

# Advantages of Organic Agriculture



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JOAM Certification Committee

# Conventional Agriculture

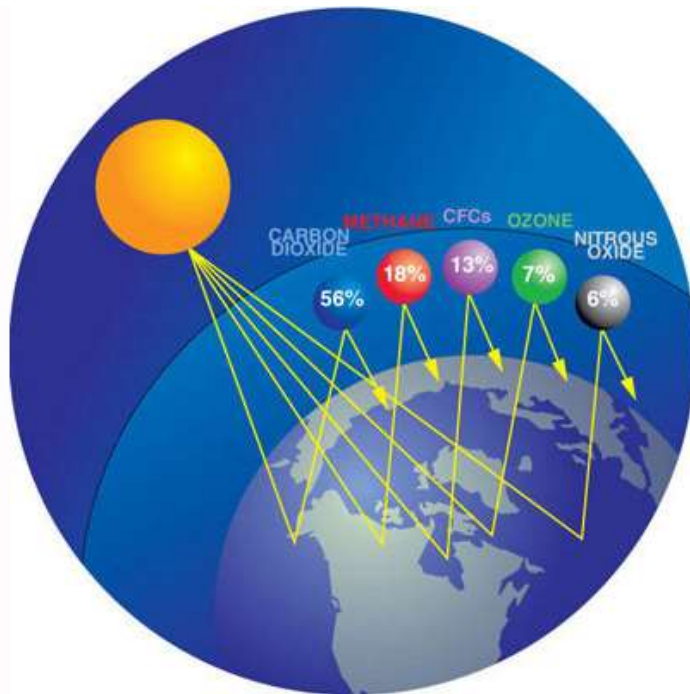
- ❖ Major inputs of fertilizers and pesticides.
- ❖ Production of these inputs require fossil fuels and large energy use
- ❖ Are associated with serious environmental and health problems.
- ❖ **One-third of our greenhouse gas emissions come from agriculture, Gilbert, 2012.**
- ❖ The Intergovernmental Panel on Climate Change (IPCC) has noted that modern agricultural practices have accounted for about one-fifth of the anthropogenic greenhouse effect,
- ❖ Producing about 50 per cent and 70 per cent, respectively of the overall anthropogenic methane and nitrogen oxides emissions.

# Effects of Conventional Farming

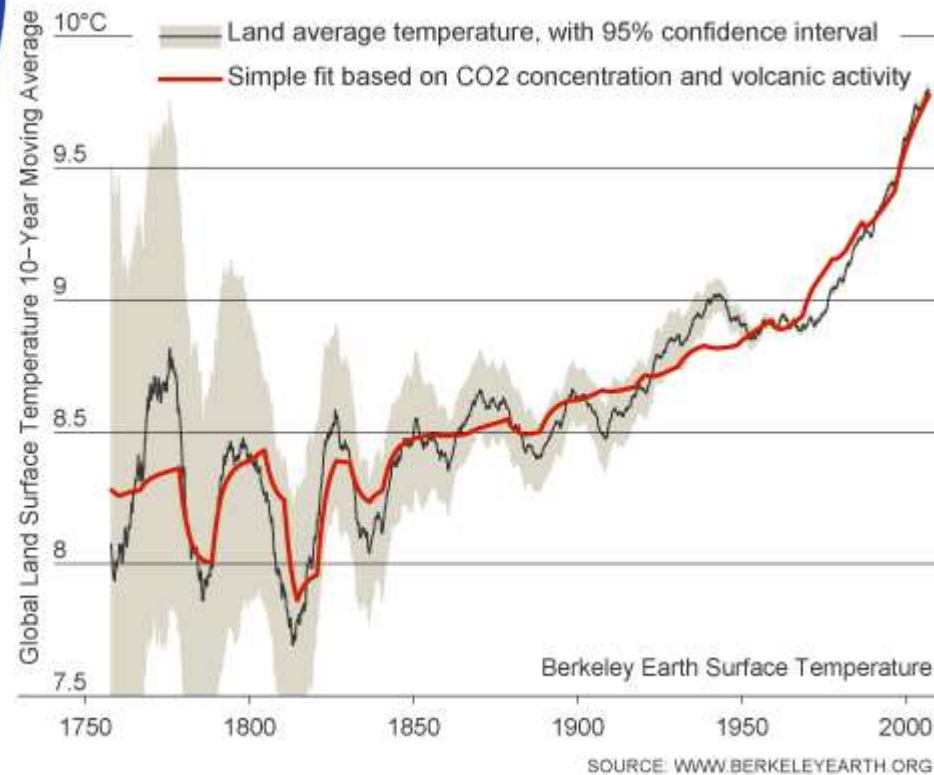
Modern agricultural farming practices have resulted in:

- ❖ The loss of natural habitat,
- ❖ Reduced soil health; soil salination and soil erosion,
- ❖ Pollution due to fertilizers and pesticides,
- ❖ Decreased groundwater levels
- ❖ Reduced food quality
- ❖ Climate change
- ❖ Increased the cost of cultivation, rendering some farmers poorer year by year.

# The Green House Effect



## Climate Change



# Threats of Climate Change

- ❖ Increased weather conditions.
- ❖ Increased water stress and drought, and desertification.
- ❖ Serious health effects; increased spread of diarrhoeal infections and infectious tropical diseases such as Malaria and other vector borne diseases.
- ❖ Populations under these stresses are at risk of destabilization, security risk, loss of livelihood, malnutrition, forced migration, and conflicts, Muller, 2009.

# Threats of Climate change

- ❖ Decreased crop yields.
- ❖ By 2050, climate change could cause irrigated wheat yields in developing countries to drop by 13%, and irrigated rice could fall by 15%. In Africa, maize yields could drop by 10–20% over the same time frame, Gilbert 2012.
- ❖ IFOAM advocates for the inclusion of Organic Agriculture in national governments' policies on addressing not only climate change, but also hunger and poverty.

# Organic Agriculture

- ❖ Organic agriculture is an approach to agriculture which maintains an ecologically balanced ecosystem. Organic products are grown in production systems that emphasize plant and animal health, preventative management of pests, and thoughtful use of approved inputs.
- ❖ The products are grown and processed according to uniform standards, verified by independent state or private organizations. All products sold as "organic" **must** be certified.



# Aims of Organic Agriculture

- ❖ According to IFOAM, the International Federation of Organic Agriculture Movements, the
- ❖ Some Aims of Organic Production and Processing are:
- ❖ To produce sufficient quantities of nutritious wholesome, high quality food.
- ❖ To work compatibly with natural cycles and living systems.
- ❖ To maintain and increase long-term fertility and sustainability of soils
- ❖ To maintain and promote genetic diversity by increasing the number of crop and plant varieties and animal breeds



# Aims of Organic Agriculture

- ❖ To promote the responsible use and conservation of water and water resources.
- ❖ To use, as far as possible, renewable resources in production and processing systems
- ❖ To provide living conditions that allow animals to express the basic aspects of their
- ❖ Innate behaviour
- ❖ To minimize all forms of pollution
- ❖ To allow and provide everyone involved, with a quality of life to that satisfies their basic needs, and furnishes an adequate return, within a safe, secure and healthy working environment
- ❖ To support the establishment of an entire production, processing and distribution chain which is both socially just and ecologically responsible
- ❖ To recognize the importance of, protect and learn from, indigenous knowledge and traditional farming systems.

# Principles of Organic Agriculture

❖ Care

❖ Health

❖ Ecology

❖ Fairness

# Ecosystem Management

## ❖ 2.1.1

- ❖ Operators shall take measures to maintain and improve landscapes and enhance biodiversity quality.

## ❖ 2.1.2

- ❖ Clearing of Primary ecosystems is prohibited

## ❖ 2.1.3

- ❖ At least 10 per cent of farm/production unit shall be part of a biodiversity program.
- ❖ Biodiversity areas may include natural fallow without grazing, swamps, natural, non commercial forests etc

# Ecosystem Management



Water Harvesting



Flowers



Forested Area

# Genetic Engineering

## ❖ 2.6.1

- ❖ The deliberate use or negligent introduction of genetically engineered organisms or their derivatives to organic farming systems or products is prohibited.
- ❖ This includes for example, seeds and propagation material, vaccines, soil conditioners, fertilizers

# Soil Health and Fertility



- Soil health is a central principle of organic agriculture, and is critical to sustainable agriculture.
- Soil health assessment is an information gathering process intended to contribute to soil health management decisions of soils.
- Crop production should promote the return of nutrients, organic matter and other resources to soil through recycling, regeneration and addition of organic materials and nutrients to the soil.

(JOAM Standards section 2.2)

# Soil Health and Fertility



- Soil degradation
  - Erosion
  - Compaction
  - Heavy irrigation leading to crusting and salinization (Chemical damage, poisoning)

- Nutrient mining, loss of plant nutrients from the soil
- Loss of soil organic matter
- Overgrazing
- Deforestation



# Promoting Soil Health and Fertility



Improve soil structure and quality by:

- ❖ Mulching and recycling organic residues
- ❖ Use of Green manures and Compost
- ❖ Efficient water conservation and water use
- ❖ Reduced tillage to prevent loss of top soil
- ❖ Reduce the use of heavy machinery where possible (reduces soil compaction)
- ❖ Prevent burning of organic matter
- ❖ Prevention of erosion (avoid cultivation of sloping land unless soil conservation systems are put in place, e.g terracing, use of shade trees)
- ❖ Avoid overgrazing of pastures (reduces soil compaction)
- ❖ These methods in enhance Carbon Sequestration since they promote higher soil organic matter.

# Soil Fertility Management





# Terracing



# Mulching



# Composting



# Raised Beds





# Green manure



# Inter-cropping



# Principles for Crop Production

## Requirement for Pest Management

**4.2.1.6** Pests, diseases and weeds should be controlled by any one, or a combination, of the following measures:

- ❖ choice of appropriate species and varieties;
- ❖ appropriate rotation programs;
- ❖ mechanical cultivation;
- ❖ protection of natural enemies of pests through provision of favourable habitat, such as hedges and nesting .
- ❖ sites, ecological buffer zones which maintain the original vegetation to house pest predators;
- ❖ diversified ecosystems. These will vary between geographical locations;





# Principles for Livestock Production

## Requirement for Health Care

- ❖ **4.2.2.5.1** Disease prevention in organic livestock production shall be based on the following principles:
  - ❖ a) the choice of appropriate breeds or strains of animals as detailed in paragraph 4.2.2.2.1 above;
  - ❖ b) the application of animal husbandry practices appropriate to the requirements of each species, encouraging strong resistance to disease and the prevention of infections;
- ❖ **4.2.2.6.1** Maintenance of livestock should be guided by an attitude of care, responsibility and respect for living creatures.





**ADVISORY!!!!**

**Disturbing Pictures  
Ahead**

# Factory Farms

- ❖ Factory farming is the production of food, especially meat and animal products, in large industrialized, settings.
- ❖ Also referred to as CAFO's (Confined Animal Feeding Operations.)
- ❖ Such an environment are stresses animals, physically and psychologically.
- ❖ Animals pose a risk to themselves and other animals.
- ❖ At risk from constraints of their limited physical space.
- ❖ Administered low doses of antibiotics daily to stimulate growth.



# Animal Welfare



<http://static.guim.co.uk/sys-images/Environment/Pix/columnists/2014/08/1389197480332/Pig-factory-farm--Lehmann-001.jpg>



[http://greenbuzz.net/wp-content/uploads/2012/07/Factory\\_Farming\\_](http://greenbuzz.net/wp-content/uploads/2012/07/Factory_Farming_)



<http://nebula.wsimg.com/e1533d6ab8f2261359c8e2167f11bacb?AccessKeyId=899770416D3F6C95C29D&disposition=0&alloworigin=1>



<http://www.animalsaustralia.org/images/page/photos/turkey3.jpg>



# Where is the Grass?



# Human and Animal Health Risks



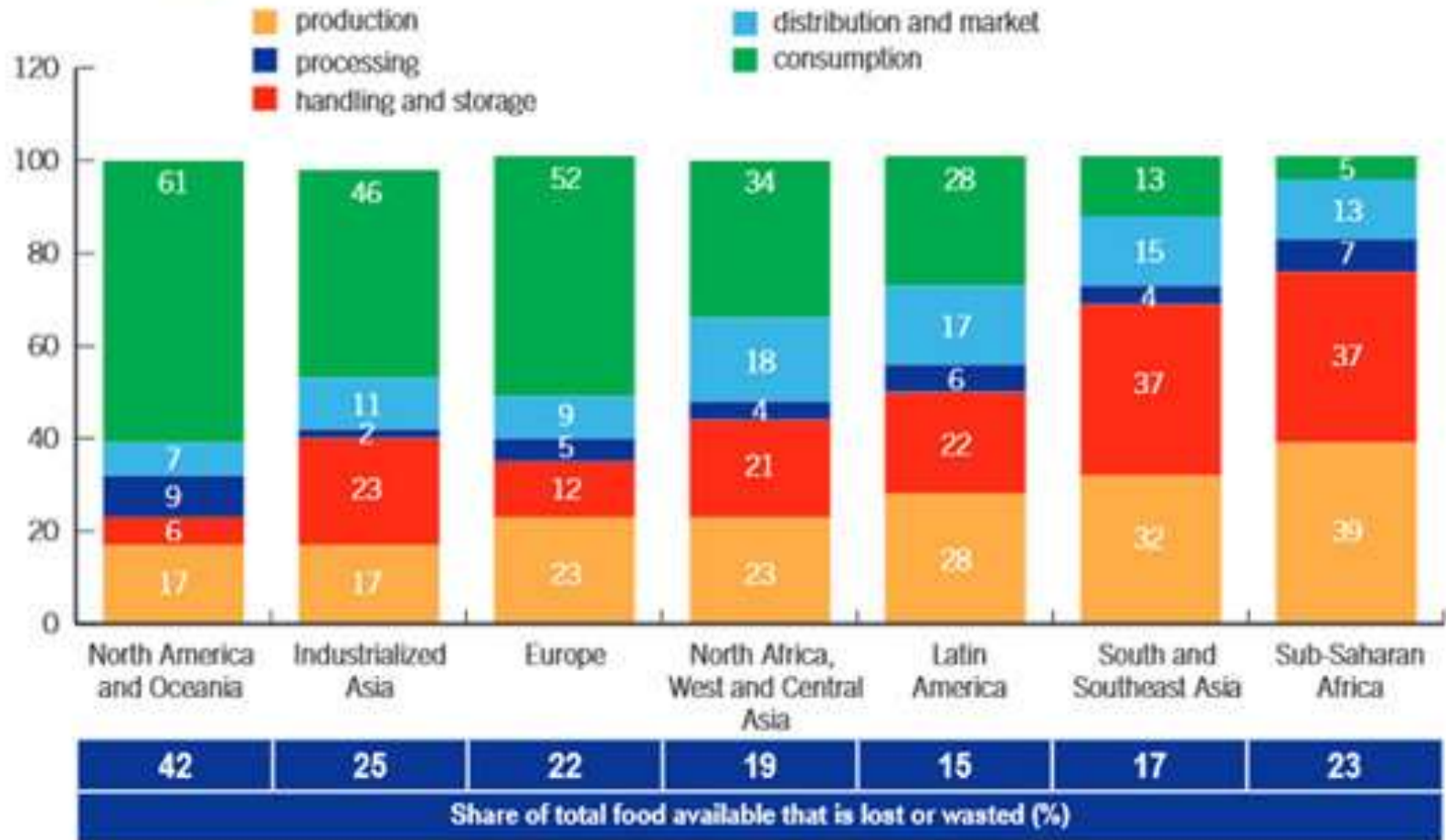
<http://www.awfw.org/wp-content/uploads/FF-Runoff.jpg>

- The overuse of antibiotics in factory farmed animals has resulted in increased antibiotic-resistant strains of bacteria in both animals and humans.
- A 2011 meat and poultry sold in US grocery stores - 47 percent - was contaminated with *Staphylococcus aureus* (methicillin-resistant *Staphylococcus aureus* – MRSA)
- Zoonosis, passage of infectious diseases from animals to humans evident in the outbreak of Avian flu H1N5 in 1997, Lister et al, 2009.



# Fate of Food

## By food chain stage



# Fate of Food



VS



- 870 million people in the world are hungry, 852 million of them in developing countries.
- Since 2007-2008, global progress in reducing hunger has lessened
- Limited availability of food in Africa has gotten worse, Gustavsson 2011.



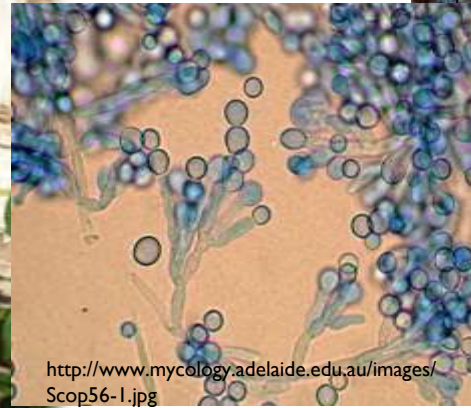
# Every Organism is Respected



Opton Lawrence



<http://earthgarden.co.za/images/Soil%20Bacteria.png>



<http://www.mycology.adelaide.edu.au/images/Scop56-1.jpg>



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UK Organic Study Tour – July 9 - 20, 2009



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# Fairness ,Traditional and Tradition

- Social Justice
- 9.1.1 Operators with more than 10 persons hired for labour should have a documented policy on social justice.
- 9.2.1 Operators should not have forced labour
- 9.3.1 Operators shall provide their employees with equal opportunity and treatment, and shall not act in a discriminatory way.

# References

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