

UNST 124g spring 2011

from challenge to action

1 **introduction**

The just sustainability challenge implies action at many scales, from the global to the local and the inter-governmental to the personal. Your research projects this term start at a global scale, with the idea of planetary boundaries, but it is likely that the actions you investigate take place at a variety of scales. *This* assignment asks you to examine actions at the personal scale, via an analysis of your own lifestyle in the context of the integrated Earth system. We will shift our focus, in and out, repeatedly this term.

An *ecological footprint* is a metric used to evaluate the demands placed on ecosystems by human resource usage (Rees, 1992; Wackernagel and Rees, 1996). At its simplest, an ecological footprint is the amount of land required to support a particular individual, city, or country with a particular lifestyle. Lifestyle in this analysis would be defined by diet, consumer goods, services, housing, energy sources and usage, and waste management. The footprint is a global quantity because the production and trade of commodities and the pollution generated by human activities are not confined within the borders of individual households or countries but are instead global.

The ecological capacity of the planet is calculated according to ecosystem services (food production, carbon sequestration in forests, and so on) in individual nations. Viewed with such a metric, the Earth as a whole has a certain human *carrying capacity*, a number of people who can be supported in a particular lifestyle. Because modern developed-world lifestyles place higher demands on ecosystems, Earth's present-day carrying capacity is smaller than it would be if all people lived less resource-intensive lifestyles. A world with 7 billion inhabitants thus requires individuals and nations to make choices that lower their individual footprint size so that more people can fit in the available ecological capacity.

Sustainability requires a global mean ecological footprint that when multiplied by the population size, fits within the available ecological area of the planet. According to the analysis made by the Center for Sustainable Economy, there are 15.71 *renewable* global hectares available per person yet we demand, as a global community 21.91 hectares per person. It is

important to recognize that some people in some countries live below that footprint while others live above it.

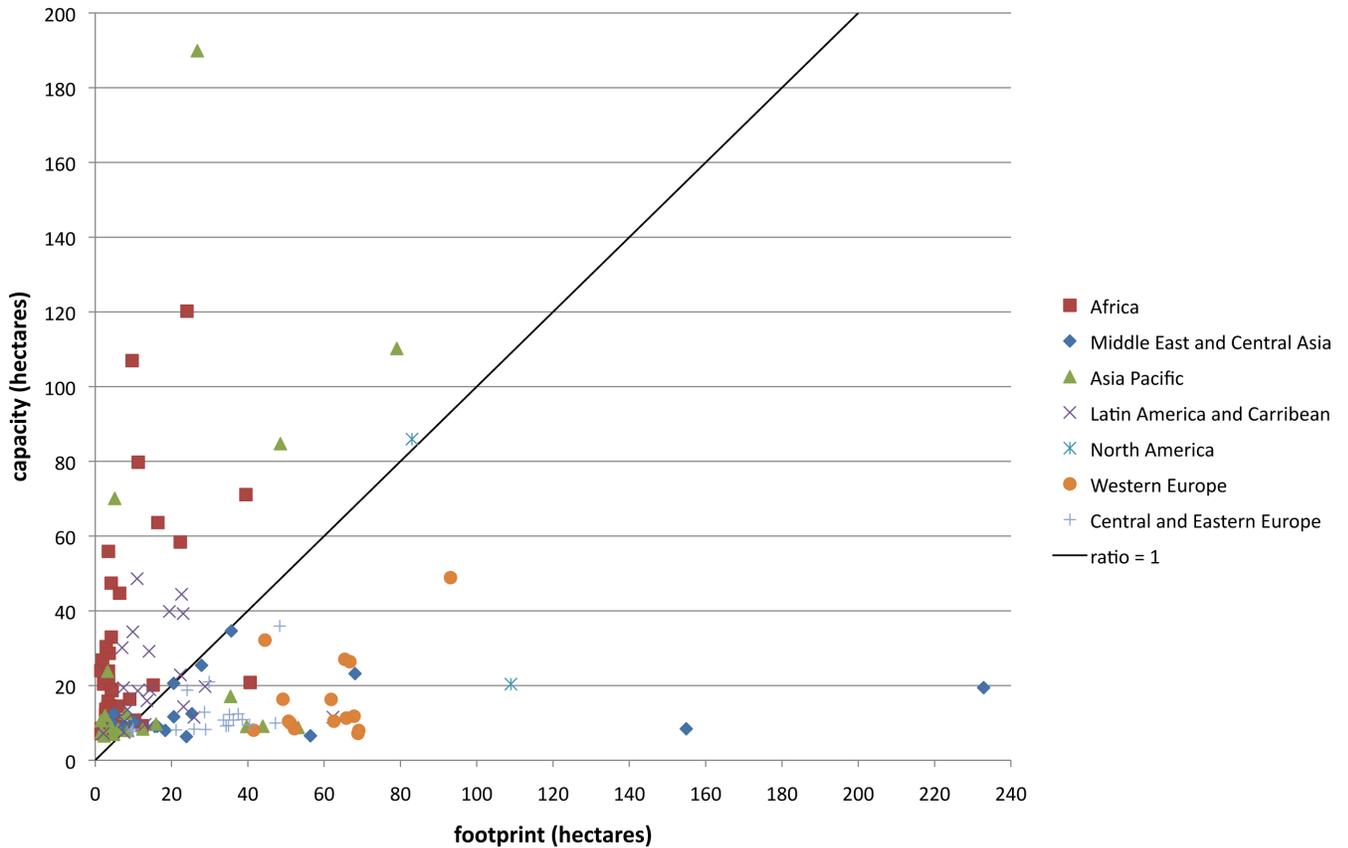


Figure 1: Ecological capacity and footprint of nations, grouped by region. The black line represents a ratio of 1 between the two quantities. In a world with no international trade or waste stream, average lifestyle in countries above the line would be below the national carrying capacity. Data from the Center for Sustainable Economy ecological footprint assessment.

2 assignment

2.1 reading

Read the short article *Beyond the Limits to Growth* by Richard Heinberg. Heinberg has written several books and gives frequent lectures on the theme of transitioning from fossil fuels to alternative energy sources. If you are interested, you can gather some insight via this interview: <http://www.theoildrum.com/story/2005/9/24/233315/937>.

1. List and describe, in a few sentences, the tasks Heinberg outlines for meeting the sustainability challenge of the 21st century.
2. Is this a scholarly article? Give examples to support your answer. *Note that “examples” is plural.*
3. How might your answer to question 2 affect how you read the article?

2.2 analysis

The ecological footprint calculator provided in this exercise considers four sources of demand on ecosystems: fossil carbon use for home energy and transportation; food production, processing, and transportation; housing; and goods and services. You can read more about the details of the analysis at the FAQ at <http://myfootprint.org>. Capacity is reported in hectares. A hectare is a metric unit of area, 10000 square meters, used in measurements of land area. One hectare is about 2.47 acres.

Download the ecofootprint Excel workbook at the class website and examine the various worksheets and their contents. The first tab, labelled **FoodAudit**, is almost identical to the sheet you used last term to enter your daily food records. The spreadsheet is set up to calculate annual totals and daily averages for you. These data are automatically transferred to the **EcoFootprint** tab where they are used to start the analysis you are asked to complete with this assignment.

Enter your food audit data into the appropriate worksheet. Please use the best data you have from last term. Your analysis will only be as good as the data you enter into the spreadsheets.

Enter data that represent your own lifestyle in sections 2 through 6 in the **EcoFootprint** worksheet and for **eating out** in section 1. The cells in which you need to enter data are shaded green. Time is required to complete this sheet successfully. You will need to research some of these items, for example the source of the electricity you use. As with the food audit, your analysis will only be as good as the data you enter into the spreadsheet. If you are in this class because you think sustainability is important, I hope you will take this assignment seriously as well.

4. What is your total ecological footprint? Is your lifestyle above or below the global carrying capacity computed by the Center for Sustainable Economy?
5. Do you think that result is a reasonable representation of your actual footprint? If your answer is no, what do you think is missing and what might you do about that?

2.3 action

6. Examine the individual elements of your ecological footprint. What aspects of your lifestyle make relatively large contributions to your footprint?
7. Suppose you decide to try to reduce your ecological footprint. Identify three changes you could make that would have the largest effect. *You can use the worksheet to examine the effect of different changes. Suppose you reduce your driving by 25%. How much does that affect your footprint?*
8. Select one of the changes you identified in question (7) and try it for two weeks. **We will discuss the outcomes of your projects on May 30th.** Please spend a few minutes budgeting your time so that you will be able to finish the project and turn in the result on that day. Keep daily notes on your project and write a short summary reflecting on the experience when you are done. Was the change you decided to make easy? Did you give up?

3 references

Heinberg, R. (2010). Beyond the Limits to Growth. In *The Post-Carbon Reader*. Watershed Media. <http://www.postcarbon.org/reader/toc>