



SAMRUDHI

Agriculture Policy: 2020

Department of Agriculture & Farmers' Empowerment
Government of Odisha

SAMRUDHI - Agriculture Policy 2020

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Introduction

SAMRUDHI- Agricultural Policy 2020, 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. The current policy aims to give further thrust to the success delivered through concerted efforts under the previous agricultural policies of the state.

The aim is to actualize the vast untapped potential of agriculture in Odisha and strengthen the economic and social well-being of its farmers, sharecroppers and landless agricultural households while ensuring the growth process is environmentally, economically and technologically inclusive, scalable and sustainable.

Earlier Agricultural Policies of Odisha

The Government of Odisha (GoO) announced its first agricultural policy in 1996. The Policy accorded industry status to agriculture. Its aim was to double food grain and oilseed production and bring a shift from subsistence agriculture to commercial agriculture.

In 2008, GoO announced its second policy where the emphasis was on improving economic condition of farmers through sustainable agriculture development, integrated farming, organic farming, agro-processing and restructuring agriculture extension system for ensuring agriculture growth of 4 percent.

The third policy was released in 2013. It focused on increasing farmer incomes and their welfare. The tools of change were through diversification, rainfed farming, contract farming, post-harvest management and agriculture marketing, integrated watershed development and dry land agriculture.

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. 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 per cent of its people live in rural areas and about 61.8 per cent of its 17.5 million workforce is employed in agriculture.¹ The sector contributes about 18 per cent to the state's GDP. The state has a gross cropped area of about 8 million hectares, 46 per cent of which is double-cropped.² Paddy is the main crop and covers about 3.89 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 products: paddy, meat, milk and brinjal. Paddy accounts for 24.4 per cent 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 inflicting colossal damage to the Agri-sector. Despite of this, agriculture has proven to be one of the most resilient sectors of the state.

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 all-India average of 3.1 per cent. The state accounts for 3 per cent of India's agricultural GDP.

Odisha is the largest producer of sweet potato in India. It generates the largest Value Of Output (VOO)⁵ in India in the 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 (*parmali*). It also ranks high in the production of okra, cauliflower, and cashew.

¹ Census 2011

² Cropping intensity estimated from state government data

³ Financial Year 2015-16 (MOSPI, GOI)

⁴ For triennium average 2015-16

⁵ Financial Year 2015-16

Farmers' Income

An average farmer in Odisha earned about Rs. 7,731 per month, i.e., about Rs. 92,772 per year⁶. (Source: NABARD NAFIS 2015-16). In 2002-03, the average monthly income was Rs.1,062⁷, which means that in 13 years between 2002-03 and 2015-16, Odisha farmer's incomes grew more than seven times⁸ or at a compound annual growth rate (CAGR) of 16.5 per cent in nominal terms and 8.4 per cent in real terms.⁹ During the same period, the all-India average income of farmers grew from Rs.2,115 to Rs.8,931, i.e., at a CAGR of 11.7 per cent in nominal and 3.7 per cent in real terms.

Even though the absolute level of Odisha farmer incomes (in 2015-16) is lower than all-India average, the rate at which these incomes grew between 2002-03 and 2015-16 is more than double India's average growth rate. In fact, a state-wise comparison of these growth rates reveal that Odisha farmer incomes grew the fastest in this period in the entire country.

In addition to this, farmers' incomes in Odisha increased much faster than even the rate at which its own agricultural GDP increased. Between 2002-03 and 2015-16, its agricultural GDP increased at a CAGR of 3.7 per cent and its farmers' incomes grew at more than double that rate at 8.4 per cent.

These are encouraging signs. 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, recognises the constraints and formulates a policy to overcome the challenges and harness the potential and opportunities that fast-emerging markets within the state and outside provide while keeping the policy focus steadfast on farmers' well-being.

Successes and Policy innovations

The biggest measurable success is the unprecedented growth of farmers' incomes in the state as observed in the recent past. An analysis of the data¹⁰ reveals that this growth is explained by

⁶ NABARD NAFIS 2015-16

⁷ NSSO 2002-2003

⁸ There is difference in methodology between NSSO 2002-03 and NAFIS 2015-16. NSSO was conducted across 20 districts with land ownership as base and NAFIS was conducted over 12 districts with Value of Production as base.

⁹ Base 2011-12.

¹⁰ 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

three factors – diversification of the agricultural production basket to high-value products such as vegetables, higher monetisation of its cereal produce and higher income from livestock farming.

The hard work of the entrepreneurial Odisha farmer, complemented with progressive interventions by government, and its visionary leadership, has catapulted Odisha agriculture to its present stature.

Some of the pioneering steps taken by Government of Odisha include the following:

1. Consistent growth in funding for agriculture: In 2018-19, Rs.17,937 crores was allocated for 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 agricultural cabinet that oversees programme implementation and inter-department co-ordination.
3. Reformed agricultural input delivery systems: The Department of Agriculture and Farmers' Empowerment undertook a multi-pronged approach to reform the agricultural input delivery system in the state. From direct benefit transfer (DBT) in seeds (over 3.5 lakh farmers benefited in 2017-18), to subsidisation of farm machinery (about 40,000 farmers received subsidies for farm mechanisation), innovations in delivering irrigation access through the Jalanidhi-I scheme (due to which the state's irrigation coverage increased to 43 per cent); to harnessing technology to improve input delivery, the department undertook to reform input management and delivery system.
4. Real-time monitoring of all the key operational areas and schemes of the department- Institutionalisation of a decision support system has helped officials monitor real-time progress and deliver on key operational areas like seed supply, fertilizer supply, PMFBY coverage, rainfall, schemes etc. via fast, data-backed decision making.
5. Developing inter-departmental convergence at the block level – This was done through Farm Information and Advisory Centre (FIAC) meetings where officials meet every fortnight and resolve problems faced by farmers.
6. Innovation awards, called the "*Mukhya Mantri Abhinav Krushi Jantrapati Samman Yojana*" for farmers who innovate in the use of farm implements have been instituted at the district and state level.
7. *Mukhyamantri Krushi Udyog Yojana* (MKUY) has been launched to support entrepreneurs in setting up their own industrial units.

output generated from cereals from higher production and higher prices realised by the farmer and (iii) higher value generated from livestock.

8. The department has started a customized Agro-advisory service under the name of “AMA KRUSHI”. More than 4 lakh farmers across Odisha have been profiled under the service and received the weekly advisory over IVRS. The service currently provides agro-advisory service on 11 crops and answer questions for 40+ crops. It also supplements the IVR service with platforms like Community Radio, Whats App, SMS to reach the last mile.

In addition, initiatives in extension such as making Village Agricultural Workers (VAW)/Agriculture Overseers (AO)/Horticulture Extension Workers (HEW)/Soil Conservation Extension Workers (SCEW)/Livestock Inspector (LI) available at farmer counselling centers at GP/*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* for exposure visits of farmers etc., have helped in building community-led initiatives.

Women farmers have also 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 at farmers’ welfare and knowledge development for better agricultural practices also gained momentum since 2013. 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 monetisation of 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 the price support scheme (PSS);
2. Promoting post-harvest management through infrastructure investment – Key initiatives included setting up of international standard assaying facility by NABL, the availability of a food safety officer at Paradip port and the creation of 10 assaying laboratories;
3. Launching the Farmer Producer Organization (FPO) Policy for linking all 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 practice 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 a 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. SAMRUDHI- Agricultural Policy 2020, Odisha builds on these achievements. But to harness the complete potential of the state's resources in an inclusive and sustainable manner, necessitates identifying challenges and constraints.

The 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 fallow lands in the state. 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 intra-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 and Deogarh, where despite low levels of irrigation coverage, 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.¹¹ The high volatility is partially explained by the impact of weather and climatic variability on agricultural growth.
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 different districts in the state, 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 also not resulted in higher sales. The custom hiring centers (CHC) too have not been able to drastically improve farmer's access to farm machinery and equipment.
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 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 due to improper choice of crops.
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, fish and meat. This should ideally have resulted in changing the composition of the state's production basket; however, a large part 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 the case of self-pollinated crops.

¹¹ Between 2000-01 and 2016-17, the coefficient of variation of Odisha's agricultural GDP growth was estimated at 2.42 against a coefficient of 1.33 at the all-India level.

11. Low fertiliser consumption: Odisha's per hectare fertiliser consumption is amongst the lowest in the country at 68 kg¹² compared to the all-India average of 123 kg and the ratio of NPK is 4.5:1.9:1 (very close to ideal ratio of 4:2:1) compared to the all India average of 6.7:2.7:1¹³.
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 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 the port in Odisha but from a port further away in the neighbouring state of Andhra Pradesh (involving huge logistical and financial costs),
15. Slow growth in fish production - Growth in total fish production in Odisha is slow when 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 SAMRUDHI- Agricultural Policy 2020, Odisha 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.

¹² Per hectare fertiliser consumption for India average is 123.4 kg, for Punjab it is 232.2 kg and Bihar 198.4 kg.

¹³ While site and crop specific nutrient demand may indicate a different ratio, the overall application of fertiliser including organic manure, is abysmally low

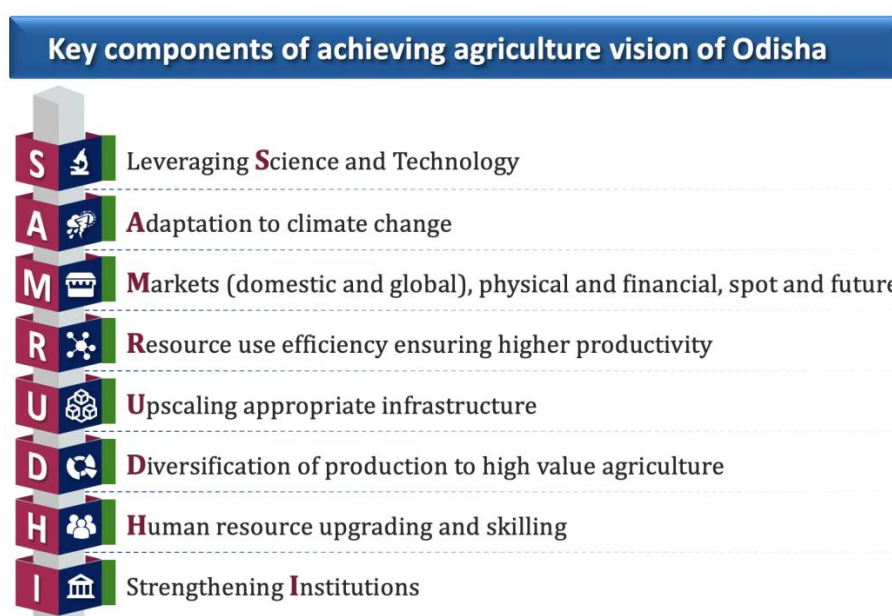
Objective

This policy will focus on farmers'¹⁴ well-being and aim is to achieve the following objectives:

1. Ensuring continuous growth in farmers' income
2. Making the growth process inclusive of small and marginal farmers, and landless farmers
3. Ensuring sustainable, stable and scalable agricultural growth.

Strategy

The sector-specific strategy in the policy are designed on eight pillars: **"SAMRUDHI"**



A 360-degree reform approach strategised

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

1. Creating an ecosystem interlinking inputs, production and markets
2. Focusing on sustainable increase in yields of paddy and diversification to high value agriculture (HVA)

¹⁴Farmers include those engaged in crops, livestock, poultry, fisheries, dairy and all other related activities.

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 wastage by promoting pre and post-harvest management
8. Adapting to climate change – techniques, technology and management
9. Leveraging the power of data and technology for planning and monitoring
10. Leveraging central government schemes

Defined by these broader contours and propelled by the SAMRUDHI strategy, commodity-specific and input-specific vision and interventions have been identified and spelt out 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)*. The scheme was launched in December 2018 and was designed to deliver an unconditional cash transfer directly to small and marginal farmers, sharecroppers and landless agricultural households. Up to a total of 75 lakh farmer families will directly benefit from this scheme.

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

1. Small and marginal farmers, including sharecroppers, are entitled to receive financial assistance as per KALIA scheme. This is an unconditional payment and the farmer gets it just before each cropping season to support his agricultural activities.
2. Landless agricultural households: To handhold landless agricultural households to help create sustainable livelihoods, the state government, under the KALIA scheme, has committed to giving financial assistance to the selected agricultural landless agricultural household. The payment will be made in three instalments. While the first instalment is unconditional, the subsequent two instalments are conditional upon the progress made by the landless in livelihood activity. The government also undertakes training and monitoring through its network of VAWs/AOs/HEWs/SCEWs/LIs to ensure that the landless are genuinely helped to develop the livelihood activities they choose to pursue.
3. Insurance cover: The component will provide the 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 will be provided to all savings bank account holders of between the ages of 18 and 50 years. The Government of Odisha will bear the farmers' share of the annual premium.
 - b. Personal accident cover of Rs.2.00 lakh for all savings bank account holders aged between 18 and 50 years. The Government of Odisha will bear the farmer's share of premium.
 - c. In respect of beneficiaries whose age is between 51 and 70 years, the entire amount towards annual premium will be borne by the Government of Odisha.

4. **Kalia Scholarship:** The government will bear the educational expenses of the children of the KALIA beneficiaries who have taken admission in government-run professional colleges and technical institutions on merit basis.

This 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. The 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 such activities 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 the 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 sanitization 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 government to provide all round support to the farmers and ensure greater inclusiveness by extending the coverage of the scheme to all eligible beneficiaries.
6. **Spreading awareness and synergising the extension system:** The department will undertake awareness programs whenever required during activities like disbursement

of financial assistance, training for livelihood activities provided to landless farmers under KALIA etc.

7. **Regular monitoring and evaluation of KALIA:** The scheme will be reviewed on key performance indicators. A third-party evaluation will be utilised to assess the impact on KALIA beneficiaries and suggest fine-tuning of the scheme. Regular block and district-level interactions with implementing authorities will be undertaken.
8. **Awards and recognition of successful KALIA beneficiaries:** Farmers who are able to improve their livelihoods exceptionally using KALIA will be identified and duly rewarded on a yearly basis. High performing officials at all levels of the hierarchy will also be duly recognised.

Chapter 2

Diversification

Close to half of the state's gross cropped area is under paddy (triennium ending 2017-18). With a cropping intensity of 42 percent, it will not be wrong to say that paddy is the main crop of the state and kharif is the main cropping season. But Odisha paddy farmers have been suffering in the recent years, mainly due to falling profitability (due to rising costs of cultivation and lower value realization) and fluctuating yields (due to climate variability).

Odisha nutrition levels need improvement. As per National Family Health Survey (NFHS) 2015-16 results, 34 percent of the children are underweight due to malnutrition. In this case, importance of a balanced diet that comprises of cereals, pulses, fruits and vegetables, other proteins like meat, egg, soy cannot be overstated.

In case of fruits and vegetables (F&V), not only does Odisha enjoy a unique natural comparative advantage as its agro-climatic conditions are suitable for their production, higher potential income per acre also mandates a production basket shift towards fruits and vegetables. Odisha already ranks high amongst the top Indian states in many horticulture crops¹⁵, however, the production potential remains underutilized. This policy gives a major thrust to horticulture production in the state and aims to create an enabling environment for sustained and inclusive growth.

It is important to note at this point that the state remains steadfast in its resolve to sustaining and growing paddy production in the state. The policy thrust however will be on improving productivity rather than acreage.

Apart from F&V, nutri cereals are also 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 tribal districts of Odisha. The mission has been able to increase production and improve the productivity of these crops, mainly ragi.

Maize is an important coarse cereal for the state. Maize is mainly a *kharif* crop in the state, consumes less water than paddy, is a C-4 crop that sequesters more carbon from the atmosphere, has more than 100 industrial uses and creates valuable and large quantities of

¹⁵ It is also 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.

biomass for fodder. Maize is encouraged for food, feed and industrial uses. In 2018-19, the state produced 752.41 Lakh MT covering 251.43 Lakh Hectare area with an average yield of 2,993 kg/ha. The market price of maize was 1700 per quintal for the year 2018-19.

Odisha produces about 1 MMTs of pulses and 0.55 MMTs of oilseeds.¹⁶ Groundnut and sesame (*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. Crops like oilseeds and pulses 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.

On the grounds of increasing farmers' income and improving nutritional security of the farmers and the state, there is a case for encouraging diversification- both horizontal (area expansion) and vertical (value addition and agro-processing).

This chapter explains the strategy for horizontal diversification and the chapter on Markets expands the Policy interventions for undertaking vertical diversification.

For undertaking horizontal diversification, this policy encourages four ways:

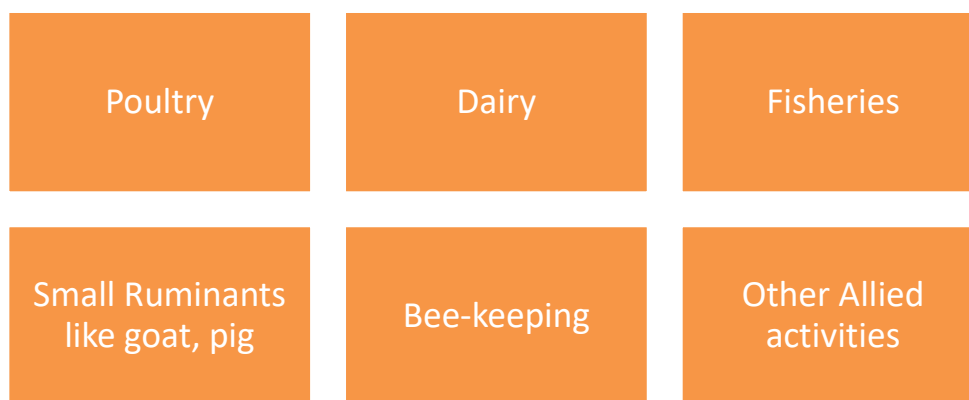
1. Taking up paddy fallows in Rabi season and sowing crops which require less water
2. Increasing access to water and employing paddy fallows in rabi for cultivating high value agriculture (HVA)
3. Diverting kharif area under paddy in areas with low yields, largely concentrated in uplands and medium lands to HVA
4. Expanding the overall GCA by improving access to water and putting the area on HVA

The strategy is two-fold: (i) Diversify to high value agriculture that includes:



And complement it with allied activities

¹⁶ Data for triennium ending 2017-18



To pursue its objective of diversification, the Policy aims to establish a strong interlinkage between production, inputs and markets. To this end, a **production-cluster approach** is envisaged in this Policy. This involves following sequential interventions:

5. A district-level agro-ecological map will be created by the Department in consultation with OUAT, with close interaction with ICAR institutions, especially ICAR-National Rice Research Institute (NRRI), Cuttack, ICAR-Central Institute for Freshwater Aquaculture (CIFA), Bhubaneswar, ICAR-Indian Institute of Water Management (IIWM), Bhubaneswar, ICAR-Central Institute for Women in Agriculture (CIWA), Bhubaneswar, Regional Centre of ICAR-Central Tuber Crops Research Institute (CTCRI), Bhubaneswar, Regional Centre of ICAR-Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Koraput, the Central Horticultural Experiment Station (CHES) of ICAR-Indian Institute of Horticultural Research (IIHR), Bhubaneswar and the ICAR-Foot and Mouth Disease Lab, Bhubaneswar
6. The agro-ecological map will form the basis of a district-level production plan that will be created by OUAT in consultation with the Department of Agriculture and Farmers' Empowerment, that will identify the ideal cropping pattern for each district
7. This will form the basis for cluster-based production centres those will be identified across the state for major crops- Under the cluster-based approach, regional production belts and clusters (full or mini clusters) will be identified and those will be supported through relevant central and state government schemes and programmes.
8. Investment in infrastructure: Resources from Rashtriya Krishi Vikas Yojana (RKVY) and other central and state government schemes will be utilized to create supporting infrastructure including connectivity, access to power, storage and warehousing in the identified production clusters;
9. Efficient value-chains from cluster-based production centres will be created to ensure maximum value-capture by farmers.

10. An incentive package based on the proposed clusters will be announced. The package will provide access to quality seeds and planting material, irrigation support and infrastructure for post-harvest grading, storage, and sales.
11. Markets will be linked to production clusters. A 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.
12. Farmer producer companies will provide inputs and link individual farmers to banks to enable easier access to credit; they will be given necessary licences for such inputs. They will collect the output, store, transport and sell it in the market or to processors and retailers.

Overall, the focus is to:

1. Expand area and productivity of nutri-cereals,
2. Expand area under oilseeds and pulses, particularly areas with lower access to water, areas in the upland regions
3. 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 farmers to make the shift
4. To address the yield gap across major pulse growing districts 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.
5. Intercropping of oilseed and pulse crops will be encouraged, especially with paddy and sugarcane.
6. Introduction of oilseeds in non-traditional areas will be supported.
7. 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
 - c. This will be supplemented by micro-irrigation initiatives, which is expected to cover at least 0.1 million hectares.
 - i. 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.
 - d. Cropped area under hybrid vegetables will be doubled from the present 10 per cent of the cropped area under vegetables.

- e. 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.
 - f. Efforts will be made to identify and promote new techniques and technologies of production such as high-density plantation and protected cultivation.
 - g. In the upcoming five years, area under poly green houses will be increased to 0.6 million square meters (from 0.18 million square meters), under shade net house to 2 million square meters (from 1.5 million square meters) and area for floriculture under protected cultivation will also be expanded to 0.5 million square meters (from 0.2 million square meters)
 - h. Promotion of intercrop in mango and cashew orchards will be encouraged.
8. In addition to the above interventions, the Policy will be providing thrust to Livestock and Fisheries (elaborated in the chapter on Livestock and Fisheries). Transfers received under KALIA for these activities will be built upon.

Organic Agriculture

To respond to challenges from climate change and to enhance farmer incomes, Department of Agriculture and Farmers' Empowerment released the Odisha Organic Farming Policy, 2018. The aim is to undertake 360-degree development of organic farming in the state and increase the acreage from 20,800 hectares currently to at least 200,000 hectares in the next five years.

From ensuring economic and physical access to relevant and efficient inputs to standardising post-harvest management to developing markets, both domestic and global, the policy aims to create a conducive 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 rain-fed, dryland and hilly areas, are prone to weather and climate vagaries. Increasing agricultural productivity and farmers' income in these areas has always been a daunting challenge for policy makers. Due to various factors including geographical location and the use of traditional cultivation practices, the existing level of fertilizer and pesticide use is low in these areas, i.e., they are 'naturally organic' areas. These areas are amenable to a quick shift to 'organic agriculture' and will be identified as clusters to promote organic farming. Soil health cards will help identify these areas. Once the shift to organic farming is made, it takes time for soil systems to regain their fertility and crop yields to

return to pre-transition levels. Hence, a rational approach to choosing the area and crops to be brought under 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 rain-fed 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, higher yield can be realised because of comprehensive interventions made in poorly performing farms.
2. Organic farming of niche commodities will be promoted 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 will be promoted with R&D support.
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. Certification facilities will be provided.
5. Zero budget natural farming 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 considered 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 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 cultivating cereals and horticultural crops and is involved dairy farming is in a good position to do integrated farming. Similarly, a farmer with poultry and fisheries can combine the two with benefit. A farmer growing horticultural crops will do well with beekeeping to assist pollination and to get honey.

In this regard, following interventions are being suggested:

1. Integrated farming system model will be developed for all 10 agro-climatic zones by KVK/RRTTS (OUAT).
2. 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
3. KVKs will be tasked with setting up at least ten integrated farming models each in their jurisdiction.
4. 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.

With an aim to enhance farmer incomes and ensure that the growth process continues to be inclusive of the state's small and marginal farmers, in addition to above, the Policy makes vital changes as given in the Chapters to follow.

Chapter 3

Markets, Infrastructure, Value-chains and Processing

Ensuring timely and sufficient access to transparent and deep markets and to supporting infrastructure to all farmers will be a guiding goalpost of this Policy. Policy's thrust to produce higher quality and higher quantity per hectare will be concurrently supported by policy incentives that will deliver deeper, and efficient markets. Efforts will be made to deepen access to fair and remunerative markets and to bring transparency in the system. Supporting infrastructure that involves storages, warehouses, logistical support will be ensured while creating a conducive and a stable policy environment to encourage private participation wherever possible.

This mandates a 360-degree approach where the state sells all what it produces and also it produces things that are demanded and can be sold. This requires building strong interlinkage between the dynamic demand and supply situation in the market. The policy proposes to encourage creation of a new marketing model where differentiation of produce is encouraged, adequate storage and transport facilities are provided, there are facilities of e-auction and e-trading, price discovery mechanism is transparent and efficient and farmers have real-time access to prices and there is a robust price forecasting system that helps farmer take informed decision before sowing of crops. The overall aim will be to take markets to farmers.

To capture a greater share of the consumer rupee for a farmer, the Policy gives thrust to agri-entrepreneurship and encourages vertical diversification, where the focus will be on value addition, agro-processing and value chain development with emphasis on primary processing at farmers level to ensure secondary employment and profitability. This will be complemented by IT-based forward linkages established in product and geographical terms that will form the basis of a value-based supply planning.

As markets in agriculture in India are strongly inter-linked with credit, labor and land markets, innovations to de-link them will be an objective. For example, models that offer options for storage linked to credit will be identified and implemented wherever possible to discourage distress sales by farmers who lack storage facilities.

In addition, the state government intends to undertake the following measures:

1. Progressively and holistically undertake reforms in the related policies:

- a. The Model Contract Farming Act, 2018, will be changed according to the requirement of the state and will be implemented. The objective of contract farming is to help farmers enter a pre-season price agreement of sale for their produce. This will ensure benefits of economies of scale and increased investment on farms.
 - b. On the similar lines, the Model Agricultural Produce and Livestock Marketing Act (APLM), 2017 will be modified according to the state's requirement and will be implemented. This will include setting-up of private markets, facilitating and creating farmer-consumer markets, promoting direct sales to exporters/processors and customers, and streamlining of the existing regulated markets by, *inter alia*, ensuring single point levy of market fee, a unified single trading licence in a state, and declaring warehouses/silos/cold storage as market sub-yard. E-trading of commodities will be promoted via electronic National Agriculture Market (eNAM) portal.
 - c. State notifications under the Essential Commodities Act will be reviewed to deliver a stable and predictable policy environment. This will 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 provided financial and technical support with assistance from NABKISAN, a subsidiary of 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 NABARD model of joint liability groups (JLGs) will be promoted to channelise small growers into the value chain
2. Warehousing and logistics infrastructure will be created and scaled-up: Odisha markets need to be made modern and scientific. Investments in marketing infrastructure is most crucial and this will be aligned with state's production clusters. For this, following are envisaged in the Policy:
- a. A new warehousing and logistics policy for Odisha to encourage private investments will be announced separately.

- b. More warehouses will be created/strengthened at the village/block level in the state, they may be registered under the state Warehousing Development and Regulatory Authority (WDRA).
 - I. Smaller storages at the village or at farm-level by the farmers or FPOs will be encouraged through policy support
 - c. The existing network of procurement centres at PACS level will be strengthened to benefit small and marginal farmers.
 - d. The farmers/entrepreneurs shall have access to avail post-harvest loan from the Banks/Financial Institutions for the stock kept in the godowns of State Warehousing Corporation (SWC)/Private Storage godowns/Cold storages registered under WDRA through Negotiable Ware House Receipt (NWR).
 - e. All the godowns of SWC shall be registered with WDRA.
 - f. With e-NWRs, the private sector shall be motivated for investment in cold chain/storage godowns.
 - g. At the wholesale market level, investment will be made and encouraged in creating facilities for assaying, sorting, cleaning and grading based on size, colour and texture.
 - h. Wholesale markets with facilities for storage, pack house operations and cold storage facilities will be set up through the marketing board both with and without private sector participation.
 - i. To encourage local employment opportunities, drying, sorting and packaging of food grains in particular will be extensively standardized and promoted
 - j. Greater rigour will be brought in the standardization of equipment for the assaying labs in order to ensure maximum coverage of crops and to serve their bulk handling
 - k. All *panchayats* will have storage and warehousing facilities
 - l. All regulated market committee (RMCs) will be modernized to provide warehousing and professional agricultural marketing and extension support
3. The government has now shifted its attention to promoting farmers as businessmen or as “agri-preneurs”. This will result in rapid modernization of the agricultural sector. Role of Agricultural Promotion and Investment Corporation of Odisha (APICOL) will be pivotal in this. For encouraging agri-preneurs, the Department will:
- a. Align working of APICOL with the cluster-approach; particularly for horticulture products, allied activities like poultry, fishery and supply of inputs like seeds and manure, agri-entrepreneurs.

- b. Efforts will be made to identify, counsel and train agri-preneurs on the basis of clusters where similar crops are grown.
 - c. To promote agri- entrepreneurship at grassroots level, pilots will be created in tribal areas and for small and marginal farmers. NGOs will be invited for collaboration.
 - d. The Government of Odisha will promote entrepreneurship through women SHGs/SMEs for making locally produced compost/biomass or Trichoderma cultures.
 - e. An index for monitoring ease of doing agri-business will be created and monitored. The index will be created by the Department in consultation with APICOL, OUAT and other stakeholders.
 - f. Create awareness about the incentives offered to agri- entrepreneurs under various government schemes. Use of digital and print media will be used extensively for this.
4. The Policy places high importance in promoting use of market intelligence in agriculture. This entails providing the farmers with real-time access to price information. This will not only help farmers plan the sale better, undertake better crop planning but will also help in unlocking the land-labour-credit nexus by making the farmer better informed about the actual market prices. For this,
- a. The Department will create a market information system (MIS) to disseminate the prices on to the farmer's phone.
 - b. Not just the ongoing prices, if the farmer can know in advance the prices that are likely to prevail in coming months then he can make an informed decision about the crop he wants to sow. For this, the Department, with the help of OUAT, GOI's Mahalanobis National Crop Forecast Centre (MNCFC) and ICAR, and other institutions like NCDEX, will develop a robust price forecasting system. An interactive dashboard that will provide real time price forecast will be created and through the application, this price information will be taken to farmers in a timely manner. This will be done initially for only the principal crops and horticulture commodities.
 - c. Link farmers with international trading platforms and also help identify business opportunities beyond state and national boundaries
5. Procurement of crops under central government's minimum support price (MSP) regime will be made more broad-based and its coverage in terms of area and crops will be expanded. This will entail following:

- a. A special focus to expand procurement of oilseeds, cereals, maize, etc. The target is to procure at least 25 percent of their production in the next five years for crops like oilseeds, cereals, maize etc.
 - b. Through a system of incentives and commission payments, government will examine options to include private traders operating in markets to complement the MSP operations. This is likely to include unbundling of the procurement operations where operations like procurement and/or storage may be outsourced to private individuals, or private sector may be encouraged through PM Aasha's private procurement and stockiest scheme (PPSS).
 - c. The network of procurement operations will be expanded in its area coverage
 - d. Creating storages is crucial and state will invest itself or encourage private sector to create a widely spread and connected network of warehouses in the state
 - e. 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.
6. Unless more markets are created to absorb growing production, farmers will continue to suffer for growing more than the demand. With an aim to create new markets for the procured crops, state government will link procurement of at least nutri cereals to the public distribution system (PDS) and the Integrated Child Development Services (ICDS) scheme's mid-day meal scheme for the school going children.
7. To smoothen inter- and intra-year fluctuations in supply of crops, processing can play a vital role. Basic processing at the farm-level will also improve share of farmer in a consumer rupee. In this regard, following interventions are identified:
- a. 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
 - b. Greater focus will be placed on the food processing industry to enhancing value addition in vegetable and fruit crops.
 - c. Growing quantities of rice will be fortified and distributed under PDS. 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.
 - d. Skill development training on primary processing, value addition and agro-processing will be imparted to unemployed youth, landless agricultural households, women SHG members etc.

- e. 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
8. Paddy being the most important crop of the state, improvements in its milling efficiency is pivotal. To improve milling infrastructure and efficiency, the following measures will be put in place.
- a. Paddy milling capacity in the state will be made more scientific and focus will be on lowering the gap between the existing milling capacity and its utilization.
 - b. Existing paddy has a low out-turn ration and to improve that 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 is available currently. This would include improved varieties, cultivation practices, and management of pests and diseases.
 - c. 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.
9. Exports will be an important market for Odisha's produce. An export enabling environment will be created through the following measures.
- a. 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.
 - b. Since there exists a shortage of testing laboratories, the government intends to increase their number to facilitate quicker issue of health certificates wherever needed for exports.
 - c. Efforts will be made to augment the capacity of Gopalpur Port, Dhamra Port and Paradip Port to handle agriculture cargo.
 - d. A green channel will be created at Odisha ports, in particular to avoid deterioration of perishables due to congestion at ports.
 - e. Coastal liners to link Kolkata and Vizag ports with Odisha ports will be promoted.
 - f. Export-based clusters and contract farming will be promoted to help ensure traceability of farm produce.
 - g. Exports to other states of the country will also be a focus and will be encouraged through adequate policy support
10. New avenues of monetizing the produce will be explored and scaled-up. That will include:
- a. Enhance utilisation of crop residues as fodder

- b. Efforts to market rabi maize domestically and nationally.
 - c. Use of financial commodity instruments like futures and options to deepen markets of particularly for crops with great domestic and global potential like maize
 - d. Oilcakes are essential for livestock feed; so linkage with oilseed processors and feed manufacturers will be developed.
11. Marketing policies and requirements of infrastructure and logistics for cereals differs from those for fruits and vegetables (and even for the allied activities as elaborated in the Chapter dedicated to allied activities). To avoid losses, F&V would require robust and shorter value-chains. In addition to the interventions identified above, following interventions are proposed in particular for horticulture products and their identified clusters:
- a. Create standard grading of at least the major F&V crops/commodities: To leverage markets beyond state boundaries, standardization of the grades of major crops will have to be created;
 - b. Investment will be made and encouraged in creating facilities for assaying, sorting, cleaning and grading based on size, colour and texture and packaging facilities with labeling for easy traceability. These facilities will be common and will be made available to farmers at farm level and market level making them affordable for small farmers.
 - c. The state will have at least 30 functional infrastructure for collecting, sorting and grading of produce in the state;
 - d. As majority of marketing in F&V is done under traditional marketing, with a number of intermediaries, private mandies with adequate infrastructure will be developed.
 - e. Particularly for F&V products that are higher value, have easily differentiable grades and have high potential of trade beyond state boundaries, the state will aim to create online traceability portals on lines of APEDA's GrapeNet and MangoNet. These will not only help in standardization of products in the form of maximum residue levels, but the commodity can also be tracked back to the farm level or its origin.
 - f. Integrated cold-chain systems will be created and promoted for F&V which will include pre-cooling, cold storages, reefer vans, etc. Wherever possible, cold storages will be linked to WDRA and they issue NWRs that will help farmers in post-harvest finance.
 - i. Commodity specific export-oriented infrastructure facilities particularly required for F&V, such as pack houses, ripening chambers, irradiation

facilities, hot water treatment will be promoted in the state, allowing farmers to export their commodities to markets abroad.

- g. 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.
- h. Wherever possible protected cultivation of F&V through poly-houses and greenhouses will be promoted through required economic incentives. To the extent possible, this promotion will be in consonance with the production cluster map of the state.
 - i. A technical cell will be set up in OUAT or the department to assess the quality of required infrastructure and advise farmers on the appropriate choices available
 - ii. Training of the farmers will be conducted for running polyhouses
 - iii. FPOs and other farmer groups will be encouraged to adopt practice of protected cultivation so that with groups of farmers the benefits of economies of scale can be leveraged.

Chapter 4

Production and Productivity

Improvement of productivity is crucial for Odisha for all crops. The Policy will undertake concentrated efforts to increase Total Factor Productivity (TFP) of all crops, including thrust crops like cereals, pulses, oilseeds, cotton and sugarcane on a sustainable basis. Aim will be to reduce/rationalize costs of production and improve farmer profitability. 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 are 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.

Land and Soil

1. At least 0.5 million hectares will be added to the *rabi* cropping area (currently at 2.3 million hectares)
2. Fallow land will be reduced – At least about 0.3 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* programme with ICRISAT will also be used to accomplish this
 - c. By encouraging cultivation of low-water consuming crops like pulses, oilseeds and fodder, fallow land will be reduced. Improved production technology will be provided to facilitate this.
3. The Model Agriculture Land Leasing Act 2016 will be amended as per the states requirement and implemented to improve the access to land to farmers, sharecroppers, landless and private individuals. In this effort, the right of landowners will be duly protected.
4. Department will undertake to create and update database of tenant farmers and sharecroppers. A document certifying their cultivation practice will be issued to them.
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. Revival and strengthening of State Land Use Board will be taken up and restrictions on transferring of agriculture land for non-agriculture purposes will be reviewed and strengthened wherever required.
7. Fresh land capability classification map and soil nutrient map of the state will be prepared in consultation with OUAT, ORSAC and other experts.
8. Degraded land is a major problem in the state. Most of the land are upland with undulating topography. Extensive land development exercise will be undertaken for these land
9. Suitable farming systems such as agro-forestry will be adopted with farmers' participation for land allotted under FRA and land under shifting cultivation keeping in view agro-ecology
10. 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 the following:
 - a. Development of district-level soil fertility maps with panchayat/village as units. These will be based on available data from soil health cards.
 - b. Bringing more technical competence in sample collection and testing of soil and encouraging private sector to supplement government efforts. New technologies will be utilised for this effort.
 - c. Investments in soil testing infrastructure will be scaled-up
 - d. Introducing incentives for soil amendments as required in respective regions
 - e. Integration of the soil health card portal with the integrated fertiliser management system (I-FMS) and promotion of site-specific nutrient management based on village/panchayat/block level soil data
 - f. Updating soil health status every three years at the village/panchayat level
11. Soils are also a reservoir of water. Soil moisture retention capacity, soil microbial activity, and soil fertility play seminal roles in mitigating the effects of dry spells in rain-fed areas. Government will provide suitable incentives for farmers for the addition of organic matter.
12. Salinity of soils is another big problem in Odisha. Excess salt in the soil impairs its productivity adversely. To address this problem, the state government intends to implement the following measures:
 - a. Improve drainage: Both land shaping and provision of drainage will be made. Drainage development will be through surface/sub-surface/bio-drainage/or a

combined approach followed by appropriate agronomic measures. Wherever possible, MGNREGA assignments will be used towards this purpose.

- b. Drainage Line Treatment (DLT) in upper and middle reaches is important to enhance productivity by retaining soil and moisture. This will also reverse the land degrading process and help in bringing more acres into cultivation.
 - c. Introduction of salt-tolerant varieties and crop rotation techniques: Relevant crop-type and variety-type for saline soils will be identified and the information disseminated to farmers. To reduce the level of salinity over time, crop rotation patterns will be studied, and information disseminated to farmers.
 - d. In water-logged saline soils, water table depth will be lowered through sub-surface drainage techniques
 - e. To check for the quality of water being used for irrigation, soil health card (SHC) test labs will be used
 - f. Soil test-based fertiliser use: Fertilisation will be mapped with soil requirements, particularly for the areas with high salinity (identified using the soil health card results).
13. The 3-M (matter, moisture, microbes) framework as envisioned in the Odisha Organic Policy will guide the soil strategy for rain-fed areas. The state government will initiate living soil pilots with a focus on farmer-to-farmer /inter-community knowledge exchanges based on the 3-M framework.
14. Most horticulture crops are grown in up and medium lands – use of soil amendments will be made a part of the horticulture incentive package.
15. 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.

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 the use of the most appropriate seeds from a regional, ecological and farmers' income point of view. Use of poor-quality seeds will be discouraged.

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

1. Dynamic seed rolling 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), previous trends and targets of introducing new varieties replacing older varieties
 - a. The aim will be to increase the SRR to 33 percent for paddy, 20 percent for moong, groundnut and mustard and about 12 percent for biri. For, cross pollinated crops, the targeted SRR is 50 per cent.
 - b. Increase Variety Replacement Ratio (VRR): This will be done by phasing-out old varieties of seeds and replacing them with hybrid and HYV seeds to enhance productivity. At the same time, the better performing indigenous and local varieties will be identified and promoted.
2. 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.
3. In case of paddy, ten varieties make up over 95 per cent of the sales of certified seeds. In order to move towards a regime of high income realisation, better varieties with differentiating characteristics such as high yield, disaster resilience, high milling recovery, maturity fitting to land type and hydrology, summer rice, etc., will be identified and promoted. In addition, potential high earners among traditional rice varieties will be identified and promoted in regions favourable to their cultivation.
4. Seed Quality:
 - a. The quality of all seeds will be monitored as per the parameters outlined in the Seed Act, 1966, Seed Rule 1968 and Seeds (control) Order 1983 and subsequent amendments
 - b. 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.
 - c. Model guidelines for seed licensing will be issued to tackle the problem of heterogeneity in seed licensing procedures across the state.
 - d. In addition to seeds supplied through the State Seed Corporation, certified seeds of private companies will be encouraged.
 - i. The variety/seeds developed/produced by the private sector will be duly evaluated before being distributed to farmers.
 - ii. An IT-based solution for regulating the private seed suppliers will be implemented

- e. Quality enforcement squads will be set up to ensure the quality of seeds in accordance with the provisions of the Seed Control Order, 1983.
- 5. Seed Corporation, OUAT, government farms, the private sector and farmers will be involved to ensure that enough seeds will be produced and supplied.
- 6. Newly released seeds by private organizations will be tested as per protocols of the state
- 7. Disaster Management:
 - a. 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.
 - b. 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.
- 8. Climate-smart seed delivery:
 - a. A crop contingency plan will be prepared with a 'seed reserve' policy in areas of repeated calamity stress.
 - b. Promotion of flood tolerant varieties in flood prone areas and drought resistant varieties in drought prone areas and salt tolerant varieties in salinity affected areas will be undertaken.
- 9. The possibility of selling seeds to farmers through PoS machines/biometric scanner devices will be examined and piloted.
- 10. Seed quality testing will be insisted upon. Local seeds that are more climate resilient and have high 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.

Water Management

Timely access to adequate quantities of water is crucial for agriculture. Close to 43 per cent of the state's gross cropped area (GCA) is under assured irrigation. About 62 per cent of the state's irrigation needs are met from government canals, about 19 per cent from private water sources, 15 per cent from tube wells and other wells and about 5 per cent from tanks.¹⁷ Irrigation resources in the state are underutilised – there is a large gap between the irrigation potential created (IPC) and irrigation potential utilised (IPU). About 49 percent of state's IPC is currently

¹⁷ Source: Directorate of Economics and Statistics, GOI

utilized. Besides, from the tail-end of the distribution system, there are gaps identified between IPU and actual received. This presents a unique opportunity for productivity enhancement in the state without having to invest heavily in new projects. The aim is two-fold: increase irrigation potential created and ensure its maximum utilisation.

Important as it is to provide access to adequate water, it is also necessary to undertake efforts to improve water-use efficiency (defined as the ratio of crop yield (in kg) and water consumption (in cubic metres)). With the effects of climate change, reflected in the intensity of rains, rising temperatures, dry spells between rainy days, frequency of floods and droughts, conservation of water and its efficient use becomes important.

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

1. Increase irrigation potential utilized (IPU) as a percent of the irrigation potential created (IPC) from current 49 percent to at least 70 percent in the upcoming five years;
2. Increase irrigation coverage from 43 per cent to 53 per cent of gross cropped area (GCA) in the next five years.
3. At least one lakh extra farm ponds will be created in the next five years;
4. Efforts will be made in particular to ensure access to sufficient water for areas in the tail-end of a command area or distribution system; otherwise, appropriate changes in schemes like Jalanidhi will be made so that these individuals are able to benefit from them.
 - a. The PLIPs established under Jalanidhi scheme will be increased from 16.5 thousand to at least 60 thousand in the next five years;
 - b. IP created through Jalanidhi will be expanded from 36,000 ha currently to 1,50,000 hectares in next five years
5. 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 farmers.
6. Sustainable water use in agriculture will be encouraged:
 - a. Areas will be studied and mapped to assess the extent and intensity of water shortage for agricultural purposes.
 - b. Paddy is the most important crop and is a water-guzzler. Using technological innovations and research, water used for producing per kilogram of paddy will be reduced to at least half in the next five years.

- c. Promote conjunctive use of or surface and groundwater resources¹⁸ through government and private canals, public and private tanks, ponds, other village level water harvesting structures and public and private tube wells.
- d. Efficiency of water use will be promoted through various measures including micro irrigation and sub-surface irrigation.
 - i. Focus will be on irrigating plants and not the soil, therefore surface drip irrigation and use of sprinklers will be mapped for their crop-wise efficiency and farmers will be encouraged to adopt these.
 - ii. At least 0.2 million hectares will be put under micro irrigation in the next five years where at least 0.13 million hectares will be under sprinkler irrigation and about 35,000 hectares under drip irrigation
- e. Water conservation schemes will be taken up on priority through programmes like MGNREGA and techniques of retaining residual moisture will be emphasised.
- f. 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.
- g. The cropping pattern will be adjusted for optimal utilisation of available water resources.
- h. A water literacy movement would be launched, and regulations will be put in place for the sustainable use of ground water.
 - i. Focus will be given on optimal use of both green and blue water
- 7. A separate window will be created to address problems facing rain-fed agriculture, where poor farmers dominate.
- 8. 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.
- 9. Managing dry-spells: Crop failure and low productivity in rain-fed areas is primarily a consequence of dry spells. Keeping this in view, Government of Odisha will invest in the following:
 - a. Initiation of protective/critical irrigation in rain-fed areas to secure crops and improve ecologically sustainable cropping intensity through participatory water

¹⁸ As per FAO, “conjunctive use of surface and groundwater consists of harmoniously combining the use of both sources of water in order to minimize the undesirable physical, environmental and economical effects of each solution and to optimize the water demand/supply balance.”

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

- b. The government will take up the following; 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; and watershed activities through MGNREGA and Pradhan Mantri Krishi Sinchai Yojana (PMKSY) in the rain-fed and drought-prone areas of the state.
 - c. Awareness generation, appropriate use of water and community management will be taken up through participatory rural appraisal (PRA) exercises, training programmes, and simulation games.
10. Attention will be paid to projects for drainage where water logging is frequent and problematic.
 11. Performance of Water User Associations (WUAs) will be reviewed and a conducive ecosystem will be built to enable them to improve water use efficiency in the states
 12. Participatory Watershed Management will be prioritised as an ongoing programme in order to conserve soil, water and biodiversity.
 13. Focus on sub-surface water storage in addition to rainwater harvesting, rainwater conservation will be stressed particularly in rain-fed regions
 14. In case of paddy,
 - a. Water conservation measures to ensure that water moisture is retained in the soil to be utilised for rabi cropping will be encouraged.
 - b. 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.
 - c. Gram panchayats will be facilitated with devices like automatic rain gauge and digital moisture meters for better information on crop operations.

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 to increase fertility. Since fertiliser consumption per hectare is very low in comparison to all India average, use of chemical fertilisers, and where appropriate organic fertilisers, will continue to be supported, and in addition the focus will be on balanced fertilization, and discouraged use of spurious fertilizers.

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 the 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 soil tests.
 - c. The SHC database will be aligned with the integrated fertiliser management system (IFMS).
2. The PACS will be strengthened to act as one-stop support centre for supply of seeds, fertilisers, bio-fertilisers, pesticides and bio-pesticides. The rural youth will also be encouraged to take up such activities under the Agri-Entrepreneurship Promotion Scheme (AEPS).
3. Use of plant and animal waste and bio-fertilisers will be promoted with appropriately designed incentives.
4. An awareness campaign on the use of agricultural waste and bio-fertilisers will be launched to ensure that overuse of chemical fertilisers does not lead to soil health deterioration and water pollution.
5. Synergy with micro-irrigation: a higher subsidy will be provided for liquid fertilisers to encourage fertigation with micro-irrigation
6. 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 at sale points in their respective localities.
 - b. Attempts will be made to minimise manual and adjusted transactions by retailers by shifting to the use of technology (PoS Machines)
 - c. To arrest sale of spurious fertilizers, labelling of the fertilizer bags will be reviewed and will likely be made mandatory. This will provide traceability and discourage sale of fake products
7. Streamlining the fertiliser value-chain
 - a. The fertiliser licensing process will be streamlined to ensure transparency and effective distribution.
 - b. Initiatives such as fertiliser advisories to dealers and farmers through WhatsApp, *kisan rathyatra*, 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.

8. In case of paddy,
 - a. Nutrient management of rice will be based on soil tests and use of Leaf Colour Chart (LCC) and green seeker.
 - b. Widespread application of site and variety specific nutrient management system like Rice Crop Manager that rationalises nutrient use based on the principle of nutrient replacement by the previous crop (rice+ sequence crop), specific to the farmers' plot and variety cultivated will be encouraged.

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 a 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 organised to assess pest/disease situation and the agro-eco-system will be studied to enable timely advice on IPM control measures.
 - c. Extension activities will be strengthened to popularise the 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 unless it is 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.
 - h. To prevent sale of spurious chemicals, the Department will undertake to make barcoding compulsory so that a specific batch of chemicals can be tracked
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 seeds saved by them for future use in a scientific manner.

3. A new state pest policy will be launched, which will aim to create an integrated data backed decision support system for pest management
4. An IT-based system on pest management will be developed and used
5. A forecasting model to predict pest incidence will be based on weather parameters, historical and scientific data.
6. Demand forecasting for prepositioning of pesticides based on pest incidence will be created.
7. Pesticide procurement will be strictly based on quality. A monitoring of effectiveness will also be done, and low performing pesticides will be removed from the approved list of pesticides.
8. 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 suppliers of faulty chemicals and failed pesticides will be removed from approved list
9. Pesticides regulatory framework will be aligned with food safety laws to make adoption broad base
10. Bio pesticides will be tested and approved for use.

Farm Mechanisation

One reason for low income from cultivation in Odisha is high labour costs that erode the profitability of farming. Left with little income, farmers are unable to invest in mechanisation that could improve farm productivity and hence incomes. Currently farm power availability is 1.68 kw/hectare and the aim is to increase it to at least 2 kw/ha in the next five years. The Government will ensure timely access to adequate machinery for all in an affordable manner.

The level of farm mechanisation in Odisha is much lower as compared to high productivity states. There is scope to increase the level of mechanisation to improve productivity and farm incomes.

The mechanisation policy focus will be on the following:

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 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. At least 750 CHCs will be set up in the state in the next five years
3. In the case of farm implements, the thrust will be on developing the right type of machines for farmers in Odisha and the focus will be on custom service centres keeping in view the large number of small-sized land holdings that makes it uneconomical to own machinery.
4. To create local employment opportunity, *uber-ization* model of farm machinery will be adopted and promoted.
5. For encouraging mechanised paddy transplantation, at least 1 lakh hectares of mechanized line transplanting will be promoted in the next five years
6. Increasing feminisation of agriculture demands more 'women friendly' (smaller) machines and these will be encouraged with higher incentives compared to normal farm machinery.
7. Innovation in manufacture of small user-friendly farm machinery/ implement for small holders and women farmers will to be incentivised.

Credit

There are 42 banks in the state that disbursed about Rs.15,327 crore under Kisan Credit Card (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 financial assistance to the States's land owners, sharecroppers and landless agricultural households. Even though the scheme document does not specify the purpose for which the money is to be used by 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. New channels of credit will be promoted through MFIs (micro finance institutions), which work on social collateral and NBFCs (non- banking financial companies);
2. New beneficiary target groups like FPOs will be actively promoted in co-ordination with NABARD to identify schemes where state support is required
3. Ensure wider coverage of the farm credit, crop loans would be extended at zero percent interest rate for loans upto Rs. 50,000/- per season (Kharif and Rabi).
4. RBI and SLBC will be persuaded to use one meta database to verify information
5. To ensure that tenant farmers have access to institutional credit, appropriate financial instruments will be designed and promoted.
6. Credit guarantees for fresh loanee farmers will be promoted- Modification will be introduced in the state government credit guarantee scheme for agricultural loans to ensure that benefits reach all small and marginal farmers. The Government of Odisha has already signed an MoU with NABKISAN, a subsidiary of NABARD to provide credit guarantees to FPOs.
7. The revised KCC scheme (covering crops, horticulture, livestock, poultry and fishing) will be implemented and monitored effectively to cover all eligible occupations and families. Banks will be asked to provide loans to meet the working capital requirement of livestock and fishery-based activities in the state.
8. Provision for pledge loans against warehouse receipts will be taken up as a priority.
9. There is provision to avail credit of 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.
10. To ensure easier access to credit, the following measures will be taken.
 - 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.

Chapter 5

Livestock and 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 the 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 per cent of bovines in the state. Interventions in dairy include:

1. Efforts will be made to improve the 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 by strengthening semen stations, expanding the coverage of artificial insemination (AI) and putting in place systems for effective AI delivery through information driven management for accountability.
2. Training/re-orienting of 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, *Binjharपुरi*, *Khariar*, *Motu* and *Ghumsari*, and two buffalo breeds, namely, *Chilika* and *Kalahandi*, have been recognised as registered indigenous bovine breeds. Conservation and improvement of these breeds will be taken up in their respective native tracts in association with breeder societies.

9. Dairying through co-operatives will be encouraged by creating infrastructure for cattle feed manufacturing, milk procurement, processing and 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., will be taken up. A campaign to eliminate FMD through vaccination will be taken up to cover 100 per cent 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 de-worming coverage will be increased to cover at least 80% of the bovines. The de-worming 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 emphasize mixed feeding.
23. For feed from crop by-products, infrastructure will be created for the 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 the 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. The production of bypass fat, protein and other feed supplements, especially area specific mineral mixture will be promoted.
26. Livestock insurance will be introduced with larger coverage and higher support from the government (50 per cent of productive milch animals)
27. Women SHGs and the 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 emphasise 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

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 will 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-pedigree semen will be produced in the frozen semen station of the F&ARD 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. To conserve and improve the native germplasm available in the state, special programmes need to be taken up through the Breeder's Society.

Poultry

More than 80 per cent 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. The focus of the current policy will be on backyard poultry, while ensuring sustained growth of the organized commercial poultry farm.

Backyard poultry generates additional income and improves the nutritional status among the poorest of the poor. It also 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 "agriprenurship" in poultry by involving women self-help groups (SHGs). These SHGs will be encouraged to confederate for better marketing.
3. Low-input technology birds suitable to the local climate will be promoted for livelihood support to landless, small and marginal farmers.
4. Large integrators in the poultry sector will be facilitated to set up decentralized production models to usher in rural prosperity through a poultry revolution.
 - a. Integrators will be assisted to set up decentralised production models of about 3000-7000 birds per farmer
5. For broilers, medium sized farmers with about 5000-1,00,000 birds will be encouraged through an integrator model.
6. Vaccinators will be trained to provide vaccination at the 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.
 - a. Local women will be trained to vaccinate the birds
7. Vaccines will be subsidised for small/backyard poultry units.
8. Use of antibiotics in poultry will be regulated and efforts will be made through an effective extension machinery to ensure that antibiotics are used only for disease treatment and not as a growth enhancer.
9. Medium term credit for purchase of birds will be made available through banks.

10. Poultry feed factories will be incentivised: Private sector will be encouraged to put up poultry feed factories to support the sector.
11. Entrepreneurs will be encouraged to establish organic manure plants using poultry manure as raw material.
12. Vertical integration will be developed where processing and value addition of poultry meat is done.
13. Farmer producer organisations will be formed for aggregation of poultry, egg and meat in the rural areas.
14. Private sector participation will be encouraged to set up modern poultry processing units.
15. Education regarding and awareness of the nutritive value of eggs and poultry through various platforms like World Egg Day etc. would be intensified.
16. 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:

1. The F&ARD department will undertake the identification of breeds of goats that grow faster and gain weight quickly under Odisha's climatic conditions.
2. Genetic improvement of sheep and goat will be through selective breeding. A buck exchange programme will be promoted to reduce in-breeding.
3. 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.
4. Goat rearing will be encouraged in village clusters.

5. An efficient system of marketing for goats will be set up.
6. Veterinary services for goat rearing will be enhanced.
7. Vaccines will be provided at subsidised rates to goat rearers. Full vaccination coverage will be given.
8. 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.
9. Medium-term credit for the purchase of animals will be made available through banks.
10. Trade in live goats will be improved:
 - a. 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.
 - b. The improvements will aim to ensure higher value for farmers, based on the weight of the animal
11. The private sector will be encouraged to set up modern abattoirs in important markets.
12. State will also invest in setting up of modern abattoirs, especially in the cities
13. To further provide impetus to this activity, the state will provide high genetic-potential, fast-growing goat breeds to farmers through various schemes including KALIA.

Fisheries

Among the successes of Odisha's 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 up 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 geographic information system (GIS) based Management Information System (MIS) or GIS-based MIS established in 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:
 - a. Revising the leasing policy of ponds/water bodies and making it fisherman friendly.
 - i. 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.
 - ii. Fisherman co-operatives/SHGs/FPOs will be given preference in the leasing of ponds.
 - b. Providing good quality fish seedlings to fishermen by creating a chain of hatcheries for selected fish varieties.
 - i. Upgrading 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.
 - ii. Implementing a fish hatchery certification programme under the national guideline for quality seed production in the state.
 - iii. Promoting advanced carp fingerling production by private seed growers and women SHGs.

- iv. Promoting species diversification by introducing and scaling minor carps, Pangasius, Tilapia, Anabas, Magur, etc., through the establishment of hatcheries, farm demonstrations and domestic market promotion.
- c. Promoting inland aquaculture for high value shrimps
 - i. Expanding freshwater fish farming horizontally in the state by promoting new tank construction
 - ii. Promoting an annual two-crop system 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
 - iii. Promoting solar water pumps and ground water tube wells to facilitate year-round fish farming
 - iv. Promoting freshwater prawn hatcheries farming.
 - v. Promoting ornamental fish production through clusters with market linkage support
 - vi. Promoting localised fish feed production through SME enterprises.
- d. Enhancing reservoir fish production
 - i. Encouraging primary fishermen's co-operative societies, women SHGs and young entrepreneurs to adopt cage culture in reservoirs
 - ii. Promoting aqua parks in large reservoirs for the establishment of export oriented and vertically integrated cage culture by entrepreneurs
- e. Converging schemes like MGNREGA to enhance the water holding capacity of ponds, tanks, etc., to make them suitable for fisheries
 - i. Converging with Mission Shakti to promote fish farming in GP tanks and other local water bodies by women SHGs
 - ii. Renovating derelict GP tanks and revenue tanks to make them suitable for fish farming
- f. Arranging soft loans to improve 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.
- g. Launching a special skill development module for inland aquaculture
- h. Building capacity among fish breeders and farmers: Establish fish co-operative organisations and run village-level schemes in co-ordination with panchayats to disseminate best practices and research
- i. Modifying the Reservoir Fishery Policy, 2013, to lease out all water bodies above 10Ha to the Primary Fisherman's Co-operative Society (PFCS), fish production

- groups (FPG), women SHGs and educated unemployed youth to boost fish production.
- j. Encouraging backyard fishery through fishermen friendly initiatives; federating fishermen's co-operatives to access funds from NABARD and others
 - k. Promoting 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. Strengthening marketing infrastructure for fish by setting up exclusive fish processing/sale centres in various parts of the state.
 - a. Opening hygienic fish markets in all districts.
 - b. Promoting small fish sale kiosks in all blocks.
 - c. Supporting existing village-level small-scale fish retail vendors to establish hygienic sale counters.
 7. Encouraging cold chains for fish marketing by
 - a. Establishing ice plants, pre-processing sheds and processing plants
 - b. Promoting the use of, insulated vans, auto rickshaws with ice box, motorcycles with ice box and bicycles with ice box to transport fresh chilled fish.
 - c. Establishing fish filleting and value addition plans.
 8. Promoting modern and cost-effective technology for hygienic dry fish marketing.

Chapter 6

Research, Development and Extension

The Odisha University of Agriculture and Technology (OUAT) will focus on more applied and adaptive research in agriculture and allied field, and develop new knowledge for improving productivity, nutritional security and income of farmers under climatic change while taking care of the natural resources and its sustenance. It will also focus on producing quality technical manpower.

With the focus of enhancing farmer incomes, this Policy aims to redesign and reorient the state's Research and Development (R&D) machinery. In that regard, the Policy recommends following changes.

Replacing the earlier almost exclusive focus of state's R&D (and even extension machinery) on improving crop production and productivity with a value-chain approach where each stage of farming- starting from crop planning, land preparation, sowing, to activities like weeding, harvesting, post-harvest management, storage will now be a topic of research for the scientists. Efforts will be made to identify techniques and technologies those deliver efficacy at each stage of farming.

Focus on identifying problems and generating solutions for allied activities like dairy, fishery, piggery and poultry will be given a fresh thrust.

To drive this vision, following interventions are envisaged:

1. Research priority areas for each block will be identified by OUAT in consultation with various ICAR agencies and the state's extension machinery together with farmers
2. It will be ensured that all new knowledge is relevant and sensitive particularly to needs of state's small and marginal farmers and women farmers
3. Paddy is the main crop of the state and is a water guzzler, research will focus on bringing the water consumption per kilogram of paddy to half its current level in the next five years
4. Suitable agro-ecological agronomic innovations such as System of Rice Intensification (SRI), Non-pesticidal Management (NPM), Integrated pest Management (IPM), Zero-Budget Natural Farming (ZBNF), biodynamic farming, organic agriculture, conservation

agriculture, intercropping, poly-cropping, etc., will be studied and evaluated for adoption particularly in rain-fed areas.

5. A repository of the local technologies/ farmer agronomic/traditional cropping methods/tribal cropping systems and agro ecological practices employed by farmers will be created, validated and documented to be used for wider circulation. The KVKs will be undertaking this at the district-level
6. To undertake joint research, support capacity building, including training and to provide support for incubation of agribusinesses, OUAT will work closely with ICAR institutions, especially ICAR-National Rice Research Institute (NRRI), Cuttack, ICAR-Central Institute for Freshwater Aquaculture (CIFA), Bhubaneswar, ICAR-Indian Institute of Water Management (IIWM), Bhubaneswar, ICAR-Central Institute for Women in Agriculture (CIWA), Bhubaneswar, Regional Centre of ICAR-Central Tuber Crops Research Institute (CTCRI), Bhubaneswar, Regional Centre of ICAR-Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Koraput, the Central Horticultural Experiment Station (CHES) of ICAR-Indian Institute of Horticultural Research (IIHR), Bhubaneswar and the ICAR-Foot and Mouth Disease Lab, Bhubaneswar.
 - a. Crop specific Centre of Excellence (for crops other than paddy) will be promoted for research and actual application in the field
7. Role of *Krishi Vigyan Kendras* (KVK) will be reoriented to support local needs:
 - a. Efforts will be made to address challenges and constraints suffered by farmers on the field and therefore KVKs will refine available technologies and create new ones to address local needs
 - b. A problem-solving advisory support will be created at the district-level
 - c. Greater coordination between Agriculture Technology Management Agency (ATMAs) and KVKs is envisaged
 - d. KVKs will adopt few villages as model village for taking refined technologies to the farmers
8. OUAT students will be required to spend a prescribed minimum period in farmers' fields as part of the curriculum with support from the government.
9. OUAT faculty will be encouraged for a two-way exchange of learning, ideas and problems with farmers and other stakeholders, so that the R&D system becomes efficient and effective.
10. Tissue culture plants, particularly bananas, for higher yields will be made available through OUAT. Need-based associations with private tissue culture laboratories will be made

11. Alternate crop establishment methods for paddy like direct seeding of paddy, SRI, etc. will be studied and zones will be identified for its implementation.

The envisaged transition of the R&D system will be complemented by a reformed agricultural extension system.

The transition 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 the state’s current agriculture extension system. 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 human resources, their capabilities and outreach, the knowledge gap of extension agencies will be addressed on a priority basis and re-skilling will be 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 the processing of produce at the farm level to the extent feasible.

Interventions to strengthen the extension system will include:

1. Expanding the farmer counselling centres to all the 6,798 GPs within the next five years
2. At least 500,000 farmers will be trained in the next five years
3. 100 percent geo-tagging of crop cutting/demonstration activities will be done in the next five years
4. Extension related manpower will be created and strengthened at district, block and village-level;
5. Demand and supply of skills at all levels will be mapped and efforts will be made to bridge the gap. The methodology of the mapping will be designed by OUAT in consultation with ICAR, State Agricultural Management & Extension Training Institutes (SAMETI) and CGIAR and the actual mapping will be done by KVKs/ATMA.
6. 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;
7. Regular training and skill upgradation of extension functionaries and field-level extension staff will be ensured through OUAT
8. The physical infrastructure of the agencies involved in the extension system will be strengthened

9. 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.
10. 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.
11. A combination of farmer-led and market-led extension system will be given impetus.
12. Since most farmers have access to mobile phones, a system of two-way communication through mobiles will be established to enable farmers to get regular and timely advisories on weather, plant protection, farming operations and markets and pose questions and get timely and accurate responses on them.
13. Private sector participation in deepening and improving the reach and relevance of the extension system will be encouraged. Role of private players will be especially sought to create a system to help farmers with timely information on markets, particularly regarding crop selection, demand for and supply of crop produce, expected price of commodity and availability of infrastructure facilities for storage, transport and marketing of produce.
14. Extension services will promote greater value capture across value-chain:
 - a. OUAT, with support from the Indian Council of Agricultural Research (ICAR), SAMETI and CGIAR institutions, will focus on creating new knowledge and its dissemination for activities across the farming value chain, covering production, post-production, storage and logistics inter alia.
 - b. VAW and allied village level field functionaries of the Government will be trained for these activities to handhold groups of farmers for achieving greater efficiency in the value-chain.
 - c. Leveraging on the real-time market information module that will be created and promoted by the Department of Agriculture and Farmers' Empowerment and Cooperation Department, VAW and allied village level field functionaries of the Government will be able to provide market-related guidance to the farmers;
15. As a focus, the extension machinery of the state will promote the adoption of water-conservation practices like use of precision agriculture techniques, 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

16. With each KVK and regional research & transfer of technology station (RRTTS) in possession of some land, KVKs and RRTTS will be encouraged to incubate private initiatives in extension delivery.
17. Extension system will support the government's drive to promote agri- entrepreneurs and will enable farmers to shift to agro-business. These 'agri-preneurs' (agricultural graduates and other qualified entrepreneurs) will be skilled to achieve greater value addition through agro-processing and propagation of modern extension services. In this regard,
 - a. Training material will be created in consultation with specialized ICAR institutes like National Rice Research Institute (NRRI), Central Institute of Freshwater Aquaculture (CIFA), and National Research Centre for Women in Agriculture (NRCWA)
 - b. The trainers and the staff will be trained at incubation centres of GoI's National Institute of Agricultural Extension Management (MANAGE), at ICAR's National Academy of Agricultural Research Management (NAARM) and at local facilities of International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).
18. 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.
19. 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. The Department of Agriculture and Farmers' Empowerment, in consultation with the OUAT, will decide the parameters of evaluation, the frequency of the evaluation and the agency to undertake it.
20. Barefoot agri-technologists need to be created through skill development training to provide various need-based services to farmers on cost-recovery basis.
21. Government will conduct an apprenticeship programme for agriculture students. The programme will be applicable to undergraduate and postgraduate students.

- a. The students will be involved in multiple extension activities planned during the year and will help the department strengthen these activities on the ground.
 - b. The performance of students enrolled for apprenticeship will be measured using technology tools.
22. The Ama Krushi project will be used to:
- a. Create profiles of farmers across the state. The objective will be to send customised advisory for the farmers based on profile data.
 - b. Provide an integrated 24/7 call centre for farmers to resolve the queries related to farming, animal husbandry and fisheries.
 - c. Towards improving the capability to receive feedback from farmers and disseminate agro-advisories using IVRS.
23. 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.
24. Conversion of agricultural waste: Recycling and utilising agricultural waste will give a further fillip to farmers' income.
25. Since horticulture is a specialised discipline, training will be provided to all horticultural farmers and extension staff on a priority basis.
26. OUAT will use their students to train horticultural farmers under the Atal skill missions. Convergence of schemes using private players will be included.
27. 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.
28. The government will explore the possibility of instituting a rain-fed farming fellowship in partnership with ICAR/OUAT/NCDS/private institutes and companies and other donors.
29. A working group on rain-fed agriculture will be formed to guide implementation of the "Odisha Rain-fed Agriculture Mission" with members from ICAR institutes, CSIR institutes, National rainfed Area Authority (NRAA), National Institute of Agricultural Extension Management (MANAGE), OUAT, Odisha PTG (particularly vulnerable tribal groups) Empowerment and Livelihoods Improvement Programme" (OPELIP), Mission Shakti, Paramparagat Krishi Vikas Yojana (PKVY) Resource Centres, the programme secretariat of the Special Programme for the promotion of Integrated Farming among others.

Chapter 7

Disaster management and Insurance

Risk management:

The production risk of all major crops will be taken care of through the Crop Insurance Scheme/*Pradhan Mantri Fasal Bima Yojana* (PMFBY). The year-on-year growth rate in the number of farmers who have obtained crop insurance is over 10 per cent, reaching 2.08 million farmers in 2018. The year-on-year growth in the number of non-loanee farmers who have obtained crop insurance is a commendable, reaching 7.4 lakh farmers, according to available data. The growth in non-loanee farmers accessing crop insurance is particularly significant.

Interventions in this regard are:

1. Expand the coverage of crops and area under the crop insurance scheme. To do that, Department will:
 - a. Undertake awareness and publicity campaigns
 - b. Ensure timely settlement of claims that will encourage farmers to take insurance in ensuing cropping seasons;
 - c. Bring tenant farmers and share croppers under the ambit of insurance who would have availed crop loans based on the document certifying cultivation practice, issued to them by the Department
2. Improve integrity and accuracy of the crop cutting experiments (CCE)
 - a. Employ external expert agencies to regularly evaluate integrity of CCE
 - b. Reduce time lag in informing insurance companies to undertake CCE
 - c. Use space technology as pilot before state-wide scaling up
 - d. Use of loss assessment through Mobile application
3. Promote weather-based insurance (WBIS):
 - a. Ensure real-time weather data collection and processing
 - b. Weather stations to be installed or made functional at block levels.
 - c. Ensure accuracy and integrity of Term sheets
 - d. In collaboration with experts like OUAT, undertake an analysis connecting areas affected with weather and climatic events like cyclones, droughts etc. This vulnerability analysis will be regularly updated and analysed

4. Improve the efficiency and efficacy of the insurance scheme:
 - a. By finalization of the insurance tender in a timely manner;
 - b. By re-examining the implementation methodology
 - c. Use of satellite data for mapping acreage under Rabi. The data is to be matched with real data through ground truthing;
 - d. Accurately map acreage under kharif by combining real ground data with services from experts like Mahalanobis National Crop Forecast Centre (MNCFC)
 - e. Ensure accuracy in estimating the threshold data on actual yields
5. Insurance for livestock, poultry and fisheries will be enlarged to cover more than 50 per cent of the farmers in these categories.
6. A comprehensive crop insurance separately for vegetables and fruits will be introduced in consultation with the Government of India and insurance companies.

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 and restore livelihoods, particularly in agriculture as it is a specialised activity. To improve the disaster response, following interventions are being made:

1. All district disaster management plans will focus on anticipatory preparedness, prevention and rehabilitation;
2. To bring accuracy in prediction, services of experts will be utilized by the Department
3. Specific sub-plans for the restoration of agriculture and livelihoods will be made part of district disaster management plans.
4. A time-bound action plan in the event of delayed and/or deficient monsoon and floods or damage due to cyclones will be created.
5. 100 percent area will be under early warning system in the next five years
6. Sufficient reserves of seeds, fertilisers and other support like credit, etc. will be ensured
7. Process of assessment of damage will be made faster and more efficient
8. For effective management of disasters, in addition to the enhancing the technical and managerial skills, importance will be given to
 - a. Disaster management education to provide knowledge on disasters preparedness, mitigation and rehabilitation;

- b. Creating awareness about effective disaster response in various emergency situations;
 - c. Equip learners with tools for meeting emergency medical requirements;
 - d. Incorporate gender sensitive, empathy-based disaster management approach;
9. The research support system will be strengthened to evolve continuous process of analysis, action/reflection which will help to decipher gaps in disaster management plans. Towards this end, Department will encourage OUAT to undertake the multidisciplinary research projects.

Chapter 8

Women in Agriculture

Nearly 48 per cent of all labourers in Odisha are female, i.e., 9 lakhs out of 21 lakh agricultural labourers and 18 per cent 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 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 per cent 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. Efforts to get women friendly farm equipment designed, produced and promoted will be strengthened, wherever necessary.
9. 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.
10. Regular tracking of the share of women in the total number of beneficiaries in government assistance initiatives will be undertaken.
11. 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.
12. Access to credit will be improved through special focus on women.
13. A policy to encourage SHGs run and operated by women will be put in place.
14. Mission Shakti will be used to empower women farmers

Chapter 9

Improving Governance

Odisha is among the first states in the country to have an agri-cabinet. Given the centrality of the sector for the state, the aim of setting up this cabinet is to put in place a robust institutional policy making and implementation system for agriculture.

The success of the policies and programmes of the 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 the desired pace, a 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 which is based on the fundamental framework of 5T- Technology, Teamwork, Timely, Transformation and Transparency. Guided by the 5T principles, following measures will be taken to reform the governance in the state

1. **Developing 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. **Modern integrated Block office:** At the block level, a fully functional technology enabled integrated office will be set up for the block officers of Agriculture, Horticulture, Animal Husbandry, Fishery, Agricultural Marketing and other relevant department. This will promote convergence at ground level, improve delivery mechanism, and provide one stop office for farmers regarding information, soil testing, marketing support, and other facilities useful for them. At this office, private players can be encouraged for input supply and marketing product and services.
3. **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 outcomes 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.

4. 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 local state and neighbouring 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 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.
5. Performance metrics for the department officials: A robust performance metrics will be defined at all levels and technology will be used to ensure the accountability of officers to achieve performance standards. High performing officials will be rewarded/acknowledged appropriately.
6. Grievance and feedback mechanism: The government will set up a grievance redressal mechanism for farmers to enable underserved farmers to avail of the various benefits provided by government throughout the year. Similarly, a grievance redressal mechanism will be set up to ensure that department officials resolve establishment related queries in shortest possible time.
7. 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.

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 new age technology to increase the quality of farming and farm products.

The government will continue to push for the use of information technology through following initiatives –

1. Analytics for Decision-making and Agricultural Policy Transformation: Government will ensure the efforts are made to achieve the following objectives-
 - a. Improving data management and architecture to more effectively utilise existing and future data to make evidence-based policy decisions.
 - b. Monitor the implementation of and effects of policies and investment on the wellbeing and productivity of small and marginal farmers and tenant/landless farmers.
 - c. Use of new age technologies like deep learning, artificial intelligence, IOT, etc., for efficient data collection and to analyse trends in agriculture in the state.

A decision support system will be developed under the ADAPT programme, which will be an integrated platform for all relevant departmental datasets need to effectively manage the department's activities. The platform will also enable data use by officials of the government at the state, district, block, *gram panchayat* (GP) and village level. The platform will also be available on mobile for easy access by officials.

2. 100 percent program implementation will be e-monitored in the next five years by the Agriculture Department.
3. Farmer Database: Necessary steps will be taken to clean, connect and strengthen existing databases to create a single, dynamic, all-inclusive database on landowning farmers, sharecroppers and tenant farmers. The database will be used to provide various inputs, advisories and other benefits to farmers.
 - a. Farmer registration under *Ama Krushi*, P-PAS and KALIA in particular will be used for this purpose
4. Steps will be taken to adopt the use of drones for remote monitoring and procuring high-resolution satellite imagery and 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-advisories, monitoring the situation in the remote areas, crop cutting experiments, etc. The data will also be used to help farmers avail of crop insurance and credit that are rightly priced.

5. Use of IOT (sensors) will be promoted to keep a real-time check on the supply and consumption of inputs like seeds, fertilisers, pesticides etc.
6. Steps will be taken to set up automate grading and sorting of crops using robotics and machine vision. This will reduce efforts and wastage in the supply chain.
7. Technologies like blockchain will be used to support the implementation of contract farming.

Policy Implementation

Necessary administrative orders will be issued preferably within six months by the concerned departments regarding the implementation of this policy after consulting Finance Department and following relevant Government guidelines, procedures and notifications

Policy Evaluation

A critical evaluation of this policy will be carried out before launching the next agriculture policy in the state to identify the focus areas, gap and future direction.
