ICFA

भारतीय कृषि एवं खाद्य परिषद्

INDIAN COUNCIL OF FOOD AND AGRICULTURE

Report

on

Farmers' Issues

and

Agriculture Policies

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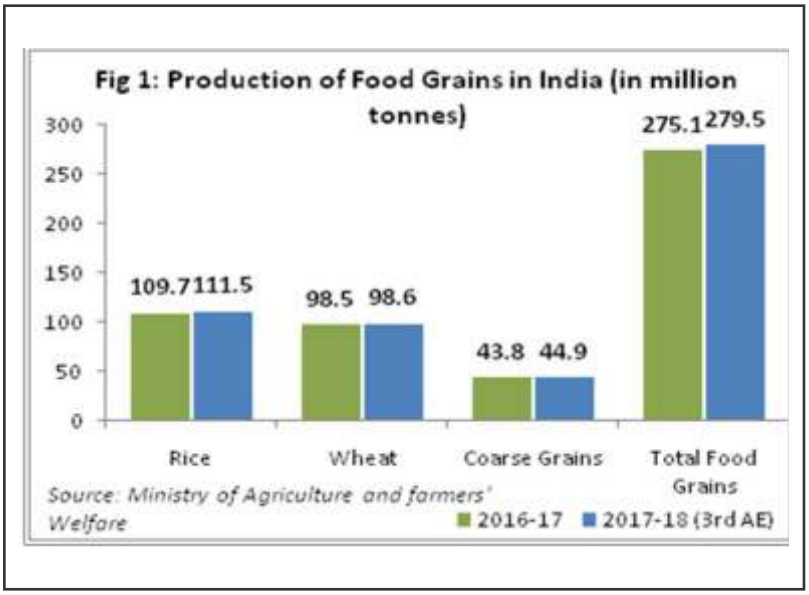
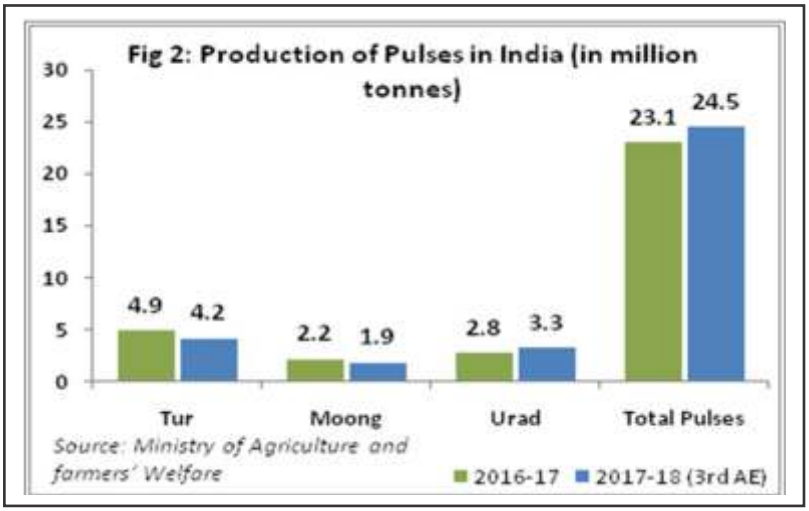
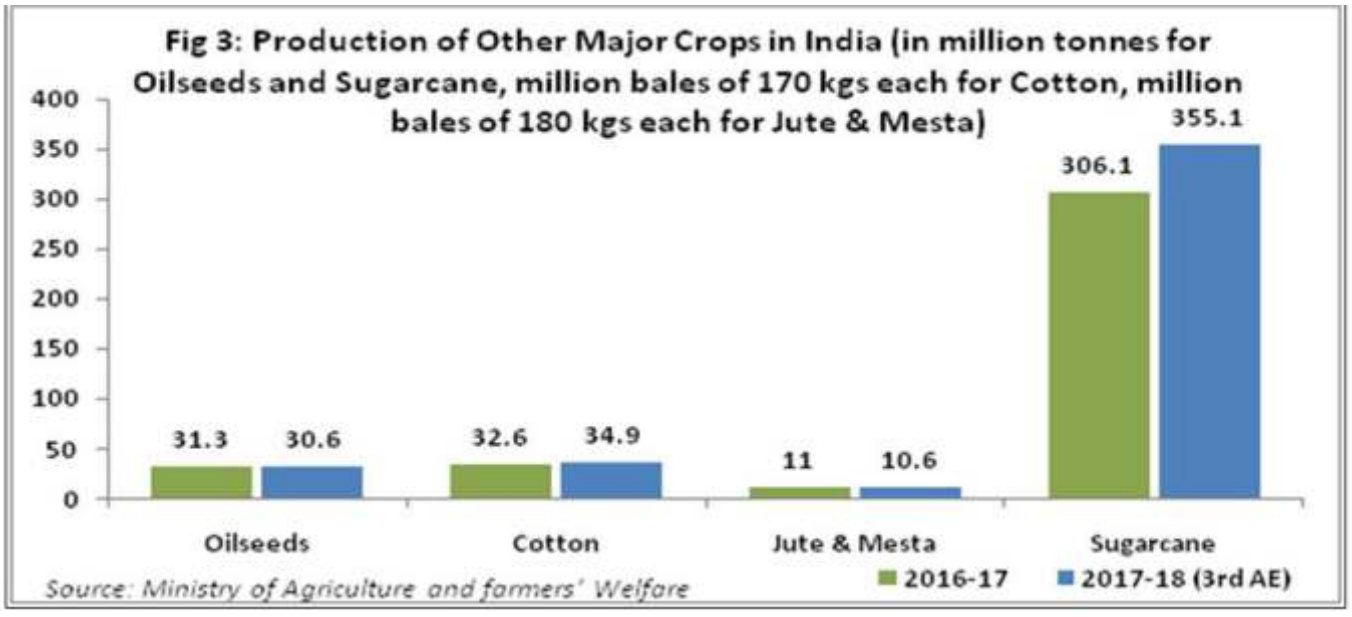
1. Background

It is a fact that farm sector distress has been troubling our Nation and bringing hardships to the very farmers who feed us. In recent times, there has been a lot of discussion on the distress that the farmers are facing. However, it is also a fact that in the recent years, Indian agriculture sector has registered growth in production of almost all major cros, most importantly in crops like pulses and oilseeds (Fig 1, Fig 2 and Fig 3). This is perhaps the paradox that while on one hand there is increasing production of crops, on the other hand we find farmers in distress. Time has come to take some fact check and examine the reality behind the discontent of increased agri production, distress of the farming community in general and the plethora of forward looking initiatives and interventions that the Government has undertaken in recent times.

ICFA through this report attempts to dissect the reality of the Indian agriculture sector in its most unadulterated terms and attempts to provide meaning, implementable and strategic thoughts related some of the glaring issues in the contemporary farm sector of the country.







2. Major Issues

2.1 Minimising Yield Gap

For a equitable development of the agri sector of the country, one of the most important interventions needed is towards reducing the huge gaps in yield of major food grains between different States. As seen in Fig 4, major food grains like rice, wheat and coarse cereals exhibit huge yield gaps between different Sates. Major rice producing States like Chattisgarh, Odisha, Madhya Pradesh, Jharkhand, Maharashtra suffer from lower yields as compared to the other important rice growing States. In case of wheat, States like Bihar, Telengana, Jharkhand, Karnataka, Maharashtra, Uttarakhand, Himachal Pradesh and J&K suffers from lower yields. Similar is the situation with coarse grains where States like Chattisgarh, Odisha, Maharashtra, Rajasthan etc. have considerably lower yields. **It is a different matter that coarse cereals as a whole suffers from low yield in India in terms of National average and large scope exists for increasing the overall National yield.**

Fig 4: View of the Yield (kg/hectare) Gap between Major Food Grains Growing States

State	Rice	Wheat	Coarse Cereals
West Bengal	2883	2825	4305
Uttar Pradesh	2132	2786	1756
Punjab	3974	4596	3678
Tamil Nadu	3918		3759
Andhra	3466		3525
Bihar	2019	2205	3337
Chattisgarh	1597		964
Odisha	1491		1163
Assam	2084	1167	
Haryana	3061	4407	1781
MP	1768	2993	1994
Telengana	2830	1000	2766
Jharkhand	1814	1701	1268
Karnataka	2547	1012	1814
Maharashtra	1714	1205	710
Gujarat	2189	2919	1632
Kerala	2834		
Rajasthan		3175	1014
Uttarakhand		2225	1361
Himachal		1968	2194
J&K		1550	1455
All India	2404	3093	1596

The advantages of narrowing down the yield gap between States in terms of food grains are three folds:

- The weaker States in terms of lower yield can come closer to the National average thereby benefiting the farmers of these crops in the respective weaker States in terms of increased income
- Some areas in the States currently having good yield status can be freed from cultivation of these crops and diverted to cultivation of alternative high value crops, thereby increasing the income of the food grain growing farmers
- In turn, the National food security remains intact as the weaker States improves and adds to the existing production whereas the farmers of the country are able to improve their return on investment by either crop diversification (shifting on to other productive crops in States where the existing yields are already high and there by fetching less price due to market glut) or yield increase (in States where the existing yield is low and as such farmers are not able to reap the benefits of higher products)

2.2 Greater Application of Biotechnology in Indian Agriculture

There is an urgent need to change the traditional methods of agriculture and one of the most important area of infusing technology based innovation in Indian agriculture is greater adoption of Agricultural biotechnology. Agriculture biotechnology has huge potential in producing quality food grains, improving the quality of soil, fighting the increasing threats of diseases in crops and countering scarcity of agricultural land because of increasing population.

The idea of a "Second Green Revolution" in the country shall remain incomplete without a simultaneous focus on "Gene Revolution". With the advent of various R&D based biotechnology innovations, on the role of agricultural biotechnologies in sustained food systems and nutrition is profound. India needs to take up R&D in agricultural biotechnology and its field level application in a mission mode. ICFA took a quick glance of the number of patents granted to Indian scientists in the field of biotechnology from 2012 to 2015. Idea was to get a feel of the outcomes of various Agri biotech related R&D activities in terms of patents being filed. It reveals the following status:

Table 1: Status of R&D in Agri Biotechnology in terms of Granted Patents

Year	Total No. of Patents Granted	Number of Patents Granted Directly Related to Agri Biotechnology	Title of the Agri Biotech Patent
2012-2013	**10**	**4**	1. A Process for the production of organic formulation of bio-pesticide Pseudomonas fluorescens (Author: Dr. M. S. Rao) 2. Process of Extracting Anti White Spot Syndrome Virus Molecules from Mangrove Plants (Authors: Prof. I.S. Bright Singh; Dr. Rosamma Philip; Mr. N. S. Sudheer) 3. A Micro Satellite DNA Marker Used For Identifying Disease Resistant Populations of Penaeus monodon or Giant Tiger Prawn (Author: Dr. Nripendranath Mandal; Mr. Kuntal Mukherjee) 4. A Process for the Production of Organic Formulation of Bio-pesticide Pseudomonas fluorescens (Author: Dr. Mahendrakar Sreenivasa Rao)
2013-14	**5**	**0**	None
2014-15	**15**	**5**	1. A Process for the production of organic formulation of Bio-pesticide Pseudomonas Fluorescens (Author: S. Rao) 2. Resistance of plants to biotic and abiotic stresses by overexpression of protochlorophyllide oxidoreductase c and its isoforms (Authors: Baishnab Charan Tripathy) 3. Method of preparing dialysed extract of fenugreek seeds which induces hypoglycemia, mediated, in part, via stimulation of insulin signaling pathway (Authors: Manoj K. Bhat; Maleppillil V.; Vijayakumar) 4. Novel small interfering RNA (siRNA) directed against metal binding region in the p2 promoter of proto-oncogene c-myc resulting in its transcriptional gene silencing (Auhtor: Subrata Sinha; Partha Prasad Chattopadhyay; Mohit Mehndiratt) 5. In vivo labeling of mammalian tagged peanut butter (Authors: N.K. Dhingra; Vidhyasankar)
Source: Department of Biotechnology, Govt. of India			

Over a period of 3 years, out of 30 patents granted in the field of Biotechnology to reaserch works in India, 9 patents can be directly or indirectly related to agri biotechnology. If this can be considered as an indicator, one then feels a need to intensify R&D activities that can be actually adopted at field level.

Some of the areas where India can initiate further intensive R&D activities in time bound manner are the following:

Table 2: 'Green Revolution' coupled with 'Gene Revolution': Possible Agri biotechnological Breakthroughs	
Focus Areas of Agri Biotechnology Interventions	**International R&D Achievements**
Developing tolerant rice varieties to face climate-change driven situation in agricultural farms.	Development of Great Super Rice (GSR). Considered as a major agri-biotechnological achievement for improving use-efficiency of water, nutrients and pest resistance without any genetic modifications
Shelf-life enhancement of fruits and vegetables through biotechnology interventions altering the nucleotide sequence of ethylene gene	Path breaking international researches in melons and tomatoes
Bringing important crops to higher productivity levels under low farm resource and management	Crop improvement of Bambara groundnut
Developing water efficient field crops	Recent research outcome of research for water efficient maize (WEMA) for Africa by CIMMYT
Crop improvement using marker-assisted selection process	Achievement in genome assemblies in species of cultivated and wild chick peas
Biotechnology based combat of disease problems and drought tolerance in the crop	Recent researches on Microbial community analysis of chickpea root zone
Enhancing grain nutrition in rice, wheat and other crops through biotechnology for providing marginalised populations with basic nutrition	Recent biotech research achievements in areas of biofortified rice, wheat, sweet potato, etc
Delivery of new biotechnologies that aid in managing climate change directed farm ecologies	Recent research outcomes from projects like The AdapTree project of western Canada (University of British Colombia) related to single nucleotide polymorphisms associated with climatic variables for about 23,000 genes
Biotechnological R&D in forest trees	Solutions from international biotechnology and molecular science researches in the improvement of Eucalyptus pulp yield, improvement of Allanblackia trees for their oil content in Africa
Biotechnology based suppression of the toxigenic fungal species for the benefit of small hold farmers	Utilising a toxigenic Aspergillus flavus strain (AflaSafe) for suppressing in containing the aflatoxin in maize and groundnut
Source: ICFA secondary research from biotech R&D articles	

Other than these, to reap the benefits of biotechnology in the animal husbandry sector, more research activities can be taken up in areas like:

- cost-effective production of vaccines
- sexual selection of poultry eggs
- using microbial genes to degrade lignin and cellulose in the gut of livestock animals for reduced methane emission
- Single nucleotide polymorphism (SNP) markers were used to improve dairy cattle
- genetic basis for fecundity in goats
- developments in animal nutrition to improve metabolic efficiency
- increased tolerance to biotic and abiotic stresses in farm animals
- researches in non-digestible bioactive molecules for selective growth of certain flora in gastro-intestinal environment that helps in digestion, assimilation and absorbtion of critical nutrients from the food that are consumed, thereby increasing the feed to body weight conversion ratio
- developing diagnostic tools to detect tuberculosis pathogen in dairy products
- application of Gene-modification technologies in fisheries along with gene banking in fish

2.3 Improving agricultural productivity in rain fed regions of India

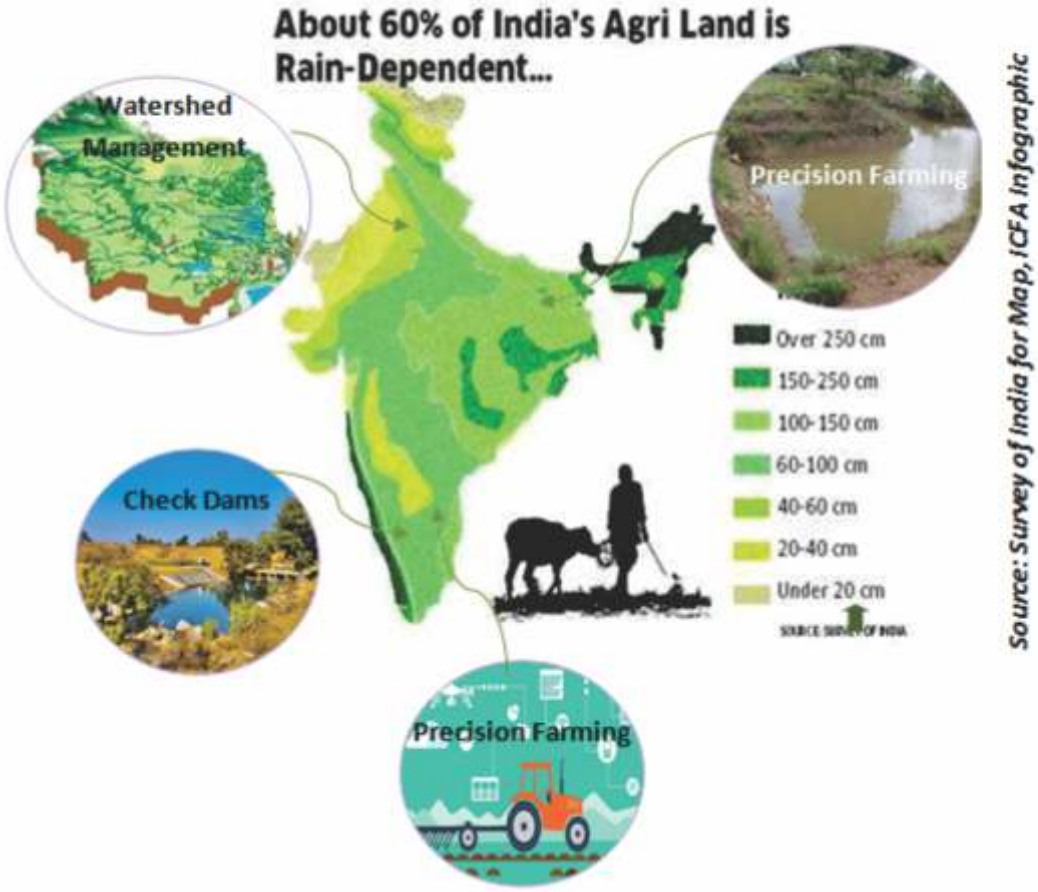
India ranks first in rainfed agriculture globally in both area and the value of produce. Covering an area of over 86 million ha, rainfed regions in India contribute substantially toward food grain production. Overall, the rainfed areas produce 40% of the food grains, support two-thirds of the livestock population, and are critical to food security, equity, and sustainability.

Fig 5: Contributions of Rain Fed Areas in India's Agriculture

Source: ICFA Infographic from various data sources

Though a number of systematic efforts have been taken up in the past and various ongoing programmes are continuing in the present, still experts in the sector feel a need for further systematic and scientific approach for enhancing crop productivity in the rain fed regions of the country. Chandrababu Naidu Committee report (2003) aimed at bringing 69 million hectare area under Micro-Irrigation to save water and input costs, increase productivity and improve quality of output needs to ve revisited and implemented. Some of the other immediate interventions needed for developing productivity in the region is depicted in the following infographics:

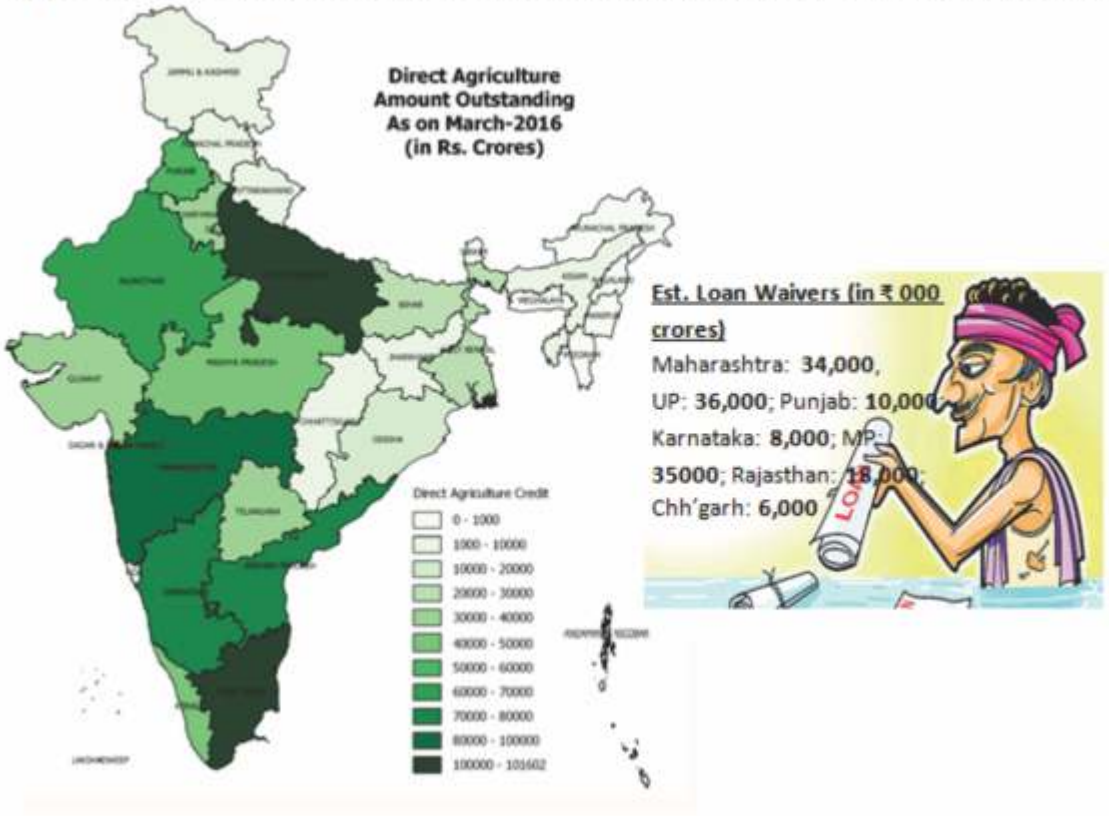
Fig 6: Specific 'Mission Mode Interventions' Needed for Rainfed



2.4 Are Loan waivers the solution?

Time has come to ask some hard hitting questions about loan waivers from various State Governments as well as Central Government from time to time. Is loan waiver the solution to farmers distress or are they leading the farmers and the agriculture sector as a whole into a visous cycle? High time that policy makers, politicians and farmers groups brainstorm on this and come out with specific resolutions towards delinking farm sector from populist measures and short term polical gains.

Fig 7: Status of Farm Loan Outstanding with the Banking Sector and Some of the Loan Waivers



Source: ICFA Infographics with Data from RBI

Though bad loans in agriculture sector have zoomed leading to cautious approaches from banks on farm lending. This can be one of the major reasons of only a marginal increase of about 4.39% in farming loan disbursal to RS. 11,63,253 crore in in 2017-18 from RS. 11,14,313 crore in the previous fiscal of 2016-17. Indian banking sectorhas reported an increase of 38.2% in agriculture loan defaults for fiscal 2017-18, which is an addition to the already wooes of the banks , which is already grappling with the mounting bad corporate debt. NPAs in farming sector has risen by over RS. 23,000 crore to a total of RS. 83,153 crore as compared with RS. 60,161 crore in the financial year ended on March 2017.

Farm loan waivers produce long term ills for the economy and the farm sector as well. It chokes the fund flow to the farm sector in the long run.

Fig 8: The Irreversible and Long term Menace of farm Loan Waivers

Source: ICFA Infographics

2.5 Greater convergence of Fertiliser Subsidy, Rationalizing of NPK pricing and Soil health Cards

Fertilisersubsidy and rationalizing NPK pricing is ineffective unless there is a policy on promoting crop specific speciality fertilisers and fertigation, besides setting standards and regulating bio-fertilisers under Soil Health Mission. Currently there is a non convergence of policies like fertiliser subsidies and soil health card. Without these being linked to each other, such interventions in tehir own silos will actually not help farmers reap the benefits from either of the interventions.

2.6 Arresting crop losses through a judicious use crop protection chemicals through IPM and checking the flow of spurious pesticides

Crop losses due to pest and diseases in India are huge and estimates range from 90,000 to 1.50 lac crores annually. Crop protection chemicals play an important role not only in crop productivity, cost reduction and quality improvement but also in protecting crops from pests and diseases. Once used judicously and in a responsible manner, cost benefit ratio of using pesticides is heavily in favour of farmers. Spurious pesticides are find rampant entry to the marketing system and strong measures are needed on the ground to control this menace.

2.7 Small and medium farmers to be more into the centre of focus in every policy formulations and interventions

Its an irony that a country where as much as 67 percent of India's farmland is held by the marginal farmers with holdings below one hectare, against less than 1 percent in large holdings of 10 hectares and above, the benefits of various interventions, welfare measures, advent of technologies, rising farm credit etc. are actually not reaching the small farmers. Urgent steps are needed to direct the benefits to the small farmers. Although in the recent years, with the help of technology and mesures like Direct Benefit Transfers (DBT), Government is trying to reach this important section of the farmers, further steps are needed which are actually being executed on the ground level.

Fig 9: Comparison in Farm Sizes (in hectares)

Fig 10: The Broken Link with the Small Hold Farmers in India

2.8 Integrated Water Use Policy

It is a cause for concern is that currently, the proportion of net irrigated area to net area sown was 45.70 percent, which shows that for half the country's farmland irrigation is yet to reach farmers, who rely entirely on rains for their crops. According to agricultutural census, out of the total 64.57 million hectare net irrigated area, 48.16 percent is accounted for by small and marginal holdings, 43.77 percent by semi-medium and Medium holdings and 8.07 percent by large holdings

Government should critically examine several ongoing initiatives and develop its country-wide system for judicious and integrated use and management of water. A national commission on efficient water use in agriculture should be established to assess the various issues, regulatory concerns, water laws and legislations, research, technology development and community involvement.

Some of the essential aspects of water use policy that needs more focus and ground level implementation are:

- Help resource-poor farmers in the rainfed ecosystems, who practice less-intensive agriculture though efficient water use
- Crop Planning considering water requirements and availability of water. needs to be done keeping water resources of a region and the water intake by various crosp in mind. For example high water consuming crops like paddy and sugarcane should be grown in high rainfall areas
- Training and capacity building of farmers on water usage systems to encourage them to shift away from flood irrigation systems, which affects productivity and wastes water

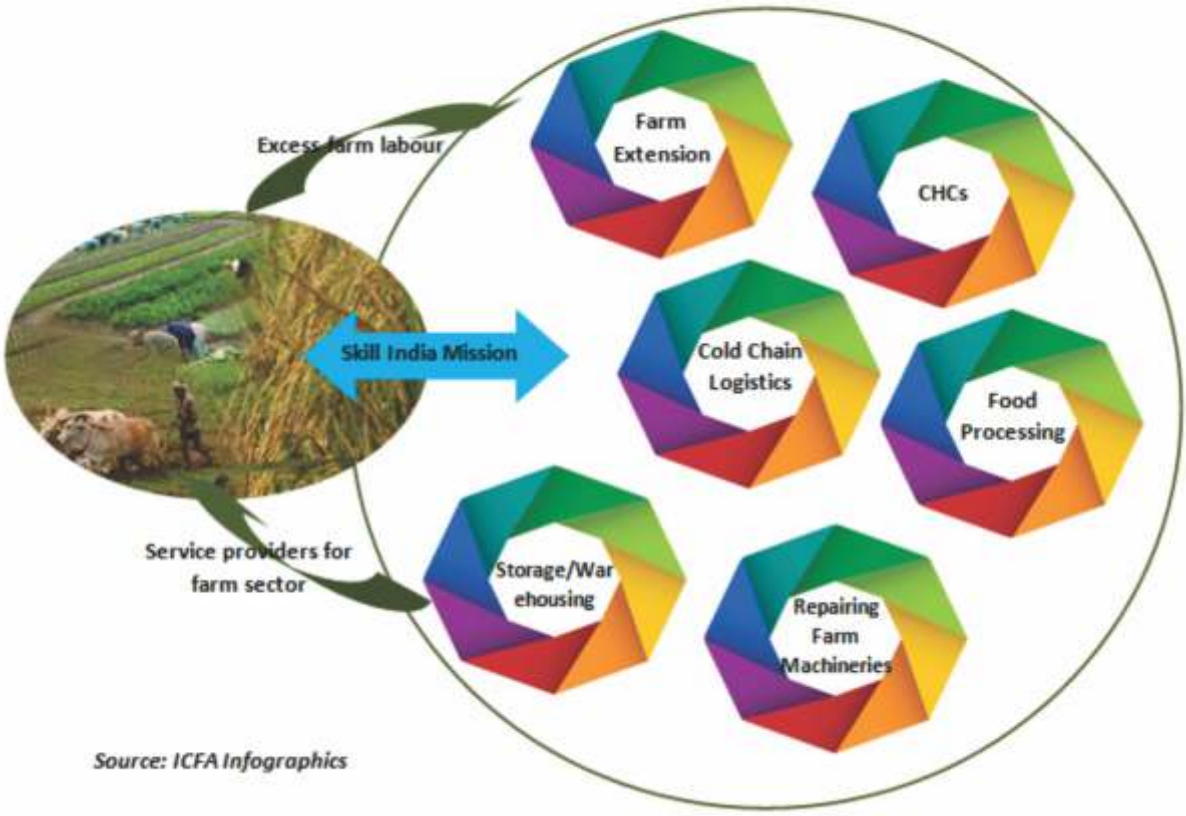
2.9 Promotion of integrated farming system

There is a need to promote integrated farming system with synergic blending of crops, horticulture, dairy, fisheries, poultry, etc. This is a viable option to provide regular income and at site employment to small land holder, thereby decreasing cultivation cost through multiple use of resources and providing much needed resilience for predicted climate change scenario. Model Farms @ Rs. 200 lacs each need to be established in each district with 100% GOI funds for farmers to learn and adopt.

2.10 Making agriculture more profitable by weaning away disguised employment in agri sector

High growth in population leads to surplus labour, especially in the rural areas. India, being the second most-populous country, has almost 70% of its total population in the rural areas. Surplus labour exists in the rural areas, however, employment in such areas mostly remains seasonal, thus causing disguised unemployment. One way to get rid of this problem is to converge Skill India mission in rural sector to undertake training and capacity building programmes for rural masses in areas like farm extension, running of Custom Hiring Centres (CHCs), cold chain logistics, food processing, micro warehousing and storage facilties, repairing of farm machineries, market linkage activities, post harvest management (PHM) etc.

Fig 11: Redistribution of Excess Farm Labours and Reducing Disguised Employment in Farm Sector



Source: ICFA Infographics

2.11 Dairy for Small Farmers

Dairy husbandry is a boon for small farmers, as a family with three cows or buffaloes can earn an annual income of Rs. 50,000 to 60,000, while conserving our precious native breeds. With stall-fed, high yielding animals, the dung availability will increase by 3 to 4 times, giving a boost to biogas and agricultural production. With introduction of good goat husbandry practices by appointing local youth to facilitate the activities as Field Guides, 35 million goat keepers in the country who are living below the poverty line, can enhance their income by many folds.

2.12 Intensive vegetable production

Promotion of intensive vegetable production using improved varieties, organic manure and drip irrigation, can provide five times higher annual income, to the tune of RS 2 lakhs per acre as evident from various interventions at farmers level. Farmers in semi-arid areas with 2-3 cows or 8-10 goats and cultivating dual purpose food grain crops on 0.4 ha land, have been earning RS 60,000 to RS 75,000 per annum. With efficient watershed development, land use planning and selecting of suitable crops, the income of the farmers can go up by 80-100% to generate an annual income of RS 40,000 to 60,000, there by closing near to the mission of doubling of farmers' income by 2022.

2.13 Agri marketing reforms and greater market linkages

Agri marketing needs further reforms with focus on small hold farmers of the country along with providing efficient market linkage mechanisms for the small hold farmers. Some of the intervention that are currently needed are:

- Revision of the APMC Act and monitoring its implementation in the states
- Easing of norms of licensing for initiatives like eNAM and greater convergence of various Government organizations, defense sector etc. for procurement through eNAM
- Reforms to the APMC Acts to permit pan-India trades, electronic auctions and trading in warehousing receipts
- Stengthening of agri infrastructure, storage systems and market yards
- Reducing post harvest losses by strengthening grain storage infrastructure, cool chain systems for perishables, post harvest processing and value addition, transport, marketing, commerce and trade
- FDI policy in food sector need to be relooked and allowed with more research inputs available now on its benefits

2.14 Other interventions

- Structural reforms in agriculture pertaining to land leasing and market restrictions need to be addressed
- Through a nationwide crops competitiveness study, profiling of crops and animal resources should be done for different States. This will help in indexing them against national and global benchmarks on cost, quality and productivity parameters, and their short, medium and long term strategic advantages
- Agriculture needs to be brought to the Concurrent List. This will help in bringing the entire gamut of post production activities in agriculture, such as PHM, marketing, processing, infrastructure, agribusiness etc. under the concurrent list of the Constitution for better central planning. This is imporatnt in the light of the fact that food and agriculture is globalizing and role of central Government is increasing in making laws and policies, especially in post harvest, trade and agribusinesses, where MNCs and corporate sector are involved in big way
- Implementing Agribusiness Hubs Model, operating on a national platform and establishing 2.40 lac multi-functional Agribusiness hubs in all the Gram Panchayats of the country
- ICT-based agricultural extension is need of the hour to bring incredible opportunities and has the potential of enabling the empowerment of farming communities

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