies excess worms that can be fed to poultry



Vermiculture Hub

Where we meet the worms!



Mealworm

- Voracious eaters!
- For leftover foods
- Used as poultry feed
- Produces vermicast



Earthworm

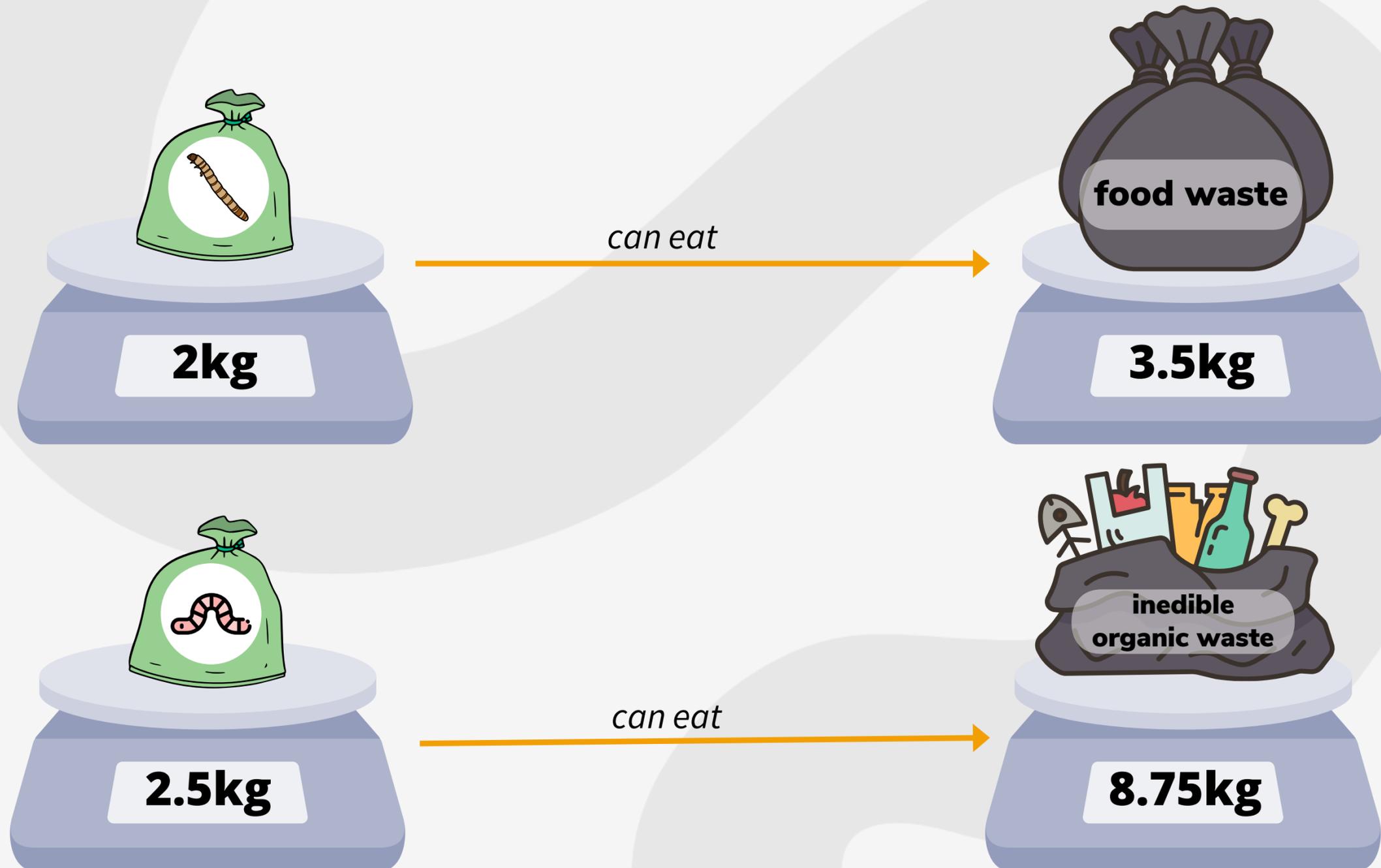
- Slimy friends!
- For inedible organic wastes
- Helps soil aeration
- Produces vermicast



Vermiculture Hub

Leftover food is processed to be useful again.

per
week





Vermiculture Hub

Leftover food is processed to be useful again.

per week



can eat



can eat

Weekly food wastage of the average ASEAN person





Vermiculture Hub

Fertilizer vs. Compost vs. Vermicast

Vermicast is the **best choice** for crop production!



Fertilizer

- Manufactured for plant productivity
- Chemically synthesized
- Instantly available
- Waterways leaching
- Sufficient in nutrients



Compost

- Aerobic degradation of livestock dung
- Naturally produced
- Takes time to process
- Might smell bad
- Sufficient in nutrients



Vermicast

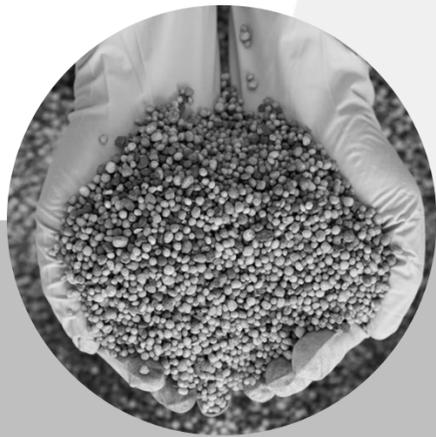
- Castings by worms from organic wastes
- Naturally produced
- Faster to process
- **Environment-friendly**
- **Richer in macronutrients**



Vermiculture Hub

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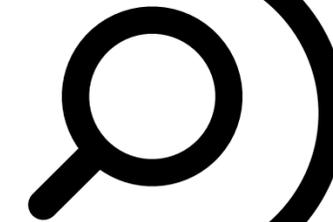


Vermiculture Hub

As it goes!



The Earthleigh Plan



News



Maps



Earthleigh Mobile



Impact





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Phase 3 of the Earthleigh Plan.

Earthleigh Mobile



ONLINE FEATURES



COMMUNITY
CONNECT



Hey, do you have spinach seeds? I could trade some cabbage sprouts for it!

Sure thing! Take some vermicasts with it as well!



People within the community and beyond could reach out with each other to foster camaraderie!



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ONLINE FEATURES



PARTICIPATION
REWARDS

*Because of your continuous support of Earthleigh,
these startup kits are available to you!*



If people dispose their food wastes through Earthleigh, they could be legible for items that could help them start their own urban gardening!



Earthleigh Mobile



**>10
mobile
phones**

per 10 people in ASEAN
in 2019 (except for Laos at
6.08 per 10 people)

Source: ASEAN Secretariat



Earthleigh Mobile



<5
people

per 10 people in Indonesia (4.77), Cambodia (4.05), Myanmar (3.31), and Laos (2.55) have access to the internet in 2019.

Source: ASEAN Secretariat



*Ergo, the Earthleigh supplementary app will prioritize its **offline features** over its online features.*



Earthleigh Mobile

 OFFLINE FEATURES



INFO ON
PLANTED CROPS



Lettuce

Fast Growth: 21d
High in: Vitamin B9, C, Fiber,
and Iron
click for more details



Corn

Average Growth: 70d
High in: Vitamin B1, B9, C, Fiber,
Phosphorus, and Magnesium
click for more details



Pea

Average Growth: 55d
High in: Vitamin A, B9, C, K, Potassium,
Magnesium, Iron, and Zinc
click for more details



Papaya

Slow Growth: 1y
High in: Vitamin A, B1, B5, B9, Copper,
and Magnesium
click for more details



Earthleigh Mobile

 OFFLINE FEATURES



PLANNER FOR
PLANTING



Crop rotation is important to cycle the nutrients in the soil properly!

Earthleigh Mobile



**WATERING
REMINDERS**



**HARVESTING
REMINDERS**



Watering Reminder!

Your beet will wilt in 3 days! Don't forget to water them by then!



Harvesting Reminder!

Your beet will be ready for harvesting in 3 days! Get ready by then!



Watering Reminder!

Your beet are wilting! Water them now and give them some care!

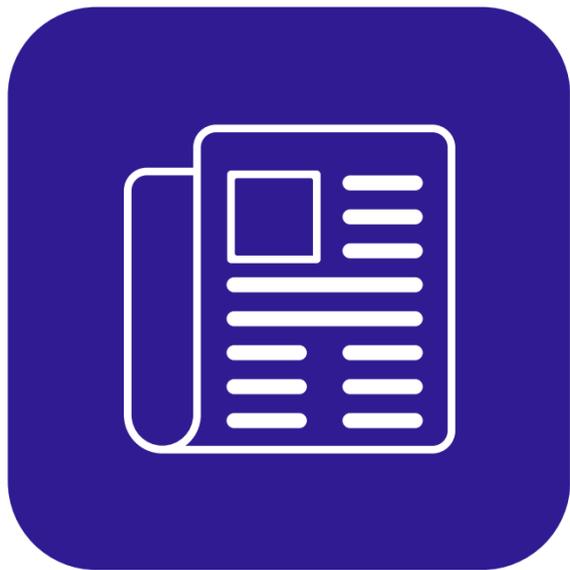
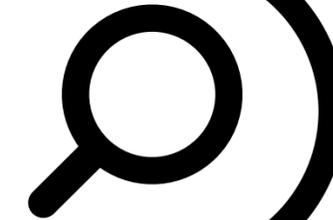


Harvesting Reminder!

Your beet are ready to be harvested! Go get them now!



The Earthleigh Plan



News



Maps



Earthleigh Mobile



Impact





Earthleigh is a team effort,



Local Community



Farms



Local Government



ASEAN & SAP

**and will only be possible with
these stakeholders.**



Food price is on a tightrope.

Aside from the pandemic, other current events are causing food prices to be volatile.

159.7
FPI

from March 2022 is an **ALL-TIME HIGH**

Source: FAO

12.6%
FPI

compared to February 2022, during which the Russo-Ukrainian War escalated

Source: FAO

15%

could be the increase in food prices due to the Russo-Ukrainian War

Source: BBC News

FAO Food Price Index (FPI) since 2020

1M 3M 6M YTD 1Y All



Source: FAO



People cannot afford food and get hungry.

The vicious cycle of poverty.



People struggle with jobs.



People stay and suffer in poverty.





Healthy people can help the community grow further.



People will learn to grow their own food.



The problem with starvation will be eased.

Create a positive feedback loop of sustainability!



The community will become resilient and self-sustaining.



Leftovers can be made as fertilizers to help grow more food.



With **Earthleigh** achieved, so are these 🎯 **AEC** and **ASCC** targets



AEC B.8
Sustainable Economic
Development (41 - vi)

AEC C.5
Food, Agriculture,
and Forestry (57 - i, iii, viii)



ASCC B.2
Equitable Access for All (iii)

ASCC D.5
Enhanced and Optimised
Financing Systems, Food,
Water, Energy Availability,
and other Social Safety Nets in
Times of Crises by making
Resources more Available,
Accessible, Affordable, and
Sustainable (i, iv)

And finally, the following

SDG targets

TARGET 12-2



SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES

By 2030, **achieve the sustainable management and efficient use of natural resources.**

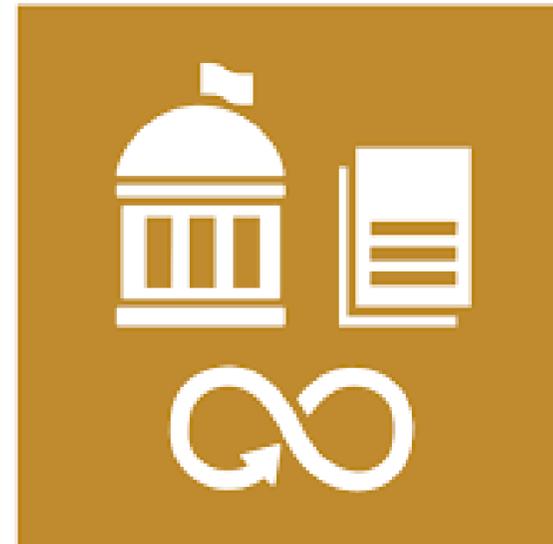
TARGET 12-3



HALVE GLOBAL PER CAPITA FOOD WASTE

By 2030, **halve per capita global food waste** at the retail and consumer levels and **reduce food losses** along production and supply chains, including post-harvest losses.

TARGET 12-7



PROMOTE SUSTAINABLE PUBLIC PROCUREMENT PRACTICES

Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

TARGET 11-6



REDUCE THE ENVIRONMENTAL IMPACT OF CITIES

By 2030, **reduce the adverse per capita environmental impact of cities,** including by paying special attention to air quality and municipal and other **waste management.**

TARGET 11-7



PROVIDE ACCESS TO SAFE AND INCLUSIVE GREEN AND PUBLIC SPACES

By 2030, provide universal access to safe, inclusive and accessible, **green and public spaces,** in particular for women and children, older persons and persons with disabilities.

Let's start Earthleigh.



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- Most graphics used were provided by Canva.
- Mockup of the Earthleigh Compound was provided by Gardena.
- Logos were provided by Google Images.
- Graphs and Figures were provided by SAP.
- Assets from *Animal Crossing: New Horizons* were taken from <https://www.animal-crossing.com/new-horizons/>
- Footages of the Earthleigh Compound were created from the game *Animal Crossing: New Horizons* published by Nintendo.

Addendum 1

Vermicast Details

Vermicast can give agricultural soil **increased moisture retention, better nutrient holding capacity, and superior soil structure.**

Vermicast can result in soil with **lower pathogen levels.**

Vermicast can result in soil **free of toxic waste.**

Earthworms ingest a lot of heavy metals in their body

Earthworms can also break down complex chemicals to non-toxic forms

Vermicast tends to be **higher in phosphorus and potassium** content.

Vermicast tends to be **higher in nitrates** (plant-available form of **nitrogen**).

Earthworms release about 0.01 g nitrate on the soil when they die

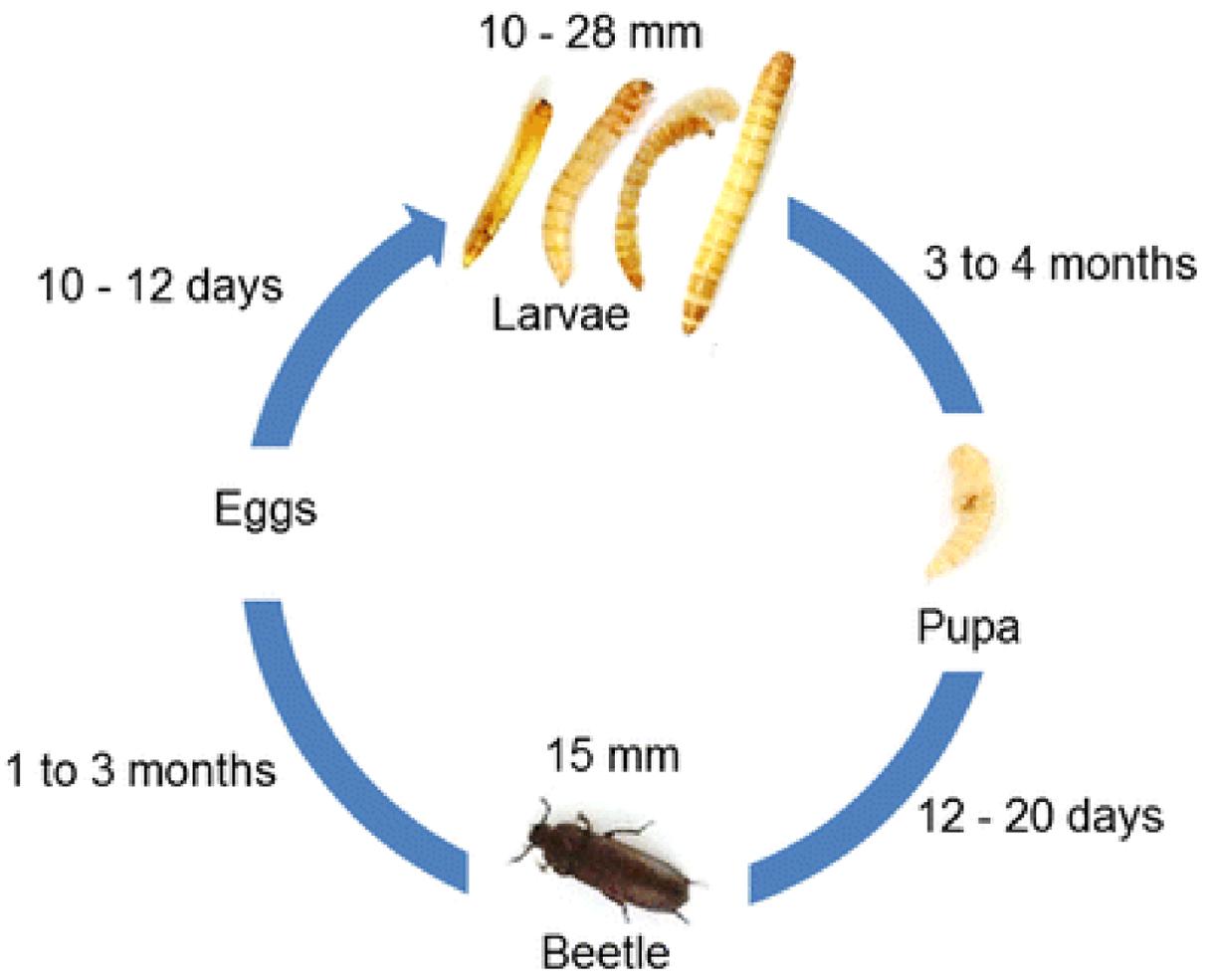
Earthworm excretions can also enrich nitrate content of the soil

 Phosphorus (P), potassium (K), and nitrogen (N) are **primary macronutrients** that allow plant growth.

Addendum 2

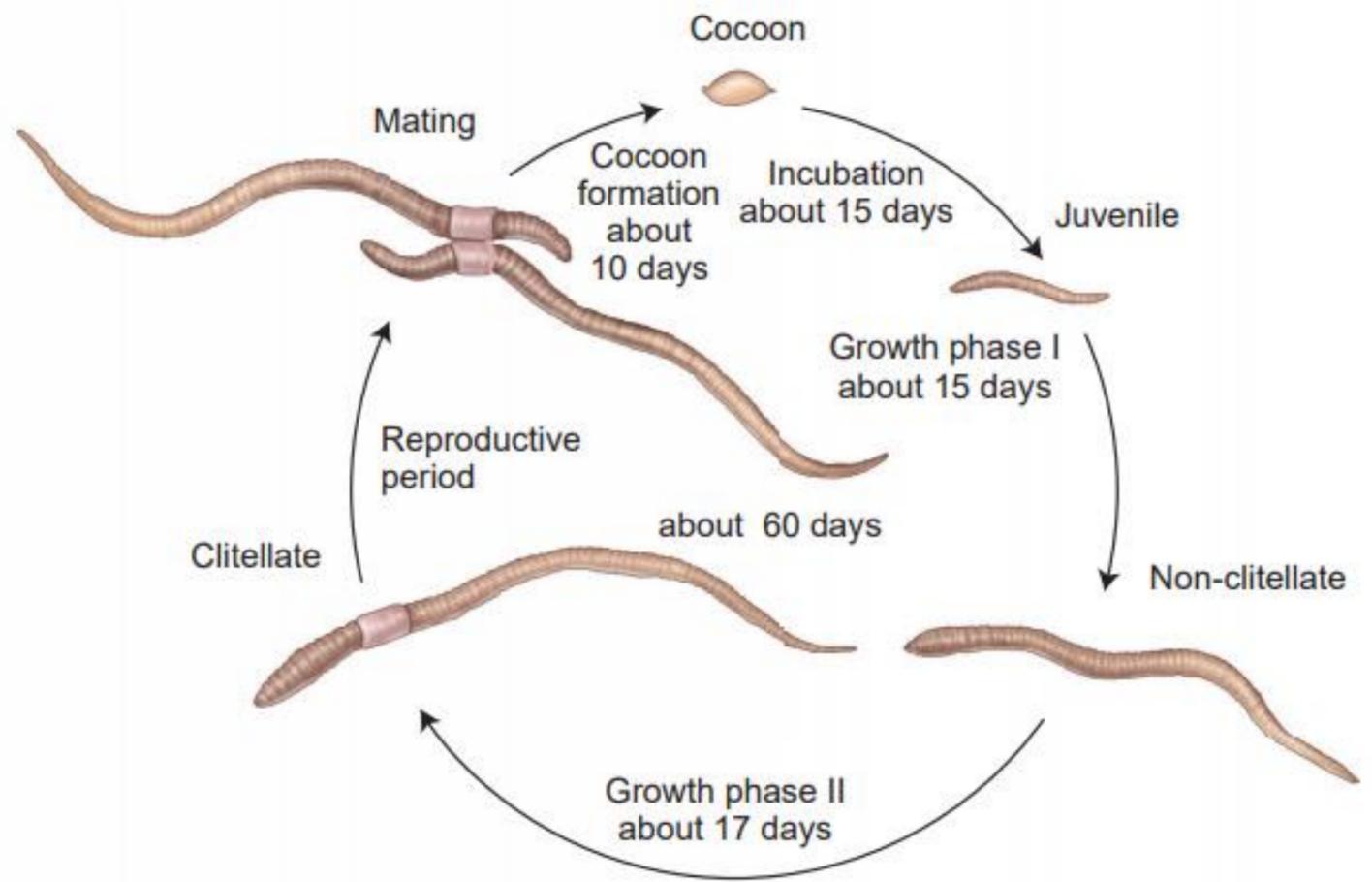
Worm Life

Mealworm Life Cycle



Source: Ong et al., 2018

Earthworm Life Cycle



Source: Gov't of Tamil, Nadu

Gallery 1

Welcome to Earthleigh!



Warm Welcome!



The Earthleigh Staff



Earthleigh Overview 1



Earthleigh Overview 2

Gallery 2

The Community Garden



Harvesting Crops



Sowing Seeds



Caring for Saplings



Residents' Backyards

Gallery 3

The Vermiculture Hub



Spoiled Crops



Wasted Food



Feeding the Worms



Vermiculture Hub Interior

Gallery 4

The Greenspot



Relaxing with Food



Resting After a Day's Work



Food Preparation



Evening Meal

Gallery 5

Compound Construction



Plot Development



Night's Work



Unloading Shipments



Relocation of Wildlife

Gallery 6

Residents' Involvement



Researching the Community



House Visits



Local Greenhouse



Use of Vermicast

Gallery 8

Earthleigh's Impact



Healthy Sprouts



Bountiful Harvests



Relaxed Residents



Food Supply Secured

Gallery 9

Visit Earthleigh!



Come visit Earthleigh!
DA-9805-9941-6666

With your Nintendo Switch, visit Earthleigh through Animal Crossing: New Horizons with the Dream Address above!