

Muinín Catalyst STEAM Education for Sustainable Development and Futures Literacy

SDG2 The Future Of Food



Programme Phase 2: Exploration and Experimentation

Micro-Module 4: Feeding the World Sustainably and Responsibly in the 21st Century

Subject Areas: Art and Design, Agricultural Science, CPSE, Home Economics, SPHE



SDG2 Feeding the World Sustainably and Responsibly in the 21st Century



Micro-Module 4: Feeding the World Sustainably and Responsibly in the 21st Century

Exploration and Experimentation

Subjects: Art and Design, Agricultural Science, CPSE, Home Economics, SPHE

Micro-module Summary: Feeding the World Sustainably and Responsibly in the 21st Century

The last century has seen the emergence of a global society dominated in many ways by multinational corporations and supply chains (or value chains) that stretch from one side of the planet to the next. Services and products produced by companies and industry delivered on scale across the globe have enabled billions of people to move beyond poverty, to feed their families, and gain access to affordable and nutritious food every day. Incredible progress has been achieved for humanity in this era, but a huge price has been paid by mother nature, the animal kingdom, workers, and farming communities all over our planet.

Over these 7 lessons, learners will learn about the value chains behind the everyday goods and foods we consume, gain deep understanding of the link between agriculture and food production, business, human development, and climate change. Students will apply learnings from the lessons through group projects and presentations to address people and planet related challenges existing in real and broken food value chains today.

In this module, the learners will:

- Learn about human progress, population growth and agriculture through the ages
- Understand how our global food systems work
- Learn about the externalities and costs of producing and consuming food
- Learn about value chains, shareholders, profits and stakeholders
- Gain an understanding into the journey of the products in our cupboards

Materials

- Lesson plans
- Worksheets



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Feeding the World Sustainably and Responsibly in the 21st Century

Lesson 1: 2000 Years of Human Agriculture, Population and Progress

Through this lesson we'll learn about the growth in global populations through the ages exploring how population rates have rocketed up in the past century, understanding how and why population is expected to plateau at 10-11 billion by the end of 2100, and explore the links between population growth, agriculture, and food.

Resources: Worksheet: Population Curve Exercise, Worksheet: Nitrogen as Fertiliser, Worksheet: World of Data Links and Questions

Lesson 2: The Food We Eat: Where Does Our Food Come From?

In this lesson, we'll dive into our cupboards, larders, shopping trolleys and bellies to learn what we eat and why, where we buy these foods, where and how they're made, and where they come from.

Resources: Worksheet: The Top Foods We Eat, Worksheet: The Food Pyramid, Worksheet: Breakfast

Lesson 3: Food, Agriculture and Climate Change

In this lesson, we'll learn about the connection between industrial agriculture, our global food systems and climate change. Learners will explore our food systems to understand the various and complex ways in which agriculture impacts the natural world, including through land and water use and the production of greenhouse gases from farming. In this lesson we'll attempt to explore whether a more sustainable and climate friendly way is possible and see if our food systems can be reinvented!

Resources: The Four Impacts of Agriculture Worksheet, Top Foods and their Environmental Impact Worksheet

Lesson 4: From Farm to Fork: The Steps of Food Value Change

Each day our plates are filled with foods that come to us from farmers and producers from every country and continent in the world. The supply chains and value chains behind our food stretch across the globe. In this lesson Learners explore the paths our food travels, learn more about farming, harvesting, production, packaging, and the transport of our food and try to understand the true cost of our food.

Resources: Worksheet: Value Chain Definitions, Worksheet: Bananas and the Steps of a Value Chain, Worksheet: Value Chains in the Media

Lesson 5: Case Studies - Coffee, Tea and Cocoa

Coffee, Tea, and Chocolate (Cocoa) are some of the world's most popular drinks and treats. These are massive global industries worth billions, yet our current model of business sees little of the

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income or profits make their way back to the workers and farmers who put in the hard work to bring these goods to us. In this lesson Learners will look at business as usual in the tea, coffee and cocoa industries and question whether things can be better.

Resources: Worksheet: Ethical Trade Definitions, Worksheet: FairChain and Moyee Coffee, Worksheet: Tony Chocolonely's Chocolate, Worksheet: FrankAboutTea

Lesson 6: Supermarkets, Farmers and our Broken Value Chains

Today we buy most of our food from a handful of supermarkets. These multinational companies are tremendously successful and profitable at delivering all kinds of food to us when and where we want it. They dominate the planet's food supply systems. In this lesson we'll try to understand why the global food system is so broken that farmers can starve and struggle while supermarkets profit and explore whether a better way is possible for the future.

Resources: Worksheet: The Power of Supermarkets, Worksheet; Living Income for Farmers, Worksheet: How to Solve Farmer Poverty?

Lesson 7: Value Chain Exercise

In this lesson, we'll take a deep dive into the value chains behind some of the everyday foods we all enjoy and plot the journey through the value chains these foods make, identifying the human and environmental problems that exist within these food systems, and attempting to discover what innovations and solutions can help change the systems behind our foods to do right by customers, farmers, workers, company owners, and our planet.

Resources: Worksheet: Value Chain Six Stages, People and Planet

Module development and expertise: Killian Stokes, Moyee Coffee Co-Founder and Proudly Made in Africa CEO

Using the Resources:

If you wish to use these resources, we can offer an induction and online support throughout the module to help you plan integration into your projects and timetable. To register for this option, please contact us e:hello@futurefocus21c.com

For more information on the resources please visit www.muinincatalyst.com

Setting up an online learning environment for the lessons on this module:

Our lessons integrate the use of virtual learning environments. To ensure seamless use of our

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lessons, a module should be set up on your school's virtual learning environment such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers.

You can also use Google Sites or Microsoft Sway to encourage learners to present their work over the year - this can easily be set up to reflect the aims of TY and provide a showcase for their work as well as assessment tool.

Setting up a Canva Education account.

If your virtual learning environment does not support document sharing, we recommend OneDrive or Google Drive. As our lessons integrate design, our lessons also refer to Canva. Educators and schools are able to open a free [Canva for Education](#) account by registering. Canva for Education provides primary and secondary school teachers and students with premium features and templates. You can then also set up lessons and invite your learners to the class.

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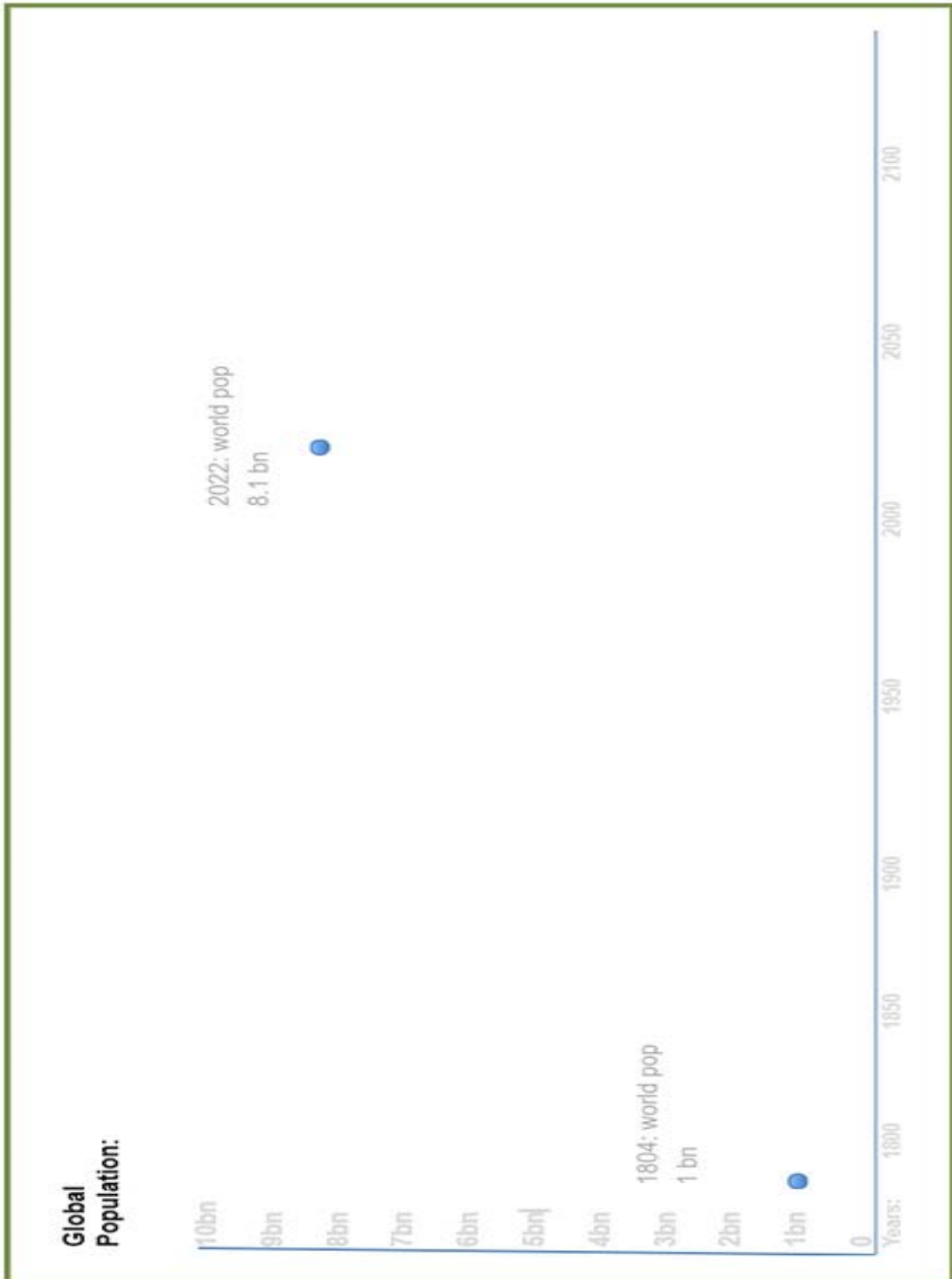
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MM4: L1 WS POPULATION CURVE EXERCISE

2 ZERO HUNGER



Working in pairs, and using the internet to search if required, plot out the timeline for when global population reached 2, 3, 4, 5, 6 and 7 billion and when it is expected to reach 9 and 10 billion.



MM4: L1 WS NITROGEN AS A FERTILIZER

2 ZERO HUNGER



Part 1

The Haber Process is (circle one):

- a. Turning air into fertiliser
- b. Turning water into fertiliser
- c. Turning fertiliser into air
- d. Turning water into air

True or False: A nitrogen gas molecule plus three hydrogen gas molecules gets you two ammonia gas molecules t_____ / f_____

Without the Haber process how many people could farmers feed? _____

Where do plants normally get their nitrogen? _____

What percentage of the air is nitrogen? _____

In what year did Fritz Haber make his discovery?

Part 2

How much ammonia is produced in the world each year? _____

How many elephants would it take to match the weight of that ammonia _____

What % of the ammonia produced is used for fertiliser in agriculture _____

What percentage of fertiliser is not absorbed by these plants _____

Where does this nitrogen go and what does it lead to?

MM4: L2 WS ANALYSIS OF GROWTH OF CROP



Working in pairs, visit the two world of data websites, explore the data and answer the questions below:

First Website: <https://ourworldindata.org/fertilizers>

Question 1: Looking at fertilizer use and using the map view, try to capture the names of the countries that have applied less than 12.5 kg of nitrogen fertiliser per hectare:

Question 2: What do you notice about these countries?

Second Website: <https://ourworldindata.org/crop-yields>

Question 3: Looking at four key crops: corn (maize), rice, cereal & wheat, what are the two smallest yield segments per hectare per crop?

Wheat: _____ & _____
Corn (Maize): _____ & _____
Rice: _____ & _____
Cereal: _____ & _____

Question 4: Name 5 countries from these two lowest performing segments for each of the four crops:

MM4: L2 WS THE TOP FOODS WE EAT

2 ZERO HUNGER



75% of our calories come from just 12 crops and 5 animals.
Can you name them?

You have five minutes to fill in the blanks.

Crop 1: _____

Animal 1: _____

Crop 2: _____

Animal 2: _____

Crop 3: _____

Animal 3: _____

Crop 4: _____

Animal 4: _____

Crop 5: _____

Animal 5: _____

Crop 6: _____

Crop 7: _____

Crop 8: _____

Crop 9: _____

Crop 10: _____

Crop 11: _____

Crop 12: _____

MM4: L2 WS THE TOP FOODS WE EAT

2 ZERO HUNGER



THE TOP FOODS WE EAT

Answers:

Crops:

Wheat, Sugar, Rice, Corn/Maize, Soy, Potatoes, Palm Oil, Cassava, Sorghum, Millet, Groundnut, Sweet Potatoe

Animals:

Cows, Buffalo, Chickens, Pigs, Goats

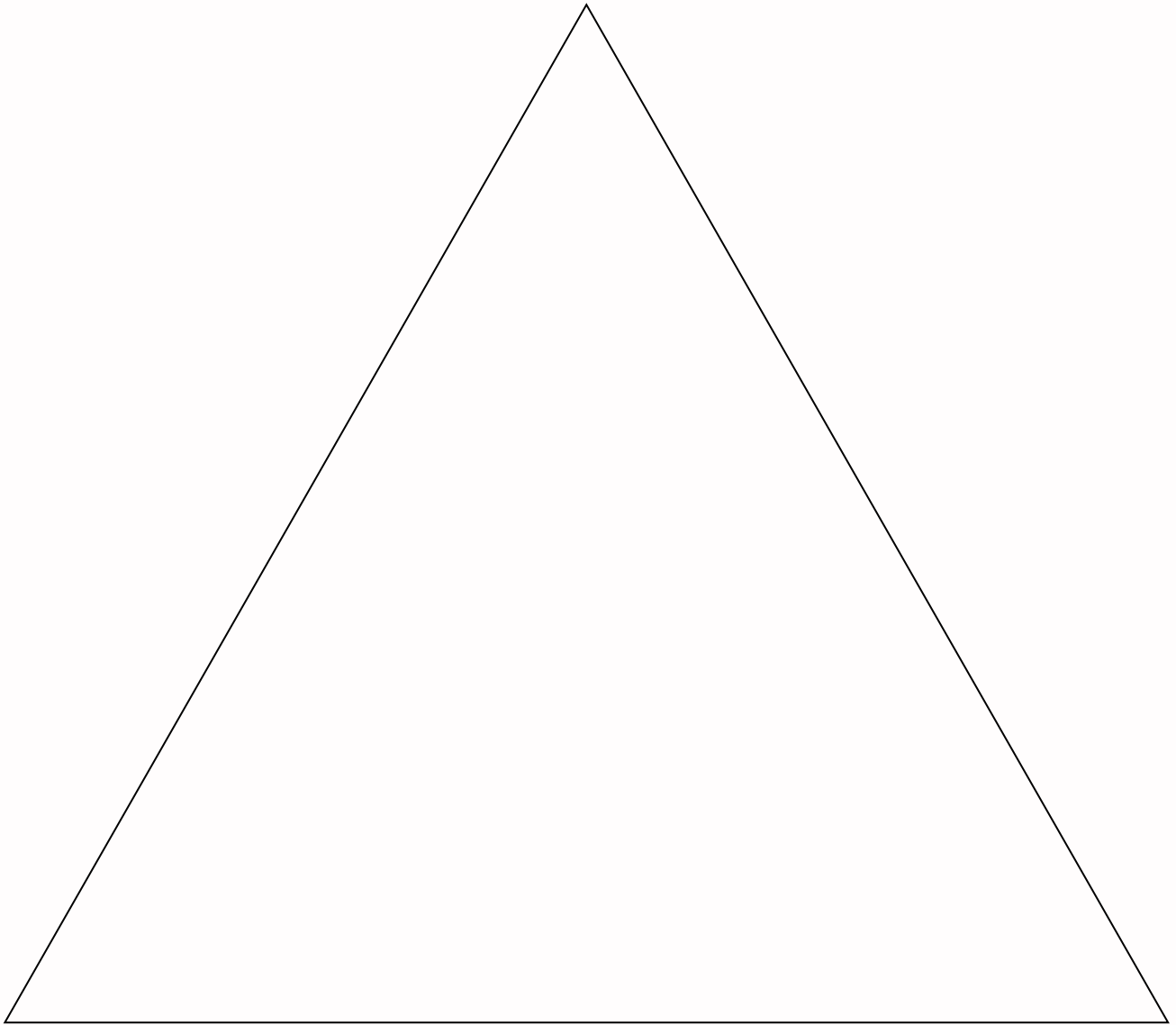
MM4: L2 WS Food Pyramid

2 ZERO HUNGER



Nutritionists typically say there are six different food groups.

Can you name each food group and place them in the food pyramid below?



As a group, can you think of five different food items for each food group?

Draw or write them in the food pyramid above.

MM4: L2 WS FOOD PYRAMID BREAKFAST

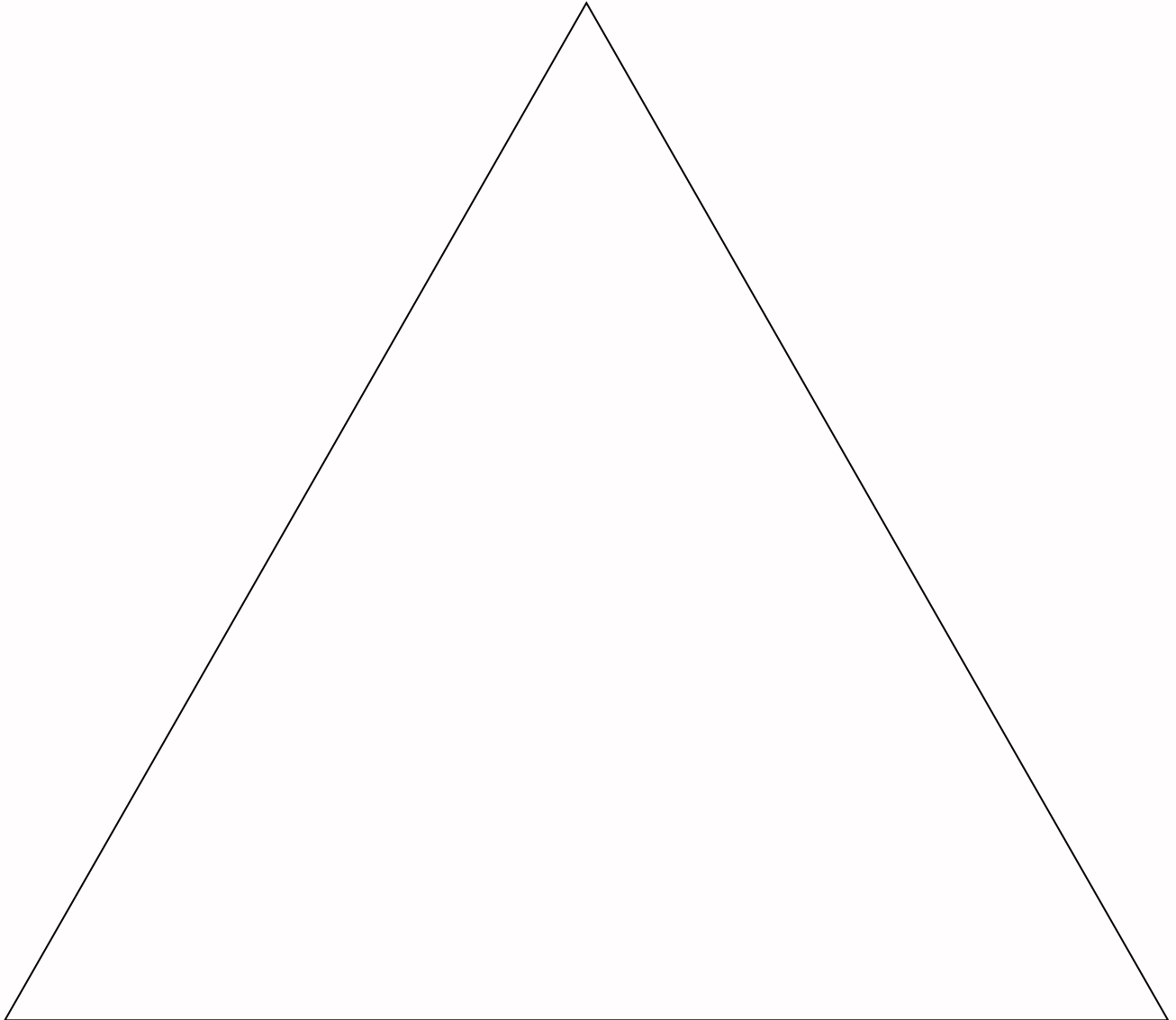
2 ZERO HUNGER



BREAKFAST

Part 1

Using the food pyramid below, brainstorm a typical breakfast in your assigned country and sort each item into an appropriate food group.



MM4: L2 WS FOOD PYRAMID BREAKFAST



BREAKFAST

Part 2

Why do you think the breakfast foods in part 1 are so popular in your assigned country?

Where do you think the breakfast foods in part 1 are made / produced?

How do you think these foods are made / produced?

Do you think we could grow or produce the breakfast foods in part 1 at your home in your assigned country?

MM4: L2 WS FOOD PYRAMID BREAKFAST

2 ZERO HUNGER



BREAKFAST

What is food-miles? Write a definition with your group.

What do you think the relationship between food miles and our carbon footprint is?

What stages of travel and transportation do you think food goes through to reach Ireland?

Do you think your breakfast in part 1 has to travel far to reach your plate? If so, how far?

Where would you buy the breakfast foods in part 1? Are there any alternative places where you could buy these foods?

MM4: L2 WS FOOD PYRAMID BREAKFAST



BREAKFAST

How sustainable do you think your breakfast in part 1 is?

Part 3

We are going to calculate the food miles of our breakfasts from part 1!

First, identify the country of origin of each breakfast food item from part 1:

Now, use www.foodmiles.com & <https://www.distancesfrom.com/> to look up the food miles of each item.

Then, add all of the food miles together.

Does your breakfast have a high amount of food miles or a low amount of food miles?

MM4: L2 WS FOOD PYRAMID BREAKFAST



BREAKFAST

Which of the food items had the highest and lowest food miles? Why do you think this is the case?

Did any of the food items' food miles surprise you? If so, which ones and why?

How could we make our breakfast from part 1 more sustainable? Is there any item that has a high amount of food miles we can do without or replace? If so, what and what could we replace it with?

MM4: L3 WS THE 4 IMPACTS OF AGRICULTURE

2 ZERO HUNGER



As a group, write your own definition for each of the following words:

Land Use:

Water Use:

Carbon Footprint:

Eutrophication:

MM4: L3 WS TOP FOODS ENVIRONMENTAL IMPACT

2 ZERO HUNGER



You will be assigned 1-2 foods from the list below, and a worksheet for each food.

Visit the website: <https://ourworldindata.org/environmental-impacts-of-food>

and interact with the data explorer diagram ensuring your allocated food is showing.

Foods:

1. Beef (Herd)
2. Lamb
3. Pigs
4. Chickens & Poultry
5. Eggs
6. Rice
7. Wheat
8. Sugar Cane
9. Potatoes
10. Maize / Corn
11. Cassava
12. Soy / Soy Milk
13. Bananas
14. Coffee
15. Tomatoes
16. Prawns
17. Nuts
18. Groundnuts
19. Milk
20. Dark Chocolate

MM4: L3 WS TOP FOODS ENVIRONMENTAL IMPACT



Food (write in the name of the food you are researching):

Color in the columns below to the right level of each impact for your food.

Carbon
Footprint p/kg:

100 Kgs CO₂

0 Kgs CO₂

Water
Use p/kg:

6,000 Litres

0 Litres

Land
Use p/kg:

400 sq metres

0 Sq Metres

Eutrophy
p/kg:

400 grams

0 Grams

MM4: L3 WS TOP FOODS ENVIRONMENTAL IMPACT



Food (write in the name of the food you are researching):

Color in the columns below to the right level of each impact for your food.

Carbon
Footprint p/kg:

Water
Use p/kg:

Land
Use p/kg:

Eutrophy
p/kg:

100 Kgs CO2

6,000 Litres

400 sq metres

400 grams

0 Kgs CO2

0 Litres

0 Sq Metres

0 Grams

MM4:L4 WS VALUE CHAIN DEFINITIONS

2 ZERO HUNGER



As a group, write your own definition or description for each of the terms:

What is a Value Chain?

What is an External Cost?

What is a Hidden Cost?

What is the difference between an external cost and a hidden cost?

MM4: L4 WS BANANAS & VALUE CHAINS STAGES

2 ZERO HUNGER



Take notes during the video and attempt to identify the activities for each of the following stages of the value chain. Identify who carries out this work and where this activity takes place.

Stage 1: Farming: What is involved? Who does it?

Stage 2: Harvesting: What is involved? Who does it?

Stage 3: Shipping: What is involved? Who does it?

Stage 4: Production: What is involved? Who does it?

MM4: L4 WS BANANAS & VALUE CHAINS STAGES

2 ZERO HUNGER



Take notes during the video and attempt to identify the activities for each of the following stages of the value chain. Identify who carries out this work and where this activity takes place.

Stage 5: Packaging: What is involved? Who does it?

Stage 6: Selling & Consuming (and waste disposal):

MM4: L4 WS VALUE CHAINS IN THE MEDIA

2 ZERO HUNGER



You will be allocated a media article. Read the article and answer the following questions:

Which stage of the food value chain does the article relate to?

What impact is this issue having?

Is there an impact for the consumer? for farmers? for workers? for the food company/brand?

Who is paying the cost or price of this problem?

Who, if anyone, is solving the issue?

MM4: L4 WS VALUE CHAINS IN THE MEDIA

2 ZERO HUNGER



Article 1:

Supermarkets wasting 200,000 tonnes of food that could go to needy, says charities: <https://www.theguardian.com/business/2022/feb/22/supermarkets-wasting-200000-tonnes-of-food-that-could-go-to-needy-say-charities>

Article 2:

Warning that coffee could disappear from shelves by 2050 due to climate change: <https://www.irishexaminer.com/news/arid-41081876.html>

or

Sustainability of global coffee production 'at risk' - report: https://www.rte.ie/news/2019/0117/1023727-coffee_at_risk/

Article 3:

Container ship begins exit from Suez Canal 106 days after getting stuck: <https://www.rte.ie/news/world/2021/0707/1233615-suez-canal/>

Article 4:

In the year to end child labour, COVID wreaks havoc: The pandemic has fuelled trafficking of children to work in mines and cocoa plantations: <https://www.irishtimes.com/news/world/in-the-year-to-end-child-labour-covid-wreaks-havoc-1.4762320>

or

Mars, Nestle, and Hershey to face child slavery lawsuit in US: <https://www.theguardian.com/global-development/2021/feb/12/mars-nestle-and-hershey-to-face-landmark-child-slavery-lawsuit-in-us>

MM4: L5 WS ETHICAL TRADE DEFINITIONS

2 ZERO HUNGER



As a group, write your own definition or description for each terms below

What is Fairtrade?

What is Rainforest Alliance?

What is the B Corp Movement?

What is FairChain?



CASE STUDY 1: MOYEE COFFEE

Visit the [moyeecoffee.ie](https://www.moyeecoffee.ie) and [moyeecoffee.com](https://www.moyeecoffee.com) websites to learn about the radical approach of this impact driven “fairchain” coffee company. Refer to their impact report: <https://www.moyeecoffee.com/wp-content/uploads/2023/01/Moyee-Coffee-Impact-Report.pdf>
Answer the following questions:

When was the company founded? _____

Where is the company based? _____

What is the mission or purpose of the company?

How big is the company? _____

Describe how the company operates through out the six stages of the value chain?

What is the main impact focus of the company?

MM4: L5 WS CASE STUDY MOYEE COFFEE



CASE STUDY 1: MOYEE COFFEE

How does the company differ from other coffee companies?

In your view can the company's approach be mainstreamed and adopted as the global norm in the coffee industry?

What challenges might be faced by the global coffee industry to adopt Moyee's approach?

MM4: L5 WS CASE STUDY TONY'S CHOCOLONELY

2 ZERO HUNGER



CASE STUDY 2: TONY'S CHOCOLONELY

Visit the tonyschocolonely.com/uk/en/ website to learn more about this company's efforts to create the world's first slave free bar of chocolate. Refer to their impact report: <https://tonyschocolonely.com/us/en/annual-fair-reports/annual-fair-report-2021-2022> Answer the following questions:

When was the company founded? _____

Where is the company based? _____

What is the mission or purpose of the company?

How big is the company? _____

Describe how the company operates through out the six stages of the value chain?

What is the main impact focus of the company?

MM4: L5 WS CASE STUDY TONY'S CHOCOLONELY

2 ZERO HUNGER



CASE STUDY 2: TONY'S CHOCOLONELY

How does the company differ from other chocolate companies?

In your view can the company's approach be mainstreamed and adopted as the global norm in the chocolate industry?

What challenges might be faced by the global chocolate industry to adopt Tony's Chocolonely's approach?

MM4: L5 WS CASE STUDY FRANKBOUTTEA



CASE STUDY 3: FRANKBOUTTEA

Visit the frankabouttea.com website to learn more about this company's efforts to redesign the value chain for tea. Answer the following questions:

When was the company founded? _____

Where is the company based? _____

What is the mission or purpose of the company?

How big is the company? _____

Describe how the company operates through out the six stages of the value chain?

What is the main impact focus of the company?

MM4: L5 WS CASE STUDY FRANKABOUTTEA

2 ZERO HUNGER



CASE STUDY 3: FRANKABOUTTEA

How does the company differ from other tea companies?

In your view can the company's approach be mainstreamed and adopted as the global norm in the tea industry?

What challenges might be faced by the global tea industry to adopt FrankAboutTea's approach?

MM4: L6 WS THE POWER OF SUPERMARKETS

2 ZERO HUNGER



Supermarkets in Ireland:

<https://www.checkout.ie/tag/kantar> https://www.theconsumergoodsforum.com/wp-content/uploads/2022/07/Global-Summit-2022_Irish-Retail-Scene.pdf

Try to name the top five supermarkets in Ireland?

1. _____
2. _____
3. _____
4. _____
5. _____

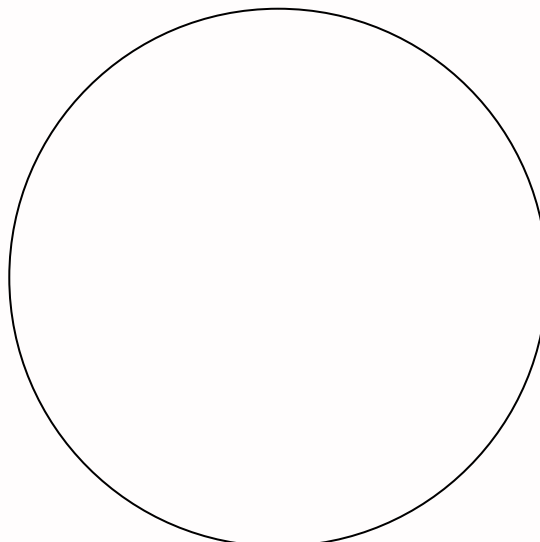
How many stores does each supermarket have across the country?

1. _____
2. _____
3. _____
4. _____
5. _____

What share of the grocery market does each supermarket possess?

1. _____
2. _____
3. _____
4. _____
5. _____

Using the circle below create a pie chart of the Irish retail food market:



MM4: L6 WS THE POWER OF SUPERMARKETS

2 ZERO HUNGER



THE POWER OF SUPERMARKETS

Repeat the exercise for two other EU countries of your choice.

Country name: _____

Try to name the top five supermarkets in this country?

1. _____
2. _____
3. _____
4. _____
5. _____

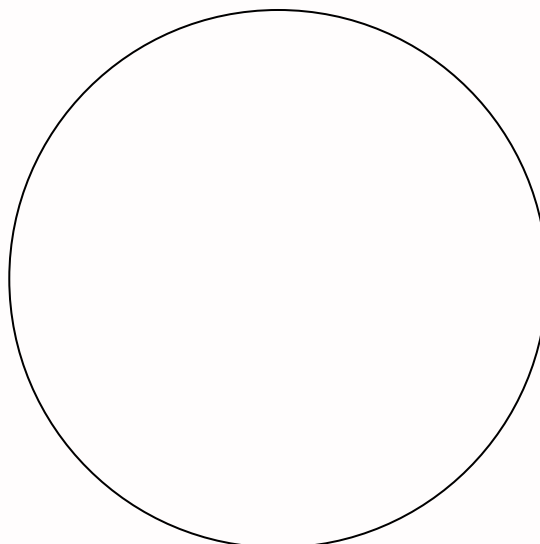
How many stores does each supermarket have across the country?

1. _____
2. _____
3. _____
4. _____
5. _____

What share of the grocery market does each supermarket possess?

1. _____
2. _____
3. _____
4. _____
5. _____

Using the circle below create a pie chart of the country's retail food market:



MM4: L6 WS THE POWER OF SUPERMARKETS

2 ZERO HUNGER



THE POWER OF SUPERMARKETS

Repeat the exercise for two other EU countries of your choice.

Country name: _____

Try to name the top five supermarkets in this country?

1. _____
2. _____
3. _____
4. _____
5. _____

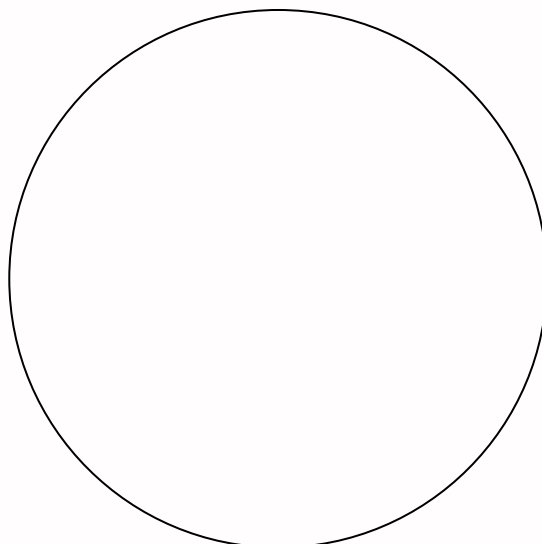
How many stores does each supermarket have across the country?

1. _____
2. _____
3. _____
4. _____
5. _____

What share of the grocery market does each supermarket possess?

1. _____
2. _____
3. _____
4. _____
5. _____

Using the circle below create a pie chart of the country's retail food market:



MM4: L6 WS LIVING INCOME FOR FARMERS



As a group, take five minutes to explore the following four diagrams:

Charts taken from the Oxfam report Ripe for Change:

<https://policy-practice.oxfam.org/resources/ripe-for-change-ending-human-suffering-in-supermarket-supply-chains-620418/>

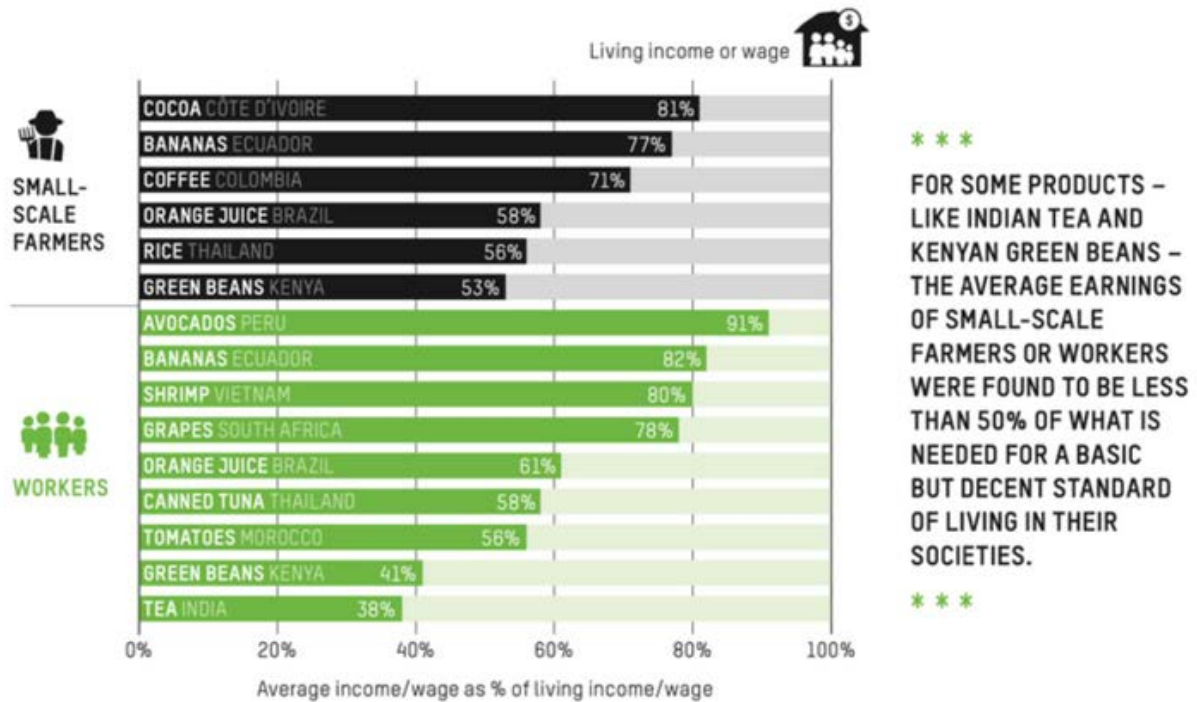


FIGURE 9: FOR CERTAIN PRODUCTS, THE INEQUALITY BETWEEN SUPERMARKETS AND THE PEOPLE PRODUCING THE FOOD THEY SELL IS PARTICULARLY STARK



Source: C. Alliot et al. (Forthcoming). Distribution of Value and Power in Food Value Chains. Oxfam-commissioned research undertaken by BASIC.

MM4: L6 WS LIVING INCOME FOR FARMERS



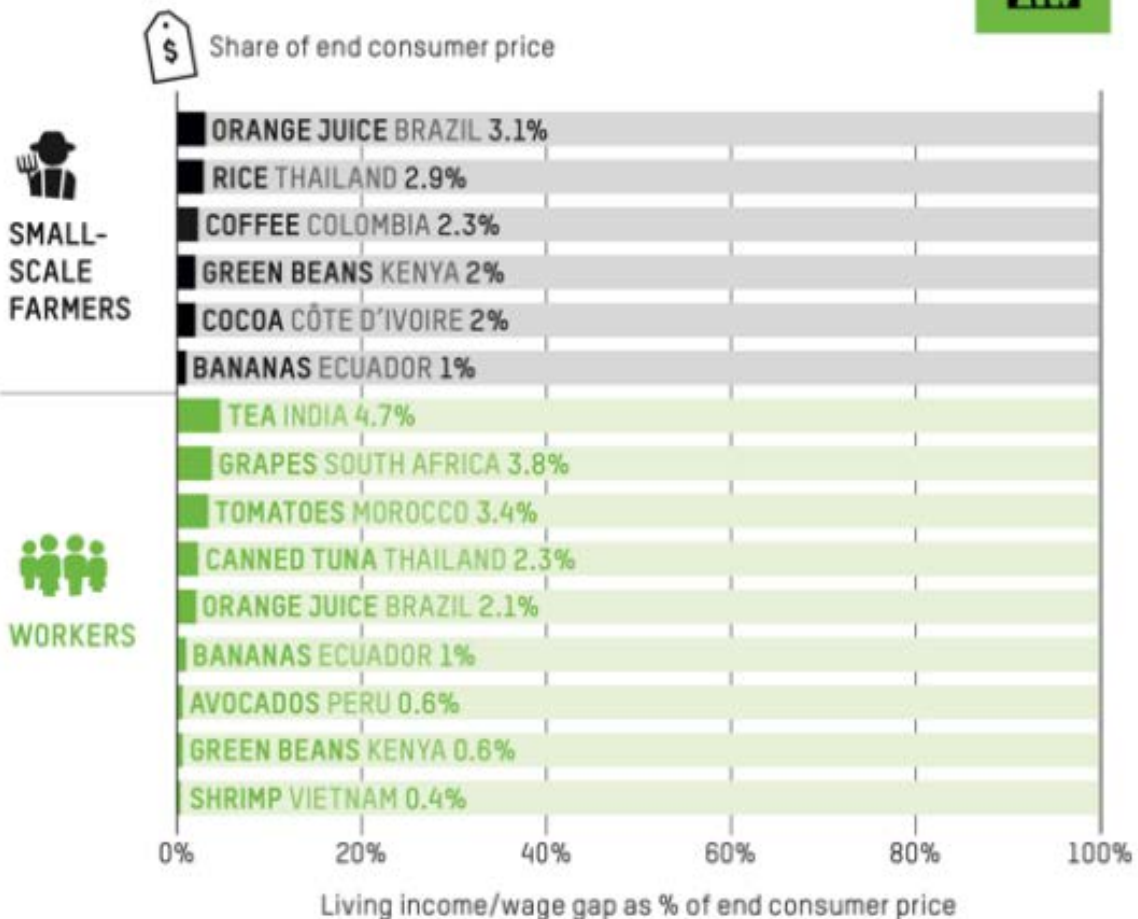
As a group, take five minutes to explore the following four diagrams:

Charts taken from the Oxfam report Ripe for Change:

<https://policy-practice.oxfam.org/resources/ripe-for-change-ending-human-suffering-in-supermarket-supply-chains-620418/>

FIGURE 10: FOR MANY PRODUCTS, THE INVESTMENT NEEDED TO CLOSE THE GAP BETWEEN PREVAILING AND LIVING INCOMES OR WAGES IS MARGINAL COMPARED TO THE END CONSUMER PRICE

Cost of closing living wage/income gap



Note: Data as of 2015. Some commodities appear twice, as they are both produced by small-scale farmers and by waged workers on large-scale plantations, in processing facilities or on fishing vessels.

Source: C. Alliot et al. (Forthcoming). Distribution of Value and Power in Food Value Chains. Oxfam-commissioned research undertaken by BASIC.

MM4: L6 WS LIVING INCOME FOR FARMERS

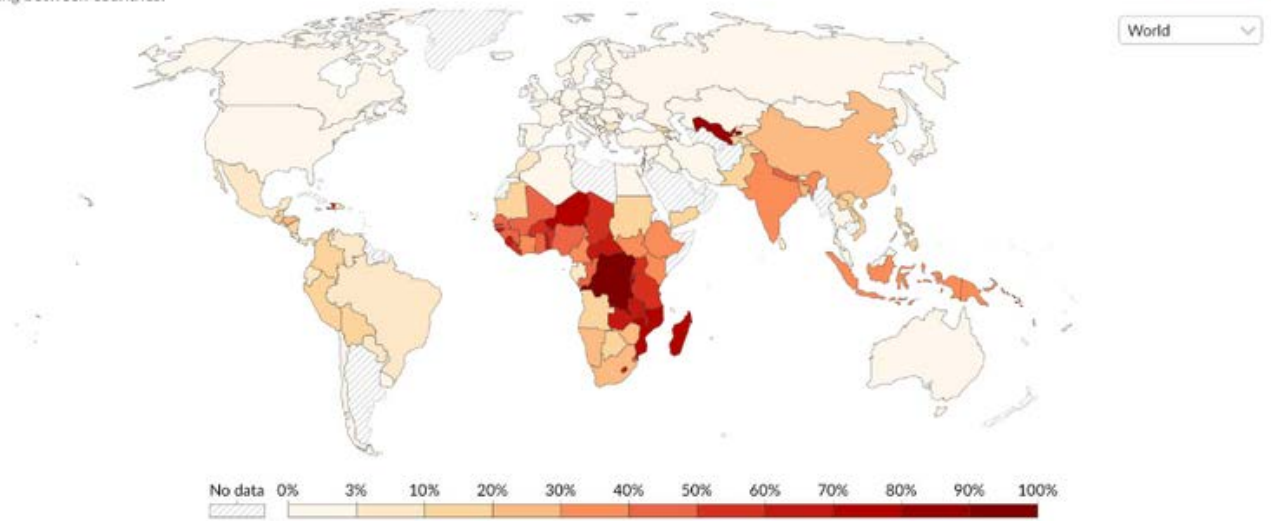


As a group, take five minutes to explore the following four diagrams:

Sourced from World in data website: <https://ourworldindata.org/poverty>

Share of population living in extreme poverty, 2006

Extreme poverty is defined as living below the International Poverty Line of \$2.15 per day. This data is adjusted for inflation and for differences in the cost of living between countries.



Source: World Bank Poverty and Inequality Platform (2022)

Note: This data is expressed in international-\$ at 2017 prices. Depending on the country and year, it relates to income measured after taxes and benefits, or consumption, per capita.

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▶ 1967 ————— 2021

Discuss your thoughts and impressions on the four charts above and the information they convey. Record your comments and observations below:

Search the internet to understand what a living income for farmers means. What various components might this include? In your own words, provide a definition for a living income in the box below.

MM4: L6 WS HOW TO SOLVE FARMER POVERTY?

2 ZERO HUNGER



As a team discuss, research, and identify 3 ways these 4 different groups can help improve wages and prosperity for farmers:

Consumers

Governments

Farmers

Supermarkets, Brands and Companies



MM4: L7 WS THE SIX VALUE CHAIN STAGES

VALUE CHAIN SIX STAGES, PEOPLE + PLANET

You will be assigned one of the following foods: orange juice, rice, coffee, cocoa, bananas, green beans, tea, coffee, prawns, or avocado. Use the additional resources worksheet and the internet to search the six stages of the value chain for your food. Use the questions in each stage to guide your search.

Our food is: _____

Stage 1: Farming

Description of this stage (activities, work, outputs):

What people are involved in this stage?

What people are impacted by this stage (local or international community, good and bad impacts)?

What materials / stuff / items are used in this stage?

What are the social impacts from this stage?

How does this work impact workers, farmers, their families, their communities?

What are the environmental outputs / impact / cost from this stage?

What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?

What pollution is generated by this stage in the value chain?

What solutions / innovations or different approaches can be used to fix these problems?

MM4: L7 WS THE SIX VALUE CHAIN STAGES

2 ZERO HUNGER



VALUE CHAIN SIX STAGES, PEOPLE + PLANET

Stage 2: Harvesting

Description of this stage (activities, work, outputs):

- What people are involved in this stage?
- Does the family get involved in harvesting?
- Are there seasonal workers? How is life for them?
- Are children involved working the harvest?
- Is harvesting dangerous?
- What people are impacted by this stage (local or international community, good and bad impacts)?
- What materials / stuff / items are used in this stage?
- What are the social impacts from this stage?
- How does this work impact workers, farmers, their families, their communities?
- What are the environmental outputs / impact / cost from this stage?
- What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?
- What pollution is generated by this stage in the value chain?
- What solutions / innovations or different approaches can be used to fix these problems?

MM4: L7 WS THE SIX VALUE CHAIN STAGES



VALUE CHAIN SIX STAGES, PEOPLE + PLANET

Stage 3: Production

Description of this stage (activities, work, outputs):

What people are involved in this stage?

What people are impacted by this stage (local or international community, good and bad impacts)?

What materials / stuff / items are used in this stage?

What machinery is involved in production?

What energy source is used?

Are there chemicals or other materials added during production?

Is there pollution or run off from the production process?

What are the social impacts from this stage?

How does this work impact workers, farmers, their families, their communities?

What are the environmental outputs / impact / cost from this stage?

What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?

What pollution is generated by this stage in the value chain?

What solutions / innovations or different approaches can be used to fix these problems?

MM4: L7 WS THE SIX VALUE CHAIN STAGES

2 ZERO HUNGER



VALUE CHAIN SIX STAGES, PEOPLE + PLANET

Stage 4: Packaging

Description of this stage (activities, work, outputs):

What people are involved in this stage?

What people are impacted by this stage (local or international community, good and bad impacts)?

What materials / stuff / items are used in this stage?

Is the packaging paper / plastic / other materials?

Is there packaging for transport separate from consumer packaging?

Where does this packaging go after its used?

What are the social impacts from this stage?

How does this work impact workers, farmers, their families, their communities?

What are the environmental outputs / impact / cost from this stage?

What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?

What pollution is generated by this stage in the value chain?

What solutions / innovations or different approaches can be used to fix these problems?

MM4: L7 WS THE SIX VALUE CHAIN STAGES

2 ZERO HUNGER



VALUE CHAIN SIX STAGES, PEOPLE + PLANET

Stage 5: Transport

Description of this stage (activities, work, outputs):

What people are involved in this stage?

What people are impacted by this stage (local or international community, good and bad impacts)?

What distances are involved?

What shipping methods are involved? By sea or air, rail or truck?

What materials / stuff / items are used in this stage?

What are the social impacts from this stage?

How does this work impact workers, farmers, their families, their communities?

What are the environmental outputs / impact / cost from this stage?

What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?

What pollution is generated by this stage in the value chain?

What solutions / innovations or different approaches can be used to fix these problems?

MM4: L7 WS THE SIX VALUE CHAIN STAGES

2 ZERO HUNGER



VALUE CHAIN SIX STAGES, PEOPLE + PLANET

Stage 6: Sales, consumption and after life

Description of this stage (activities, work, outputs):

Lined area for writing a description of the stage.

What happens the product once it has been eaten / consumed?

Is there packaging? Waste from the cooking / preparing stage?

Who deals with the waste and where does it go?

Where is the product sold and stored?

What people are involved in this stage?

What people are impacted by this stage (local or international community, good and bad impacts)?

What materials / stuff / items are used in this stage (buildings, shelves, electricity, storage and display boxes, refrigeration)?

What are the social impacts from this stage?

How does this work impact workers, farmers, their families, their communities?

What are the environmental outputs / impact / cost from this stage?

What impact is this stage having on water use, land use, water discharge and runoff, pollution, noise, light?

What pollution is generated by this stage in the value chain?

What solutions / innovations or different approaches can be used to fix these problems?