

Gist of

# KURUKSHETRA

VOL.01

March 2019

## PERSPECTIVES IN RURAL DEVELOPMENT



### Agriculture

a Key Component of Rural Development

**Financial Inclusion**  
for Economic Security

**Infrastructure** for Rural Transformation

**Healthcare Interventions**  
for Rural India

**Maternal Nutrition in India**  
Policies and Programmes

# CSE 2018 Results

11 Ranks in Top 50

28 Ranks in Top 100

183 Ranks in the Final List



Rank 11  
Pujya Priyadarshni



Rank 16  
Dhodmise Trupti Ankush



Rank 21  
Rahul Jain



Rank 24  
Anuraj Jain



RANK 31  
Mainak Ghosh



RANK 32  
Sameer Saurabh



RANK 33  
Awhale Manisha  
Manikrao



RANK 36  
Deepesh Kedia



RANK 39  
Patil Hemanta Keshav



RANK 41  
Alok Kumar



RANK 43  
Akshay Agrawal



RANK 52  
Prateek Singh



RANK 53  
Sumit Kumar



RANK 56  
Dileep Mishra



RANK 59  
Chahat Bajpai



RANK 60  
Anya Das



RANK 61  
Girdhar



RANK 63  
Vishal Sah



RANK 65  
Preeti



RANK 70  
Suraj Patel



RANK 72  
Dilip Pratap Singh  
Shekhawat



RANK 76  
Akash Bansal



RANK 77  
Shivansh Awasthi



RANK 80  
Khushboo Gupta



RANK 81  
Jay Shivani



RANK 85  
Smit Santosh Lodha



RANK 89  
Sawan Kumar



RANK 94  
Jivani Kartik  
Nagjibhai



RANK 106  
Sushil Kumar

# Incredible Results Since 2013

## CSE 2017

5 Ranks  
in top 50

34 Ranks  
in top 100

236 Ranks  
in the final list



Rank 3  
Sachin  
Gupta



Rank 6  
Koya Sree  
Harsha



Rank 8  
Anubhav  
Singh



Rank 9  
Soumya  
Sharma



Rank 10  
Abhishek  
Surana

## CSE 2016

8 Ranks  
in top 50

18 Ranks  
in top 100

215 Ranks  
in the final list



Rank 2  
Anmol Sher  
Singh Bedi



Rank 5  
Abhilash  
Mishra



Rank 12  
Tejaswi  
Rana



Rank 30  
Prabhash  
Kumar



Rank 32  
Avdesh  
Meena

## CSE 2015

5 Ranks  
in top 50

14 Ranks  
in top 100

162 Ranks  
in the final list



Rank 20  
Vipin Garg



Rank 24  
Khumanthem  
Diana Devi



Rank 25  
Chandra  
Mohan Garg



Rank 27  
Pulkit Garg



Rank 47  
Anshul  
Agarwal

## CSE 2014

6 Ranks  
in top 50

12 Ranks  
in top 100

83 Ranks  
overall selections



Rank 4  
Vandana Rao



Rank 5  
Suharsha Bhagat



Rank 16  
Ananya Das



Rank 23  
Anil Dhameliya



Rank 28  
Kushaal Yadav



Rank 39  
Vivekanand T.S

## CSE 2013

5 Ranks  
in top 50

62 Ranks  
in the final list



Rank 9  
Divyanshu Jha



Rank 12  
Neha Jain



Rank 23  
Prabhav Joshi



Rank 40  
Gaurang Rathi



Rank 46  
Udita Singh

# KURUKSHETRA – MARCH 2019 ISSUE

## PERSPECTIVES IN RURAL DEVELOPMENT

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## Chapter 1: Introduction

Rural development has gained momentum in recent times by way of financial inclusion which is of vital importance in providing economic security to individuals and families in rural India. Access to loans, savings, insurance, payments and remittance facilities to rural people at affordable cost has certainly catalyzed the process of economic transformation in rural India.

### Facilitating rural economic growth:

- For sustained rural economic growth, it is essential to develop rural infrastructure.
- Several rural infrastructure initiatives have been undertaken in the field of irrigation to create irrigation potential and expansion of installed capacity.
- Steps have been taken to improve rural drinking water infrastructure for successful operation of drinking water supply schemes in rural areas.
- Rural sanitation infrastructure has also got a tremendous boost.
- In power sector, sustained efforts have yielded in improvement of quality of power supply and power accessibility in rural areas.
- Rural connectivity is a key component of rural development and poverty alleviation in India.
  - The main mechanism for enhancing rural connectivity in a more systematic way has been the Pradhan Mantri Gram Sadak Yojana (PMGSY).
  - Recent initiatives have resulted in connecting eligible rural habitations by way of single all weather roads.
  - Time is not far when agricultural and rural markets, schools and health care centres in rural areas will be connected.
- The progress in provision of rural housing and inclusion of excluded eligible beneficiaries under the rural housing projects will go a long way in fulfilling the dream of rural people to have their own pucca houses with all facilities.
- Rapid revolution in communication sector has the potential to provide rural folks, the required digital communications infrastructure and affordable services.
- For empowering rural India in health care, the National Health Policy is envisioned to bring Healthcare system closer to the homes of people.

Mahatma Gandhi laid emphasis on the fact that India lived in villages and only through their salvation India could regain her glory and prosperity. The path of rural development India has adopted aims at making villages self-sufficient in the matters of their vital requirements and easy availability of means of production of the basic necessities of life.

## Chapter 2: Agriculture – a Key Component of Rural Development

- The agriculture sector has been facing several challenges. The economic survey (2017-18) states, “the last few Seasons have witnessed a problem of plenty: farm revenues declining for a number of crops despite increasing production and market prices falling below the minimum support prices (MSP)”.
- To meet the challenges faced by the agriculture sector and improving the economic condition of the farmers, an inter-ministerial committee has been constituted under the chairmanship of chief executive officer, National rainfed area authority, department of agriculture, cooperation and farmers welfare to examine issues relating to doubling the farmers income in real terms by 2022.
- The committee has identified the following sources of income growth –
  1. Improvement in crop and livestock productivity
  2. Resource use efficiency or savings in the cost of production
  3. Increased cropping intensity
  4. Diversification towards high value crop
  5. Improvement in real prices received by farmers
  6. Shift from farm to non-farm occupations.
- The committee is also looking into the Investments in and for agriculture - increasing public investments for agriculture-rural roads, rural electricity, irrigation; the need for policy support to enable investment by corporate sector in agriculture.

### Efforts taken by the government in doubling farmer’s income:

#### Hike in MSP:

- The Minimum Support Prices have been increased for all notified Kharif and Rabi crops and commercial crops for the season 2018-19.
- A return of at least 50% over cost of production is ensured.

#### PM-AASHA:

- Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) is an umbrella scheme that provides for a holistic arrangement for assurance of a remunerative and stable price environment for growers/farmers to increase agricultural production and productivity.
- This scheme comprises the price support scheme for pulses & oilseeds, Price Deficiency Payment Scheme & Pilot of private procurement and stockiest scheme for oilseeds to ensure MSP to the farmers.

#### e-NAM:

- National Agriculture Market or eNAM is an online trading platform for agricultural commodities in India.
- All the regulated markets have been linked electronically.
- The market facilitates trade between farmers, traders and buyers with online trading in commodities.
- The market helps in better price discovery and provides facilities for smooth marketing of their produce.

#### PMBFY:

- The Pradhan Mantrj Fasal Gima Yojana (PMFBY) was launched in 2016 after rolling back the earlier insurance schemes - National Agriculture Insurance Scheme (NAIS), Weather-based Crop Insurance scheme and Modified National Agricultural Insurance Scheme.
- Under the PMFB' farmers pay a uniform premium of just 2 per cent for the more rain-dependent kharif crops and 1.5 per cent for all rabi crops.
- The remaining share of the premium is borne equally by the Centre and the respective State Governments.

#### PM-KISAN:

- To provide an assured income Support to the small and marginal farmers, 'Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) programme has been launched.
- Under this programme, vulnerable landholding farmer families, having cultivable land upto two hectares, will be provided direct income support at the rate of Rs 6,000 per year.
- Around 12 crore Small and marginal farmer families are expected to benefit from PM-KISAN.
- Under the programme the income support will be transferred directly into the bank accounts of beneficiary farmers in three equal instalments of Rs 2,000 each.
- This programme would not only provide assured supplemental income to the most vulnerable farmer families, but would also meet their emergent needs especially before the harvest season.

#### Kisan Credit Cards:

- Issuing Kisan Credit Cards to Animal Husbandry and Fisheries farmers was a significant measure towards expanding the credit outreach amongst those farmers who are engaged in agri-allied activities.
- Those who have KCCs get agricultural credit at reduced interest rate of 7% per annum while Agriculture Ministry implements an interest subvention scheme for short term crop loans upto Rs. 3 lakh.
- Under the subvention scheme, additional subvention of 3% is given to those farmers who repay their short term crop loan on time, thus reducing the effective rate of interest only to 4% per annum.

## Chapter 3: Financial Inclusion for Economic Security

Financial Inclusion means, the delivery of financial services including banking and credit at an affordable cost to vast sections of disadvantaged and low income groups who tend to be excluded. Components of financial inclusion include access to savings, loans, insurance, payments and remittance facilities offered by the formal financial system.

- Among the key Financial Services that are of great relevance here, are risk management or risk mitigation vis-a-vis economic shocks, may be an income shock due to adverse weather conditions are natural disasters, or an expenditure shock due to health emergency or accidents, leading to a high level of unexpected expenditure.
- This aspect of financial inclusion is of vital importance in providing economic security to individuals and families especially in rural India.

### Evolution of financial inclusion:

- The measures for financial inclusion started way back in 1904, but with the advent of cooperative movement, further in 1969 with the nationalization of major banks in India the issue got real impetus in 2008, when the committee on financial inclusion, headed by Dr. C Rangarajan was formed by RBI.
- The Reserve Bank of India has been complementing the government's efforts through its numerous initiatives like introduction of priority sector lending requirements for banks, establishment of regional rural banks (RRBs), self-help group-bank linkage programme to extend the financial services to the poor and marginalized segments of the society.
- The Government of India and Indian Bank's Association, in the beginning of 2011, jointly launched 'Swabhiman' to bridge economic gap between rural and urban India. It aimed at ensuring availability of banking facility within the reach of every village with a population of over 2000 by the end of March, 2012.
- This gained a momentum with the Pradhan Mantri Jan Dhan Yojana, aiming at ensuring universal access to bank facilities, increase in the level of financial literacy and providing access to credit, insurance and pension services as well.
- RBI also undertook some measures to augment financial inclusion, such as –
  - Granting in-principle approval to the largest Micro Finance Institutions in India to commence banking operations, Permitting Non-banking Financial Companies to act as business correspondence for banks,
  - Issuing guidelines on differentiated banking licenses for a Small Banks and Payments Banks based on the recommendations of the committee on Comprehensive Financial Services for Small Business and low income households.
- NABARD launched Self Help Group-Bank linkage programme in 1992 as an alternative credit delivery mechanism for reaching the unreached.
- Like self-help groups (SHGs), the scheme of joint liability groups (JLG) is yet another institutional invention introduced in India with a view to enable landless/tenant farmers, oral lessees, secure collateral-free loans and productive purposes from the banking system, just on the basis of joint undertaking by all the members of the group.
- In January 2006, The Reserve Bank of India, on the recommendations of Khan Commission, permitted banks to employ two categories of intermediaries - Business Correspondence (BCs) and Business Facilitator (BFs). Scheduled commercial banks including regional rural banks (RRBs) and local area banks (LABs) were permitted to use the services of these agents in



providing financial and banking services throughout the country, especially in remote areas.

- Subsequently, PMJDY – a National Mission on Financial Inclusion encompassing an integrated approach to bring about comprehensive financial inclusion of households was introduced.

#### Recent developments:

- Ministry of Finance and National Informatics Centre (NIC) jointly developed a mobile app called Jan Dhan Darshak with a view to enable common people in locating a financial service touch-point.
- Direct Benefit Transfer that aims to transfer subsidies directly to the people through their bank accounts has been introduced.
- Payments Bank is a model of banks conceptualized by RBI which came just weeks after the PMJDY. It primarily focuses at enhancing financial inclusion drive by widening the spread of payment and financial services to small businesses, low-income households, migrant workforce in a secured Technology-driven environment.
- M-banking has also played a significant role.
- In view of the changes that have taken place in the financial sector over the years, RBI constituted a Committee of Executive Directors of the world to study the efficacy of the Lead Bank scheme.
- Twenty public sector banks and one private sector bank have been assigned Lead Bank responsibility in 714 district across the country.
- In order to have a planned and structured approach to financial inclusion, banks have been advised to prepare Board-approved financial inclusion plans, capturing their achievements on all parameters.
- The National Strategy for Financial Inclusion document is being finalized under the aegis of Financial Inclusion Advisory Committee to take forward the momentum.

#### Conclusion and way forward:

- The World bank's latest Global Findex data proves that India has made rapid strides in improving access to formal financial Services.
- Today more than 80 percent adults have a formal bank account. At the same time, it has cut its gender gap in financial access from 20 percentage points to six.
- PMJDY has opened more than 100 million new bank accounts, more women have been enrolled.
- The mobile phone is still the most promising empowerment tool for financial inclusion.
- Gender gap in basic access needs to be eliminated while increasing usage among all customers by making financial services more digital, flexible and relevant.
- There is an acute need for developing next generation payment systems which have a user friendly interface and local language.

## Chapter 4: Infrastructure for Rural Transformation

Around 69% of India's population lives in the rural areas. Large magnitude of the rural population, their prevailing socio-economic conditions and the quality of life calls for an all-round development in rural infrastructure to achieve the objectives of equitable and inclusive growth with Social Justice.

### Steps taken for Rural Infrastructure development and transformation:

- ❑ A specific rural infrastructure program called 'Bharat Nirman' was launched as a time-bound business plan.
- ❑ The six components included under the program are irrigation, drinking water, electrification, roads, housing and rural telephony.

The government has continued to lay focus on creation of rural infrastructure through development plans and other subject specific schematic interventions.

### Irrigation Infrastructure:

- ❑ Creation of irrigation potential and expansion of installed capacity have been important policy objectives of India's development planning.
- ❑ During 2016-17, 99 on-going major/medium Irrigation projects were prioritized for early completion under Pradhan Mantri Krishi Sinchai Yojana (PMKSY)- Accelerated Irrigation Benefits Program.
- ❑ The per capita water availability in India is reducing progressively due to increase in its population. This calls for an integrated water conservation and user-interface irrigation scheme for ensuring maximum water use efficiency.
- ❑ The full utilization of irrigation potential requires actions such as:
  1. Timely completion of field channels and drains
  2. Appropriate land leveling and shaping
  3. Involvement of farmers in taking decisions on usability of created potential.

### Rural drinking water supply:

- ❑ The National Rural Drinking Water Programme (NRDWP)'s concerted focus on the creation and sustaining the rural drinking water infrastructure resulted in the development of infrastructure and capacities for successful operation of drinking water supply schemes in rural areas.
- ❑ India's long term goal is to achieve 'Har Ghar Jal' by 2030, in line with the UN's sustainable development goals i.e., providing safe and adequate drinking water to each rural household.
- ❑ The challenge before the government is to ensure:
  - Safe drinking water in the slipped back habitations through the vigorous restoration and defunct bore pumps, carrying out repairs to water supply pipelines, augmentation of supply wherever required; and
  - Sustainability of quality water supply to initiatives already covered under one or other schemes.
- ❑ The way ahead is to ensure convergence of various rural development initiatives of like Mahatma Gandhi National Rural Employment Guarantee Act, watershed development, Restoration of water bodies etc.) backed by a need based village level water planning and budgeting.

### Rural Sanitation:

- ❑ The world's largest behavioural change movement was planned and executed through India's

### Swachh Bharat Mission (SBM).

- ❑ With concerted efforts of the Government and civil society as change makers India could achieve 98% rural sanitation coverage.
- ❑ The holistic programme has somewhat succeeded in changing the mind-set of citizens by ensuring people's participation.

### Rural Electrification:

- ❑ The Government has launched Prime Minister Saubhagya Yojana for providing electricity to all households of the country, in addition to Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY).
- ❑ To ensure quality and sustained power supply in rural areas, there is a need to switch-over from free or subsidy-driven power distribution system to a competitive user-based revenue collection and sharing model.
- ❑ The time has come to ensure active involvement of grass-root Institutions like Panchayati Raj Institutions (PRIs), Non-government organizations (NGOs), Cooperative, etc. in revenue collection, local management, operation and maintenance of power infrastructure in rural areas to assure quality and sustainable supply of electricity.

### Rural Roads:

- ❑ Pradhan Mantri Gram Sadak Yojana (PMGSY) is a one-time special intervention provides rural connectivity, by way of single all-weather road, to the eligible unconnected habitations in the core network.
- ❑ Since all the eligible rural habitations have been connected, the need of the hour is to strengthen and widen its ambit further to include major link routes which connect habitations to agricultural and rural markets, higher secondary schools and hospitals-health centers.

### Rural Housing:

- ❑ Pradhan Mantri Awas Yojana-Rural (PMAY-R) came into effect to fulfill the government's vision of "Housing for all by 2022".
- ❑ The scheme framework allows inclusion of the beneficiaries not covered under socio-economic caste census.
- ❑ It provides for a separate beneficiary list to be recorded in the gram sabha resolution.
- ❑ While the physical progress in the provision of rural housing and initiatives for inclusion of excluded eligible beneficiaries under rural housing projects is laudable, for effective implementation of the scheme, the beneficiaries need to actively participate throughout the construction process.

### Rural Telephone Connectivity:

- ❑ India is trying to transform herself as a digitally empowered society by meeting the information and communications needs of citizens and enterprises.
- ❑ This is possible only when universal, strong and affordable digital communications infrastructure and services are established.
- ❑ The country has witnessed a rapid expansion of telecommunication in the last decade.

- ❑ To provide every Indian village with telephone access and to cover difficult areas, additional mobile towers have been sanctioned.
- ❑ Efforts are also being made to install towers for National Highways to strengthen transmission network.
- ❑ The BharatNet project aims at creating network to connect all 2.5 lakh Gram Panchayat by broadband connectivity.

#### Conclusion:

Considering the implementation issues and challenges of execution of these plans and programmes at the grass-root level, it is expected that the program implementing agencies would bring in good governance and follow best practices to maximize the benefits of such development intervention.



## Chapter 5: Healthcare Interventions for Rural India

- The national health policy (NHP) 2017 of India aimed to provide Preventive and Promotive Healthcare and Universal access to good quality healthcare services through the mix of public and private healthcare services.
- It expressed its vision for Universal health coverage and creating affordable and quality healthcare for all.
- The policy assures availability of free, comprehensive primary healthcare services, for all aspects of reproductive, maternal child and adolescent health and for the most prevalent communicable, non-communicable and occupational diseases in the population. It also talked about reinforcing trust in public health care system.
- The emphasis is on establishing the 'continuum of care', for delivery of health services to protect health of women and children in an integrated manner at all life stages such as adolescence and reproductive age, pre and post-natal period and early childhood.
- It is planned that Healthcare services should cover all levels of healthcare systems to reach out to rural population at household level, community and village level through ASHA, ANM, AWW and Ayushman Mitra.
- Health and wellness centres are planned to be created in a phased manner to cover outpatient and inpatient healthcare facilities.

### Key Initiatives and Interventions:

#### Ayushman Bharat:

- As part of Ayushman Bharat programme, two major initiatives in health sector i.e, Health & Wellness centres and National Health protection scheme (NHPM) have been taken.
- Health and Wellness centres:
  - Health and Wellness centres will bring Healthcare system closer to the homes of people.
  - Also these centres will provide comprehensive Healthcare, including for non-communicable diseases and maternal and Child Health Services, free essential drugs and Diagnostic services.
  - Contribution of private sector through corporate social responsibility (CSR) and philanthropic institutions in adopting these centres is also envisaged.
- National Health protection scheme:
  - This will cover over 10 crore poor and vulnerable families providing coverage upto 5 lakh rupees per family per year for secondary and tertiary care hospitalization. The benefit also includes pre and post hospitalization expenses.
  - It is planned to have an 'Ayushman Mitra' to assist patients and co-ordinate with beneficiaries and the hospital in each empanelled public and private hospital.

#### The National Nutrition Mission:

- **The NNM** is comprehensive approach towards raising nutrition level in the country.
- NNM targets to reduce stunting, under-nutrition, Anaemia (among young children, women and adolescence girls) and reduce low birth weight by 2 per cent, 2 percent, 3 per cent and 2 per cent per annum respectively.
- Although the target to reduce stunting is at least 2 percent p.a., mission would strive to achieve reduction in a stunting from 38.4 per cent (NFHS-4) to 25 per cent by 2022 (mission 25 by 2022).

### Poshan Abhiyaan:

- ❑ This is based on convergence and collaboration of all important sector considered to be important for healthy growth of the child for first 1,000 days.
- ❑ Thus it covers all schemes Beti Bachao Beti padhao, Swachh Bharat, Adolescent care, Prenatal and postnatal care, Supplementary Nutrition, Breast Feeding counseling, Immunization, growth monitoring.
- ❑ Under portion Abhiyan, the government has fixed targets to reduce stunting, under-nutrition, Anaemia (among young children, women and adolescent girls) and reduce low birth weight.
- ❑ Mission also strives to achieve reduction in the stunting from 38.4 percent (NFSHS-4) to 20 per cent by 2022.
- ❑ In this programme, greater flexibility is given to States for better implementation, and incentives for good performance are also to be provided to states and districts.

### Scheme for adolescent girls (SAG):

- ❑ SAG was devised in the year 2010 using the ICDS infrastructure.
- ❑ It aims at breaking the inter- generational life-cycle of nutritional and gender disadvantage thus providing a supported involvement for self-development of adolescent girls.
- ❑ Realizing the multi-dimensional needs of out of a school Pre-adolescent girls (11-14years) and with an aim to motivate these girls to join a school system, the government approved implementation of restricted schemes for adolescent girls (SAG) to focus on out of a school adolescent girls in the age group of 11-14 years.
- ❑ It is to be implemented using the platform of Anganwadi Services of Umbrella ICDS schemes through aganwadi centres (AWCs).
- ❑ The key objective of the schemes is to facilitate, educate and empower adolescent girls so as to enable them to become self-reliant and aware citizens.
- ❑ The scheme covers two components:
  - First is Nutrition component in which is out of the school AGs in the age group of 11-14 years registered under the scheme will be provided supplementary nutrition similar to that of pregnant women and lactating mothers under ICDS.
  - Nutrition will be given in the form of Take of Home Ration (THR) or hot cooked meals (HCM) whichever is feasible.
  - The second component is Non-Nutrition Component. This a scheme aims at motivating out of school girls in the age group of 11-14 years to go back to formal schooling or a skill training under non-nutrition component of the scheme.

### Pradhan Mantri Matru Vandana Yojana:

- Maternity Benefit programme is implemented from January 2017, in all the district of the country.
- Under PMMVY, a cash incentive of Rs. 5,000/- is provided directly to bank/post office account of pregnant women and lactating mothers for first living child of the family subject to fulfilling a specific conditions relating to maternal and child health.
- PMMVY is implemented through a centrally deployed web based MIS software application and the focal point of implementation would be the Anganwadi centre (AWC) and ASHA/ANM workers.

- Beneficiaries taking services from private hospitals cannot avail the benefit of the scheme.

#### Way Forward:

- To assess the standards of Public Health Services, government developed Indian public health Standards (IPHS) and all the healthcare facilities should be monitored and regulated according to these standards.
- For effective implementation of Ayushman Bharat programme, the presence of public and Private Health care services in equitable manner is needed.
- The Primary Health Care program which gives a special emphasis on preventive and promotive services is the backbone of India's health system.
- The Gram Panchayats being the most important unit of local government, must be engaged in decision making through capacity building programme in order to create more empowered communities.

## Chapter 6: Maternal Nutrition In India -Policies and Programmes

Maternal malnutrition in low-income and middle income countries encompasses both under nutrition and a growing problem with overweight and obesity. Maternal undernutrition is a significant risk factor for stunting and underweight among children. Inadequate nutrient intake, early and multiple pregnancies, poverty, gender inequality, all contribute to poor maternal nutrition.

- The national nutrition strategy launched in 2017 envisages a ‘Kuposhan Mukht Bharat’ - linked to Swachh Bharat and Swasth Bharat focusing on improving health care and nutrition of most vulnerable and critical age groups.
- POSHAN Abhiyan, a flagship programme of Ministry of Women and Child Development (MWCD) covers all schemes Beti Bachao Beti padhao, Swachh Bharat, Adolescent care, Prenatal and postnatal care, Supplementary Nutrition, Breast Feeding counseling, Immunization, growth monitoring.
- The National Nutrition Mission is a comprehensive approach towards raising nutrition level in the country.
- The Integrated Child Development Scheme (ICDS) and National Health Mission (NHM) are two largest platforms that address maternal nutrition.

| Existing platforms for maternal nutrition interventions                                       |   |  |
|---|---|--|
| Intervention  | Target Population   | Platform   |
| <b>Micronutrient supplementation</b>  |   |  |
| IFA supplementation<br>Calcium supplements  | Pregnant women, Adolescent girls & Out-of-school adolescent girls   | ASHAs, Primary health system, ICDS Secondary schools, ICDS ANM, Primary health system        |
| <b>Food-based strategies</b>  |   |  |
| Take-home food rations  | Pregnant women, lactating women and adolescent girls  | ICDS, SABLA scheme   |
| Hot meals   | Primary school children   | ICDS, Government primary schools   |
| Distribution of fortified wheat flour   | Households (selected state and districts)   | PDS  |
| Distribution of double fortified salts  | Households (selected state and districts)   | PDS  |
| <b>Growth Monitoring</b>  |   |  |
| Weight monitoring in pregnancy  | Pregnant women  | Primary Health System ICDS   |
| <b>Education and Counselling</b>  |   |  |
| Diet and prevention of Anaemia<br>Adolescent health and hygiene<br>Women's health and hygiene | Pregnant women, Out-of-school adolescent girls, adolescent girls<br>Mother of 0-2 yr children, pregnant women<br>Out-of-school adolescent girls<br>Poor women | ICDS, Secondary Government Schools<br>ASHA, primary health system<br>ICDS<br>Self-Help Group |

### Maternal Anaemia:

- ❑ Anaemia is a significant health problem in India, especially among women, adolescent girls and children.
- ❑ At least half of all women in India are anaemic, regardless of age, residence or pregnancy status



with little or no change.

- ❑ India first launched a nationwide program for the prevention of anaemia among pregnant women in fourth five year plan (1969-74).
- ❑ In 2016-17, to bring Synergy in the existing iron supplement programs and schemes, Ministry of Health and Family Welfare developed the national iron + initiative that embraced all the programs across all population categories for addressing anaemia.
- ❑ The distribution of IFA supplements to pregnant woman has been part of the national policy for the prevention and treatment of maternal anaemia since the 1970s.
- ❑ Recently launched Anaemia Mukh Bharat campaign is planned to strengthen evidence-based strategies.

### Improving Diet of Pregnant Women At Home And Supplemental Food

- Under the national food security act, 2013 subsidized staple food under targeted Public Distribution system is provided to 50 per cent of the urban and 75 per cent of the rural population.
- In addition to the food through TPDS, supplemental food is provided to pregnant woman on a weekly basis as a take home ration (THR) or hot cooked meal (in few States) at Anganwadi centres as part of Integrated Child Development Services scheme.
- According to NHFS-4, 51.5 per cent of pregnant women in areas within anganwadi Centre received supplementary food and even fewer women (47.5 percent) received supplemental food during lactation. Key reasons for the poor coverage and consumption were:
- Intra-household distribution of THR. Many women reported sharing the THR with other family members.
- Poor quality of THR has been cited by many woman in various reports.
- Inadequate access to AWC services by poor families due to workload and distance has also affected the uptake of THR.
- In India, Janani Suraksha Yojana (JSY) pays Rs. 1,400 two women for institutional delivery and pay Rs. 600 to Asha for each woman they bring to a health facility for delivery.
- Pradhan Mantri Matru Vandana Yojana(PMMVY), is for all pregnant women and lactating mothers.

### Addressing Social Determinants:

- ❑ Cultural practices of early marriage lead to conception and delivery of children at a time of the lives when they are most at risk for low BMI.
- ❑ There are a range of programs addressing the issue of early marriage but a very few programs specifically focus on this.
- ❑ Family planning services till lately emphasized societal benefits of family planning (e.g., population control) rather than individual/family benefits (e.g., better health and nutrition of mother and children).
- ❑ Government policy and cultural factors (e.g., strong preference for boys and pressure on newly married couples to demonstrate fertility) are some important reasons why the majority of couples really on permanent rather than temporary contraceptive methods.
- ❑ As the problem is multifactorial a multi-pronged strategy is needed.

### Schemes for improving status of Adolescent Girls

| Scheme  | Year    | Platform | Target group                    | Objective   |
|---|---------|----------|---------------------------------|---|
| Adolescent girls scheme and Kishori Shakti Yojana             | 2000    | WCD      | 11-18 years                     | Impart vocational skills and provide nutrition & health education   |
| Nutrition Programme for Adolescent Girls (NPAG)               | 2002-03 |          |                                 |   |
| SABLA   | 2010    | WCD      | 11-18 years                     | Replaced KSY and NPAG provide <ul style="list-style-type: none"> <li>• Supplementary nutrition-600 calories, 18-20 grams of protein and micronutrients per day</li> <li>• IFA tablets</li> <li>• Health check-ups every 3 months</li> <li>• Life skills education</li> <li>• Vocational training</li> </ul> |
| Support to Training and employment programme for women (STEP) |         | WCD      | Age group of 16 years and above | Provide skills to give employability  |
| Beti Bachao Beti Padhao                                       |         | WCD      |                                 |   |

## Chapter 7: Connectivity: Transforming Rural India

The Infrastructure is the backbone of any nation's development and quality of life. India in the 21<sup>st</sup> century must strive to meet the aspirations of its citizens where benefits and services reach the door steps of citizens and contribute towards a long lasting positive impact.

### Steps taken by the government:

- Digital India program: aims to transform India into a digitally empowered society and knowledge economy by leveraging IT as growth engine of new India.
- One of the focus areas of digital India program is to promote digital literacy.
- The government envisages making at least one person e-literate in every household.
- Common Service Centres (CCSs): act as access point for delivery of various electronic services to villages in India.
- The post offices are also being made multi service delivery points and all the CSCs services can be delivered to Citizen through the post offices. Postal department has also got a payment Bank license.
- CSC will be provided access to Beneficiary Identification System (BIS), which helps in confirming application form entitled beneficiaries using SECC and RSBY databases.
- DigiGaon or Digital Village: is conceptualized as a connected village where citizens can avail various e-services of the central and state governments, and private players in rural and remote villages in the country.
- These DigiGaons are projected to be change agents, promoting rural entrepreneurship and building rural capacities and livelihoods through community participation and collective action.
- National Health Agency (NHA) which is the apex body for implementation of Ayushman Bharat - National Health Protection Mission (AB-NHPM) and Common Service Centres (CSC) scheme under the digital India program have signed a MoU to provide information and eligibility validation services to beneficiaries, especially in remote areas.
- Under 'Saubhagya Yojana', free electricity connection is provided to households.
- By March 2019, all willing families will get electricity connection.
- Rural electrification Corporation (REC) has been designated as its nodal agency for the saubhagya scheme.
- Pradhan Mantri Gram Sadak Yojana (PMGSY) aims at providing all weather road connectivity to the eligible unconnected habitations in rural areas of the country.
- The BPO movement is slowly making inroads to smaller towns to create employment opportunities and promote IT-ITeS industry and aims to secure a balanced regional growth.

### The Vision Areas of Digital India:

#### Infrastructure as utility to Every Citizen:

- High speed internet as core utility shall be made available in all Gran Panchayats.
- Cradle to grave digital identity –unique, lifelong, online and authenticable.
- Mobile phone and Bank account would enable participation in digital and financial space at individual level.
- Easy access to a Common Service Centre within their locality.

- Shareable private space on a public Cloud.
- Safe and secure Cyber-space in the country.

Governance and Services on Demand:

- Seamlessly integrated across departments or jurisdictions to provide easy and a single window access to all persons.
- Government services available in real time from online and mobile platforms.
- All citizen entitlements to be available on the Cloud to ensure easy access.
- Government services digitally transformed for improving Ease of Doing Business.
- Making financial transactions above a threshold, electronic and cashless.
- Leveraging GIS for decision support systems and development.

Digital Empowerment of Citizens:

- Universal digital literacy.
- All digital resources universally accessible.
- All Government documents/certificates to be available on the Cloud.
- Availability of digital resources/services in Indian languages.
- Collaborative digital platforms for participative governance.
- Portability of all entitlements for individuals through the Cloud.

## Chapter 8: Initiatives to Empower Rural Youth

Providing employment, securing livelihoods and improving incomes of people are among the most critical developmental outcomes that governments across boards try to achieve. The growth potential through demographic dividend depends upon shifting labour force from agriculture. The need of the hour is skilling large number of young labour force to benefit from the changing market and production structure. India can be the hub for other countries for their outsource work and manufacturing, provided India improves its education system imparting right training and skills to the labour force.

### Initiatives taken by the Government for Empowering Rural Youth:

#### 1. Mudra Yojana:

- MUDRA Yojana is a scheme to extend collateral free loans by Banks, Non- Banking Financial Companies (NBFCs) and Micro Finance Institutions (MFIs) to Small/Micro business enterprises and individuals in the non-agricultural sector to enable them to setup or expand their business activities and to generate self-employment.
- The scheme seeks to enhance employability and self-employability of youth in India, in addition to protecting the NBFCs lending to small businesses in the country.

#### 2. Pradhan Mantri Kaushal Vikas Yojana (PMKVY):

- PMKVY is a flagship program of the Ministry of Skill Development and Entrepreneurship.
- It is aimed at improving vocational skills of youth.
- Under the program, skill training would be done based on the National Skill Qualification Framework (NSQF) and industry led standards.
- Under the scheme, a monetary reward is given to trainees on assessment and certification by third party assessment bodies.
- The average monetary reward would be around Rs.8000 per trainee.
- Individuals with prior learning experience or skills are also assessed and certified under Recognition of Prior Learning (RPL)
- Short-term training, Kaushal and rozgar melas, placement assistance are among the key components of the scheme.

#### 3. Start Up India:

- It is a flagship initiative launched by the Government of India in 2016 to build a strong ecosystem for nurturing innovation and startups in the country which will drive economic growth and generate large scale employment opportunities.
- The Government through this initiative aims to empower startups to grow through innovation and design.
- The Standup India scheme was launched on 5th April, 2016 to facilitate bank loans from Scheduled Commercial Banks (SCBs) between Rs.10 lakh to Rs.1 Crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) and one woman per bank branch for setting up a greenfield enterprise in trading, services or manufacturing sector.
- The scheme is expected to benefit at least 2.5 lakh borrowers

#### 4. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):

- The Act came into force initially in 200 districts, and was extended gradually to other areas notified by the Central Government.
- This is one of the continuing flagship programs of the Government to provide minimum number of days of employment to rural people including youth.

#### 5. Deen Dayal Upadhyay Gramin Kaushal Yojana (DDU-GKY):

- The scheme caters to rural youth employment opportunities.
- One positive attitude towards this initiative is that the funds are disbursed through a digital voucher directly into the qualified applicant's bank account.
- It seeks to reposition rural India as a resource that can support the needs of global manufacturing industry.

#### 6. Self-Employment and Talent Utilization (SETU) :

- It is a techno- financial, incubation and facilitation programme to support all the aspects of start-up business and other self- employment activities, particularly in technology-driven areas.

#### 7. Self- employment in Horticulture:

- It provides funds up to 10 lakhs for starting-up a horticulture farms.
- The scheme has enhanced horticulture production, improved nutritional security and income support to farm households and others; has established convergence and synergy among multiple on-going and planned programmes for horticulture development.
- The scheme has also helped in generating employment for skilled and unskilled persons, especially unemployed youth.
- 

#### 8. National Rural Livelihood Mission (NLRM)/ Aajeevika:

- National Rural Livelihood Mission (NRLM) is a poverty alleviation project implemented by Ministry of Rural Development,
- This scheme is focused on promoting self-employment and organization of rural poor. The basic idea behind this programme is to organize the poor into SHG (Self Help Groups) groups and make them capable for self-employment.
- The scheme was succeeded by Deen Dayal Antyodaya Yojana on 25 September 2015.

#### 9. Sampoorna Grameen Rozgar Yojana:

- This scheme of the Ministry of Rural Development provides additional wage employment in the rural areas and thereby providing food security and improved nutritional levels.

#### 10. Swarnjayanti Gram Swarozgar Yojana (SGSY):

- It was introduced by the Ministry of Rural Development to assist the poor families living below the poverty line in rural areas for taking up self-employment.
- This Central Government funded scheme helps users in providing information and guidelines for setting up the Haats, credit related issues, etc.

Steps for Small and Medium Enterprises:

MSMEs are employment intensive and backbone of Indian Economy. They have a great role to play for 'Make in India' to succeed.

- There are very specific initiatives taken by the Government in the recent years to help SMEs which would provide employment opportunities to rural youth.
- There has been enhanced disbursement of funds for the MSME sector.
- The Ministry of MSME set up an online portal – MSME Samadhaan aimed at monitoring cases of delayed payments to SMEs and enforcing provisions under the MSMED Act, 2006.
- A mandatory online census of MSME is taking place following the launch of web-based MSME Databank.
- In January 2016, Ministry of Textiles introduced 'Amended Technology Upgradation Fund Scheme' with provision of one time capital subsidy for eligible benchmarked machinery.
- Scheme of Solar Charkha Mission proposes to harness non-conventional solar energy to further promote employment generation.

## Chapter 9: Agricultural Sustainability Under Resource Scarcity

India remains predominantly an agrarian country. There is a need to reorient and align policies that affect land use, crop choices, fertiliser use, irrigation practices and energy inputs to complement each other towards the common goals of sustainability and growth.

### Challenges in the Agriculture sector:

- About 70 per cent of India's arable land is drought prone, 12 per cent is flood prone, and 8 per cent is cyclone prone.
- Evaporation rates are likely to increase, potentially increasing the need for irrigation in both the river and groundwater dependent lands.
- The Fifth Assessment Report of the IPCC predicts a significant drop in Indian agricultural yield owing to temperature rise.
- Oxford Martin Future of Food Program estimates that more than a quarter of all climate-related deaths due to change in food production, and subsequent change in diets and body weight, will occur in India.
- Major challenge is to produce adequate food sustainability to meet an ever-increasing demand.
- Agricultural production also contributes to climate change, accounting for 17.6 per cent of gross greenhouse gas emissions in India. Adding emissions related to consumption, including electricity, diesel and fertilizers, and that figure rises to 27 per cent.
- Agriculture dominates India's freshwater use, accounting for 70 per cent of total consumption according to some estimates.
- Nearly half of this water comes from groundwater. Since electricity subsidies were introduced in the early 1970s, the area irrigated by groundwater has almost quadrupled.
- The use of chemical fertilizers has significantly increased. By 2015-16, it had risen to 26.2 MT. Although India's average fertilizer consumption is relatively low (at 128 kg per hectare), it varies across states.
- Again, the increasing use of fertilizers is driven by continued government subsidies. After food and petroleum, fertilizer is the next most-subsidised product.

### Various initiatives to address the challenges:

- The Economic Survey 2015-16 makes the case for 'a new paradigm' for agricultural development aimed at getting more from less resources.
  - It specifically points out the need to economize the use of water in agriculture.
- Raising similar concerns, Niti Aayog paper claimed that the "area under irrigation can be doubled in the country without extra water if we attain water use efficiency level of countries like China USA and Brazil."
  - It made a strong suggestions to improve water and fertilizer use efficiency and highlighted the need to ensure remunerative prices for farmers, measures necessary to raise productivity and spread green revolution to Eastern states.
- The call 'Per Drop More Crop', is for promoting farming through optimum utilization of water.



- The vision to double farmers' income has evoked strong responses. An appropriate strategy is required to deal with resource scarcity and environmental degradation.
- The National Mission for Sustainable Agriculture was conceptualized in 2008 to make agriculture more productive, sustainable, remunerative and climate resilient by promoting location specific integrated farming system.
- In 2014, the National Mission on Agricultural Extension and Technology was initiated to restructure and strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to the farmers.

### Way forward:

- An alternative approach is needed to change entrenched practices. This need to acknowledge the scarcity value of interlinked resources and the costs of their use and understand how they feature in farm-level decision making and village economies.
- With this knowledge, a range of levers would be available to influence consumption and production choices.
- There is a need to reorient and align policies that affect land use, crop choices, fertilizers use, irrigation practices and energy inputs to complement each other towards the common goals of sustainability and growth.
- Policies will need to combine sticks with carrots and both with better information.

## Chapter 10: Farm Technologies to Counter Climate Change

India is experiencing climate change in terms of unusual and unprecedented spells of hot weather occurring far more frequently and covering much larger areas. Global mean temperatures have risen by 0.6°C in the last century with the last decade being the warmest on record. Global environmental issues such as land degradation, loss of biodiversity, stratospheric ozone depletion along with human induced climate change have exacerbated the complicated situation. Climate change is expected to adversely impact socio-economic sectors, including water resources, agriculture, forestry, fisheries, and human settlements ecological systems and human and animal health in many parts of the world.

- Under the scenario of 4° C warming, the west coast and southern India are projected to shift to new high temperature climatic regimes with significant impacts on agriculture.
- Magnitude and geographical distribution of such climate-induced changes may affect our ability to expand the food production globally by 70 per cent to feed around 9 billion mouths in 2050.

### Greenhouse Gases Emissions:

- The active gases including water vapour, carbon dioxide, ozone, methane, nitrous oxide are collectively termed as the greenhouse gases.
- They warm the earth by absorbing energy and slowing the rate of energy escape to space.
- Emissions of carbon dioxide, methane and nitrous oxide have been linked with agricultural intensification.
- The majority of agricultural GHG emissions occurs at the primary production stage and is generated through the production and use of agricultural inputs, farm machinery, soil disturbance, residue management and irrigation, and the rising population of livestock.

### Global Warming Impacts on Agricultural Productivity in India

- Climate change affects agriculture in a number of ways, including changes in average temperature, rainfall and climate extremes; changes in pests and diseases; change in atmospheric carbon dioxide and ground-level ozone concentrations; changes in nutritional quality of some foods and changes in sea level.
- Experimental evidences confirm possibility of reducing CH<sub>4</sub> emissions - Specifically, changing continuously-flooded system to intermittent irrigation.
- Although some studies shows N<sub>2</sub>O emissions may increase under intermittent irrigation, the decrease in CH<sub>4</sub> emissions is more than that compensates this effect.
- Over the past 25 years changes in temperature of 1° C or more have been observed in Northern India during the Rabi (winter) cropping season. A studies at Indian Agricultural Research Institute (IARI), New Delhi, show that every rise in 1° C has a potential to reduce wheat production by 4- 5 million ton in the country.
- By 2030, rice and wheat are likely to see about 6 -10 percent decreases in yields.
- Crops like potatoes, soybean, chickpea and mustard are the crops on which climate change will have a neutral or positive impact.

- Crops like soybean and chickpea are likely to benefit from higher level of CO<sub>2</sub> in the atmosphere, a phenomenon referred to as CO<sub>2</sub> fertilization.
- A lot more depends on the net sown area and the geographical location of a region where a particular crop is sown. Mustard, for example will experience and neutral-to-positive impact in Northern India especially in Punjab and Haryana, where winter temperatures are very low and 1° C rise in temperature will not have much impact on production in this region.
- However, a similar rise in temperature in eastern and Central India will have a negative impact.
- Kharif (rainy season) crops will be affected more by rainfall variability, while Rabi (Winter) crops will be impacted more by minimum temperature.
- Similarly, legumes are going to be benefited because of elevated level of atmospheric CO<sub>2</sub>.
- Climate change will probably increase the risk of food security for poverty stricken population.

## Mitigation and Adaptation Technologies:

(A) Mitigation Strategies:

### 1. Soil Management

#### ☐ Soil Conservation☐

- Leaching, the movement of dissolved substances through the soil, issues of soil contamination, soil erosion etc. are common threats to soil conservation efforts.
- Farmers should use contour ridges as a strategy to minimize soil erosion to encourage better root penetration and enhance moisture conservation.
- Natural mulches moderate the soil temperatures and extreme, suppress diseases and harmful pests, and conserve the soil moisture.

#### ☐ Carbon sequestration:

- It is the process involved in carbon capture and the long-term storage of atmospheric carbon dioxide or other forms of carbon to mitigate or defer global warming.
- Soil quality is closely related to soil organic matter; high soil organic matter means high potential productivity and better health of soil.
- Soil organic matter is a key element a responsive to global warming. It improves and stabilizes the soil structure so that the soils can absorb higher amount of water.

#### ☐ Crop Residue management:

- Rice and wheat straws left in the field after combine harvesting are generally burnt by the farmers to facilitate seed bed preparation and seeding.
- Burning of crop residues in the states like Punjab, Haryana, Uttar Pradesh and Rajasthan has significantly contributed to deterioration of air quality.
- The government is encouraging the farmers to go in for mechanized options of Residue Management by way of providing subsidies on purchase of Machines and equipments.
- For crop residue management, under Sub-Mission on Agriculture Mechanization, the Department of Agriculture Cooperation and Farmers Welfare has allocated funds to Punjab, Haryana, Rajasthan and Uttar Pradesh.

#### ☐ Conservation agriculture (CA):

- The CA based system substantially reduced the production cost (upto 23 percent) but produces equal or even higher than conventional system; thereby increasing economic profitability of

production system.

- CA based production system also moderates the effect of high temperature and increases irrigation water productivity by 66-100 percent compared to traditional production systems.
- ❑ Minimum Tillage:
  - While intensive soil tillage reduces soil organic matter through aerobic mineralization, low tillage and the maintenance of a permanent soil cover (through crops, crop residues or cover crops and the introduction of diversified crop rotations) increase the soil organic matter.

## 2. Nutrient Management

- ❑ Balanced and efficient use of fertilizers practiced on each and every holding based on 4R principle i.e., right nutrient, right quantity, right time, right method of application is an attractive proposition.
- ❑ Use of fertilizers in conjunction with organic manures, biofertilizers etc. on the principle of integrated nutrient supply system is a right prescription to increase nutrient use efficiency, minimise use of mineral fertilizers, and reduce GHG emissions.
- ❑ Use of nitrification inhibitors will regulate nitrification and leaf color chart will ensure judicious use of N-fertilizers, increase N use efficiency and reduce N<sub>2</sub>O emission and also cut on the fertilizers cost.
- ❑ Integrated nutrient management:
  - Use of fertilizers along with Organic manures, green manures, vermin compost, biofertilizers, neem, karanj, pongamia cakes etc. color chart and nitrification inhibitors will improve nutrient use efficiency and improve the soil health.
  - Use of Rhizobium cultures in pulses and Azotobacter in rice wheat etc. help cutting costs on fertilizers through benefits of symbiotic and asymbiotic nitrogen fixation.
  - Many nutrient solubilizing bacteria, for example, K and Zn solubilizers are of great help. Use of phosphate solubilizing bacteria(PSB) is well known tool to solubilize natives soil P.
  - Sea weeds like Sagarika may play a great role to boost crop growth and also mitigate weather adversities.

## 3. Water Management

- Studies have shown that the threat to water scarcity is very high over central India, along the mountain ranges of Western Ghats, and in northeastern states.
- Water management assumes utmost importance as it is a key resource for sustaining life and environment.

### 1) Energy Management

- India is moving at a fast pace to adopt a green shift in its power sector to reduce dependence on the black fossil fuelled energy economy.
- Investments in clean energy rose by 22% in the first half of 2018, as compared to 2017.
- Half of world's 10 largest solar parks under construction are in India.

### 2) Reforestation

- It is the natural or intentional restocking of existing forest and Woodlands (forestation) that have been depleted, usually through deforestation.
- It is a way of rectifying or improving the quality of human life.

(B) Adapting Agriculture To Climate Change:

1. Early Warning And Information System (EWIS) can help in getting prepared for disaster management preparedness and mitigating the potential risks.
2. Selection of suitable crops and crop cultivars
3. Preference to less water and less nutrient demanding crops. Replacing the traditional crops with this climate replacing the traditional crops with this climate smart crops can help in combating the adverse effect of global warming.
4. Selection of Crops and Cultivars Tolerant to Abiotic and Biotic Stresses
5. Crop diversification - Crop diversity is a high priority adaptation measure in both irrigated and non- irrigated areas.
6. Change in Cropping Pattern And Calendar of Planting.
7. Mixed cropping/intercropping
8. Integrated Cropping System
9. The traditional knowledge and crop varieties of indigenous people and local communities could prove even more important in making agriculture adapt to climate change.
10. To minimize the incidence of pests and enhancing the use of pesticides, Integrated Pest Management is an ideal option.
11. All crops absorb CO<sub>2</sub> during growth and release it after harvest. The goal of agricultural carbon removal is to use the crop and its relation to the carbon cycle to permanently sequester carbon within the soil. This is done by selecting farming methods that return biomass to the soil and enhance the conditions in which the carbon within the plants will be reduced to its elemental nature and stored in a stable state.

**Conclusion:**

- Reduction in the GHG emissions from agricultural intensification should be the main thrust. The government must also adopt multiple approaches that include targeted subsidies for sustainable technologies.
- State and local governments must integrate policies and technologies that enhance farmer access to new innovations like zero tillage and irrigation, and provide more information on climate change vulnerability, mitigation and adaptation.
- Measures must be taken to increase low emission practices and use Information Communication Technology to increase awareness about sustainable agricultural practices.

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