Linking Earth System Dynamics and Social System Modeling

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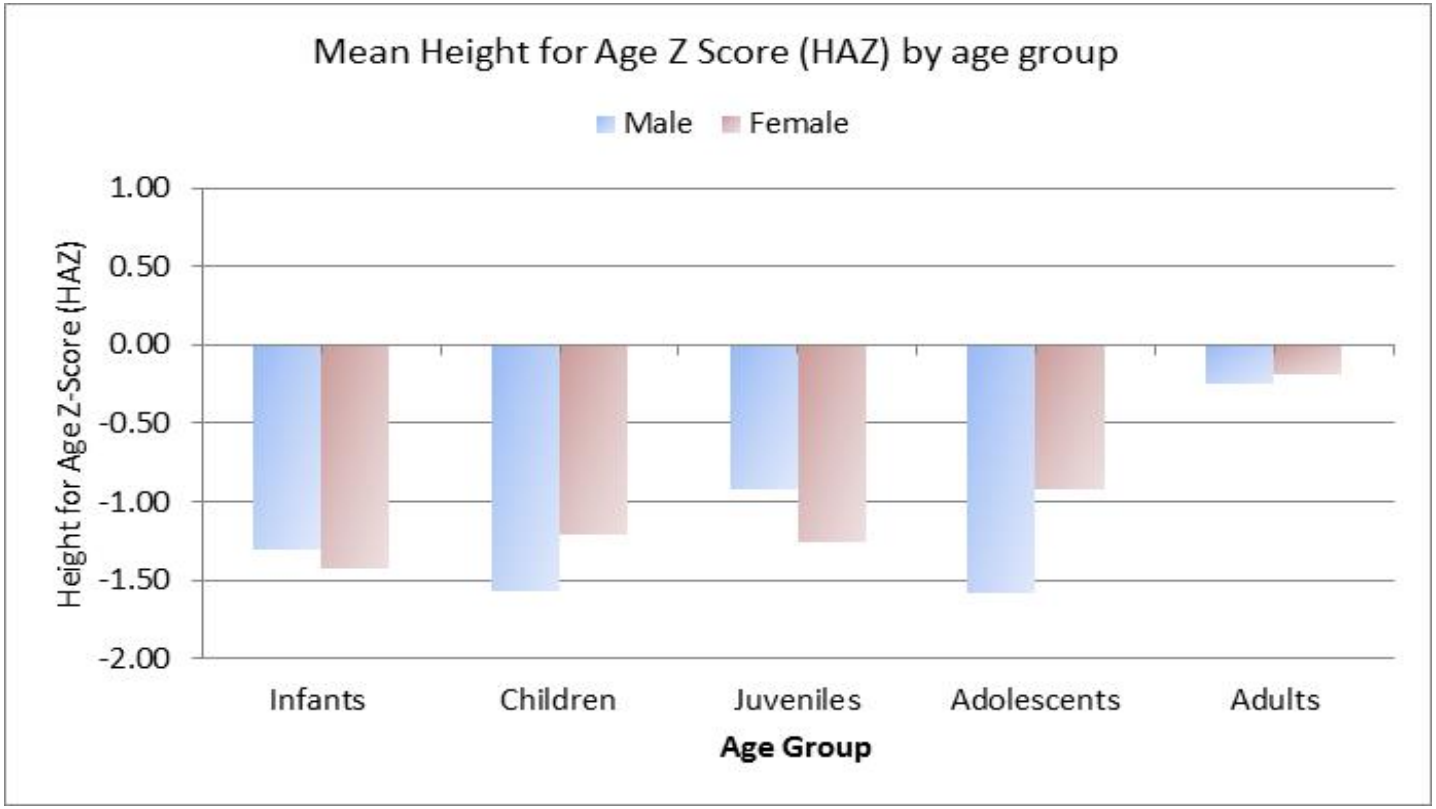
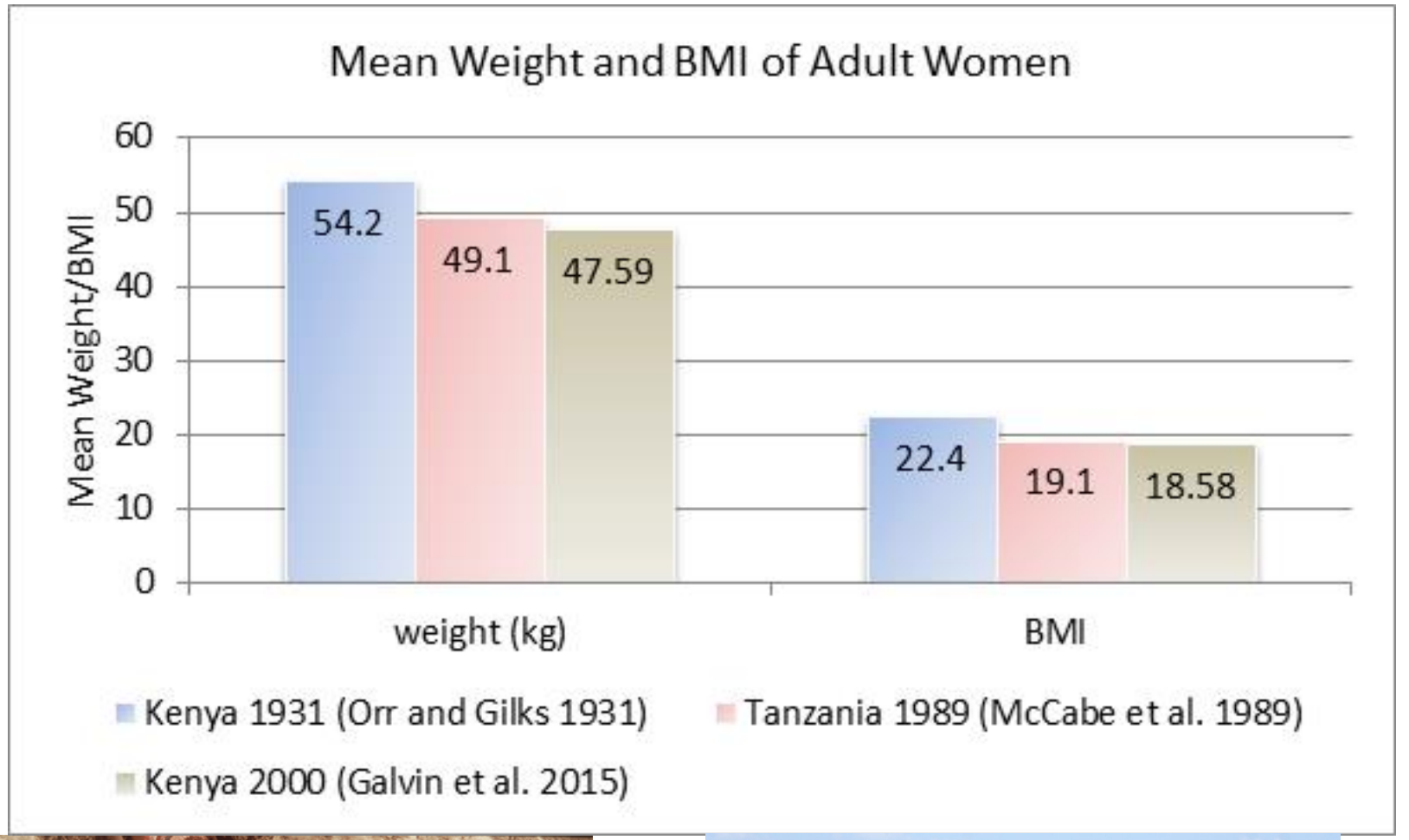

Mean Height for Age Z Score (HAZ) by age group
Male
Female
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
Height for Age Z-Score (HAZ)
Infants
Children
Juveniles
Adolescents
Adults
Age Group


Mean Weight and BMI of Adult Women
Mean Weight/BMI
60
50
40
30
20
10
0
54.2
49.1
47.59
22.4
19.1
18.58
weight (kg)
BMI
Kenya 1931 (Orr and Gilks 1931)
Tanzania 1989 (McCabe et al. 1989)
Kenya 2000 (Galvin et al. 2015)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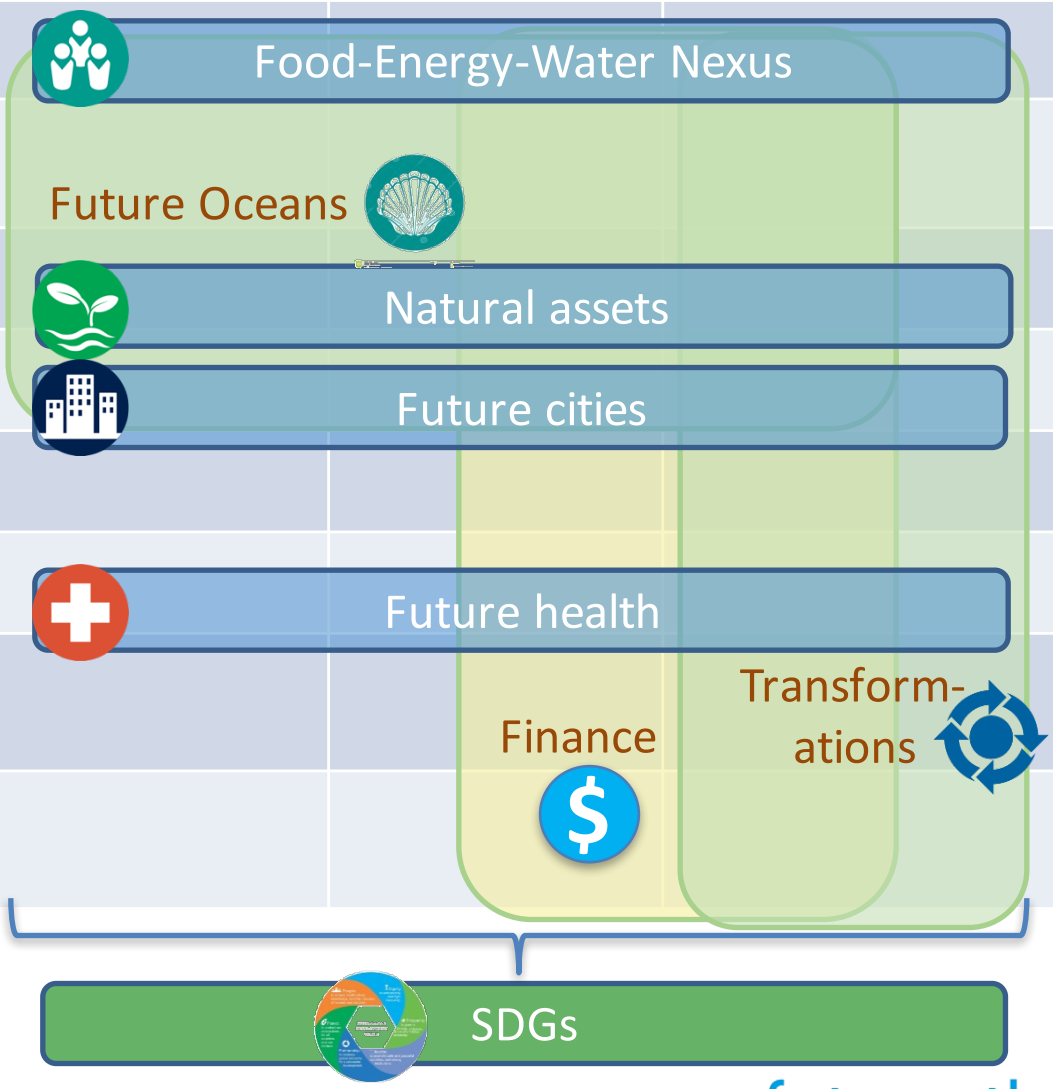
- A **global platform** for international research collaboration on global environmental change and sustainable development
  - Providing **integrated research** on major global change challenges and transformations to sustainability
  - **Solutions-oriented**, aiming to generate knowledge that contributes to new more sustainable ways of doing things
  - Strengthening partnerships between researchers, funders and users of research through **co-design** of research
  - **Communicating** science to society and society to science
- ***Responding to the need for a more nimble innovation system for global sustainability in the face of increasing rates of change***

Knowledge-Action Network initial set

Future Earth Themes / 2025 Vision Challenges	Dynamic Planet	Sustainable Development	Transformations to Sustainability
1. Water, food, energy for all			
2. Decarbonise socioeconomic systems & adapt			
3. Safeguard natural assets			
4. Build healthy, resilient cities			
5. Sustainable rural futures			
6. Improve human health under GEC			
7. Sustainable consumption and prod'n			
8. Social resilience to future threats			



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SUSTAINABLE DEVELOPMENT GOALS

https://sustainabledevelopment.un.org/sdgs

SUSTAINABLE DEVELOPMENT GOALS

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Target 2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round

2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development…

2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies…

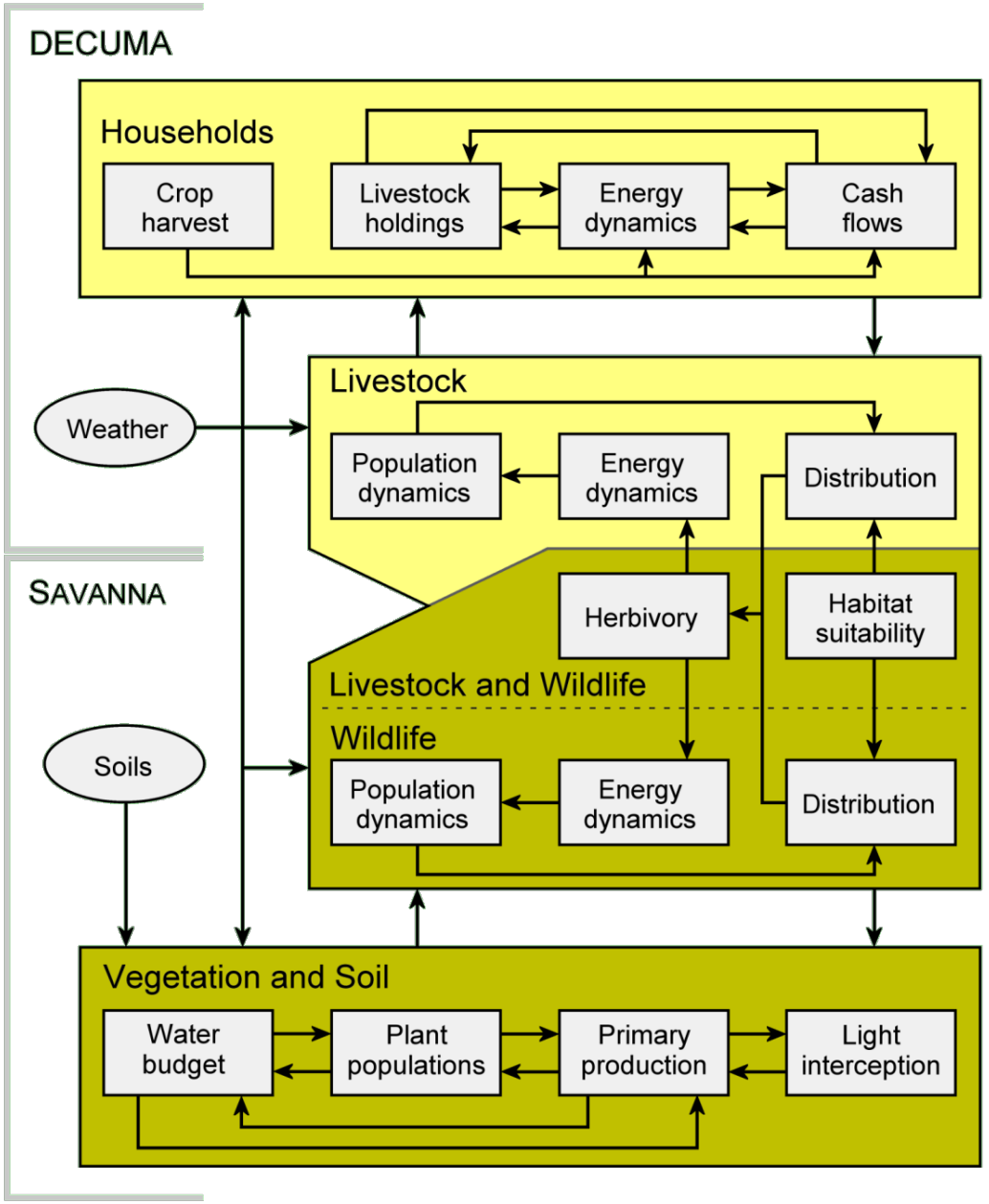
2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

Resilience in a Time of Uncertainty: Indigenous Peoples and Climate Change

Modeling a Coupled Natural and Human System

The linked SAVANNA and DECUMA (DECision-making Under Conditions of Uncertainty for Modeled Agents) models

DECUMA-SAVANNA is able to represent general ecosystem and household responses to stressors



DECUMA

Natural Resource Ecology Laboratory

DREAMAR:
Decision-making in Rangeland systems: an integrated Ecosystem-Agent-based Modeling Approach to Resilience and change

Colorado State University
Knowledge to Go Places

Landscape

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Turn:0|Mon Dec 10 19:29:55 MST 2007
Turn:1|Mon Dec 10 19:30:09 MST 2007
Turn:2|Mon Dec 10 19:30:22 MST 2007
Turn:3|Mon Dec 10 19:30:34 MST 2007
Turn:4|Mon Dec 10 19:30:46 MST 2007
Turn:5|Mon Dec 10 19:30:58 MST 2007
Turn:6|Mon Dec 10 19:31:10 MST 2007
Turn:7|Mon Dec 10 19:31:23 MST 2007
Turn:8|Mon Dec 10 19:31:35 MST 2007
Turn:9|Mon Dec 10 19:31:47 MST 2007
```

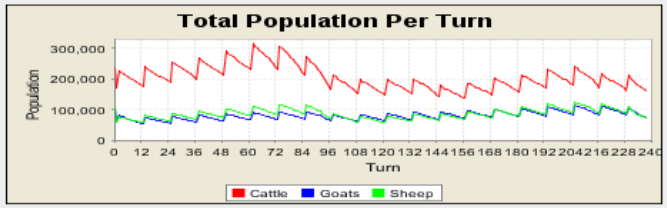
0/0:51:27

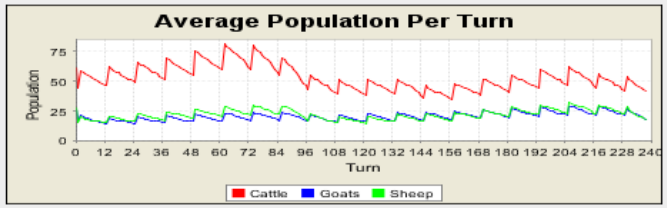
99%

Current Statistics

Number of Agents:3820

Cattle	Goats	Sheep
Mean:41	Mean:18	Mean:18
Max:1879	Max:1299	Max:4696
Min:0	Min:0	Min:0
Total:158081	Total:69858	Total:69876





Go | Reset | Pause | Cancel | Exit | Savanna | Pathways

start | Inbox for rboone@... | Command Prompt | NetBeans IDE 5.5.... | CWD | 3 Internet Explorer | Jasc Paint Shop Pro | DECUMA | 8:21 PM

Modeling engagement
Kajiado District, Kenya

Moving Forward

- Mobilize a community of modelers of coupled human and Earth system models
- Develop research initiatives/themes