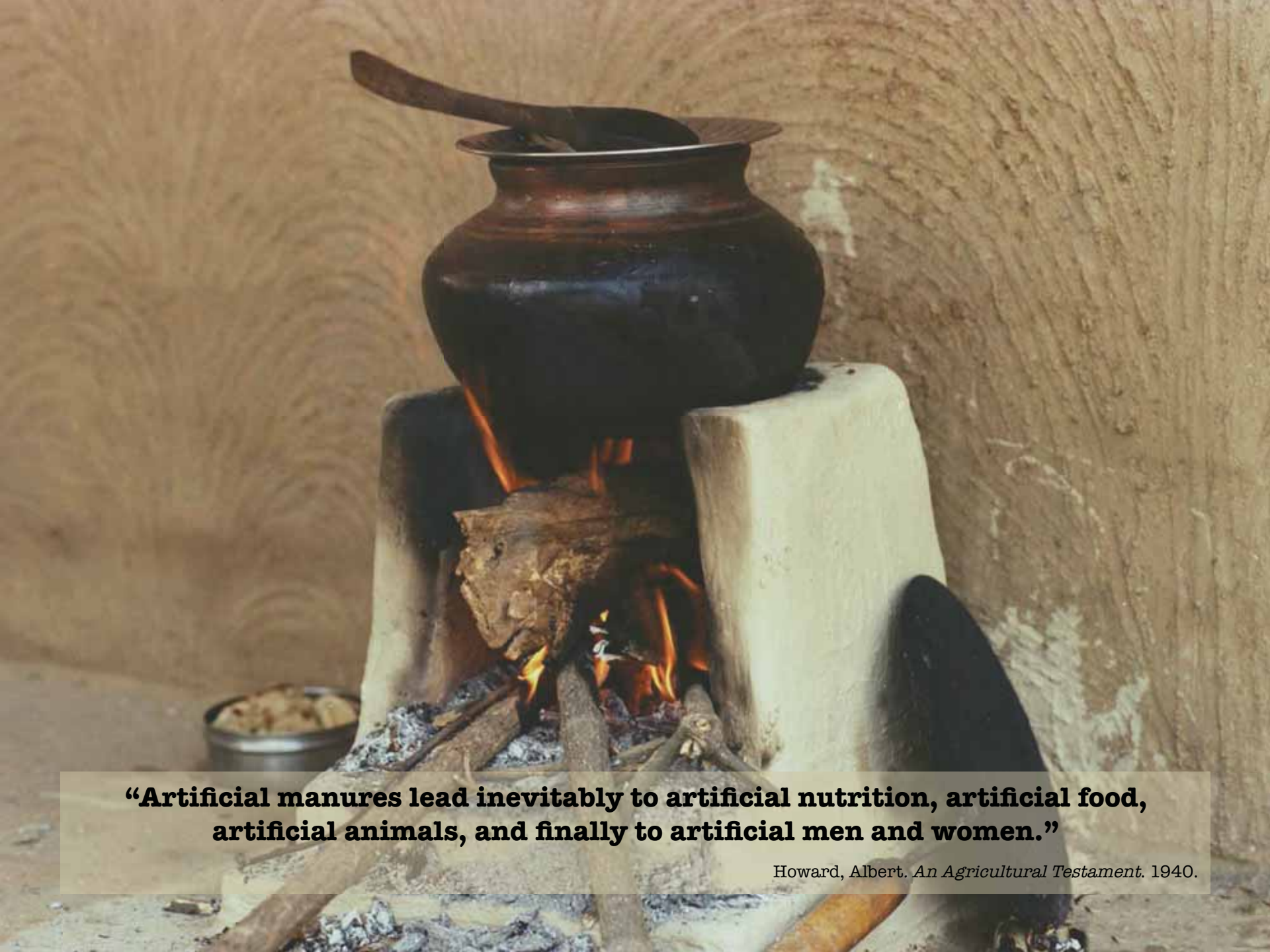
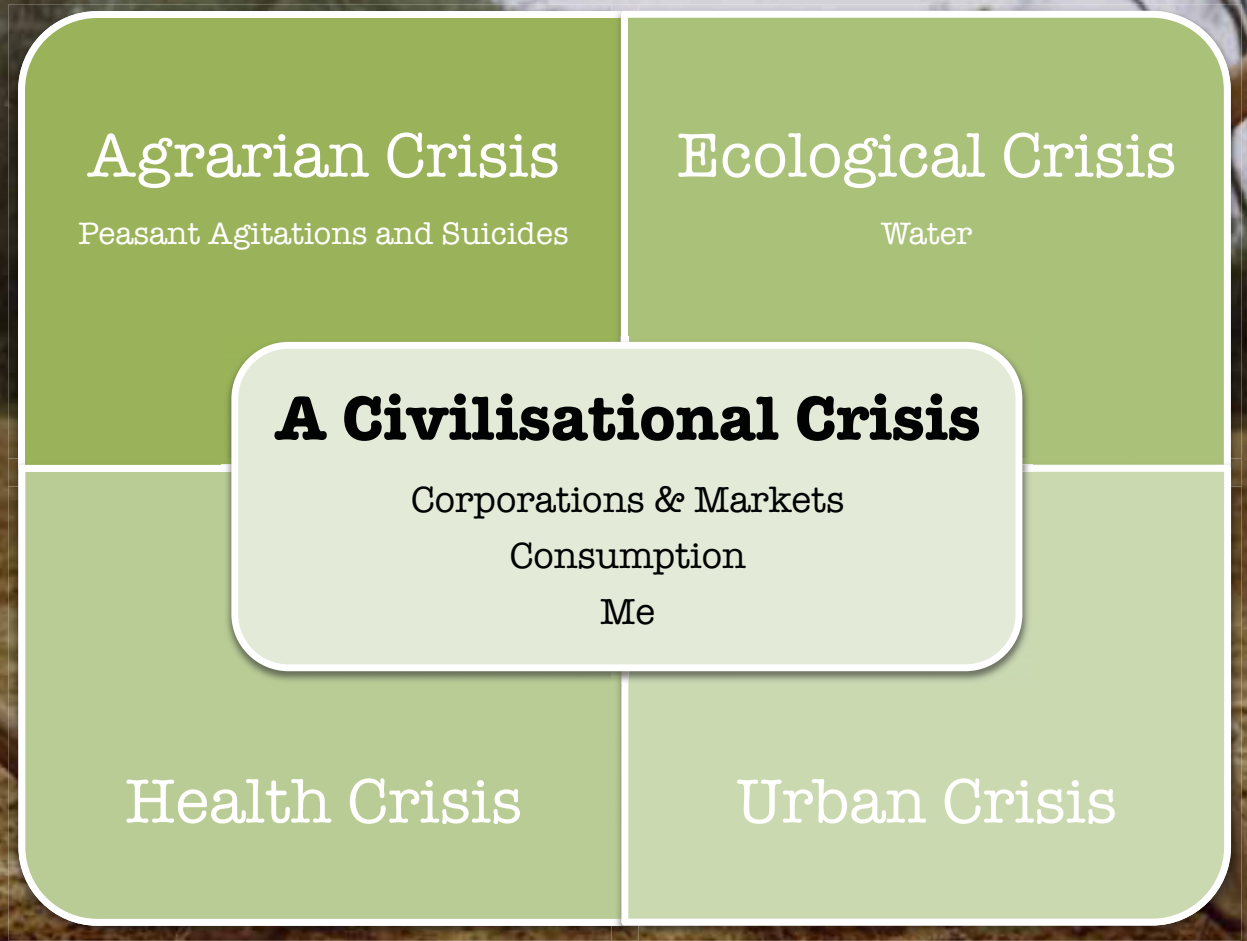


“Artificial manures lead inevitably to artificial nutrition, artificial food, artificial animals, and finally to artificial men and women.”

Howard, Albert. *An Agricultural Testament.* 1940.

A Connected World



Urban Bias

"There has always been lack of equilibrium, rather a sort of antagonism between cities and the countryside. This is particularly so in our land where the gulf of inequality between the capitalist class and the working class pales into insignificance before that which exists between the peasant farmer in our village and the middle-class town dweller. India is really two worlds - rural and urban. The relationship between the countryside and the cities is, therefore, a vital problem to us."

Singh, Charan. *India's Poverty and Its Solution.* 1964

The Urban Bias Theory

"The most important class conflict in the poor countries of the world today is not between labour and capital. Not is it between foreign and national interests. It is between the rural classes and the urban classes [...] The damage has been increased by misguided ideological imports, liberal and Marxism, and by the towns success in buying off part of the rural elite, thus transferring most of the costs of the process to the rural poor."

Lipton, Michael. *Why Poor People Stay Poor*, 1976

India

Too many people, too little land

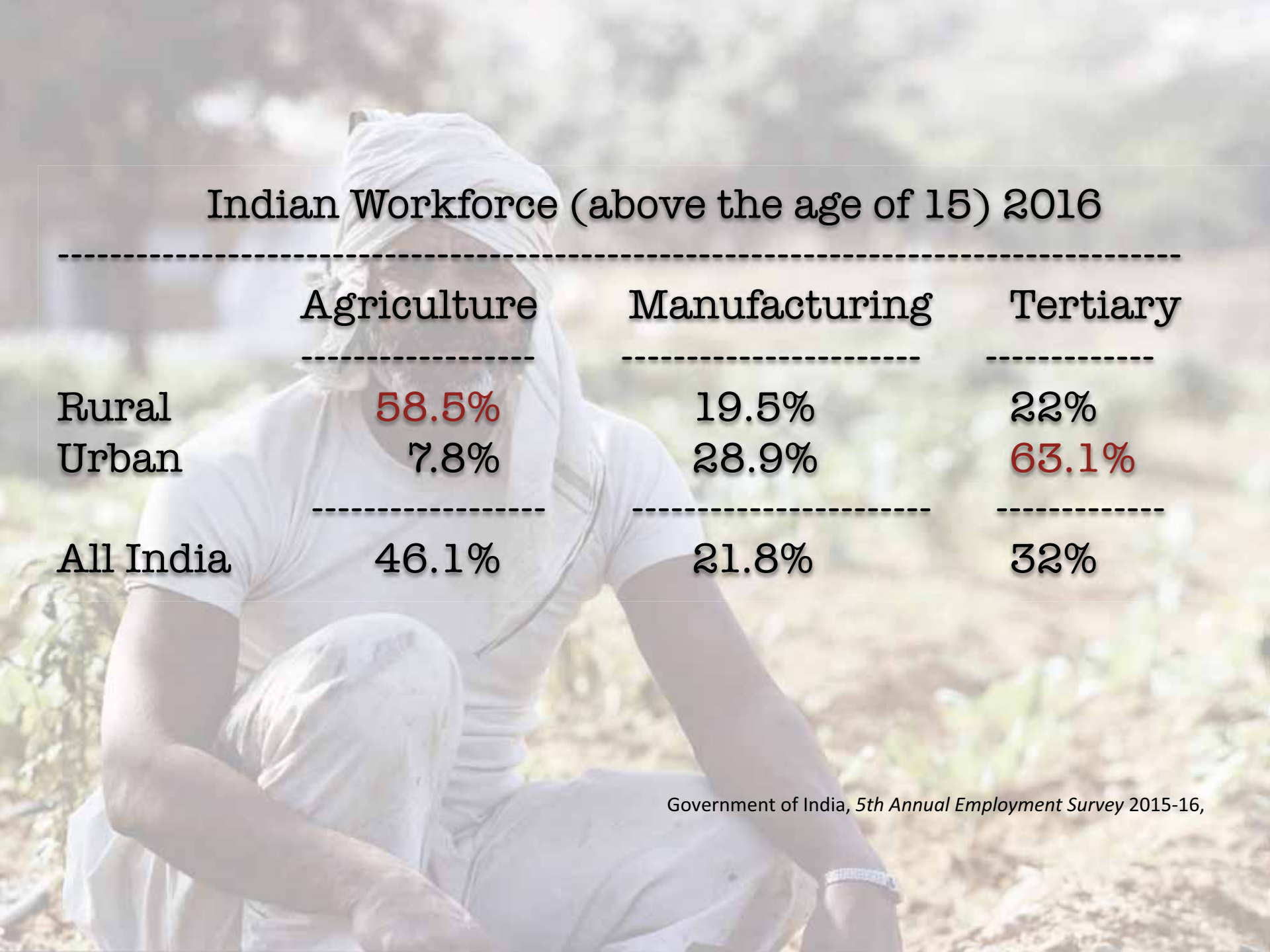
17.5% of the worlds population.
2.5% of the world's land

833 million in the villages
377 million in the cities

Terribly Poor and Unequal

1970: 85% holdings less than 10 acres land
2010: 85% were less than 5 acres

2.6 million earn more than 100,000 a month
878 million earn less than Rs 5,000 a month
287 million live on less than Rs 1,250 a month



Indian Workforce (above the age of 15) 2016

	Agriculture	Manufacturing	Tertiary
Rural	58.5%	19.5%	22%
Urban	7.8%	28.9%	63.1%
All India	46.1%	21.8%	32%

Government of India, *5th Annual Employment Survey* 2015-16,

GDP India 2015 in Percent

(2004-05 Prices)

	Agriculture	Manufacturing	Services
1950-51	51.81	14.16	33.25
1980-81	35.39	24.29	39.92
2013-14	13.94	26.13	59.93

46% of India's labor force engaged in agriculture generates only 13.94 paisa of every rupee; while the balance 54% in manufacturing and services get 86.06 paisa.

- Even if the unequal rural-urban GDP ratio of 1950 was maintained today, the peasant citizen in 2017 should have produced 37.13% of the GDP – but he produces only 13.94%.
- The unequal terms of trade in 1950 are even worse today. His inputs costs are much higher, his revenues are erratic and much lower.

And that, in a nutshell, is why he protests.

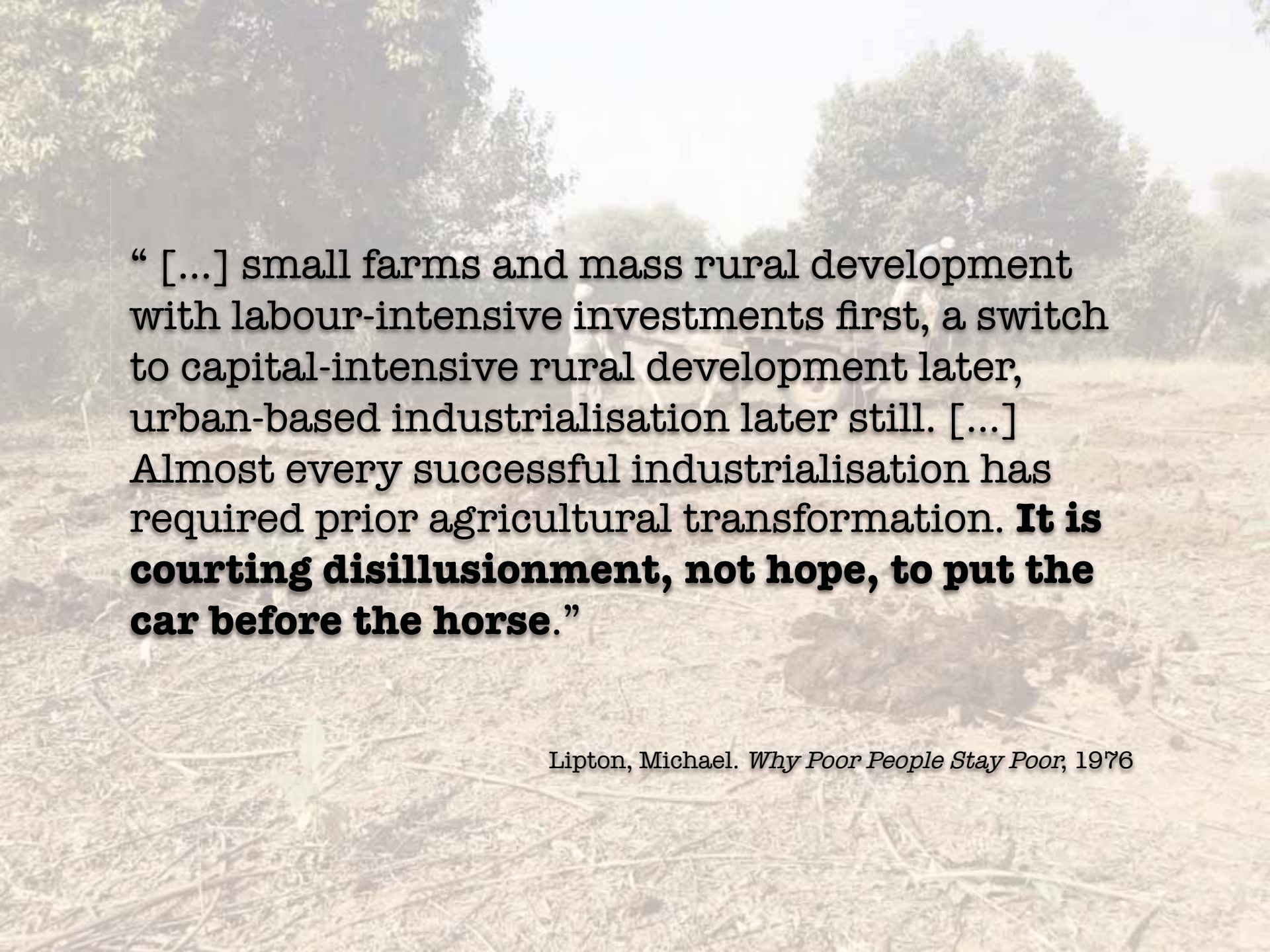
Household Average Monthly Earning

	< Rs 5,000	5001-10,000	10,001-20,000	> 20,000
Rural	27.3%	49.6%	16%	7.1%
Urban	9.3%	24.6%	28.5%	26.7%
All India	22.1%	45.5%	19.6%	12.8%

286 million live in grinding poverty: a HOUSEHOLD of 4 earns less than Rs 5,000 a month.

Rs. 1,250 a month per person
on food, clothes, shelter health, education, marriage, entertainment, old age, and death.

75% of these citizens live in the villages.



“ […] small farms and mass rural development with labour-intensive investments first, a switch to capital-intensive rural development later, urban-based industrialisation later still. […] Almost every successful industrialisation has required prior agricultural transformation. **It is courting disillusionment, not hope, to put the car before the horse**.”

Lipton, Michael. *Why Poor People Stay Poor*, 1976

अमन बाग़

Natural Systems Farming

www.amanbagh.org

Natural Systems Farming

Agro-ecological thinking

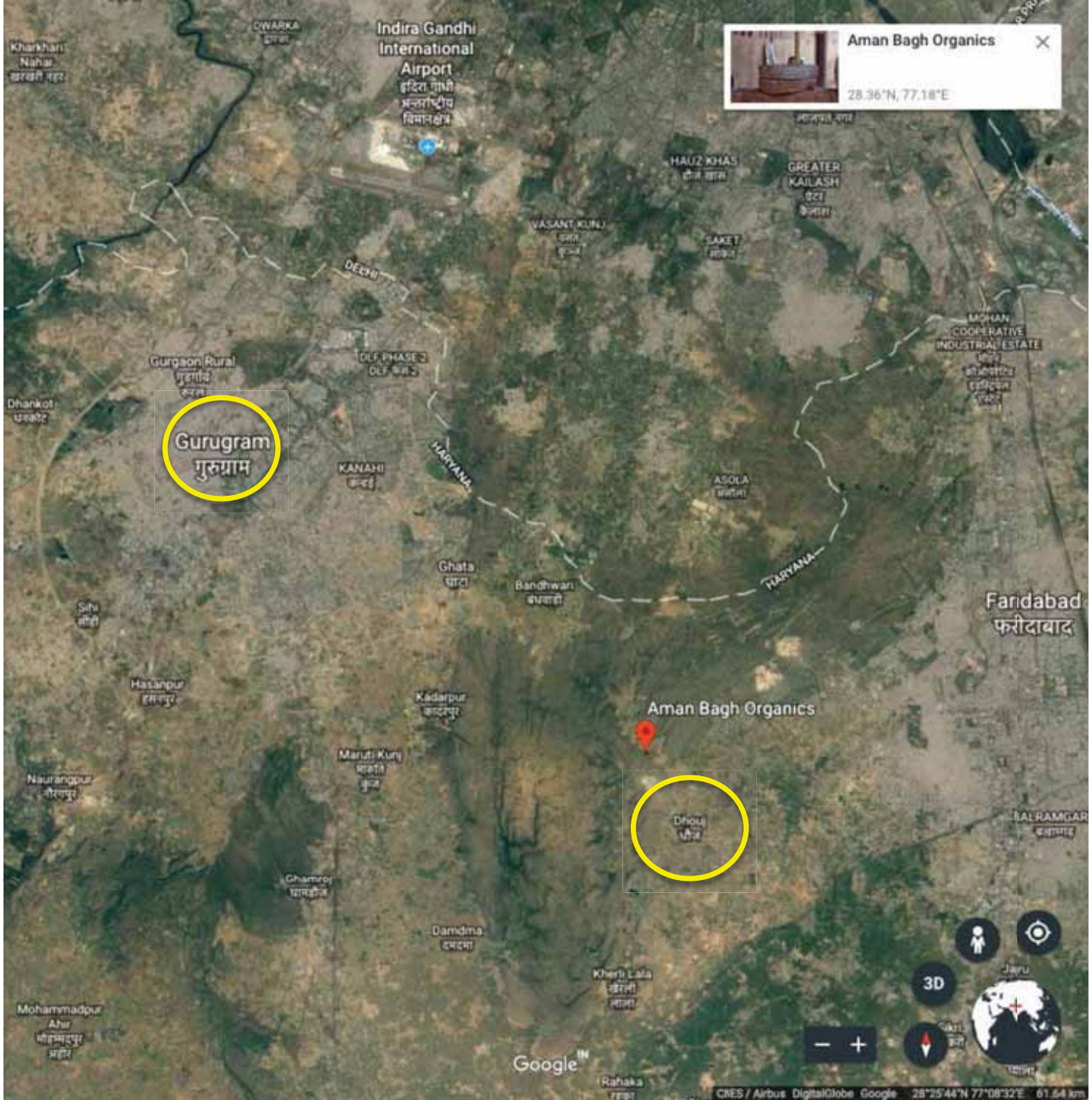
An integrated view of social, economic, environmental and political aspects of agriculture and society; not a fragmented, isolated view of each.

Knowledge of the interactions between the parts, than of the parts by themselves.

Mimic the forest, the ultimate natural farming system.

No one ploughs, seeds, waters or manures it; yet (or that's why, perhaps) it is the most fertile and sustainable eco-system on earth.

Sustainable and self-generative system that takes out as much as it puts in.


Aman Bagh Organics
28.36°N, 77.18°E
Indira Gandhi International Airport
इंदिरा गांधी अन्तर्राष्ट्रीय विमानक्षेत्र
DWARKA
Kharkhari Nahar
HAUZ KHAS
GREATER KAILASH
VASANT KUNJ
SAKET
DELHI
MOHAN COOPERATIVE INDUSTRIAL ESTATE
Gurgaon Rural
DLF PHASE 3
Dhankot
Gurugram
गुरुग्राम
KANAHI
HARYANA
ASOLA
Ghata
Bandhwari
Faridabad
फरीदाबाद
Sihi
Hasanpur
Kadarpur
Aman Bagh Organics
Maruti Kunj
Nauranggpur
Dhoul
LALRAMGAR
Ghamroj
Damdma
Kherli Lala
Mohammadpur Ahir
Google
Rahaka
3D
Jaru
CNES / Airbus DigitalGlobe Google 28°25'44"N 77°08'32"E 61.64 km

The Aman Bagh Ecology

- Mangar Village, district Faridabad – hot & arid south-west Haryana.
  - Less than 300 mm rain a year
  - Strong NW winds in May.

- 'Coarse Sandy' soil, very low (<0.2%) organic matter

- At the edge of the Mangar valley: the surrounding Aravali hill range radiates heat and traps cold, creates a challenging microclimate.

- Extreme temperatures: from 9 degrees C in January to 47 degrees C in May, humidity in monsoons.

Haryana is an 'intensively cultivated' state, 3.5% of state is forests - mostly unregulated and degraded with Prosopis Juliflora.
Grows rice, wheat, fruits & vegetables, cotton, sugarcane.
Second highest use of fertilisers & pesticides in India after Punjab.
Drastic reduction in area under coarse cereals, and lentils since 1950. 53% of state uses groundwater irrigation

Haryana exhibits all the ills of market and industrial agriculture as well as unregulated urbanisation: air, water, soil pollution.

Principles of Natural Systems Farming

1. **Interdependence and co-operation** of all living beings. A cyclical view of Growth and Decay: Nature's Round.

2. **Biodiversity** of plant and animal life as in forests. No monocultures, mixed annuals and perennials.

3. **Self Sufficiency**: minimal external inputs to the farm.

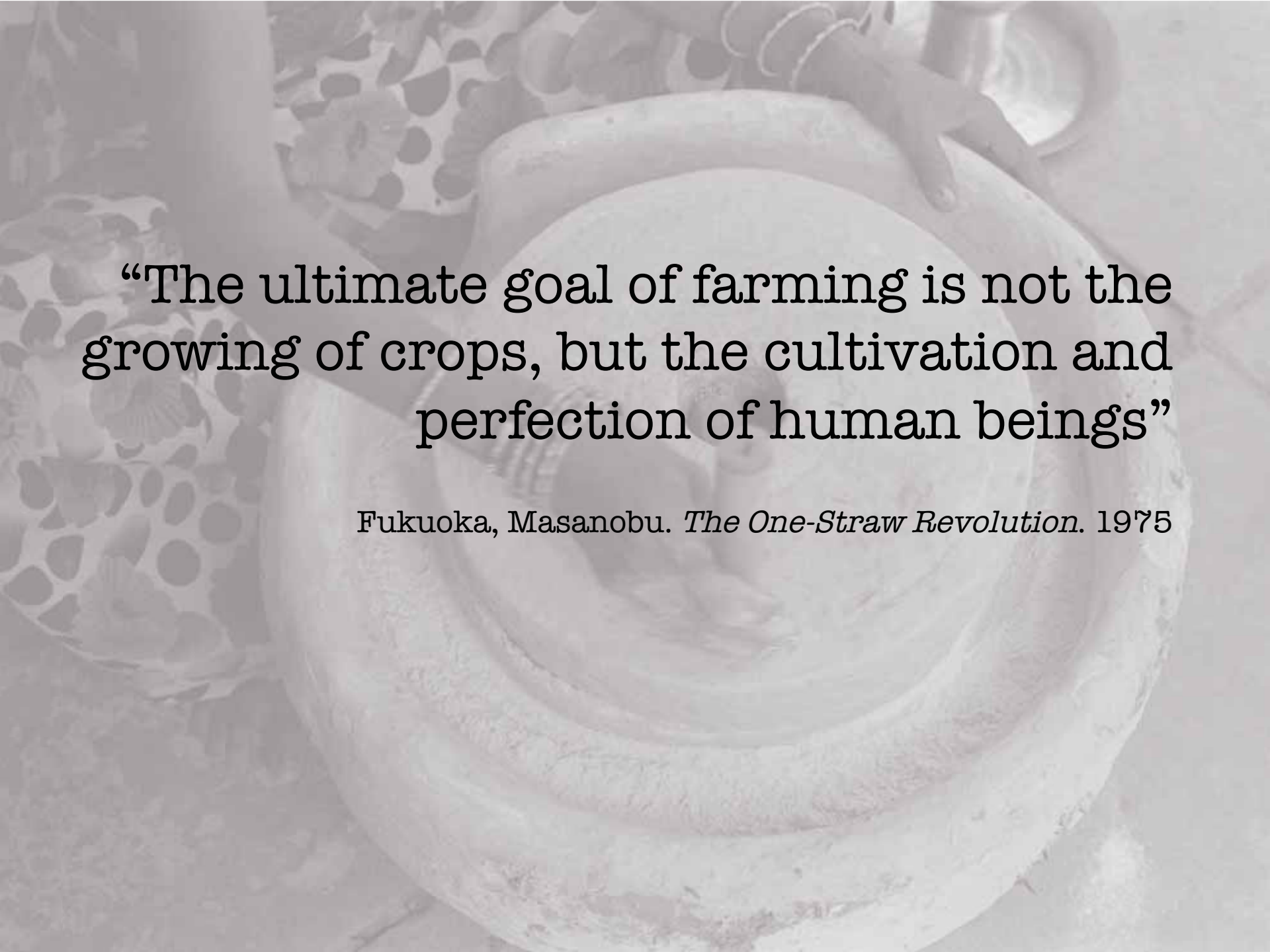
4. **Sustainability**: take only as much out of the soil as one puts back in, making it viable for indefinite generations.

5. **Knowledge is Local**: millennia-old peasant experiences, continually enhanced through careful observation. On soil, weather, seeds, crops, cattle, people.

Objective of Natural Farming

“ **The maintenance of the fertility of the soil is the first condition of any permanent system of agriculture**. In the ordinary processes of crop production fertility is steadily lost: its continuous restoration by means of manuring and soil management is therefore imperative. ”

Albert, Howard. *An Agricultural Testament*. 1940



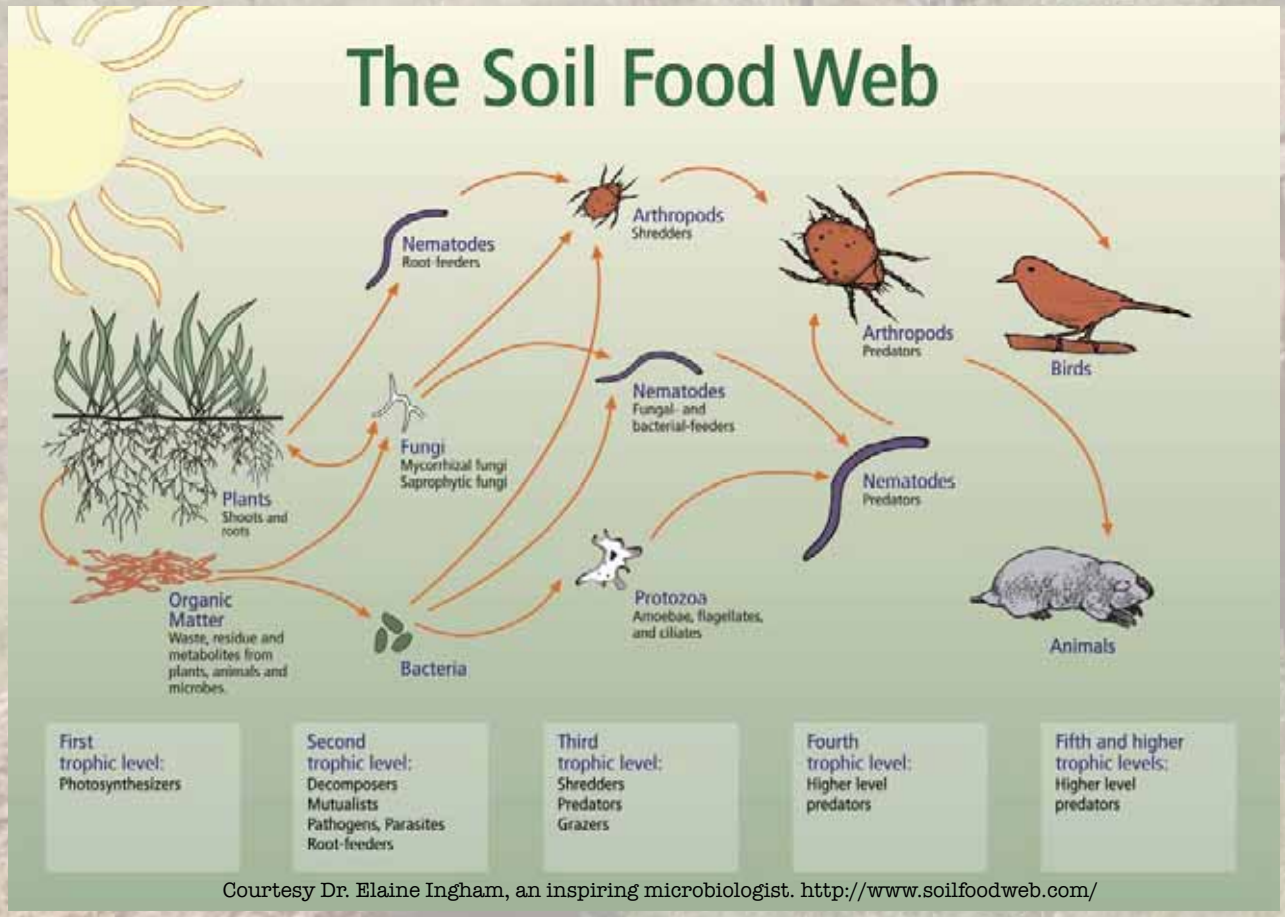
"The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings"

Fukuoka, Masanobu. *The One-Straw Revolution*. 1975

Cultural Practices

Building Soil fertility

Soil Life is fundamental
We Feed the Microorganisms, not the roots of plants



Courtesy Dr. Elaine Ingham, an inspiring microbiologist. http://www.soilfoodweb.com/

Cultural Practices

Building Soil fertility

- Green manuring, Mulching, and Building the Soil Biology.
- This biology – life in the soil - releases the chemistry, the NPK and 40+ micronutrients.

Cultural Practices

Building Soil fertility

100 tonnes of bio-diverse biomass added every year

- Our 5 heads of cattle FYM for fruits and vegetables: 20 tonnes a year.
- Bought-out FYM twice a year, applied to all tilled land: 40 tonnes
- Leaf waste from Gurgaon, vegetable waste from ISO, mulching with leaves and branches of our local trees and plants: 10 tonnes
- Mulching in orchards with village wood shavings once a year, local *Sarkanda* every winter: 5 tonnes
- Crop residues ploughed back into the soil.
- Green manuring for all tilled land twice a year: many scores of tonnes a year. Winter and summer green manure plants. Bio-diverse cocktail of grasses and legumes. Ploughed before flowering, 30 to 45 days depending on how much time we have available between our Crops.
- 1,200 liters of microorganism rich *Jeevamrit* is applied every 10 days in (a) all 500 fruit tree basins,(b) in the no-till vegetable patch, and (c) in all cropped farmland.

Islands of soil nutrition in the basins of all trees (along the tree line), plus mulching with compost, mirroring the forest floor. These islands expand as trees grow over time and in 10 years we would have transformed fertility in that entire grove

Cultural Practices

- No chemicals: fertilisers, pesticides or herbicides.
- We use natural pest repellant recipes, only when imperative.
- We believe healthy soil creates healthy plants that resist most diseases.
- Plant biodiversity and crop rotation creates a balanced environment of predators and pests
- Local seeds planted in our on-site nursery are hardy and better adapted to the local ecology.
- We use marigold and other local flowers as insect and predator attractants, we apply methods of companion planting in vegetables – e.g. garlic, onion make excellent repellants.

Cultural Practices

Tree diversity

1. 800 perennial fruit trees & shrubs, ~20 species.

1. Suhajan 200
2. Kinnow 100
3. Nimbu 110
4. Aam 40
5. Amrood 40
6. Anaar 5
7. Chiku, Sharifa, Shahtoot, Phalsa, Ber, Aamla, Bel, Kathal, Karaunda, Kela, Papita, Santara, Shahtoot, Sharifa

2. 800 flowering trees, ~30 species.

Agati, Babool, Bakan, Barh, Barna, Bistendu, Cirrus, Curry Patta, Dhau, Dhak, Giripushpa, Goolar, Khatta, Jamun, Sheesham, Subabool, Kadam, Kheri, Neem, Papdi, Peepal, Safeda, Sagwan, Sheesham, Tota, Gulmohar.

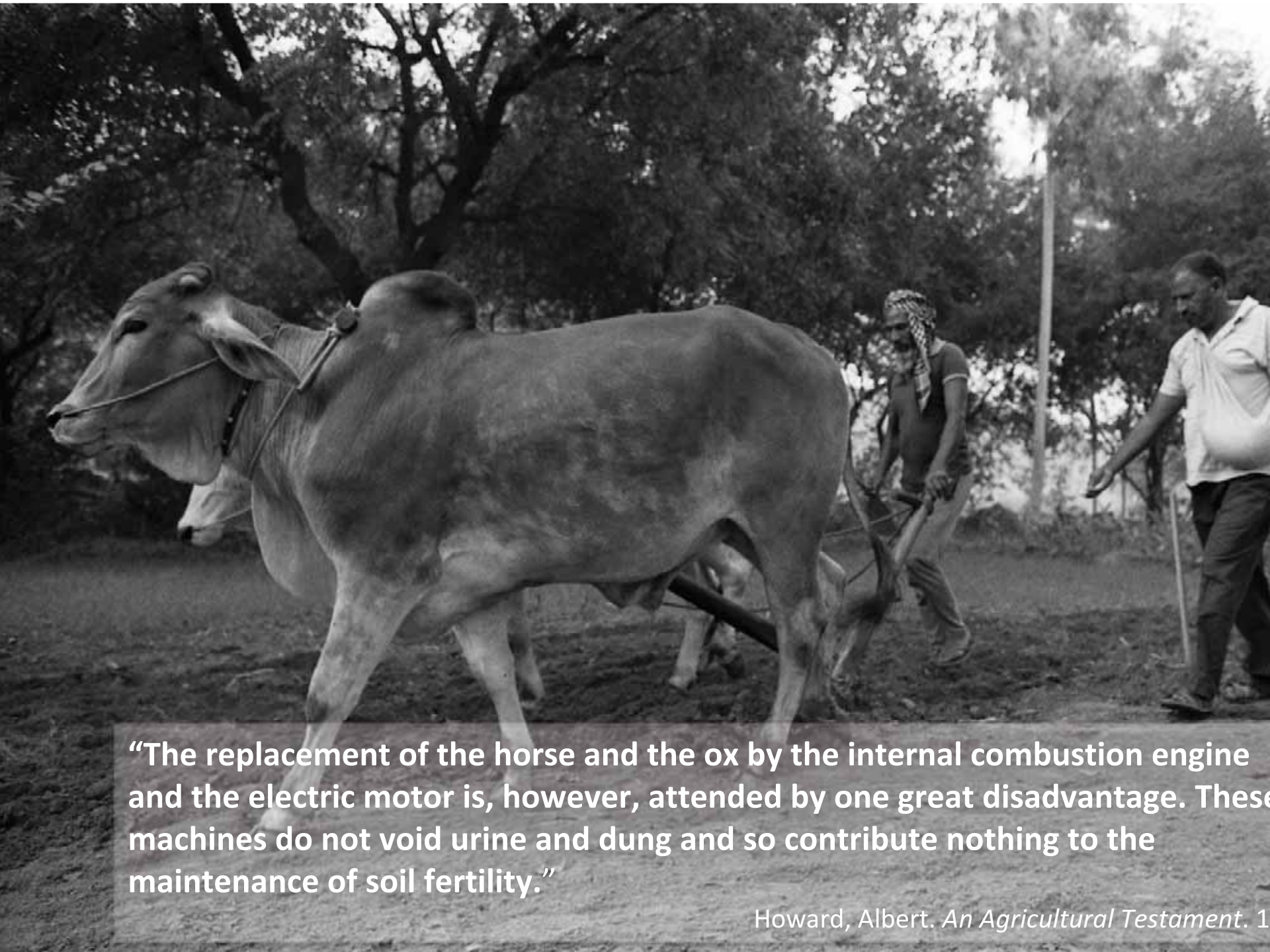
Cultural Practices

No Tractors

- 5 to 7 heads of cattle, 3 desi cows and 2 desi bullocks. All fed from the land.

- We don't use fossil fuel tractors, we use bull power. We are the only ones for 20-30 Kilometers.

- Tractors cost lakhs versus our free bulls, they guzzle imported and expensive fossil fuel, spew pollution, and eliminate labour.



“The replacement of the horse and the ox by the internal combustion engine and the electric motor is, however, attended by one great disadvantage. These machines do not void urine and dung and so contribute nothing to the maintenance of soil fertility.”

Howard, Albert. *An Agricultural Testament*. 1

Cultural Practices

Open Pollinated Seed Saving

- Owned or borrowed (similar ecology) open pollinated seeds.
- Tolerant of local weather and soil conditions and of climate change.
- No hybrid seeds.
- What I bring from West or South rarely work.
- “Seed Saving Bank” a cultural practice
- Saplings grown from seed for perennial trees at Aman Bagh do better than those brought from a commercial nursery

Cultural Practices

Biodiversity of plant life

Kharif sown

Jowar
Bajra
Gwar
Til
Bhutta
Mung
Urad
Arhar
Chauli
Sabzi bel, bhindi, haldi

Hari Khad: Dhaincha, Sana, Chauli, Mung, Arhar, Bhutta, Bajra, Jowar

Rabi sown

Gehun
Jau
Jayee
Sarson
Ganna
Masoor
Chana
Saunf
Jeera
Sabzi

Hari Khad: Berseem, Rijka, Methi, Sarson, Mooli, Gajar, Alsi, Palak, Shaljam, Chukander, Jau, Jayee,

Detailed crop rotation system documented, multi-cropping, multiple species of trees, intercropping.

Traditional annual crops, well suited to our ecology, least water use

Cultural Practices

Methane & Slurry from Cattle Manure

- 10 cubic meter plant for Rs 1 Lakh in 2013, 100 kilograms a day
- Aman Bagh is self sufficient in (Methane) cooking gas
- Slurry immediately available for manuring

Cultural Practices

Perennial Crops

- No-till and perennial bio-diverse fruit orchards in 40% of land, move to 50% in 2018.

- Eliminating cycle of 'till-sow-deweed-reap' that disturbs the soil, oxidises Carbon, ties us to high-intensity labour, and to low revenue annual crops.

- No-till fruit groves enable the building of orchard soil; and moving to a portfolio of crops and fruit that generate revenue throughout the year.


N
W
E
S
Windbreak
Windbreak
Annual Cropland
Daffodil Farm
IKEBANA FARM
Annual Cropland
Annual Cropland
Under Conversion to NTPF
Local Tree Forest
NTPF Orchard
NTPF Orchard
Local Tree Forest
Annual Cropland
NTPF Orchard
No Till Vegetables
Local Tree Forest
NTPF Orchard
Aman Bagh Organics
Manger - Dhauj Rd
Manger - Dhauj Rd
Manger - Dhauj Rd
Manger - Dhauj Rd

Cultural Practices

Water Management

Water in our arid ecology is fundamental to life. With climate change in the Aravali area during the last 2 decades, even more so. Rains are lesser, with less frequency: last 5 years Mangar valley had less than 250 mm of rain. Mining in the hills has dried the Dhauj Lake.

- Aman Bagh is water unsustainable.
- We use 'drip and sprinkler' to minimise water extraction, invested Rs. 6 lakhs on this since 2011.
- We harvest water each year during monsoons: capture roof runoff and take it to the aquifer by a 'reverse bore-well', and through contour swales and mends.
- We apply strategic design to minimise the use of water: building soil organic matter to enhance capacity of the soil to absorb and retain water, 50% of our land is no-till perennial orchards with mulch-heavy areas in each tree basin, planted many kinds of trees that create a cooler microclimate, low water use annual crops like bajra (rain fed), desi wheat (3 water cycles) - no commercial maize, sugarcane or rice.
- We do need a Mangar-wide plan to revive the Dhauj Lake, it's a huge undertaking.

Cultural Practices

The Sophistication of the 'Unskilled' and 'Illiterate' peasant

There is a complexity of knowledge in traditional systems, mostly undocumented and passed down generation to generation through careful practice.

- How to build soil health
- Knowledge of local flora
- What to plant when, when to keep it fallow
- What crop best grows with what
- When to water a crop
- The timing of monsoon rains and crop planting
- Seed saving
- Knowledge of a series of cereals, dals, oilseeds, vegetables in three distinct seasons Kharif, Rabi, Zayed.
- Cattle health and breeding
- Seed savings and storage

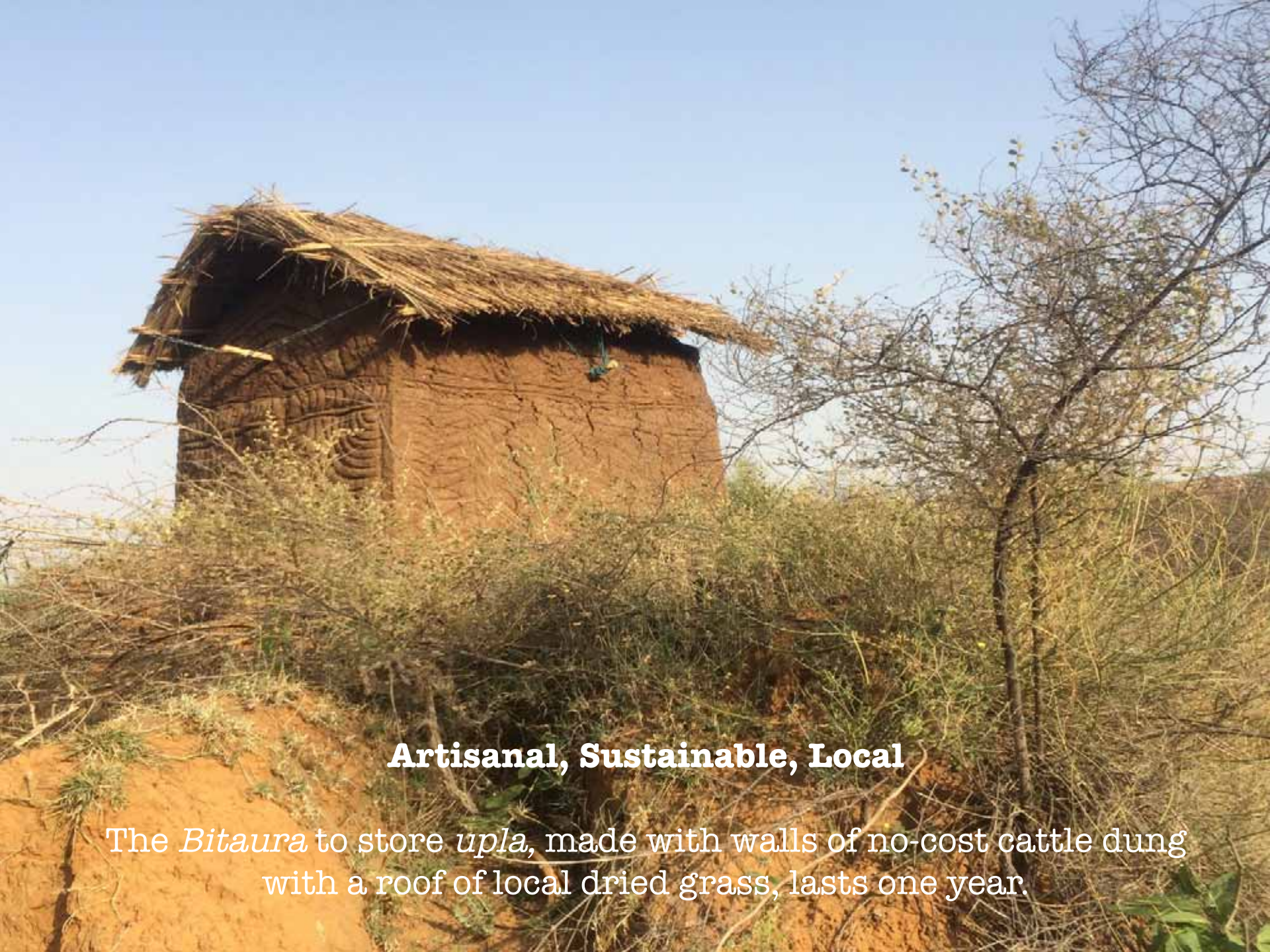
Phew

The peasant, and his cousin the village artisan, is multi-skilled for his world, but unskilled for the post-agricultural world.

It's Civilisational

Artisanal, Sustainable, Local

Bonga made from no-cost *Khatta* stems and dried *Arhar* stalks, lasts two years. Zero waste, appropriate, local technology. An art form.

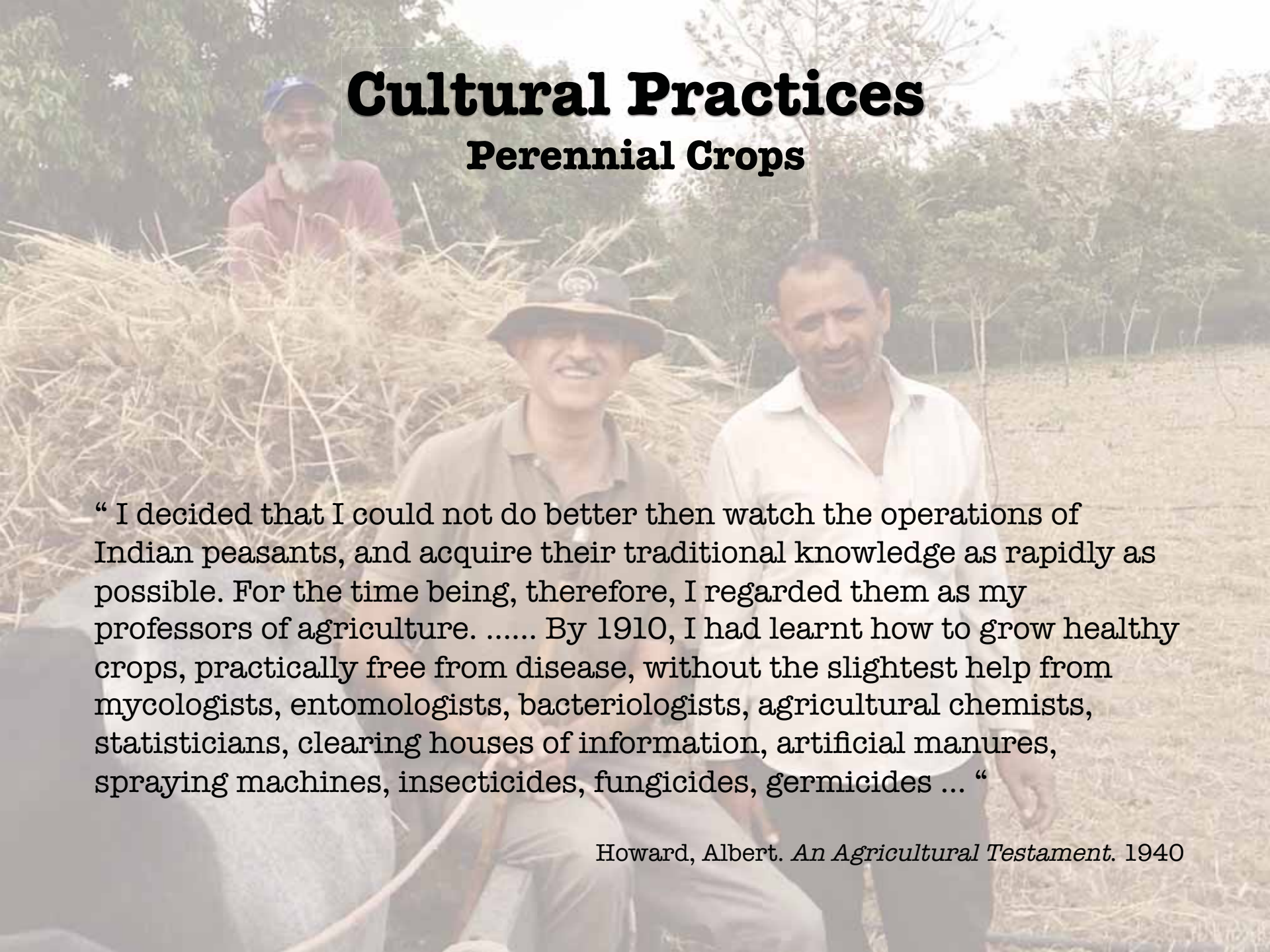


Artisanal, Sustainable, Local

The *Bitaura* to store *upla*, made with walls of no-cost cattle dung with a roof of local dried grass, lasts one year.

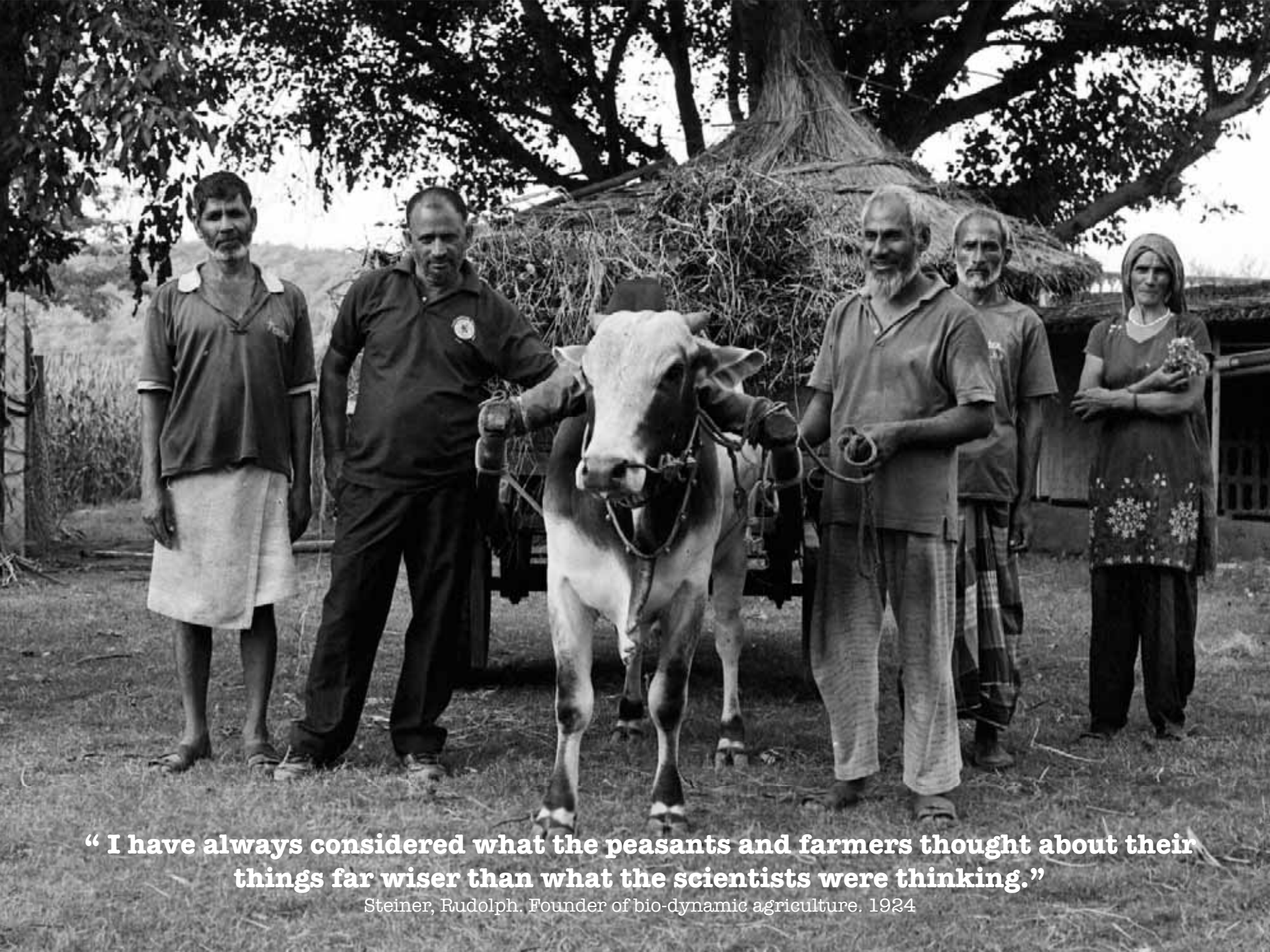
Cultural Practices

Perennial Crops



" I decided that I could not do better then watch the operations of Indian peasants, and acquire their traditional knowledge as rapidly as possible. For the time being, therefore, I regarded them as my professors of agriculture. ..... By 1910, I had learnt how to grow healthy crops, practically free from disease, without the slightest help from mycologists, entomologists, bacteriologists, agricultural chemists, statisticians, clearing houses of information, artificial manures, spraying machines, insecticides, fungicides, germicides ... "

Howard, Albert. *An Agricultural Testament.* 1940



“ I have always considered what the peasants and farmers thought about their things far wiser than what the scientists were thinking.”

Steiner, Rudolph. Founder of bio-dynamic agriculture. 1924

Sources of Learning

- **Abdul Sattar**, Aman Bagh supervisor
- **Books** & **Videos** on YouTube on agriculture, permaculture, soil, organic farming, the environment and so much more.
- **Visits** to organic farms and conferences
- **Observation & Experience**

Outcomes

- 1,500 trees planted, 400 tonnes of organic matter returned to the soil; A sustainable number of local cattle; over 70 kinds of food through a bio-diverse cropping system for cereals, lentils, oils, vegetables and fruits. Moved from wheat to barley, oats, sorghum, pearl millet.

- Organic certification in 2017.

- A deeper understanding of rural India – that is Bharat – its challenges, and opportunities to reduce inequalities.

- Enhanced personal health, and that of my family. Rural, vegan, and living in 1959.

- Respect for traditional knowledge. Literacy does not equal knowledge, and my literacy while useful is of little consequence in front of the experience of the peasant.

- 4 local marginal peasants, different religions and castes, in the small Aman Bagh community.

- The explosion of animal, bird, insect, arthropod and butterfly life

Agro-ecological thinking & natural systems farming

Challenges that Remain

1. Breaking even: living the village economy, value-added produce

2. Water sustainability

3. Energy sustainability

Images

अमन बाग़
Aman Bagh


2012 June


2017 June

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