

- Forum:** The Commission on Sustainable Development (CSD)
- Issue:** The question of the increasing soil exhaustion due to the growing demand for food.
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The world population is growing and so is the demand for food. But the world does not have unlimited resources of land and water, therefore future agricultural productions must be more sustainable and more productive at the same time. The question is how to do this?

The Food and Agriculture Organization of the United Nations (FAO) has estimated that the world food production must be increased by 70 % worldwide and nearly 100 % in developing countries by 2050 to keep up with the projected population and food consumption.

The easy way of solving this issue would be to increase the amount of land for growing crops since only about 11 % of the world's land surface is currently used for growing crops. There are significant areas of unused agricultural land and production potential especially in Sub-Saharan Africa and in South America. But this land would have a lower productivity and would mainly come from forest and savannah and a conversion of this land into agricultural land would have a negative impact on climatic and biodiversity.

Another way is to enhance yields, the FAO projections are for 90% of the growth in crop production, 80% in developing countries, to come from higher yields and increased cropping intensity, with the rest coming from land expansion. But yield growth has been slowing since 1982. In Northern America and in Europe, this has primarily been because policies changed in order to reduce the production growth. In former Soviet Union territories, it is because of the collapse of the planned production system. In Asia, it is because high level of land intensity and input use is already achieved. Soil losses and erosion also contribute and climate change will contribute to yield declines as well. The FAO has suggested that agricultural research focuses on increasing yields in unfavourable environments of the countries where the extra demand will be.

Soil exhaustion is a threat to the world because of the growing food demands mentioned above. Soil exhaustion is the loss of nutrients in soil often because of farming the same crop over and over also known as monoculture. Monoculture is an effective way of farming and will most likely increase

yields but the land will be exhausted quicker. There are different solutions such as, but not limited to:

- Let the land lie fallow, this gives the soil time to rest and renew its nutrients. Often this is too expensive especially for small farmers in developing countries who do not have enough land to let some of it lie fallow.
- Diversify production, this enables better use of the resources of the land and it also prevents the over-production of a single type of crop.
- Crop rotation, this is a practice of growing different types of crops in the same area in sequenced periods and decreases soil exhaustion. Different kind of crops require different kinds of nutrients, with crop rotation one crop is followed by another crop which either needs different nutrients or returns the nutrients of the previous crop to the ground.
- Fertilizing, this brings back nutrients to the soil and can increase yields but it can be expensive and overuse can be damaging for the environment, especially water systems.

There are a lot of benefits of keeping the soil healthy both economically and environmentally.

There are pros and cons to every single solution but which ones are the right solutions and why? How can the world's agriculture become more sustainable and more productive? What can the Commission on Sustainable Development and the UN do? How do we do it?

Further reading

- <http://www.fao.org/docrep/017/i1688e/i1688e.pdf>
- https://ec.europa.eu/research/scar/pdf/scar_3rd-foresight_2011.pdf
- <http://www.unesco.org/mab/doc/ekocd/chapter18.html>