

Food Security, Climate Change and COVID-19

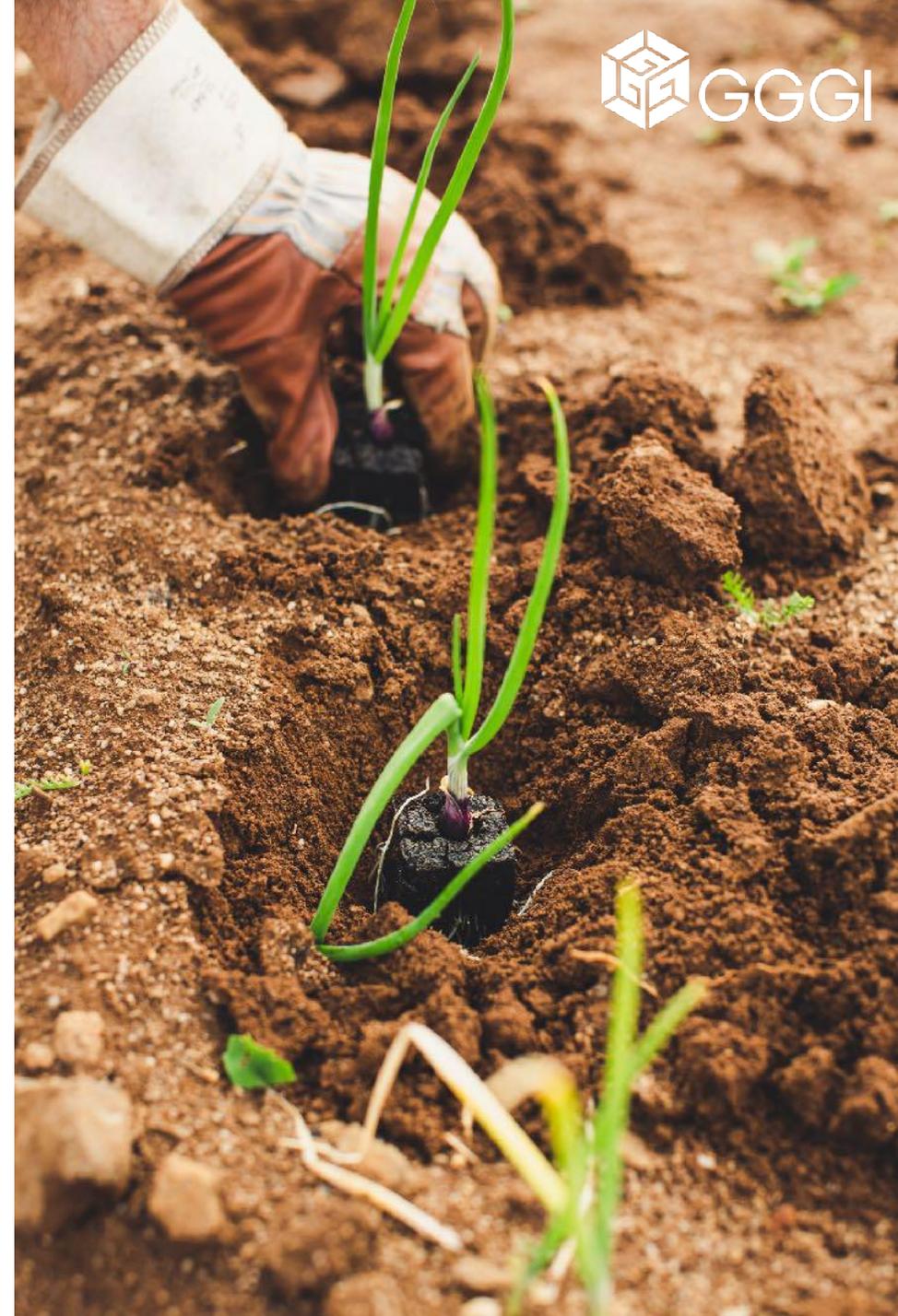
Frank Rijsberman; Director General, GGGI
2020 Global ODA Forum for Sustainable Agricultural Development

November 9, 2020



Overview

- The Sustainability Crisis for Agri-Food Systems
- Climate Smart Agriculture, Bonn Challenge, 4P1000
- Green Growth opportunities related to agri-food systems
- GGGI's work on sustainable landscapes
- Conclusions



The Climate Crisis: heat waves, fires, floods, droughts intensify



2018: Floods in **Kerala** worst in a hundred years
2019: Cyclone Idai destroys **Mozambique**



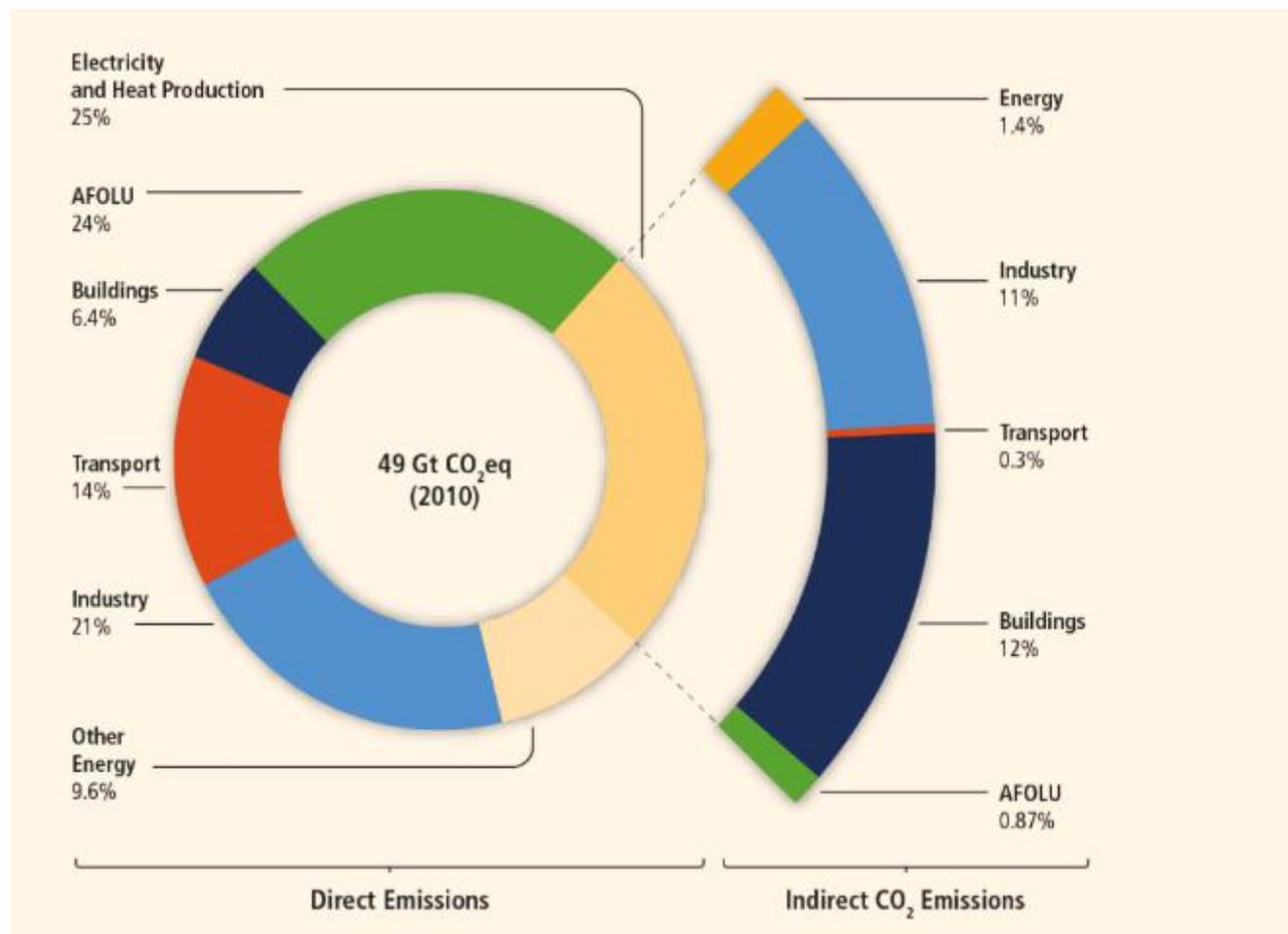
2018: Republic of **Korea** sets all-time record high temperature amid deadly heat wave
2019: Record heat waves in **Europe**



2018-20: Increasingly massive forest fires in **Arctic, Australia, California** and intense droughts affecting millions of people

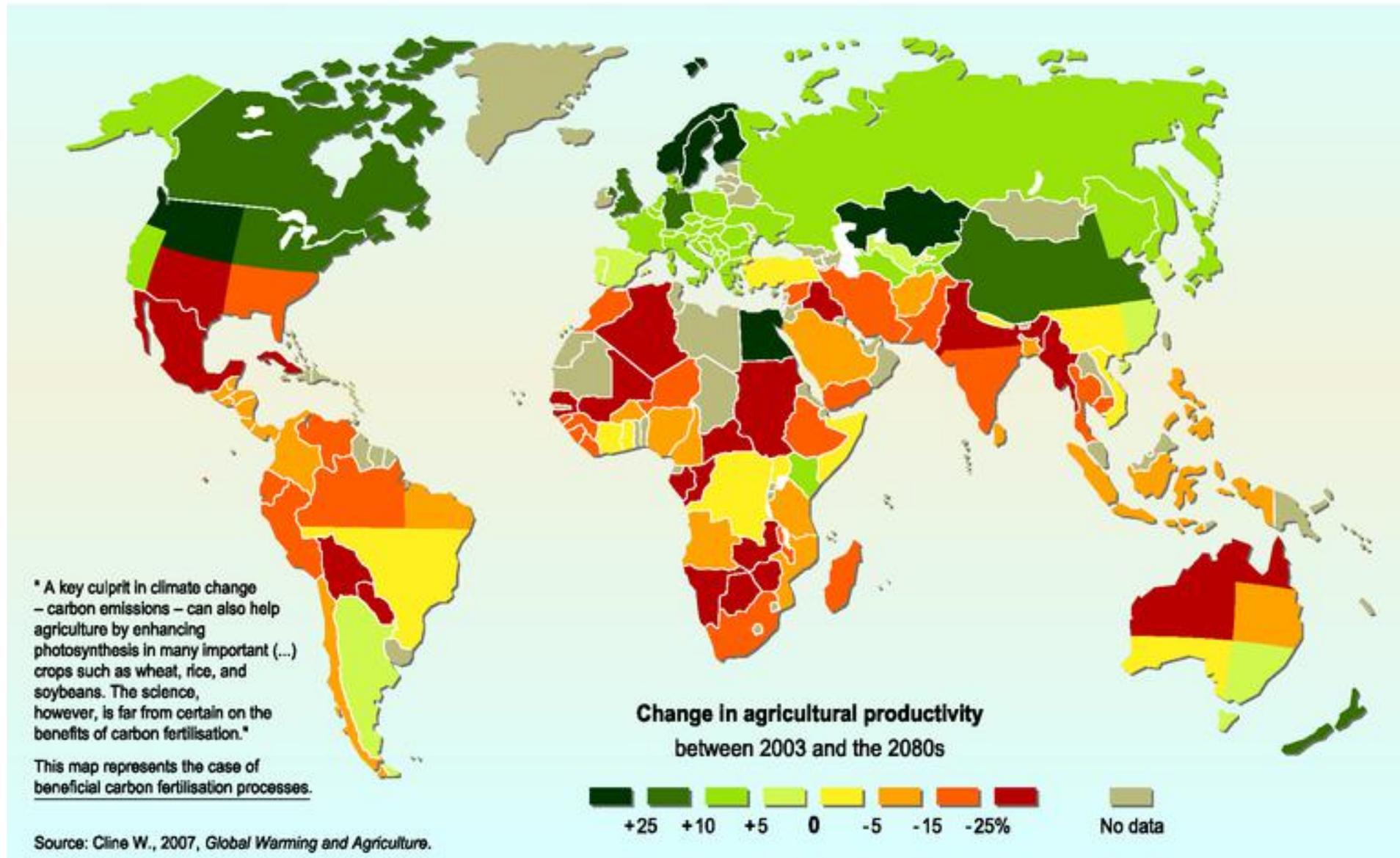
Agri-food systems as driver of climate change

Agriculture-related activities 19-29% of greenhouse gas emissions (2010)



and half of all ag-related
GHG emissions are
from the livestock sector

Projected impact of climate change on agricultural yields

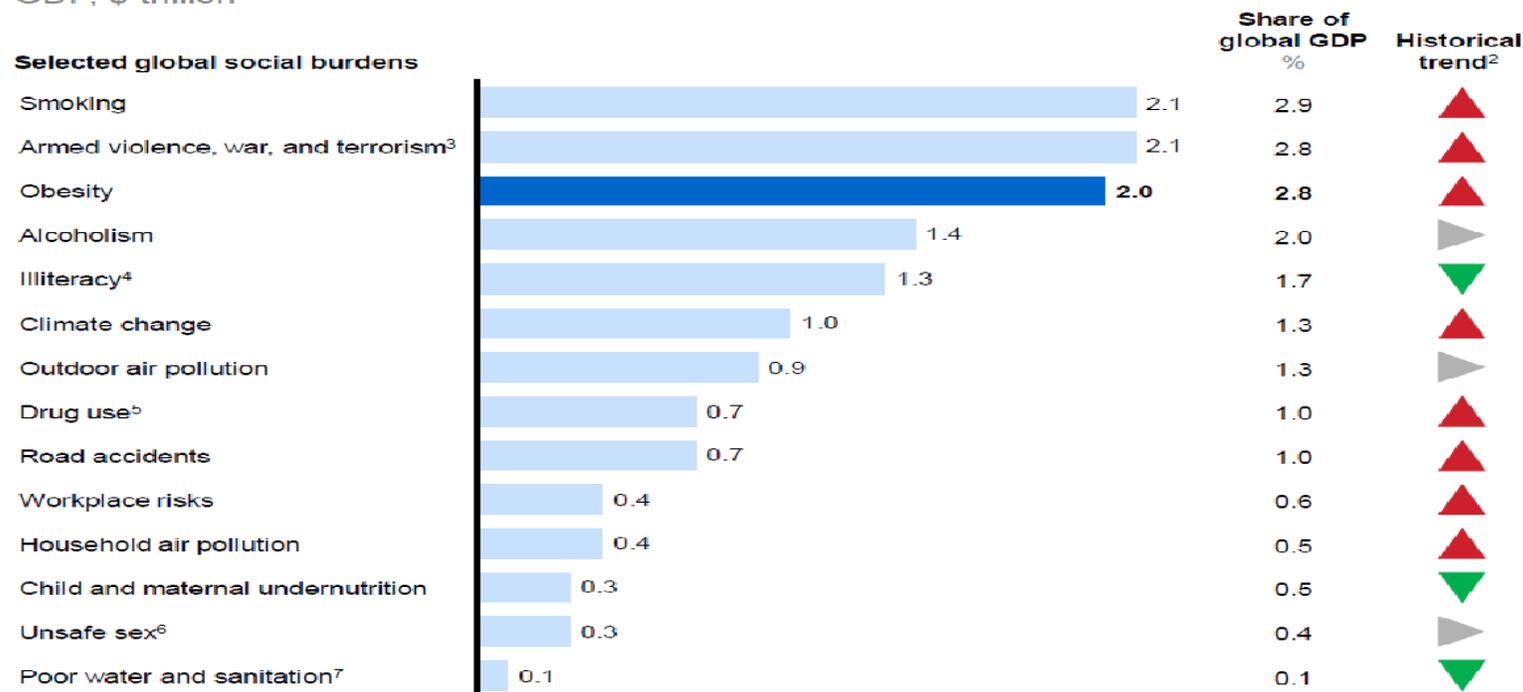


Food / Diet has become the #1 cause of ill health, overtaking smoking ..

Exhibit E1

Obesity is one of the top three global social burdens generated by human beings

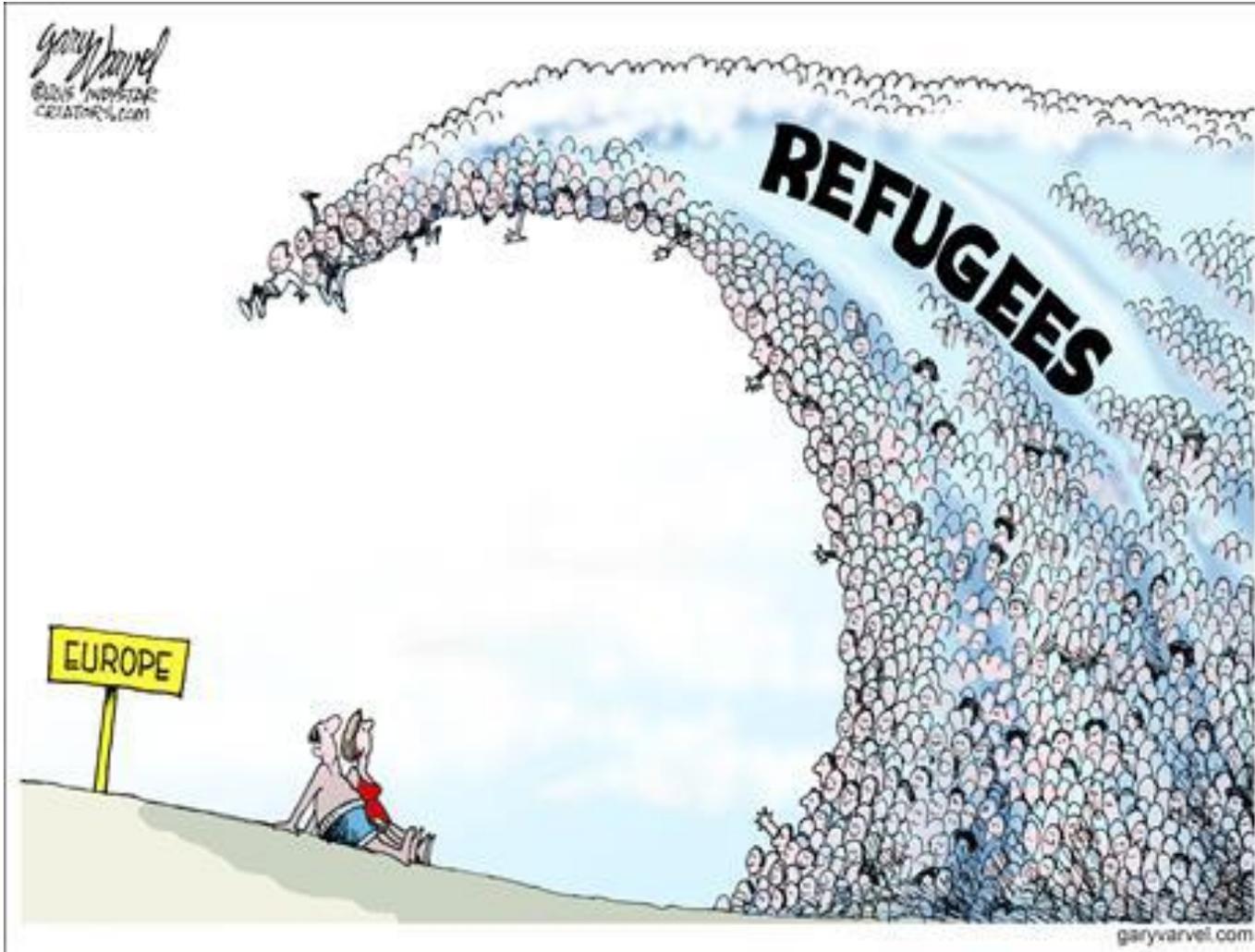
Estimated annual global direct economic impact and investment to mitigate selected global burdens, 2012¹
GDP, \$ trillion



.. with 2 billion people malnourished and another 2 billion people overweight and obese

- Too much food
- Too much sugar
- Too much processing
- Real food deserts
- Poor people eat bad food

2015 EU Refugee Crisis caused by unemployment, and conflicts over resources



- Massive un (under)-employment in rural areas
- In Africa 60% of the next generation will realistically have to find work in agri-food systems

Simply put, the challenges for Agri-Food Systems are that:

- The food we produce and eat is not healthy enough
- The planet is not healthy as a result of the food we produce
- Un(der)employment in rural areas is leading to refugee crises
- Agri-Food Systems need a *radical overhaul* - *animal sourced food particularly*
- *We need a more sustainable and inclusive model of growth* - **Green Growth**





The COVID19 Crisis: What has changed?

- COVID-19 has changed our lives more rapidly than anyone could imagine.
- For many it is a sign that our old life was not sustainable.
- Air pollution and obesity are aggravating factors for COVID-19
- Can we green the COVID recovery?
- How will the economic crisis affect green growth?
- Can we go back to our old lives?
- Can there be a Green New Deal?



A high-angle photograph of a person wearing a face mask and pulling a suitcase, standing in a queue line. The queue is formed by blue stanchions connected by a dark blue rope. Red circular markers are placed on the light-colored tiled floor to indicate social distancing. The scene is brightly lit, with shadows cast across the floor.

Achieving Green Growth & Climate Action Post COVID-19

GGGI Technical Report No. 13

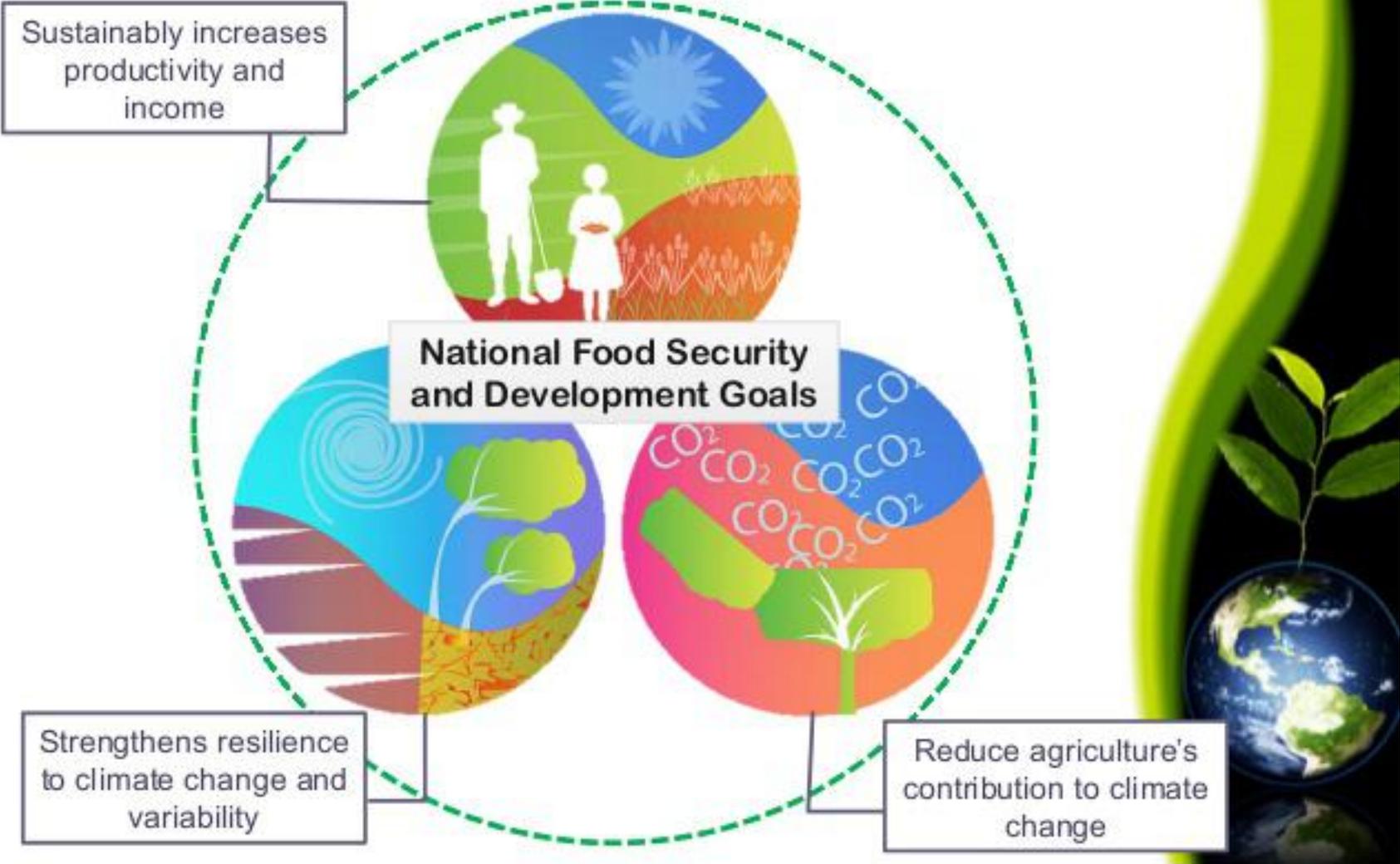
Can we build back Better ?

In this report, **GGGI** explores the challenges and opportunities posed by the **COVID-19 pandemic**, the links between health and climate crises, and the lessons we have learned from past disasters to **build back better**.

July 2020



What is CSA?

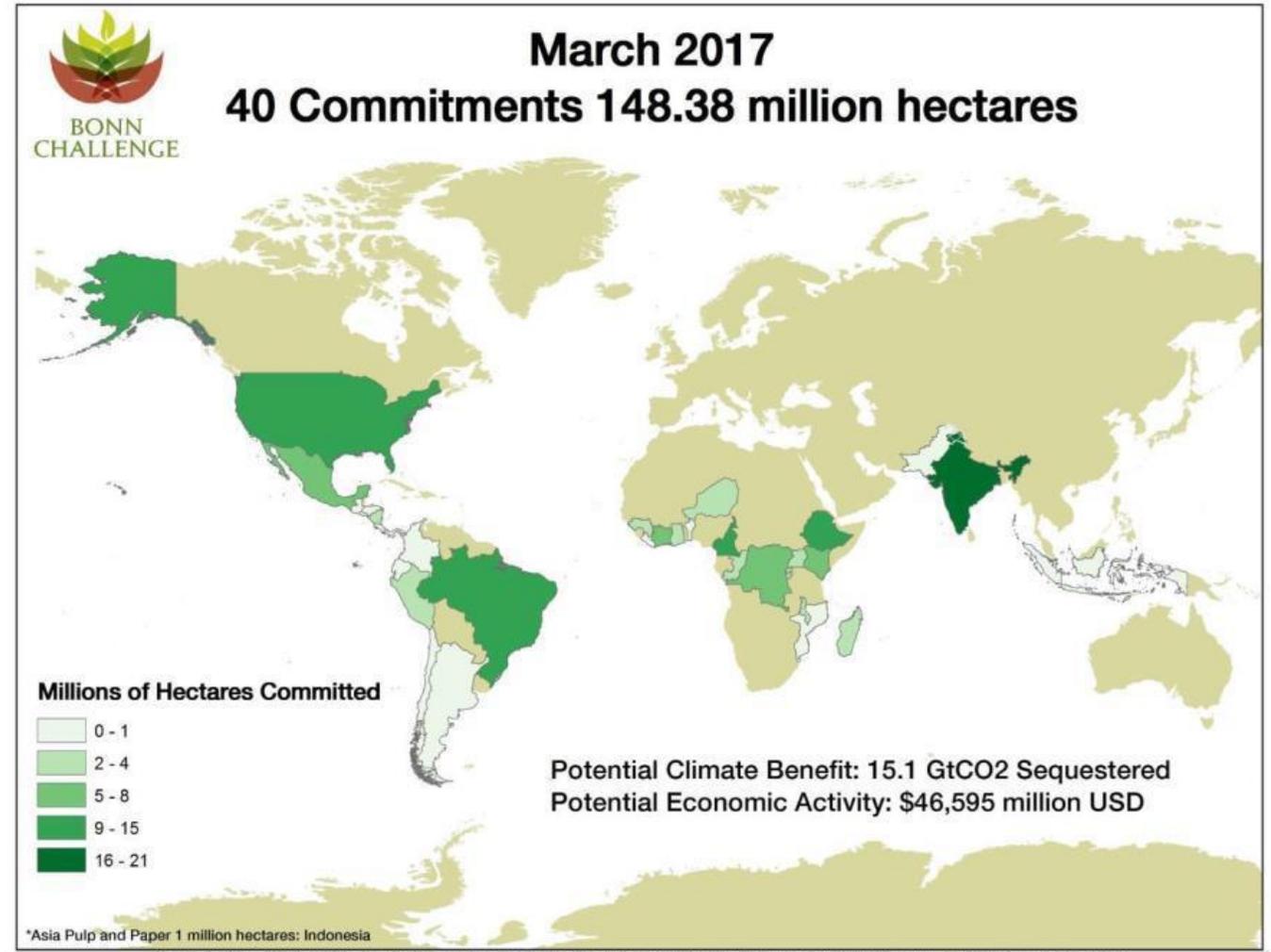


The Bonn Challenge to restore degraded landscapes



Bonn Challenge is a 2011 initiative to restore 150 million hectares of degraded landscapes by 2020, and 350.

Pledges currently stand at 210 M ha.



4 PER 1000

CARBON SEQUESTRATION IN SOILS FOR FOOD SECURITY AND THE CLIMATE

The quantity of carbon contained in the **atmosphere** increases by **4.3 billion tons** every year

+4.3 bn tons carbon / year

↑↑
CO₂ emissions



The world's **soils** contain **1 500 billion tons** of carbon in the form of organic material

absorption of CO₂ by plants



storage of organic carbon in soils

1500 bn tons carbon

If we increase by **4‰ (0.4%)** a year the quantity of carbon contained in soils, we can halt the annual increase in CO₂ in the atmosphere, which is a major contributor to the greenhouse effect and climate change

increased absorption of CO₂ by plants :



farmlands, meadows, forests...



+4‰ carbon storage in the world's soils

= more fertile soils
= soils better able to cope with the effects of climate change

HOW CAN SOILS STORE MORE CARBON?

The more soil is covered, the richer it will be in organic material and therefore in carbon. Until now, the combat against global warming has largely focused on the protection and restoration of forests. In addition to forests, we must encourage more plant cover in all its forms.



Never leave soil bare and work it less, for example by using no-till methods



introduce more intermediate crops, more row intercropping and more grass strips



Add to the hedges at field boundaries and develop agroforestry



Optimize pasture management - with longer grazing periods, for example



Restore land in poor condition e.g. the world's arid and semi-arid regions

Soil carbon sequestration

- Adding 0.4% of carbon to soils every year would solve the climate crisis.
- It would also increase agricultural productivity.
- And be good for biodiversity and ecosystems.
- A triple win.
- 4p1000 is an initiative taken by the French government at COP21 in Paris.

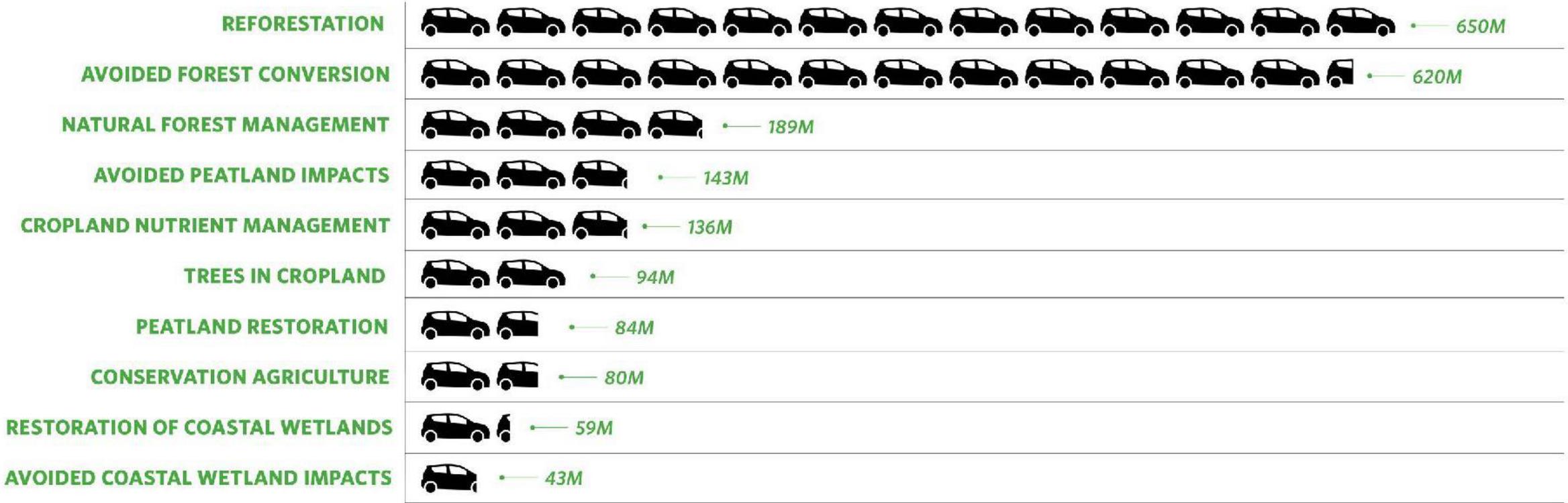
"This international initiative can reconcile the aims of **food security** and the **combat against climate change**, and therefore engage every concerned country in COP21."

Stéphane Le Foll, French Minister of Agriculture, Agrifood and Forestry

NATURAL CLIMATE SOLUTIONS

TOP 10 MITIGATION PATHWAYS¹ WITH CO-BENEFITS

Natural Climate Solutions have the same impact on emissions as taking millions of cars off the road



Global Mitigation Potential: Approximate Number of Cars Removed Each Year in Millions

 = 50M cars

¹Cost-Effective

Green growth...

.....is a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive.

The green growth approach seeks **opportunities for economic growth** that are:

- ✓ low-carbon and climate resilient
- ✓ prevent or remediate pollution
- ✓ maintain healthy natural ecosystems
- ✓ create green jobs
- ✓ reduce poverty
- ✓ enhance inclusion



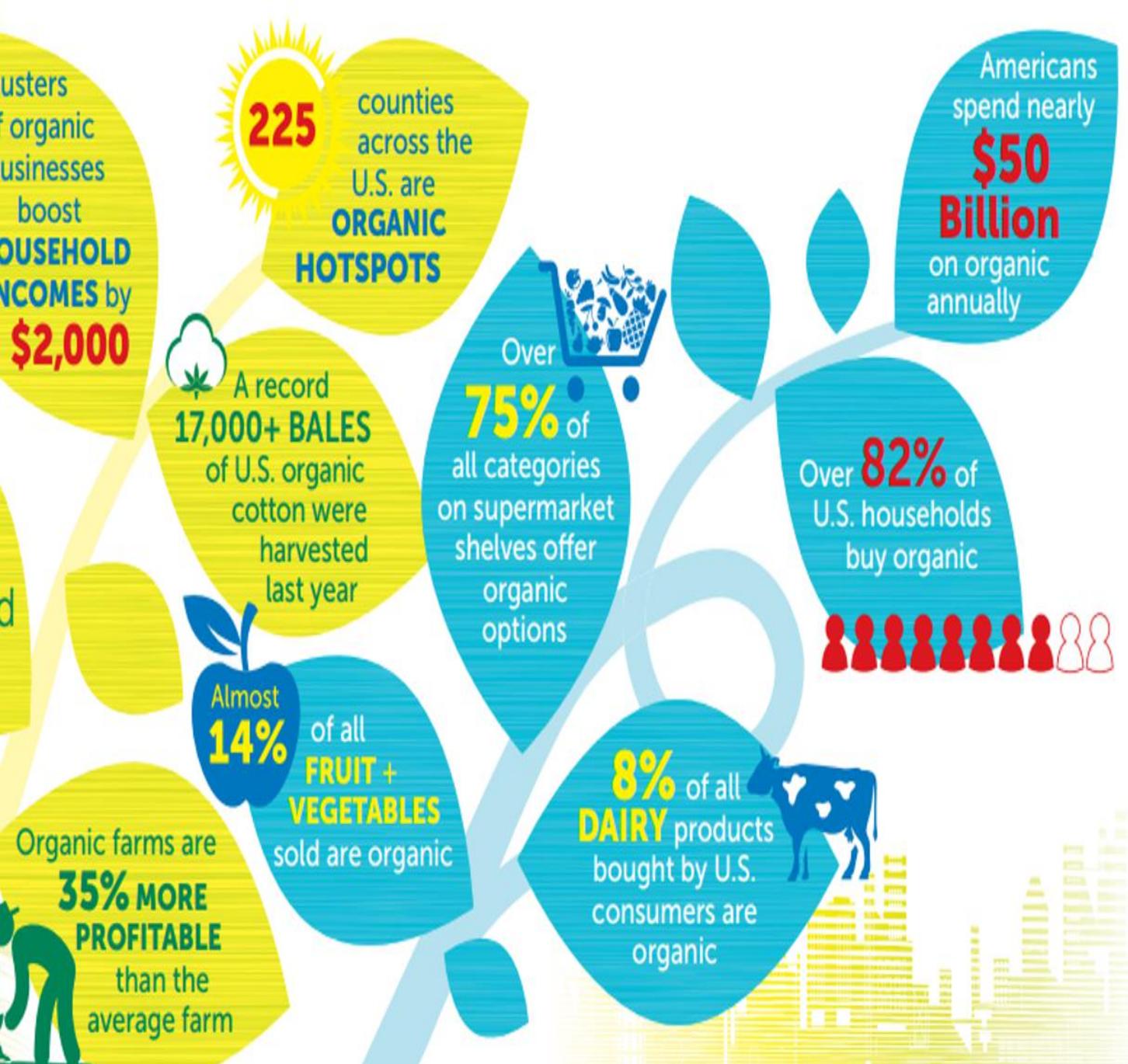
An aerial photograph of a rural landscape at sunset. In the foreground, there are rows of vineyards with golden leaves. In the middle ground, a small village with several houses is visible. In the background, a line of wind turbines stands on a ridge against a sky with soft, orange and yellow clouds.

Can agri-food systems become low-carbon, resilient & sustainable?

Transformation & disruption

Five Opportunities to Transform the Agri- Food System Green COVID-19 Recovery & Accelerate Climate Action

1. Growing consumer awareness - deep interest in *food*
2. Ongoing clean energy & transportation disruption
3. Climate-smart, low-carbon, resilient agriculture
4. Solar-powered irrigation
5. Rehabilitating degraded landscapes, forests, mangroves, peatlands



Consumer interest in healthy food

- Organic food sales soar as shoppers put quality before price (and Amazon takes over WholeFoods)
- Growing farmers' markets
- Healthy food is boring? These *recipes* will change your mind [Irish Times]
- Healthy (ier) fast food from LEON, PRET-A-MANGER
- Celebrity Chefs anchor healthier food campaigns – Jamie Oliver



**Renewable
energy on farms
is good
economics now**

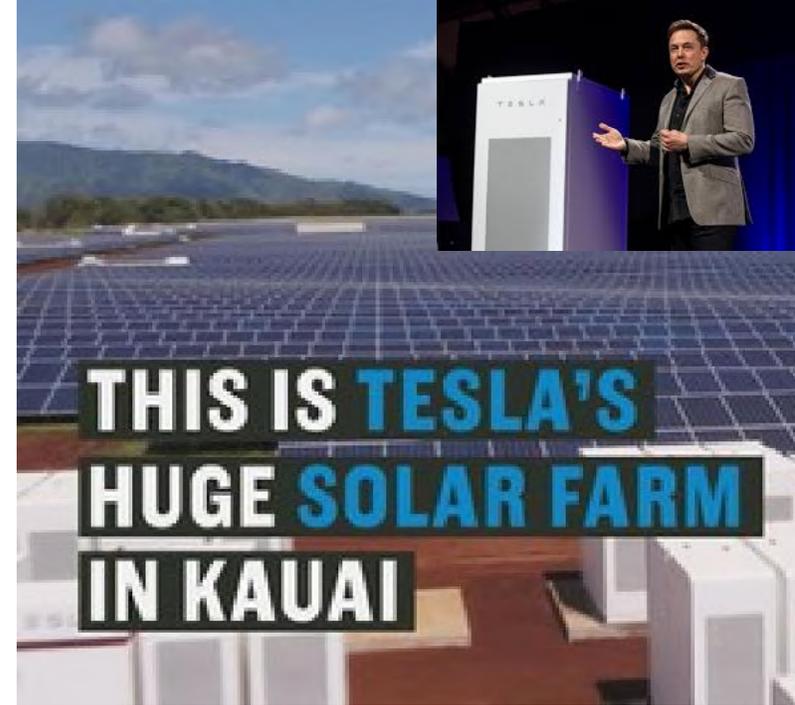
**& energy
efficient too!**



Power purchase agreement
or
On farm battery storage!



Repurpose used Nissan Leaf Battery packs



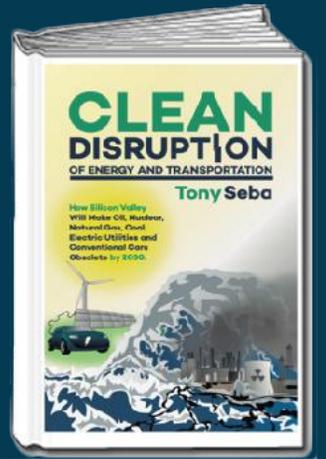
**THIS IS TESLA'S
HUGE SOLAR FARM
IN KAUAI**



The Energy Barn

Photomontage view of The Energy Barn™ - the dark green building on the right.

The Electric Vehicle Disruption



Deere
announced an
electric tractor
and Tesla a
semi-truck

Finally! An All-Electric Feed Truck, Powered Completely by Cow Poop



Using 2 Nissan Leaf battery packs & a methane Digester

Straus Organic Creamery, Marin County California

Solar irrigation pumps

Solar irrigation: India's farmers can sell electricity & save groundwater

A solar irrigation cooperative in Gujarat may have a solution for India's groundwater crisis [Mukta Patil | IndiaSpend](#) June 5, 2017 Last Updated at 08:11 IST

The Solar Pump Irrigators' Cooperative Enterprise (SPICE), which began operating in May 2016, not only made a switch from diesel to solar pumps but also adopted net metering—selling excess power to the local electricity utility.



Kenya farmer Joshua Owuor with his Sunflower solar pump. Photo: USAID/Kenya



Climate-smart, low-carbon, resilient Ag

- Grassland systems more vulnerable than cropland systems
- Highest emission intensity in low productivity systems
- *“Greenhouse gas emissions from livestock production systems are the largest source of agricultural emissions in East Africa – and the fastest growing. The livestock sector thus represents the best opportunity for mitigation in the region.”* CCAFS, CGIAR
- Brachiaria-tropical grass species bred to reduce nitrogen emissions from soil (soil carbon sequestration is critical!)
- Drought resistant maize
- Climate risk insurance
- Sustainable intensification of livestock systems in developing countries



Changing feed to reduce emissions in Indonesia
Source: CCAFS, CGIAR

The background of the slide is an aerial photograph of terraced rice fields. The fields are arranged in concentric, curved patterns on a hillside, showing varying shades of green and yellow. A small white house with a red roof is visible in the middle-left area, surrounded by several palm trees.

GGGI's work on Sustainable Landscapes



Burkina Faso's agricultural sector challenges

- Unproductive agricultural systems,
- 87% of production loss factors are due to climatic hazards,
- difficulties in accessing finance, inputs and equipment,
- poor control of water for agricultural use,
- low adoption of innovative technologies in agriculture

The Most Widespread System Irrigation Methods



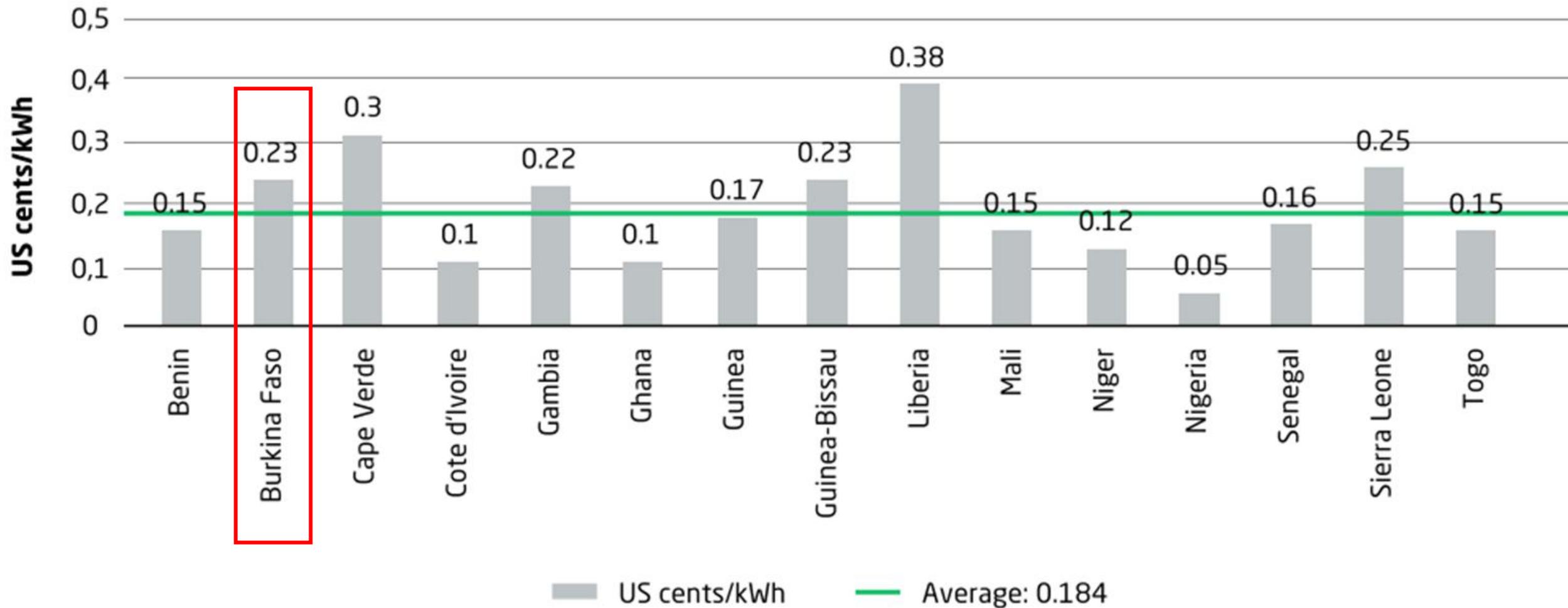
Figure: Manual water transportation

For this system, the irrigation water is withdrawn at the source with the help of flasks or various containers (gourds, buckets, watering cans) then transported and applied to the plot by the operator using the containers. It is the most widespread system on vegetable farms and especially for small-scale irrigation.



Figure: Gravitational distribution

This type of system is applicable in perimeter located at downstream of dams (Dano-moutori, Mogtéo, Bagré, Lantaogo). In this case, the supply of perimeter water is made from a downstream intake, which pours water into a canal main. This water then spreads into secondary, even tertiary canals and reaches finally the production plots.



High electricity tariff of Burkina Faso restricts irrigation powered by grid electricity. This opens an opportunity for solar based power generation units.

Impact of the integration of Solar Powered Irrigation Systems in the agriculture sector in Burkina Faso

- Support the ambition of the Burkina Faso government of have 100,000 SPIPS installed by 2025
- Support of 16 millions people to have more productive agriculture methods
- Reduce food insecurity in the regions and create more competitive agriculture sector
- Replace the irrigation pumps driven by diesel and reduce the GHG emissions



Currently over 20 thousand diesel pumps



Currently only 6 thousand solar and wind driven pumps

Solar Irrigation and Climate Smart Agriculture in Senegal River Valley

- **Self-sufficiency in rice:** Emerging Senegal Plan and post Covid19;
- Rice farming dependance on **expensive fossil fuels** for irrigation and its **vulnerability to climate change**.

When implemented, up to:

- 21 pumping stations could be switched from grid powered irrigation pumps to solar power
- 3000+ farmers could receive CSA training
- 350+ could receive cash-for work for CSA in 1,800 ha of irrigated land
- 5500+ farmers could have improved incomes from reduced costs
- 6000+ direct jobs could be created, with potential to create many times of indirect and induced jobs
- 27,000 tCO₂ emissions could be avoided

Senegal River Valley

- 45,000 rice farming households
- 87% of Senegal's national rice production



Support Climate Smart Agriculture in Kiribati

- 30 % of imports were costly food incl. fresh food such as fruits and vegetables
- 45 % of household income spent on food
- 69 % of deaths due to non-communicable diseases like diabetes
- 54 % youth unemployment

When implemented, up to:

- ✓ 40 schools could receive CSA set-up to grow nutritious vegetables in school gardens
- ✓ 6000+ students could receive awareness training
- ✓ 55 local micro agri-businesses could be supported
- ✓ 11000+ could benefit from food security and healthy local vegetables
- ✓ Reduced import and household costs, new earnings and jobs, enhanced climate resilience



[Philippines] Local Micro Businesses and Jobs in the midst of COVID-19



entrepreneurship
 MSMEs
 capital-allocation
 business-skills
 investment
 employment
 growth-focused



- **The issue.** Constant cycle of poverty for farmers in Oriental Mindoro, exacerbated by the increased frequency and severity of typhoons
- **Our thesis.** Fostering the growth of select agripreneurs – adding to the conventional support to a large number of farmers – will result in increased income, employment, and resilience to climate change in the province
- **Our approach.** Provide financing and technical assistance to a small number of competent agripreneurs, with support from lead firms in the Philippines (and Republic of Korea)



e.g. Agri cooperatives require to have PP&E support to meet the market standard (i.e. certification of their processed agri-products which enables them to be sold in a formal market)

e.g. Oriental Mindoro is known as national “calamansi king” (as producer, approx. 60% of national totla), but very little processing is done within Oriental Mindoro – less than 1% of total processed products (0.174 tons)



[Philippines] Strengthening the Entire Value Chain to Transform the Sector

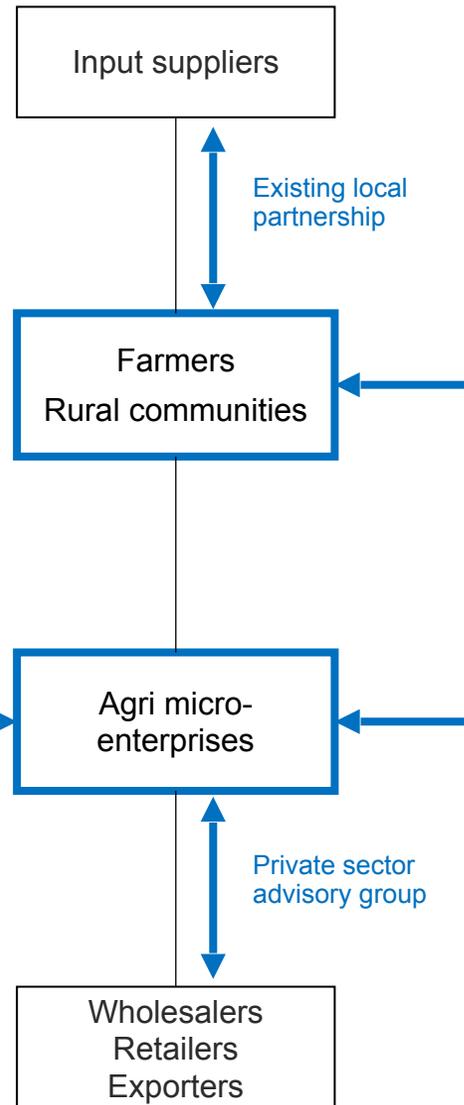
A **value chain approach** to achieving climate resilient and inclusive green growth for poor rural communities.



Component 2: Investment and technical assistance to agri micro-enterprises

Investment and technical assistance to address the financing gap among agri micro-enterprises. The improved buildings, processing equipment, and the Provincial Agricultural Center results in:

- Increased revenue for agri micro-enterprises
- Increased income for farmers
- Growth of entrepreneurship and agri processing sector in Oriental Mindoro



Component 1: Data management and Policy Development

Climate Vulnerability and Risk Information System (CVRIS) is established to address the information gap. PGOM will use CVRIS to collect climate and socioeconomic data that will inform relevant policy decisions (e.g. crop insurance, infrastructure support):

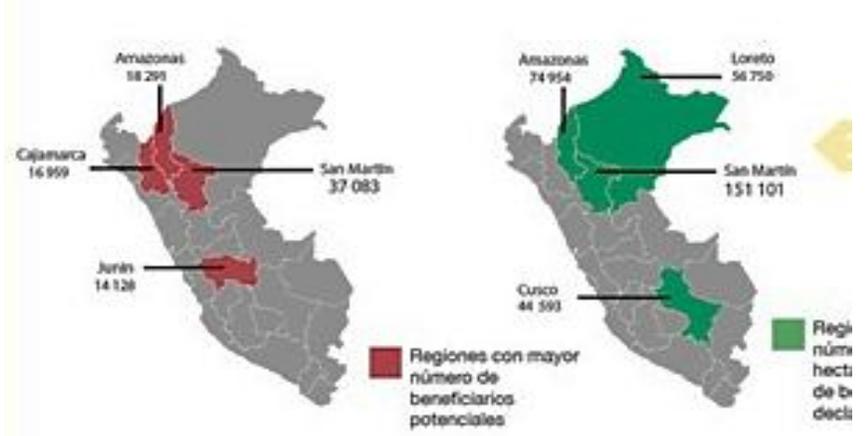
- Evidence-based planning by government officials
- Farmers making better decisions and benefitting from increased yield and income
- Agri micro-enterprises with stable supply of crops
- Reduced economic damage from extreme weather events

Component 3: Capacity Development

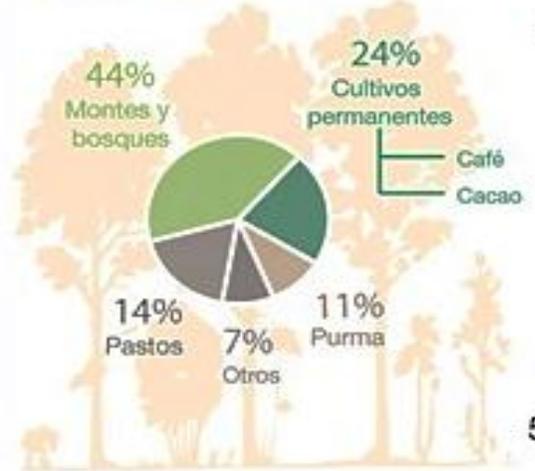
Capacity building to address the knowledge / experience gap among project beneficiaries. This results in:

- Effective utilization of CVRIS by PGOM
- Effective utilization of the Provincial Agricultural Center by farmers and agri micro-enterprises
- Improved understanding of climate forecasts by farmers
- Business training for agri micro-enterprises

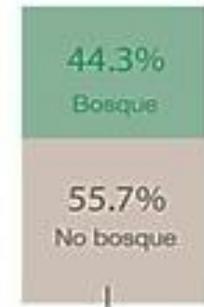
Agroforestry Concessions: Transformative Change for Reduced Deforestation



Composición del predio (superficie)



>1 millón de hectáreas de superficie se componen de



521 918 hectáreas con potencial de restauración

The Agrofor Project



The Agrofor project is a consortium of:

- **Global Green Growth Institute (GGGI):** public policy and incentives, private investment
- **World Agroforestry (ICRAF):** field work, MRV and incentive support
- **Peruvian Society for Environmental Law (SPDA):** legal assistance, regulations, communications

Institutional, legal and technological conditions

- National and regional planning for increased financing
- Accessible regulations
- Tools for registration and compliance monitoring
- New GHG and MRV instruments
- National, regional and local communications campaign

Practical technical assistance for farmers

- New technical modules
- Strengthen capacities of farmers and extension workers
- New systems for better decisions in the field, climate-smart, and linked to strengthened value chains.
- Legal support in the field

Financial incentives for AC adoption and promotion

- New business opportunities for AC farmers
- Align existing public incentive programs
- Integrate AC into REDD+ and Ecosystems Services benefit sharing

GGGI's recommended Green Deal for emerging and developing economies – **generating a total of jobs ranging from 223,500** in emerging economies to **258,600** in developing economies

Cost in USD
(Million)

Cost Share
in %



Green physical & digital infrastructure
16,800 jobs

- Build solar and wind energy assets
- Energy storage, including green hydrogen
- Grid modernization
- Digital network and AI infrastructure
- Sustainable mobility
- Green urban infra – bike lanes, waste recycling

350

30%



Building Energy Efficiency renovations & retrofits
14,400 jobs

- Insulation
- Energy-efficient heating and cooling
- Domestic energy storage

300

25%



Education and training
2,400 jobs

- Green job training
- Online education systems
- Online economy systems for the private sector

50

5%



Natural capital investment
187,500 jobs

- Restoration carbon-rich habitats (forests, peatlands, mangroves)
- Climate-smart agriculture

250

25%



Green technology R&D
2,400 jobs or **Rural support schemes**
37,500 jobs

- Green technology R&D for emerging economies
- Rural support schemes such as employment-based social assistance programs for developing economies

50

5%

Conclusions

1. Agri-food systems – and animal-sourced food systems in particular – need an *urgent and radical transformation for environmental, climate and health reasons*
2. There are many opportunities where *green growth can drive the necessary innovation* from consumer demand for quality products, to climate smart ag, solar-powered irrigation to rehabilitation of degraded landscapes
3. Particularly *focus on clean disruption of energy and transportation* – where the pace of change is super-critical & opportunities now driven by the market – to create green jobs and make ag more sustainable



51% of the renewable energy in Germany is owned by citizens and farmers, not energy companies



Thank You

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