



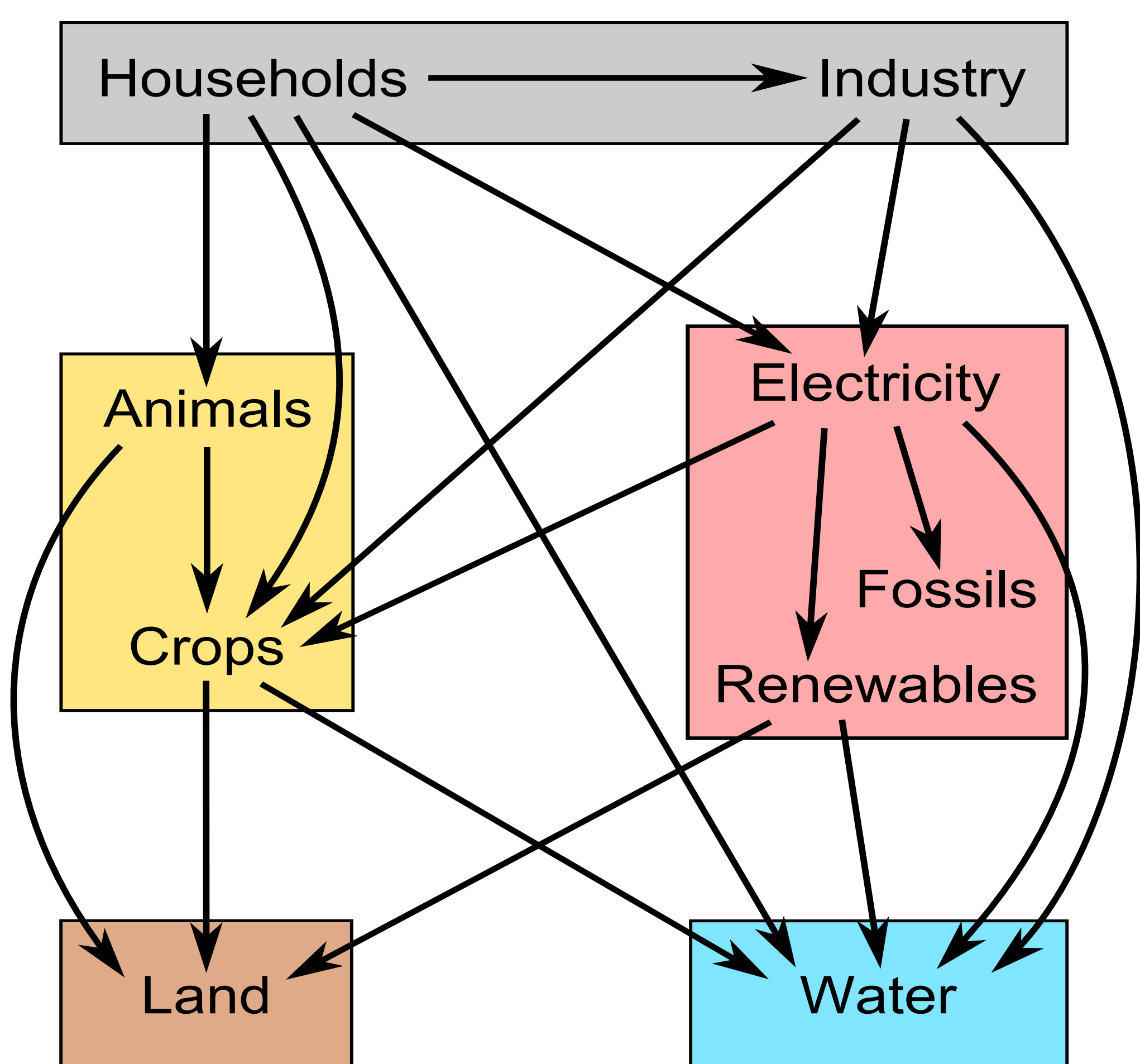
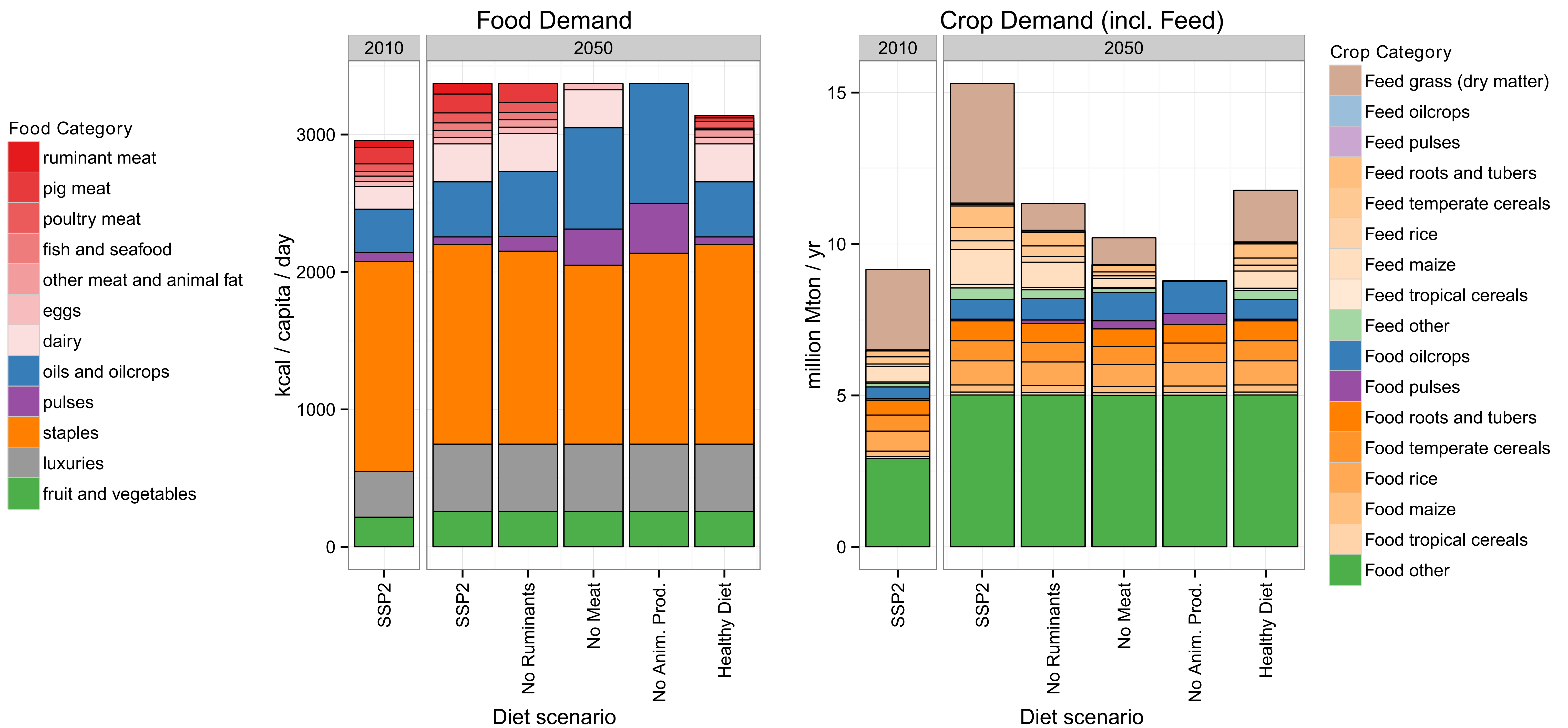
Global Sustainability: Long-term Food, Water and Energy

Sustainability: whether humanity can keep living and prospering on Earth indefinitely.

This implies staying within **planetary boundaries** of resource use and pollution, and protecting nature and biodiversity worldwide.

We focus on human **demand** for basic resources: food, water and energy. Demand for most resources is expected to **increase rapidly** in the coming decades, due to growing population and incomes especially in developing countries.

However, **lifestyle** changes and **efficiencies** along the supply chain could significantly reduce total resource demand. For example, replacing animal-based food by plant-based alternatives could reduce total crop demand:



Food, water, energy and land demand are **highly interconnected**. This is why we study resource demand-supply in the context of Integrated Assessment Models.

We incorporate the food supply chain in detail, and model resource competition, substitution, and complementary use at several levels.

For example, in our model *energy* efficiency improvements in power plants can reduce their *water* use by more than 50% globally (Bijl et al., 2016).