Agroecological Food Systems for the 21st Century

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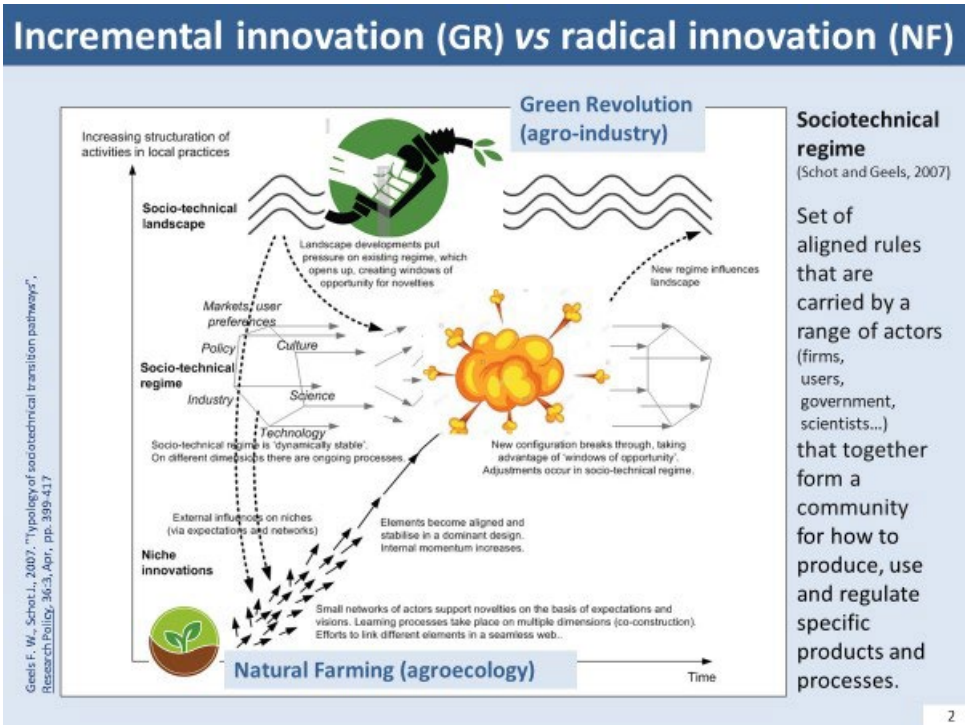
Dear colleagues,

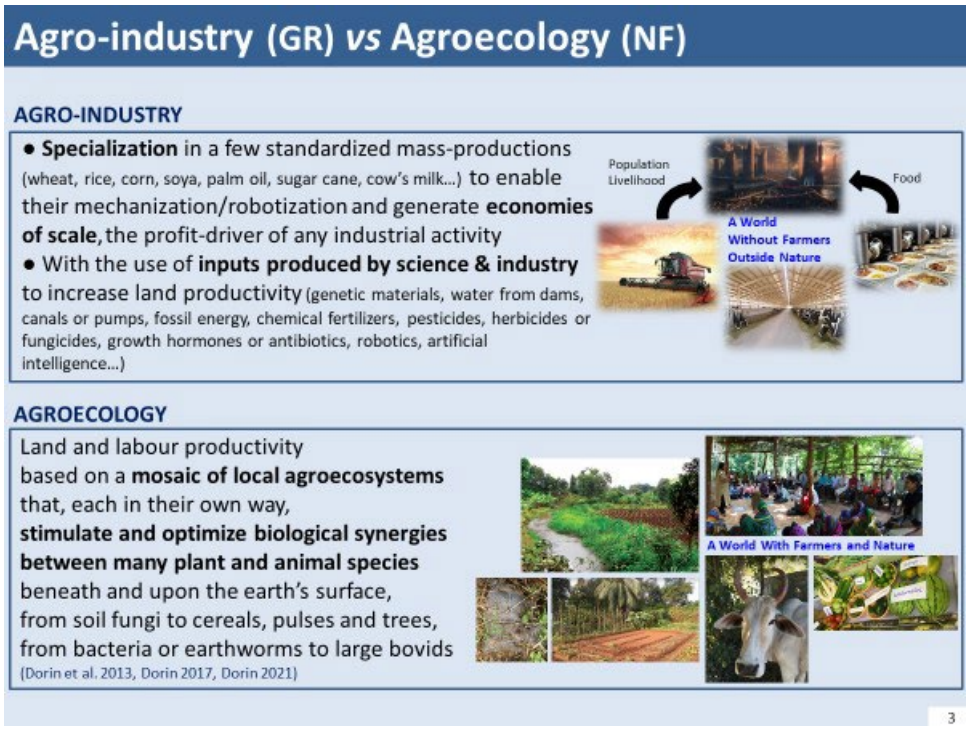
I was very honoured and grateful to NITI Aayog for inviting me to share our views and work on Natural Farming in India during this national workshop on innovative agriculture.

Today, I will present you some preliminary results of our foresight study "AgroEco2050" with the Government of Andhra Pradesh, the FAO, and a group of experts of about 30 persons.



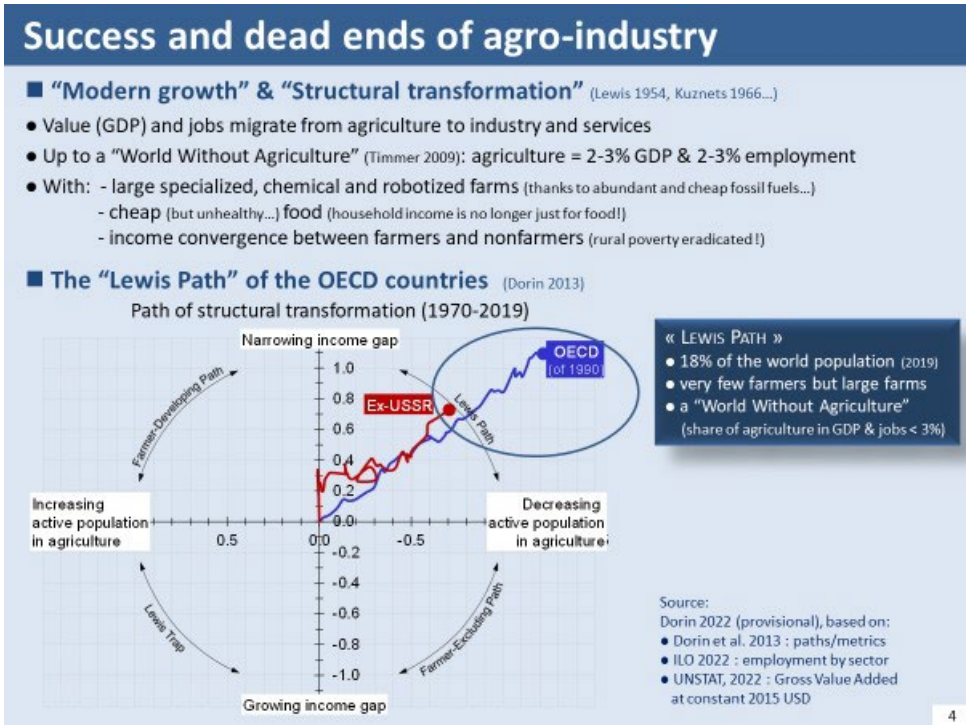
In our foresight study, we imagined and compared two contrasting scenarios for Andhra Pradesh in 2050, based on two archetypes of sociotechnical regimes:
(1) that of industrial food and agriculture which prevails in India today through the techniques and institutions of the Green Revolution,
(2) and that of agroecology which is embodied by the current development of the Andhra Pradesh Community-managed Natural Farming, or "APCNF".

Agroecology and APCNF clearly challenge our conceptions of land and labour productivity in economics or agricultural sciences. They challenge the current global regime of industrial food and agriculture. In other words, they challenge a set of aligned rules that currently dominates amongst scientists, government, firms and users that together form a community for how to produce, use and regulate specific products and processes.



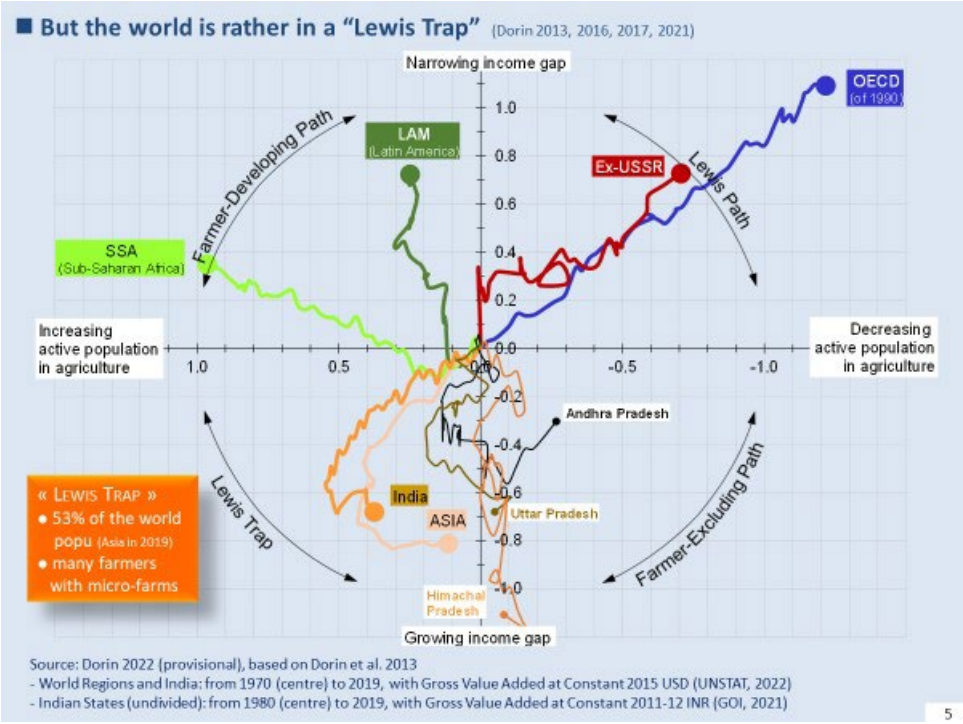
The current global regime of industrial food and agriculture has two main characteristics:
(1) One: the specialization in a few standardized mass-productions such as wheat, rice, corn or palm oil, to enable their robotization and generate economies of scale, the profit-driver of any industrial activity
(2) Two: the use of inputs produced by conventional science & industry to increase land productivity provided you add and pay for genetic materials, chemical fertilisers, pesticides and now artificial intelligence.

On the other side, you have "agroecology", which I define as follows: "a mosaic of local agroecosystems that, each in their own way, stimulate and optimize on small plots of land biological synergies between many plant and animal species below and above the soil, from soil fungi to cereals, pulses and trees, from bacteria or earthworms to large bovids".

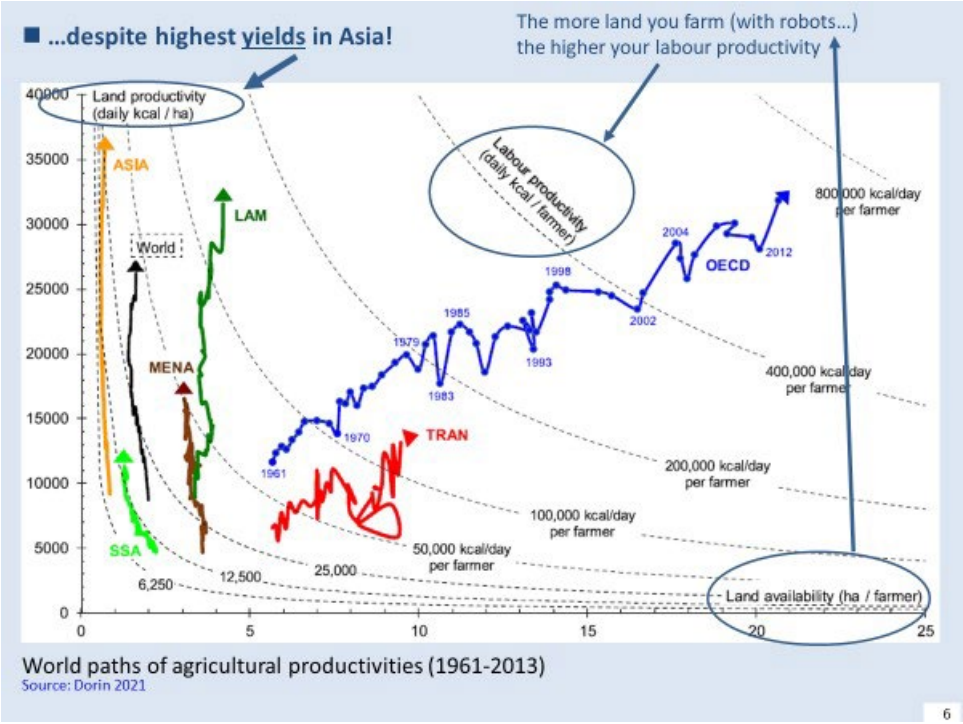


Now, let us talk a little more about the world of industrial food and agriculture. It is in fact part of a bigger world called in economics "modern economic growth" or "structural transformation". In this world, in a nutshell:
- modern economic development means values and jobs migrating from agriculture to industry to services
- until arriving in what Peter Timmer called a "World Without Agriculture" where agriculture does not represent more than 3% of GDP and 3% of employment, as today in all OECD countries
- in this "World Without Agriculture" fed by ever-growing quantities of fossil fuels, we have large specialized, chemical robotized farms, producing cheap food. The average income of farmers and non-farmers has also converged. In other words, we emptied the countryside of farmers but made those who stay much larger and richer.

I called "Lewis Path" this canonical path of structural transformation, and I tried to see which countries or regions of the world had really followed it since the year 1970, positioned here in the middle of the graphic. As you can see, I found only the OECD and transition countries. In 2019, these two regions represented about 18% of the world population. The big question is now: "what other paths has been followed by most of mankind over this half century, and why?"

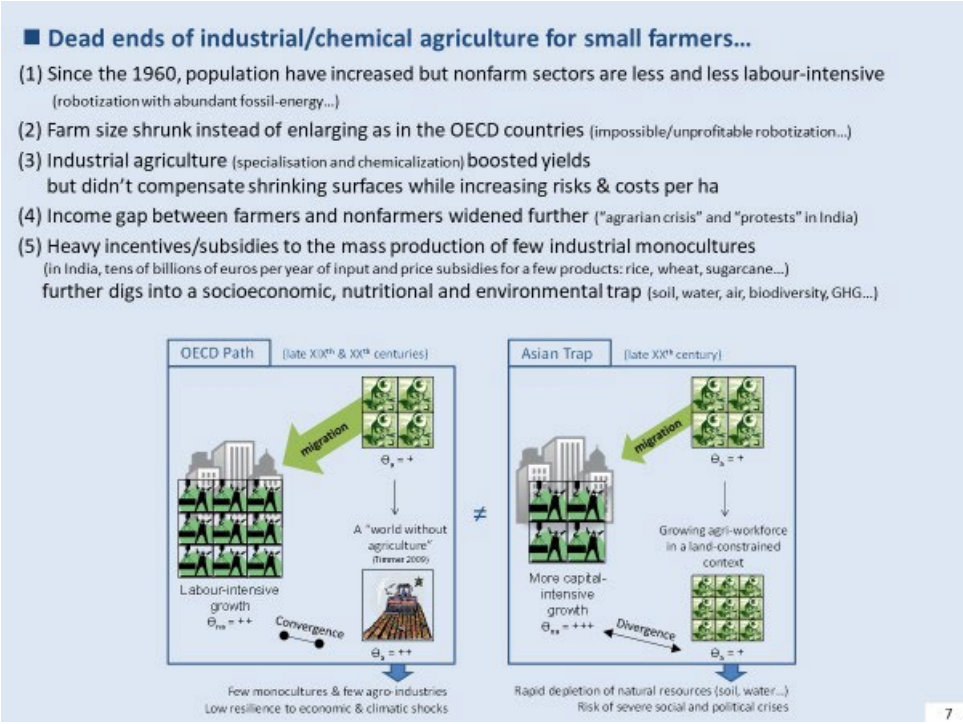


In facts, more than half of the 2019 world's population, located in Asia, had been following what I called a "Lewis Trap", where average farm size has shrunk instead of getting bigger, and where the income gap with nonfarmers has widened instead of narrowing.



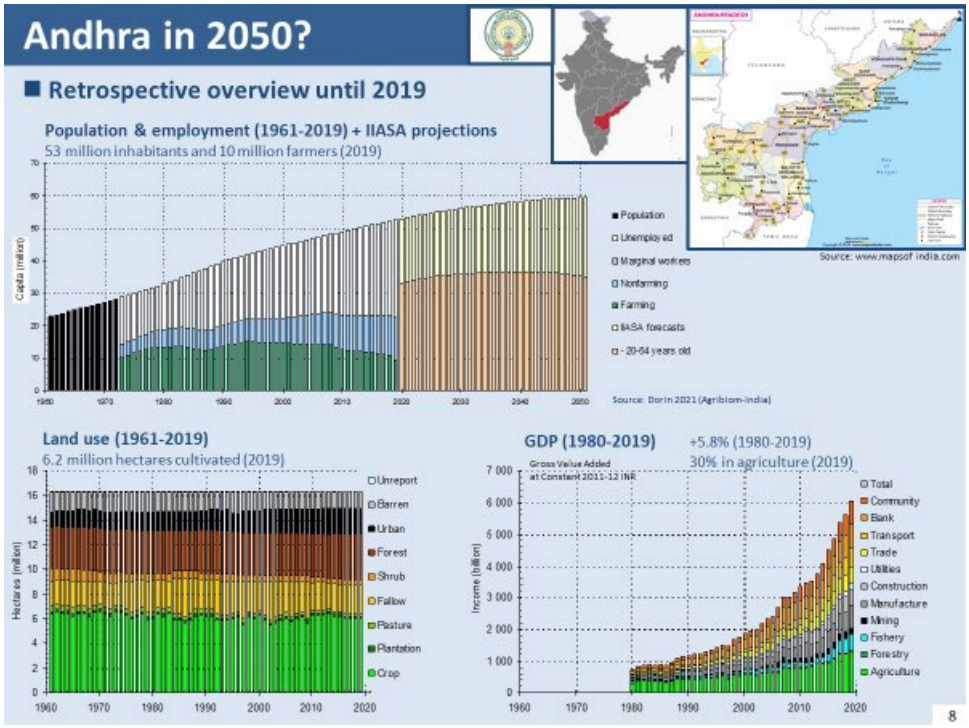
Last but not least, this worrying path of Asia is not because Asia lags in adopting modern technologies to increase agricultural yields, as we can read in the academic literature. On the contrary, Asia is the world region where these modern industrial technologies have been adopted the most, and even overused, leading to the highest average yields in calories per ha.

Overall, in Asia, we find the highest yields with the smallest farms, but also hundreds of farmers committing suicide every day due to over-indebtedness, while malnutrition and heath costs have increased dramatically, as well as the depletion of natural resources on all fronts: soil, water, air and biodiversity.

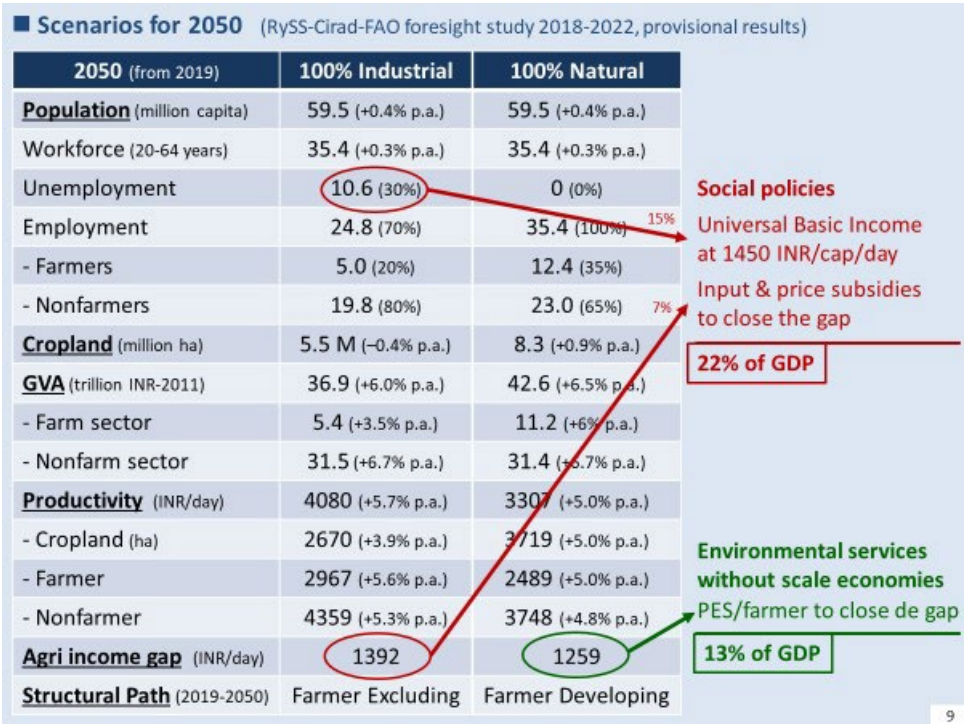


Faced with these structural dead ends of industrial agriculture, should we continue to believe in its technological promises which can only benefit the few who have privileged access to land, capital and fossil energy? Or should we test and develop another regime, much fairer, healthier and sustainable such as the Community-managed Natural Farming in Andhra Pradesh?

[On this slide, I tried to summarise and explain the dead ends of industrial food and agriculture in a country like India:
(1) One: during the second half of the 20th century, in India as elsewhere, population increased sharply but nonfarm sectors became less and less labour-intensive due to automation, hence less and less able to withdraw from agriculture the hundreds millions of workers that would have been required to enable developing countries to embarked in a Lewis Path;
(2) Two: if large deforestation doesn't occur as in Latin America, then farm size logically shrunk, making impossible large-scale mechanization and robotization of farms, the profit-driver of industrial farmers in developed countries;
(3) Three: in this land-squeezed context, specialisation and chemicalization of agriculture helped to boost yields and massively produce few crops such as wheat and rice in India, but for small farmers, it did not compensate shrinking surfaces while increasing risks and costs per ha, eroding natural factors of production, and food quality;
(4) Four: these higher risks and costs of production per hectare widened further the century-old income gap between farmers and nonfarmers, leading to a deepening "agrarian crisis" in India;
(5) Five: continuous scientific and financial incentives to industrial agriculture, which in India represent tens of billions of euros every year, only deepen these socioeconomic, nutritional, environmental and budgetary traps.]



I will now present you some preliminary results of our foresight study AgroEco2050, after reminding you that Andhra Pradesh is a State of South India with approximately 53 million inhabitants and 10 million farmers in 2019. In the same year, it cultivated 6.2 million hectares, and 30% of its GDP was generated by agriculture and allied activities.

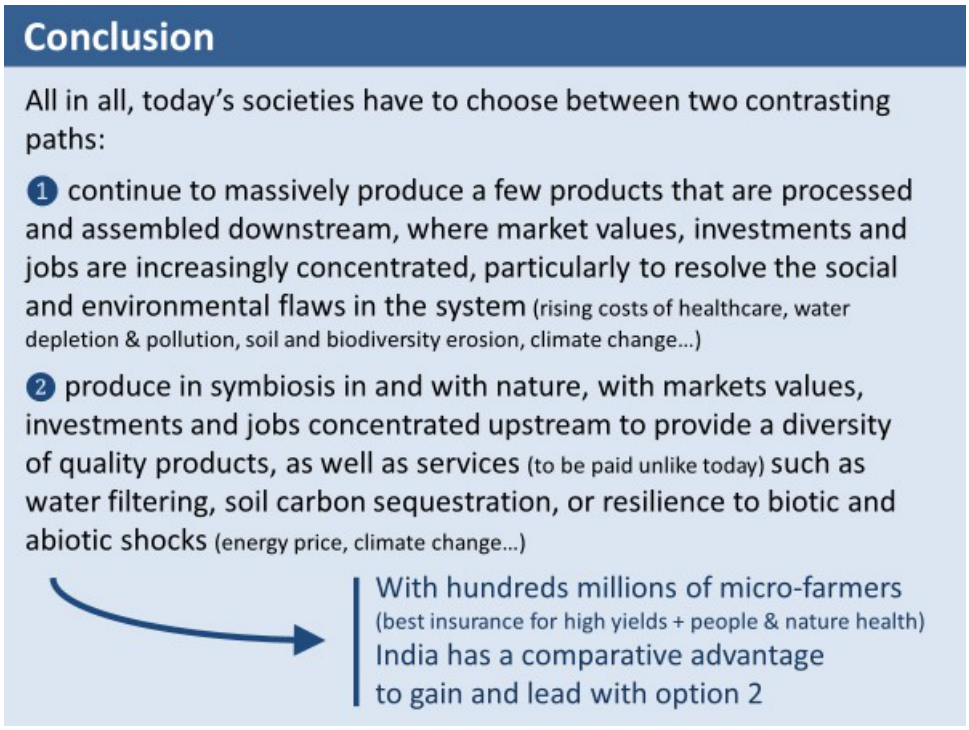


In our scenario of industrial agriculture in 2050, unemployment among the 20-64-year olds would remain at the rate of 30% as in 2019, the number of farmers would drop to 5 million, the area of cultivated land would continue to decrease, and overall economic growth would average 6% per annum from 2019 to 2050, roughly the same level as over the past three decades.

With such a scenario, inequality would increase further, both between those employed and not, and between those employed in agriculture and the others. To counter these inequalities and these poverty traps, 22% of the GDP of 2050 could be spent on social policies, which represents a huge sum with little chance of foreign funding.

With our agroecological scenario fully scaled through APCNF, 35 million women and men would be fully employed, the number of farmers would reach over 12 million as in 2011, cropland under Natural Farming would increase to 8.3 million hectares, and the overall rate of economic growth would average 6.5% per annum.

However, in this scenario as well, a fam-nonfarm income gap would persist, albeit slightly smaller than in the industrial scenario. A fair way to close it and bring harmony would then be to pay agroecological farmers for the environmental services they would provide to society, such as water saving, carbon sequestration or high resilience to climate change. This would then represent 13% of the GDP of 2050, a figure that is still very high but with chances of foreign contributions contrary to the industrial scenario.



All in all, today's societies have to choose between two contrasting paths:

(1) The first path is to continue to massively produce a few products that are processed and assembled downstream, where market values, investments and jobs are increasingly concentrated, particularly to resolve the social and environmental flaws in the system, such as rising costs of healthcare, water depletion and pollution, soil and biodiversity erosion, climate change…

(2) The second path is to produce in symbiosis in and with nature, with markets values, investments and jobs concentrated upstream to provide a diversity of quality products, as well as much sought-after but currently unpaid environmental services to small agroecological farmers.

As far as I am concerned, after more than 30 years of work in economics and agricultural sciences, including 16 in India, I have now the conviction that with millions of micro-farmers who will not disappear in the future, India can only collapse with industrial food and agriculture, when it could shine with agroecology and natural farming, if of course public policies follow and think outside the box with local stakeholders and knowledge.

Thank you for your attention.