

## The Social Ecology of Agriculture and Food Security: The Future Extension in India: Strategy and Imperative

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The path of civilization is invariably undulating; it is characterized with social, economic and technological undulation. The global agriculture, perhaps for the first time is moving through sharp and rugged undulations. If we need to 9.5 billion populations on earth by 2050, the food production needs to escalate 60 percent above its present level. It's certainly the toughest job unless huge number of people undergoes a metamorphosis in their food habit or the huge expanse of sea water is brought under productive agriculture. Against one degree Celsius increase in nocturnal temperature may account for a yield loss of 20 percent for wheat and 12 percent for rice.

Around 124 million people spanning over 51 countries are suffering from acute food crisis which indicates the severity of the problem. In 2016 the population in need of urgent action was estimated at 108 million across 48 countries. When comparing the 45 countries included in both editions of the Global Report on Food Crises\*, there has been an increase of 11 million people in need of urgent action, an 11 percent rise from 2016.

The climate shocks have driven 32 million of people in Africa to serious food insecurity. More than 3 million food-insecure people were in Latin America and the Caribbean (five countries), while 3 million were in South Asia (three countries).

The land degradation at a mammoth scale (17 percent of land of the world) has added a new dimension to the entire crisis. The soil erosions are caused by wind, water and other bio-chemical processes. While most of this damage was caused by water and wind erosion, other forms of soil degradation are induced by biological, chemical, and physical processes. Narrowing down of land-man ratio is creating pressure on agricultural land at a higher rate con-

siderably owing to population growth and agricultural modernization. Small-scale farming is the largest occupation in the world, involving over 2.5 billion people, over 70% of who live below the poverty line.

The global prevalence of wasting is around 8 percent, still higher than the internationally agreed nutrition target to reduce and maintain childhood wasting to below 5 percent by 2025. The issues of high wasting and stunting levels persist in areas of confounding crisis.

In areas with climate shocks, where access to food, health care, clean water and sanitation services are limited, high acute malnutrition rates persist, as is the case in northern Kenya, in Sindh province in Pakistan as well as parts of Ethiopia and Madagascar. The report highlights that a high proportion of children under 2 are not consuming the minimum diet required for optimal growth and development, which contributes to high acute and chronic malnutrition levels.

A comparison of 2016 and 2017 shows that more people need support and it's for longer periods. Young children and pregnant and breastfeeding women are extremely vulnerable in emergencies and their nutritional status must be protected to prevent malnutrition and guarantee survival.

India's deepening farm crisis: 76% farmers want to give up farming, shows study.

Increasing disillusionment on agricultural occupation, thanks to its extreme uncertainty and fragile nature of income, the farmers are quitting agriculture as a dependable means of livelihood. This has a serious threat to our food security as well. The Centre

for Study of Developing Societies (CSDS), based in Delhi, found that given an option majority of farmers in the country would prefer to take up some other work. Poor income, bleak future and stress are the main reasons why they want to give up farming. Around 18 percent of respondents surveyed said it was because of family pressure that they are continuing with farming. The CSDS study report “State of Indian Farmers”, was released in Delhi on Tuesday. (Jyotika Sood Last Updated: Monday 12 March 2018 | 05:36:13 AM)

The sample size of the study is not very large—just 36 households per district. National Sample Survey office (NSSO) and Census surveys, which also pointed to agrarian crisis and increasing number of people giving up farming, covered hundreds of thousands respondents. None the less the CSDS study lends further credence to reports of the poor state of India’s farmers

Over 11,000 interviews were conducted for the report, which included one female and one young member of the respondent household. The idea was to have insight into the socio-economic conditions, expectations and hopes of the farmers to understand what is ailing them.

Citing NSSO findings, they said the average monthly income of farm households in the country is Rs 2,115, which is lower than the monthly expense of Rs 2,700 and is pushing such households into a vicious cycle of impoverishment. Their income is much lower than what even a peon in a government job earns, said activists and leaders working with farmers, at a press conference held in Delhi.

The policy of “produce more and prosper”, they said the government endlessly promoted high-external-input-based intensive agriculture that has turned out to be “produce more and perish” for farmers.

This approach has spoiled Indian soil, leaving at least 25 percent of land degraded, and water and farms poisoned with synthetic chemicals. To add to their woes, the minimum support prices (MSP) offered by the government for agricultural produce are not based on present input prices but based on an old formula that doesn’t cover all costs incurred by farmers. This translates into loss for them. The present market systems and land acquisition is further compounding their problems. All these factors have made agriculture unsustainable, forcing farmers to commit suicide—there is one suicide every half an hour—and 2,300 farmers quitting agriculture every day.

- 70 percent of farmers never heard about direct cash transfer
- Only 19 want subsidies to continue as it is
- Only 27 percent have heard about the land acquisition law
- 83 percent farmers clueless about foreign direct investment (FDI)
- 70 percent farmers never contacted any Kisan call centers
- 47 percent farmers say that overall condition of farmers in the country is bad

### The roots of the crisis

- **Fragmentation of land:** Demographic pressure has pushed down the land: man, ratio to less than 0.2 hectares of cultivable land per head of rural population. It has also progressively pushed down the size structure of landholdings. Around 83% of rural households are either entirely landless or own less than 1 hectare of land. Another 14% own less than 3 hectares. At the opposite end, less than 0.25 of rural households own more than 10 hectares of land and a minuscule 0.01% own over 20 hectares
- **Weather:** The large majority of small farmers are dependent on the rains. A weak monsoon or even a delayed monsoon—timing matters—means a significant loss of output. Soil fertility, pests and plant diseases is another risk.
- **Price variations:** Farmers are usually at the mercy of traders. The better the crop the lower would be the price. Net income sometimes collapses if there is a very good crop of perishables. The highly distorted and exploitative product market is the second most important factor responsible for the misery of the small farmer.
- **MSP:** small farmers usually do not benefit from the government assured MSPs. It mainly benefits the large traders who sell grain to the government. Small farmers typically do not have enough marketable surpluses to justify the cost of transporting the crop to government corporations in the towns. Their crop is usually sold to traders at rock bottom post-harvest prices in the village itself or the nearest mandi.
- **APMCs:** Agricultural Produce Market Committees (APMCs), which were supposed to protect the farmer, have had the opposite effect. Farmers have to sell their produce through auctions in regulated markets controlled by cartels of licensed traders, whose licenses give them oligopolistic market power. These cartels fix low purchase prices, extract large commissions, delay payments, etc. According to a study, the farmers may typically get as little as 25% of the price that consumers finally pay.

- **Migration:** The rural youth, especially young males, are migrating to the towns and cities for a better future. But their dreams are quickly shattered. There is not much employment growth anyway and they lack the skills required for a decent job. What remains is a burgeoning army of unemployed, miserable and frustrated young men.

#### High-input cost of farm labour

1. The cost of labor has risen due to social welfare programmes and minimum wage levels
2. Also, the problem is the availability of labour at the right time and at the right cost
3. At peak times, like sowing, transplanting, harvesting, etc., it is very difficult to get sufficient farm labour
4. One solution to address this is greater reliance on technology
5. It can be through farm mechanization, the use of weedicides or genetic engineering, that can lower input and time costs
6. Farmers should be encouraged to use such labour - saving options instead of being burdened with the social objective of protecting rural employment and being denied access to new technology.

#### New forms of grass root organization: Agricultural Produce Market Committee Act

1. APMC Act prohibits farmers from selling their produce in any mandi (grain/commodity market) other than their designated one
2. This makes farmers vulnerable to middlemen and vested interests
3. They are exposed to global prices but are not provided with access to cost-efficient technologies and information systems.

#### Agricultural extension system: It needs to be revamped and making it more inclusive

1. It has collapsed in many parts of the country
2. The farmer is forced to depend on the advice of agri-input dealers and commercial organizations instead.

#### Structural changes: A must to usher functional changes

1. We need to ensure that institutional financing is available and accessible and benefit provision is simplified while disbursed funds are effectively monitored

2. States should seek to establish early warning signals, monitoring farmers who go past set limits and seek unsustainable loans
3. Village-wise lists of deeply indebted farmers must be prepared annually to identify farmers on the flight path to penury and potential suicide.

#### Removing contradictions is one of the imminent responsibilities

Farmers are producing food for are to ensure our breakfast, lunch and dinner to ensure our food security, but are they themselves secured? Every cost for farming is certain, but every return is uncertain. Their debts are inevitable, but harvests are uncertain. The price of input is escalating, that of output is either stale or apparently decreasing. Can we provide an EMI, an Equal Monthly Income? And, there is serious gender discrimination. Farm women contribute 75-85 percent to the productive operation in farming; they have access only to 10-15 percent of the output value [1-13].

We have to be optimistic, but we too need an honest endeavor to translate vicissitudes into valor.

#### Future Extension strategy

India has already passed through three distinctive phases of agricultural evolution in terms of its growth, diversity and distributive characters. These are:

1. Inductive phase of development or seed-fertilizer-irrigation era (1960-1980),
2. Stimulative phase of agricultural development i.e. series of stimuli in the form of subsidy, incentive, capacity building and infrastructure creation (1980-2000),
3. Now, we are in the simulative phase of development, primarily ICT and DSS driven.

The future extension strategy shall invite both proven and innovative technologies, at the same time keep on extrapolating extension strategy with renewed concept and dimensions. These are:

- I. Creation and application of DSS (Decision Support System) and local web portals for serving community level customers.
- II. Integration of weather, production and market intelligence and online sharing of forecast data and field feedbacks,
- III. Database Management (DBM), Broad based extension (BBE) through creation of Management Information System (MIS), Enterprise Resource Planning (ERP) and Supply Chain Management (SCM),

- IV. Creation of community banks at the grassroots level, gene bank, credit bank, Custom Hiring Center (CHC) and special skill banks on high value horticulture, fishery and Animal Resource Management (ARM),
- V. Equal Monthly Income (EMI) for each of the practicing farmers by applying methodology for expected prices and customized prices for the farmers to be splittable over months,
- VI. Extension strategy for soil, water and biodiversity stewardship to be supported by Natural Resource Management (NRM) committee and PBR (Peoples Biodiversity Registration) operating at the block level.
- VII. The newly created FPO's need to be supported by market led extension with a clear focus on need of small and marginal farm entrepreneurs.
- VIII. Gender, age and community issues need both policy and technology support. NRC on farm women should be empowered with policy frame working and its inclusion in the Niti Ayog.
- IX. IFPRI should be organically linked with block level agricultural research and extension systems. So that, future projection and present interventions on hunger and nutrition can be linked.
- X. Global agriculture and policies (Production, productivity and equity) is to be linked with micro-level data bank. So that, more reliable forecasting and effective execution can be possible,
- XI. Future extension will be more relying on micro-level participatory data analysis and macro-level meta-data analysis (agricultural data analysis) and machine learning process can be helpful in simulation analysis and capacity building of the extension professionals.
- XII. A task force on farm energy management is an essential extension for targeting energy conservation, renewability and energy equity for ushering suitable extension interventions. Energy literacy among the farmers is going to be an imperative.
- XIII. New age extension strategy must frame up for the required transformation of the role of farmers from biological crop producers to climate managers. So that the global warming and climate change to be dealt with higher level mitigation and adaptation. NICRA can be extrapolated to small farm and fragmented farm resource and energy management with new text and dicta.
- XIV. Forecasting of health and nutrition status of millions, continuous hunger indexing and malnutrition assessment have been an imperative for new age extension strategy.

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