AIPSN Campaign on 75 Years Of Indian Agriculture

75 Years of Indian Independence and Agriculture

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75 Years of Indian Independence and Agriculture

Illusive Growth in Agriculture?

Seventy five years have passed since we attained independence from Colonial Briton. During this period Indian country side had undergone many transformative changes in both agricultural production, relations and development, thus impacting rural lives. With nearly 65 percent of population still living in villages and a majority dependent on agriculture, it is time to examine how farmers fared during the 75 years.

Agricultural growth remains a prerequisite for sustainable economic growth and poverty reduction for the economies in transition. Agriculture not only ensures food security but also provides livelihood to millions of rural poor. Experts claim that investment agriculture is 2 to 3 times affective in alleviating poverty compared to any other sector in economy with returns of 1 : 12.

From the early decades of the last century farmers played an important role in social transformation and mobilized country side in fight against British colonialism. Apart from achieving independence they had two major objectives- emancipation from feudal bondage, land to the tiller and attainment of social equality & economic prosperity in villages. How far these cherished goals have been reached

after these long years of independence an important issue. Soon after independence Zamindari, Rytwari and other means of land ownership had been abolished. However, the very structure of land ownership in villages did not change significantly with bulk of the land concentrated in hands of large sections of rich & middle peasantry with only a miniscule portion became accessible to small & landless peasantry belonging to backward &dalit sections. With the half-hearted land-reforms undertaken by different states having failed in most parts of the country, the problem remains largely unresolved. As of 2020, 84.2% of the peasantry fell in the category of small and marginal farmers, owning less than two hectares. This large section together owns a only 47.3% of cropped area, while the remaining 52.7% is held by a small minority of large and medium farmers who make up a mere 13.8% of the farmers. Indian agriculture is diverse with varied soils, rainfall, climate and cultivated crops and divided in to 13 different agro- climatic zones. Overall 48.9 % of cultivable land is irrigated with large tracks remaining dry lands dependent on monsoons. In terms of annual agricultural productivity, growth rates and farmer incomes states vary, ranging from 0.25 (Bihar) to 2.69 (Tamilnadu), all India average being 1.69. A major obstacle for backwardness of Indian villages is land question i.e.,Unequal ownership of land and participation in agricultural production and distribution. Interestingly land owned by rich farmers is largely irrigated and well equipped with farm machinery and

other storage infrastructure. Although land reforms have been presumed a means to overcome differences in land ownership, the implementation was largely symbolic except states of West Bengal, Kerala and Andhra Pradesh.

During 70's after waging militant land struggles by Left parties, sections of land less Dalits and backward sections of rural communities was distributed by state governments with land not more than 4 % of total cultivable land in the country. Small land holding farmers are generally resource poor and are often subjected to climate and market vagaries. Naturally the productivity of small farms is low.

With persisting high levels of social and economic inequalities and backward production system food production was insufficient to feed the nation. During the first decade after indolence compared to other sectors of the economy, agriculture was grossly neglected. With low domestic production near famine conditions prevailed. The whole nation was surviving on 'Ship to mouth' largely dependent on import of food grains to meet shortages. Starting late 50's governments started increasing investments in agriculture sector to correct the miserable food shortages and reduce hunger. Accordingly large dams such as Bakranangal and Nagarjunasagar were built. Fertilizer factorieswere built and rural electrification initiated. These investments have brought alarge tracks under irrigation. Desi (indigenous) varieties of food crops & cattle breeds were less productive

and developments of more productive & high yielders were required to increase food production. Consequently dozens of agricultural and veterinary universities & research institutions under ICAR were established with assistance from USA under US land grant University model. As per the advice & supervision of Rockefeller, Ford foundations of America, elite seed of wheat and Rice were imported from International crop research institutions located in Mexico and Philippines and introduced to Indian fields for cultivation. Thus in late 60's Green revolution was initiated in Indian villages. However, with introduction of new seeds in Green revolution, seeds ceased to be an input saved by farmer and resow season after season. Seed became rather a complete package, dictating how much the other inputs- fertilizer, pesticides, tractors, diesel etc. should be used. In short a complete package of inputs in cultivation came under the control of major global chemical & seed MNCs. The imported crop seeds were align to the local cultivation conditions and local rainfall pattern (agro eco system) and required input of irrigation, farm machinery and high doses of chemical fertilizers to obtain high grain yields. As the new seeds were align to local soils, climate the former had brought a multitude of new crop pests, weeds and diseases, hitherto unknown to Indian fields. After the World War II and Vietnam invasion a large section of chemical industry remained under utilized. In this background, strategically planted Green revolution came handy for American & Western MNCs for

expansion of production and marketing of fertilizers, pesticides and herbicides in Indian villages. Increased expenditure on inputs like fertilizers, tractors and pesticides had several folds raised the cost of cultivation. Deep rooted in villages' Green revolution helpedestablisha strong grip of foreign seed and chemical MNC's on Indian food production.

In the first decades of 21st century, with rapid implementation of neoliberal reforms, the challenges have shifted to capture of agriculture and the markets by multinational corporations for its produce.The control of agricultural inputs is one of the primary means through which corporations are taking over agriculture. The 'big four' corporations Bayer-Monsanto, ChemChina-Syngenta, DOW-Dupont and BASF - today control over 70% of the inputs such as fertilizers and commercial seeds.

Table-1: summarizes income disparities in in Indian villages.

Category	No. of cultivators (million)	No. of cultivators % share	Area Occupied % share	Per Cultivator Annual Income (Rs.) 2015-16	Monthly Income(Rs.) 2015-16
Marginal<1ha	99.86	68.53	24.15	33,636	2,803
Small(1to2ha)	25.78	17.69	23.2	1,16,196	9,683
Semi-Medium(2-4 ha)	18.76	9.44	23.65	2,15,656	17,971
Medium(4-10 ha)	5.48	3.76	19.96	4,35,846	36,320
Large(>10 ha)	0.83	0.57	9.04	4,35,846	1,06,844
Total/Average	145.71	100.00	100.00	87,614	7,301

Source : Data on number of cultivators and area occupied was obtained from Agricultural Census 2015-16, Ministry of Agriculture and Farmers' Welfare, Government of India, 2018.

Hunger amidst Plenty: Production of food grains has increased several folds i.e. six times from 51mln tons in 1950 to nearly 310mln tons by 2021 thus making the nation so called 'Self sufficient' in food production.The following Table illustrates the rise in food production.

Table 2: Class wise Income from Agriculture (Rs.) 2015-16 at constant prices

Food Item	Production (mln.t) (between 1950- 2021)	Improvement Rate (1951 to 2021)
Food grains	51.0 to 310.0	6 x
Fruits & Vegetables	31.0 to320.0	10 x
Milk	17.0 to 210.0	12x (World No 1)
Fish	0.75 to 14.1	18 x

Despite the impressive growth rates achieved during the last 75 years and much said 'Self sufficiency' in food production, today (2021) India among 116 nations slipped down to 101thposition. Ironically it was in 94th place in 2020. Despite the overflowing grain stocks with FCI, food availability has fallen significantly in villages. High level of beneficiaries (up to 80 percent) of Government's subsidized food security scheme is a clear testimony to prevailing hunger

and malnutrition in villages. Data from various surveys indicate high levels of child mortality, child stunting and with almost half of children and mothers malnourished. The enigma of persistence of hunger amongst plenty testifies the reality of rural India. The mode of food production has shifted from one's family consumption to markets.

Despite in the success in food production

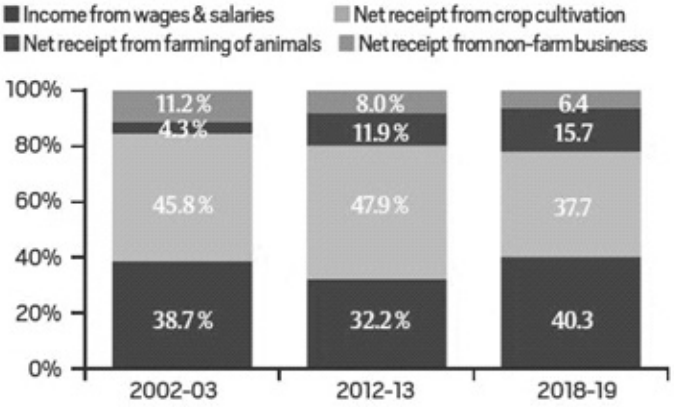
- India is home for 200mln people, 50% of rural poor and shares quarter of total hungry in the world.
- With 40% of world's malnourished population, country is losing nearly 9% of annual GDP.
- Although rural women constitute 62% of work force they face wage discrimination and hardly own any financial assets.
- Average income of a small farmer both from cultivation and nonfarm activity is approximately Rs. 6,200. No farmer wants his children to practice farming again.

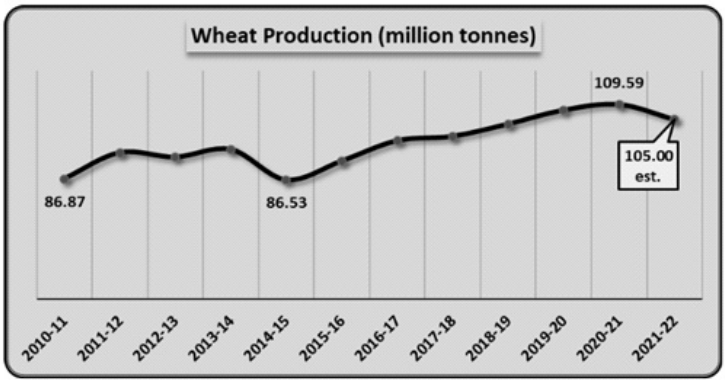
Shift from self consumption to Markets :

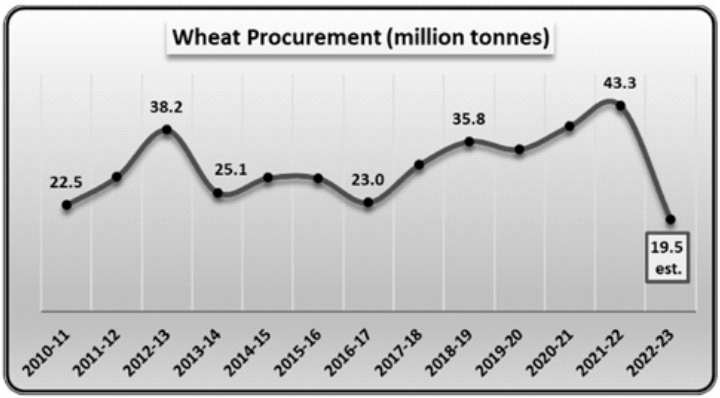
As food became a marketable commodity, all three areas of its production viz., input acquisition, production, marketing and distribution turned have come increasingly under the control of capital. Gradually Green revolution pushed Indian agriculture from food grain production to cultivation of cash crops such as Cotton, sugarcane to horticultural crops to cater to needs urban India and abroad

through exports. Statistics reveal that of the Rs. 100 paid by urban consumers while purchasing food items, the farmer's share is not exceeding Rs. 32. All other middle men in the chain seems to be deriving high profits except the food producer. There appears Early IX century Marxist economist Kautsky first noted the loss of peasantry in markets in favor of capital and flow of surplus from villages to urban area and termed it market disequilibrium. As capitalist mode of production started dominating, regular fall in market prices as dictated by domestic& world grain MNCs, crisis in villages from unequal exchange between farm & industrial goods, the agricultural crisis further deepened. Bankrupt from barrowed credit and nearly 4.0lac small & tenant farmers (mostly cultivators of Bt cotton, chilies and cash crops) committed suicides. During the last two decades significantly reduced subsidies on fertilizers, electricity, diesel and farm extension activities following neo liberal prescriptions of imperialist agencies such as WTO, IMF and others. Though the governments introduced some remedial schemes like crop support prices bank credits and crop insurance, their implementation was tardy and largely benefited rich farmers and industrialists. An interesting development in the second decade of this century is organized protests from farmers protesting against neoliberal pro corporate policies of union government. Recent farmers march to Parliament, massive Nasik Padayatra and historic year long farmer's peaceful struggles are clear examples of resistance.

COMPOSITION OF FARMERS' INCOME







Data reveals that only 40.3% comes from crop cultivation and the rest comes from non farm labour in other fields and others. These data testifies the existing crisis in agriculture.

Apart from capturing agricultural inputs MNCs today deeply invested all along the value chains. Apart from well-known western corporations such as Walmart, Amazon etc., many Indian corporations like Reliance, TATA, Adani own their brand super markets as part of value chains, thus entered in to direct purchase of farm commodities, their storage and marketing (including exports). The major fury witnessed during yearlongfarmers agitation against three farm laws was naturally directed against monopoly and domination of total agricultural sector starting from inputs, production, marketing, and storage to marketing.

Ecological crisis:

Another negative affect of green revolution is intensive farming where high yields are assured only by application of high dose of fertilizers, water and pesticides. chemicalization has damaged the soil and the surrounding plant microflora ie plant friendly & cooperative microorganisms, insects, earthworms and birds. Concentrated & high levels of Nitrogen, pesticides and pesticides often kept away the later from root & plant environment thus depleting natural fertility of soil. For example of the 100 Kgs of Urea applied only 32kgs is absorbed by the crop and the rest ends up as a pollutant to water

bodies .Unutilized Nitrogenous fertilizers evaporates as Nitrous oxide, an important Green house gas.

Cultivation of rice by tapping ground water has resulted in plummeting ground water levels. Scientists predict Punjab with depleted ground water and climate change would soon turn in to a desert. Only alternative is replacing present water guzzling wheat- rice cropping pattern by less water demanding wheat, pulses, oil seeds and millets. This was the cropping system traditionally suits to Punjab ecosystem i.e. soils, local rainfall pattern and ecology. Climate change has further worsened the agriculture with consequent unseasonal rains, received total rainfall in a small interval followed by floods. Altered monsoon pattern and recorded very high temperatures resulting severe droughts. Excessive heat recorded in colder regions has pushed cultivation of apples and other crops to warmer tracks thus affecting their yields significantly.

Climate change could depress crop yields up to 30 percent by 2050, putting about 80 million more people at risk of undernourishment, according to a paper by the International Food Policy Research Institute produced for the Global Commission on Adaptation. Apart from plummeting ground water levels and environmental crisis today Punjab is suffering from serious malnutrion as pulses & vegetables are not cultivated and became unaffordable to rural population.

Transfer of food, surplus capital and even the soil nutrients (which are irreplaceable, away from recycling

locally) has resulted in serious economic, nutritional and ecological crisis. Karl Marx in his Ecological note books (1860) cautions export of large scale food to far off urban areas away from local consumption writes the former breaks local food cycle and causes depletion of soil from it's nutrients. Later Marxist ecologist Bellomy Foster termed it 'Metabolic rift'. For example, Punjab termed as harbinger of Green revolution with high levels of food grain production unfortunately suffers from severe malnutrition. Till 70's pulses, Jowar and oil seeds apart from wheat were major crops till the onset of Green revolution. As a result whet-rice monocycle replaced cultivation of pulses-wheat-mustard cropping system that was suited to local rainfall pattern and soils. Increased rice Cultivation required high levels of irrigation which came from exploitation of ground water. It was estimated that for production of 1 G of rice nearly 1,410 liters of water is required, while 10,000 liters for harvesting 1Kg of cotton. Besides these crops are align to local ecosystem and require application of high doses of Nitrogen fertilizers and pesticides or control of new pests that were unknown earlier to this region.

Agricultural Research and Extension:

Research in development of new technology is necessary for rising production and productivity in agriculture. In June 1964, when Lal Bhahadur Shastriji was finalizing his ministry, nobody wanted the agriculture portfolio. When C. Subramaniyam was appointed as

Agriculture minister, the nation was already in the throes of food crisis. We were importing 150 million tons of food grains (i.e. Almost one tenth of our annual consumption) from US, under Pl-480 scheme accepting the humiliating conditions attached to the imports. Self-sufficiency in food grains became top priority. India imported under guidance of Consultative Group on International Agricultural Research (CGIAR, a body funded by Rockfeller and Ford foundations), semi-dwarf high yielding (HY) wheats, developed by Borlaug and his team at the International Maize and Wheat Improvement Center (CIMMYT), Mexico, that ushered in the Green Revolution in India. Adaptation of imported germplasm to innovate indigenous varieties-like Kalyan, by DS Athwal and Sona by MS Swaminathan-aided the spread of this revolution. Around the same time, high yielding rice-IR8-developed by Peter Jennings and Henry M Beachell of International Rice Research Institute (IRRI, another CGIAR institution) was imported.

Indian geneticists actively supported gave a new thrust to Indian agriculture embedded with modern technology. The Green revolution and the subsequent attainment of self sufficiency in food production were achieved with implementation of a two pronged strategy- active propagation of High Yielding Varieties (HYV) of wheat and rice and to encourage farmers by providing market support prices. Alongside were established National Seeds Corporation (NSC) , Food Corporation of India and National

Dairy Development board at Anand headed by legendary Dr. D.V. Kurian. The subsequent success Green, white and blue revolutions that brought self sufficiency in food, milk and fish production was achieved by infusion of new research policy based on modern science and technology.

Productivity of most of the crops was comparable to the global average. The low crop yields cannot be attributed to "non-availability" of improved technologies but several factors including inequalities in farming community, access to the modern technologies, lack of crop technology suitable for small farmer holdings, short growing season, varied agro-climatic conditions and weather extremities are other causes for low productivity. Establishment of nearly 50 state agricultural universities, Krishi Vijnan Kendras in every district and 100 research institutes had paved the way in dissemination of agricultural technology and development of agriculture in the country. As shown in Table 1 above huge success has been achieved after independence. However, India's crop yields are lower than those in the US, Europe and China. India's rice yield was 2191 kg/hectare, while the global average stood at 3026 kg/hectare, while wheat is 2750 kg/hectare as against the world average yield of 3289 kg/hectare. Whereas in India, on the same land, farmers grow more than one crop in a year and per day. From the very beginning, a major flaw in the agricultural R&D policy has been the neglect of farming needs of small farmers. The green revolution was drafted and developed

technology was adopted mainly to cater the needs of large farms. The technology was based on introduction of plant genes 'Norin' (wheat) and "Dae woo gen' (rice) in to Indian wheat and rice varieties respectively. Introduced high yielding Mexican wheat and TN 1 and IR rice varieties containing the above genes were crossed with Indian native counterparts to develop High Yielding crop varieties. But the new genes had the ability to change plant physiology thus facilitating high grain yields. But the irony is high yields are possible only under application of heavy doses of chemical fertilizers, irrigation and pesticides. This technology was introduced by CGIAR through International wheat (CIMYT, Mexico) and IRRI (Philippines), Use of high quantities of inputs i.e. chemical fertilizers and tractors had enormously benefited Western MNCs manufacturing & marketing agro chemicals, seeds and tractors. In a way Green revolution helped the imperialism to enter Indian villages and establish a strong grip over Indian agriculture. On the other side high input based Green revolution largely benefited resource rich big farmers fetching profits from bumper harvests. Although small and marginal farmers were forced to adopt new technology by investing large sums for purchase of costly inputs lured by prospects of high grain yields. Small farmers had to borrow large sums of money for purchase of costly inputs, which subsequently impoverished them. It should be noted that nearly 70 percent of food produced in the country is produced in small farms owned by small, marginal and tenant farmers.

Since the unprecedented success of the green revolution, there have been significant advancements in science, its organization and management and transfer of technology to end users. The research system expanded considerably and extension system has undergone a continuous change. Advancements in molecular biology and information technology have taken shape and research on animals and horticultural crops has expanded.

R & D in Public sector, had witnessed a significant change after introduction of various International treaties such as IPS &Patents, WTO, new seed policy (allowing private seed firms to operate), subsequently leading to market monopoly in seed industry (with hybrid and transgenic seeds in cotton, maize, vegetables and others).

Although small farmers were instrumental in increasing food production and making green revolution they fell in to debt trap and further pauperized. Thus the R& D strategy underlying green revolution has benefited domestic rich farmers, grain traders and foreign agro-chemical MNCs enormously. Even the mandate of public sector research moved further away from research onrain fed crops to more on to Hybrid crops,herbicide tolerant GM crops, cotton, maize, Soybean and commercial crops involving crop biotechnology. Ironically practically no suitable technologies like micro irrigation, cropping systems and non availability of drought tolerant varieties of small millets, pulses and oil seeds. Incidentally these are the crops that ensure certain level of security from vagaries of weather and pests

traditionally cultivated in small holder farms. Unlike crop varieties, where seeds from earlier crop can be used for sowing in subsequent seasons,instead public research emphasis on development of hybrid seeds pushed small farmers to acquire new seeds every season from markets. With domination of domestic seed market by mostly Global MNCs such as Monsanto, Cargil, Bayer and their Indian partner seed companies. High price seeds charged by seed firms and gradual weakening of public seed production & distribution small farmers are forced to incur invest large sums on purchase of inputs in crop cultivation. The financial woes of farmers began with opening of Indian rural markets to foreign seed multinational firms under neoliberal policy implementation by subsequent governments by entering in to agreements with WTO and other imperialist agencies.

Table.3.Investments in Agricultural Research and Extension.

(Budget allocations, % of GDP)

Year	Research	Extension
1983	0.25	0.10
2021	0.39	0.18

Australia and USA spend nearly 3.0 $ of their GDP.

A clear shift in curriculum and research from management of larger holdings to needs of small holder farmer holdings. It should focus on local agro ecological needs to sustain production and income enhancement in small farmer food production systems.

Crop Diversity:

Diversifying from existing cropping systems, predominated by rice and wheat in many unsustainable landscapes, to more nutritious and environment-friendly crops have often been suggested to address challenges of climate change and malnutrition. Cropping systems proceeding a major cereal crop (wheat in northern states, rice in Southern, eastern & North Eastern states) cultivation of millets and oil seeds is a viable alternative. However, such a transition must protected by assuring profitable MSPs to millets and oil seed crops to benefit income base of the farmers. Diversification to crops like pulses, oilseeds, vegetables and fruits, adapted to specific agro-ecologies, must also be planned, and implemented by the states with suitable incentives to farmers during the changeover. Such diversification would not only increase the nutritional value of the food system, but also holds potential to reduce water use and green house gas emissions. However, diversifying to new portfolio of crops will require establishment of small and medium scale agro food industry to meet youth employment needs in villages. Crop Diversity Mono culture or cultivation of one or few crops season after season depletes nutrients and water from soils thus making them infertile within a few years. Mono culture also damages environment(with use of high doses of fertilizers, pesticides, ruins organic structure of soils depleted of plant friendly microorganisms, earth worms and insects. Apart ecological damage monoculture robs diet of village poor of pulses, vegetable oils & greens.

Pulses and some oil seeds fix Nitrogen from atmosphere in soil, and hence require low doses of chemical

fertilizers and irrigated water. Cultivation of a rice or wheat soon after pulses also benefits the later, reducing fertilizer requirement. Besides, alternative crops reduce incidence of pests and diseases apart from improvement of ground water and other water sources, brings extra income to farm families.

Cultivation of short duration (45 to 65 days) of lentils or pulses like green gram allows farmers to grow in rice fields between growing seasons. This helps smallholder farmers diversify their incomes and nutrition sources, which is vital in context of climate change.

Provision of animal proteins to 1.3billion population may not be possible in near future. Fish significantly substitute dietary protein needs. Hence fish production should also become an integral part of small holder food production system. Integration of crop, animal husbandry, fish and bee keeping promotes recycling nutrients sustainably. Apart from improvement in nutritional status could potentially enhance farmer incomes from small holdings.

Sustainable Agriculture:

Today Indian agriculture is facing two major problems- Impoverishment of small & marginal farmers and serious deterioration of natural Agro ecology. Economic crisis of farming community has worsened further during the last two decades mainly due to price inequalities prevailing in markets. While crisis in agro ecology could be attributed to disproportionate exploitation of natural resources and climate change. However both the above problems faced during the last 75 years of independence capitalist are intrinsically linked to capitalist mode of agricultural development. These issues

need to be addressed to attain further progress in agricultural development and farmers well being.

Two major social issues of Indian villages - hunger and malnutrition can be addressed with adoption of nature friendly sustainable farming methods. Nearly 50 percent of children and young women suffer from malnutrition, and consequently causing 9% loss of GDP. Studies reveal investment of every 1 Re on Balwadi, midday meal & women nutrition fetches return of Rs. 16 to 40 in terms of health and socio-economic development. Interestingly investments in agriculture amount to one twelth, compared to other sectors of economy. Experts claim that investments in agriculture are 2 to 3 times more affective in addressing rural poverty to investment in other sectors of economy.

Integrative Agriculture:

To fulfill basic needs of small farmer households including food (cereals, pulse oil seeds, milk, fruit, honey,

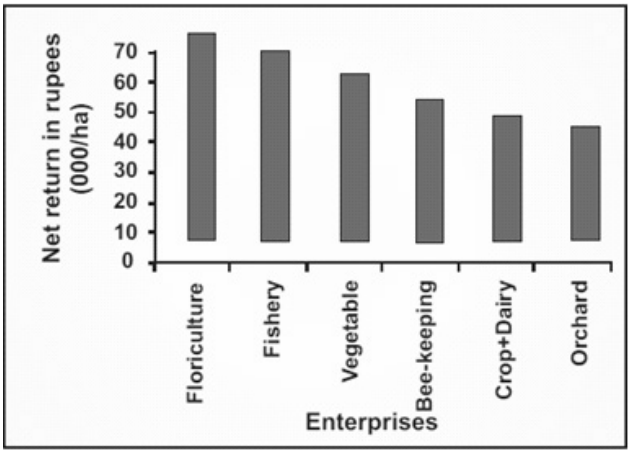


Fig.1. Economic benefits of Integrated Farming Systems,ICAR, 2019.

fish, meat etc.) feed, fodder,fuel and fiber, a well-focused Integrated Farming strategy is needed.

In small farmer holdings income from crop cultivation does not exceed 43 % of total households. Apart from crops, diary, piggery, bee keeping and vegetable production should be supplemented. Demonstrated Integrative farming systems conducted at Modipuram(UP), Coimbatore TN) show an extra income up to Rs.79,000 per season from 1 ha with investment of Rs. 12,000 in small farmer holdings.Ruling BJP government instead of doubling farm income by 2022, as promised has instead doubled crop cultivation expenses. It necessitates towage united fight to replace pro-corporate neoliberal economic reforms with Small farmer cooperatives in farming, diaryand small scale food processing units to address distressed rural communities.

In short present crisis in agricultural production, farmer income and environment can be better addressed by bringing radical policy changes that primarily benefit small farmer production systems. An alternative strategy stands on four pillars- 1) Land reforms 2) Sustainable farming 3) Farmer income security 4) Attainment of food & nutritional security.There is an urgent need to implement land reforms, replace present mode of ecologically damaging capitalist mode of production by eco friendly sustainable farming preferably practiced in farmer cooperative production systems.

If agriculture goes wrong,
nothing else will have a chance
to go right in the country

- MS Swaminathan