**Structural Human Ecology**

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| **Statement** | **Variable** |  |
| The **growth of all organisms** and societies requires the **expenditure of energy**. (Duncan 1964) | GDP, GDPpc |  |
| The **structural organization of society** influences the flow of material resources, as well as **the rate and scale of energy consumption**. (Duncan 1964) | ? |  |
| **Preindustrial societies** generally relied on **limited supplies of biomass for energy**, which in part restricted the forms of social organization and **constrained the overall energy demands** (Harvey, 1996; Smil, 1994). | GDP\_Ind |  |
| **Industrial societies**, employing steam engines, **greatly increased the consumption of coal** (and energy in general) and the productive capacity of manufacturing. | GDP\_Ind |  |
| **Population growth increases energy consumption** and the overall demands placed on nature (Mazur 1994) | P |  |
| Beyond studying the impacts of population size, STIRPAT scholars also incorporate other demographic considerations, such as the **age structure of nations** and **levels of urbanization** (Dietz et al., 2007). | P\_Ndep, URB |  |
| **Affluence** is the **primary driver of greenhouse gas emissions** (Dietz et al., 2007; Jorgenson & Birkholz, 2010; Jorgenson & Clark, 2010; Rosa, York, & Dietz, 2004; York et al., 2003b) | GDPpc |  |

**Ecological Modernization Theory and the Environmental Kuznets Curve Hypothesis**

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| **Statement** | **Variable** |  |
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**International Political Economy and the Environment**

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| **Statement** | **Variable** |  |
| During the Industrial Revolution, the burning of fossil fuels, such as coal, **increased the mobility**  **of capital**, as factories could be built in locations removed from the rivers that had been previ-ously used for power (Marx, 1976; Smil, 1994). | ? |  |
| **Capital** became increasingly dependent on the burning of fossil fuels to increase the scale and intensity of production to further the accumulation process (Clark & York, 2005; Foster, 2002). |  |  |
| **Technological innovation** is an integral part of contemporary economic development. It sim-  plifies the labor process, allowing companies to automate production, move operations overseas, reduce costs, and/or produce new commodities. Within the coal industry, technological innova- tions, such as mountaintop removal techniques, displaced workers and increased the recovery of coal, while at the same time expanding the scale of environmental degradation (Austin & Clark, 2012; Bell & York, 2010; Fox, 1999). New | EE |  |
| Contemporary research indicates that **economic expansion generally outstrips any gains made in energy efficiency** (Clark & Foster, 2001; Jevons, 1906; Jorgenson, 2009; Polimeni, Mayumi, Giampietro, & Alcott, 2008) | EE, GDP |  |
| This arrangement—consisting of a hierarchical division of nations where economic, political, and military strength resides in the hands of the dominant capitalist nations—facilitates the unequal accumulation of capital between spheres within the global economy (Kentor, 2000). | ? |  |
| Economic growth in the Global North was, in part, achieved through the consumption of coal and other nonrenewable resources and the exploitation of distant lands (Burkett & Foster, 2006; Hornborg, 2011). | ? |  |
| Periodic shifts within the world-economic system influence development patterns, sites of production, the international division of labor, and the location of ecological degradation. | ? |  |
| Many less-developed countries experienced a deepening of foreign debt, which resulted in austerity measures developed by global governance and financial institutions. These austerity measures, such as structural adjustment programs, encouraged the governments of indebted countries to create more favorable conditions for foreign investors and transnational corporations and to focus on export-oriented manufacturing. (McMichael 2008) | Manu, Manu\_GDP, Manu\_Ex |  |
| A number of push factors spurred this transference of manufacturing to the developing countries: **rising labor costs in developed countries**, **transition to a service economy in developed economies**, and the **pressure of rising intercapitalist rivalries** (Caporaso, 1981). More recently, this process has been facilitated by the **accelerated development of information and communication technology**, which allows for the geographic growth of commodity chains and the associated manufacturing processes (Milberg & Winkler, 2009). | ? |  |
| Instead, developing countries must expand their consumption of energy, including coal, in order to power export-oriented manufacturing operations | Manu, Manu\_GDP, Manu\_Ex |  |
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