

Sustainable Rural Lands

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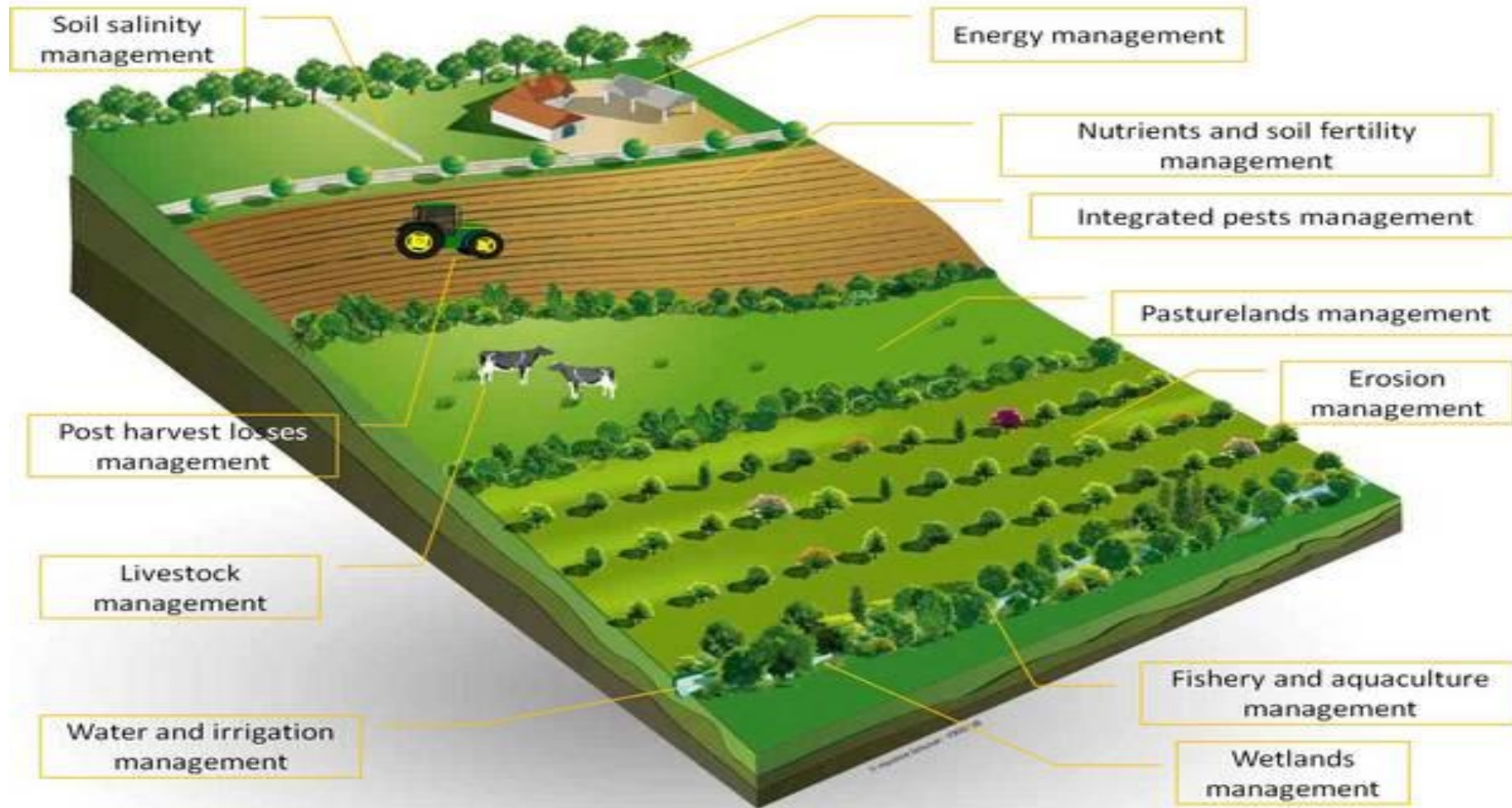
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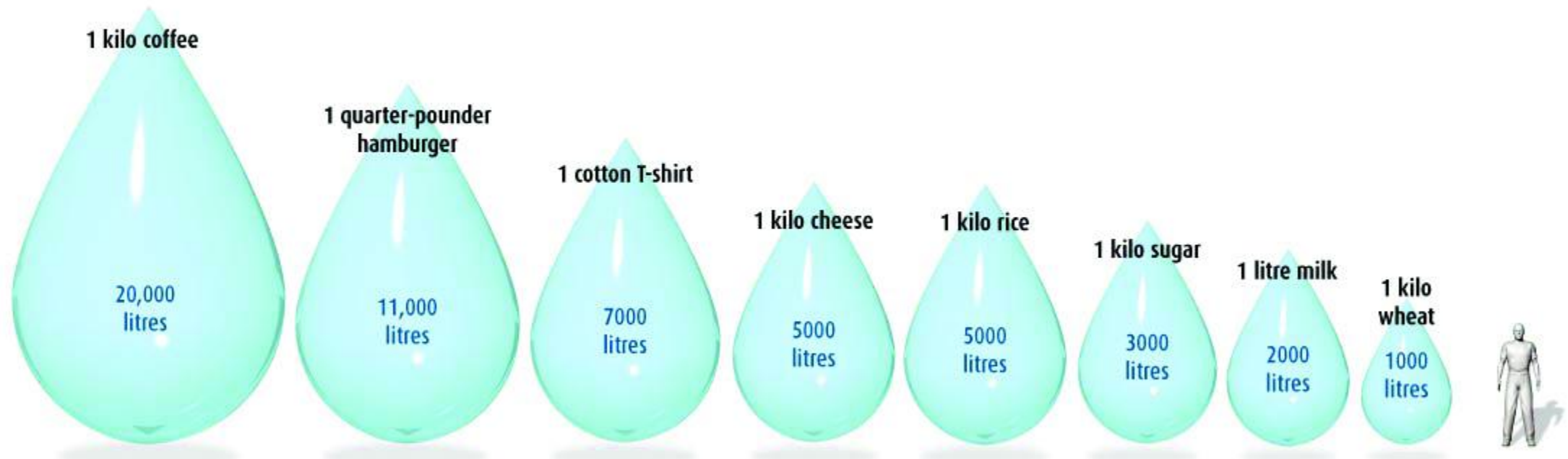
SUSTAINABLE AGRICULTURE



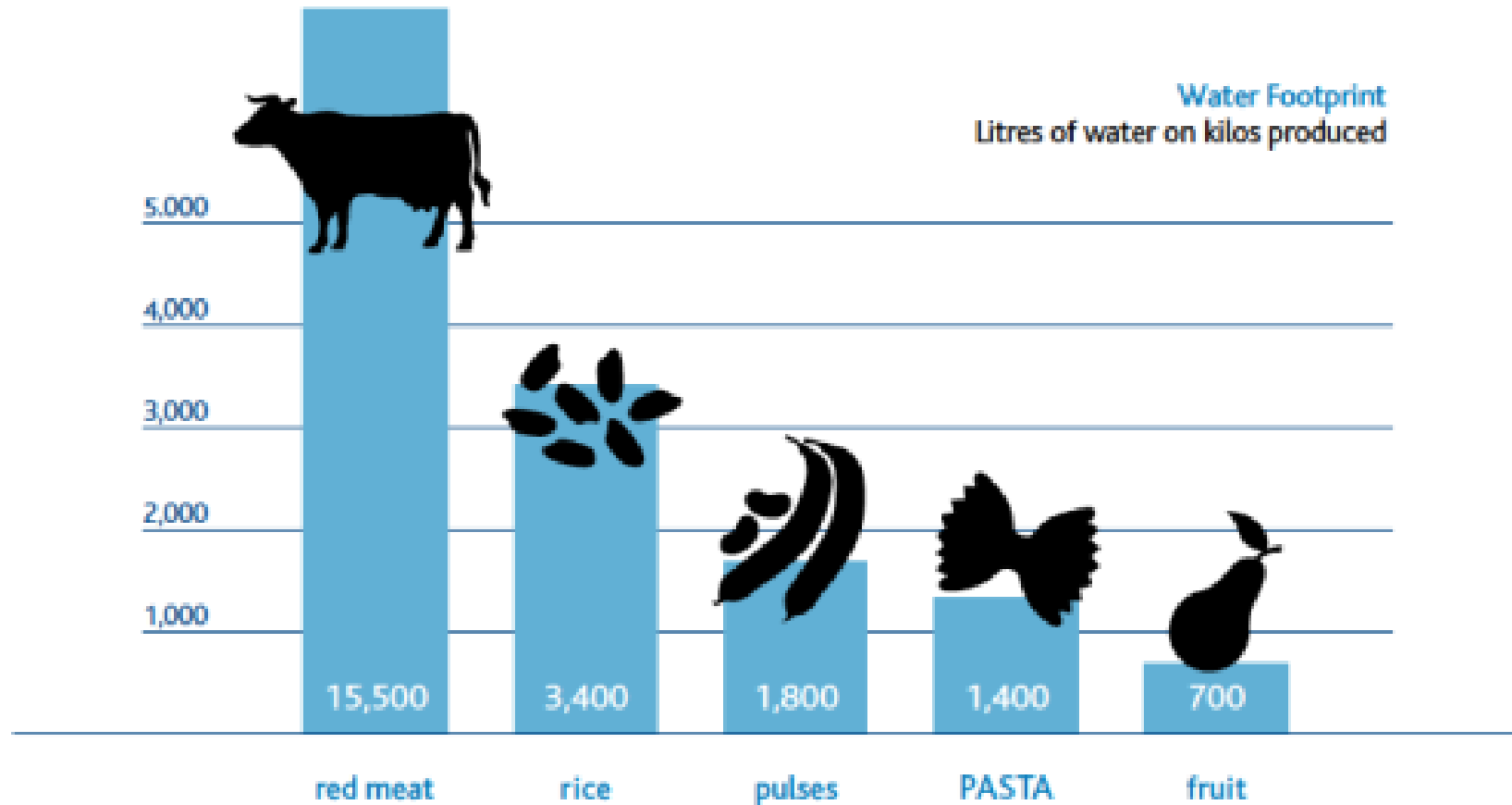
Water use in agriculture water footprint

THIRSTY WORK

It takes staggering quantities of water to grow some common crops – water that many countries cannot afford to lose



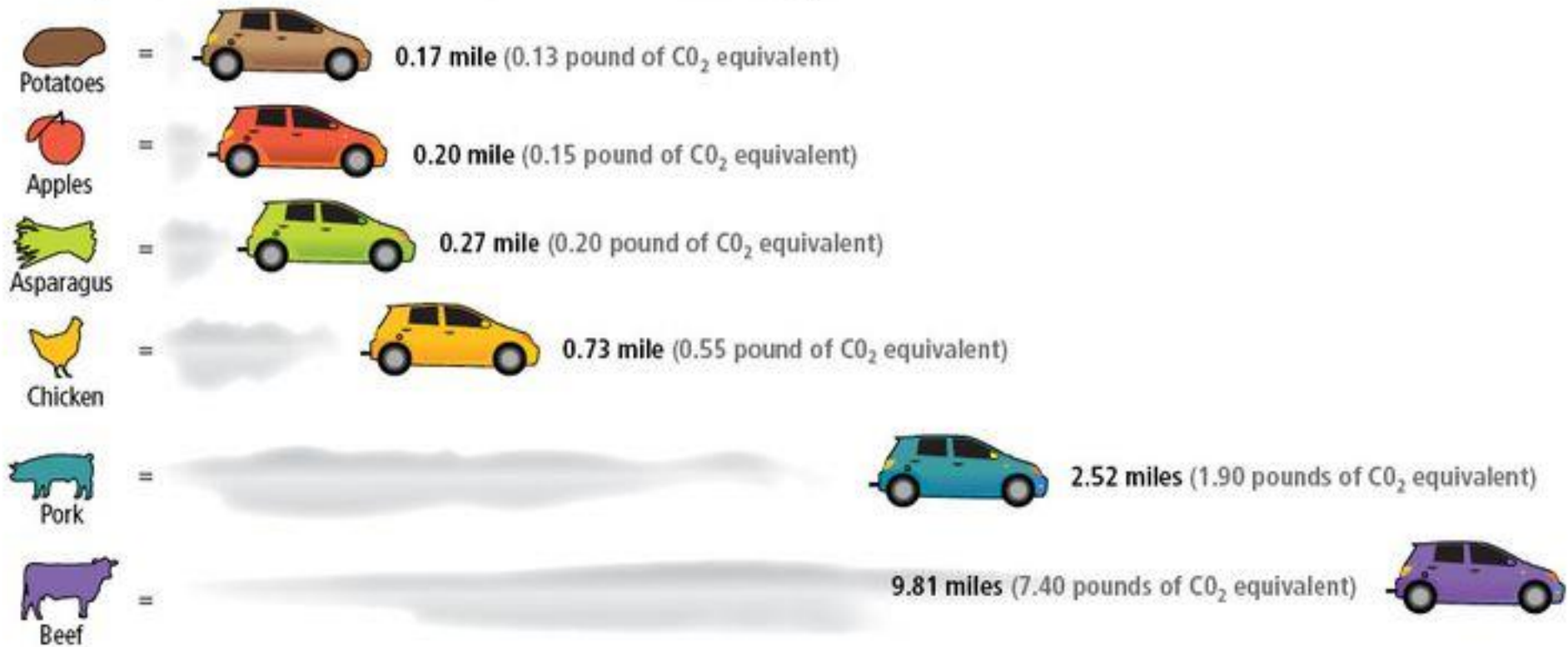
Water use in agriculture water footprint



Energy use in agriculture

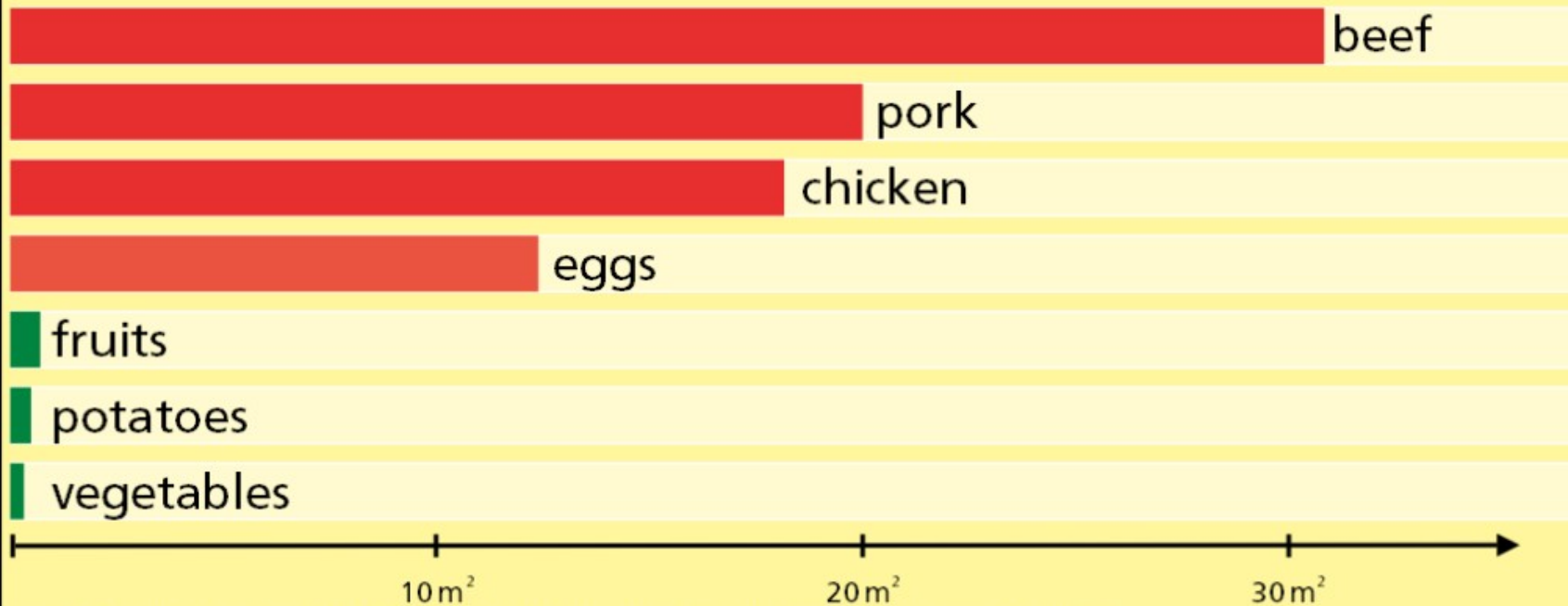
CO₂ footprint

CO₂-equivalent emissions from producing half a pound of this food ... are the same as emissions from driving ...



Land requirements

Land needed for the production of 1 kilo food:




Source: Ökologie & Landbau, 159,3/2011, pages 40–42, www.soel.de – Diagram: SVV, www.vegetarismus.ch

What It Takes To Make A Quarter-Pound Hamburger



feed
6.7
Pounds of grains and forage




water
52.8
Gallons for drinking water and irrigating feed crops



land
74.5
Square feet for grazing and growing feed crops



fossil fuel energy
1,036
Btus for feed production and transport. That's enough to power a typical microwave for 18 minutes.



Mass

6.7	=	3.03907
Pound		Kilogram

Volume

53	=	200.627
US liquid gallon		Litre

<http://www.metric-conversions.org/weight/pounds-to-kilograms.htm>

Source: J.L. Capper, *Journal of Animal Science*, July, 2011.

Credit: Producers: Eliza Barclay, Jessica Stoller-Conrad; Designer: Kevin Uhrmacher/NPR



Water, food and bio-energy

Water needed to produce:

- 1 kilo of wheat: 1 000 litres
- 1 kilo of meat (beef): 15,000 litres **dietary shift to impact water consumption**

Daily water requirements per person:

- Drinking: 2-3 litres
- Domestic needs: 20–300 litres
- Food: 2 000-3 000 litres

With 2500 litres of water, we can produce:

- 1 litre of biofuel
- food for one person for one day

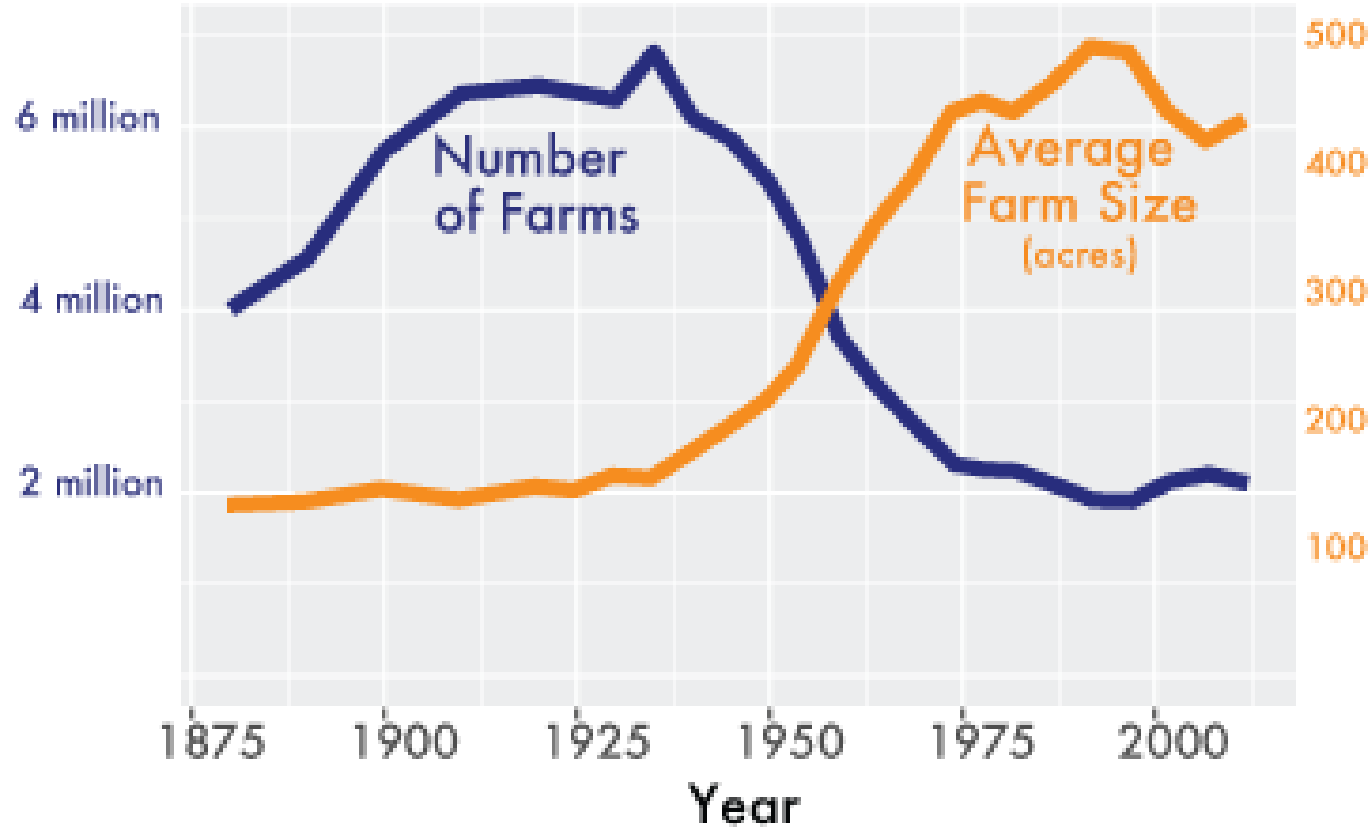
\$114B

in annual investments is needed to achieve SDG 6 over the next 15 years. Current funding for water supply and sanitation is about

\$33B

6 CLEAN WATER AND SANITATION



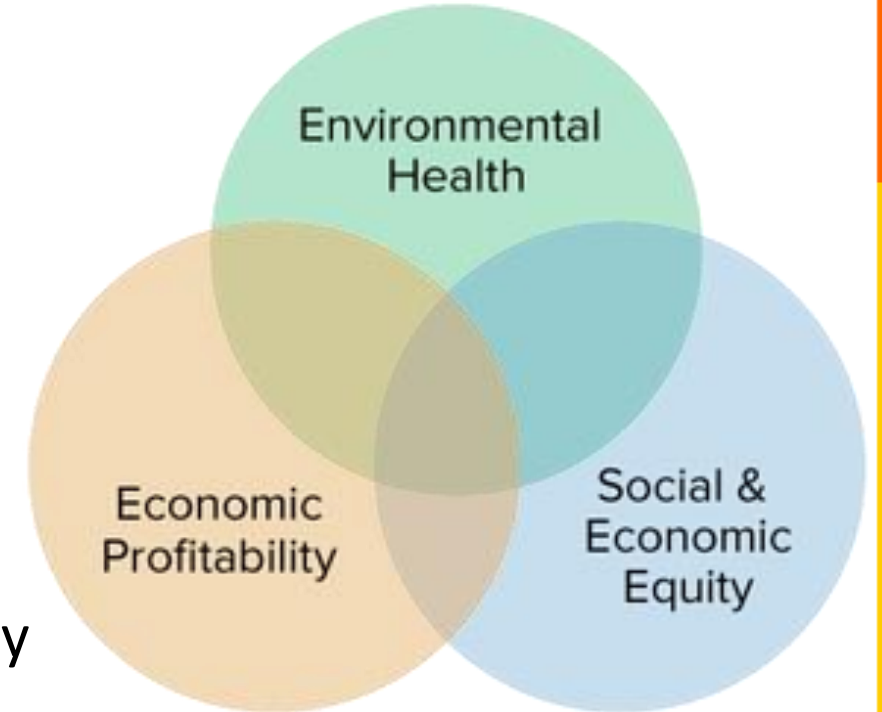


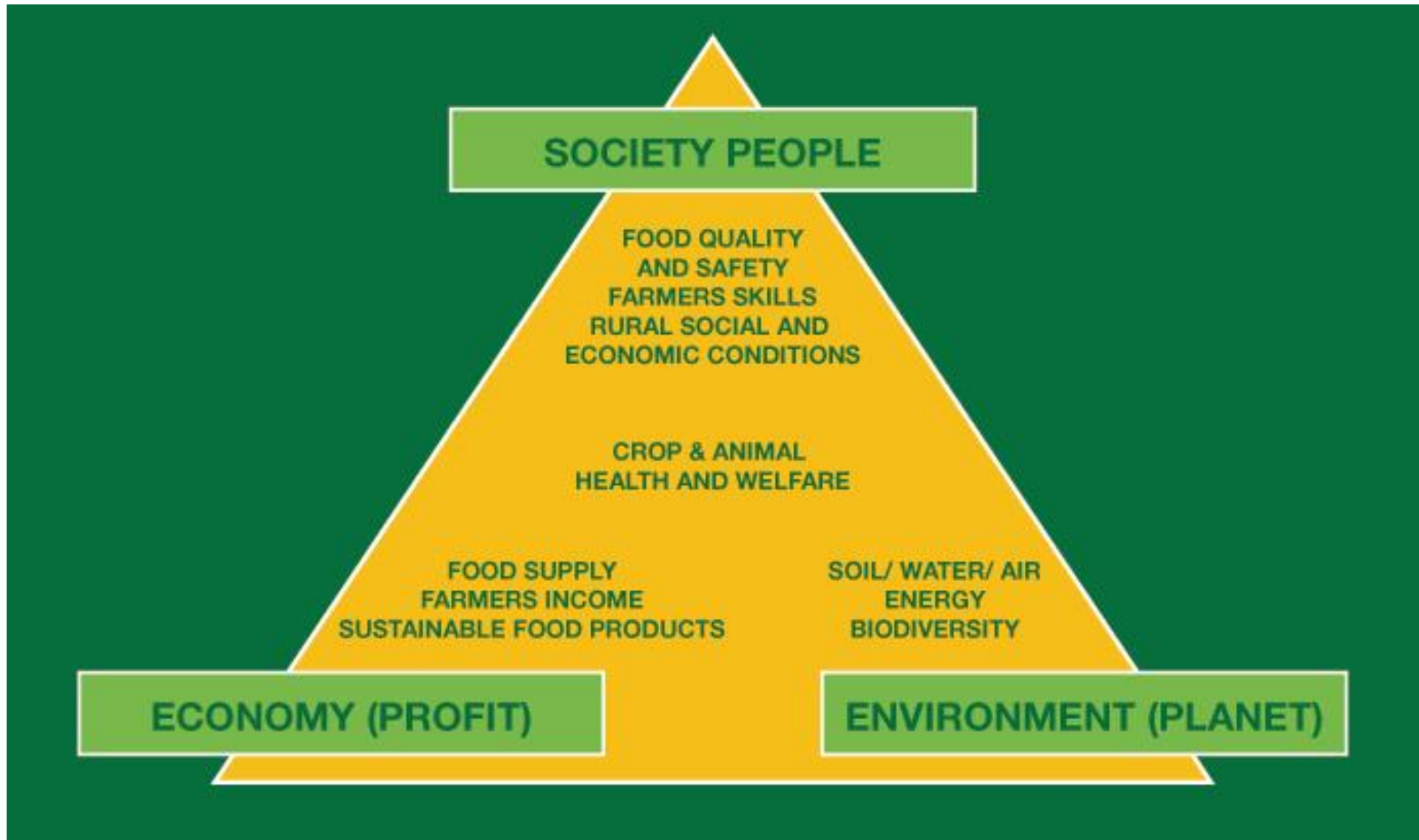
Since World War II the number of U.S. farms has declined and the average farm size has increased. Data from USDA Census of Agriculture.



What is sustainable agriculture?

- The practice of farming using principles of ecology, the study of relationship between organisms and their habitat.
- an integrated system of plant and animal production practices having **site-specific** application that will over long-term:
 - Satisfy human needs (food and fiber)
 - Efficient use of non-renewable sources, on-farm resources
 - sustain economic viability of farm operations
 - Enhance the quality of life for farmers and society as a whole





Sustainable agriculture

- Protects and renews the natural environment,
 - Builds local economies, and
 - Enhances the quality of life of farmers and farm workers.
-
- Development and support of group-based businesses is a strategy for increasing the sustainability of agriculture.

Cooperative Development Institute US

Circular system Circular economy



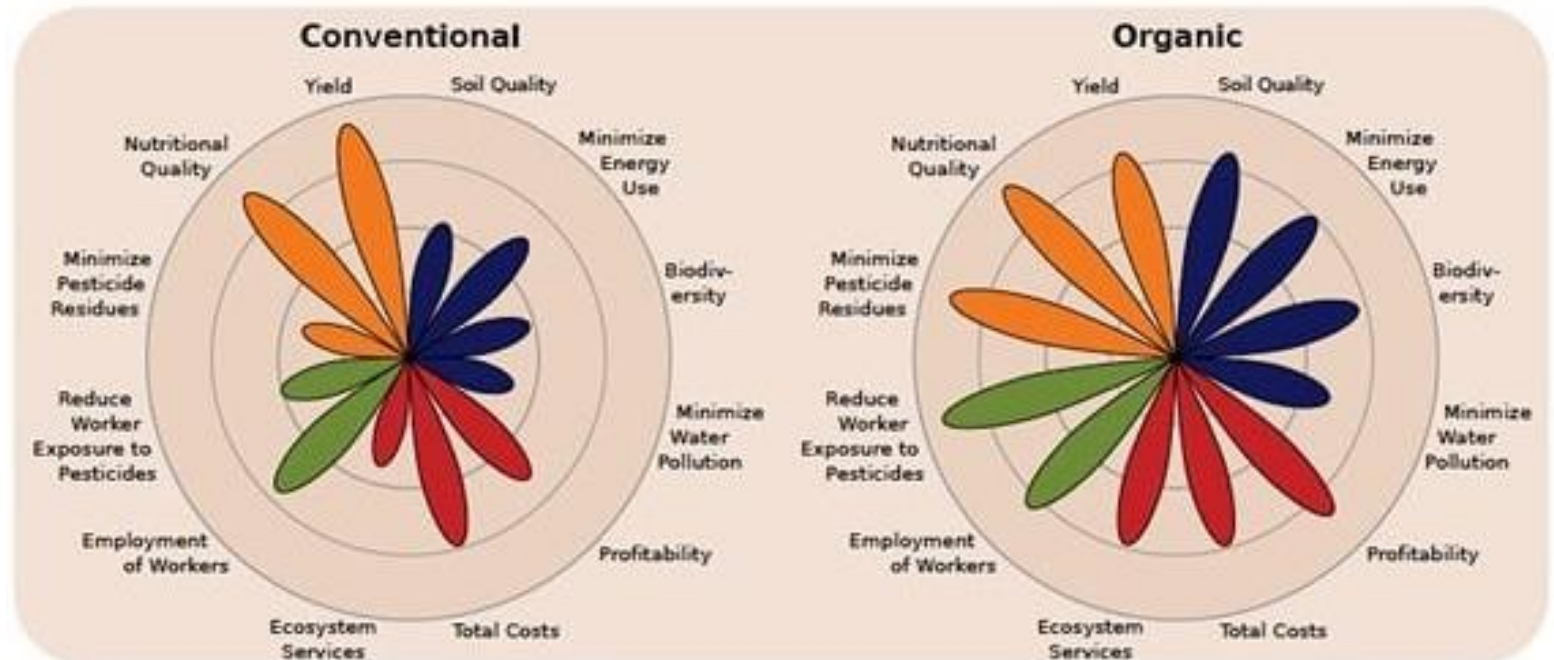
Conventional Farming System	Sustainable Farming System
Strong reliance on rapid technological innovation and skills	Strong reliance on farmer management, knowledge and skills
Large capital investments required for production and management technology	Smaller capital investments required in general
Large-scale farms	Small to medium scale farms
Monoculture: single crops/row crops grown continuously over many seasons	Diversified cropping system
Extensive use of pesticides, fertilizers and energy; external energy inputs	Reduced use of pesticides fertilizers alternate sources of fertilizers and use of natural cycles
Lower labor costs (less labor required, lower better workers wages, higher reliance on migrant seasonal labor	Higher labor costs (more labor required and usually worker wages)
Dependency on commodity supply chains and minimum corporate vertical integrators for marketing	Emphasis on direct marketing and on pre-specialty markets; project and enterprise diversification; value adding
Produce livestock in confined concentrated livestock systems	Produce livestock in pasture-based systems
Reliance on fossil fuel to grow and transport crops	Lower use of fossil fuel in production, and an emphasis on locally grown regional food systems (so less

How Important Is it To Buy Organic?

Fact	Non Organic Food	Organic Food
Nutrients	During processing, non organic foods lose some nutrients and such nutrients have to be artificially added back to the food.	Organic foods contain more nutrients, that is, a higher amount of minerals and vitamin C.
Fertilizers	Chemical fertilizers are used to provide nutrients for the growth of crops in conventional farming.	Natural fertilizers like green manure and compost are used for the plants and soil in organic farming. If the question is of chemical fertilizers vs organic fertilizers, then chemical fertilizers are obviously more harmful.
Pesticides	In conventional farming, there are over 450 pesticides which are permitted for use. Many of these pesticides are toxic.	Pesticides are not allowed in organic gardening or farming. In certain cases, they may be allowed but only after considering factors like necessity, effect on human health and environmental health.
Herbicides	Herbicides are used in non organic farming to protect crops from insects and weeds. Herbicides sometimes leave a harmful toxic residue on the plants.	Methods like crop rotation and hand weeding are used instead of herbicides in organic gardening and farming.
Sewage Sludge	Human waste is used as a fertilizer to grow crops in conventional farming. This contaminated sewage sludge may cause diseases.	Use of sewage sludge is not permitted in organic farming.
Irradiation	Non organic food is irradiated, to kill harmful bacteria and other microorganisms. Such radiations might cause diseases in human beings.	Irradiation is avoided in organic farming.
Nitrate Amount	Fertilizers contain nitrate as a common ingredient and this nitrate gets converted to nitrosamines, which may be retained in the food and be cancer causing.	Organic food contains lesser amount of nitrates in it.

Can organic farming feed the world?

- <https://www.scientificamerican.com/article/organic-farming-yields-and-feeding-the-world-under-climate-change/>
- <https://www.theguardian.com/sustainable-business/2016/aug/14/organic-farming-agriculture-world-hunger>
- <http://www.worldwatch.org/node/4060>
- <https://www.wsj.com/articles/can-organic-food-feed-the-world-1436757046>



I ♥ Agriculture



I AM AGRICULTURE – ARE YOU?

Success stories

Vermont Fresh Network

info@vermontfresh.net, www.vermontfresh.net

Amy Trubek, Executive Director

- The Vermont Fresh Network (VFN) builds **innovative partnerships among farmers, chefs and consumers** to strengthen Vermont's agriculture. A strong farm economy creates local jobs, provides nutritious food and preserves the close-knit communities of Vermont. The VFN helps farms and restaurants team up to provide the freshest local food at restaurants. They have produced a Dining Guide and website to link consumers and chefs with Vermont farms.

Success stories

Tuscarora Organic Growers Cooperative, Inc.

HCR 71 Box 168-B

Hustontown, PA 17229

Phone: 814-448-2173 fax: 814-448-2333

info@tog.coop, www.tog.coop

Chris Fullerton, Manager – chris@tog.coop

- Tuscarora Organic Growers (TOG) is a cooperatively run wholesale distributor of in season organic products located in south central Pennsylvania, serving customers in the Washington, DC area and other parts of the mid-Atlantic region.

Success stories

Red Tomato

www.redtomato.org

Michael Rozyne, Managing Director, mrozyne@redtomato.org

Red Tomato is a not-for-profit marketing organization started in 1998 to ‘reinvent’ local food systems by reconnecting small-scale ecological family farmers to nearby supermarkets. Red Tomato distributes produce from 30 family farmers to supermarkets in greater metropolitan Boston. The organization is expanding into more supermarkets, and exploring new ideas to establish brand recognition

Success stories

New York Bold LLC

www.newyorkbold.com

New York Bold LLC, the owners of the locally grown “onions with attitude,” has the wheels turning for expansion. After an encouraging introduction into the market within New York State, they are increasing the distribution of the New York Bold brand into more eastern U.S. markets. In order to facilitate that growth they are contacting other grocery store chains and have been looking into purchasing additional packing and weighing machines.

References

- <https://www.2030wrg.org/>
- www.SARE.org