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	Climate Crisis and Agriculture							
	Impact on agriculture							
				and				
		role of	agricultur	e in tackling the	crisis			
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Shreekumar

Sangatya Commune Nakre P.O., Karkala Taluk Udupi District Karnataka 576 117 Email: shreeudp@gmail.com

Satyagraha Dialogues, Socialist Party (India), Sep 12, 2020

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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Outline						

- 1 The Climate Crisis
- **2** Effects of climate change on agriculture
- **3** Effects of climate change on Indian agriculture
- 4 Contribution of bad agricultural practices to climate change
- **5** Steps to contain climate change
- **6** Building resilience
- **7** Cuba's example



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- A rise of 2°C may lead to runaway global warming.
- In order to prevent this, our carbon emission must be net zero by 2040.
- This implies that 80% of the known fossil fuel reserves must be left untapped.
- However, our fossil fuel use and carbon emission continue to increase.

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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## Consequences of global warming on climate

• Increase in frequency and intensity of extreme weather events

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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### Consequences of global warming on climate

- Increase in frequency and intensity of extreme weather events
- Some regions will have lower rainfall, greater variability in rainfall, frequent floods and droughts.

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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### Consequences of global warming on climate

- Increase in frequency and intensity of extreme weather events
- Some regions will have lower rainfall, greater variability in rainfall, frequent floods and droughts.
- Some regions will experience floods and scarcity of water at different parts of the year.

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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Consequ	ences on agrie	culture				

• Increase in temperature is causing shifts in the habitats of some plant and animal species; and extinction of some species

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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- Warmer and shorter winters may reduce vernalisation (flowering induced by cold winter) in some plants, such as wheat, and consequent drop in yields.

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- Crop yields are expected to drop in the tropics and might increase in temperate regions under optimum hydrological conditions, but the loss in the tropics will be much more than any gains likely in the temperate zone.
- Sea level rise will cause submergence of low-lying areas as well as salinity ingress into groundwater in some areas.

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• India is experiencing unpredictability of monsoon as well as spells of heavy rain and droughts.

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- Global warming leads to shrinking as well as faster melting of the Himalayan glaciers, thus resulting in floods as well as scarcity of water at different times of the year.

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- Adverse effect on the forests of the Western Ghats is resulting in floods during monsoon as well as reduced availability of water in the rivers during the rest of the year.

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- Floods result in erosion of topsoil, exacerbated by past changes in land use, such as large scale excavation for mining, quarrying, construction, etc.

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- Rice and wheat yields are likely to drop by 20% to 30%.

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- Floods result in erosion of topsoil, exacerbated by past changes in land use, such as large scale excavation for mining, quarrying, construction, etc.
- Rice and wheat yields are likely to drop by 20% to 30%.
- Coastal areas are threatened with submergence due to sea level rise and salinity ingress into groundwater.

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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• Carbon emissions from machinery, fertilisers and chemicals

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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- Carbon emissions from machinery, fertilisers and chemicals
- Burning of crop residues



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- Increased water use
- Loss of soil fertility and erosion
- Loss of biodiversity

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Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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## • Promote better farming practices

• Adopt organic/natural farming: close nutrient cycle

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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- Adopt organic/natural farming: close nutrient cycle
- Use water economically; stop extractive use of groundwater

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- Adopt organic/natural farming: close nutrient cycle
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- Rebuild soil fertility increase soil organic carbon

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- Adopt organic/natural farming: close nutrient cycle
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- Rebuild soil fertility increase soil organic carbon
- Grow what suits the local ecosystem

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- Adopt organic/natural farming: close nutrient cycle
- Use water economically; stop extractive use of groundwater
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- Grow what suits the local ecosystem
- Grow more perennials and preserve naturally growing edibles

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- Increase diversity of food crops as well as other vegetation
| Climate Crisis | Effects on agriculture | Effects in India | Contribution of agriculture | Containment | Resilience | Cuba |
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- Grow what suits the local ecosystem
- Grow more perennials and preserve naturally growing edibles
- Increase diversity of food crops as well as other vegetation
- Changes in food consumption habits
  - Consume local food
  - Consume more of perennials and what grows naturally
  - Limit intake of non-vegetarian food, especially what is produced on an industrial scale

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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• Stop building new power plants based on fossil fuels and invest in renewable energy

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- Stop building new power plants based on fossil fuels and invest in renewable energy
- Ban polluting industries, including factory-scale aquaculture in the vicinity of farmlands

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- Policy of GDP growth and profit maximisation at any cost must be abandoned.

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- Policy of GDP growth and profit maximisation at any cost must be abandoned.
- Stop diversion of agricultural and forest lands for industrial purposes and grand development projects such as bullet trains

Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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 Tax carbon emissions sufficiently to encourage the use of renewable resources and a shift in favour of employment-intensive industries.

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- Policy support to agriculture in the form of attractive minimum support prices for produce

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- Policy support to agriculture in the form of attractive minimum support prices for produce
- Policy support for a transition to sustainable agriculture; phase out subsidies and provide minimum income guarantee to farmers during the transition to sustainable agriculture.



### Is pursuit of GDP growth really helping us?



Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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## HDI vs per capita Ecological Footprint

#### Human Welfare and Ecological Footprints compared



Climate Crisis	Effects on agriculture	Effects in India	Contribution of agriculture	Containment	Resilience	Cuba
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Steps ne	eded for build	ling resilie	nce			

• Invest in watershed development, so as to save soil and build groundwater reserves. Land use plan must be done at the level of micro-watersheds

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- Promote reforestation where forest cover has been degraded or lost, recover biological diversity
- Ban unsustainable extraction of groundwater. Stop large scale irrigation and free electricity for irrigation resulting in change in cropping patterns.
- Encourage dryland agriculture, growing of millets and a greater variety of crops that suit local ecological conditions.



• Ban genetically modified seeds; conserve traditional seeds which preserve the autonomy of farmers and are more resilient to variability in weather conditions



- Ban genetically modified seeds; conserve traditional seeds which preserve the autonomy of farmers and are more resilient to variability in weather conditions
- Train farmers in agro-ecology. A holistic approach is needed so as to rebuild soil fertility and water security, and recover biological diversity of flora and fauna even on farm lands.

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- Support small-scale, ecologically sustainable agriculture which not only is more productive but provides more employment and takes better care of the soil

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- Enact land reforms so that there is more equitable distribution of land, avoid short-term land tenancy in which the grower has no stake in maintaining soil health

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- Encourage urban gardening and farming.



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- Compensate farmers for losses incurred due to extreme weather events and droughts
- In general minimisation of risk must be the primary concern rather than productivity at any cost
- Introduce youth and children to land-based activities and vocations during their education

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- Made a determined shift to organic farming
- Ensured minimum nutrition for all during the transition

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- Built farmers' markets
- Made agriculture economically attractive

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- Made a determined shift to organic farming
- Ensured minimum nutrition for all during the transition
- Trained people and trainers in permaculture
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- Built farmers' markets
- Made agriculture economically attractive
- Resulted in improvement in diet and health

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- Ensured minimum nutrition for all during the transition
- Trained people and trainers in permaculture
- Encouraged urban gardening and farming
- Built farmers' markets
- Made agriculture economically attractive
- Resulted in improvement in diet and health
- We need to act with the same sense of urgency