

# Good food production and consumption: food scarcity essay example

[Education](#), [Sustainability](#)



## **Introduction**

As defined by the Brundtland Commission, sustainability is a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (EPA 2014). Food production and consumption patterns and trends are one of the main contributing factors to environment pollution today. In the event of a growing global population and demographic change, the sustainability issues arising out of the food system are likely to turn more serious in the near future. It is expected that the economic prosperity and the growth of population will increase the demand for food beyond the natural capacity, making it necessary to address the growing need for food through the improvement of agricultural productivity. Though various techniques are being used for increasing the agricultural productivity, the question as regards the sustainability of these techniques has become a debatable topic. This essay will discuss this sustainability issue in greater detail, touching upon the food demand-supply gap, current production techniques and their impact on the environment, and the sustainable solution to the food scarcity problem of the world.

## **Food Production and Consumption Gap**

### **Productivity Improvement Techniques**

Improvement of agricultural productivity is looked upon as the only solution to overcome the food scarcity or the Malthusian crisis - a condition in which the demand of food due to the ever-increasing population will exceed the natural capacity, bringing in a widespread famine (GHI 2012). In order to

produce more yields per hectare, different technologies have evolved with the capacity to produce more agriculture output per unit of agricultural input (Hofstrand, 2014). Some of the measures taken to increase the agricultural productivity include the use of pesticides and herbicides, chemical fertilizers, and the GMO technology.

## **Chemical Fertilizers**

In order to increase agricultural productivity and improve the livelihood of the farmers, the use of fertilizers was not a new practice. In fact, ancient farmers used fertilizers to produce improved quality yields. However, the fertilizer technology has evolved a lot ever since the need of chemicals for growing plants has come into the forefront (Savci 2012). The modern chemical fertilizers composed of mainly nitrogen, potassium compounds, and phosphorus are found to improve the growth of the plants and yields, but at the cost of the environment, which would be discussed later.

## **Pesticide and Herbicide**

According to FAO, due to the onslaught of weeds, pests and different diseases, about 20-40% of the world's crop production is destroyed annually. Therefore, pesticides and herbicides are used for protecting crops. The crop destruction would double if the existing uses of pesticides are abandoned, thereby increasing the food prices substantially (CLA 2014). Through the use of pesticides, the crop protection industry tries to enable the farmers to grow crops in abundance and prevent the food prices from rising.

## **GMO**

In order to fulfill the growing demands of food of the world population, GMO technology, which is a faster process of producing crops with enhanced desirable traits, has hit the market, replacing the conventional production in recent decades. Conventional agriculture is a time-consuming affair. Besides, the use of pesticides and herbicides is harmful for human health, and therefore, the genetic engineers have come up with the solution of GMO technology, which not only increases agricultural productivity by 1.7%, but also makes crops tolerant to pests, reducing the need of using pesticides (Reisch, Eberle and Lorek 2013). USDA has found out that genetic engineering technology increases the production of yields and the land efficiency (GHI 2012).

## **Intensive Livestock and Fish Farming**

In order to fulfill the needs of meat and fish, intensive livestock farming and fish farming are taking place to increase the production of poultry and fish. Intensive livestock farming, also referred as factory farming, is a process in which livestock animals are raised in confinement in a factory like condition. The intensive livestock operations have the capacity to accommodate a large number of animals, including hogs, chicken, turkey, and cows in a limited space. The purpose of such intensive operations is to produce as much milk, eggs, and meat as possible with least effort and at low cost (Fraser 2005). Fish farming is also done in the same way in enclosed tanks and pools for commercial purposes to breed fishes at low cost and with less effort. The fishes mainly used for farming include salmon, tilapia, carp, and catfish.

## **Why Current Techniques are not Sustainable?**

As per the findings of the EU Environmental Impact of Products (EIPRO), of all the products, meat and meat products make the highest environmental impact, contributing to about 4-12% Global Warming Potential (GWP) and 14-23% eutrophication of all products. The next highest impact is made by the dairy products like milk, butter, and cheese, which account for 2-4% of GWP and 10-13% eutrophication (Foster et al 2006). The foods identified to have lower levels of environmental impact include sweets, soft drinks, sweets, and plant based products like cereals.

## **Impact of Chemical Pesticide on Environment**

All the methods used for increasing the agricultural productivity to meet the food demands of the growing world population are not sustainable for the long run, because all these methods have serious impact on the environment. Pesticides that are used for killing the weeds and pests to protect crops make a hazardous impact on the environment and human health. Pesticide residues are reportedly found in various vegetables like lettuce and potatoes, fruits like apples, nectarines, and strawberries, and even fish like fresh salmon. Pesticides are extremely toxic the residues of which in food products can contribute to a range of health issues such as cancer, reproductive damage, and endocrine disruption. The types of cancer caused by pesticides include brain, breast, bone, testicular, prostate, ovarian, leukemia, and liver cancers. Pesticides harm the agricultural land by destroying the helpful insects, worms, and soil microorganisms that naturally maintain the health of soil and prevent pest infestation (TAC 2012).

Pesticides also weaken the immunity system of plants, reducing the essential nutrients in the soil like phosphorous and nitrogen.

## **Impact of Chemical Fertilizers**

Chemical fertilizers, composed of phosphate, ammonium, nitrate, and potassium salt, leave damaging effects on the environment by polluting water, air, and soil. Plants use only 50% of the chemical fertilizers applied to the soil, 2-20% fertilizers are lost in evaporation, 15-25% reacts with the organic compounds in the soil, and the remaining 2-10% mix into ground and surface water, causing water pollution (Savci 2012). Fertilizers containing a high level of potassium and sodium deteriorate the soil structure, and nitrogenous fertilizers impact the PH liming of the soil. Too much application of chemical fertilizers also pollutes the air by releasing toxic gas like nitrogen oxide into the atmosphere.

## **Sustainable Approach to Food Scarcity Problem**

There are several agricultural and livestock raising techniques that are environment-friendly and sustainable. Some of the techniques are described below:

### **Crop Rotation**

Crop rotation is another technique used for increasing agricultural productivity. In crop rotation, the succeeding crops that are cultivated are of different variety, genus and species than the previous crop. Examples include row crops after small grains, barley after wheat, grain crops after legumes and so on. The rotation sequence would be about 2-3 years or longer period of duration (Aprodev 2012). Besides increased productivity,

crop rotation is also useful for improving the fertility of soil, reducing soil erosion, reducing the risk of pests and weather damage, and increasing net profits.

## **Cover Crops**

When the ground is kept bare between two crops, then problems like soil erosion, weeds and degradation of soil quality can happen. If crops like hairy vetch, oats and clover are used as cover crops, then all those problems can be reduced drastically, reducing the need for herbicides, fertilizers and insecticides.

## **Natural Pest Predators**

Many birds, insects and spiders are natural predators against pests. If a farmer or group of farmers can manage the predators' population in and around the agricultural field, then the problem of pests can be reduced hugely. Lady bugs, beetles, fly parasites and green lacewing larvae are some of the natural predators that are beneficial for crops (CLA 2014).

## **Usage of Rainwater and Crop waste**

Storing rainwater and then using it for agriculture can reduce the need for water. Cover crops and the crop wastes can also be used as manure or can be used to improve the condition of soil which can reduce the requirement of fertilizers.

## **Managed Grazing**

Currently, most of the livestock are fed only one type of food. Instead, livestock should be grazed in different areas so that they get a variety of

nutrients. This will not only improve the quality of livestock, but will also reduce soil erosion as animals will not tromping over the same area again and again and the grass will get a chance to grow back. The manure left behind will also improve the quality of soil (Reisch, Eberle and Lorek 2013).

## **Conclusion**

The main challenges with all the above techniques are that the productivity of crops using these techniques is yet to reach the productivity ranges of the existing techniques. The use of chemical fertilizers, pesticides and herbicides can reach high levels of productivity that organic farming or other environment-friendly techniques cannot reach. Therefore, these techniques need to be implemented slowly. Slow increases in the organic farming in the coming years probably will be the best approach.

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