The Need for Crops, Livestock, and Water
Humans rely on agriculture and livestock for sustenance, and the demand for food is projected to double in the next 50 years. Corn and soy are the primary crops of United States agriculture production, consumed by humans and used in the raising of livestock. Water is an important resource for the production of both agriculture and livestock, but water use by the agriculture and livestock industries results in various forms of pollution. This project will examine how water and land are used in the United States and the efficiency of both resources in producing calories for human consumption.

Negative Impacts of Agriculture
Along with producing the most amount of energy with our water, reducing the amount of water wasted is also crucial. Our water resources used for irrigation are rapidly being depleted, especially in western states. Water can be lost to evaporation or to runoff if too much is used. This water may be contaminated with a variety of pesticides or nutrients that impact nearby water sources. Developing and implementing advanced irrigation systems will increase water efficiency and quality.

Land Efficiency of Agriculture
Figure 1 shows the percentage of crop acreage in America devoted to various crops. Corn and soybean production accounts for over half of all agricultural land.

Figure 2 shows how many calories are produced per square foot of land for the most common food crops in the U.S.

Corn and soybeans are both commonly grown crops and also yield the most calories per square foot of land. A large portion of these crops are not consumed by humans for food. Much of soy and corn are used to feed livestock or to produce other goods rather than directly feeding people.

Water Efficiency of Agriculture
Water is a large part of growing crops and raising livestock. Efficiency of water use in agriculture is determined by the amount of calories produced per gallon of water used. Table 1 shows the energy yield per gallon of water for major crops and main meat groups in the United States. Corn, wheat, and soybeans are the most water-efficient crops, and far more efficient than the major livestock meats.

Energy Efficiency of Agriculture
It is no surprise that raising livestock utilizes the most efficient crops, corn and soybeans. The calories per square foot and per gallon of water used for these crops are beneficial to raising livestock quickly. Livestock can then be turned into potential calories for human consumption. The issue lies in the inefficient use of water while raising livestock. Most meats are inefficient in this sense, because the majority of the energy consumed by the animal is lost and not transferred to humans. When consuming beef, humans only receive about 0.5% of the energy a cow consumes.

Food For Thought
While vegetables are absent from this study, increasing grains in human diets, and decreasing meat consumption is the most efficient way for humans to intake calories. Not only will water consumption be reduced, the likelihood of pollution from farm irrigation run-off would also decrease.

Works Cited