



***Hot Topic:
Sustainable Food Supply***

***Achieving Sustainability &
Food Security***

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October 20th 2013

2013 AND FNCE

Houston, TX

DISCLOSURE

Christine McCullum-Gomez, PhD, RD, LD

- Board Member/Advisory Panel
 - *Journal of Hunger and Environmental Nutrition*
(Editorial Review Board - Current)
 - Field to Plate (Creative Advisor - Current)

OBJECTIVES

- Define key terms including: “sustainability” “sustainable intensification” and “sustainable diets.”
- Describe global trends that challenge the achievement of sustainability and food security.
- Recognize how a perspective on sustainable development that includes both planetary and social boundaries is crucial to achieving sustainability and food security.

Definitions

Sustainability –

“To live within the ecological carrying capacity of Earth.” (Moore and Rees, 2013)

“Sustainability creates and maintains conditions under which humans and nature can exist in productive harmony and fulfills the social, economic, and other requirements of present and future generations.” (Nordin et al., 2013)

Definitions

Food security –

“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life.”

Based on this definition, four food security dimensions can be identified: food availability, economic and physical access to food, food utilization and stability over time.

Source: *The State of Food Insecurity in the World 2013. The Multiple Dimensions of Food Security.* Rome: FAO; 2013; pp. 16-17.

Global Trends Challenging Sustainability & Food Security

- **Climate Change**
- **Human Population Growth & Consumption Patterns (Resource Consumption)**
- **Pollution**
- **Extinctions**
- **Loss of Diverse Ecosystems**

Source: *Scientific Consensus on Maintaining Humanity's Life Support Systems in the 21st Century. Information for Policy Makers.* Millennium Alliance for Humanity & the Biosphere. May 2013. Available at: <http://mahb.stanford.edu/wp-content/uploads/2013/05/Consensus-Statement.pdf>

More on Global Trends...

“Over the last decade, world grain reserves have fallen by one third. World food prices have more than doubled, triggering a worldwide land rush [“land grabs” or “land acquisitions”] and ushering a new geopolitics of food. ***Food is the new oil.*** ***Land is the new gold*** [emphasis added].”

Fearing they might not be able to buy the needed grain from the market, some more affluent countries have taken the unusual step of buying or leasing land in other countries that grow food for themselves. These land acquisition deals have grown rapidly in number. Most of them are in Africa.

Source: Brown L. *Full Planet, Empty Plates: The New Geopolitics of Food Scarcity*. New York: W.W. Norton and Company. 2012.

Consumption Patterns in Fair Share, World Average, & High Consumption Countries (Global Footprint Network & Moore and Rees, 2013)

Selected Consumption Measures	Fair Earth-Share: 1 Planet	World Average: 1.5 Planets	High-Consumption: 3 Planets
Daily calorie supply	2,424	(per person) 2,809	3,383
Meat consumption (kilograms/year)	20	40	100
Motor vehicle travel (kilometers per year)	582	2,600	6,600
Home energy use in kilowatt-hours (per year)	2,300	3,500	9,300

Global Trends: Interactions



Source: *Scientific Consensus on Maintaining Humanity's Life Support Systems in the 21st Century. Information for Policy Makers.* Millennium Alliance for Humanity & the Biosphere. May 2013. Available at:

<http://mahb.stanford.edu/wp-content/uploads/2013/05/Consensus-Statement.pdf>

A Safe Operating Space for Interconnected Food & Climate Systems

- Improve Crop Yields [Sustainable Intensification]
- Change Diets [Sustainable Diets]
- Reduce Waste
- Adapt to Climate Change
- Reduce Agricultural Greenhouse Gas Emissions (GHGs)

Sources: <http://bit.ly/SafeSpaceClimateFood> and Beddington J, et al. *Achieving Food Security in the Face of Climate Change. Final Report from the Commission on Sustainable Agriculture and Climate Change*. CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS), Copenhagen, Denmark. 2012. Available at: www.ccafs.cgiar.org/commission

Sustainable Intensification (SI)

- When implemented appropriately, sustainable intensification uses suitable technologies to increase production per hectare, without negative environmental consequences on site or off site, and while maintaining other ecosystem services.” (Beddington et al., 2012)
- “Increase food production from existing farmland in ways that place far less pressure on the environment and that do not undermine our capacity to continue producing food in the future.” (Garnett et al., 2013)
- Sources: Beddington J, et al. *Achieving Food Security in the Face of Climate Change. Final Report from the Commission on Sustainable Agriculture and Climate Change*. CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS), Copenhagen, Denmark. 2012. Garnett T, et al. Sustainable intensification in agriculture: premises and policies. *Science*; 2013;341:33.

Sustainable Intensification (SI)

- The need to increase production;
- Increased production must met through higher yields because increasing the area of land in agriculture requires major environmental costs;
- Food security requires as much attention to increasing environmental sustainability as to raising productivity; and
- SI denotes a goal but does not specify a priori how it should be attained or which techniques to use. Merits of diverse approaches – e.g., conventional, “high tech,” agro-ecology, or organic – should be rigorously tested and assessed, taking biophysical and social contexts into account.

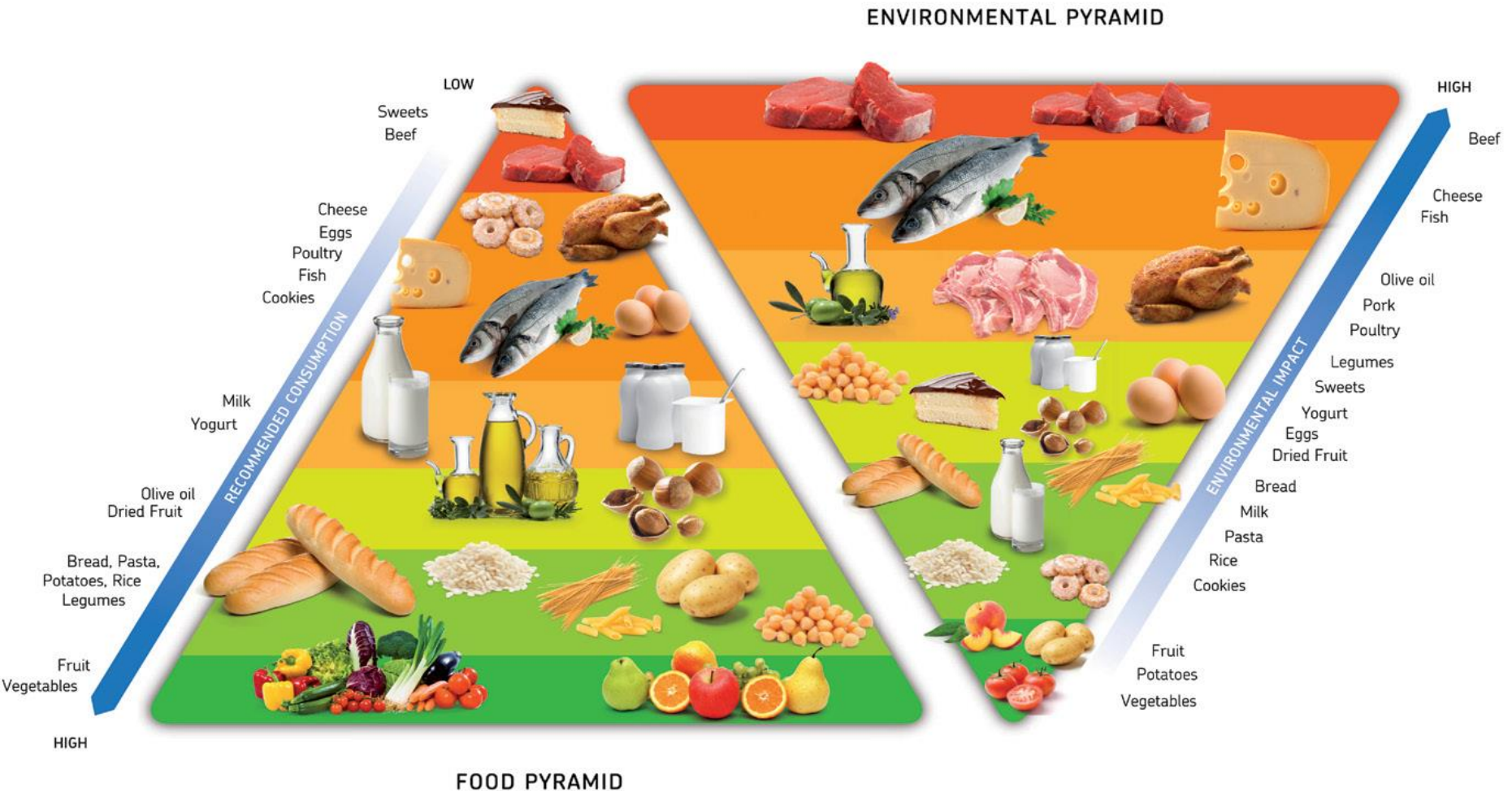
Source: Garnett T, et al. Sustainable intensification in agriculture: premises and policies. *Science*; 2013;341:33.

Sustainable Diets

“Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.”

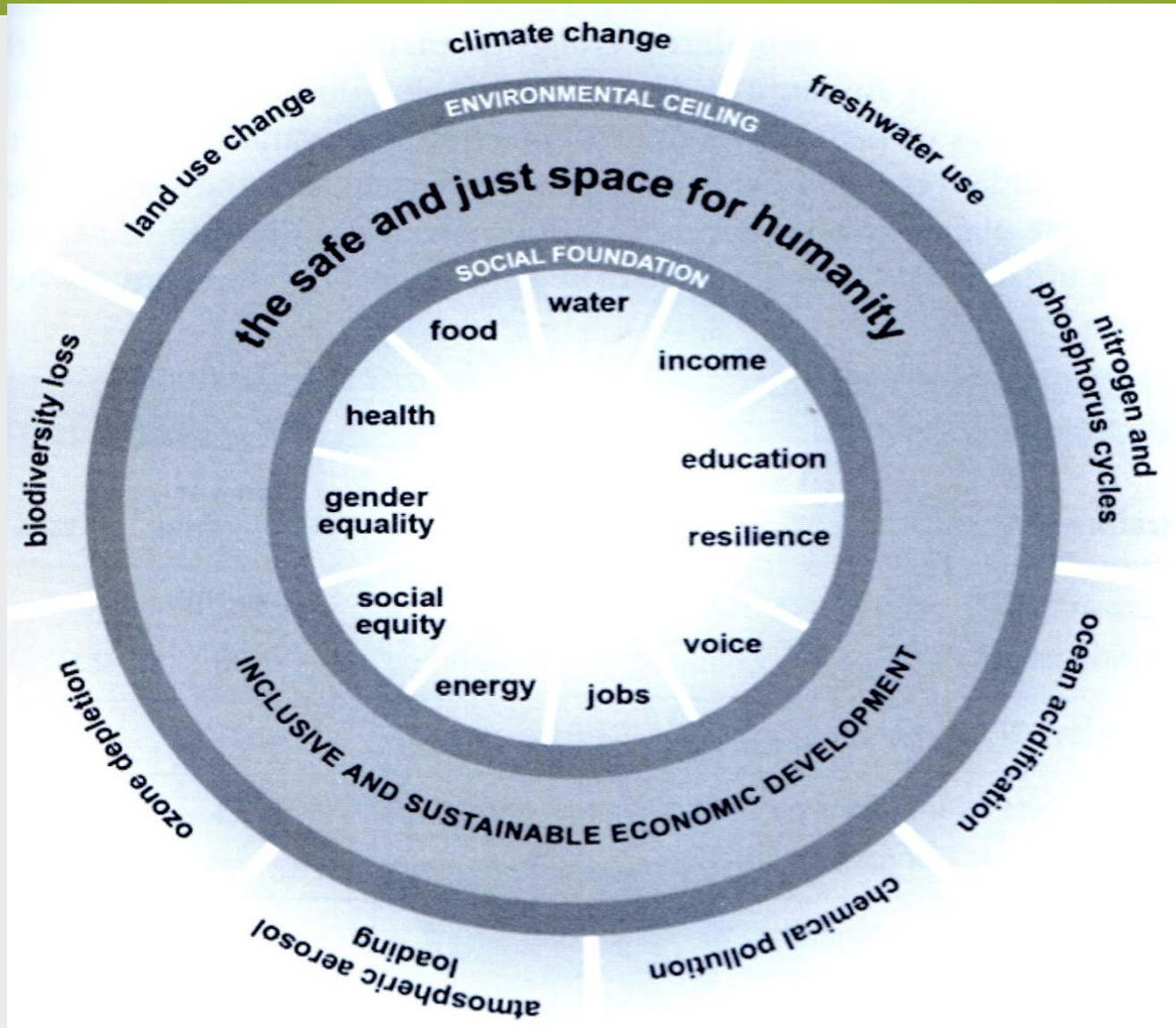
Source: Sustainable Diets and Biodiversity. Directions and Solutions for Policy, Research, and Action. Rome: FAO and Biodiversity International; 2012; p. 7. Available at: <http://www.fao.org/docrep/016/i3004e/i3004e00.htm>

The Double Pyramid



Source: Ciati R, Ruini L. Double pyramid: Healthy food for people and sustainable for the planet. In: *Sustainable Diets and Biodiversity. Directions and Solutions for Policy, Research, and Action*. Rome: FAO and Biodiversity International; 2012; pp. 280-293. Available at: <http://www.fao.org/docrep/016/i3004e/i3004e00.htm>

Sustainable Development (Planetary and Social Boundaries – Raworth, 2013)



Sustainable Development (cont'd)

“Only if issues such as equity, access, and distribution are addressed can increases in production improve food security. Addressing these issues offers other important benefits. For example, improved gender equality and education have been related to reduced population growth as well as increased food production and food security.”

Source: Hanspach J, Abson DJ, Loos J, et al. Develop, then intensify (letter). *Science*. 2013;341:713.

Hot Topic: Sustainable Food Supply

Is Biotechnology a Solution to Food Insecurity?

It depends on how the technology is used...

- Address the current intellectual property rights regime
- A change in the direction of research - more focus on “orphan crops”

Furthermore:

Improving crops is one thing, designing productive and resilient farming systems is another... It requires a broader approach. Agro-ecological practices such as agroforestry & intercropping represent a huge untapped potential.

We must scale up systems such as farmers' seed banks (local seed exchange systems promoting agro-biodiversity), farmer field schools, and participatory plant breeding if we want to cope with climate change & reduce hunger at the same time.

- *Oliver De Schutter, UN Special Rapporteur on the Right to Food*

Source: De Schutter, O. *Seed Policies and the Right to Food: Enhancing Agrobiodiversity and Encouraging Innovation*; October 2009. Available at:

http://www.srfood.org/images/stories/pdf/officialreports/20091021_report-ga64_seed-policies-and-the-right-to-food_en.pdf

As the Oromo of Ethiopia say, “You can’t wake a person who’s pretending to sleep.” We need to wake up to the fact that we live on a finite planet.

- Jason Clay, World Wildlife Fund

Source: Clay, J. Externalities: The costs of natural resource degradation. In: *A Sustainability Challenge: Food Security for All, Report of Two Workshops*. Washington DC: National Academies Press; 2012, p.197.

PRACTICE APPLICATIONS

- Use the *Meat Eater's Guide to Climate Change and Health*
<http://www.ewg.org/meateatersguide/>

- Choose sustainable seafood

http://wwf.panda.org/what_we_do/how_we_work/conservation/marine/sustainable_fishing/sustainable_seafood/seafood_guides/

(e.g., Environmental Defense Seafood Selector, Monterey Bay Aquarium Seafood Watch, Marine Stewardship Council-Certified Sustainable Seafood)

- Take steps to make choices for a healthful, sustainable diet

Mary Meck Higgins, PhD, RD. *Making Everyday Choices for a Healthy, Sustainable Diet* (Kansas State University, August 2012)

<http://www.ksre.ksu.edu/HumanNutrition/p.aspx?tabid=232>

- Review info. within Oxfam America's *Behind the Brands Campaign*

<http://www.behindthebrands.org/en-us>

OTHER SELECTED RESOURCES

Position of the Academy of Nutrition and Dietetics: Nutrition Security in Developing Nations: Sustainable Food, Water and Health. *J Acad Nutr Diet.* 2013;113-581-595.

Practice Paper of the Academy of Nutrition and Dietetics: Promoting Ecological Sustainability within the Food System. *J. Acad Nutr Diet.* 2013;113;464.

AND's Hunger and Environmental Nutrition Dietetic Practice Group –

<http://www.hendpg.org>

Sustainable, Resilient and Healthy Food and Water Systems Glossary

<http://www.hendpg.org/page/professional-development>

OTHER SELECTED RESOURCES (cont'd)

Oliver De Schutter, U.N. Special Rapporteur on the Right to Food -
<http://www.srfood.org/en>

Worldwatch Institute's *Nourishing the Planet* -
<http://www.worldwatch.org/nourishingtheplanet>

Toolkit: Reducing the Food Wastage Footprint (FAO, 2013) -
<http://www.fao.org/docrep/018/i3342e/i3342e.pdf>

OTHER SELECTED RESOURCES (cont'd)

23 Mobile Apps Changing the Food System (Foodtank) -

<http://foodtank.org/news/2013/10/twenty-three-mobile-apps-changing-the-food-system>

Sustainable Food Systems for Security and Nutrition: The need for social movements (Eric Holt-Giménez, 2013) -

http://www.worldfooddayusa.org/sustainable_food_systems_for_security_and_nutrition_the_need_for_social_movements?utm_source=twitter&utm_medium=social%20media&utm_campaign=FAOnews&utm_content=gk