

Draft Agricultural Policy of Odisha 2019

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Introduction

Odisha's Agricultural Policy 2019 is focused on farmers' well-being and is formulated to build on the inherent strengths of its agriculture and allied sectors, to address the constraints it faces and to make optimal use of resources and opportunities emerging on account of advancement in technology, and the emergence of accelerated economic growth in the state and the country. This policy aims to give further thrust to the success delivered through concerted efforts directed under the previous agricultural policies of the state.

Aim is to actualise the vast untapped potential of Odisha agriculture, strengthen the economic and social well-being of its farmers, sharecroppers and landless labourers while ensuring the growth process is environmentally, economically and technologically inclusive, scalable and sustainable.

Earlier Agricultural Policies of Odisha

The Government of Odisha announced its first agricultural policy in 1996. Subsequent policies were announced in 2008 and 2013.

Odisha is known to be a thought leader. Back in 2008, the state government acknowledged the centrality of farmers' welfare in its vision for agriculture. It not only identified ways to improve production and productivity but also focused on activities to improve farmer well-being. This focus was given a further thrust in the 2013 Policy where enhancing incomes of farmers became the central theme. The current policy builds on that and aims to give an economic, social, technological and political thrust to promoting farmers as producers, entrepreneurs and innovators.

State of Agriculture in Odisha

Odisha is largely a rural and an agrarian economy. Close to 83 percent of its people live in rural areas and about 61.8 percent of its 17.5 million work-force is employed in agriculture.¹ The sector contributes about 18 percent to the state's GDP. The state has a gross cropped area of about 8 million hectares, 46 percent of which is double-cropped². Paddy is the main crop and covers acreage of about 2.87 million hectares (for the triennium ending 2017-18). Odisha produces about Rs.75,800 crore worth of agricultural and allied output.³ More than half this value is generated from four crops: paddy, meat, milk and brinjal. Paddy accounts for 24.4 percent of the value, meat 11.3 per cent, milk 9.1 per cent and brinjal 6.8 per cent (total share of vegetables is 25.3 per cent).⁴

The state is divided into 10 agro-climatic zones and it suffers from frequent droughts and floods and sometimes both in the same year.

About 5 percent of India's poor live in Odisha and the poverty ratio in the state is 32.6 percent, which places Odisha in the list of poorer states in India. High poverty levels combined with over dependence on agriculture makes it imperative that the agriculture policy focuses on farmer well-being.

Agricultural GDP

In the 16 years since the beginning of this century (2000/01 to 2016-17), Odisha's agricultural GDP nearly doubled in real terms, clocking an average annual growth rate of about 4.5 per cent, higher than the India average of 3.1 per cent. The state accounts for 3 per cent of India's agricultural GDP.

¹ Census 2011

² Cropping intensity estimated from state government data

³ Financial Year 2015-16 (MOSPI, GOI)

⁴ For triennium average 2015-16

Odisha is the largest producer of sweet potato in India. It generates the largest value of output (VOO)⁵ in India in case of cowpea, sunhemp and pumpkin. Its VOO ranks second in India in the case of brinjal, sunflower, cabbage, jujube (*ber*), bitter gourd, lemon and pointed gourd (*parmal*). It also ranks high in the production of okra, cauliflower, and cashew.

Farmers' Income

An average Odisha farmer earned about Rs. 7,731 per month i.e. about Rs. 92,772 per year. (Source: NABARD NAFIS 2015-16). In 2002-03, his average monthly income was Rs.1,062 which means that in the 13 years between 2002-03 and 2015-16, Odisha farmer's incomes grew more than seven times or at a compound annual growth rate (CAGR) of 16.5 per cent in nominal terms and 8.4 percent in real terms.⁶ Comparing the CAGR with other Indian states, Odisha's growth rate emerges the highest achieved by any state in the country during that period. During the same period, average Indian farmer's income grew from Rs.2,115 to Rs.8,931 i.e. at a CAGR of 11.7 percent in nominal and 3.7 percent in real terms. Odisha is fast catching up with other Indian states.

Odisha's farmer incomes grew much faster than even the rate at which its own agricultural GDP grew. Between 2002-03 and 2015-16, its agricultural GDP grew at a CAGR of 3.7 percent and its farmer incomes grew at more than double that rate at 8.4 percent.

These are encouraging signs. Strategically, it is evident that the state is placed on a high growth path in agriculture and it is important that the Odisha government builds on these successes, recognizes the constraints and formulates a policy to overcome the challenges and harness potential and opportunities that the fast-emerging markets within the state and outside provide while keeping the policy focus steadfast on *farmers' well-being*.

⁵ Financial Year 2015-16

⁶ Base 2011-12

Successes and Policy innovations

Biggest measurable success of Odisha farmers is in the unprecedented growth of incomes of its farmers as observed in the recent past. An analysis of the data⁷ reveals that this growth is explained by three factors, *inter alia*:

- a) diversification of agricultural production basket to products which are high value for example vegetables,
- b) higher monetization of its cereal produce; and
- c) higher value the Odisha livestock farmer earned.

The hard work of the entrepreneurial Odisha farmer complemented with progressive interventions by government, and its visionary leadership, have together catapulted Odisha agriculture to its present stature. Some of the pioneering steps taken by Government of Odisha include:

1. Consistent growth in investment in agriculture: In 2018-19, Rs. 17,000 crores were invested into the sector;
2. Exclusive budget for agriculture and setting up of an agriculture Cabinet: The state has an exclusive budget for agriculture and an independent agri-cabinet that oversees programme implementation and interdepartmental coordination;
3. Reformed agri-inputs delivery systems: The state department of agriculture undertook a multi-pronged approach to reform the agri-input delivery system in the state. From direct benefit transfer (DBT) in seed (over 3.5 lakh farmers benefited in 2017-18), to subsidization of farm machinery (about 40,000 farmers received subsidies for farm mechanisation), innovations in community irrigation access through the Jalnidhi-I scheme (due to which state's irrigation coverage increased to 43 per cent); to harnessing technology

⁷ Drivers of farmer income growth: Results of an econometric time-series analysis on Odisha agriculture reveals that between 1999-2000 and 2015-16, gross value of agricultural output in Odisha (taken as a proxy for farmers' income as the data on the latter is not available) grew because of, *inter alia*, three factors, (i) diversification to high value agriculture including oilseeds, pulses and vegetables, (ii) improvements in value of output generated from cereals from higher production and higher prices realised by the farmer and (iii) higher value generated from livestock.

to improve input delivery, the department undertook to reform the input management and delivery system.

4. Real-time monitoring of scheme implementation- Institutionalisation of a decision support system has helped officials to monitor real-time progress and deliver via fast, data-backed decision making;
5. Developing inter-departmental convergence at block level – This was done through Farm Information and Advisory Centre (FIAC) meetings where officials met farmers every fortnight and resolved problems;
6. Innovation awards for the farmers who innovate in the use of farm implements have been instituted at district and state level “*Mukhya Mantri Abhinav Krushi Jantrapati Samman Yojana*”
7. *Mukhyamantri Krushi Udyog Yojana(MKUY)* has been launched to support entrepreneurs in setting up their own industrial units
8. *Krushi Unnat Sahjogi Programme* has been launched in partnership with state agriculture universities to promote inclusion of youth in agriculture, assist DoAFE in delivery of schemes efficiently and resolve on-ground issues of farmer
9. DoAFE has already signed an MoU with Nabkisan Finance (A subsidiary of NABARD) to provide credit guarantee to FPOs.

In addition, initiatives in extension such as mandating village agri-worker (VAW) to be available at the Panchayati Raj Institution (PRI) office on designated days to provide counselling to farmers, organisation of *Krushak Sampark Mela* at the block level, district level *Krishi Mahotsav* and state level exhibitions-cum-farmers’ fairs and *Krushak Sachetanata Karyakrama*, etc., have helped in building community-led initiatives.

Women farmers received special attention. Efforts were made to reduce drudgery and promote efficiency by involving institutions like ICAR’s Central Institute for Women in Agriculture (CIWA) and Odisha University of Agriculture and Technology (OUAT) among others.

Focus on traditional and mega schemes aimed towards farmers’ welfare and knowledge development for better agricultural practices also gained momentum in the past years.

Schemes like KALIA, credit guarantee schemes, etc., are innovative schemes that have successfully provided financial stability to farmers. MoUs with seven international agencies and five national agencies, setting-up of research institutes (high altitude research station of OUAT in Koraput, Jute Research Station in Kendrapara and a Sugarcane Research Station in Nayagarh) and agriculture polytechnics (10) have provided crucial improvement in technical manpower for agriculture, availability of quality seeds and cultivation practices.

In addition, the department undertook new initiatives to promote monetization of Odisha farm produce. The department's five-pronged approach in that regard included:

1. Diversification of the production basket – Incentivising non-paddy crops (pulses, oilseeds, maize, cotton and horticultural crops) under the state plan, seed reserve policy for non-paddy crops, assured procurement for pulses and oilseeds and millets under PSS;
2. Promoting post-harvest management through infrastructure investment – Key initiatives included setting up of international standard assaying facility by NABL, availability of food safety officer at Paradip port and creation of 10 assaying laboratories;
3. Launching the Farmer Producer Organization (FPO) Policy for linking all the farmers, mainly ones sowing high value crops like fruits, vegetables, flowers, spices etc. to the markets
4. Promotion of tribal regions by creating agriculture production clusters (APCs) – about 1 lakh farmers in 20-25 production groups are being created to practise market-linked production of identified crops, especially horticulture crops; SAFAL in co-ordination with Odisha Livelihood Mission (OLM) workers worked to deliver better price discovery in mango; and *gram unnati* promoted demand-driven production in coconut.
5. Launching the organic farming policy to promote organic farming and provide market for the products.

Odisha's Agriculture and Farmers' Empowerment Department, in line with the vision outlined in the Odisha Agriculture Policy 2013, ensured the holistic development and progress of all aspects of the state's agriculture. Odisha Agricultural Policy 2019 builds on these achievements. But to harness the complete potential of the state's resources in an inclusive and sustainable manner, necessitates scoping challenges and constraints.

Major constraints in Odisha's agriculture have been identified as follows:

1. Shrinking land and landholding size: Increasing pressure on land has led to fragmentation resulting in the average land holding size falling to 0.95 ha in 2015-16 from 1.89 ha in 1970-71. The impact of natural calamities additionally has expanded Odisha's fallow lands. In 2015-16, about 1.7 million hectares of land was classified as fallow of which 0.7 million hectares are permanent fallows.
2. Falling numbers of cultivators and growing landless: With increasing fragmentation of land, the total number of cultivators has shrunk in the state. Between Census 2001 and 2011, Odisha's agricultural labour force increased from 9.2 million to 10.8 million. While the number of people who are cultivators (or the number of people who own land) fell from 4.2 million to 4.1 million, the number of labourers or are landless increased from 5 million to 6.7 million. From 46 per cent, the share of cultivators in state's total agricultural workforce fell to 38 per cent.
3. Huge inter-state disparity in farmers' incomes: Among Odisha's 30 districts, farmers in 17 districts earned lower incomes than the state average. For example, a Jharsuguda farmer earned five times more than a Keonjhar farmer.
4. Gap between irrigation coverage and cropping intensities: There is a gap between irrigation coverage and level of cropping intensities (proportion of area taking more than one crop) reported in the state. Higher irrigation coverage is expected to result in higher cropping intensities. But despite high levels of irrigation coverage (as a percentage of gross cropped area), cropping intensities in districts like Bargarh, Malkangiri, Koraput, Sambalpur and Bhadrak are low. Then there are districts like

Nayagarh, Angul, Deogarh, and Kalahandi, where despite low levels of irrigation coverage, the cropping intensities are high.

5. High but volatile agricultural GDP growth: Between 2000-01 and 2016-17, Odisha's agricultural GDP grew at an average annual rate of 4.5 per cent compared to India's average of 3.1 per cent during the period. Analysis reveals that Odisha's growth rate is more volatile than the all-India rate.⁸ The high volatility is partially explained by the impact of weather and climatic variability on agricultural growth in Odisha.
6. Low productivity per hectare: While Odisha's productivity in major crops like paddy, groundnut, gram, lentils, etc., have improved over time, it is still below those of some of the best states in India. There is also large a yield gap between the state's different districts, indicating a gap in resources, diffusion of technology and sharing of knowledge.
7. Highly labour-intensive production processes: Shrinking landholding sizes and low levels of absolute incomes restrict the investment capability of a farmer; consequently, the dominant role of labour in the cultivation process in the state for most crops has continued over the years. Subsidising the purchase of farm machines and equipment has not resulted in their sales picking up momentum in the state. This high dependence on labour has shrunk farmer profits as farm wages have been rising.
8. High dependence on weather and climate: During the last five years, variability in production (mainly of paddy) points to the need for more effective climate resilient strategies. While the importance of paddy to the farmers in the state cannot be overlooked, the productivity of large areas under paddy cultivation is low, resulting in very low returns to the farmers. Some districts cultivate paddy during the *rabi* season as well depending on the availability of irrigation, but productivity is low, implying sub-optimal benefits from irrigation.

⁸ Between 2000-01 and 2016-17, the coefficient of variation of agricultural GDP growth was estimated to be 2.42 for Odisha and 1.33 for all-India.

9. Growing gap between Odisha's demand (consumption basket) and supply (production basket): The state's economy is growing fast and, as is the trend elsewhere, the consumption basket is changing. Consumers are increasingly demanding more pulses, vegetables, dairy, eggs and meat. This should ideally drive the state's production basket; however, most of the eggs, pulses and meat that are consumed by the state are imported from neighbouring states.
10. Low seed replacement ratio: The SRR for most crops grown in the state, barring paddy, are lower than the national average as well as below the desired level of 33 per cent, especially in case of self-pollinated crops.
11. Low fertiliser consumption: Odisha's per hectare fertiliser consumption is amongst the lowest in the country at 56.8 kg⁹ compared to an all-India average of 123 kg and the ratio of NPK is 5:2.1:1 compared to the all India average of 6.7:2.7:1¹⁰.
12. Low cost–low value trap: Odisha is a low-cost producer of most crops but due to market problems (aggregation, accessibility and adequacy), the value realised by farmers is low. Due to a sharp rise in costs of production, driven mainly by rising labour costs, and a slower growth in the market value of produce, Odisha farmer's profitability in most crops has been shrinking.
13. Livestock is not inclusive or suffers inefficiencies: According to the data on farmer income, only the landless and near-landless Odisha agricultural workers earned from livestock. Marginal and small farmers (with landholdings greater than 0.01 hectares but less than 2 hectares) earned very little from livestock activities. In addition, there are problems of extremely low milk yields, inexplicably high numbers of male cattle and very low levels of organised milk processing in the state. Although the poultry sector has expanded, it has not been inclusive of the small farmers since the decentralised production model favours large farms and the model itself is still in its

⁹ Per hectare fertiliser consumption for India average is 123.4 kg, for Punjab it is 232.2 kg and Bihar 198.4 kg.

¹⁰ While a site and crop specific nutrient demand may indicate a different ratio, the overall application of fertilizer fertiliser including organic manure, is abysmally low

infancy. Goat-rearers were found to have suffered due to inadequate marketing/technology/extension support.

14. Growing exports of Odisha fish from Andhra Pradesh port: While both production and export of fish and fish products from Odisha are growing fast, there are two problems: one, the growing export is not happening through Odisha's port but from a port far away in the neighbouring state of Andhra Pradesh (involving huge logistical and financial costs), and two, growth in total fish production in Odisha is slow compared to the growth in the states of Andhra Pradesh, Bihar and UP.

To build on the strengths, while addressing the concerns and keeping farmers' welfare as its central theme, the 2019 Odisha Agriculture Policy vision is presented next.

Vision

To harness the potential of Odisha's agricultural sector in a sustainable manner, aimed at continuously raising farmers' incomes and welfare while ensuring nutritional security.

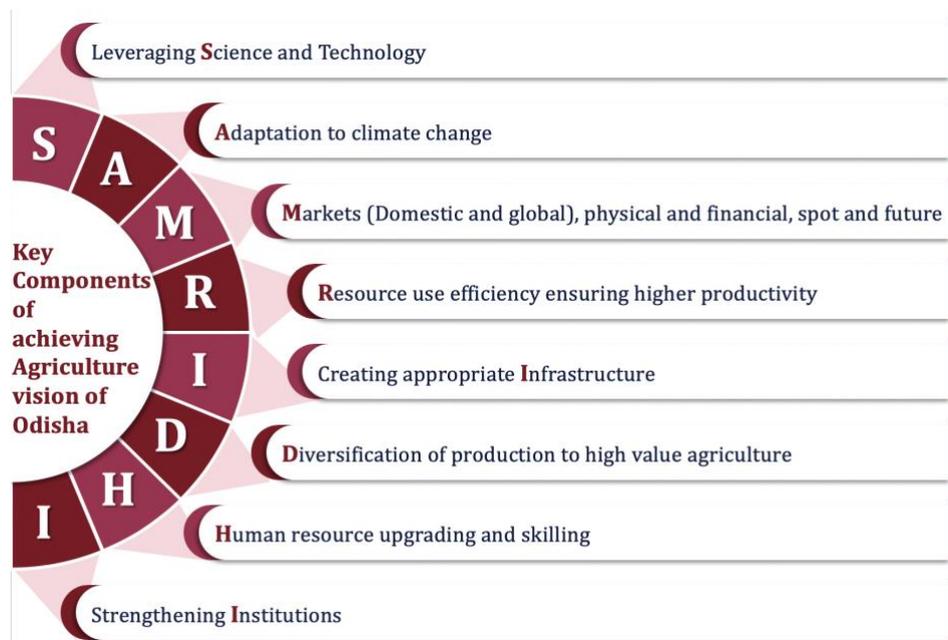
Objective

This policy will be focused on farmer¹¹ well-being with the following objectives:

1. Continuous growth in farmer incomes
2. Making the growth process inclusive of small and marginal farmers
3. Ensuring sustainable, stable and scalable agricultural growth.

Strategy

The sector-specific strategy in the Policy are designed on 8 pillars: **"SAMRIDHI"**



¹¹Farmers include those engaged in crops, livestock, poultry, fisheries, dairy and all other related activities.

A 360-degree reform-approach strategized

Instead of reforming the agriculture sector in silos and taking a piece-meal reform approach, the aim of this policy is to coherently and progressively undertake simultaneous reforms. Broad strategies are:

1. Creating an ecosystem interlinking inputs-production-markets
2. Focusing on sustainable increase in yields of paddy and diversification to high value agriculture (HVA)
3. Encouraging efficient and ecologically sensitive use of inputs: mainly water, land and soil
4. Promoting processing – including cleaning, grading, etc., for better value capture
5. Creating value-chains particularly of vegetables, livestock: dairy and poultry
6. Encouraging aggregation of farmers in farmer producer organisations (FPO)
7. Reducing wastages by promoting pre and post-harvest management
8. Adapting to climate change – techniques, technology and management
9. Leveraging the power of data for planning and monitoring
10. Leveraging central government schemes

Defined by these broader contours and propelled by the SAMRIDHI strategy, commodity-specific and input-specific vision and interventions are identified and laid in the upcoming Chapters.

Chapter 1 Building on KALIA

In a pioneering effort to improve farmer's income and welfare, Odisha undertook the implementation of its flagship scheme for farmers called Krushak Assistance for Livelihood and Income Augmentation (KALIA). Named after Lord Jaganath, the scheme was launched in December 2018 and was designed to deliver an unconditional cash transfer to every small and marginal farmer, sharecropper and landless labourers' bank account. A total of 75 lakh farmer families will directly benefit from this scheme.

Under the scheme, there are six types of beneficiaries/benefits:

1. Small and marginal farmers: That includes sharecroppers and landowners who are entitled to receive Rs. 5,000 twice in a year. This is an unconditional payment and the farmer gets it just before each cropping season and he may use it to support his agricultural activities or for other purposes.
2. Landless labourers: To handhold landless labourers to help create sustainable livelihoods; under KALIA, the state government has committed to giving Rs. 12,500 to all landless labourers. The government also undertakes training and monitoring through its extension workers from Agriculture, Horticulture, Animal Husbandry and Fisheries to ensure that the landless are genuinely helped to develop the livelihood activities they choose to pursue.
3. Vulnerable agricultural households: The cultivators and landless labourers who may not be able to avail livelihood options due to old age, disability, disease or any other reason will get a lump sum financial assistance of Rs. 10,000/- per family provided to take care of their sustenance.
4. Insurance cover: The component will provide following insurance cover to cultivators and landless agricultural labourers, who are primarily dependent on agriculture as the main activity.
 - a. Life insurance cover of Rs. 2.00 lakh at a nominal premium will be provided to all savings bank account holder of age between 18-50 years. Government of Odisha will bear some part of the farmers' share of the premium.

- b. Personal accident cover of Rs.2.00 lakh at a nominal annual premium for all savings bank account holder aged between 18-50 years. Government of Odisha will bear some part of the farmers' share of the premium.
 - c. In respect of the above beneficiary whose age is between 51-70 years, the entire amount towards annual premium will be borne by Government of Odisha.
5. The interest rate for the crop loan upto Rs. 50,000 will be reduced to 0 percent from 1 percent, thus making them interest free.

This amount of economic support is expected to catalyse inclusive agricultural growth in the state. A farmer will be socially and economically empowered through these initiatives. KALIA will remain a flagship scheme of the government and will be strengthened and continued during the next five years.

KALIA is a scheme that is backed by thorough analysis and is aimed at becoming a developmental intervention that will be leveraged to not only increase productivity but also raise incomes of farmers and landless labourers in an inclusive and sustainable manner. Focus under KALIA in the next five years will be on the following:

1. **Create sustainable livelihood activities for landless-** To empower the landless, the Government of Odisha will hand-hold individuals to create and sustain financially remunerative livelihood activities. The government will ensure a conducive policy environment for that to flourish
2. **Empowering farmers** by, *inter alia*, interlinking inputs, production and markets.
3. **Create a robust, dynamic and complete database of Odisha's agricultural workforce:** With KALIA scheme, the state now has updated data of its various stakeholders. Going forward, efforts will be made to identify and profile every Odisha cultivator, landless agricultural labourer and sharecropper. The database will be updated with *aadhaar* numbers and mobile numbers.
4. **Last-mile financial connectivity will be streamlined:** Innovative methods of ensuring last mile financial connectivity will be explored and promoted in remote areas. Bank accounts will be verified with the help of banking institutions such as the State Bank of India, the state level bankers' committee and the Odisha State

Co-operative Bank. In addition, the database of the National Payments Corporation of India (NPCI) will be leveraged to ensure delivery to every beneficiary.

5. **Update and purification of Land records:** Concerted efforts will be employed to update the land records (Bhulekh database), bring convergence of that database with data on loans (KCC data), sale of produce (P-PAS data), and the sale of seeds (DBT data) databases. This will enable the state government to support 360-degree development of every Odisha farmer.
6. To **promote transparency** in future operations, a four-pronged strategy has been designed.
 - An instalment-wise and beneficiary-wise database of payments received, and funds utilised (wherever possible and required) will be tracked.
 - A database of excluded beneficiaries will be regularly reviewed and updated.¹²
 - All green-form records will be reviewed, field-level surveys undertaken wherever the need arises and existing databases like *Biju Krushak Kalyan Yojana* will be utilised to update missing/incorrect/required data related to the selected beneficiaries under KALIA.
 - An MIS system will be created and managed by the department to track progress under KALIA. This will provide real-time access to status of on-ground trainings, physical assets that are created under the livelihood component of KALIA and provide a mobile application for real-time data updates from the field.
7. **Spreading awareness and synergising the extension system:** To provide and promote training and awareness to KALIA stakeholders, the following methods will be used by the department:
 - a. Organised information phone calls will be made, the YouTube Channel will be used, frequently asked questions (FAQs) will be made readily available on digital and non-digital channels with a 24-hour department helpline.

¹² These are those beneficiaries who were excluded for benefits under KALIA. These people included public servants, income tax/professional tax payers, identified using other databases and voluntary deletions, done through red-forms or suo-moto deletions.

- b. *KALIA Barta* will be created to monitor and analyse the nature of questions asked and the resolution rate. High quality training material in English and Oriya will be developed for both officers and end-beneficiaries.
- 8. **Regular monitoring and evaluation of KALIA:** The scheme will be reviewed on key performance indicators. A third-party evaluation will be utilised to assess impact on KALIA beneficiaries and suggest fine-tuning of the scheme. Regular block and district-level interactions with implementing authorities will be undertaken. To ensure the alignment and smooth and progressive roll-out of KALIA and to manage internal and external communication and programme objectives, a PMU will be created.
- 9. **Awards and recognition of successful KALIA beneficiaries:** Farmers who are able to transform their livelihoods successfully using KALIA will be identified and duly rewarded on a yearly basis. High performing officials at all levels of hierarchy will also be duly recognised.

Chapter 2 Input Management

Provision of good quality inputs at affordable prices and in time is key to agricultural development. To achieve this, the combined efforts of the government, research organisations, public and private sectors is crucial. While the policy environment is important to ensure this, proper implementation and real-time monitoring is critical. The policy outlines the various interventions and processes to achieve this.

Seeds

Seed is one of the most important inputs that enhance agriculture productivity. Use of quality seeds *appropriate to the regions* in the state will be encouraged through a programme of differentiated subsidy and other incentives. While the general policy of subsidy for seeds will continue, it will be calibrated to encourage most appropriate seeds from a regional, ecological and farmers' income point of view. Use of sub-optimal seeds will be discouraged.

The state will lead the adoption of improved seeds through the following measures:

- a. Dynamic seed plans: These will be based on crop-wise area-wise (season-wise) actual seed rate per hectare. This will be mapped with desired/targeted seed replacement rate (SRR), and varietal replacement rate (VRR).
 - i. The aim is to increase the seed replacement rate (SRR) to 33 per cent for self-pollinated crops and 50 per cent for cross-pollinated crops in alternating years.
 - ii. Increase variety replacement ratio (VRR): This will be done by phasing-out old varieties of seeds and replacing them with hybrid and improved varieties.
- b. Climate resilience and seeds: Odisha University of Agriculture and Technology (OUAT) along with Indian Council of Agricultural Research (ICAR) and CGIAR institutions like International Rice Research Institute (IRRI) will develop climate resilient varieties of crops suitable for the 10 agro-climatic zones of the state.
- c. Seed Quality:

- i. The quality of all seeds will be monitored as per parameters outlined in the Seed Act, 1966
 - ii. Seed testing facilities will be upgraded in terms of both personnel and technical expertise. Regular performance monitoring will be undertaken to maintain the quality of test results
 - iii. To tackle the problem of heterogeneity in seed licensing procedures across state, model guidelines for seed licensing will be issued
 - iv. In addition to seed supplied through the Seeds Corporation, certified seeds of private companies will be encouraged. The variety/seeds developed/produced by private sectors will be duly evaluated before giving to farmers
 - v. Quality enforcement squads will be set up to ensure the quality of seeds in accordance with the provisions of the Seed Control Order, 1983
- d. Involvement of seed corporation, OUAT, Government farms, private sectors and farmers will be made, and enough seeds will be produced and supplied
- e. Disaster Management:
- i. As per the Seed Reserve Policy, five per cent of the season's paddy requirement and 10 per cent of the non-paddy requirement will be reserved by seed supplying agencies for disaster contingencies as a renewable seed reserve
 - ii. In addition, the department will work out the seed requirements of different districts in heavy rainfall and drought situations and keep a realistic seed buffer through OSSC
- f. The possibility of selling seeds to farmers through PoS machines will be examined and piloted.

Genetic Material

The strategy in the livestock sector is long term and will start with the improvement and composition of breeds.

1. Artificial Insemination (AI) of milch animals would be stepped up to reach 20 lakh AIs per year.

2. The breeds will be selected from a list of appropriate high genetic merit bulls, both exotic and indigenous as envisaged in the Odisha Bovine Breeding Policy, 2015.
3. Disease-free and high pedigreed semen will be produced in the frozen semen station of the department and, if necessary, procured from other certified semen stations. Quality of semen will be ensured before they are supplied to AI centres.
4. Sex-sorted semen will be encouraged with a higher level of incentivisation.
5. In the case of poultry, low-input technology birds suitable to the local climate will be promoted for livelihood support to landless, small and marginal farmers.
6. To conserve and improve the native germplasm available in the state, special programmes need to be taken up through the Breeder's Society.
7. In goat rearing, the department will undertake the identification of breeds that grow faster and gain weight quickly under climatic conditions of Odisha.
8. Genetic improvement of sheep and goat will be through selective breeding. A buck exchange programme will be promoted to reduce in-breeding.
9. Selected breeds of goats and sheep with high quality genetic makeup will be identified, conserved and developed for their uniqueness. In particular, five breeds of goat, i.e., Black Bengal, *Ganjam*, *Ghumsuri*, *Raighar*, *Maraguda*, and three breeds of sheep, *Bolangir*, *Ganjam* and *Kendrapada* will be in focus in the coming five years.

Fertilisers

Increase in agricultural production depends a lot on the fertility of the soil. The use of chemical fertilisers is the quickest and the most popular option. Since fertiliser consumption per hectare is very poor in the state, use of chemical fertilisers will continue to be supported, but the focus will be on balanced fertilisation to avoid over use of chemical fertilisers.

The areas of focus will be as follows:

1. Promoting balanced fertilisation:
 - a. The soil health and nutrient status for each region will be profiled and the results will be used to identify and recommend optimal and efficient amount and composition of fertilisers needed for the region/soil-type. The data from soil health cards (SHCs) will also be used.

- b. The data processed under SHC will be strengthened to include more than the current nine parameters in the soil tests.
 - c. The SHC database will be aligned with the integrated fertiliser management system (IFMS).
- 2. Use of plant and animal waste and bio-fertilisers will be promoted with appropriately designed incentives.
- 3. An awareness campaign on the use of agricultural waste and bio-fertilisers will be launched to ensure that over use of chemical fertilisers does not lead to soil health deterioration and water pollution.
- 4. Synergy with Micro-irrigation: a higher subsidy will be provided for liquid fertilisers to encourage fertigation with micro-irrigation
- 5. An IT based, on-line monitoring system will be set up to monitor the sales of fertilisers and disbursement of subsidy to ensure its proper use.
 - a. The availability of fertilisers at each sale point will be linked to a web-based information system so that farmers are aware of the stock position in their respective sale points.
 - b. Attempts will be made to minimise manual and adjusted transactions by retailers by shifting to use of technology (PoS Machines)
- 6. Streamlining the fertiliser value-chain
 - a. The fertiliser licensing process will be streamlined to ensure transparency and effective distribution.
 - b. Fertiliser-cum-SHC inspection units will be set-up at the district level that will realign MPR of fertiliser sale for wholesalers in line with the national scheme “DBT in fertiliser”.
 - c. Initiatives such as fertiliser advisories to dealers and farmers through WhatsApp, *kisanrath yatra*, radio, NEWS and *kisan mela* at the gram panchayat (GP) level. Awareness wall paintings of soil fertiliser index maps in villages will be initiated/stepped-up.

Crop Protection

To alleviate pest attacks, which are a recurring problem for Odisha farmers, the focus of the department will be on the following:

1. Aligning crop protection measures to Pest Surveillance System and Integrated Pest Management System (IPM): To prevent indiscriminate use of pesticides, this alignment is crucial.
 - a. A Crop Pest Surveillance System will be created that will be a web and mobile based, ICT enabled pest surveillance Information System.
 - b. Regular pest surveillance and monitoring will be organized to assess pest/disease situation and study agro-eco-system to advise timely IPM control measures;
 - c. Extension activities will be strengthened to popularising IPM approach among farming community;
 - d. IPM and use of bio-pesticides will be promoted as the preferred option.
 - i. Farmers' own concoctions of bio pesticides will not require any approval except for commercial sale.
 - e. Chemical pesticides will not be permitted for sale in areas declared as organic.
 - f. Use of crop-protection chemicals will be recommended only where necessary.
 - g. The pesticide regulatory framework will be aligned with food safety laws to make adoption broad based.
2. Seed treatment will be made a priority: While all seeds meant for sale will be mandatorily treated with the necessary plant protection chemicals, farmers will be encouraged to treat the seed saved by them for future use in a scientific manner.
3. State pest policy: A new state Pest Policy will be launched which will aim to create an integrated data backed decision support system for Pest Management
4. Technology inclusion: IT based system on pest management will be developed.
5. Forewarning system: A forecasting model to predict pest incidence will be based on weather parameters, historical and scientific data.
6. Demand and supply matching system: Demand forecasting for prepositioning of pesticides based on pest incidence will be created.
7. Pesticide supply chain improvement: Pesticide procurement will be strictly based on quality. A monitoring of effectiveness will be also done and low performing pesticides will be removed from the list.

8. Quality control: A prescribed minimum number of samples of approved pesticides (1200 annually) will be taken every season and tested and necessary disciplinary/legal action will be initiated against defaulters.

Farm mechanisation

One of the reasons for low incomes from cultivation by the farmers in Odisha is the high cost of labour that squeeze farmer incomes. With low incomes, these farmers are unable to access quality inputs. It is a trap for the small and marginal farmer of Odisha. To break the trap, Odisha government will ensure timely access to adequate machinery for all in an affordable manner.

Modern agriculture has raised productivity through mechanisation to increase the quality and precision of the operations. This will be the focus of the mechanisation programme. Many operations like land levelling, sowing and planting, application of fertiliser, harvesting and threshing have undergone improvement in efficiency using farm machines. The state has a very low level of farm mechanisation compared to high productivity states. There is scope for increasing the level of mechanisation to improve productivity and income of farmers.

The policy focus will be on:

1. Designing a service-support mechanism for farm machines: For small and marginal landholders of Odisha, a new mode of support will be designed where the state government will encourage hiring of farm equipment by subsidising the service costs through DBT.
2. Custom hiring centres: Successful models of CHS from other states will be studied and the model will be replicated by employing educated youth and promoting PPP and private entrepreneurship.

In the case of farm implements, the thrust will be on developing the right type of machines for farmers of Odisha and the focus will be on custom service centres keeping in view of the large number of small-size of land holdings which makes it uneconomical to own machinery.

3. Women friendly equipments: Increasing feminisation of agriculture demands more 'women friendly' (smaller) machines and these will be encouraged with higher incentives compared to normal farm machinery.

Credit

There are 42 banks in the state that disbursed about Rs. 15,327 crore under KCC in 2017-18. The objective under the current policy is to expand credit coverage and improve the credit culture in the state. The emphasis is to ensure timely access to sufficient funds for the state's agricultural workforce, particularly for landowners, sharecroppers, oral lessees, and farmers with very small landholdings and those engaged in allied activities.

The recently introduced KALIA scheme is a disruptive scheme in this regard. It provides direct unconditional cash transfer to the state's landowners, sharecroppers and landless agricultural workers. While a farmer gets Rs 10,000 in two instalments of Rs. 5,000 per season, the landless are entitled to a transfer of Rs. 12,500. Even though the scheme document does not specify the purpose for which the money is to be used by the farmers, it is designed to support their initial working capital needs. For the landless, however, the transfer is meant to invest in livelihood options, thereby making the transfer conditional in some sense. Nevertheless, the money transferred under KALIA is primarily meant to support the initial working capital and investment needs of the agricultural workforce in the state.

But KALIA does not take care of all the credit needs of farmers. They will still need institutional credit and KCC for operations. To streamline access to credit further, the following measures are identified for action:

1. Additional channels: New channels of credit will be promoted through MFIs (micro finance institutions), which work on social collateral and NBFCs (non-banking financial companies);
2. Include new beneficiaries: Actively promote new beneficiary target groups in coordination with NABARD to identify schemes where state support is required, viz.,

- Promotion and development of farmer producer organisations, Farm Sector Promotion Fund (FSPF) – farmers’ club programme, capacity building for adoption of new technology
 - Ensure wider coverage of the crop loans that are given at zero percent interest rate
 - RBI and SLBC will be persuaded to use one meta database to verify information
 - Modification in the state government credit guarantee scheme in agricultural loans will be initiated to ensure that benefit reaches particularly the real small and marginal farmers, i.e., credit guarantees for fresh loanee farmers. Government of Odisha has already signed an MoU with Nabkisan Finance Ltd. to provide credit guarantee to FPOs.
3. Revision in KCC scheme and implementation: The revised KCC scheme (covering crops, horticulture, livestock, poultry and fishing) will be implemented and monitored effectively to cover all eligible occupations and families. The banks will be asked to facilitate loan towards working capital requirement for livestock and fishery-based activities in the state.
 4. Warehouse receipts: Provision for pledge loans against warehouse receipts will be taken up as a priority.
 5. Promotion of credit for allied sectors: There is provision to avail credit up to Rs.10 lakh for dairy and poultry farming activities, etc., under the “*Mudra*” scheme (PMMY). Banks will be persuaded to extend credit under PMMY to farmers/entrepreneurs for livestock and poultry farming.

Risk management

The production risk of all major crops will be taken care of through the Pradhan mantri fasal bima yojana (PMFBY). The year-on-year growth rate in farmers who have obtained crop insurance is over 10 per cent, reaching 2.02 million farmers in 2018. Meanwhile, the year-on-year growth rate in non-loanee farmers who have obtained crop insurance is at a whopping 79.27 per cent, reaching 272,909 farmers, according to the data. The growth in non-loanee farmers accessing crop insurance is particularly significant.

The scheme will be strengthened and modified (if required) to promote weather-based insurance, increase non-loanee farmers' insurance coverage and allow for mixed cropping and increase in the number of crops notified. The real problem is the price risk. While there are no instruments to take care of this risk other than the MSP and the Minimum Price Intervention Scheme (MIS), alternate models will be thought through while strengthening existing options.

Insurance for livestock, poultry and fisheries will be enlarged to cover more than 50 per cent of the farmers in these categories. To safeguard the interests of farmers, the KALIA scheme provides life insurance to all farmers.

Chapter 3 Land and Water Management

Land and Soil

1. At least 1 million hectares will be added to *rabi* cropping area (currently at 2.3 million hectares)
2. Fallow lands will be reduced- At least about 0.6 million hectares of land from the total fallow including current fallows will be reclaimed in the next five years.
 - a. Trends in fallow lands will be studied carefully at district/block-level and effective steps will be taken to reclaim land that can be made more productive;
 - b. The *Bhoochetna program* with ICRISAT will also be used to accomplish this
 - c. By encouraging cultivation of low-water consuming crops like pulses, oilseeds and fodder, fallow lands will be reduced. Improved production technology will be provided to facilitate this
3. **Adoption of Model Agriculture Land Leasing Act 2016:** The Act will be implemented with suitable amendments to improve land access to Odisha's farmers, sharecroppers, landless and private individuals. In this effort, interests of landowners will be critical and protected.
4. To ensure that tenant farmers will have access to institutional credit, appropriate financial instruments will be designed and promoted.
5. **Digitisation of land records** will be taken up for effective implementation of all land related benefit schemes. **Geo-tagging**, along with **location agnostic online registration** of land records will be taken up.
6. Soil: Soil health improvement and its conservation is fundamental to raising farm productivity. Close to 12.6 lakh soil health cards (SHC) have been issued to farmers in the state. Sustainable enhancement of soil health and fertility will be the focus of all efforts in this regard. Interventions in this regard will include:
 - Development of **district-level soil fertility maps** with *panchayat/village* as units. These will be based on the available data from soil health cards.
 - Bringing more technical competence in sample collection and testing of soil and encouraging the private sector to supplement government efforts. New technologies will be utilized for this effort.

- Investments in soil testing infrastructure will be scaled-up
 - Introducing incentives for **soil amendments** as required in respective regions
 - Integration of Soil Health Card Portal with Integrated Fertiliser Management System (I-FMS) and promotion of site-specific **nutrient management** based on village/*panchayat*/block level soil data
 - Updating soil health status every three years at the village / panchayat level
7. Soils are also a reservoir of water. Soil moisture retention capacity, soil microbial activity, and soil fertility play a seminal role in mitigating the effects of dry spells in rainfed areas. Government shall provide suitable incentives for farmers for the addition of organic matter.
8. Salinity of soils is another big problem for Odisha state. Excess salt in the soil impairs its productivity adversely impacting crops. To address this problem:
- a. Improve drainage: Both land shaping and provision of drainage will be made. Drainage development will be through surface/subsurface/bio-drainage/or a combined approach followed by appropriate agronomic measures. Wherever possible, MGNREGA assignments will be used towards this purpose;
 - b. Introduction of salt-tolerant varieties and crop rotation techniques: Relevant crop-type and variety-type for the saline soils will be identified and communicated to farmers. To reduce the level of salinity over time, crop rotation patterns will be studied and communicated to farmers.
 - c. In water-logged saline soils, water table depth will be lowered through subsurface drainage techniques
 - d. To check for the quality of water being used for irrigation, soil health card (SHC) test labs will be used
 - e. Soil test-based fertilizer use: Particularly for the areas with high salinity, fertilization will be mapped with the soil requirements (identified using the soil health card results)

9. Government of Odisha shall promote entrepreneurship through women SHGs/SMEs for making locally produced compost/biomass or Trichoderma cultures.
10. The 3-M (Matter, Moisture, Microbes) framework as envisioned in the Odisha Organic Policy shall guide soil strategy for rainfed areas. Government of Odisha shall initiate living soil pilots with a focus on the farmer to farmer /inter-community knowledge exchanges based on the 3-M framework.

Water Management

Timely access to adequate quantities of water is crucial for agriculture. Close to 43 percent of state's GCA is under assured irrigation. About 62 percent of the state's irrigation needs are met from government canal, about 19 per cent from private canals, 15 percent from tube wells and other wells and about 5 percent from tanks¹³. Irrigation resources in the state are underutilized- there is a large gap between its irrigation potential created (IPC) and irrigation potential utilised (IPU). Besides from the tail-end of the distribution system, there are gaps identified between IPU and actual received. This presents a unique low-hanging opportunity for productivity enhancement in the state without having to invest heavily in new projects. The aim is two-fold: increase the irrigation potential created and ensure its maximum utilization.

As important it is to provide access to adequate water, it is to undertake efforts to improve water-use efficiency (defined as the ratio of crop yield (in kgs) and water consumption (in cubic meters)). With rampant effects of climate change where changes are observed in the intensity of rains, rising temperatures, dry spells between rainy days, frequency of floods and droughts- conservation of water and its most efficient use becomes potent.

To achieve and address these issues and concerns, focus of Department in the following five years will be on:

1. Increase of coverage: Increase irrigation coverage from 43 percent to 53 percent of gross cropped area (GCA) in the next five years.

¹³ Source: Directorate of Economics and Statistics, GOI

2. Focus on last mile connectivity: Efforts will be made to ensure access to sufficient water for areas in the tail-end of a command area or distribution system, otherwise they will be allowed to benefit from schemes like Jalnidhi
3. Use of renewable energy: Solar powered irrigation pumps will be encouraged to meet farm energy requirements. Efforts will also be made to connect the solar panels to the grid; this will generate additional income for the farmers.
4. Sustainable water-use in agriculture will be encouraged:
 - a. Promote conjunctive use of water resources through government and private canals, public and private tanks, ponds, other village level water harvesting structures and public and private tube wells.
 - b. Efficiency of water-use will be promoted through various measures including micro irrigation and sub-surface irrigation.
 - c. Focus will be on irrigating the plant and not the soil, therefore surface drip irrigation, subsurface drip irrigation, and use of sprinklers will be mapped for their crop-wise efficiency and encouraged for adoption;
 - d. Water conservation schemes will be taken up on priority through programs like MGNREGA and techniques of retaining residual moisture will be emphasised.
 - e. Wasteful methods of irrigation and techniques of production (like flooding in paddy) will be discouraged and efficient and effective technological alternatives will be identified and communicated to farmers
 - f. Cropping patterns system will be adjusted for optimal utilisation of available water resources.
5. Focus on rain-fed areas: A separate window will be created to address problems facing rain-fed agriculture, where poorer farmers dominate.
6. Rainfall-water use efficiency: For rain-fed areas, the focus will be on the management of surface water, groundwater, recharging of aquifers and participatory usage of common pooled water resources of rainwater
7. Managing dry-spells: Crop failure and low productivity in rainfed areas is primarily a consequence of dry spells. Keeping in view, Government of Odisha shall invest in the following:
 - a. Initiation of protective/critical irrigation in rainfed areas to secure crops and improve agro ecologically sustainable cropping intensity through

participatory water security management (groundwater and surface water sources) in the cluster approach.

- b. Government of Odisha shall take up creation and repair of farm ponds on a cluster mode, in-situ conservation, rain water harvesting and watershed activities, integrated natural resource management, biomass regeneration, medicinal and aromatic plantation, watershed activities through MGNREGA, PMKSY in rainfed and drought-prone areas of Odisha.
 - c. Awareness generation, appropriate use of water and community management shall be taken up through PRA exercises, training programmes, and simulation games.
8. Revamp of drainage facilities: Attention will be paid to projects for drainage where water logging is frequent and problematic.

Chapter 4 Agricultural Research and Innovation

The Odisha University of Agriculture and Technology (OUAT) besides producing quality technical manpower, will focus on fundamental research in agriculture and allied field, and develop technologies and innovation for improving productivity, nutritional security and income of farmers under climatic change while taking care of the natural resources and its sustenance. To give thrust to this approach, the following interventions are envisaged:

1. To undertake research, OUAT will work closely with ICAR institutions, especially those located in Odisha
2. Role of Krishi Vigyan Kendras (KVK):
 - a. KVKs will be refining the available technologies for the local needs.
 - b. KVKs will make demonstrations, impart training to extension workers and farmers.
 - c. KVKs will adopt few villages as model village for taking the refined technologies to the farmers
3. OUAT students will be required to spend a prescribed minimum period in farmers' fields as part of the curriculum, with the support from the government.
4. OUAT faculty will be encouraged for a two-way exchange of learnings, ideas and problems so that R&D system becomes efficient and effective.
5. Suitable agro-ecological agronomic innovations such as SRI, NPM, IPM, ZBNF, Biodynamic farming, organic agriculture, conservation agriculture, intercropping, poly-cropping, etc shall be taken up in rainfed areas. Government will take up documentation of farmer agronomic/traditional cropping methods/tribal cropping system and agro ecological practices shall be promoted.

Chapter 5 Agricultural Extension and Skill Building

The transition of Odisha agriculture from a paddy-based cropping system to a farmer focused farming system – encompassing cereals, oilseeds, pulses, fruits and vegetables, livestock, poultry and fisheries – demands re-orientation and strengthening of its current agriculture extension system. The extension systems will be re-engineered to cover not only agriculture and horticulture but also livestock, poultry and fisheries. While the current extension system will be strengthened in terms of number and outreach, the knowledge gap of extension agencies will be addressed on a priority basis and re-skilling done. The conventional idea of extension of introducing new seeds and new farming methods will be replaced by a combination of the introduction of proven technologies and methods, problem solving vis-à-vis the challenges faced by farmers specific to their regions and providing advice whenever required including developing market linkages and encouraging processing of the produce at the farm level to the extent feasible.

Interventions to strengthen the extension system will include:

1. Mapping gaps in skills at district-level: OUAT in conjunction with ICAR and CGIAR institution will map the demand for and supply of skills in agriculture at the district level and co-ordinate to impart the required skills to farmers and agricultural labour.
2. Need base plans: Bottom-up planning at the district and block levels will be undertaken to develop strategic research extension plans (SREP). Subject matter specialists at KVKs will orient their refinement of technologies to these block level/district action plans;
3. Use of latest technologies and practices: As a focus, the extension machinery of the state will promote the adoption of, precision agriculture, energy friendly irrigation pumps, micro irrigation, climate smart technologies, internet of things (IoT), and use of technology in animal husbandry to monitor animal behaviour, health, production and markets, wherever possible.
4. Innovation fund: The state will create an agricultural innovation fund for technical handholding, imparting knowledge and free dissemination of technical know-how. This will be a multi-disciplinary activity. It will be guided by multidisciplinary scientific team.

5. Strengthening of infrastructure: The Agriculture Technology Management Agency (ATMAs) infrastructure will be harnessed and will be strengthened as knowledge centres for farmers, providing information on soils, technology, inputs, farming practices and markets.
6. Convergence between different departments and agencies: Roll-out of extension services through various institutions including *Panchayati Raj* institutions, co-operatives, farmers' organisations, farmers' field schools and non-government organisations working in the area will be strengthened. Convergence of these agencies will be ensured.
7. Peer learning mechanism: Farmer-led extension will be given impetus to encourage learning from each other.
8. Conversion of agricultural waste: Recycling and utilising agricultural waste would give a further fillip to farmers' income.
9. Mobile based advisory: Since most farmers have access to mobile phones, a system of communication through mobiles will be established to enable farmers get regular advisories on weather, plant protection, farming operations and markets.
 - a. Farmers will also be able to pose their problems and get advisories in time.
10. Public-private partnerships: The focus will be on promoting PPP in extension delivery. With each KVK and Regional Research & Transfer of Technology Stations (RRTTS) in possession of some land, KVKs and RRTTS will be encouraged to incubate private initiatives in extension delivery.
11. Market-led extension services: Service providers that help the farmers with timely information on markets, particularly regarding (i) crop selection (ii) demand for and supply of crop produce, (iii) expected price of commodity and (iv) availability of infrastructure facilities for storage, transport and marketing of produce, will be encouraged.
12. Extension services will promote value-addition:
 - a. OUAT, with support from the Indian Council of Agricultural Research (ICAR) and CGIAR institution, will focus on providing interventions on integrated farming across the farming value chain, covering production, post-production, processing and other value addition activities.
 - b. Value-added extension: To reduce post-harvest losses and increase value-capture, farmers will be encouraged to convert their raw produce to

processed products (this may include something as basic as undertaking grading of the produce and packaging the produce in a customised manner). These value-added extension services will be a focus.

13. Focus on post harvest: Efforts will be made to shift farmers to agro-business and impart them with farm related skills, which are currently in short supply. The state government will create and nurture 'agri-preneurs' (agricultural graduates and other qualified entrepreneurs) to achieve greater value addition through agro-processing and propagation of modern extension services.
14. Agricultural clinics will be promoted.
15. Quality assurance: As product quality assurance is key to export and domestic market competitiveness, the Department of Agriculture and Farmers' Empowerment, together with the help of the Department of MSME, will endeavour to provide advisories on food safety guidelines.
 - a. At least five modern quality testing laboratories will be set up in consultation with FSSAI and APEDA.
 - b. The laboratories will also serve as monitoring agencies for effective quality control especially with reference to pre and post-harvest quality issues.
 - c. These laboratories will serve as extension development agents for a quality assurance programme.
16. Performance management: The performance of the extension machinery will be regularly reviewed by external agencies and well performing individuals/agencies will be strengthened to disseminate best practices at the field level.
17. Involvement of youth: Government will conduct an apprenticeship program for the agriculture students. The program would be applicable to the undergraduate and postgraduate students.
 - a. The students would be involved in multiple extension activities planned during the year and will help the department in strengthening these activities on the ground.
 - b. The performance of the students enrolled for the apprenticeship will be measured using technology tools.
18. 24x7 call centre at state: The AMA KRUSHI project will be promoted for creating a profile of the farmers across the state. The objectives of AMA KRUSHI project are:

- a) To create customized advisory the farmers based on profile data and disseminate it;
- b) To provide integrated 24/7 call centre for farmers to resolve the queries related to farming, animal husbandry and fisheries;
- c) To build capabilities of taking feedback from farmers

Chapter 6 Markets and Infrastructure

Reforming markets will be one of the most potent tools under this policy. Odisha's drive to produce higher quality and higher quantity per hectare will be simultaneously supported by policy incentives that will deliver deeper, border and transparent markets. Efforts will be made to deepen access to fair and remunerative markets and to bring transparency in the system. Models that offer options for storage linked to credit will be used to discourage distress sale by farmers who lack storage facilities.

This calls for a new marketing model where differentiation of produce is encouraged, arrangements for transparent price discovery are made and adequate storage and transport facilities are provided. This requires a policy that permits participation by the private sector and by farmer groups, encourages investments in warehousing and cold chains, and building adequate infrastructure.

With this in view, the following will be done.

1. Warehousing and logistics infrastructure:
 - a. Policy: A new warehousing and logistics policy for Odisha to encourage private investments will be announced separately.
 - b. PACS Procurement Centres: The existing network of procurement centres at PACS level will be strengthened to benefit small and marginal farmers. Warehousing facilities will be created/strengthened at the village/block level.
 - c. Negotiable warehouse receipts: Pledge financing at warehouses, through negotiable warehouse receipts (NWR), will be popularised as an alternative means of financing. The Department of Agriculture and Farmers' Empowerment will draw up guidelines to promote warehouse-based post-harvest loans and e-NWR trading.
 - d. Storage facilities: Wholesale markets with facilities for storage, pack house operations and cold storage facilities will be set up either through the marketing board and/or with private sector participation.
All Panchayats will have storage and warehousing facilities

- e. Modernization of infrastructure: All regulated market committee (RMCs) will be modernized to provide warehousing and professional agri-marketing and extension support
2. A strategic drive will initiate progressive and holistic marketing reforms, which will include the following:
- a. Efforts will be made to adopt the Model Contract Farming Act, 2018 and a mechanism for quick dispute resolution will be set up for the smooth functioning of the system. Objective of contract farming is to help farmers enter a pre-season price agreement of sale of their produce. This will ensure benefits of economies of scale and increased investment on farms;
 - b. Adoption of the Model Agricultural Produce and Livestock Marketing Act (APLM), 2017, as per state requirements: This will include the setting up of markets in the private sector, allowing direct sales to exporters/processors and customers, farmer-consumer markets, e-trading, single point levy of market fee, a unified single trading licence in a state, declaring warehouses/silos/cold storage as market sub-yards
 - c. State notifications under the Essential Commodities Act will be reviewed to encourage large investments in agricultural technology and infrastructure.
 - d. *Gramin* Agricultural Markets (GrAMs) will be developed on priority to bring markets closer to the farm-gate.
 - e. Promote farmer producer organisations (FPOs): Farmer producer companies will be encouraged with financial and technical support with assistance from SFAC and NABARD.
 - i. A business model for FPCs will be designed in consultation with experts.
 - ii. A state federation of FPOs/FPCs will be set up.
 - iii. Benefits accorded to start-ups under the Start-up India Mission will be extended to FPOs.
 - iv. The National Bank for Agriculture and Rural Development (NABARD's) model of joint liability groups will be promoted to channelise small growers into the value chain
 - f. Procurement

- i. A special focus will be to improve the procurement under PDS for Paddy and PSS for oilseeds, cereals, maize etc. by 25% in the next 5 years.
- g. Processing
 - i. Village-level collection centres for fruits and vegetables will be linked to larger processing units. The private sector will be encouraged to set up units to link supplies from these centres
 - ii. Greater focus will be placed on the food processing industry to enhancing value addition in vegetable and fruit crops. The government has now shifted its attention to promoting “agripreneurs”. This will result in rapid modernisation of the agricultural sector
- h. Government will examine options for including private traders operating in markets to complement the minimum support price regime through a system of incentives and commission payments. This may include outsourcing procurement and storage operations, undertaking Private Procurement & Stockist Scheme under PM-Aasha scheme of GOI *inter alia*
- i. Convergence in government initiatives will be ensured by issuing appropriate orders for converging initiatives of different state departments and non-government organisations to develop effective procurement linkages, processing facilities, retail chains and export activity.
 - i. This will facilitate synergies between various initiatives such as the *Rashtriya Krishi Vikas Yojana* (RKVY) of the agriculture ministry, viability gap funding of the Ministry of Commerce for cold chains and warehousing infrastructure development and *Pradhan Mantri Kisan Sampada Yojana*
- j. An export enabling environment will be created through the following measures.
 - i. The development of export-oriented clusters: with support from the Agricultural and Processed Food Export Development Authority (APEDA) with common infrastructure facilities will be taken up.

These clusters will contain a functional, end-to-end cold chain system along with processing facilities.

- ii. Increase the number of testing laboratories: There exists a shortage of testing laboratories, essential for health certificates for exports.
- iii. Efforts will be made to augment the capacity of Gopalpur Port, Dhamra Port and Paradip Port to handle agricultural cargo.
- iv. Particularly for avoiding deterioration of perishables due to congestion at ports, green channel will be created at Odisha ports
- v. Promote coastal liners to link Kolkata and Vizag ports with Odisha ports
- vi. Ensure traceability mechanism: export-based clusters and contract farming to help ensure traceability of farm produce.

Chapter 7 Crop Specific interventions

In addition to the directional interventions mentioned in specific chapters, the Department proposes to undertake certain crop specific activities mentioned in this Chapter

Cereals: Paddy

Odisha produces about 10 million metric tonnes of paddy in a year from about 3.8 million hectares of land. It has an average yield of about 2.7 tonnes per hectare (TE 2017-18). The state grows paddy both in kharif and *rabi* season producing about 9.9 MMTs and 1.13 MMTs respectively. Yields in the *kharif* season (2.7 tonnes/ha) are lower than those in the *rabi* season (5.1 tonnes/ha) (TE 2017-18).

The cost of cultivation of paddy in Odisha is comparatively higher than in neighbouring states and is rising mainly on account of increased labour cost. The paddy farmer is observed to be in a low cost, low value, and low profit equilibrium. Compared to neighbouring states, Odisha's cost of cultivating paddy is low but so is the value at which the paddy is sold. Besides, there is also the yield gap issue. Paddy yields in Odisha are low compared to other states. There is also yield disparity between districts. There are a number of regions with high acreage under paddy but with very low yields. There is also an issue of markets. Although procurement has been stepped up, there are still some farmers who are not able to realise the minimum support price during the harvest months.

Considering paddy is the largest cultivated crop in the state, improvements in productivity and value realised by farmers per unit will be the focus of intervention.

Interventions on the input side: In addition to the interventions highlighted in the Input Management Chapter, following policy changes are perceived for paddy:

1. Seeds: Ten varieties make up over 95 percent of the sales of certified seeds. In order to move towards a regime of high income realisation, the top varieties that with differentiating characteristics such as high yield, nourishment advantage,

disaster resilience, milling suitability, short-duration maturity, off-season paddy, etc., will be identified and promoted. In addition,

- a. The seed replacement ratio (SRR) will be enhanced to a level of 33 per cent.
 - b. Potential high earners among traditional rice varieties will be identified and promoted in regions favourable for such cultivators.
 - c. Climate-smart seed delivery:
 - i. A crop contingency plan will be prepared with a 'seed reserve' policy in areas of repeated calamity stress.
 - ii. Promotion of flood tolerant varieties in flood prone areas and drought resistant varieties in dry lands will be undertaken.
2. Fertilisers:
- a. Nutrient management of rice will be based on soil tests and use of leaf Colour Chart (LCC) and green seeker
3. Considering the long-term variability in the monsoon pattern, efforts to adjust paddy sowing patterns to coincide with the availability of rain water will be encouraged.
4. Since labour costs are seen to be high and affecting the profitability of paddy farming, appropriate mechanisation efforts will be promoted.
5. Procurement under MSP
- a. The network of procurement under the MSP scheme will be expanded to ensure that no farmer has to sell below the minimum support price.
 - b. Bottom-up estimation of crop will become the basis of the procurement plan and a network of warehouses will be created.
6. Rice fortification and inclusion under mid-day meal scheme: The current successful pilot of distributing fortified rice to school children in Gajapati and Dhenkanal district will be scaled-up to other districts in a phased manner.
7. Milling infrastructure and efficiency
- a. A research and development mission will be launched to upgrade the quality of paddy so that it can fetch a higher out-turn of rice than what is available currently. This would include improved varieties, cultivation practices, and management of pests and diseases.
 - b. A policy to improve the quality of rice milling in the state will be put in place to ensure better value capture for by-products like bran, husk, etc.

8. The paddy cultivation technique using system of rice intensification (SRI) has been successful in districts of Kandhamal, Sundargarh among others and it will be scaled up
9. Alternates will be developed to the flooding technique of paddy farming. Farmers tend to overuse water in paddy cropping, which leads to lower yields and wastage of water.
10. Water conservation measures to ensure that water moisture is retained in the soil to be utilised for *rabi* cropping will be encouraged.
11. Overuse of water will be discouraged with the help of *panchayat* level functionaries. Where water and moisture levels are stressed, alternate crops like maize, millet, pulses, oilseeds, etc. will be encouraged.
12. *Gram panchayats* will be facilitated with devices like automatic rain gauge and digital moisture meter for better information on crop operations.

Cereals: Nutri Cereals

Nutri (coarse) cereals are central to Odisha's drive for enhancing farmers' incomes and improving the level of nutrition. The Odisha Millet Mission (OMM) was launched to ensure food and nutrition security in the comparatively poorer districts of Odisha. The Mission has been able to increase production and improve productivity of these crops. Both maize and *ragi* are important nutri cereals for the state. To promote production, productivity and marketability of nutri cereals, the following measures will be taken.

Interventions:

- Further increase area and productivity of all nutri-cereals in rainfed areas
- Introduce new high yielding varieties
- Introduce better crop management
- Enhance utilisation of crop residues as fodder
- Improve decentralised procurement of coarse cereals and link to market with PDS and mid-day meals
- Ensure market linkage for the marketable surplus.
- Create a comprehensive block-level time-bound workflow under the Millets Mission

- Improve implementation of the schemes through regular feedback collected from field-level executioners and officials at the block level
- Monitor scheme implementation regularly using field responses/surveys and real-time data monitoring
- Smoothen disbursement of funds till the last mile

There will be concerted efforts in particular to encourage maize production and processing in the state. Maize is mainly a *kharif* crop in the state, consumes less water than paddy, is a C-4 crop that fixes carbon in the soil, has more than 100 industrial uses and creates valuable and large quantities of biomass for fodder. Maize is encouraged for food, feed and industrial uses.

Interventions

1. Acreage under *rabi* maize will be encouraged in the state
2. Efforts will be taken to market *rabi* maize domestically and nationally.
3. Financial commodity instruments will be leveraged to deepen maize markets
4. Focus on the production and productivity of maize
5. Encourage production of fortified maize in the form of quality protein maize (QPM) to promote maize as a food
6. Incentivise maize-based silage pits at the farmer level or private feed maker level. This silage is to be used as cattle feed
7. Thrust to poultry in the state, catapulted by the distributed KALIA benefits, will be supported by maize production, the most important ingredient in poultry feed.

Oilseeds and Pulses

Odisha produces about 1 MMTs of pulses and 0.55 MMTs of oilseeds.¹⁴ Groundnut and til are the most important oilseed crops and moong and biri are the most important pulse crops in the state. Yields in Odisha are low compared to other states and there are yield gaps between districts.

Conservation agriculture (in this case, diversification away from paddy) is key to sustainable agriculture in Odisha. Therefore, there is need to shift existing paddy acreage

¹⁴ Data for triennium ending 2017-18

to other crops like oilseeds and pulses, which are not only environmentally better but also yield larger incomes. They require less water and support balanced nutrition among farmers who may retain part of the production for their own consumption. To give a thrust to the sector, the following will be done.

Interventions

1. Strengthen procurement: Government will broad base and strengthen procurement operations and efforts will be made to adopt a procurement threshold level of at least 15 and 10 per cent of the marketed surpluses for pulses and oilseeds respectively.
2. Diversification: Efforts will be made to diversify rice cultivation acreage to pulses and oilseeds, wherever possible. Concerted efforts will be made to bring areas with low irrigation into pulses production, mainly *moong*.
3. Targeting of fallow land: Fallow areas will be encouraged to be brought under pulses. In particular, post-*kharif* rice fallows may be diverted to pulses. Necessary technological back up will be provided to the farmers to make the shift
4. Efforts to improve the pulse yields will be undertaken.
5. Yield enhancement: To address the yield gap across major pulse growing district in the state, the department will identify blocks where yield levels are visibly lower than the district/state averages and provide them additional support after diagnosing the reasons for low productivity.
6. Intercropping: Oilseed and pulse crops intercropping will be encouraged, especially with paddy and sugarcane.
7. District-level action plan: Specific district level plans will be developed to identify and promote production clusters for oilseeds and pulses.
8. Introduction of oilseeds in non-traditional areas will be supported
9. Investment promotion: Investments in creating milling and storage capacities in the state will be synced with the identified production clusters.
10. Better linkage: Oilcakes are essential for livestock feed, so linkage with oilseed processors and feed manufacturers will be developed.

Chapter 8 Horticulture

The total area under horticultural crops is approximately 1.36 million hectares with a production of 12.16 million metric tonnes as per 2016-17 data. Vegetable crops account for 0.67 million hectares followed by fruits at 0.33 million hectares and plantation crops at 0.23 million hectares. Floriculture covers 7500 hectares and spices 12,300 hectares. Odisha ranks highly amongst the top Indian states in many horticulture crops. It is the largest producer of sweet potato in India. Of the total value of horticultural crops produced in the country, the state generates the largest VOO in *pumpkin* and ranks second in the case of *brinjal*, sunflower, cabbage, jujube (ber), bitter gourd, lemon and pointed gourd (parmal) in the country.

The state enjoys a natural comparative advantage for horticulture but its potential has not been completely exploited. The agro-climatic conditions in the state are suitable for fruits, spices and vegetables. Additionally, as the per hectare income generating potential is higher in the case of horticulture compared to cereals or pulses, this policy gives a major thrust to horticulture production in the state and aims to create an enabling environment for sustained and inclusive growth.

The following interventions are envisaged:

1. Cluster-based production centres for various fruit, vegetables and spices crops will be created
 - a. Under the cluster-based approach, regional production belts and clusters will be identified and supported through relevant central and state government schemes and programmes.
 - b. Efficient value-chains from cluster-based production centres will be created to ensure maximum value-capture by farmers.
 - c. Increased role of the soil health cards (SHCs) in these clusters is visualised in these belts.
2. Acreage under fruit, vegetables and spices will be increased:
 - a. Acreage will be expanded, particularly in areas with irrigation potential
 - b. The department's target of adding 0.4 million hectares is likely to add acreage under fruit, vegetables and spices

- i. This will be supplemented by the micro-irrigation initiatives which is expected to cover at least 0.1 million hectares.
 - c. Additionally, farmers will be encouraged to shift part of the *rabi* acreage of 2.3 million hectares away from pulses to horticultural crops to enhance their incomes.
- 3. In addition, acreage under fruit, vegetables and spices will be promoted by designing an incentive mechanism to make farmers shift from cereal crops to HVA.
- 4. The increased production will be dynamically linked to markets.
- 5. Production plans will meet the food safety concerns of the consumer.
 - a. Advisories on use of plant protection measures will take market needs into consideration
- 6. Introducing the use of hybrid technology in vegetables: At present, 10 percent of the cropped area under vegetables is under hybrids. It is targeted to at least double this area.
- 7. Rootstock technology has shown the capacity to double production and be resilient to climate stress. Measures will be taken to standardise and promote usage of rootstocks to produce fruits.
- 8. Efforts will be made to identify and promote new techniques and technologies of production such as high-density plantation and protected cultivation.
- 9. Markets
 - a. Getting the markets right is crucial for value capture. Production will be part of an integrated package.
 - I. For important vegetables, cold-chains will be set up, mostly in the private sector and farmers' participation with cold storages, reefer vans, ripening chambers, etc.
 - II. FPOs will be encouraged to link up with the market directly or through large processing or retail companies to produce to the market, both in terms of quantity and quality
 - III. Markets will also be linked to production clusters. 100 to 150 small holders (producer group) can collectively produce two to three crops in an area of 40 to 50 acres of land. About 3000 to 5000 such producers come together to form a producer company.

- b. Farmer producers companies will provide inputs, link credit with banks and will be given necessary licences for such inputs. They will collect the output, store, transport and sell it to market or processors and retailers
 - c. The state agriculture marketing board will create the required market friendly specifications for each product and provide infrastructure for grading, assaying, packaging and storage at selected APMCs or other locations
 - d. Branding: an effort will be made to create brand equity for crops of value to Odisha like brinjal, mango, etc., by creating a market mechanism based on compliance to specifications, processes, and regulations and by creating a dispute resolution mechanism through a participatory model. An incentive package based on the proposed clusters will be announced. The package will provide economic and physical access to quality seeds and planting material, irrigation support and infrastructure for post-harvest grading, storage, and sales.
 - e. Production plans will be market driven to ensure that there is no overproduction
10. Seeds: Seed quality testing will be insisted upon. Local seeds that are more climate resilient and have comparable yield potential will be identified and encouraged. Community hi-tech vegetable nurseries will be supported at the block level to provide quality seedlings to farmers. Entrepreneurs will be trained to raise quality seedlings. Nurseries will be accredited by the state government and/or NHB, Government of India.
11. Irrigation: To develop fruit, vegetables and spices on a production belt/cluster-basis, assured access to irrigation will be ensured to the selected clusters.
12. Credit:
- a. A credit package will be negotiated with financing institutions with appropriate subsidies for the entire horticulture value chain with special emphasis on FPOs.
 - b. KCC for horticulture crops will be made broad-based, more effective and efficient
13. Land/ Soil Quality:

- a. Most horticulture crops are grown in up and medium lands – use of soil amendments will be made a part of the horticulture incentive package
- b. Financial support to erect small support structures for getting better yields from tomatoes, other climbers, etc. will be a part of the package for horticulture.

14. Research, Innovation and Extension:

- a. Horticulture is a specialised discipline and training of all horticultural farmers and extension staff will be given on priority.
- b. OUAT will use their students to train horticultural farmers under the Atal skill missions. Convergence of schemes using private players will be included.
- c. Special training programmes on the maintenance of drip irrigation units, poly-house and net house units will be given. Training on pre and post-harvest management, which includes grading, sorting, packing, and transportation, will be part of the modules.
- d. Promotion of intercrop in mango and cashew orchards will be encouraged.
- e. Establishment of new orchards with increased productivity and better quality will be incentivised.
- f. Tissue culture plants particularly in bananas for higher yields will be made available through OUAT. Need based association with private tissue culture laboratories will be made.
- g. Drip irrigation and fertigation will be supported in the clusters.

15. Crop insurance for horticulture: The current insurance instruments for horticulture crops have been found to be inadequate since all crops are not effectively covered and the parameters are also vastly different. Comprehensive crop insurance separately for vegetables and fruits will be introduced in consultation with the Government of India and insurance companies.

16. Protected cultivation: The schemes for protected cultivation will focus on horticulture clusters and will be linked to the market value chain. A technical cell will be set up in OUAT or the department to assess the quality of the required infrastructure and advise farmers on the appropriate choices available. Subsidies will be directed to crops with high value earning and employment potential.

17. Extension system for horticulture: Investments in horticulture require new skills and knowledge of technology. Existing horticulture extension workers (HEWs) will be mapped for their supply and demand and concerted efforts will be maintained for their training and skilling. Pre- and post-harvest produce management will be a focus.
18. Efforts will be made to create a pest surveillance system for horticulture crops.

Chapter 9 Livestock & Fisheries

Livestock has contributed significantly to the increase in farmers' incomes in Odisha. This has been the main source of income for landless and marginal farmers. The policy for livestock development will focus on dairy, poultry and live animals (primarily goats). A linkage to nutrition of the poorer sections will be provided through dairy and poultry.

Dairy

Dairying in Odisha is predominantly ancillary to agriculture but forms a sustainable source of income for marginal and landless farmers who own more than 80 percent of bovines in the state. Interventions in dairy include:

1. Efforts to improve genetic potential of the cattle and buffaloes to improve per animal milk output. Cross-breeding with high genetic merit bulls of good Indian and foreign breeds will be promoted through the strengthening of semen stations, expanding artificial insemination (AI) coverage and putting in place systems for effective AI delivery through information driven management for accountability.
2. Training/re-orienting of the artificial insemination (AI) technicians will be taken up in certified/accredited AI training institutes to ensure adherence to the standard operating procedure (SOP) to perform artificial Insemination.
3. The reproductive efficiency of dairy animals will be improved by using advanced breeding technology for sustained breed improvement.
4. Sex-sorted semen will be introduced and made affordable to improve the productivity and profitability of the sector.
5. Organised breeding will cover 1.5 million breedable bovines in the coming five years.
6. All milch animals will be tagged in the next two years.
7. A comprehensive digitised system of recording animals for facilitating selection will be developed and implemented.
8. Four cattle breeds, namely, *Binjharpuri*, *Khariar*, *Motu* and *Ghumsari*, and two buffalo breeds, namely, *Chilika* and *Kalahandi*, have been recognised as registered indigenous bovine breeds of Odisha. Conservation and improvement of these

breeds will be taken up in their respective native tracts in association with breeder societies.

9. Dairying through cooperatives will be encouraged by creating infrastructure for cattle feed manufacturing, milk procurement, processing & marketing.
10. The private sector will be incentivised to create a value chain for dairy products at the village level.
11. The current procurement of nearly 20 per cent of total milk output will be increased to 25 per cent during the next five years through OMFED and private milk processors.
12. OMFED will expand the milk cold chain, particularly at the village level through collection centres, to cover all viable village co-operatives within the next five years. Bulk milk coolers (BMC) will be provided to all villages whose catchment area offers at least 500 litres of milk per day.
13. Integrated farming systems involving agriculture-horticulture-livestock-fishery will be promoted.
14. Preventive animal health care services for control of major diseases like foot and mouth disease (FMD), brucellosis, HS, BQ, theileriosis, IBR and other diseases like mastitis etc. would be taken up. A campaign to eliminate FMD through vaccination will be taken up to cover 100 percent of animals in the state.
15. An IT-based network for epidemiological surveillance will be developed
16. The availability of veterinary services will be expanded to cover all villages with a minimum of 100 animals.
17. The deworming coverage will be increased to cover at least 80% of the bovines. The deworming campaigns will be in a pulse mode carried out twice a year
18. A fodder development programme to grow fodder in public lands and fallow lands will be put in place.
19. The ration balancing programme for milch animals will be expanded to cover 10,000 villages.
20. Farmers will be trained to formulate balanced ration by utilising locally available feed ingredients as livestock feed.
21. To improve the availability and quality of feed, farmers will be encouraged to use silage.

22. Measures will be taken to promote chaff-cutters for dry and green fodder to emphasise mixed feeding.
23. For feed from crop by-products, infrastructure will be created for collection of crop residues, baling, enrichment and storing by introducing modern equipment like mowers, reapers, balers, straw makers, etc., at the village level. These machines can be housed at custom hiring centres and similar facilities.
24. To mitigate scarcity of quality fodder, measures to promote cultivation of newly developed and notified varieties/hybrids of fodder crops, perennial grasses and legumes and unconventional/under-utilised feed resources like *moringa*, etc. will be taken up.
25. Compound feed production by feed mills will be incentivised to cater to the nutritional requirements of animals with different productive potential. Promoting production of bypass fat, protein and other feed supplements, especially area specific mineral mixture.
26. Livestock insurance will be introduced with larger coverage and higher support from the government (50 percent of productive milch animals)
27. Women SHGs and National Livestock Mission will be leveraged for developing the sector.
28. Medium-term credit for purchase of animals will be made available through banks.
29. The livestock extension system will be expanded and re-skilled.
30. KVKs will give emphasis on livestock extension and establish various method and result demonstrations to promote modern practices in dairy management.
31. Progressive farmers will be used as village level extension workers, who can assist and further train livestock producers in the adoption of new technologies and advanced husbandry practices and in the identification of diseases.
32. Private *goshalas* will be given support to maintain old, destitute and stray animals to ensure prevention of cruelty to animals

Poultry

More than 80 percent of the state's poultry output is produced in organised commercial farms. Major poultry companies like Suguna, Shalimar, Venkys, Pasupathy and Indian Broiler have vertically integrated operations that account for approximately 60-70 per cent of the total chicken production in the state. Backyard poultry generates additional income and improves the nutritional status among the poorest of the poor. Backyard poultry plays a pivotal role in providing livelihoods and achieving nutritional security in rural areas.

The following are envisaged:

1. Backyard poultry will be encouraged through the KALIA initiative to cater to local markets.
2. Department will boost Entrepreneurship Development and Employment Generation and allow 'Agripreneurship' in poultry by involving women self-help groups (SHGs). These SHGs will be encouraged to confederate for better marketing.
3. Large integrators in the poultry sector will be incentivized to set up decentralized production models to usher in rural prosperity through a poultry revolution.
 - Integrators will be assisted to set up decentralised production models of about 3000-7000 birds per farmer
4. For broilers, medium sized farmers of about 5000-1,00,000 birds, through an integrator model will be encouraged
5. Vaccinators will be trained to provide vaccination at village / farm level: A substantial number of Sahayaks will be trained in vaccination of poultry and vaccines will be made available through government veterinary hospitals.
 - Local women will be trained to vaccinate the birds
6. Vaccines will be provided on subsidy basis for small / backyard poultry units
7. Use of antibiotics in poultry will be regulated and efforts will be made through an effective extension machinery that antibiotics are used only for disease treatment and not as growth enhancer
8. Medium term credit for purchase of birds will be made available through banks
9. Poultry feed factories will be incentivised: Private sector will be encouraged to put up poultry feed factories to support the sector.
10. Entrepreneurs would be promoted for establishment of organic manure plants using poultry manure as raw material.

11. Vertical integration would be developed where processing and value addition of poultry meat would be done.
12. Farmer Producer's Organisations would be formed for aggregation of poultry egg and meat in the rural areas.
13. Private sector participation will be encouraged in setting up modern units of poultry processing
14. Education and awareness about nutritive value of eggs and poultry through various platforms like World Egg Day etc. would be intensified.
15. Distribution of eggs through mid-day meal scheme under Integrated Child Development Services (ICDS) will be expanded

Small Ruminants

The sale of live animals has increased in Odisha, providing better incomes to large numbers of marginal farmers and landless households. The state will set up goat rearing centres in the state to make available one-month old goats to farmers. The state will enable the setting up of a separate marketing infrastructure under APMCs for sale of live animals through a transparent platform with the requisite support for quality assurance. The meat processing industry will be incentivised. And increased participation of private sectors and FPOs will be explored.

Since goat rearing has a large potential in the state, a package consisting of the following will be launched:

- Goat rearing will be encouraged in village clusters.
- An efficient system of marketing for goats will be set up.
- Veterinary services for goat rearing will be enhanced.
- Vaccines will be provided at subsidised rates to goat rearers. Full vaccination coverage will be given.
- To ensure that farmers get feed of the right quality for milch animals, poultry or fish, appropriate standards will be notified for commercially produced cattle feed, poultry feed and fish feed.
- Medium-term credit for the purchase of animals will be made available through banks.

- Trade of live goats will be improved:
 - It is currently done in a non-transparent manner through conventional *haats*. Therefore, a system of transparent trade in goats, backed by appropriate certificates by a veterinarian, will be set up through the APLM/APMC act provisions.
 - The improvements will aim to ensure higher value for farmers, based on the weight of the animal
- The private sector will be encouraged to set up modern abattoirs in important markets.
- To further provide impetus to this activity, the state will provide high genetic merit, fast-growing goat breeds to farmers through various schemes including KALIA.

Fisheries

Among the successes of Odisha agricultural and allied activities is the growth in fisheries. This sector is identified as one of the growth propellers for an Odisha farmer going forward.

Between 2008-09 and 2017-18, total fish production in the state almost doubled (increased from 3.7 lakh tonnes to 6.8 lakh tonnes), registering a CAGR of 7 per cent. Production of inland fisheries grew faster at CAGR 9.3 per cent compared to marine fisheries that grew at a meagre 1.2 per cent. Although it accounts for a lower share of inland fisheries, brackish water fisheries are picking momentum. Marine exports in the period grew at an astounding CAGR of 26 per cent and, in 2017-18, Odisha's marine exports were worth Rs.2,782 crore. In terms of the unit value of exports (UVE), Odisha's marine exports have become more valuable as UVE grew from Rs.253 per kilogram to Rs.538 per kilogram. However, all of Odisha's marine exports were routed through Andhra Pradesh's Vizag port. To give an impetus to the sector, the government will ensure the following:

1. Infrastructure at fish landing centres will be improved to ensure that the quality of fish does not deteriorate. This will include hygienic platforms, space for cold stores, provision of ice slabs, etc.

2. Deep sea fishing will be promoted by introducing tuna long-liner vessels of >15 metres.
3. Welfare schemes for fishermen will be introduced including life insurance, assistance to buy fishing boats, nets, etc., and climate information services to fishers to manage weather-related risks.
4. Digitisation and geo-tagging of fisheries assets in the state will be taken up using GIS-based MIS established in the PMU of the Directorate of Fisheries to effectively implement all fisheries related benefit schemes. Besides, GIS and spatial planning tools will be used to plan fisheries development in the state efficiently.
5. Inland fisheries will be encouraged through the following measures:
 - Revising the leasing policy of ponds/water bodies and making it fisherman friendly.
 - a. Long-term leasing of freshwater ponds/water bodies and government land to take up freshwater fishing by fishermen, entrepreneurs, educated, unemployed youth and women SHGs.
 - b. Fisherman co-operatives/SHGs/FPOs will be given preference in the leasing of ponds.
 - Providing good quality fish seedlings to fishermen by creating a chain of hatcheries for selected fish varieties
 - a. Upgradation of private and government fish hatcheries for year-round production of quality carp seeds including genetically improved varieties such as *Jayanti Rohu*, improved *Catla*, *Amur carp* etc.
 - b. Implementation of fish hatchery certification programme under the national guideline for quality seed production in the state
 - c. Promotion of advanced carp fingerling production by private seed growers and women SHGs.
 - d. Promotion of species diversification by introducing and scaling minor carps, *Pangasius*, *Tilapia*, *Anabas*, *Magur*, etc., through the establishment of hatcheries, farm demonstrations and domestic market promotion
 - Promoting inland aquaculture for high value shrimps
 - a. Horizontal expansion of freshwater fish farming in the state by promoting new tank construction

- b. Promotion of two crop system per year by stocking advanced carp fingerlings (100-200g) and thus doubling carp productivity from the present 2.8 mt/ha/year to 6 mt/ha/year in the next five years
- c. Promotion of solar water pumps and ground water tube wells to facilitate year-round fish farming
- d. Promotion of freshwater prawn hatcheries farming.
- e. Promotion of ornamental fish production in cluster approach with market linkage support
- f. Promotion of integrated farming systems including agriculture.
- g. Promotion of localised fish feed production through SME enterprises.
- Enhancement of reservoir fish production
 - a. Encouragement of primary fishermen's co-operative societies, women SHGs and young entrepreneurs for cage culture in reservoirs
 - b. Promotion of aqua parks in large reservoirs for the establishment of export oriented and vertically integrated cage culture by entrepreneurs
- Converging schemes like MGNREGA to enhance the water holding capacity of ponds, tanks, etc., to make them suitable for fisheries
 - a. Convergence with Mission *Shakti* to promote fish farming in GP tanks and other local water bodies by women SHGs
 - b. Renovation of derelict GP tanks and revenue tanks will be taken up to make them suitable for fish farming
- Soft loans will be arranged for improvement of fish ponds: As fish farming is a capital-intensive activity, bank loans are essential for the digging of ponds and procurement of farm agro-inputs such as fish fingerlings, feed, fertilisers, medicines, etc.
- A special skill development module for inland aquaculture will be launched
- Capacity building for fish breeders and farmers: Establish fish co-operative organisations and run village-level schemes in coordination with *panchayats* to disseminate best practices and research
- The Reservoir Fishery Policy, 2013, will be modified to lease out all water bodies above 10Ha to the PFCS, women SHGs and educated unemployed youth to boost fish production.

- Backyard fishery will be encouraged through fishermen friendly initiatives and fishermen's co-operatives will be federated to access funds from NABARD and others
 - Promotion of nutrition-sensitive and climate resilient carp-mola polyculture in backyard tanks and small water bodies (GP tanks, MIPs), especially in tribal and vulnerable community areas.
6. Marketing infrastructure for fish will be strengthened by setting exclusive fish processing/sale centres in various parts of the state.
 - a. Hygienic fish markets will be opened in all districts.
 - b. Small fish sale kiosks will be promoted in all blocks.
 - c. Existing village-level small-scale fish retail vendors will be supported to establish hygienic sale counters.
 7. Cold chains for fish marketing will be encouraged
 - a. Ice plants, pre-processing sheds and processing plants will be established
 - b. To transport fresh chilled, insulated vans, auto rickshaws with ice box, motorcycles with ice box and bicycles with ice box will be promoted.
 - c. Fish filleting and value addition plans will be established.
 8. Modern and cost-effective technology will be promoted for hygienic dry fish marketing.

Chapter 10 Sustainable Agriculture

Having discussed water and soil conservation and management in the earlier chapters, here the focus is on organic farming and integrated farming systems in Odisha.

Organic Agriculture

To respond to challenges from climate change and enhance farmer incomes, Odisha's department of agriculture released Odisha Organic Farming Policy 2018. The aim is to undertake a 360-degree development of organic farming in the state. From ensuring economic and physical access to relevant and efficient inputs to standardizing post-harvest management to developing markets both domestic and global, the Policy aims to create a conducive policy framework to promote organic farming in the state. This overall agricultural policy of the state reinforces and aims to provide a thrust to that policy.

Sizable parts of the state, particularly those located in rainfed, dryland and hilly areas, are prone to weather and climate vagaries. Increasing agricultural productivity and farmer incomes in these areas has always been a daunting challenge for the policy makers. Due to various factors including geographical location, practice of traditional cultivation practices, existing level of fertilizer and pesticide use is low in these areas i.e. they some 'naturally organic' areas. These areas are amenable to a quick shift to 'organic agriculture' and will be identified as clusters for promotion. The soil health cards would give an idea of these areas and such areas will be earmarked based on the available data. It takes time for soil systems to regain and crop yields to restore to comparable levels. Hence, a rational approach to choose area and crops for practising organic farming is essential.

While encouraging a shift to organic farming, the emphasis will be on market driven production programmes where the produce can be sold at premium prices. Systems will be put in place to ensure easy certification of such organic produce.

In addition, the following will be done.

1. Regions with poor endowments like rainfed and hilly tracts, where consumption of external inputs is low and per hectare yields are also low will be identified and organic farming will be promoted there. In such regions there is no fear of yield

drop, on the contrary, a higher yield can be expected to be realised because of comprehensive interventions made in poorly performing farms.

2. Promoting organic farming of niche commodities in regions where the state has comparative advantage. To begin with, organic farming for low-volume high-value crops like spices, medicinal plants etc., fruits and vegetables along with R&D support will be promoted.
3. Availability of organic manures in adequate amounts and at affordable costs to the farmers will be ensured.
4. Targeted efforts to create a market for niche products will be made. Spices and vegetables unique to the state will be branded by the Spice and Horticulture Board to encourage their production and certification facilities provided.
5. Zero budget natural farming: It is now being adopted successfully in some states providing notable increases in farmers' net income by sharply reducing costs of production and improving incomes by raising yields and improving the quality of agricultural produce. This method of farming is advocated to be highly cost-effective and environment-friendly. This technology will be tested, validated and adopted in the state.
6. There are patented herbal inputs that improve soil quality and make plants more pest resistant. These herbal inputs, for which actual performance data is now available for a few thousand farmers, will be tested and then applied across the state.
7. Rapid progress has also been made in organic farming techniques, which have also helped improve incomes of farmers. These will be carefully examined for possible application across the state

Integrated Farming

A large number of farmers do integrated farming in a traditional way. Farmers who are able to combine agriculture with dairying, animal husbandry, poultry, fishery, etc., are able to generate more income for themselves. However, most programmes of the government are crop or activity specific. This places a farmer who has more than one crop or activity at a disadvantage since he has to approach different authorities to avail of various benefits. A farmer with cereals, horticulture and dairy is in a good position to do organic farming. Similarly, a farmer with poultry and fisheries can combine the two

with benefit. A farmer doing horticulture will do well with bee-keeping to assist pollination and to get honey. The government will set up pilots for integrated farming in selected blocks to demonstrate the value of integrated farming and to test options that will optimise the income of farmers. KVKs will be tasked with setting up at least ten integrated farming models each in their jurisdiction. The pilots will also test an integrated extension system and provide inputs and technology support. After the pilot stage, successful models will be scaled up.

Chapter 11 Disaster Management

The Odisha farmer is subject to the vagaries of weather and climate; floods, droughts and cyclones affect the farmers frequently, destroying their wealth and taking away their income. Disaster management plans are in place at the district and state levels to save lives and infrastructure, restoring livelihoods, particularly in agriculture as it is a specialised activity. Specific sub-plans for the restoration of agriculture and livelihoods will be made part of district disaster management plans. This will include time-bound action plans in the event of delayed and/or deficient monsoon and floods or damage due to cyclones. These plans will be backed up by sufficient reserves of seeds, fertilisers and other support like credit, etc.

Chapter 12 Women in Agriculture

Nearly 48 per cent of all labourers in Odisha are female, i.e., 9 lakh out of 21 lakh agricultural labourers and 18 percent of all cultivators are women. Women are engaged heavily in all phases of the agricultural cycle, i.e., sowing, intercultural activities, harvesting and post-harvest management. Women-owned landholdings are limited and uneconomical, resulting in their higher involvement as agricultural labourers. There are an estimated 500,000 single landless women in Odisha. They will be treated as a special target group for development intervention.

Women are important project partners in agricultural development; emphasis thus will be laid upon capacity-building and their empowerment. The Odisha government has dedicated a large amount of funds and incentives towards the economic and social empowerment of women in the state. Women friendly farm equipment has been designed produced and promoted and, wherever necessary, convergence between various research and implementation institutions has been brought about.

This plan gives thrust to the past policies and will introduce the following initiatives:

1. Expand the coverage of the scheme of extending interest free loans for women SHGs up to Rs. 5 lakhs.
2. More equitable product and service delivery mechanism will be created for women farmers.
3. More women agriculturists will be trained and placed in the state agricultural extension system.
4. Female extension workers will be provided a conducive and safe environment, ensuring enough opportunities for growth for enterprising workers.
5. Regular monitoring of the implementation of various schemes will have an additional variable segregating performance based on gender.
6. At least 30 percent of the horticulture and small livestock scheme budgets will be dedicated to women.

7. Agricultural extension material will be revised to cater to the needs of women farmers with more focus on backyard livestock/poultry/fisheries and women-friendly crops like vegetables and techniques of production.
8. Both farm products and production technologies will be designed keeping women users in mind.
9. Efforts to get women friendly farm equipment designed, produced and promoted will be strengthened, wherever necessary.
10. The creativity, productivity and entrepreneurship of women and their capacity to further their skills will continue to receive focus. Progressive women farmers will be duly rewarded and recognised.
11. Regular tracking of the share of women in the total number of beneficiaries in government assistance initiatives will be undertaken.
12. Efforts will be made to remove the drudgery of farm women by ensuring access to new tools and implements that increase their efficiency and improve productivity.
13. Government of Odisha shall encourage low-risk-low-reward agriculture or assured market options for single women households, and small and marginal farmers. Further income generation opportunities shall be generated through skill-building and provision of services under the various Government of Odisha schemes such as procurement, ICDS, MDM, etc.
14. Access to credit will be improved through a special focus on women.
15. A policy to encourage SHGs run and operated by women will be put in place.
16. Mission Shakti will be used to empower women farmers

Chapter 13 Role of Data and Technology

The imprints of technology are increasing in Agriculture with major advancement in data science (Machine Learning, Artificial Intelligence etc.), remote sensing, Geographic Information System (GIS) etc. It is pertinent to focus on the widespread usage and adoption of the new age technology to increase the quality of farming and farming products.

The government will continue to give full thrust to the use of Information Technology through following initiatives -

1. Analytics for Decision-making and Agricultural Policy Transformation: Government will continue to support the Analytics for Decision-making and Agricultural Policy Transformation (ADAPT) program to achieve the following objectives-

- Improving data management and architecture to more effectively utilize existing and future data in order to make evidence-based policy decisions.
- Monitor the implementation of the effects of the policies and investment on the well being and productivity of the small and marginal farmers and tenant/landless farmers.
- Use of new age technologies like deep learning, artificial intelligence, IOT, etc. for efficient data collection and analyze the trends in the agriculture in the state.

A Decision Support System would be developed under the ADAPT program which would be an integrated platform for all the relevant datasets in the department for the purpose of effective management of the activities carried out by the department. The platform will also enable the usage of the data by the officials of the government at the State, district, block, Gram Panchayat (GP) and village level. The platform would also be available on mobile for easy access by the officials.

2. Farmer Database: Necessary steps will be taken to clean, connect and strengthen the existing databases of the farmers to create a single dynamic all-inclusive database of farmers. The database would be further leveraged to provide various inputs, advisory and other benefits to the farmers.
3. Steps would be taken to strengthen the use of existing technology system and introduce new system for better collection of data.

4. Steps would be taken to strengthen the use of drones for remote monitoring, procurement of high-resolution satellite imagery, weather analysis from IMD as well through private partnerships. The analysis of the data from various sources will be used in activities like creating agro-advisory, monitoring the situation in the remote areas, crop cutting experiment etc. The data would also be used to help the farmers avail crop insurance and credit that are rightly priced.
5. Use of IOT (sensors) would be promoted to keep the real-time check on the supply and consumption of inputs like seeds, fertilizers, pesticides etc.
6. Steps would be taken for setting up technology system for automated grading and sorting of crops using robotics and machine vision. This will reduce efforts and wastage in the supply chain.
7. Technologies like Blockchain would be used to support the implementation of contract farming.
8. A PMU and data science team will be setup for managing the technology operations and promote the usage of data.

Chapter 14 Transformation in Governance

Odisha is among the first states in the country to have an agri-cabinet. Given the centrality of the sector for the state, setting up of this Cabinet is to put in place a robust institutional system for policy making and implementation in the agri-sector. Success of policies and programs of State government depends on how effectively they are adopted and implemented by the relevant government machinery. Therefore, to ensure that the reform agenda of the government is implemented at a desired pace, transformation in governance is needed.

Various departments and agencies of the government deliver different inputs and financial benefits to farmers. The governance around farmers should be efficient, timely, relevant and responsive. Keeping these objectives in focus, the following shall be done:

1. **Convergence:** A robust institutional mechanism for convergence will be created. All actions at the block, *panchayat* and village level will be converged so that there is a single point of contact for the farmer. This person will be supported by the technical departments required to ensure that farmers' needs are met. Administrative instructions on effective convergence at the state, district, block, *panchayat* and village level will be issued, specifying the role and responsibility of each functionary in the concerned department. A digital system will be put in place to support these efforts at convergence.
2. **Review and Monitoring:** While government allocates substantial amounts of money for agriculture related activities, it is important to get the best outcomes for farmers in the state. With this in view, a monitoring mechanism will be put in place to improve the performance and the outcome of all schemes. A platform will be created to capture the performance of various agriculture and allied departments and to take timely corrective action if gaps or failures are found.
3. **Performance Metrics for the Department Officials:** A robust performance metrics will be defined at all the levels and technology system would be used to ensure the accountability of the officers to the same. High performing officials will be rewarded/acknowledged appropriately.
4. **Grievance and Feedback mechanism:** will set up grievance redressal mechanism for the farmers to enable underserved farmers to avail various benefits provided

by government throughout the year. Similarly, a grievance redressal mechanism will be setup for the department officials to resolve the establishment related queries in shortest possible time.

5. Capacity building: It is necessary to build managerial, technological and data capacity at different levels of governance to ensure efficient delivery of government schemes and services.
6. Decentralised governance structure: Odisha has established a three-tiered, decentralised administrative system through *panchayat raj*. The Odisha government has taken steps to pass on the administration of a majority of developmental activities to the *gram panchayats*. This institutional mechanism will be used to the best advantage. Specifically, the state will endeavour to ensure the following:
 - a. Each *gram panchayat* will prepare a crop plan that will be discussed in the *panchayat* and displayed prominently. The *gram panchayat* office will also display technical information like soil health as well as prices of important commodities prevailing in the domestic markets.
 - b. Each *gram panchayat* will have a storage godown and farmers will be encouraged to deposit their produce in these godowns.
 - c. *Gram panchayats* will be provided the required physical infrastructure needed to demonstrate and popularise new technologies. As indicated elsewhere in this policy document, the *gram panchayats* will also maintain a demonstration plot of its own, with the help of agricultural consultants to demonstrate the working of new technologies.
 - d. Each *gram panchayat* will be equipped with a computer kiosk preloaded with all requisite information about technology, prices of various crops and other prerequisites. This will be looked after by the village agriculture worker (VAW). Public-private partnerships will be explored to establish such computer kiosks.
7. Rainfed-farming fellowship shall be explored in partnership with the SBI foundation, Donor and other CSR in partnership with ICAR/OUAT/NCDS/Private Institutes. A PMU will be setup for management of the fellowship.

8. A working group on rainfed-agriculture shall be formed to guide implementation of the “Odisha Rainfed Agriculture Mission” with members from ICAR institutes, CSIR institutes, MoA-NRAA, MoA-MANAGE, OUAT, NCDS, OPELIP, Mission Shakti, PKVY Resource Centers, Programme Secretariat of Special Programme for the promotion of Integrated Farming and other members.

POLICY IMPLEMENTATION:

Necessary administrative orders will be issued within three months by the concerned departments regarding the implementation of this policy.

There is an expectation of a five per cent increase in central and state government outlays and close to 75 percent of this will be spent on implementing the key interventions identified in the policy.

ANNEXURE: List of Abbreviations

ADAPT	Analytics for Decision making and Agricultural Policy Transformation
AP	Andhra Pradesh
APC	Agriculture Production Clusters
APMC	Agricultural Produce Market Committee
ATMA	Agricultural Technology Management Policy
ATR	Action Taken Report
BOT	Build Operate Transfer
CACP	Commission for Agricultural Cost and Prices
CAGR	Compound Annual Growth Rate
CCE	Crop Cutting Experiments
CIWA	Central Institute for Women in Agriculture
DAFP	Department of Agriculture and Farmers' Empowerment
DBT	Direct Benefit Transfer
DPR	Detailed Project Report
e-NAM	National Agriculture Market
eNWR	Electronic Negotiable Warehouse Receipt
FAQ	Frequently Asked Questions
FIAC	Farm Information and Advisory centres
FL	Family Labour
FPO	Farmer Producer Organisation
FSPF	Farm Sector Promotion Fund
GDP	Gross Domestic Product
GOI	Government of India
GP	Gram Panchayat
HVA	High value agriculture
ICAR	Indian Council for Agricultural Research
ICT	Information and Communication Technologies
I-FMS	Integrated Fertiliser Management System
INM	Integrated Nutrient Management
IPM	Integrated Pest Management
IRRI	International Rice Research Institute
ISRO	Indian Space Research Organisation
IT	Information Technology
JLG	Joint Liability Groups
KALIA	Krushak Assistance for Livelihood and Income Augmentation
KCC	Kisan Credit Card
KVK	Krishi Vigyan Kendra
LCC	Leaf Colour Chart
LUS	Land Use Statistics
MFI	Micro Finance Institutions
MGNREG	
A	Mahatma Gandhi National Rural Employment Guarantee Act
MIDH	Mission for Integrated Development of Horticulture
MIS	Management Information System
MMT	Million Metric Tonnes
MP	Madhya Pradesh

MSP	Minimum Support Price
MT	Metric Tonne
NABARD	National Bank for Agriculture and Rural Development
NABL	National Accreditation Board for Testing and Calibration Laboratories
NBFC	Non-banking Financial Company
NCDEX	National Commodity and Derivatives Exchange
NeML	National e-Markets Limited
NFSA	National Food Security Act
NFSM	National Food Security Mission
NGO	Non-government Organisations
NHB	National Horticulture Board
NMOOP	National Mission on Oilseeds and Oil Palm
NMSA	National Mission for Sustainable Agriculture
NPCI	National Payments Corporation of India
NPK	Nitrogen, Phosphate and Potash
NSSO	National Sample Survey Organisation
OLM	Odisha Livelihood Mission
OMFED	Orissa State Co-operative Milk Producers' Federation
OSAM	Odisha Agricultural Marketing Board
OSSC	Odisha State Seed Corporation Limited
OUAT	Odisha University of Agriculture and Technology
PDS	Public Distribution System
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PMU	Project Management Unit
P-PAS	Paddy Procurement Automation System
PPP	Public Private Partnership
PRI	Panchayati Raj Institutions
PSS	Price Support Scheme
RBI	Reserve Bank of India
SECC	Socio –Economic Caste Census
SFSS	State Food Security Scheme
SHC	Soil Health Cards
SHF	Small Holder Farms
SHG	Self Help Groups
SLBC	State Level Banker's Committee
SRR	Seed Replacement Ratio/Seed Replacement Rate
STD	Subscriber Trunk Dialling
TE	Triennium Ending
UP	Uttar Pradesh
VAW	Village Agriculture Worker
VOO	Value of Output
VRR	Variety Replacement Ratio
WS	Wholesale