

Discuss with your table...

- What do you find exciting about including global perspectives or sustainability into your courses?
- What are your anxieties/concerns about including sustainability or global perspectives into your courses?



Think Globally, Teach Locally

February 19, 2020

Center for Teaching and Learning

The Center for Serve-Learn-Sustain

Atlanta Global Studies Center

Why SDGs?



SLS Student Learning Objectives (SLOs)

Students will be able to:

1. Identify relationships among ecological, social, and economic systems.
2. Demonstrate skills needed to work effectively in different types of communities.
3. Evaluate how decisions impact the sustainability of communities.
4. Describe how they can use their discipline to make communities more sustainable.

How does SLS support curricular integration?

- SLS Course affiliation & mini-grants
- Linked courses: cross-disciplinary, connected by themes
 - Equitable and Sustainable Development
 - Green Infrastructure, Water, & Citizen Science
 - Community Health
- SLS-affiliated Capstone projects
- **Teaching Toolkit and other resources**



THINK GLOBALLY, TEACH LOCALLY

Faculty member: Rosa Arriaga

Course: User Interface Design

SLO alignment: SLO 2

Teaching tools & SLS support:

- * SLCE orientation
- * Parkway Community Tool

Community engagement:

Boys & Girls Club of Metro
Atlanta



Faculty member: Jennifer
Leavey

Course: Intro. to Research
(COS 2000)

SLO alignment: SLO 3

Teaching tools : *ReGenesis*
Case Study: Chemical Safety
and Ethics in Relation to
Communities



Atlanta Global Studies Center



Atlanta Global Studies Center



- A National Resource Center (NRC), funded by a U.S. Dept. of Education Title VI grant -- one of only seven awards in the nation
- A partnership of Georgia Tech and Georgia State University; Collaborations with Emory, Spelman, Agnes Scott, KSU, UGA, UNG
- Strategic partnerships with:
 - *RCE –Greater Atlanta*: Regional sustainability network acknowledged by the United Nations University as a Regional Centre of Expertise (RCE) on Education for Sustainable Development (ESD)
 - *GA Depts. of Education and Economic Development, City of Atlanta...*
- Mission: AGSC builds international awareness, global competence, and advanced language capacity in higher education, the private & public sector, and the K-12 community to empower the region's global agenda. AGSC integrates and emphasizes principles of **Education for Sustainable Development (ESD)** and **UN Sustainable Development Goals (UN SDGs)** in its programming and initiatives.
- **Signature Initiatives**
 - Visiting scholars-in-residence program: Hosting international researchers focusing on UN SDGs
 - Faculty grants to advance ESD/UN SDGs: Course development and research travel grants
 - Annual symposium: UN SDGs in Education, Research, and Community Engagement
 - Collaboratorium series: A supportive and creative space for sharing sustainability-related research, teaching and community engagement practices to explore and foster innovative collaborations



AtlantaGlobalStudies.gatech.edu

Sustainable Development Goals

Dr. Jairo Garcia

After World War II



Degraded air quality in two megacities: (a) Los Angeles in 1948 (from the Los Angeles Times Photographic Archive, UCLA; and (b) Beijing 65 years later (© JasonLee/Reuters/Corbis).

After World War II



- Donora, Pennsylvania, October 1948
- Smog from a zinc factory in town killed 20 people and left thousands sick

After World War II



- Great Smog of London - 1952
- Smog from coal plants killed 4,000 people and 100,000 sick



On April 22, 1970, 20 million Americans took to the streets, parks, and auditoriums to demonstrate for a healthy, sustainable environment in massive coast-to-coast rallies.

NEPA



What is the National Environmental Policy Act?

The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. The range of actions covered by NEPA is broad and includes:

- making decisions on permit applications,
- adopting federal land management actions, and
- constructing highways and other publicly-owned facilities.

Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations.



The International community agreed to the notion that both development and the environment could be managed in a mutually beneficial way.

United Nations Conference on the Human Environment (Stockholm Conference)

The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics.

Stockholm, Sweden
June 5-16, 1972

MORE INFORMATION

- [A/CONF.48/14/REV.1 - Report of the United Nations Conference on Human Environment](#)



Norwegian Prime Minister Gro Harlem Brundtland



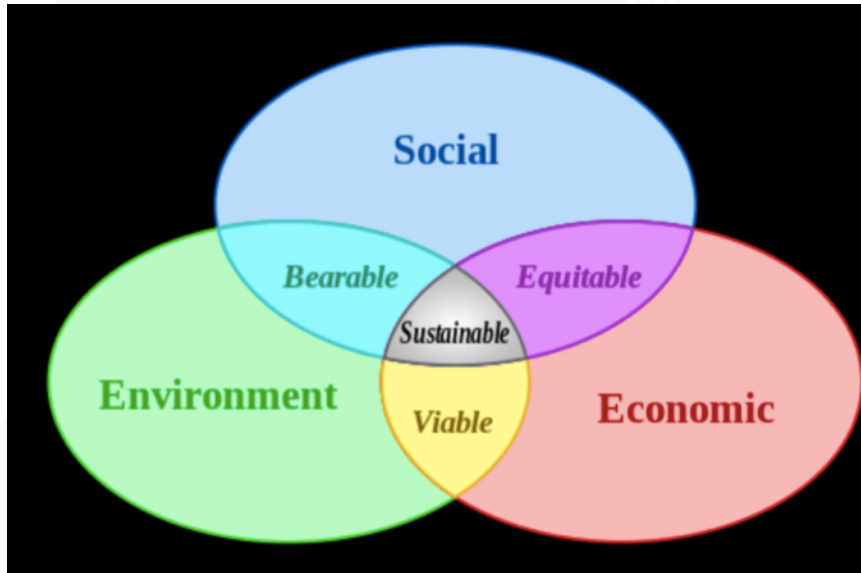
The Brundtland Report

Sustainable development is defined in the report as:

"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Brundtland Definition is generally accepted:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”



Business Definition: Triple Bottom Line

- People
- Profit
- Planet



Agenda 21 is a non-binding action plan of the United Nations with regard to sustainable development.

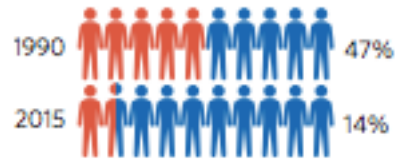
The "21" in Agenda 21 refers to the 21st century. Its aim is achieving global sustainable development. One major objective of the agenda 21 is that every local government should draw its own local Agenda 21.

Millennium Development Goals: 2015

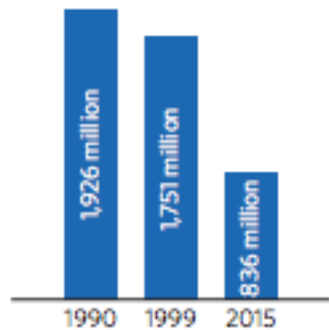


Millennium Development Goals: 2015

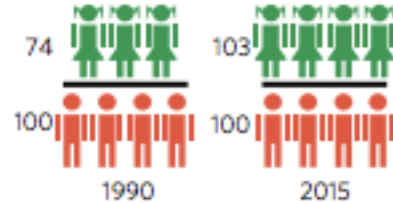
Extreme poverty rate in developing countries



Global number of extreme poor



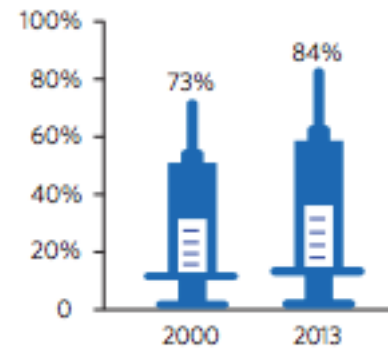
Primary school enrolment ratio in Southern Asia



90% of countries have more women in parliament since 1995



Global measles vaccine coverage

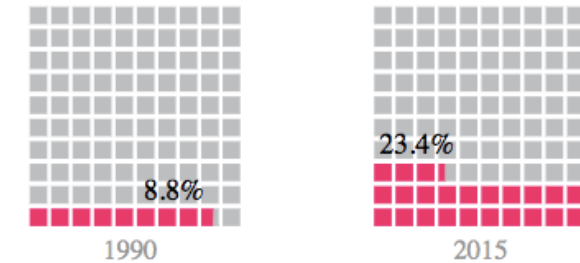


MDG 7

Access to piped drinking water since 1990 (billion)



Terrestrial and marine protected areas in Latin America and the Caribbean



https://www.un.org/millenniumgoals/2015_MDG_Report/pdf

Agenda 2030: Sustainable Development Goals



SUSTAINABLE DEVELOPMENT GOALS

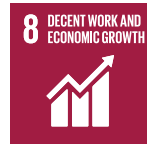


PEACE

PARTNERSHIP



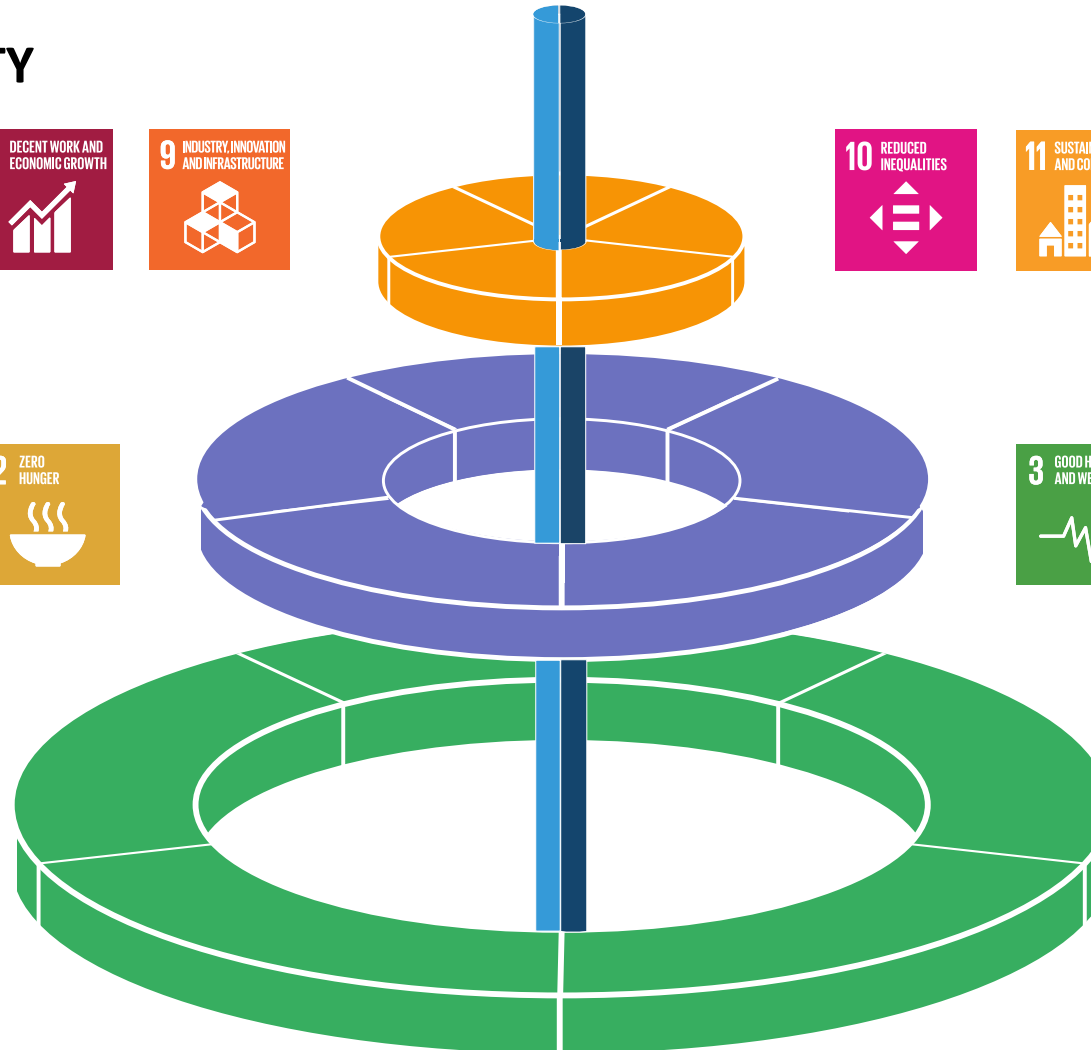
PROSPERITY



PEOPLE

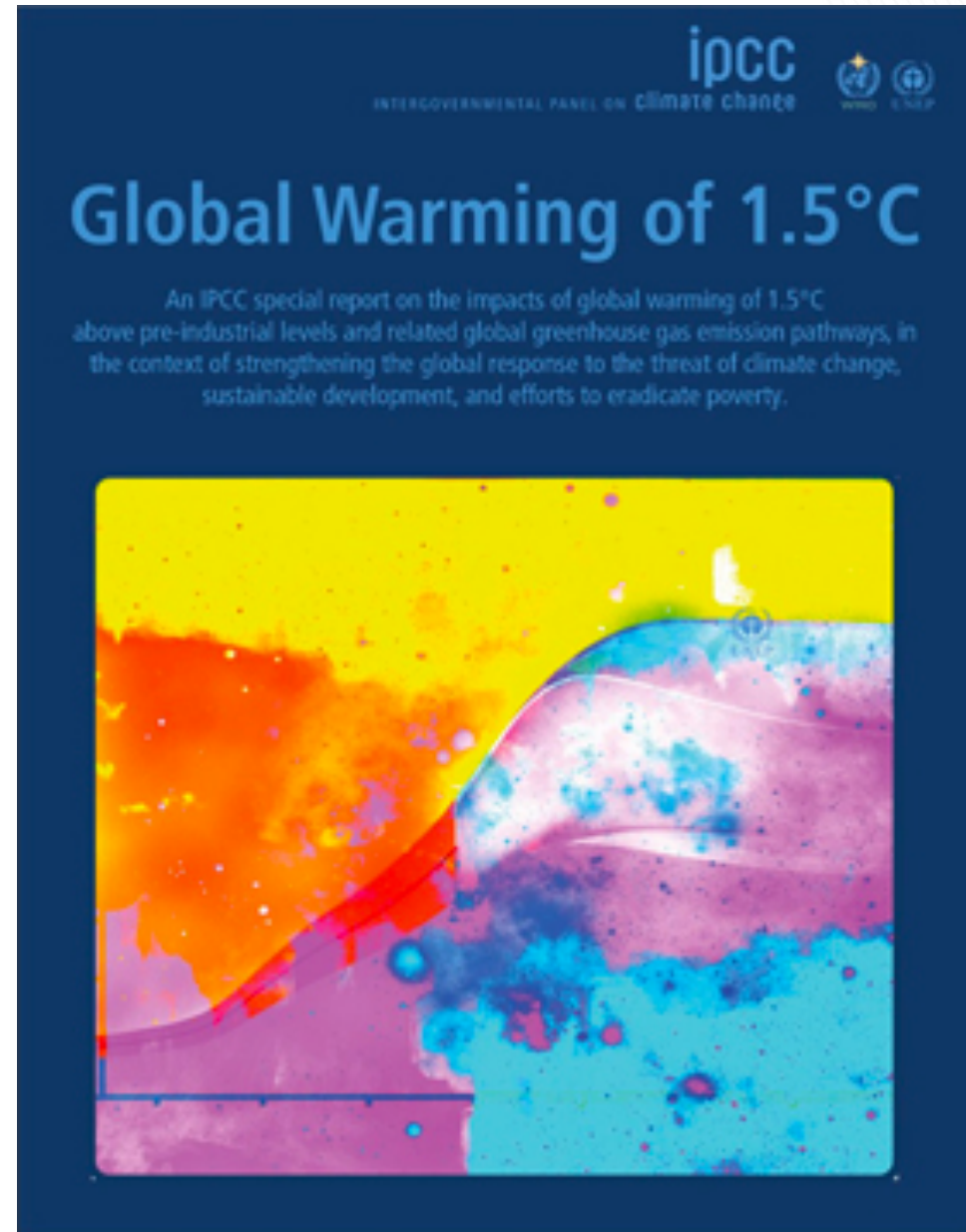


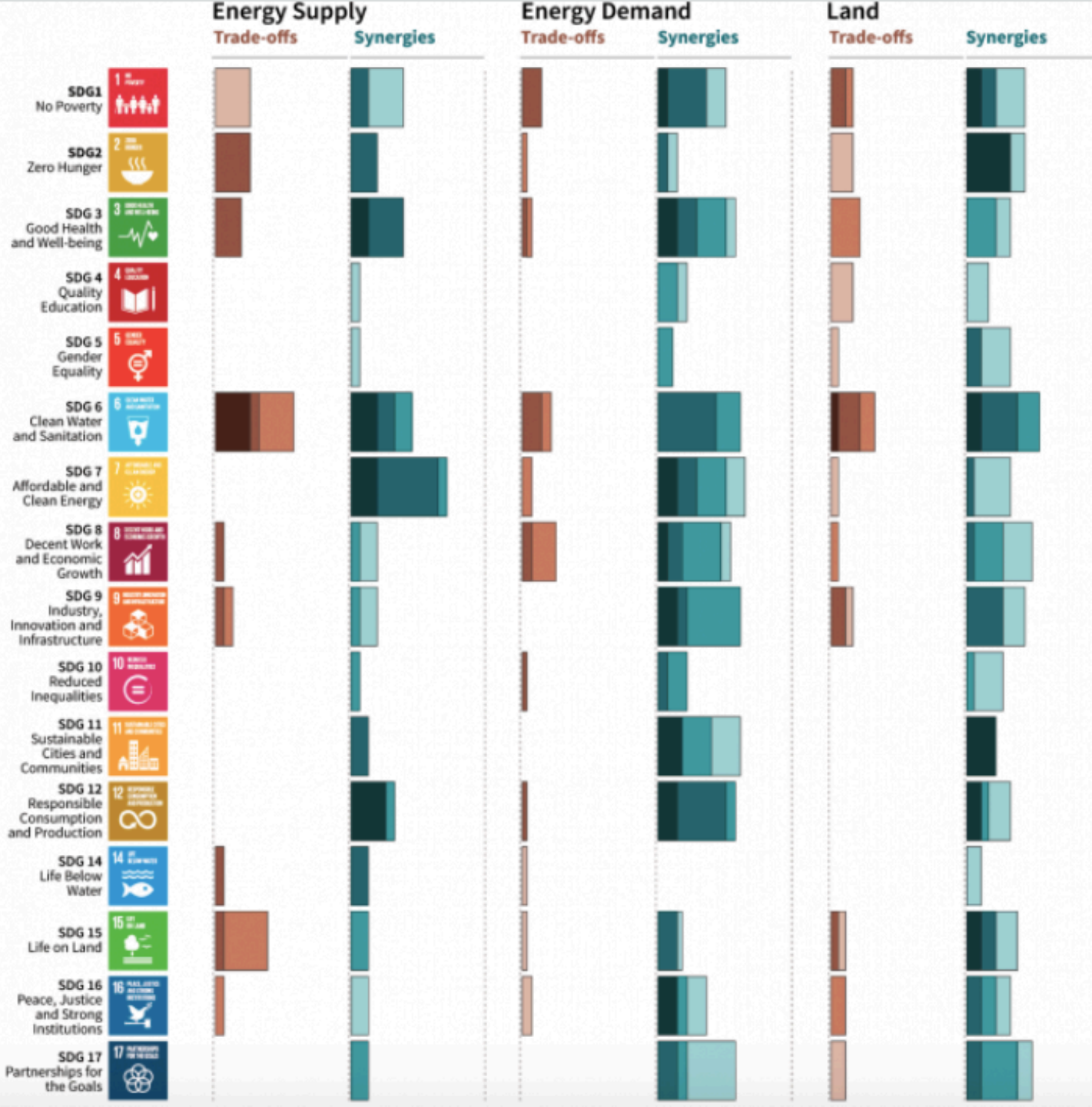
PLANET





Climate Summit for Local Leaders



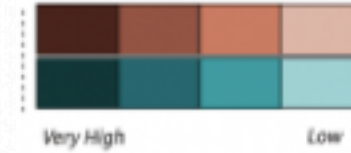


Length shows strength of connection



The overall size of the coloured bars depict the relative potential for synergies and trade-offs between the sectoral mitigation options and the SDGs.

Shades show level of confidence



The shades depict the level of confidence of the assessed potential for Trade-offs/Synergies.



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Leave a Mark

- Which SDG aligns with your course?
- Grab a sticky note and mark it on the flag

SDG Pioneer Panel



Joyelle Harris

Electrical and Computer Engineering

Introducing students to the SDGs

Course: Global Leadership

- Required for Global Leadership Living Learning Community (LLC)
- Typical enrollment: 110 – 115 first year students

Introduce SDGs to these students through three workshop assignments:

- Research
- Application
- Teaching

Introducing students to the SDGs

- Course: Global Leadership
- Research assignment
 - Identify target community within the US or abroad who would benefit from advancing the SDG.
 - Find data about the SDG that pertains to that community.
 - Identify relevant resources and organizations who are currently serving or could serve that community to advance that SDG.
- Application assignment
- Teaching assignment

Introducing students to the SDGs

- Course: Global Leadership
- Research assignment
- Application assignment
 - Identify a need for this SDG within your community or within a local community with whom you are familiar.
 - As a professional in your field, how can you advance the SDG in the future?
 - Discuss one practical strategy or activity that you can implement immediately to advance the SDG.
- Teaching assignment

Introducing students to the SDGs

- Course: Global Leadership
- Research assignment
- Application assignment
- Teaching assignment
 - Prepare a 3 – 5 minute interactive lesson to teach your peers a single piece of information that is relevant to the SDG.
 - Tell your peers one learning objective for the activity.
 - Complete the activity and teach your peers.
 - Perform a knowledge check after the activity to ensure your learning objective was achieved.
 - After all lessons are complete, write a brief summary of what you learned from your peers.



Britta Kallin


Modern Languages - German

UN SDGs in GT's “GRMN 3696: Sustainability in Germany”

Sustainability in German Studies
February 19, 2020
Britta Kallin



SLS – Teaching Toolkits

	Introduction to SLS & Sustainable Communities		
Discipline: All	Type: In-Class Exercise, Guest Speaker, Discussion	Time Commitment: 50-60 Minutes	Category: Intro to SLS and Creating Sustainable Communities; GT1000
OVERVIEW: <p>This tool, intended to be used towards the beginning of the semester, helps instructors frame their course to students in relation to SLS and our mission of educating students to help “create sustainable communities.” It also prompts students to begin exploring additional opportunities for connecting to SLS, this semester and beyond.</p> <p><u>This tool was contributed by Jennifer Hirsch.</u></p>			
INSTRUCTIONS: <ol style="list-style-type: none">1. Introduce students to SLS and talk with them about your course’s SLS affiliation and how it contributes to the SLS mission and vision - to educate students to contribute to the task of creating sustainable communities where humans and nature flourish, in Georgia, the U.S., and around the globe (read full text here).			

RCE – Greater Atlanta (since 2019)



REGIONAL CENTRE OF EXPERTISE
ON EDUCATION FOR
SUSTAINABLE DEVELOPMENT

ACKNOWLEDGED BY



**UNITED NATIONS
UNIVERSITY**

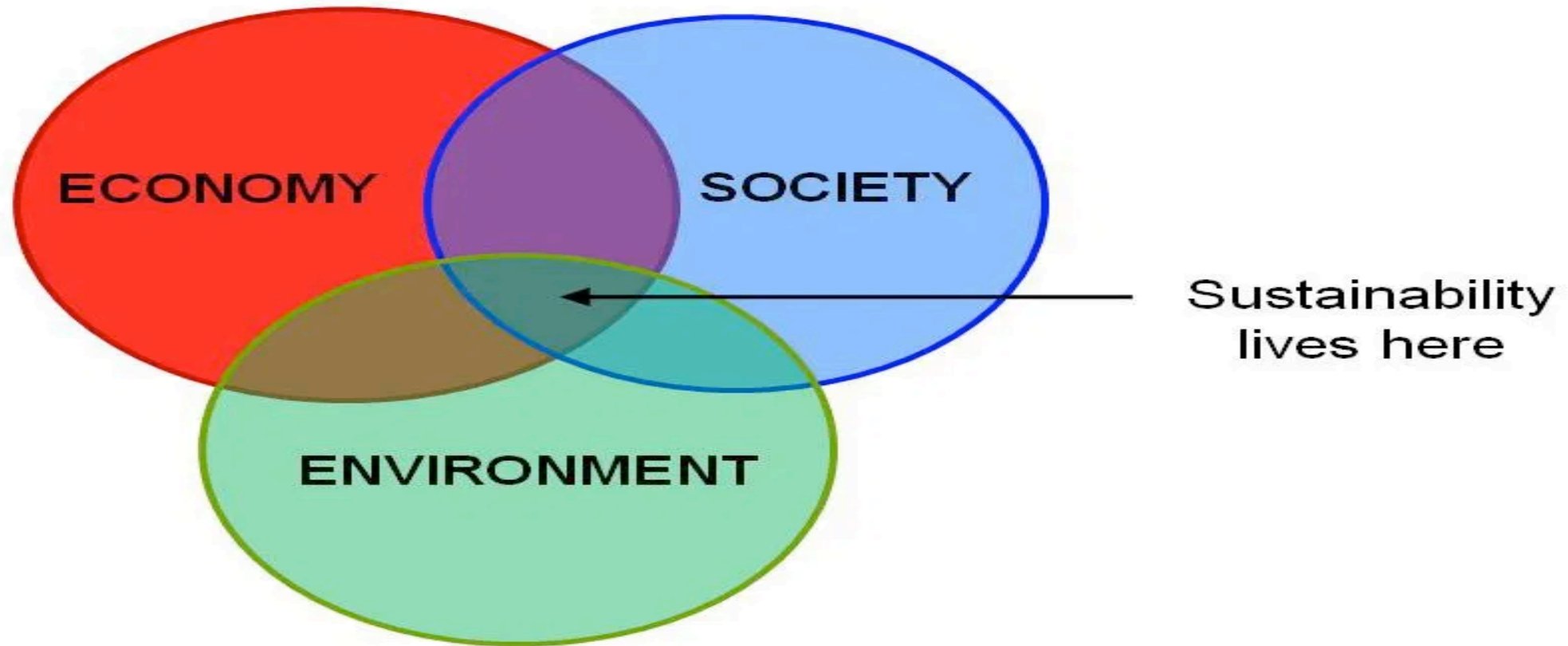
Sustainability / Nachhaltigkeit



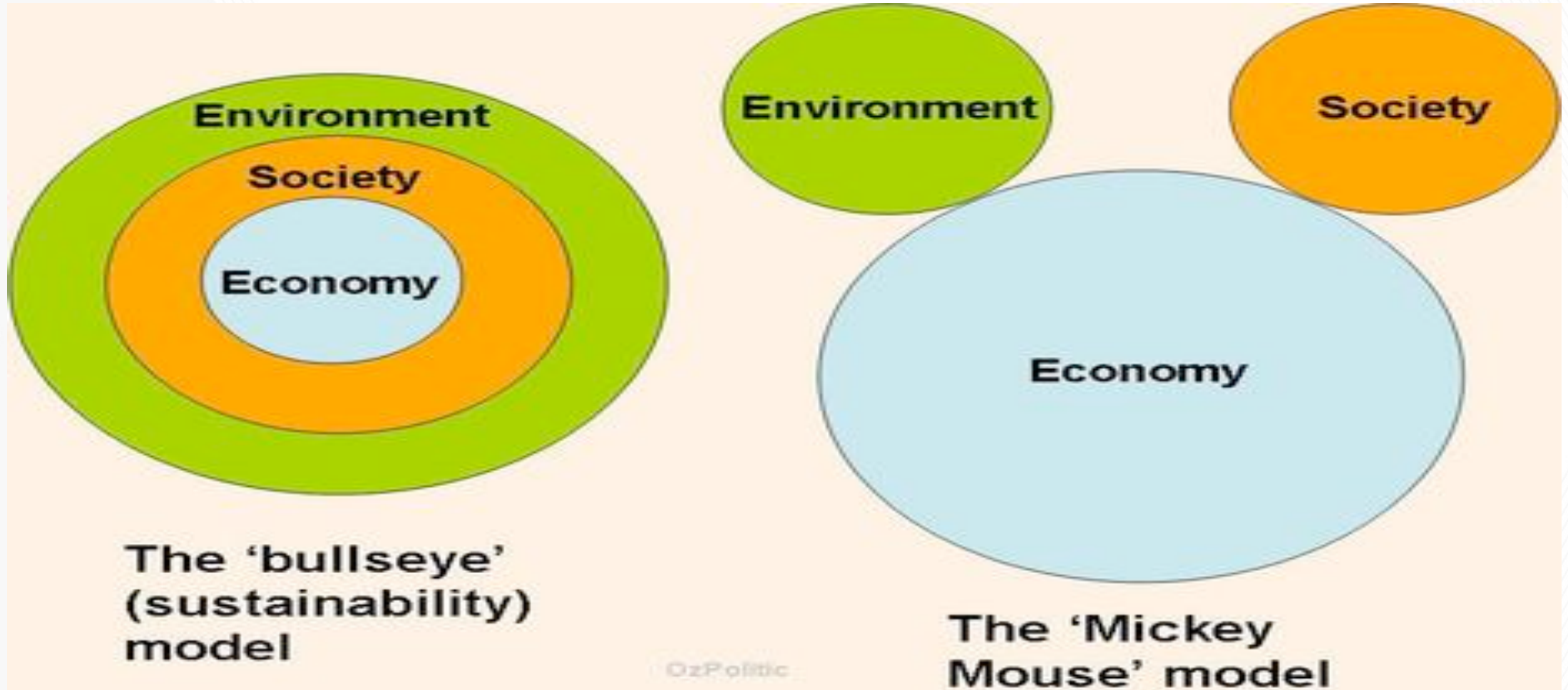
UN Ziele für nachhaltige Entwicklung (UN SDGs)



Sustainability Models



Sustainability Models



Economic Sustainability: Ökologischer Fußabdruck



Ökologischer Handabdruck



HAND PRINT
Action Towards
Sustainability

Ökologischer Handabdruck



positive Effekte steigern

- Lebensqualität
- gesellschaftlicher Zusammenhalt
- Nachhaltigkeitsbewusstsein
- Qualität der Ökosysteme
- etc.

negative Effekte reduzieren

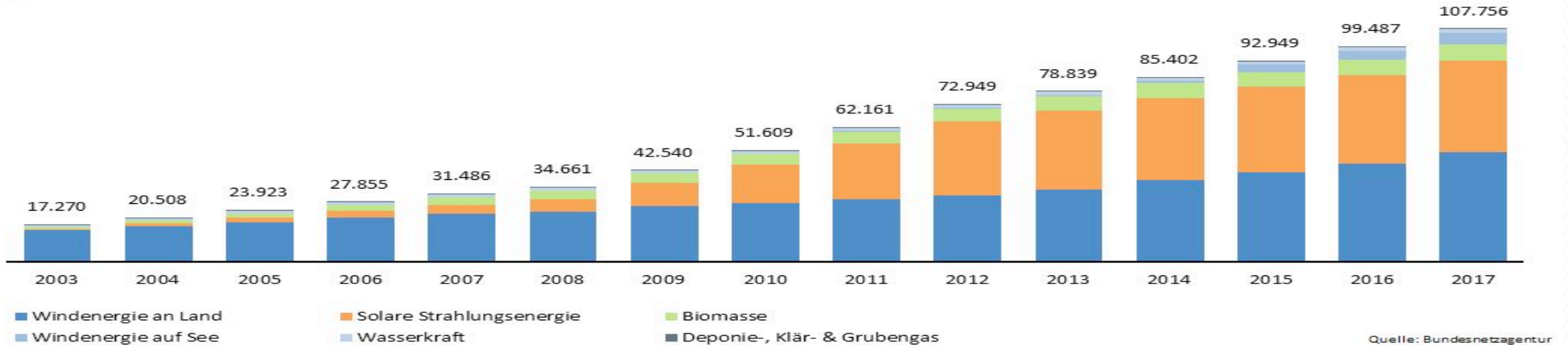
- Übernutzung der Ressourcen
- Emissionen, Abfälle
- Soziale Auswirkungen, z.B. Menschenrechtsverletzungen
- etc.

Degrowth / Postmaterialism



Renewable Energies Law in Germany (1990-)

Entwicklung der installierten Leistung nach erneuerbaren Energieträgern
in MW



Michael Braungart, William McDonough, *Cradle to Cradle: Remaking the Way We Make Things* (2002)



C2C



C2C – Frosch-Produkte



C2C - Frosch-Produkte



Anthropocene / Anthropozän



Eugene F. Stoermer,
Professor of Biology,
University of
Michigan, School of
Natural Resources
and Environment



Paul J. Crutzen,
Atmospheric
Chemist, Max
Planck Institute for
Chemistry, Mainz,
Germany

Mindfulness / Simple Living



Social Sustainability



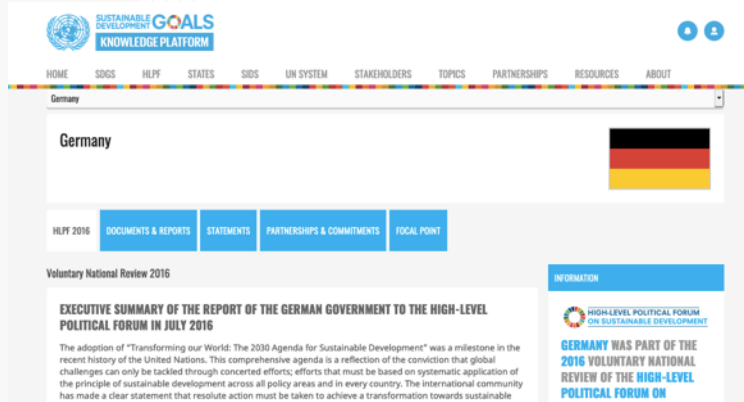
Social Sustainability



Racism in Germany



Gender and Sustainability



Sustainable Development Knowledge Platform

Gender equality, girls' education, professional expectations, gender and religion, LGBTQIA* and Trans networks, laws, and opportunities



Questions or
suggestions?

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Jairo Garcia

City and Regional Planning

CP2233 & SDGs

by:

Dr. Jairo Garcia

Spring 2020

Course Description:

The objective of this course is to introduce students to the theory and practice of the challenges of sustainable development (aka sustainability) as applied to the built environment and its interconnectivity with the natural environment. It addresses a range of specific sustainability-related issues such as sprawl and smart growth, climate change, transportation, social equity and environmental justice, food systems, and community engagement



Sustainable Urban Dvmt - CP-223...

CP-2233-C
Spring 2020

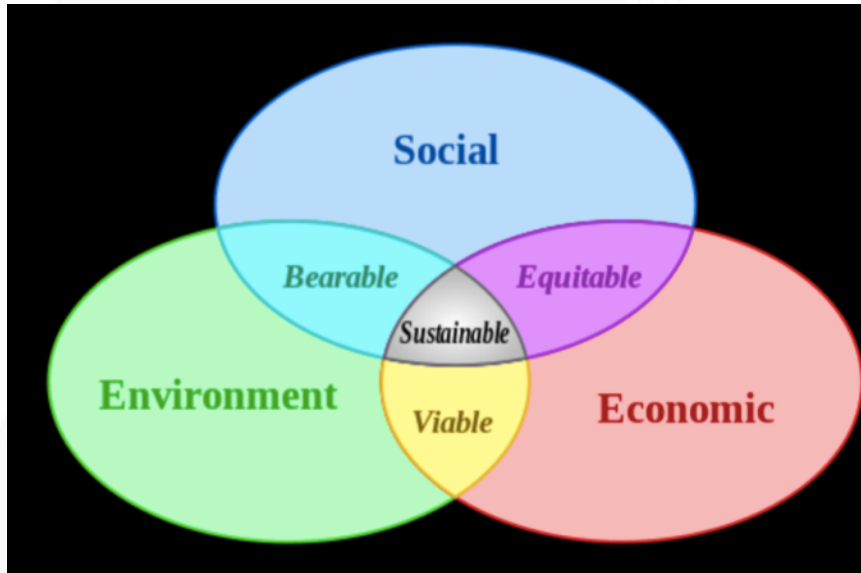
Learning Objectives:

By the end of the course and in accordance with the Serve-Learn-Sustain (SLS) Learning Outcomes, students will have accomplished the following:

- ✓ Explain the relationship between urban growth and climate change at local, national, and global scales. Describe some of the challenges that climate change poses for major urban centers.
- ✓ Evaluate the sustainability of a variety of urban centers, in relation to social equity, environment, and economy "3 Es".
- ✓ Explain how and why urban environmental problems often disproportionately impact vulnerable communities such as low-income communities and communities of color.
- ✓ Provide examples that show a variety of ways that research, policies, and practices in sustainable urban planning can enhance sustainable urban development, which respects to all "3Es."

The Brundtland Definition is generally accepted:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”



Business Definition: Triple Bottom Line

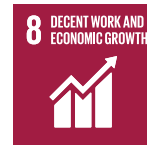
- People
- Profit
- Planet

PEACE

PARTNERSHIP



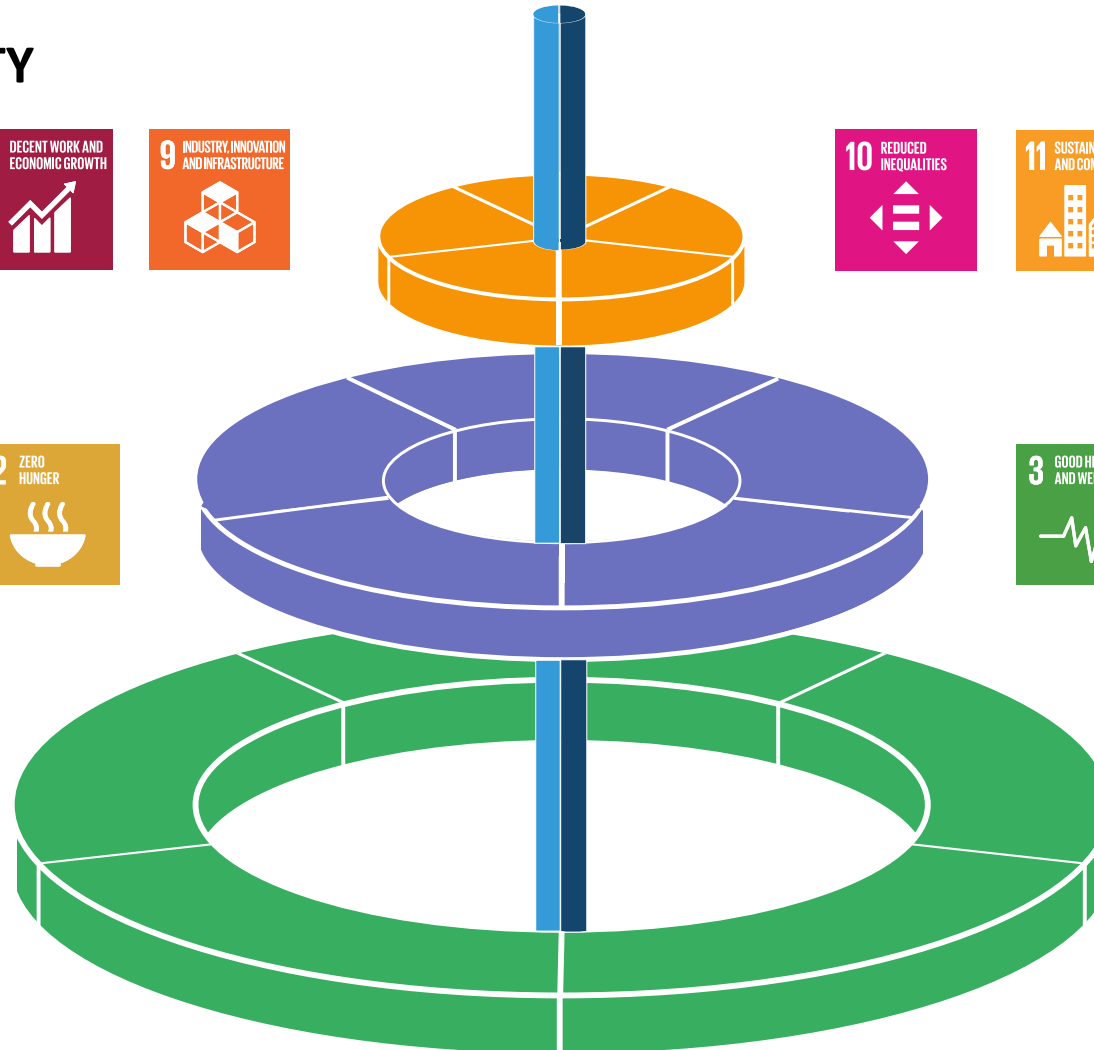
PROSPERITY












PEOPLE

















PLANET



Week	Date	Topic
1	Jan 7 Jan 9	Introduction SDG 11 & 13: Sustainable Cities & Climate Change  
2	Jan 14 Jan 16	SDG 7: Clean Energy Overview Sources of Energy Cities & Alternative Energy  
3	Jan 21 Jan 23	SDG 6: Clean Water and Sanitation Overview water cycle & urban sources of water Cities & Water resources (the Atlanta Regional case)  
4	Jan 28 Jan 30	SDG 3, 9 & 11: Sustainable Transportation Sustainable Transportation Urban Mobility: Electrification, Micro-mobility, Autonomous Vehicles   

5	Feb 4 Feb 6	SDG 12: Waste Management Urban Waste Management theory Urban Waste Management (City of Atlanta)  
6	Feb 11 Feb 13	SDG 2: Food Systems Urban food systems theory Urban gardens and Urban forests (City of Atlanta)  
7	Feb 18 Feb 20	SDG 14 & 15: Urban Trees and Green Spaces Urban Green Spaces theory Tree Ordinance and Green Spaces in Atlanta   
8	Feb 25 Feb 27	Presentations Team 1-5 Midterm Exam

9	Mar 3 Mar 5	SDG 14 & 15: Urban Biodiversity Urban ecosystems & Biodiversity theory Biodiversity in Atlanta   
10	Mar 10 Mar 12	SDG 11: Sustainable Land Use Sustainable Land Use Theory Land Use Case: City of Atlanta  
11	Mar 24 Mar 26	SDG 1, 5, 10, 11: Equity Urban Equity Theory Equity in Atlanta     
12	Mar 31 Apr 2	SDG 11 & 13: Sustainable Metrics & Resilient Cities Metrics for Sustainable Development Resilient Cities  
13	Apr 7 Apr 9	SDG 11: Smart Cities & Cities of the Future Theory Smart Cities Theory Cities of the Future  
14	Apr 14 Apr 16	Team Presentations Presentations SUD Tools Teams 6-10 Presentations Cities
15	Apr 21 Apr 23	Site Visit Final Exam

Example 1: Sustainable Energy

2

Jan 14

Jan 16

SDG 7: Clean Energy

Overview Sources of Energy



Cities & Alternative Energy



- Environment
- Economics
- Equity

Environment	Economy	Equity
Fossil fuels vs. Renewables: <ul style="list-style-type: none">- Extraction- Carbon emissions- Other waste	The low-carbon economy: <ul style="list-style-type: none">- Externalities- Prices of energy- Job generation & GDP	Access to Energy: <ul style="list-style-type: none">- Energy burden- Distributed Generation- Energy Democracy

Example 2: Food Systems

6	Feb 11 Feb 13	SDG 2: Food Systems Urban food systems theory Urban gardens and Urban forests (City of Atlanta)  
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Environment	Economy	Equity
Carbon intensive food systems <ul style="list-style-type: none">- Extraction- Carbon emissions- Food waste	Local food systems: <ul style="list-style-type: none">- Urban gardens- Vertical farming- Food forests	Access to Food: <ul style="list-style-type: none">- Food deserts- Malnutrition in the time of abundance- Local food generation

Conclusions

- Sustainable Development Goals provide a robust framework:
 - ✓ Economy
 - ✓ Ecology and
 - ✓ Equity
- Sustainable Development Goals can be applied to any specific field
- Consideration of synergies and tradeoffs should be applied when including SDGs in the different fields



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Shatakshee Dhongde

Economics

Think Globally: The UN SDGs



Teach Locally

- Econ 3161: Econometric Analysis
- Fall and Spring Semester
- Application of Statistical Methods to Economics
- Required course for all Economics majors and double major
- Many minors also take the course
- Class size: 30 to 35 students
- Course requirement: Midterm and Final exam + Research paper

Teach Locally

- Research paper
- Choose a topic aligning with the UN SDGs
- Review most recent literature and write a summary
- Choose data and conduct analysis
 - Simple descriptive statistics
 - Estimating regression models
 - Testing significance of the estimates
 - Conducting sensitivity analysis

Think Globally, Teach Locally

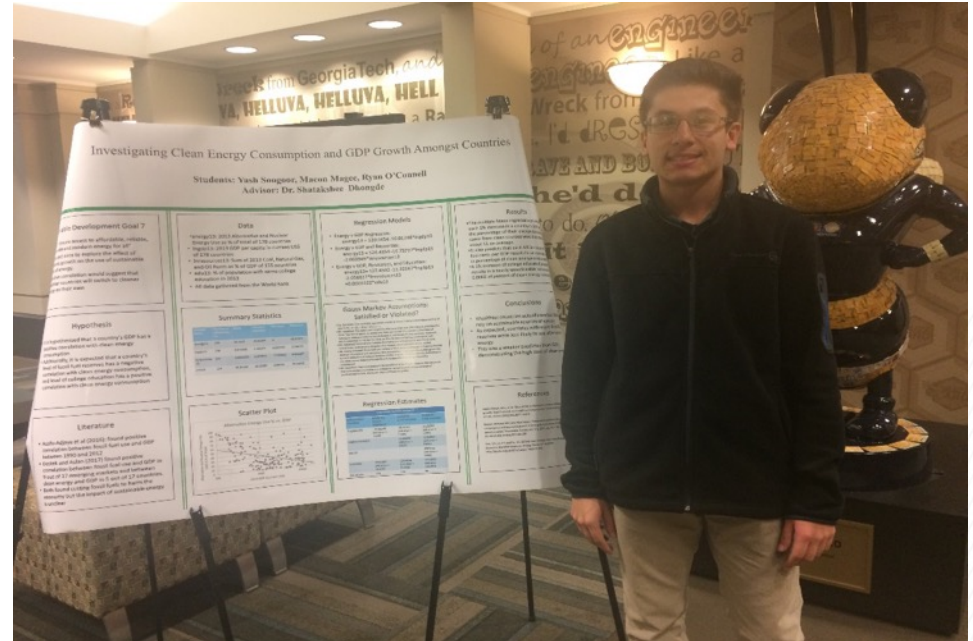
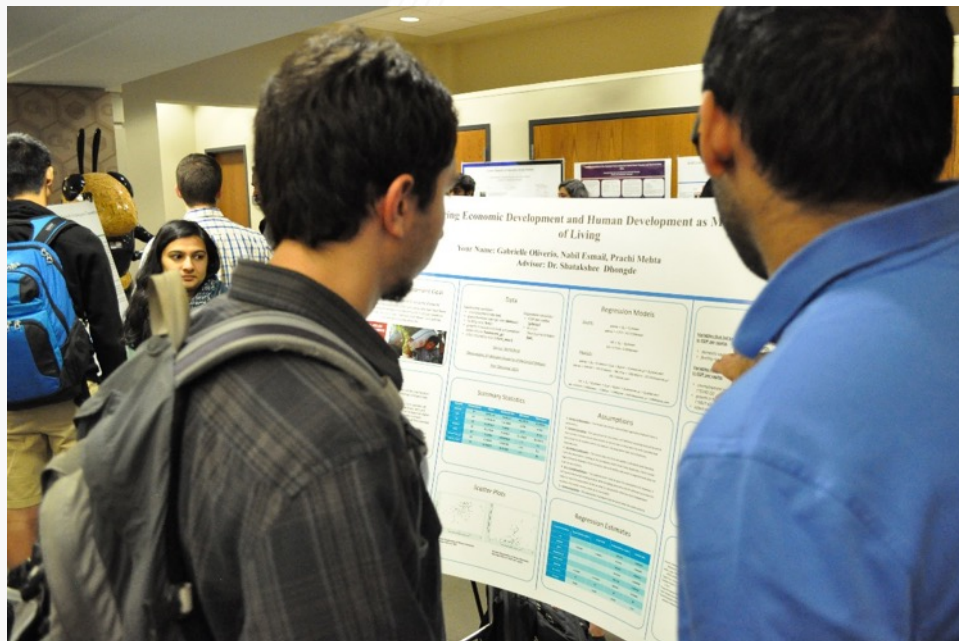
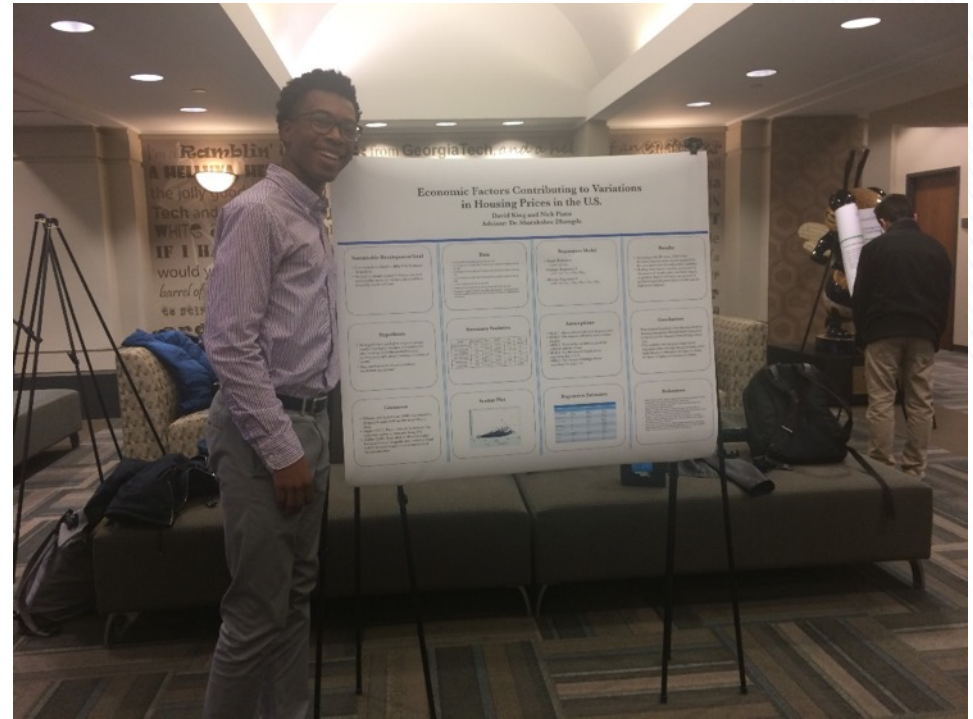
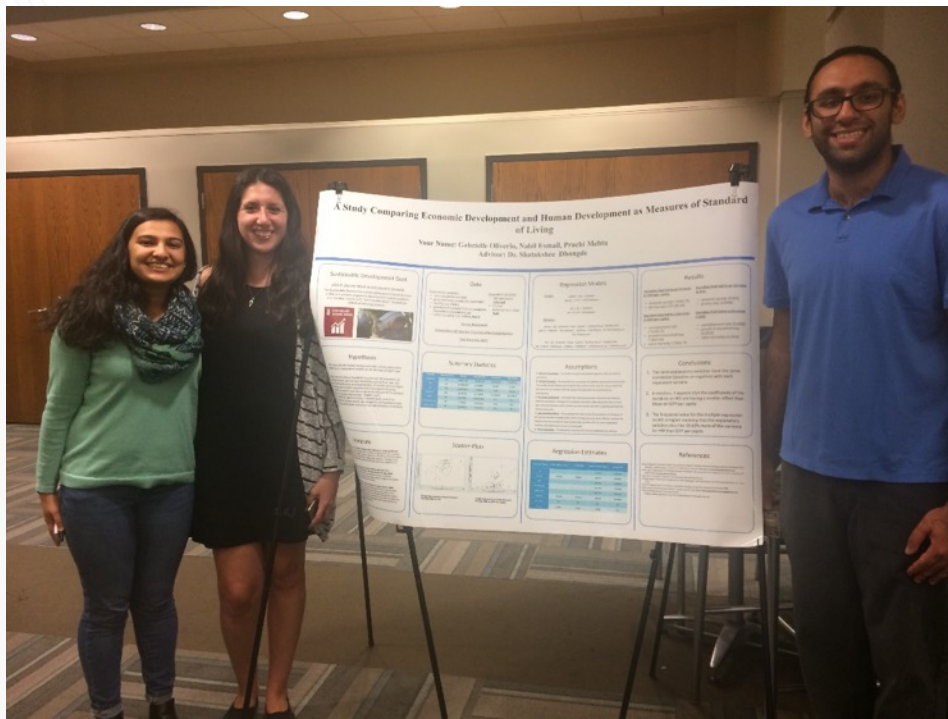
Examples of Research Topics

- Factors affecting poverty rates in the United States
- Relationship between income inequality and economic growth
- Measuring the Impact of Education on Income
- Cross-country differences in per capita income
- Impact of inequality on human development across countries
- Variation in Infant mortality rates across countries

Liam's Legacy Symposium: 2017



Creating, Implementing, and Measuring the U.N. Sustainable Development Goals



New Graduate Certificate in Global Development

- Fall 2020
- School of Economics and Sam Nunn School of International Affairs in the Ivan Allen College of Liberal Arts in collaboration with School of City and Regional Planning in the College of Design
- Graduate Certificate in Global Development
- Courses offered from all three disciplines
- Capstone project: local, national or international



Raghuram Pucha

Mechanical Engineering

Think Globally, Teach Locally

A Socio-Technical Project-based Teaching /Learning with SDG Framework

Raghu Pucha, PhD
School of Mechanical Engineering

Feb. 19, 2020

ENGINEERING DESIGN GRAPHICS COURSE (ME 1770)

ME 1770: Introduction to Engineering Design and Visualization

Project-based Learning

Individual projects with focus on **form** and
team projects with focus on **functionality**.

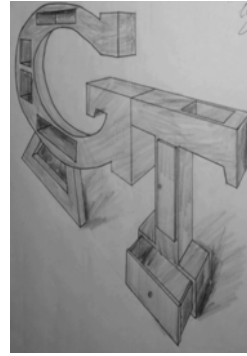
**Design ideation methods with creative
and critical thinking activities**

Offered in Spring, Fall (9-10 sections) and
Summer (2 sections). Each section 45-50
students. Around 1000 students per year.

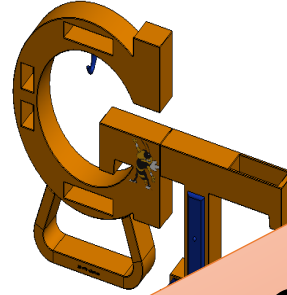
Student Design Projects (No intervention) (Design GT Souvenirs)



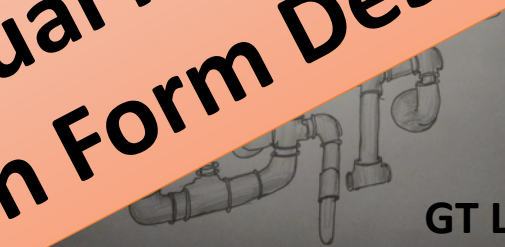
Pencil Holder



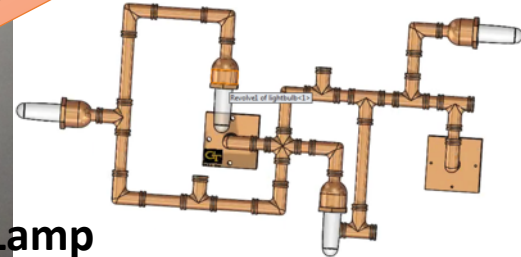
Desk Organizer



Tea Kettle



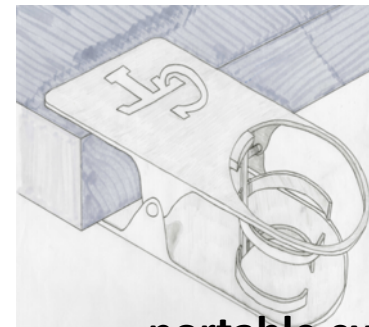
GT Lamp



Tape Dispenser



Pen with Bottle Opener

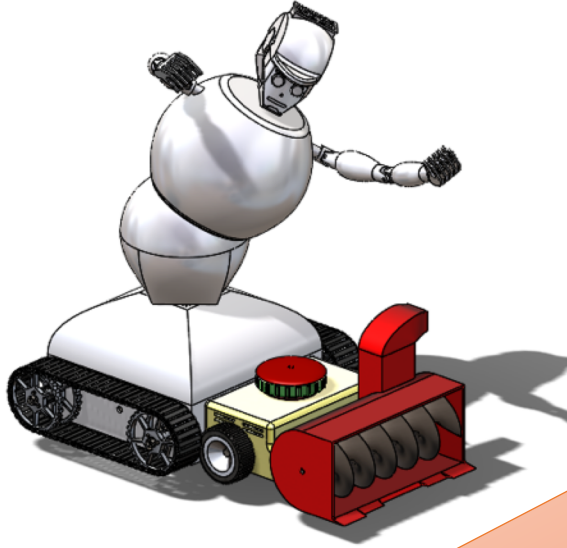


portable cup holder



Individual Projects
focus on Form Design

Traditional Team projects (No intervention) (Large Engineering Structures)



Snow-blower



**Team Projects focus
on Functional Design**



THINK GLOBALLY LEARN LOCALLY– UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS



Why Sustainability Intervention?

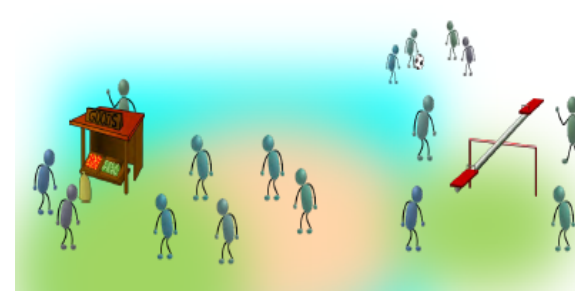
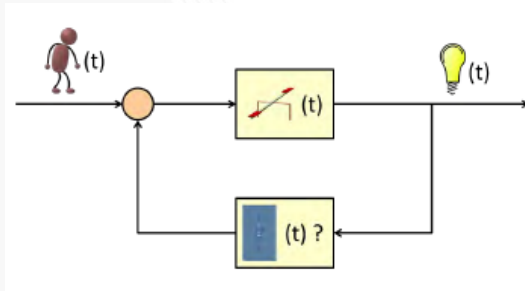
- University training in problem solving is primarily done using decontextualized text-book problems.
- Traditional Engineering Design (Teaching & Learning)
 - Viewed as a technical problem solving discipline.
 - Engineer is identified as problem solver – not problem definer.
 - Assumes Communities are homogeneous entities and can be treated as a “client” or “customer”.
 - For many, design means “design-for-Industry”.

Socio-technical project-based learning with context

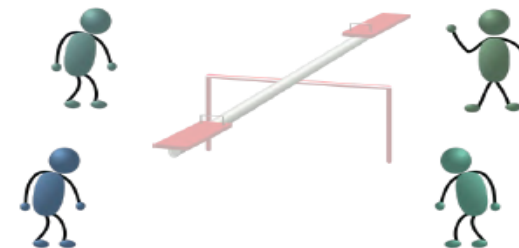
- Design-for-Sustainability Projects / Activities are defined contextually.
- Students are required to consider the following in the design activities and projects.
 - Responsible consumption and sustainability.
 - In addition to technical constraints, understand structural conditions
 - who suffers and who benefits.
 - Increasing opportunities and resources.
 - Reducing imposed risks and harms.
 - Enhancing human capabilities.
 - Listening to community – “design-for-community” Vs “Design-for-Industry”

Socio-technical project-based learning with context

Spec



Conf



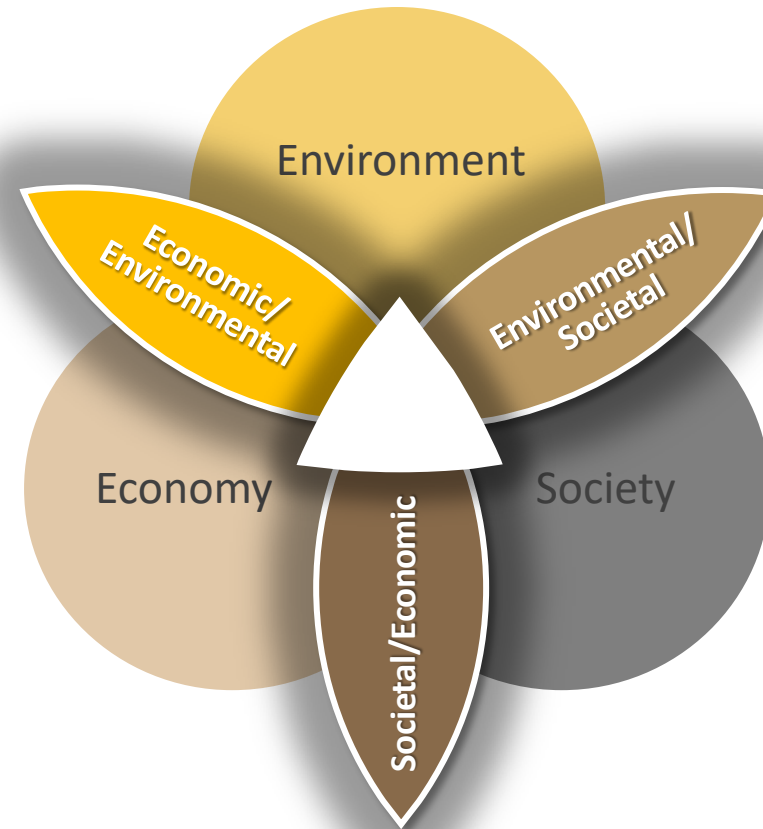
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ACKNOWLEDGMENT: ANDREA MAZZURCO, PURDUE

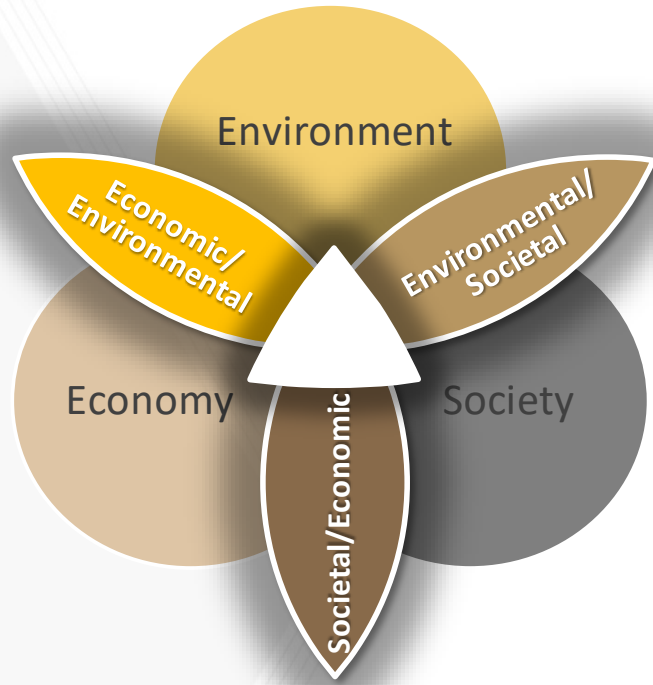
APPROACH FOR SUSTAINABLE COMMUNITIES

3 Ps

- (1) Social sustainability (**People**)
- (2) Environmental sustainability (**Planet**) and
- (3) Economic sustainability (**Profit**)



As an Integrated System – with an emphasis on projects that address two or more spheres



SOCIAL/ECONOMIC SUSTAINABILITY (TEAM PROJECTS)

Humanitarian designs of Large Engineering structures with context (CAD)



Trash Drone 3000

SDG / Challenge

Clean Water and Sanitation:

Ensure availability and sustainable management of water and sanitation for all.

Basic Design: Designed a large six propelled drone with a grated bottom that lowers and picks up trash. Excess water is let out of the trash containment area through the holes in the tray that keep trash, but filter out water. There is a piston in the drone that compresses the trash and a hinge opens the back so that trash can be emptied in the waste management facility.





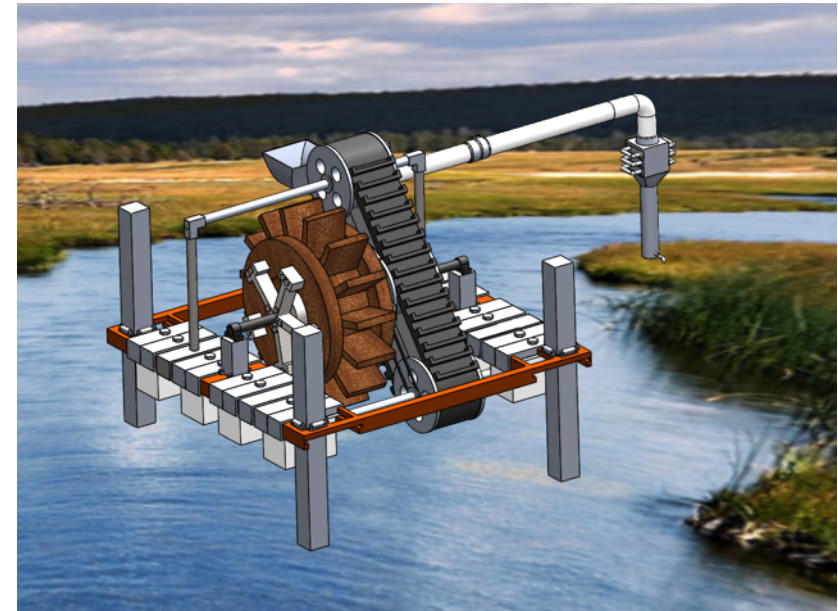
Clean water filtration system

SDG / Challenge

Clean Water and Sanitation:

Ensure availability and sustainable management of water and sanitation for all.

Basic Design: This system can store clean water in a tank that can be sized as necessary for the targeted community. The entire system is scalable as well, allowing for different sized rivers and water needs to be considered in the deployment process. The system is also low-tech, requiring no external power source and contains easily replaceable parts for maintenance. All this combines to create a low-cost, low-tech, easily deployable solution which can address clean water needs for developing communities.





Hydroelectricity for Slums in Monsoon

SDG / Challenge

Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient and sustainable.

Basic Design: Harvests the kinetic energy of rainfall to supply electricity to slums inhabitants. Since rainfall is intermittent, electricity is stored in a battery to ensure an uninterrupted supply. This electricity could be used for lighting, cooking or to power electronic devices, raising the standard of living in the slum.





The Compress Can

SDG / Challenge

Sustainable Cities and

Communities: Make cities and human settlements inclusive, safe, resilient and sustainable.

Basic Design: The Compress Can uses solar energy to power a pair of pistons that opens the trash door. Solar panels on the top of the bin provide energy to the electromagnet, which keeps the trap doors closed thus maintaining an air-tight seal to limit the emission of smell and bacteria from the bin, and the hydraulic press which uses a large panel and telescoping arms to compress the waste within the bin to maximize the amount of waste that can be stored therefore maximizing the time between pickups. This function will decrease the frequency that the massive, diesel-consuming garbage trucks spend on the road.



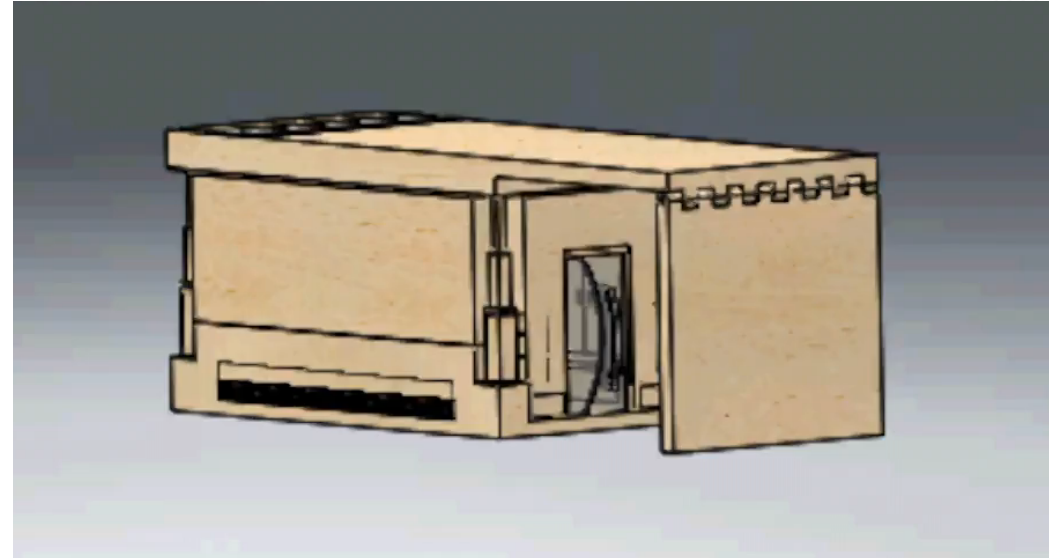


Refugee Mobile Housing Complex

SDG / Challenge

Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient and sustainable.

Basic Design: Develop an inexpensive transportable shelter for refugees. This design consist of four side walls and an additional patio wall that all fold flat on top of one another, as well as four posts that hold the roof up, and collapse to bring the roof down to the top of the collapsed walls.





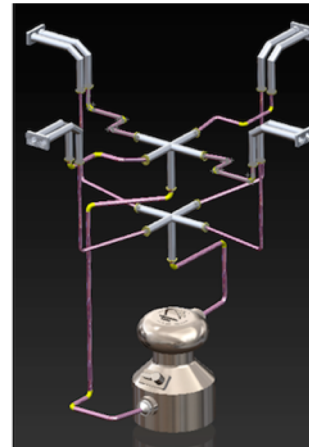
Low-cost dehumidifiers for Proctor Creek watershed, Atlanta

SDG / Challenge

Sustainable Cities and Communities:

Make cities and human settlements inclusive, safe, resilient and sustainable.

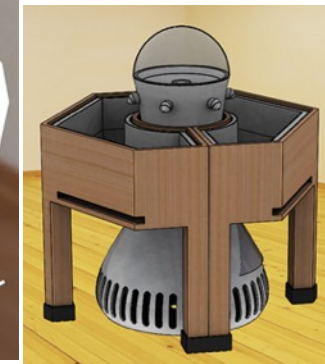
Basic Designs: Low-cost dehumidifiers as a potential solution for reducing public health risks associated with mold and mildew in the Proctor Creek watershed. The water vapor removed from air in homes could potential be reused for gardening and dehumidifiers that utilize solar energy may not have a huge impact on energy bills. Alternative Low-cost multi-purpose dehumidification approaches and designs are also proposed.



Multi-home
Dehumidifier



Low-cost
Dehumidifier



Dehumidifier with
home garden



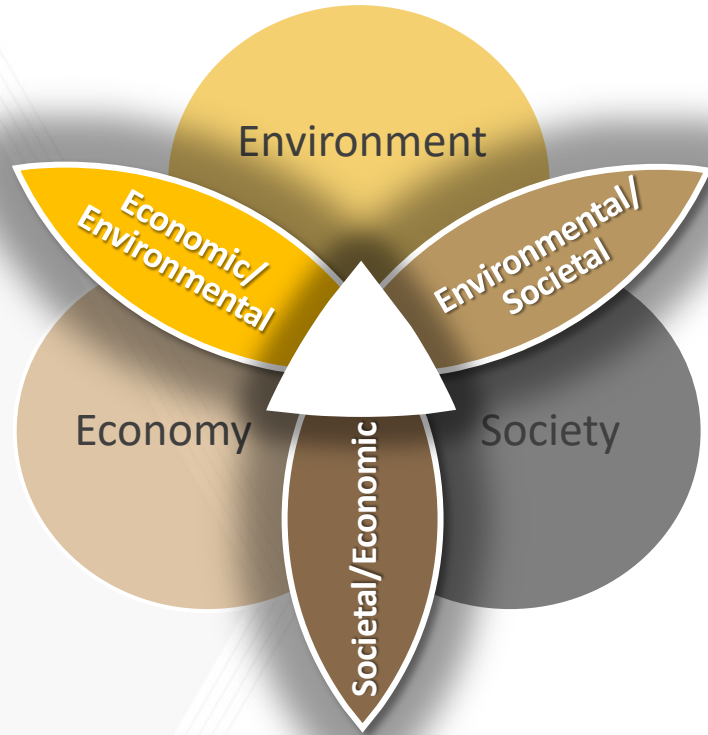
Hope for a Bee

SDG / Challenge

Life on Land : Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Basic Design: Uses reflected sunlight to heat the beehive in order to kill the infections Varroa Mites, in turn promoting the growth of the bee population, therefore increasing the spread of flowering plants.

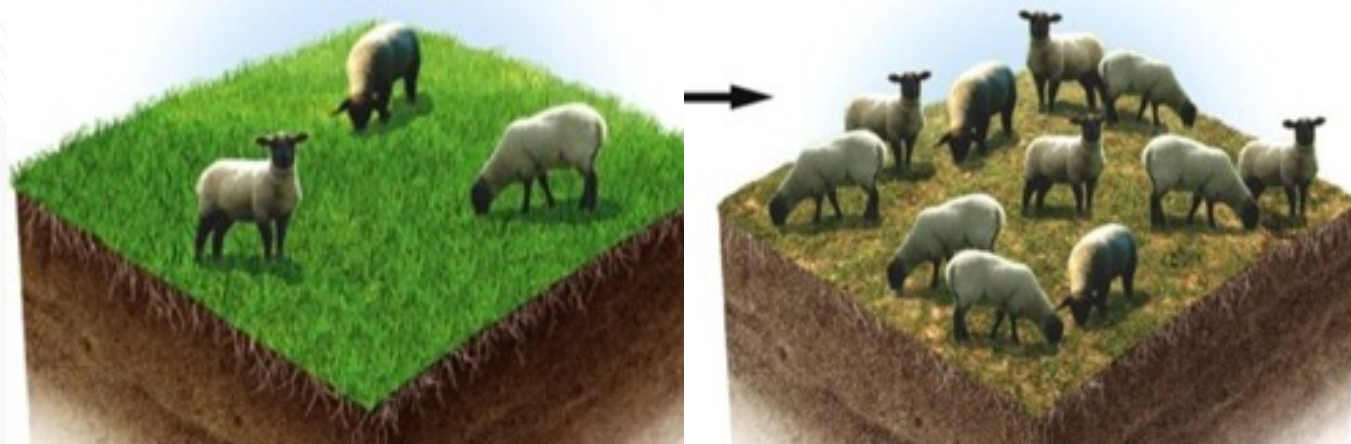




ENVIRONMENTAL/ECONOMIC SUSTAINABILITY (INDIVIDUAL PROJECTS)

**Product design with external representations promoting
sustainable resource-use (CAD and 3D Print)**

Responsible Consumption: The Tragedy of the Commons



Common resources get used more than is socially desirable.

One person's sustainable choices can be neutralized by others' wasteful behavior.

Leading to depleting or spoiling that resource through their collective action.

External Representations Design* promoting Responsible Consumption

- Environmental decision-making and sustainable resource-use can be both complex and challenging
- External Representations Design
 - Make hidden information **explicit**
 - Lower the **cognitive load** involved in sustainability decisions.
 - Motivates people to make decisions that sustain resources, and **persist with this behavior.**

Example: Product Designs with External Representations promoting sustainable resource use

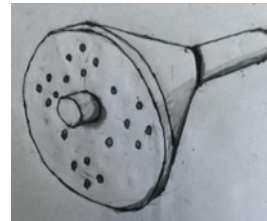
Project Description

- Using external representations, design creative and unique appliances that promote sustainable use of natural resources for Home & office use of Georgia Tech community.

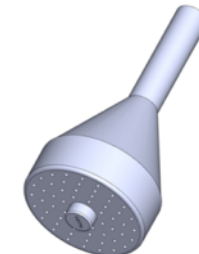
External Representation design:

Flow of water is terminated after certain amount of water is used.

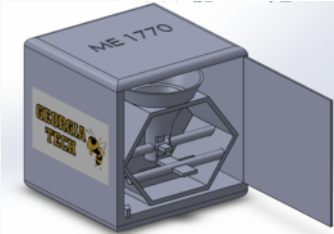
- Make hidden information explicit
- Lower the cognitive load involved in sustainability decisions.



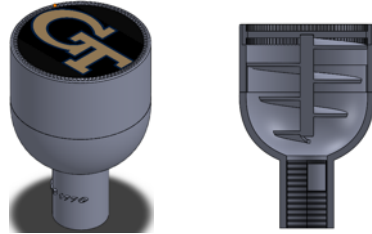
Water saving shower head with external representations



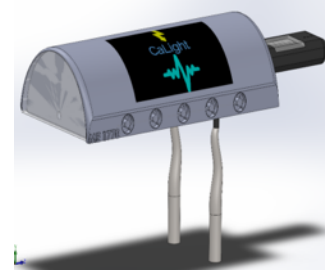
Experimental Class: Appliance Designs with external representation for responsible use of resources (Individual Project)



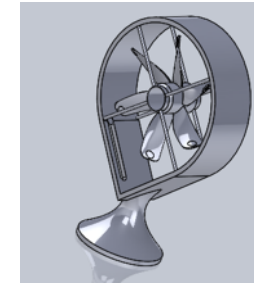
Water saving device



Smart Shower Heads



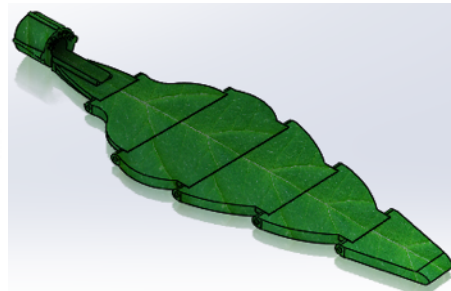
Sustainable Table-lamp



Smart sustainable fan



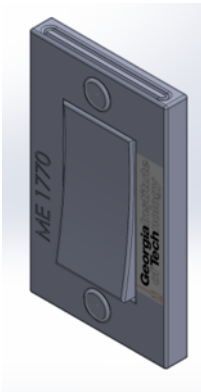
Faucets with usage monitor



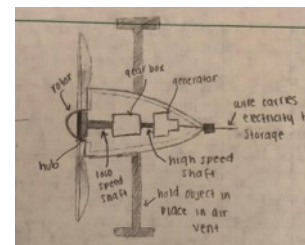
Hydro-electric Generator



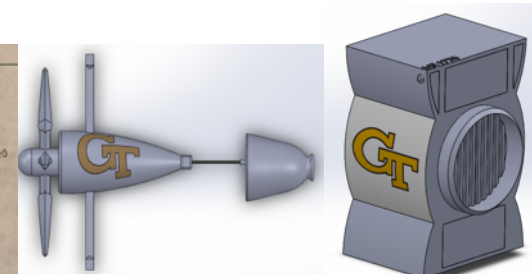
Eco Light Switches



Portable Heater



Mini windmill for dorm



STUDENT LEARNING OUTCOMES



SLS Student Learning Outcomes

1. Students will be able to identify relationships among ecological, social, and economic systems.
2. Students will be able to demonstrate skills needed to work effectively in different types of communities.
3. Students will be able to evaluate how decisions impact the sustainability of communities.
4. Students will be able to describe how they can use their discipline to make communities more sustainable.

ME 1770 – Applicable SLOs – 1, 3, and 4

Sustainability **systems-thinking** skills

- Systems thinking provides an understanding of a system by examining the linkages and interactions between the elements that comprise the whole of the system.
- Sustainability system-thinking skills include
 - I. Identify static / dynamic relationships among ecological, social, and economic factors of sustainability
 - II. Influence of context and evaluate how design decisions impact the sustainability of communities

Additional Resources

Connecting to Your Course

- How might the UN SDGs connect to your existing course learning goals? How might you need to expand your goals?
- How might you incorporate the UN SDGs into assignments and other assessments?
- How might you engage your students in learning activities related to the UN SDGs?

Easy	Exciting	Dream Big

How can we help?

- Please complete the evaluation before you go
- What additional resources can we provide?