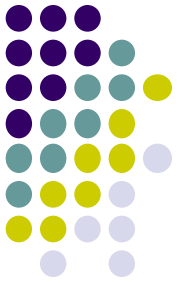


# **Forum on Sustainable Agriculture**

***Columbia University Earth Institute, the School of  
International and Public Affairs and the Tamer Center  
for Social Enterprise***

***April 21, 2016***

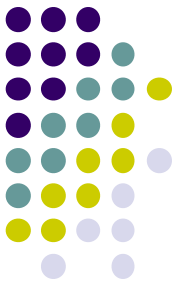




***Tweet your questions to:***  
***#CUSustainAgForum2016***

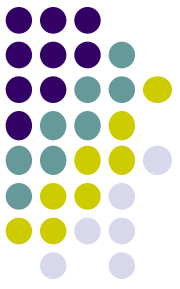


# "The County Agent," Norman Rockwell, 1948



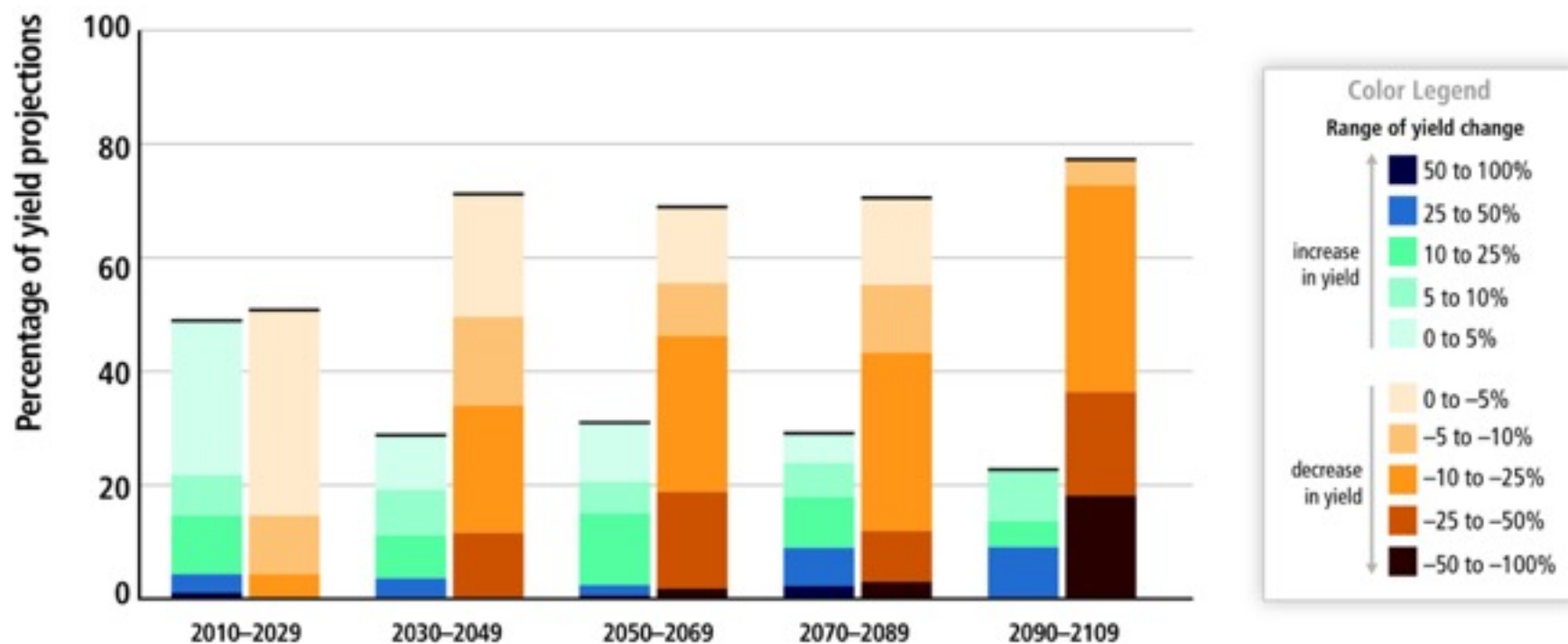
Source: Norman Rockwell painted "The County Agent" for the cover of the July 24, 1948 issue of the Saturday Evening Post.

# What is Sustainable Agriculture?



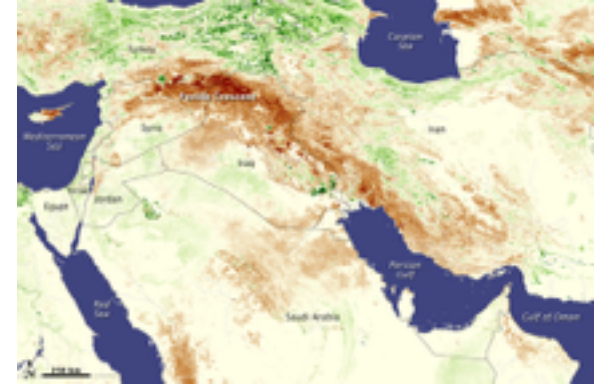
Agriculture is sustainable when it:

- Feeds and nourishes people
- Restores and protects the land, air, water and other species on our planet (across the full product lifecycle)
- Is resilient to and helps mitigate climate change
- Provides livelihoods and dignity for farmers, workers, families and rural communities



**Figure SPM.7** | Summary of projected changes in crop yields, due to climate change over the 21st century. The figure includes projections for different emission scenarios, for tropical and temperate regions, and for adaptation and no-adaptation cases combined. Relatively few studies have considered impacts on cropping systems for scenarios where global mean temperatures increase by 4°C or more. For five timeframes in the near term and long term, data (n=1090) are plotted in the 20-year period on the horizontal axis that includes the midpoint of each future projection period. Changes in crop yields are relative to late-20th-century levels. Data for each timeframe sum to 100%. [Figure 7-5]

## "Did Climate Change Help Spark The Syrian War? Scientists Link Warming Trend to Record Drought and Later Unrest"



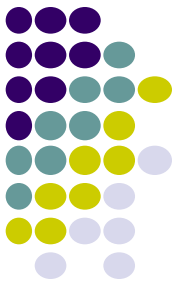
"A recent study coauthored by Richard Seager of Columbia University's Lamont-Doherty Earth Observatory says **a record drought that ravaged Syria in 2006-2010 was likely stoked by ongoing manmade climate change, and that the drought may have helped propel the 2011 Syrian uprising.**

Researchers say the drought, the worst ever recorded in the region, destroyed agriculture in the breadbasket region of northern Syria, driving dispossessed farmers to cities, where poverty, government mismanagement and other factors created unrest that exploded in spring 2011. The conflict has since evolved into a complex multinational war that has killed at least 200,000 people and displaced millions.

The draught "**added to all the other stressors**, it helped kick things over the threshold into open conflict. And a drought of that severity was made much more likely by the ongoing human-driven drying of that region."

Source: The Earth Institute, Columbia University, 3/2/15, <http://earth.columbia.edu/articles/view/3235/>

# A practice By Any Other Name...



- The many perspectives and approaches to sustainable agriculture
  - Agricultural best management practices
  - Rotational grazing
  - Sustainable intensification
  - USDA organic
  - Climate-smart agriculture
  - Permaculture, restoration agriculture, holistic management
  - Local agriculture/foodsheds
  - Multi-trophic aquaculture
- How is this a departure from traditional and conventional agricultural systems and what are the benefits?



# "A Lesson in Identity," Byron Joel

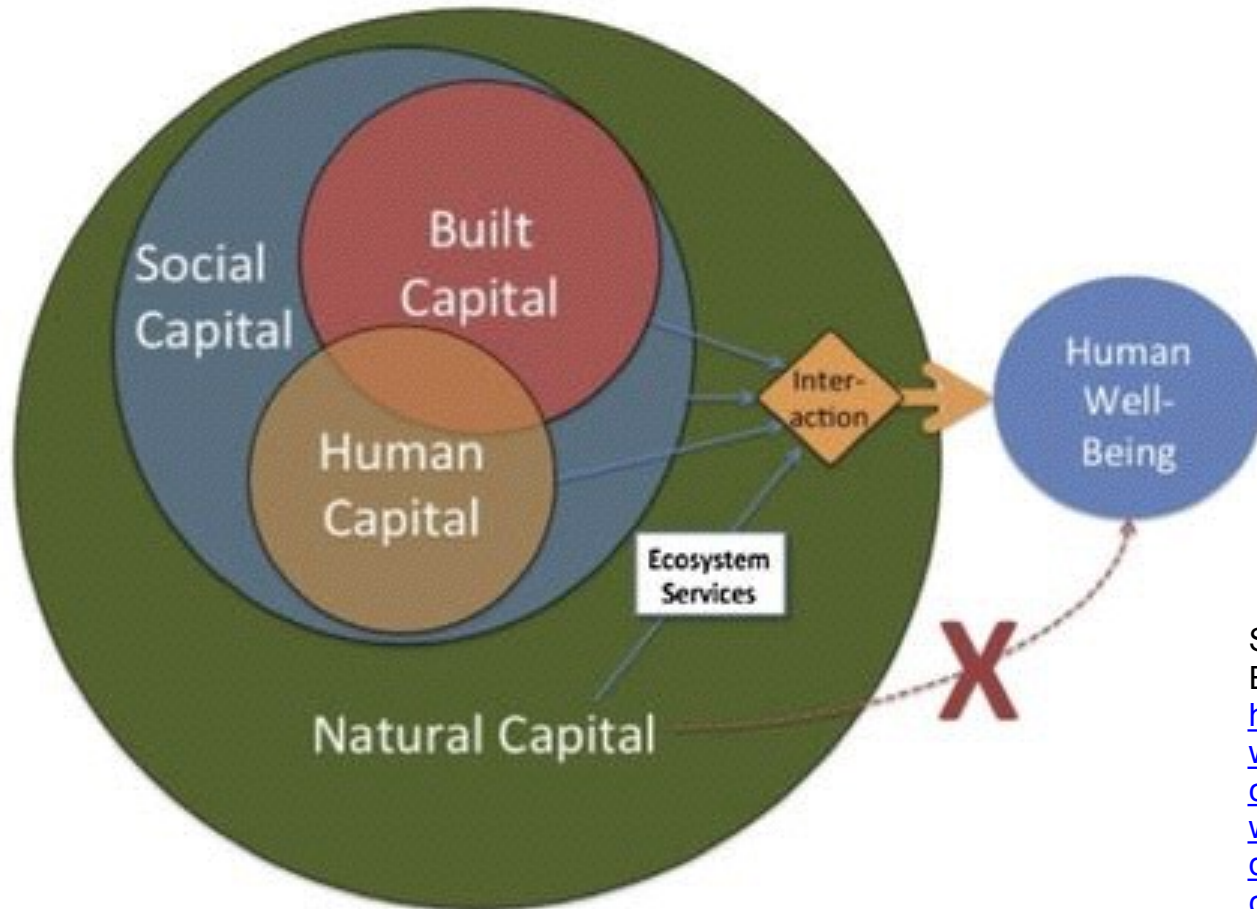


***Ecology is the primary economy.***

***Ecological function is true wealth.***

Byron Joel is a permaculture practitioner, designer and instructor in SW Australia, The 2015 essay is available at, <http://oaktreedesigns.com.au/return-to-morocco-2015/>, audio at <http://www.thepermaculturepodcast.com/2016/episode-1605/>





Source: Journal of Global Environmental Change, <http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/article-costanza-et-al.pdf>

**Fig. 1.** Interaction between built, social, human and natural capital required to produce human well-being. Built and human capital (the economy) are embedded in society which is embedded in the rest of nature. Ecosystem services are the relative contribution of natural capital to human well-being, they do not flow directly. It is therefore essential to adopt a broad, transdisciplinary perspective in order to address ecosystem services.

**It all starts with the Soil**





A collection of glass jars filled with various seeds and grains. In the foreground, a jar with a white lid is filled with reddish-brown lentils. To its right, a jar with a green lid is filled with white beans with black spots. Behind these, several other jars with green lids contain almonds, red beans, and yellow corn. The jars are set against a rustic wooden background with a woven basket visible in the upper part of the frame.

*And then it's the seeds...*



***And don't forget the people!***





# The Soil, Seeds and People are Part of the Larger System of Life on Earth



- To advance sustainable agriculture we must understand the broad array of **dynamic, interdependent (complex) systems** within which farms function.
- This systems view builds on the realization that everything in the biosphere -- the system of life on earth -- is connected to everything else. When we significantly impact one part of this system, there are ramifications throughout.
- *It is about context and visualizing desired outcomes versus merely attempting to solve problems.*

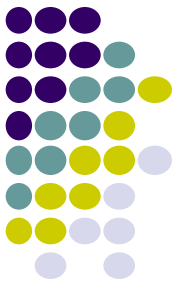
# Agroecology



- Has evolved to address "the key challenges of mitigating environmental impacts of agriculture while dramatically increasing global food production, improving livelihoods, and thereby reducing chronic hunger and malnutrition over the coming decades."
- At present, it can be interpreted as a scientific discipline, a movement, or a practice.

Source: "Agroecology -- A Review from a Global Change Perspective," Dr. Thomas P. Tomich, 2011, <http://www.annualreviews.org/eprint/YbVsSFxF7I7c4RqsybXb/full/10.1146/annurev-environ-012110-121302>

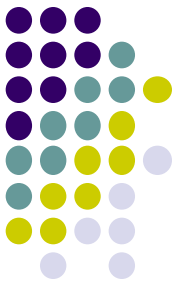
# Agroecology (Cont'd.)



- Key elements:
  - “Conceptualizes agriculture within the context of global change and studies it as a coupled system that involves a wide range of social and natural processes.
  - Addresses the challenge of agrobiodiversity at landscape, regional, and global scales.
  - Acknowledges that unless alternative nutrient management practices can be expanded dramatically, continuation of business as usual will result in unprecedented nutrient loading, with significant adverse environmental consequences.
  - Addresses current livestock production practices that increasingly have been decoupled from cropping systems, creating barriers to effective waste management and nutrient cycling.

Source: "Agroecology -- A Review from a Global Change Perspective," Dr. Thomas P. Tomich, 2011, <http://www.annualreviews.org/eprint/YbVsSFx7I7c4RqsybXb/full/10.1146/annurev-environ-012110-121302>

# Our Presenters



- **John Fullerton -- Founder and President of Capital Institute**, a collaborative working to explore and effect the economic transition to a more just, regenerative, and sustainable way of living through the transformation of finance. He is also an impact investment practitioner, serving as the Principal of Level 3 Capital Advisors, LLC and the Co-Founder and Director of Grasslands, LLC, a holistic ranch management company in partnership with the Savory Institute.
- **Kathleen Frith -- President and Executive Director of Glynwood Farm**, an agricultural nonprofit based in New York's Hudson Valley that advances food system transformation and works to ensure that farming thrives in this region. She was previously Managing Director of the Center for Health and the Global Environment at Harvard University's Medical School, addressing the correlation between human health and the global environment, with a focus on sustainable food and marine systems.
- **Derek Denckla -- Impact investor, strategic advisor and serial social entrepreneur who founded and directs the non-profit Slow Money NYC**, a community of 1300 linked through networking events to increase investment in and success of local, sustainable food and farm businesses.



# Why a Forum?

***"a place, meeting, or medium where ideas and views on a particular issue can be exchanged."***



***Thank you for your interest and participation!***

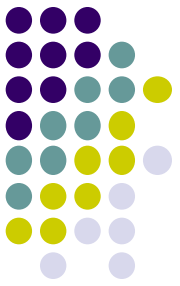


**Jeffrey Potent**

Adjunct Professor

Earth Institute and the School of International and Public Affairs

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