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ANALYSIS OF POLICY INTERVENTIONS IN AGRICULTURE AND ICT BASED MECHANISTIC APPROACH TOWARDS SUSTAINABILITY: AN INDIAN PERSPECTIVE

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ABSTRACT

The present work stressed the negative prospects of the green revolution in India because of which despite having surplus productivity, there is a shortage of approximately 39% of food in comparison to demand. The present study investigated both qualitative and quantitative data regarding the input and output of agriculture to determine the currently existing gaps. Data from Government Organizations, Surveys, Audit reports were collected and evaluated. The analysis revealed that past policy interventions have collapsed in uplifting the farmer's income which has caught farmers into financial crisis. Under these circumstances, the farmer's growth is a matter of concern for policymakers. To overcome the present gap, the current Government has taken several new initiatives regarding organic agriculture and exemption of farmers from mandis to benefit the farmer which is expected to be proved as a milestone in uplifting the growth of Indian agriculture system. Present study aimed to propose a digitalized mechanistic approach to bring synchronization among Government, producer and consumer. Objective of the present study is to develop a mirrored view between Government initiatives and farmers for sustainable development of agriculture and people associated with them.

Contribution/ Originality
The present study acts as a reflective analysis of policies and schemes initiated for benefitting the farmers and thereby proposes a digitalized mechanistic approach to overcome the limitations associated with it.

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1. INTRODUCTION

India has a hefty disparate agricultural sector, which contributes to about 16% of India's GDP and 10% of export earnings. In the global market, India ranks amongst topmost countries in crop production. In the case of cereals, India ranks third in the world market and contributes 11.1% to the country's economy. Indian scenario has experienced an abrupt increase in food grain production from 51 to 285 million tonnes during the tenure of 1950-51 to 2017-18 (Moray, 2019). An astounding endeavor of farmers plays a vital role in the success of the agriculture sector and their income is directly related to crop. An analysis of the productivity factor provides an insight into the nature and drivers of agriculture growth. Production efficiency of the Indian agriculture sector has enormously enhanced from 1980 till today with an exception of the period from 1997 to 2003 wherein the productivity declined due to weather shocks. India dominates over other countries in terms of agricultural exports. Agriculture trade has grown from USD 3.6 to 22 billion from 2000 to 2013. There exists a variation between the export of wheat and coarse grains, and have often reached high levels, currently, the export of protein meal is flourishing rapidly. India has recently become one of the top bovine meat exporters. An escalation in agricultural productivity and industrial growth greatly contributed towards the country's economy which ultimately leads to the decline in the poverty rate. The poverty rate has almost reduced to half, falling from around 55 to around 28% over the past 10-year. Despite the impressive growth and development, still, a large population of India is under the poverty line. India has a high population pressure on land and other resources to fulfill its food and other developmental needs (Government of India and Sally, 2018).

Currently, a major crisis to be seen in farming is farmer's income. The average income of a farmer is observed to be about 65 USD/month/family. There also have been reports about people moving out of agriculture in the past 20 years and no other sector has given them breakthrough employment as a result of which farmers are wandering from one place to another in search of work opportunities. Conclusively it can be said that the collapse of public institutions and the failure of agriculture policies that are running from several decades in accomplishing the needs of farmers have caught Indian farmers in crisis. The present work is an attempt to highlight the production, availability, and shortage of food in the country and the overview of a scheme initiated for the welfare of farmers and the major loopholes associated with it which are held responsible for its failure (Deshpande, 2017; Chait, 2019). The secondary data was obtained with the help and positive prospects of Governmental organizations, surveys, and respective Ministries, without their support it would have been impossible to frame the present study.

2. PRODUCTION, AVAILABILITY AND FOOD CRISIS IN INDIA

Agriculture productivity has sharply increased in the past few decades. The yield of rabi crops has been contributing significantly to the total foodgrain production over the 1970–71 to 2016-17 and a similar trend has been observed in yield of Kharif food grain (Figure 1).

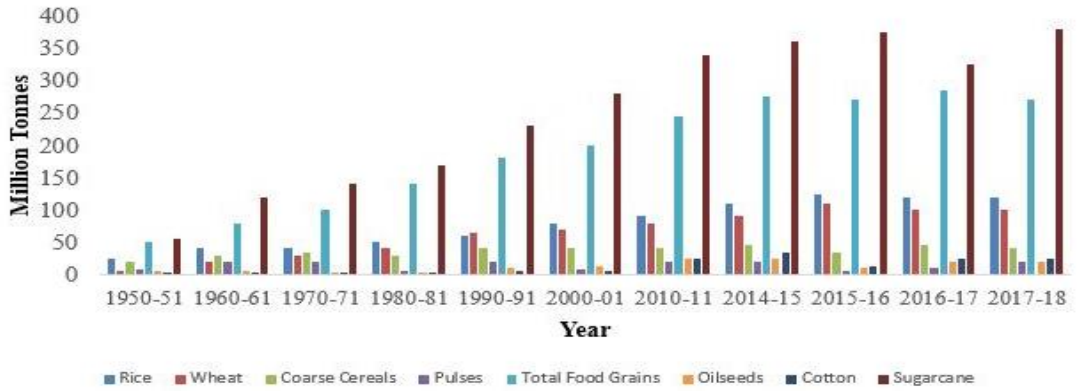

Figure 1: Year-wise production of Rabi and Kharif crops in India

As India's agriculture productivity was compared with other countries it was observed that it has grown at a slower pace as compared to others. For instance, the yield for rice has increased from 1.3 to 4.9 tonnes/ha in Brazil whereas in India it increased from 2.0 to 3.6 and in China's productivity grew from 4.3 to 6.7 (Figure 2) (Government of India, 2019; Indian Council for Research on International Economic Relations, 2018).

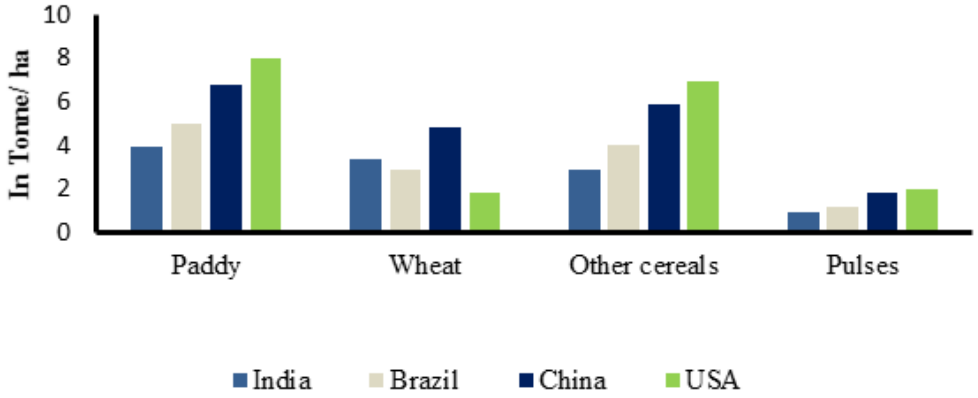

Figure 2: Yield of food grains in different countries in 2014-15 (Tonnes/ha)

Apart from all this, India's production is surplus to meet the need of the present population. In 2018, India's population was estimated to be 1.35 billion. On average in India, 1 person consumes 101.7g food grains per day thereby constituting an average of 37kg per year. So the total population of India (2018) requires 49.52 tonnes to meet their food requirement. Total production of food grains (wheat and rice) in 2018 remained to be 614386000 tonnes per year which are abundant to meet the country's requirement. Wastage, hoarding, and export also affect availability. Majorly food wastage which constitutes approximately 40% of total production whereas hoarding and export which constitutes an average of 0.5 and 0.02% respectively act as the major factors held responsible for food shortage (Planning commission Government of India, 2015; PRS Legislative Research, 2019). Approximately the Indian population suffers from 193 lakh tonnes of food shortage every year and the ratio is increasing rapidly at a faster pace. To encounter the issue of the food crisis, the Government has initiated several schemes for the farmer's welfare and a brief description of it has been highlighted in the upcoming sections of the article.

3. GOVERNMENT SCHEMES AND POLICIES FOR THE WELFARE OF FARMERS

Farmers are enormously smashed due to norms and regulations imposed by the domestic market and export trade restrictions, which collectively lead to forceful imposition of producer prices that are below the market value of their products. Agriculture Ministry of India has initiated several programs such as subsidies over different commodities, more than 20 schemes at the National level and various others at the State level have been initiated with the motto of farmer's welfare. Despite such tremendous efforts and the expenditure of such a high ratio of the Indian economy, the farmer's condition has not improved so far. Unfortunately, in the Indian Governance system, the process of policy formation is greatly influenced by political considerations, and realities are often ignored at the cost of the financial health of the economy and social equity among farmers. Ground trusting of the policies and schemes and their loopholes have been briefly mentioned in the upcoming section of the article.

3.1. Subsidies and its influence over commodities

The subsidy is a Government incentive paid to agricultural organizations, agribusinesses, and farms to supplement their income, to manage the supply of agricultural products. Subsidies play a crucial role in the country's economy and are vital for farmer's welfare. Producer and consumer subsidies both are important at their respective places for reinforcing the equities, income level and to support disadvantaged sections. In terms of income transfer also, subsidies play a crucial role to provide benefits to the depressed section of society.

According to the Government's budget of 2019-2020, subsidy bill on food, fertilizer, and fuel is estimated to go up by 13.32% to 39.35 billion USD. An immense increase has been made in fuel subsidy of the total subsidy bill which is depicted to be around 4.89 billion USD from the revised estimate of 3.24 billion USD for 2018-19. When the fuel subsidy bill was considered it was observed that the LPG subsidy is expected to be of 4.30 billion USD for 2019-2020 in comparison to 2.65 billion USD which was in 2018-19. Whereas a slight decline in kerosene subsidy was observed in comparison to the previous year which was previously 593.51 million USD and now it reduced to 585.55 million USD. In the case of the food subsidy bill, an increase of 7.54% to 24.03 billion USD for the current year has been observed from the previous estimate of 22.34 billion USD. Similarly, the fertilizer subsidy is projected to be enhanced by 14.14% to 10.43 billion USD in 2019-20 from the revised estimate of 9.14 billion USD in the last fiscal. Out of this allocation, urea subsidy itself constitutes an average of 7 billion USD and nutrient-based subsidies of 3.43 billion USD, as per the Budget document (Figure 3) (Government of India, 2019; Karnik and Lalvani, 1996).

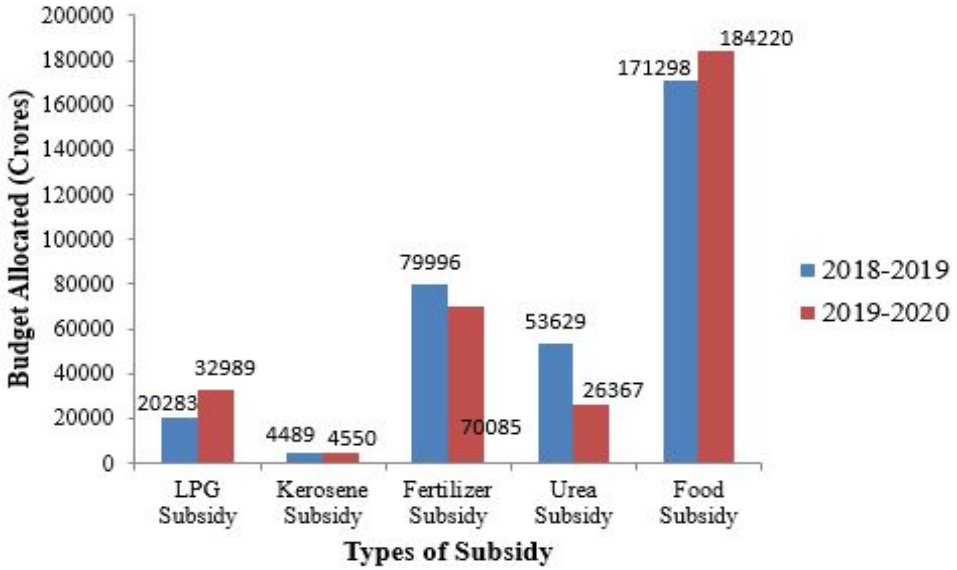

Figure 3: Subsidy provided on different commodities during 2018-2020 by Government

3.1.1. An insight of agriculture subsidies provided by the Indian government

Despite the allocation of a large number of subsidies to fertilizers, power, and irrigation, a current policy couldn't improve farmer's state rather it has reduced gross farm revenue by 6% and it was consistently observed during 2014-16. This type of support to producers is generally measured in terms of share transfer from consumers and taxpayers in gross farm revenues and is generally comprised of 6.9% of gross farm receipts and -13.1% of market price support. Collectively, a negative producer support estimate (PSE) has been observed which is greatly affecting farmer's state. It was predicted that to avail the maximum benefit of it, consumer subsidies need to be provided directly to the intended beneficiaries either in the form of food stamps, to avoid stealing of agricultural commodities available in the public distribution system and to provide the consumers with the choice of food which they would like to purchase.

The benefits of Government schemes and policies are being mostly given to big farmers having landholding of 10 acres (4.05 hectares) and above. Only 10 percent of poor and small farmers with an average landholding of 1-4 acres (0.4 to 1.6 ha) have been benefited from Government schemes and subsidies. Farmers blamed the State and Central Governments for their present condition as 74% of them alleged they do not get any farming-related information from officials of the agriculture department. 62% of farmers were not even informed about the minimum support price strategy of Government and among those who have heard about MSP, 64% were not satisfied with the price which the Government offers (Sharma, 2004).

3.2. Government-sponsored schemes for the welfare of farmers

The government of India has made farmer's welfare as their utmost priority and is implementing several farmers' welfare schemes to strengthen the agriculture sector and to improve their economic conditions. The government has embarked on several new initiatives and is motivating farmers to opt for the new projects and is self-financing a part of the total cost of the project (Figure 4).

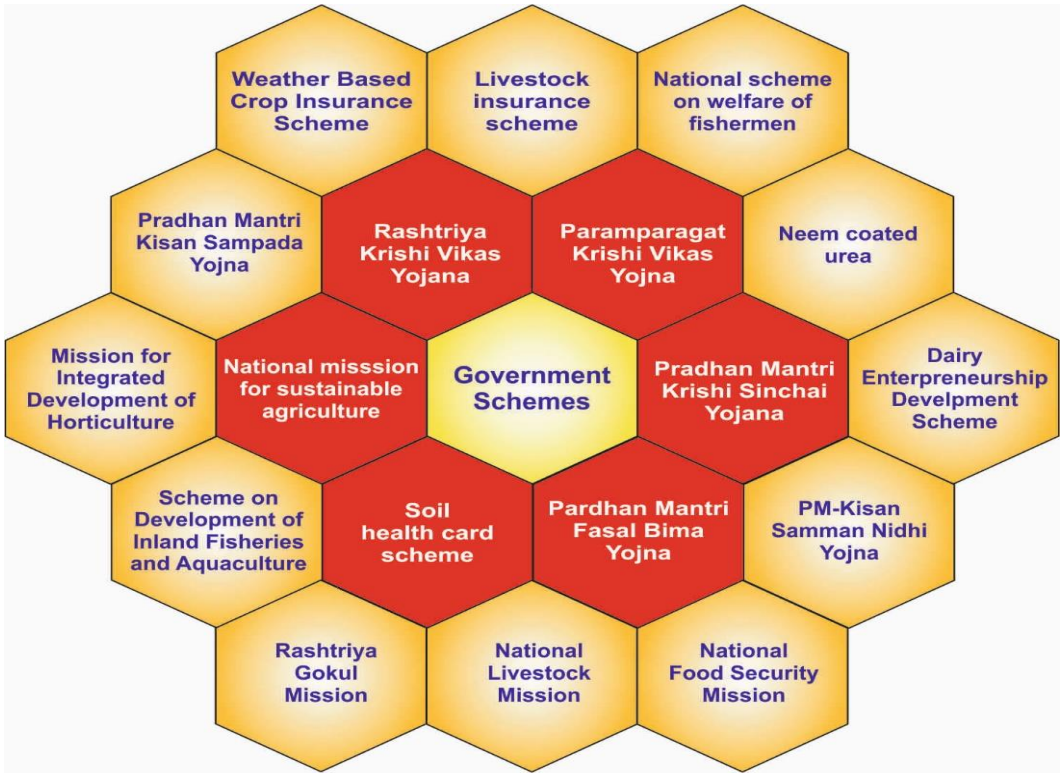

Figure 4: Schemes initiated by Government for farmer's welfare

The motto of initiating these projects is to enhance the capital investment, sustained income flow, and employment areas of national importance. The schemes initiated by the Government have been listed below (Table: 1). (Government of India, 2014; Amarender, 2017; Government of India (PMKSY), 2019; Business standard, 2019; Government of India (SHC), 2019; Government of India (NMSA), 2018; Government of Haryana Pashudhan, 2019; National portal of India, 2019; Bank bazaar, 2019; Ramappa and Manjunatha, 2017; Ghosh, 2018; PM-Kisan Samman Nidhi, 2019; MEEN Arunachal, 2015; MIDH, 2018).

Table 1: Details of Government initiated schemes

Kick start Objectives	Implementing Agency	Budget Allocation in USD (Year)	Beneficiary	Present standpoints	Problems
Rashtriya Krishi Vikas Yojana (RKVY), 2007					
Development of agriculture and allied sectors. To reduce the yield gaps in important crops. To maximize returns to the farmers in agriculture and allied sectors.	Ministry of Agriculture & Farmers Welfare	469.5 million USD (2018-2019)	10679 farmers in twelve selected sectors (2014) 35000 farmers in the drought compensation plan	Budget allocated: 4.9 billion USD (2007-08 to 2011-12). Expenditure: 3.0 billion USD for implementing 7234 projects Unutilized: 1.94 billion USD (by the end of 11th FYP). 80 % of the total expenditure is concentrated in only 8, out of 20 sectors.	Underutilization of funds. Limited number of sectors covered. More than 55 % of the projects were initiated after 2 years of implementation of the scheme.
Paramparagat Krishi Vikas Yojana (PKVY), 2015					
To conduct model organic cluster demonstrations at farmer's field. To promote organic farming and to disseminate the latest technologies regarding organic farming.	Ministry of Agriculture & Farmers Welfare	18.05 million USD (2017-2018)	48949 farmers 2,25,635 involved in organic farming (2016-17)	Average cost per hectare in paddy is reduced due to organic agriculture by 17.2%, while gross returns decreased by 9%. The yield of organic agriculture was less than conventional by 9.1%.	Insufficient funds/ delay in fund release. Only encouraging input companies rather than farmers. PKVY guidelines are not flexible, enough state requirements. Existing organic farmers were selected who were already part of other schemes.
Pradhan Mantri Krishi Sinchai Yojana (PMKSY), 2015					
To enhance the physical access of water (Har Khet ko pani). To enhance the adoption of	Ministry of Agriculture & Farmers Welfare	456.54 million USD (2019-20)	19,17,952 farmers from 2016-17 to 2019-20	PMKSY contradicts with the National Water Policy-2012.	In Maharashtra, most of the projects are still pending attributed to inordinate

precision – irrigation and other water-saving technologies (More crop per drop). To introduce sustainable water conservation practices. To ensure the integrated development of rainfed areas.				Capital intensive technology to elite farmers has created informal water markets and this has destroyed the Indian irrigation system.	delays and allegations of corruption.
Pradhan Mantri Fasal Bima Yojana (PMFBY), 2016					
To provide insurance coverage and financial support during crop loss resulting from natural calamities, pests and diseases. To stabilize the income of farmers to ensure their continuous process in farming.	Ministry of Agriculture & Farmers Welfare	1.82 billion USD (2019-2020)	18, 54,43,390 farmers from 2016-17 to 2019-20.	The benefit of all the crop insurance schemes was availed by farmers of Gujarat, Maharashtra, Andhra Pradesh and Madhya Pradesh. Their share was nearly 80 % of the claims paid in the country. The scheme will continue to be on 'area approach basis' - village/village Panchayat for major crops and the area above that level for other crops.	Bihar, Assam and North-eastern states lagged in availing the benefits of crop insurance. Individual farmers suffering losses are not going to benefit unless the entire area gets affected.
Soil Health Card Scheme (SHC) (2015)					
Healthy Earth, Green Farm. Testing the quality and type of soil.	Ministry of Agriculture & Farmers Welfare	42 million USD (2019-2020)	Total no. of samples collected in Cycle I and II: 5,21,81,553 Total no. of samples tested: 5,19,25,197 Total no. of SHC	The same fertilizers were recommended for every farm. A significant reduction (20-30%) was observed in the use of Urea and DAP in paddy and cotton.	SHC has been issued to certain farmers without soil testing. There is no one method of treating the soil that applies to all farmers.

			distributed in cycle I and II: 21,24,98,902	Cost of cultivation was reduced from 13-52 USD per acre.	
National Mission for Sustainable Agriculture (NMSA), 2013					
To make agriculture more productive, sustainable, remunerative and climate-resilient. To adopt comprehensive soil health management practices. To optimize the utilization of water resources (‘more crop per drop’).	Ministry of Agriculture & Farmers Welfare	161.35 million USD (2018-2019)	544 farmers (National Bamboo Mission). 2,43,233 in Rainfed Area Development from 2016-17 to 2019-20. 4536 (Sub-mission on agroforestry).	The proposed strategies of the mission given importance only to water and largely ignored the usage of chemical fertilizers. The use of chemical fertilizer required more irrigation as compared to organic farming.	The proposed strategies are targeting only the big farmers. Further, the scheme could not combat the challenges faced by agriculture due to climate change.
Weather Based Crop Insurance Scheme (WBCIS)/ Restructured WBCIS, 2015/2016					
To provide insurance against crop loss resulting from adverse weather conditions.	Ministry of Agriculture & Farmers Welfare	91.3 million USD (2013-2014)	15 lakh farmers have been insured in Kharif	The budget allocated have been completely utilized. All the claims are settled within the shortest possible time.	Non-coverage of perils other than weather.
Livestock Insurance Scheme, 2005					
To provide insurance protection to cattle rearers against income losses due to the death of their animals. To attain qualitative improvement in livestock and their products.	Ministry of fisheries, Animal Husbandry and dairying	3.91 million USD (2011-2012)	7.44 lakh animals insured during 2016-17	A loss ratio of >150% was observed during the valuation and identification of cattle due to poor monitoring processes.	Lengthy claims settlement process. Poor veterinary infrastructure.
National Scheme on Welfare of Fishermen, 2002					
To provide basic amenities like drinking water and sanitation to improve the living standard of fishers' villages.	Ministry of Agriculture	83.48 million USD	3.5 lakh fishers covered under saving-cum-relief; 3 lakh fishermen under group	Incomplete registrations, poor internal control. Government did not	Allocated funds were neither utilized within time.

To provide social security for active fishers and their dependents.			accident insurance; 6400 fishermen per year under training and extension.	consider the deteriorating situation of the Pilot Prawn hatchery to avoid further infructuous expenditure.	
Neem coated urea (NCU), 2015					
About 248 Lakh Metric Ton of indigenously manufactured urea will be made available to farmers at the statutory MRP notified by the Government. Reduction in a diversion of urea towards a non-agricultural purpose.	Government of India	53,629 have been allocated to urea subsidy in 2019	Around 23000dealers have been benefitted.	Difficult to differentiate between NCU & NU. No training on the crop-wise application of NCU.	The price of NCU is higher than plain urea. Due to a lack of irrigational facilities, the desired benefits of NCU are not extracted.
Dairy Entrepreneurship Development Scheme (DEDS), 2005-2006					
To promote setting up of modern dairy farms for the production of clean milk. To encourage heifer calf rearing, thereby conserving good breeding stock and to upgrade the quality and traditional technology to handle milk on a commercial scale.	National Bank for Agriculture and Rural Development (NABARD)	42.39 million USD (2019-2020)	32,581 farmers have been benefitted from (1.04.2018-28.02.2019). Further, 2 lakh people have been employed	A significant increase of around 123 % in overall average milk production per beneficiary entrepreneur has been observed. SC/ST subsidy is under-utilized in several States.	In the Western Region, Private Banks are charging a lower interest rate than the nationalized banks. (Ratnakar Bank -11.25% for 3 years). Bihar, MP, Gujarat, Maharashtra, Jharkhand & Kerala have reported less than 10 % of SC/ST beneficiaries.
PM-Kisan Samman Nidhi Yojana (PM-KSNY), 2018					
To support farmers whose income is insufficient for their sustenance	Ministry of Agriculture & Farmers Welfare	9.7 billion USD (2019-20)	2,60,000 00 (2018-19); 8,50,00000 (2019-20).	According to the Agriculture department, 6.68 lakh payments failed while paying the first installment while 1.32 lakh failed during	About 60% of eligible farmers are deprived of the PM Kisan Samman Nidhi benefits as the States have not added them to the list of beneficiaries.

				the second installment. West Bengal has not yet registered a single farmer for the scheme	
National Food Security Mission (NFSM), 2007					
To increase the production of rice, wheat, pulses, coarse cereals (Maize and Barley) and Nutri-cereals To restore soil fertility and productivity at the individual farm level To enhance farm level economy	Ministry of Agriculture & Farmers Welfare	260.88 million USD (2019-20)	18,08,216 from 2016-17 to 2019-20	In 2007-08, NFSM was implemented in 482 districts of 19 states The production of rice, wheat and pulses has been increased from 93.36, 75.81, 14.2 (2006-07) to 105.31, 94.88 and 17.09 million tonnes (2011-12).	Total area under rice cultivation declined from 44.92 (2007-08) lakh ha to 44.00 lakh ha (2011-12) In FY2015-16, 1279.15 crores have been allocated, of which only 573-19 crores have been utilized
National Livestock Mission (NLM), 2014-15					
Sustainable growth and development of the livestock sector, including poultry To increase the availability of fodder and feed to substantially reduce the demand-supply gap	Ministry of Fisheries, Animal Husbandry and Dairying	26 million USD (2019-20)	32,981 under Entrepreneurship Development & Employment Generation (EDEG). 3.68 lakh beneficiaries under Rural Backyard Poultry Development 35.64 lakh animals have been insured	41 state Poultry /Sheep/ Goat Piggery Breeding Farms have been established. 54,930 Chaff Cutters have been distributed 3823 silage units established 519 Livestock Melas have been Organized 223 Livestock Farmers Group and 121 Farmers Field Schools have been established	CAG report revealed that 5.40 crores were lying idle and the objective of providing effective veterinary health services to livestock remained unachieved in Uttar Pradesh.
Rashtriya Gokul Mission (RGM), 2014					
Development and conservation of indigenous breeds To enhance milk production and	Ministry of Fisheries, Animal Husbandry and	97.83 million USD (2019-20)	1,26,47,471 animals have been registered in various states and	20 Gokul Grams have been established in 13 states	Each '*Gokul Gram'* was proposed to be spread over 200 hectares and house 1000

productivity of the bovine population To arrange quality Artificial Insemination (AI) services at farmers' doorstep	Dairying (Department of Animal Husbandry and Dairying)		UTs till 27-07-18 22 Gopal Ratnaand 21 Kamdhenu awards have been distributed	In Madhya Pradesh and Andhra Pradesh, 2 National Kamdhenu Breeding Centers have been established	heads of cattle Due to a lack of funding and resources, several States have been reluctant to set up the '*Gokul Grams'*.
The scheme on Development of Inland Fisheries and Aquaculture-Blue Revolution, 2014-15					
To increase the overall fish production for economic prosperity To modernize the fisheries with special focus on new technologies	Ministry of Agriculture & Farmers Welfare	643 (2018-19)	Approved construction of 12,430 fishermen houses Financial assistance provided to 2.43 lakh fishermen annually under Saving-cum-Relief component during fishing lean/ban period	Central assistance of 240.91 million USD released (up to 31st Aug 2018) to promote the Fisheries Sector Assistance provided for bringing 29,127.73 ha area under aquaculture Approved establishment of 389 of fish/prawn hatcheries	Accumulation of organic matter, both in the form of unconsumed feed and feces leads to the process of eutrophication
Mission for Integrated Development of Horticulture (MIDH), 2014-15					
To promote holistic growth of the horticulture sector, including bamboo and coconut To enhance horticulture production, augment farmer's income and strengthen nutritional security To support skill development and create employment generation opportunities for rural youth in horticulture	Ministry of Agriculture & Farmers Welfare	290 million USD (2019-20)	5,13,054 from 2016-17 to 2019-20	Organic cultivation is adopted in 1.51 lakh ha, in seven States. Karnataka has established 420 nurseries accounting for a 19% share followed by Kerala 13% while Tamil Nadu, Orissa, MP, AP have accomplished 7-8%.	During the 11th plan, an amount of 1.14 billion USD was approved for the implementation of the scheme. Against this, an amount of 482.4 million USD was released up to 2010-11 and an amount of 571 million USD was spent that includes the unspent balance amount of 92.6 million USD of 10th plan.

3.3. Analysis of growth in the agriculture sector

In 2018-19, the Agriculture Ministry has been allocated 7.5 billion USD and the amount was 14.6% more than the revised estimate in 2017-18. A major section of the Union budget has predominantly focused on subsidies. In 2016-17, the allocation under the Ministry observed a sudden increase due to the initiation of the 'Interest Subsidy Scheme' which is currently being accounted under the Ministry of Agriculture from 2016-17, previously it was used to be considered under the Finance Ministry.

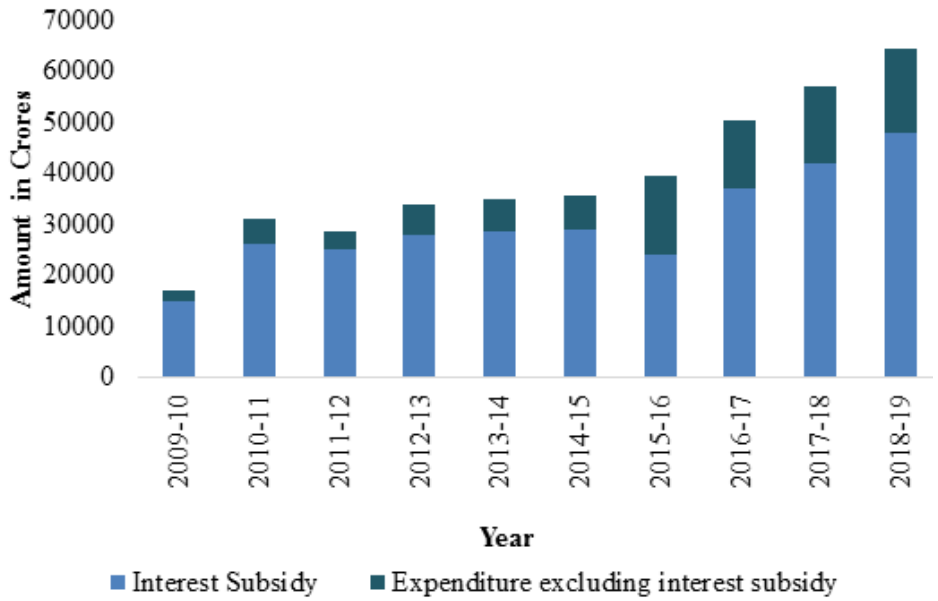

Figure 5: Year-wise expenditure of government over the subsidies

When a reality check was carried out between the allocated budget and actual expenditure it was observed that in 2017-18, the allocated budget was revised down by 1.5% (Figure 5). Between the tenure of 2009-10 and 2015-16, the actual expenditure was observed to be lesser than the budgeted expenditure, except for the years 2010-11 and 2016-17. Report of the standing committee on agriculture (2016) reveals that reducing allocated budget at the later stages may be a result of slow spending in the first two quarters of the financial year which reveals that there is no uniform distribution of funds and nor its release is uniform (Figure 6) (Hansen, 2016).

Figure 6: Deviation from budgeted expenditure

2.3.1 Departmental expenditure

About 82% of this allocated budget is proposed to be spent on five schemes. These are the Interest Subsidy Scheme (32%), Pradhan Mantri Fasal Bima Yojana (28%), Pradhan Mantri Krishi Sinchayi Yojana (9%), Rashtriya Krishi Vikas Yojana (8%), and National Mission of Horticulture (5%) because of which the other sections remained deprived of financial benefits.

A decline in the contribution of agriculture and allied sectors towards the country's economy has observed from 18.2% in 2012-13 to 16.5% in 2017-18. Furthermore, the growth in the agriculture sector has remained volatile over the past few years. In 2017-18, 2.1% of reduction in growth rate was observed in comparison to 2016-2017. Within the agriculture sector also, variation in the contributing share of the crop sector is observed which declined from 65% in 2011-12 to 60% by 2015-16.

Under-utilization of funds has also remained a matter of concern. The Standing Committee on Agriculture (2017) observed that funds under the PMKVY reduced drastically and continuously between 2012 and 2017. 70.43 million USD allocated to the scheme in 2016-17 and out of it 507.6 million USD were released. A shortfall of around 28% in the released amount was observed furthermore out of this released amount, only around 443.50 million USD was utilized. The committee also noticed that only 12 States have prepared state agriculture plans till February 2017 which is needed for the implementation of the scheme. 38% of district agriculture plans have been prepared so far which are needed to be approved on a priority basis without any further delay to avoid a reduction in the allocated amount at later stages (Rathi, 2018).

3.4. Analysis of government policies on agriculture: a reflective study

The Comptroller and Auditor General of India (CAG) in their 2015 annual report revealed that the total RKVY budget allocation from 2007-08 to 2011-12 was 4.9 billion USD. The expenditure acquired was 3.0 billion USD for the implementation of 7234 projects initiated under RKVY. The allocation ratio for the expenditure was observed to be 0.61 which revealed that they had an unutilized amount of 1.9 billion USD at the end of the 11th financial year programme. The maximum expenditure allocation ratio was identified as 0.72 in South India and the minimum ratio of 0.57 was noted in East and North East India (CAG Report, 2018).

CAG reported that 100 projects got abandoned in India and out of these 28 projects were in Andhra Pradesh, Kerala, Rajasthan, Sikkim and Uttar Pradesh. An in-depth analysis revealed that the major reason behind this is the non-availability of staff, non-viability of the project, improper release of funds, unresponsive behavior of beneficiaries and Ministry has already spent 17.6 million USD on these dropped projects which reflected that this money went in waste. In Punjab which is commonly called as the food basket of India, Ministry has released 5.81 million USD, which is slightly lesser than the total allocation of 11.73 million USD and this amount has also not been utilized so far. A similar movement of money was observed in Bihar, Telangana and Jharkhand. 99 million USD was found parked in personal ledger accounts in 11 States. CAG report revealed that expenditure of 13.84 million USD was found to be indulging in 50 projects in seven States without taking any prior permission from the State Level Sanctioning Committee (SLSC).

When PMKSY was analyzed, it was observed that the benefit of the scheme was restricted to only a few States and only 5 out of 16 projects were under implementation. The remaining 11 projects were yet to be commenced because of approval issues. These 5 projects were originally started during 1975-1983 which indicated that there exists an implementation delay for four decades. An audit also underlined the hidden facts behind these 5 projects and revealed that these projects have not yet achieved the stage from where the common man can be benefitted. CAG reported that the Government has initiated several schemes for promoting organic produce but ground truthing revealed that they have not provided a steady market to the farmers for this. There exists a threatening shortage of good quality organic input thereby enhancing risk towards loss of yield. Currently, the available quantity of organic fertilizers is far beyond the desired limits furthermore presence of spurious players in the market makes the situation more complicated. Ongoing supply chain in organic farming is underdeveloped and it is highly difficult for small scale farmers to access the market and they are deprived of financial benefits from the Government to improve the current scenario (CAG Report, 2018).

4. SWOT ANALYSIS OF INPUT IN INDIAN AGRICULTURE

Strength, weakness, opportunities and threats of various schemes and policies have been critically analyzed to understand the gap between policymakers and farmers (CAG Report, 2018; Ghosh, 2018; MIDH, 2018; Business standard, 2019).

Table 2: Evaluation of strength, weakness, opportunities and threats of Government initiated schemes

Strength	Weakness	Opportunities	Threat
Government subsidy bill on food, fertilizer, fuel is estimated to be enhanced by 13.32% to 39.35 billion USD in 2019-2020 to benefit a larger population	Improper/delayed drafting of agriculture plans	2,25,14,611 farmers have been benefitted from Direct Benefit Transfer	Under-utilization of fund, communication gap between Scheme agency and Ministry
RKVY incentivized the States to increase public investment in agriculture and allied sectors.	To RKVY 704 billion USD allocated in 2016-17, 507 million USD were released, out of this released amount only 443.5 million USD was utilized	10679 farmers in twelve selected sectors, 35000 farmers have been benefitted in drought compensation plan in 2014	According to the CAG report, the expenditure reported by the scheme is different from the expenditure reported by the Ministry
469 million USD (2018-2019) have been allocated only to RKVY	More than 55% of the projects were started after 2 years of the launch of the project. 80% of the total budget was concentrated on only 8 States.	RKVY is currently focusing on a limited number of the sector which can be further elaborated to provide benefits in other areas as well	CAG auditors said that the execution of projects was marked by administration delays, poor contact management, and improper monitoring.
In Anantapur, Andhra Pradesh 1,41,975 farmers have been benefitted with an average increase of 31.8 % in their annual income under Pradhan Mantri Krishi Sinchai Yojana	Most of these projects have not been completed till now and the majority of incomplete projects lies in Maharashtra face inordinate delays and allegations of corruption	19,17,952 farmers have been benefitted from 2016-17 to 2019-20	Capital intensive technology to elite farmers has created informal water markets and this has destroyed the Indian irrigation system. PMKSY contradicts the National Water Policy-2012, formulated by the Government itself
PMFBY is one of the World's largest crop insurance programs aimed at providing risk cover to Indian farmers from production vulnerabilities	80% of the claims have been availed by only 4 states. Bihar, Assam and North-eastern state lagged in availing the benefits of crop insurance leading to the mercy state of farmers of that particular region.	18,54,43,390 farmers have been benefitted from 2016-17 to 2019-20.	The scheme will continue to be on 'area approach basis'-village/village Panchayat for major crops and the area above that level for other crops. The individual farmers suffering losses are not going to be benefitted unless the entire area gets affected
Soil health card scheme resulted in a significant reduction in the use of Urea and DAP by 20-30% in paddy and cotton in some states.	There is no one method of treating the soil that applies to all farmers. The basic soil quality varies depending on the crop cycle, different soil treatments that affect the	21,24,98,902 Soil health cards have been distributed	Soil health card has been issued to certain farmers without even testing the soil of their farms. Same fertilizers are recommended for every farm of a region.

	micronutrients and the micro-fauna/flora		Chemical analysis for N, OC, P, K and micronutrients only indicate their availability without reflecting the soil fertility
PM Kisan Samman Nidhi Yojna support farmers whose income is insufficient for their sustenance	About 60% of eligible farmers are deprived of the benefits as the States have not added them to the list of beneficiaries.	2,60,00000 farmers during 2018-19 and 8,50,00000 during 2019-20 have been benefitted are more are getting registered to avail the benefits.	6.68 lakh payments failed while paying the first installment while 1.32 lakh failed during the second installment.

5. AN APPROACH TOWARDS DIGITALIZED AGRICULTURE: TRACEABILITY, AVAILABILITY AND TRANSPARENCY

Addressing the challenges in agriculture needs a transformation strategy rooted in technological advancement (Tinh *et al.,* 2019). The agriculture sector lags far behind in the adoption of technology, despite the urgent need to look for the solution to rectify the current issues as mentioned in previous sections of the article. Despite availability, there is unequal access to the solution. The concept of traceability, availability and transparency merged with updated technology may act as an effective measure to overcome the issues associated with agriculture.

Agricultural traceability indicated the compilation and maintenance of documents related to the supply chain process thereby ensuring the guarantee of product between producer and consumer. History of a product can be easily traced during the period of its crisis and the Government can have a better hold over its policies and schemes initiated for farmers' welfare and over the hoarding and wastage issues majorly responsible for it. Whereas agriculture transparency deals with the idea of affirmation of the quality of a product by determination of product certification at every step of the supply chain. This data is useful in ensuring, whether the Government's initiatives have been implemented as per the suggested directions or are getting extorted to benefit a specific section. When it comes to availability, it affirms the direct communication between the farmer and the Government regarding the availability and needs to produce thereby providing actual reimbursement of their labor and produce (Opara, 2003).

5.1. Proposed ICT based mechanism of traceability, availability, and transparency for sustainable agriculture

To overcome this issue, a team of Scientists in Patanjali Research Institute Haridwar, India is currently working on it and has prepared a proposed framework underlined as 'Information and communications technology (ICT) based mechanism of traceability, availability, and transparency for sustainable agriculture'. The proposed mechanism will act as a central repository body to keep farmers, consumers and Governmental bodies in one ring to develop a mirrored view between Government's initiatives for farmers, production, and consumption of agriculture products (Figure 7).

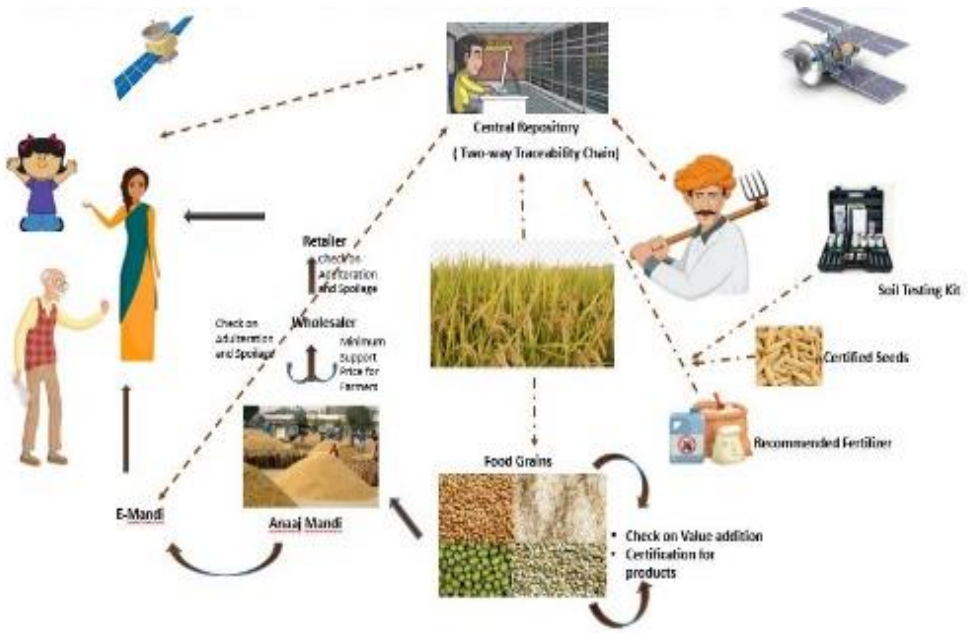

Figure 7: A digitalized mechanistic approach towards sustainable development

6. CONCLUSION

The country's economy plays a vital role in formulating it to be self-sufficient in food grains. The divergence between production and availability is reflected from weeping eyes due to hunger. Despite a significant hike in budgetary allocation for agriculture, the farmer's state has remained the same for several decades in the history of Indian agriculture. We have acutely monitored the agriculture status of India and found that there exists a massive gap between the Agriculture Ministry of India and a farmer, depicting the reason why the promises and dreams of Government remained unachievable probably due to insufficient hold over food hoardings, adulteration, and food wastage. Despite the initiation of more than 17 schemes at the National level and several others at the State level, the number of beneficiaries freezes to few restricted States and countable communities. Under-utilization of funds, improper/delayed drafting of agriculture plans, and communication gap between scheme agency and Ministry have remained a major reason for failure. CAG report revealed that several projects abandoned after the initiation due to non-viability of project, short release/non- availability of funds, the unwillingness of beneficiaries and because of which huge sum of money wasted which reflects the long tenure errors committed by policymakers after independence in shaping the schemes or policies of Indian agriculture. Absurdity made by Government needs to be rectified with immediate action against the impoverished state of farmers for the better growth of the Indian economy. The attempts initiated by the current Government to uplift the status of organic agriculture and permitting the farmer to directly relate their products with the consumer, are highly appreciable. We believe that the positive modifications made by the current policymakers will help to boost the economic status of Indian farmers and will prove as a boon for Indian agriculture in the coming future. Further, we emphasize the digitalized mechanistic approach for sustainable agriculture and to benefit the farmers.

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