Integration of Social Science Dimensions into an International Animal Agriculture Course

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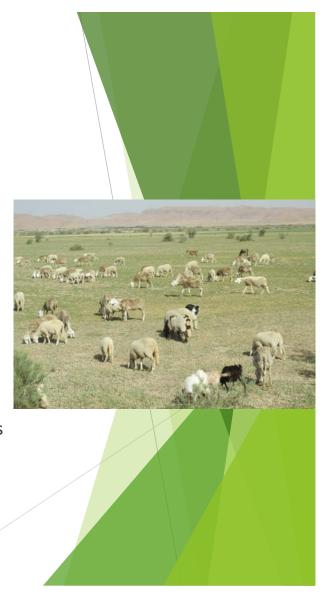Iowa State University, Ames, Iowa 50011 USA

Introduction

► Iowa State University (ISU) requires all undergraduate students to fulfill an "international perspectives" requirement prior to graduation

► The purpose of the requirement is to "promote students' understanding of cultural diversity and interdependence on a global scale"

► Requirement can be met by completion of:

  ► three credits of approved course work, or

  ► equivalent alternative academic experience (such as a study abroad program)

► To be designated as an approved international perspectives course, a course must meet two of five student learning outcomes approved at the university level

► Each college within the university determines its own approved courses list to ensure relevance to majors within the college

Background

- To expand global perspectives of ISU students, an International Animal Agriculture course (AnS 441) was developed in 2013 by ISU animal science distinguished professor Max Rothschild

- AnS 441 was designed to compare and contrast livestock production systems in developing nations and the U.S.

- Major course topics include:
    - 1. role of animal-source foods in fulfillment of human dietary nutrient requirements
    - 2. importance of livestock production systems in attainment of global food security
    - 3. sustainability of animal production systems, including alternative species
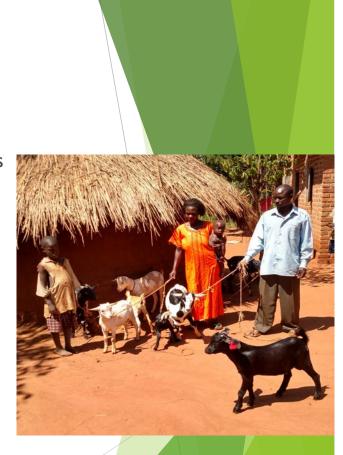   - 4. resilience and gender roles

Background

▶ AnS 441 course instructor changed in 2018

▶ Content was revised to increase the social science dimensions of the course

▶ Goals of the course content changes were two-fold:

  ▶ 1. to provide objective measures by which to compare developing countries

  ▶ 2. to prepare students for careers in international animal agriculture development
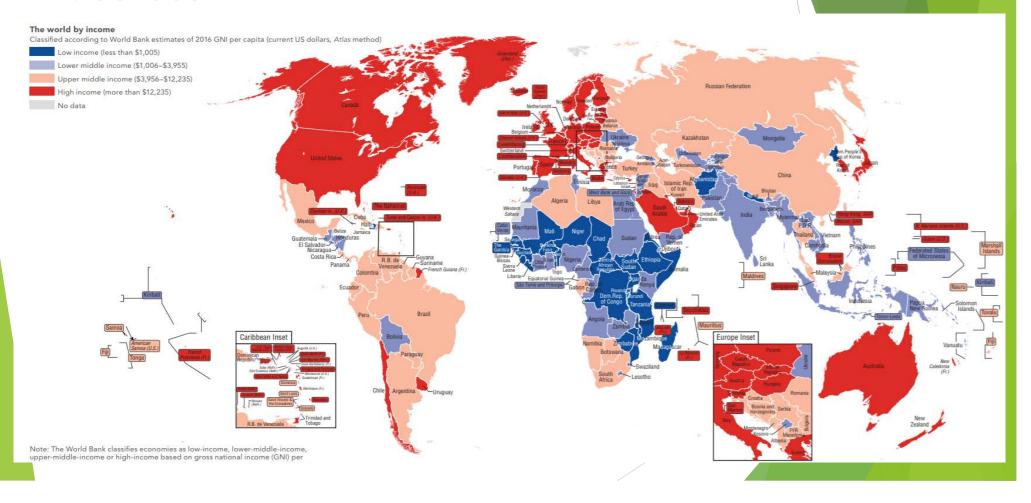
Objective

▶ The objective of this presentation is to describe the impact of integrating economic and other social development indicators into a technically-oriented animal science course

Methods

▶ In spring semester 2018, economic and social development indicators were incorporated into AnS 441

▶ Economic indicators obtained from World Bank data (https://data.worldbank.org/indicator) included:

  ▶ Gross domestic product (GDP, in current US $)

  ▶ GDP per capita

  ▶ Gross national income (GNI, Atlas method, in current US $)

  ▶ GNI per capita, PPP (purchasing power parity; in current US $)

  ▶ GINI coefficient (measure of income distribution within a country)

    ▶ 0= perfectly equal income distribution; 1= one person controls all wealth

Methods

The world by income
Classified according to World Bank estimates of 2016 GNI per capita (current US dollars, *Atlas* method)

- Low income (less than $1,005)
- Lower middle income ($1,006–$3,955)
- Upper middle income ($3,956–$12,235)
- High income (more than $12,235)
- No data

Note: The World Bank classifies economies as low-income, lower-middle-income, upper-middle-income or high-income based on gross national income (GNI) per

Methods

- Social development indicators included:
  - Human Development Index (HDI)
    - Scale from 0 (worst) to 1 (best)
    - Based on life expectancy at birth, education (years of schooling), per capita income
- Human development indices were obtained from United Nations Development Programme data (http://hdr.undp.org/en/data)

Human Development Index values, by country grouping, 1990–2017

Human development classification (Human Development Index value)

Very high (0.800 or greater)

High (0.700–0.799)

Medium (0.550–0.699)

Low (Less than 0.550)

OECD
Europe & Central Asia
Latin America & the Caribbean
East Asia & the Pacific
World
Arab States
South Asia
Sub-Saharan Africa

Source: Human Development Report Office.

Methods

▶ After explaining these economic and social development indicators, students were asked to incorporate them into a 15-minute oral presentation regarding animal agriculture in their assigned developing country

▶ Other information required in the presentation included:

  ▶ Geographical location, predominant language(s) and religion(s), government structure

  ▶ Livestock and poultry numbers and productivity data, livestock and poultry live animal and product imports and exports, land area and description (all from FAOSTAT)

  ▶ Animal genetic resources, feed resources, disease challenges

▶ Feedback from students was obtained via Plus/Delta surveys, assignment feedback questionnaires, and course evaluations

Results

- Below is an example of how students typically presented economic and social development indicators for their assigned country

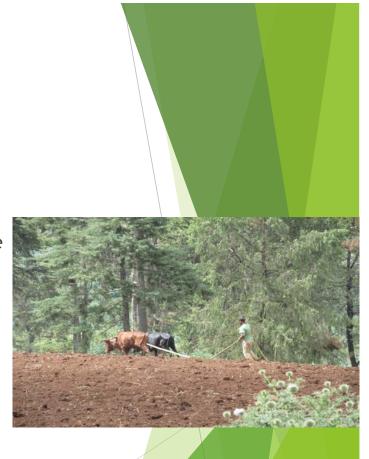|	GHANA	UNITED STATES
Gross Domestic Product (GDP)		
GDP (current US $)	$59.0 billion	$19.4 trillion
GDP, Purchasing Power Parity (current intl $)	$129.5 billion	$19.4 trillion
Gross Domestic Product (GDP) Per Capita		
GDP per capita (current US $)	$2,046	$59,532
GDP per capita, PPP (current US $)	$4,492	$59,532
Gross National Income (GNI) Per Capita		
GNI per capita, Atlas method (current US $)	$1,880	$58,270
Human Development Index	.579 (Rank: 139th)	.920 (Rank: 10th)
GINI Coefficient	.435	.415

Results

- Based on end of semester course evaluations in 2018, a detailed handout explaining the various economic and social development indicators was developed

- In 2019, this handout was distributed to students after introducing the indicators during lecture

- Example student feedback:
  - I loved diving into one specific country and discussing all of the socio-economic/cultural aspects of agriculture that we had talked about in class
  - Helped me get a better understanding of economic situations in developing counties
  - Helped to compare how we live with what people in other countries are going through
  - The FAOSTAT and World Bank databases were a great way to research a country. I am grateful to know about these for future reference.

Conclusions/Recommendations

▶ Social science concepts were successfully integrated into an animal science course

▶ Based on our experience, we recommend that agricultural science educators:

  ▶ 1. form partnerships with social science educators who can bring a cross-disciplinary perspective to their courses

  ▶ 2. introduce social science aspects into their courses to facilitate student cognition of the intertwinement of natural sciences and social sciences in agriculture

Questions?