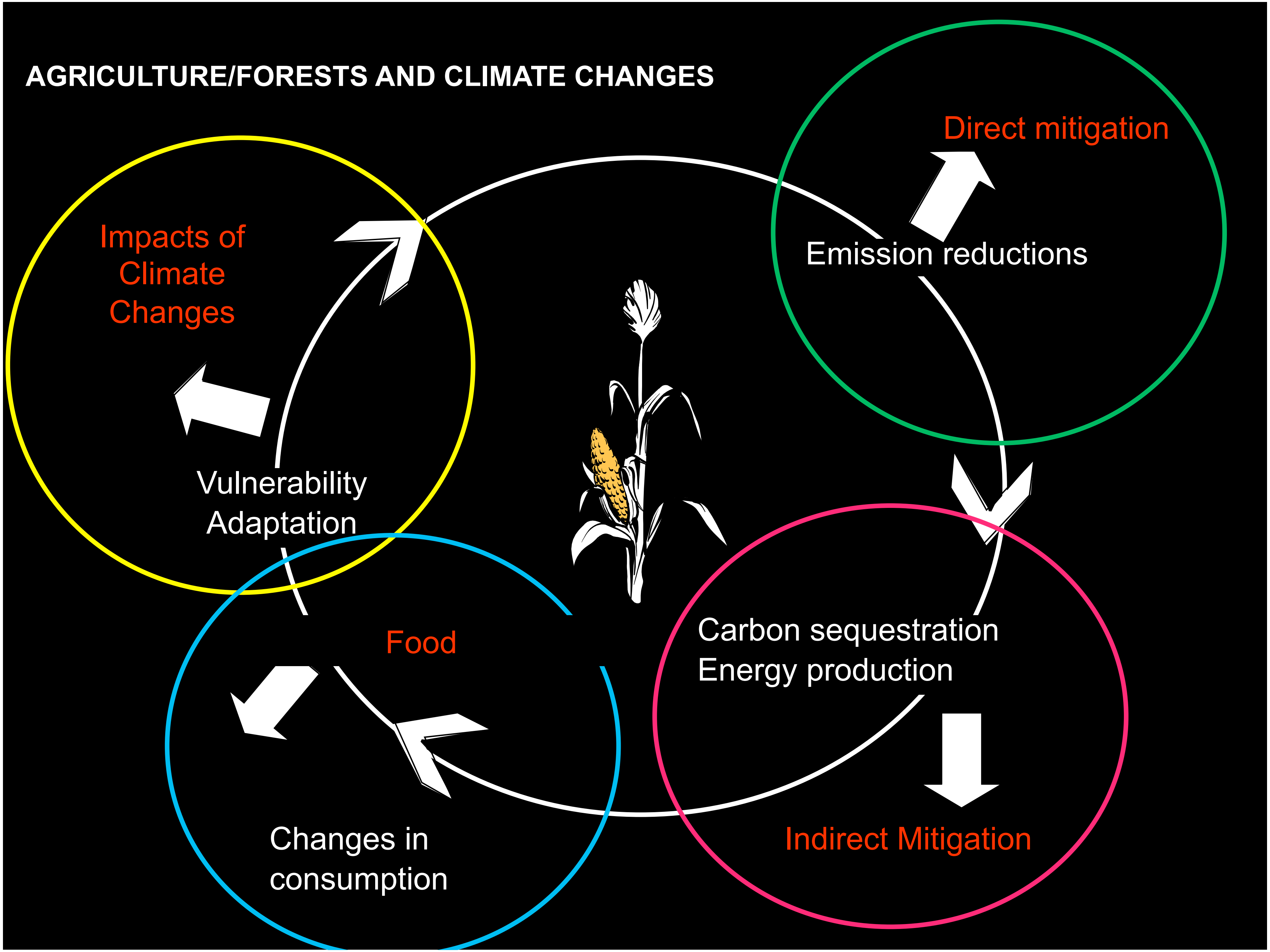
BIG versus SMART Agriculture

AGRICULTURE/FORESTS AND CLIMATE CHANGES



Impacts of Climate Changes

Vulnerability
Adaptation

Direct mitigation

Emission reductions

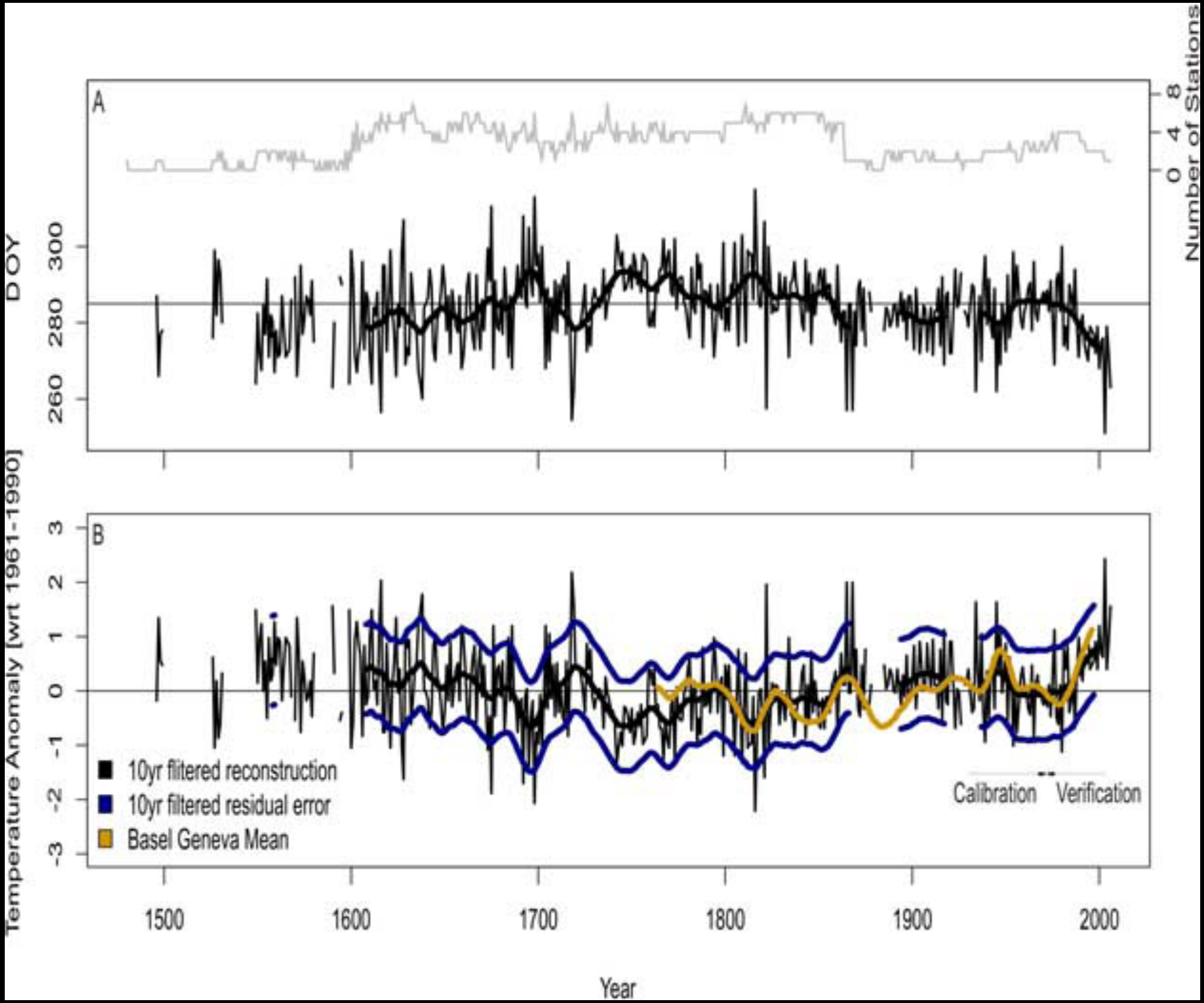
Carbon sequestration
Energy production

Indirect Mitigation

Food

Changes in consumption

PAST CLIMATE RECONSTRUCTION BY WINE HARVEST DATE

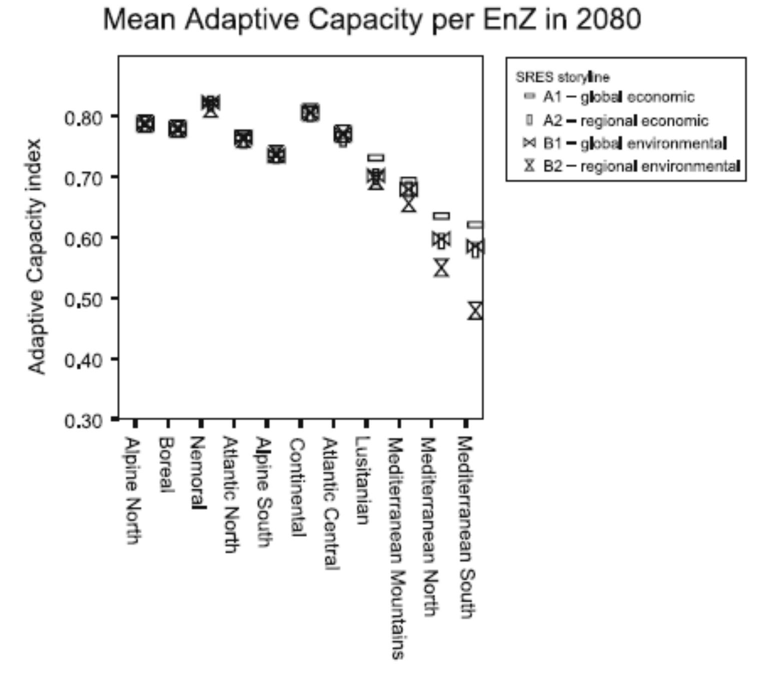


Meyer 2007 Switzerland

1. Abbiamo la capacità di fornire agli imprenditori agricoli previsioni stagionali dettagliate ?

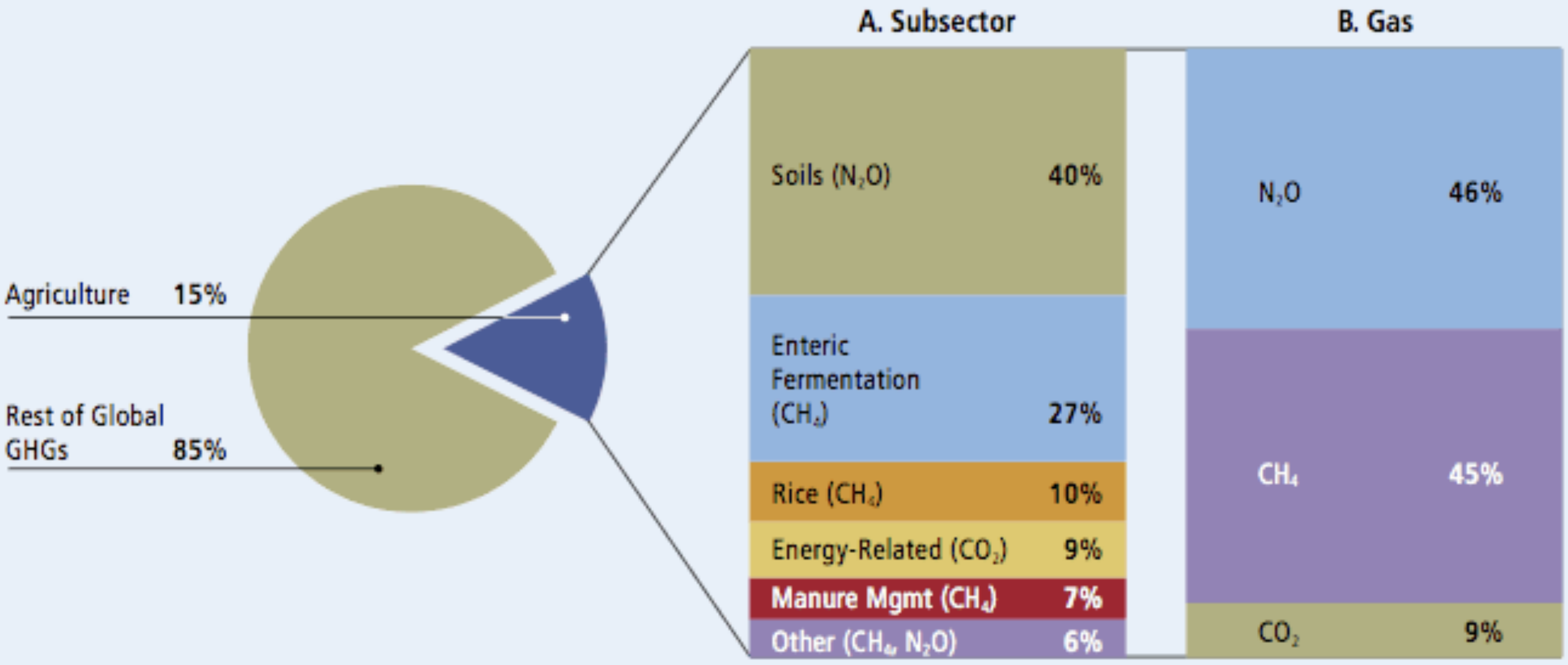
(risoluzione temporale 15 gg/ risoluzione spaziale 1km)

2. Quali sono i rischi e le capacità di adattamento del sistema agricolo ? (irrigazione, calendari di semina, strumenti finanziari, formazione etc)



Greenhouse gases emissions

Figure 15.1. **GHGs from Agriculture**



Sources & Notes: EPA, 2004. See Appendix 2.A for data sources Appendix 2.B for sector definition. Absolute emissions in this sector, estimated here for 2000, are 6,205 $MtCO_2$.

The Greenhouse gas balance of italian agro-industry

(1778 kg CO2eq/year per capita)

Settore	*Mt CO2 eq*
Agriculture production	**47,1**
Enteric fermentation	**11,6**
Manure and waste	**6,9**
Transport	**19,8**
Industrial transformation	**5,5**
Packaging	**13,1**
TOTAL	**104,0**

[1] Con il termine emissioni della produzione agricola si intendono tutte le emissioni di gas serra in seguito alle lavorazioni, irrigazione, concimazioni etc. fino al confine dell'azienda (*Farm gate*)

[2] Escluse foraggere

[3] Dato elaborato da NIR (ISPRA,2009)

[4] Dato elaborato da NIR (ISPRA,2009)

ISMEA 2009, Rapporto AGRICARBON

1. Come possiamo ridurre l’uso di input esterni in agricultura mantenendo qualità e quantità?

2. Siamo in grado di cogliere l’innovazione tecnologica con l’agricultura di precisione ?
(Analisi costi/benefici,rotazioni,)

Soil greening

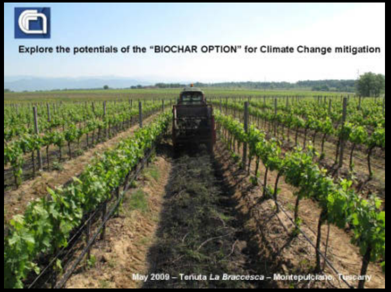
Grass-land
12 years
20 years
30 years
40 years
Clear Fell
Height: ~4m
Height: ~9m
Height: ~14m
Height: ~17m

Reforestation

Green Chemistry

Organic farming

Minimum tillage


Explore the potentials of the "BIOCHAR OPTION" for Climate Change mitigation
May 2009 – Tenuta La Braccesca – Montepulciano, Tuscany

Biochar

Bioenergy

GREEN INFRASTRUCTURES

Natural areas

Conservation lands

Working lands

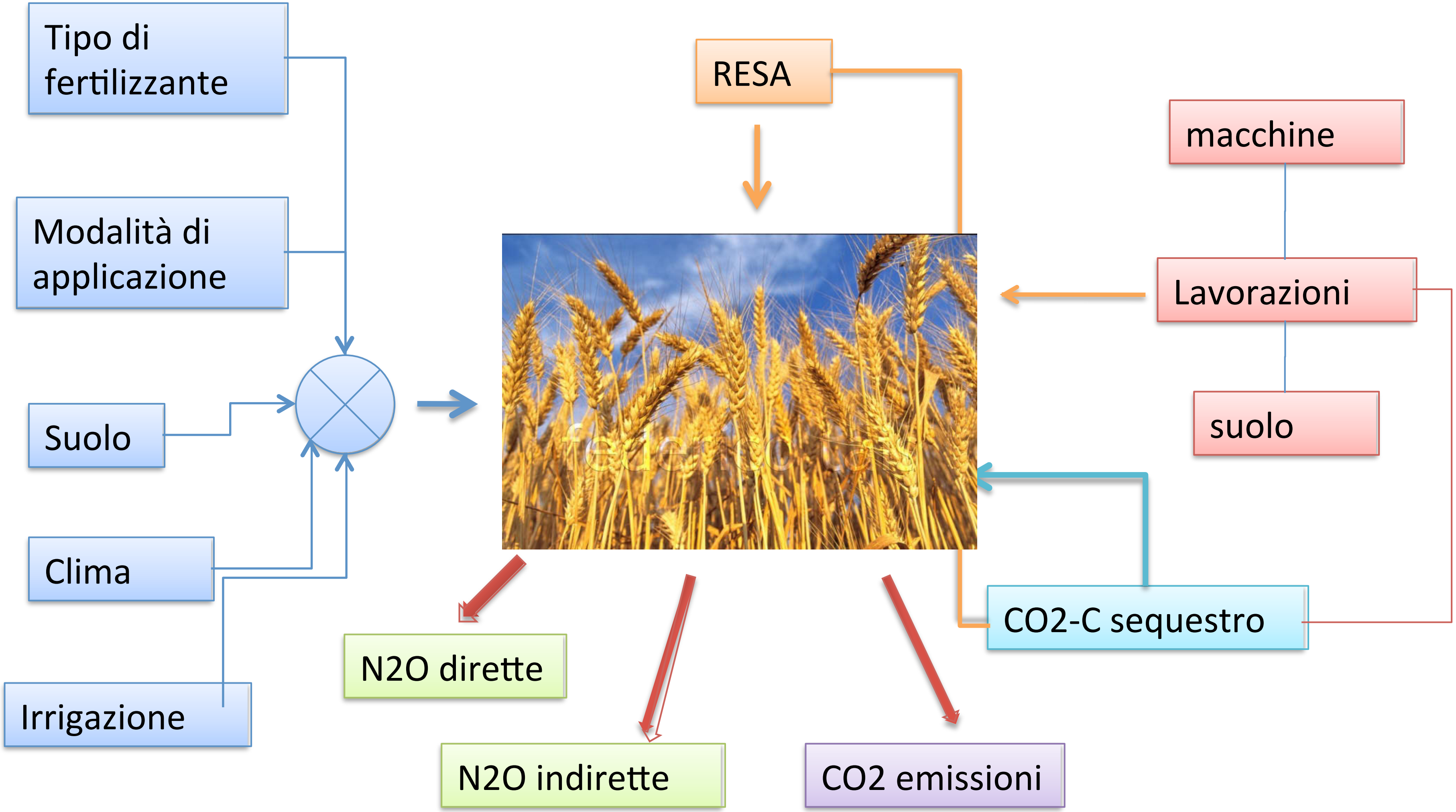
Open Spaces

that sustains “our natural life-support system”

Source—*Green Infrastructure.* 2006. Mark A. Benedict and Edward T. McMahon

Implementazione dell’analisi del CARBON FOODPRINT

FASE I - Bilancio al livello di produzione



Tipo di fertilizzante

Modalità di applicazione

Suolo

Clima

Irrigazione

RESA

macchine

Lavorazioni

suolo

CO2-C sequestro

N2O dirette

N2O indirette

CO2 emissioni

Implementazione dell'analisi del CARBON FOODPRINT

FASE II - Bilancio al livello di azienda agricola

Biocarburante per macchine agricole

Ottimizzazione/ riciclo/recupero materiali

Energia da biomassa di scarti agricoli

Energie rinnovabili

Produzione di biogas

Integrazione di filiera

Bilancio al livello di distretto agroalimentare

Tribano PD
Google

Riforestazione/
recupero

Agricoltura
sostenibile

Colture per
biomassa/energia

Produzione di
biochar

Ottimizzazione dei
trasporti/stoccaggio

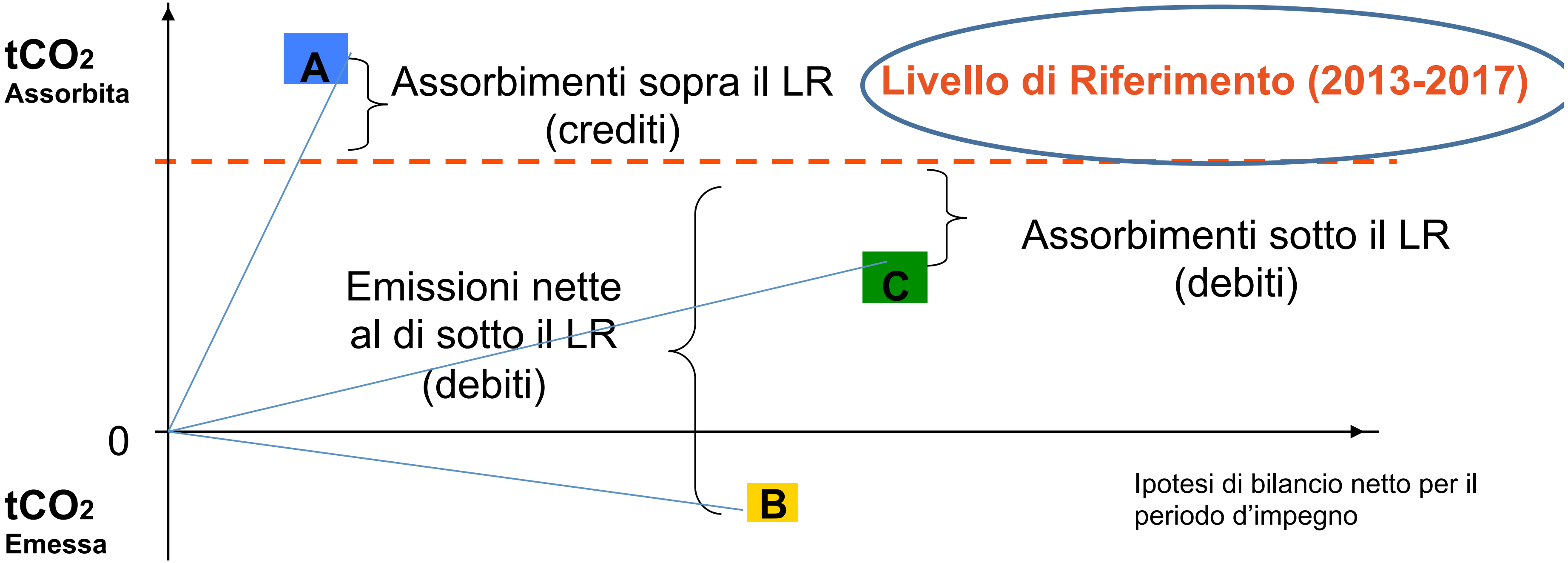
Compostaggio/
gassificazione dei
residui

Aree per produzione di
energia rinnovabile

CO2-equivalente prodotta/
Marketing

POST-2012

22,17 Mt CO2



Livello di Riferimento (2013-2017)

tCO2
Assorbita

A

Assorbimenti sopra il LR
(crediti)

Assorbimenti sotto il LR
(debiti)

C

Emissioni nette
al di sotto il LR
(debiti)

0

tCO2
Emessa

B

Ipotesi di bilancio netto per il
periodo d'impegno

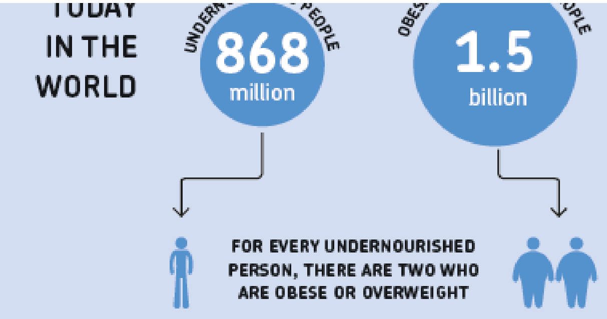
INCLUSIONE DEI PRODOTTI LEGNOSI

ESCLUSIONE DEGLI EVENTI DI FORZA MAGGIORE

OR OBESITY?

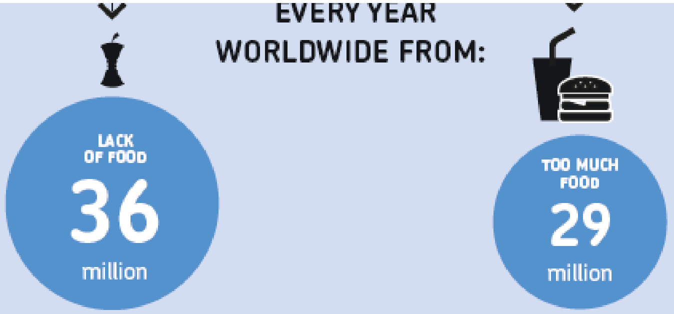
Today, worldwide, for every malnourished person, there are two people who are obese or overweight.

TODAY IN THE WORLD



FOR EVERY UNDERNOURISHED PERSON, THERE ARE TWO WHO ARE OBESE OR OVERWEIGHT

EVERY YEAR WORLDWIDE FROM:

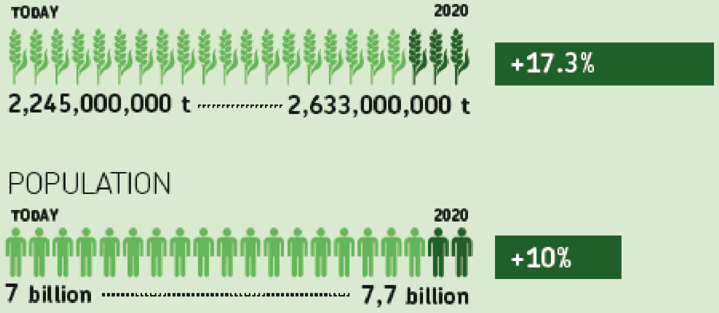


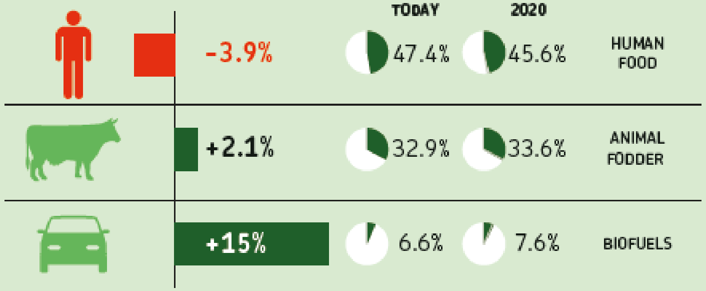
FEED PEOPLE, ANIMALS, OR CARS?

One-third of all food production worldwide is destined for feeding livestock. In addition, a growing share of agricultural land is used for the production of biofuel. As a result, we are choosing to feed automobiles instead of people.

* allocation of the use of grains as a percentage between animal food, human food, and the production of biofuel

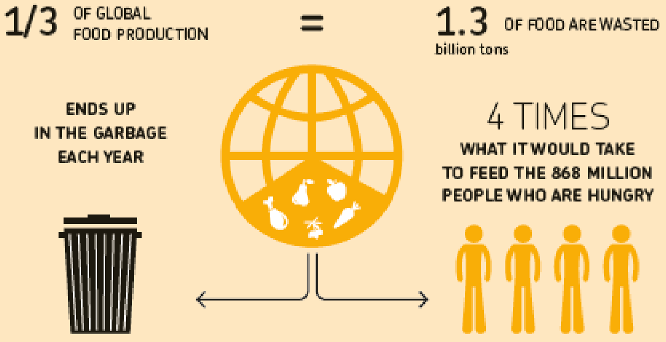
GRAIN PRODUCTION IN THE WORLD AND ITS USE*





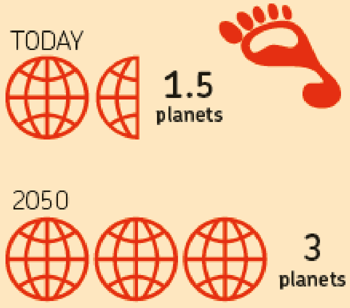
FEED WASTE OR FEED THE HUNGRY?

Every year worldwide, 1.3 billion tons of perfectly edible food are wasted, while 868 million people suffer from hunger.


1/3 OF GLOBAL FOOD PRODUCTION
=
1.3 billion tons OF FOOD ARE WASTED
ENDS UP IN THE GARBAGE EACH YEAR
4 TIMES
WHAT IT WOULD TAKE TO FEED THE 868 MILLION PEOPLE WHO ARE HUNGRY

THE PLANET'S BALANCE IS NEGATIVE

Today, what is consumed is greater than what we are able to regenerate.
For our current lifestyle, we will need 1.5 planets, and in 40 years we will need 3


TODAY
1.5
planets
2050
3
planets

FOR FOOD
& NUTRITION