

Government of Andhra Pradesh

Raithu Kosam

Primary Sector Development: Status, Strategy and Action Plan



Submitted to

NITI Aayog

01 July 2015



Planning Department
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Contents

Abstract.....	01
Part-1 Status.....	02
1.1. Background	02
1.2. Why Primary Sector?	03
a) High dependency-low productivity.....	03
b) Unsustained growth in primary sector	04
c) Poor soil healthmanagement	04
d) Agricultural education, research and extension.....	05
e) Damages from natural calamities.....	05
Part-2 Strategy	05
2.1. Introduction	05
2.2 Double digit growth	08
a) Designing a new path	08
b) Why Double Digit Growth	08
c) Capacity building	13
2.3. Large scale pilot sites for learning	13
a) Criteria for selection	15
b) Strategy for implementation	15
c) Mission strategy 4 ICES.....	15
2.4. Improve crop productivity and quality	16
a) Soil health management	16
b) Integrated nutrient management	17
c) Improve crop productivity levels in rainfed areas.....	18
d) Enhancing productivity of food crops	21
e) Improve inputs use efficiency levels	25
f) Quality of agri produce.....	25
2.5. Water use Efficiency	27
a) Integrated water resources management.....	28
b) Groundwater management	28
c) Micro-irrigation and fertigation.....	30
2.6. Value addition	32
a) Promoting agri business.....	32
b)Boost up agro processing and value addition.....	32
c) Incubator models.....	35
d) Potential and benefits	35
e) Agricultural marketing facilities.....	36
f) Generate more jobs	37

2.7. Policy orientation.....	38
Part-3 Action Plan for 2015-16	38
3.1. Introduction	38
3.2. Primary sector contributions.....	38
3.3. Sectoral targets.....	39
3.4. Growth engines	39
3.5. Better governance mechanism	44
a) Separate annual agriculture budget	44
b) Effective monitoring and key performing indicators	44
c) Building better field data systems.....	49
d) Integrate agromet advisory services and climate smart crop insurance.....	50
e) Rythu Sadhikara Samstha (Farmer’s Empowerment Cooperation).....	50
f) Adopt result framework approach.....	50
g) Convergence of line departments.....	51
Annexure 1: Primary Sector Mission: Constitution of the Governing Body – Orders – Issued	52
Annexure 2: Farmers’ empowerment Programme – Establishment of Rythu Sadhikara Samstha – Orders - Issued.....	54
Annexure 3: APMIP- Horti. Department - Implementation of OFWM - Micro Irrigation as Annuity based projects - Expression of Interest to be called for from MI Companies Reg	59
Annexure 4: Planning Department: Constitution of two task forces on Agriculture Development (Primary Group) and Poverty (Social Group)–Orders– Issued.....	61
Annexure 5: AP Primary Sector Mission – Pubic Private Partnership in pilot sites of AP Primary Sector Mission – Reg.....	64
References.....	66

List of Tables

Table 1. Yield gap (kg/ha) in different crops across different states (TE 2011-12).....	03
Table 2. Crop productivity average in India vs world and country with highest yield (kg/ha)...	03
Table 3. Annual growth rate (%) in primary sector in different states.....	04
Table 4. Workshops held for AP- Primary Sector Mission.....	14
Table 5. Agriculture and allied services – GSDP contribution and growth rate (current prices) (2004-05 to 2015-15 and targets for 2015-16).....	41
Table 6. Agriculture sector (crop wise) GVA and Growth rate at current prices (2004-05 to 2015-15 and Targets for 2015-16)	42
Table 7. Major agriculture crops GVA and production (2013-14 to 2014-15 and 2015-16 targets).....	43
Table 8. District wise agriculture crops GVA (Rs. crore) targets for 2015-16 crop wise GVA contribution for districts 2015-16.....	43

List of Figures

Figure 1. Progress made from August 2014 to May 2015	07
Figure 2. How we will achieve Double Digit Growth.....	10
Figure 3. What we will need to do to achieve Double Digit Growth.....	10
Figure 4. Raithu Kosam Strategy	11
Figure 5. Chickpea Revolution in Andhra Pradesh.....	12
Figure 6. Andhra Pradesh Primary Sector Mission Pilot Sites.....	14
Figure 7. Water Surplus across districts.....	29
Figure 8. Percentage of groundwater irrigated area to total gross area irrigated.....	30

Abstract

The newly created Andhra Pradesh State in June 2014, has embarked on designing an innovative path of development. Through its Swarnandhra Vision-2029 by the year 2022, it strives to reach top three states category in India.

Primary Sector Mission was the pioneer (out of the seven missions) to form and function from October 2014. It has designed a separate strategy to move towards a double digit growth through 13 pilot sites for innovations (each with ~ 10,000 ha area in all the 13 districts) adopting best practices to boost up productivity and improve livelihoods of small and marginal farmers through science-led scaling-up process. It covers agriculture, horticulture, livestock and fisheries sector. Through a series of consultation meetings and capacity building workshops, the Mission has developed action plans for the next four years and being implemented for the year 2015-16. Also identified potential areas for pivotal role by Farmer Producer Organizations, NGOs, and PPP options for value addition and marketing. Technical assistance for the primary sector is provided by a consortium of scientific organisations led by the International Crop Research Institute for the Semi-Arid Tropics; it includes CGIAR institutes, ICAR institutes, State Universities of agriculture, horticulture, livestock and fisheries, besides non-governmental organisations and private companies.

Effective governance mechanism is the hall mark of this Mission. Monitoring system has been designed and institutionalized by the Center for Good Governance. The governing body is chaired by the Chief Minister, Agricultural Production Commissioner and Special Chief Secretary of the Planning Department is the Mission Director and Special Chief Secretary/Principal Secretary of the Agricultural Department is the Mission Coordinator.

Part-1 Status¹

1.1 Background

The Government of Andhra Pradesh as part of Swarnandhra Vision-2029 has constituted seven Missions namely: 1) Primary Sector, 2) Social Empowerment 3) Knowledge and Skill Development 4) Urban Development 5) Industries /Manufacturing 6) Infrastructure and 7) Service Sector. In view of the constraints and at the same time, the huge potential, the state has embarked on harnessing the potential by transforming the Primary Sector. Hence, Government of Andhra Pradesh has decided, first to design a strategy to transform the agriculture and allied sectors, and then to operationalize it in a phased manner. The Hon'ble Chief Minister Sri N Chandrababu Naidu has committed to transform the Primary Sector under his leadership and has set the aspirational goal of making Andhra Pradesh as one of the three top leading states in India through Swarnandhra Vision by 2029. The Hon'ble Chief Minister has stressed on: (a) increasing productivity of the primary sector; (b) mitigating the impact of droughts through water conservation and micro-irrigation; (c) postharvest management to reduce wastage; and (d) establishment of processing, value addition capacity and supply chain of the identified crops.

For this, Government of Andhra Pradesh, through its agriculture department had requested the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) to prepare the Draft Strategy Paper for Transforming Agriculture in Andhra Pradesh during the next five years (2015-2019). As a follow-up action, the Department of Agriculture had organized a series of meetings with all the concerned Principal Secretaries, Commissioners, Directors and other senior officers from the State Agricultural Universities and research institutions.

The Primary Sector Mission was launched by Hon. Ex-President of India Dr. APJ Abdul Kalam along with Hon'ble Chief Minister, Shri Chandrababu Naidu on 6th October 2014 with a long-term Swarnandhra Vision 2029 for a very comprehensive long-term planning encompassing all the government and non-government agencies in agriculture sector and for overall development of agriculture and allied sectors. ICRISAT plays a crucial role in providing technical assistance to the Government of Andhra Pradesh in steering this process of Primary Sector development. Several consultation workshops² were organized to

¹This report was prepared by Dr KV Raju, Principal Scientist and Assistant Director and Dr SP Wani, Director, both from ICRISAT Development Center of the International Crop Research Institute for the Semi-Arid Tropics, Patancheru, Telangana, for Planning Department of the Government of Andhra Pradesh.

² During the year 2015, on 4th February at Hyderabad, 24th February at Vishakapatnam, and 10th March at Vishakapatnam, these workshops were organized by the Government of Andhra Pradesh and ICRISAT.

elicit suggestions from leading experts and private organizations involved in the Primary Sector.

1.2 Why Primary Sector?

a) High dependency-low productivity:

In Andhra Pradesh state, while majority of the population (62%) for their livelihood depend on agriculture related activities, it contributes only 27.84% to the state Gross Domestic Product (GSDP) and is growing at 5.9% (2014-15). For several decades, more than 70% of population was dependent on agriculture related activities. At all India level this percentage has been reduced to 58% and the recent National Sample Survey Organisation(NSSO) 70th round indicated that this is declining further to 48%. All this indicates that the state need to make the Primary Sector more efficient and effective for improving the rural livelihoods.

The newly formed Andhra Pradesh State, popularly known as the “rice bowl of India” has huge potential to develop. Though it has a total cultivated area of 6.35 million ha, crop productivity is low (see Table 1 and 2) and stagnant and the cost of cultivation has increased.

Table 1. Yield gap (kg/ha) in different crops across different states (TE 2011-12).

Crop	Andhra Pradesh	Highest	Second Best	Percentage gap
Rice	3116	3918 (TN)	3741 (PUN)	20.0
Jowar	1887	2011 (MP)	-	6.6
Bajra	1704	2452 (TN)	2040 (HAR)	43.9
Maize	7012	7012 (AP)	6042 (TN)	-
Redgram	402	1693 (KER)	1514 (BIH)	321.0
Bengal gram	1142	1295 (BIH)	-	13.4
Groundnut	640	2751 (TN)	1938 (WB)	329.8
Sunflower	713	1857 (PUN)	1809 (TN)	160.4
Soybean	1615	2000 (KER)	1694 (MEG)	23.8
Castor	381	1988 (GUJ)	1530 (RAJ)	421.7
Sugarcane	82000	102837 (TN)	90251 (KAR)	25.4
Cotton	386	703 (HAR)	698 (PUN)	82.1
Tobacco	1805	3069 (UP)	1899 (GUJ)	70.0

Source: DES, Government of Andhra Pradesh, 2015.

Table 2. Crop productivity average in India vs World and Country with Highest Yield (kg/ha)

Crop	World average (TE2011-12)	India (TE2012)	Country with highest yield (TE2012)
Paddy	4397	3514	6661 (China)
Wheat	3094	3000	7360 (UK)
Maize (corn)	5097	2321	8858 (USA)
Chickpeas (gram)	917	912	1663 (Ethiopia)
Pigeonpeas (tur)	786	681	1320 (Myanmar)
Groundnut	1626	1212	4069 (USA)
Rapeseed/mustard	1855	1163	3588 (UK)
Cotton	769	517	1920 (Australia)

Sugarcane	70470	69227	125587(Peru)
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TE-Triennium ending; Source: FAO, 2014.

But farmer's income is not commensurate with production cost. Factors like increased labour cost, out-migration to nearby urban areas and inflationary pressures have added to the miseries of farmers' livelihoods. Further, distress sale of commodities, absence of adequate storage and processing facilities and non-remunerative prices have also added to miseries of farmers over the years.

However, the state is bestowed with a total geographical area of 1,60,200 sq km spread over in 13 districts of six agroclimatic zones and broadly five different soil types to cultivate a wide range of crops. The state has a total population of 49.83 million (Census 2011), with density of 308 per sq km and literacy level of 67.41 per cent. The state is also endowed with a long coastal line (974 km) and high percentage of entrepreneurial talented people in both rural and urban areas, which has also resulted in large number of innovative activities in the Primary Sector. With this endorsement, the state has gained first rank in terms of fish production, fish exports, egg production.

b) Unsustained growth in Primary Sector:

Andhra Pradesh has shown negative growth rate in Primary Sector during the past few years (-1.54 to -1.14 per cent at constant prices) and good growth rate in some years (3.22 to 7.69 per cent). Annual growth rates in comparison with other states are shown below in Table 3.

Table 3. Annual growth rate (%) in primary sector in different states.

State	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Gujarat	23.10	-0.73	8.73	-7.17	-0.74	21.64	5.02	-6.96
Tamil Nadu	13.26	13.24	-4.41	-0.29	6.35	7.47	9.51	-10.22
Karnataka	9.92	-2.84	12.37	2.27	4.07	16.17	-1.95	2.30
Maharashtra	9.20	14.03	13.76	-15.45	1.02	17.75	4.58	-2.14
Andhra Pradesh	-1.54	3.22	17.92	-1.78	6.84	-1.14	1.36	7.69

c) Poor soil health management:

Over the years, inadequate soil health management has led to land degradation and excessive and indiscriminate use of chemical fertilizers. This has disturbed the balance of nutrients and crop growth; saline and alkali soils with low crop productivity were not reclaimed. The chemical fertilizer consumption has increased from 21.08 lakh tons in 1994-95 to 38.12 lakh tons in 2013-14; the decadal increase was 15% (during 1994-2003) and shot up to 57% (during 2003-13). Untimely availability of chemical fertilizers has also led

to increase in the sale price. The price of DAP (diammonium phosphate) increased from Rs.485 in 2009 to Rs.1386 in 2013 per bag; the trend was similar for other complex fertilizers too (Rs.362 in 2008 to Rs.1323 in 2013). This was another reason for increased cost of cultivation.

d) Agricultural education, research and extension:

The state is deprived of adequate number of agriculture and allied sectors-based universities, colleges and training centres, and research organizations. The state is not sufficiently equipped to meet the demand for certified skill workers at various levels in Primary Sector.

e) Damages from natural calamities:

The extent of damages caused by natural calamities has increased over the years. During the last six years (2008-09 to 2013-14), 20.18 lakh ha were affected in united Andhra Pradesh; of which, 75 per cent (15.16 lakh ha) is in new Andhra Pradesh. While the damage control assistance (for united Andhra Pradesh) sought from Government of India was for Rs.47,838 crores (during 2004-05 to 2014-15), actual funds released were only 17 per cent of the total. This has further aggravated the situation to undertake permanent measures to control damages in natural calamity affected areas.

Part-2 Strategy

2.1 Introduction

To convert the crisis faced by the primary sector in Andhra Pradesh, into an opportunity, the Government of Andhra Pradesh has committed to transform the primary sector into an equitable, scientific, and prosperous and climate smart sector. To move on this path, the State has designed a strategy³ to transform the agriculture and allied sectors in Partnership with International Crops Research Institute (ICRISAT). As part of this strategy, the stress is on: (a) increasing productivity of the primary sector; (b) mitigating the impact of droughts through water conservation and micro-irrigation; (c) postharvest management to reduce the wastage; and (d) establishment of processing, value addition capacity and supply chain of the identified crops.

The Government of Andhra Pradesh (GOAP) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has signed a memorandum of understanding on 17th January, 2015, in the presence of

³Full version of this Primary Sector Strategy Document is available on www.aponline.gov.in.

Honorable Chief Minister to collaborate to transform the agriculture and allied sector through development of a new Primary sector strategy by adopting the principles of convergence, collective action, consortium to build partnerships and capacity building to promote innovations, inclusivity, sustainable intensification operationalize it in a phased manner with a technical support to be provided by ICRISAT. The primary sector strategy document is a part of the proposed Vision 2029 of Andhra Pradesh. The vision that will set the standards for a new development paradigm in tune with the changed scenarios to enable Andhra Pradesh among the best three performing states in India by 2022 marking India @75.

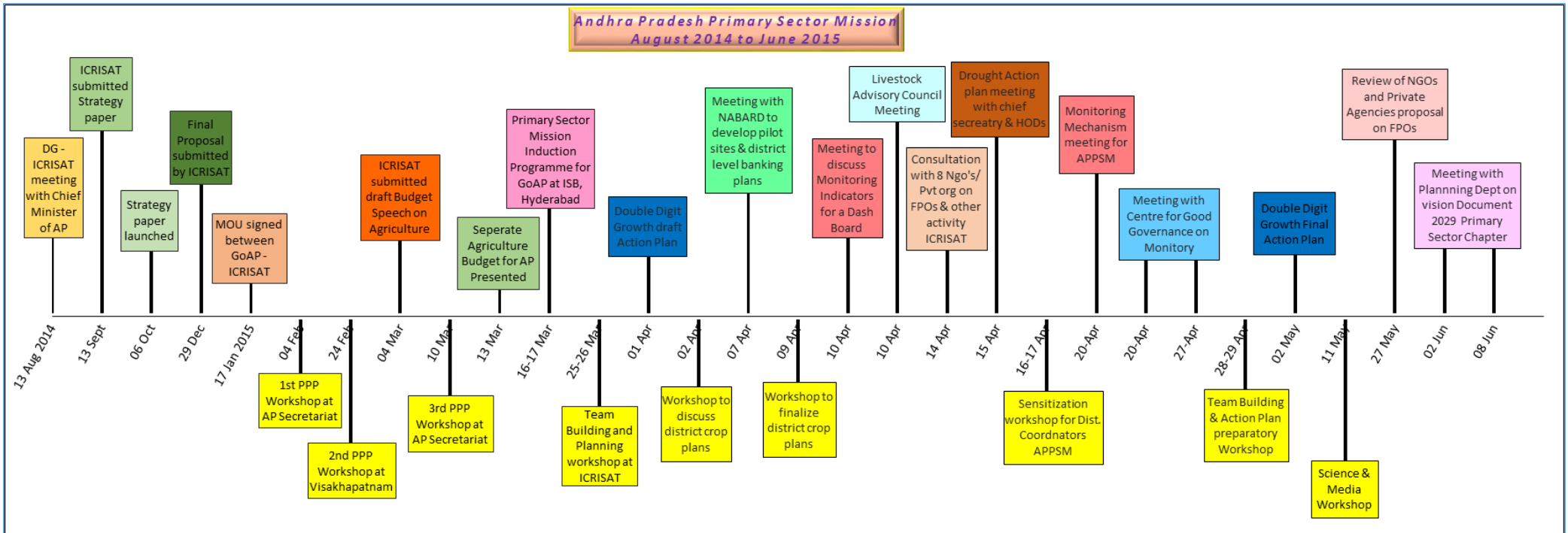
The overall goal of this collaboration between the Government of Andhra Pradesh and ICRISAT consortium (includes CGIAR institutes, ICAR institutes, State universities of agriculture, horticulture, animal husbandry, and others) is “To help the Government of Andhra Pradesh to effectively plan, implement and monitor the primary sector mission to transform the agriculture, to enable the state to reach the top three performance states in the country by 2022.

The specific objectives of the collaboration are as follows.

1. To establish pilot sites of learning in 13 districts (10,000 ha) each to operationalize the convergence of primary sector for increasing productivity, profitability and sustainability through science-led development and climate smart agriculture.
2. Establish international quality assurance standards for selected soil analysis labs in the state and pilot test innovative extension system for 13 mandals.
3. To provide support to primary sector mission director for planning, effective convergence as well as adopting Inclusive Market Oriented Development (IMOD) strategy to benefit small farmholders through public private partnerships and also to guide the mission directorate for organizing global investors meet for primary sector to promote private investments in the state.
4. To help identify consultants to prepare potential areas for DPR and guidelines to develop and select project implementators on PPP mode, through transaction advisors
5. To assist the mission director in developing relevant a) policies (e.g. integrated agri-business policy) b) result framework document c) financial allocations and incentives
6. To assist in identifying and establishing a network of certified skills training canters across the state on PPP mode.

7. To assist in developing weekly monitoring and evaluation system for effective convergence and implementation of the mission in the state
8. Undertake documentation and develop dissemination strategy for the primary sector mission

Figure 1. Progress made from August 2014 to June 2015.



2.2 Double Digit Growth

a) Designing a new path:

Moving away from the “business as usual approach”, AP state has initiated an intensive “mission mode” approach that will speed up the growth process. The state is committed to reach into one of the top three performing states in India by 2022 – India’s 75th year of Independence. To achieve this goal, the state has identified 7 Missions, 5 Grids and embarked on 5 campaigns. These are the three pillars of the new edifice that we are building.

As part of the inclusive growth strategy, prime focus is the agriculture sector linked with improvement in soil fertility, better seed, reducing the cost of cultivation, productivity enhancement and value addition in the agriculture, horticulture, livestock and fisheries subsectors. The state plans to make a structural change – labour force shifting from agriculture to non-farmland service sectors. Necessary skilling needs to be done to improve productivity of the abundant labour force.

Primary sector in Andhra Pradesh accounted for over 27% of the State’s GSDP or Rs. 1.43 lakh crore in 2014-15. This contribution is expected to increase to Rs. 1.69 lakh crore in 2015-16. The 18.2% increase in primary sector is expected through concerted effort between the departments, district collectors, farmers and other stakeholders. Key activities proposed for increased production and productivity include; area expansion for crops, provision of irrigation facilities and micronutrients and quality seeds, increased mechanisation, formation of Farmer Producer Organisations (FPOs), introduction of favorable policies and provision of better post-harvest infrastructure.

b) Why Double Digit Growth in Primary Sector:

More than sixty two per cent of the population is dependent for their livelihoods on agriculture, it is imperative to develop the primary sector to reduce poverty. Secondly, Andhra Pradesh is blessed with rich natural resource base such as land and water in nine coastal districts at the same time, four Rayalaseema districts which have water scarcity but also provide an opportunity to harness their potential by establishing seed production systems in the region as well as good horticultural systems. Thirdly, the human capital in the state of Andhra Pradesh is famous for their entrepreneurial skills and hard work as they do agriculture as a business not only in Andhra but across the globe. With these strengths, government of Andhra Pradesh has decided to

transform the agriculture through Primary Sector development by adopting a mission approach through science-led development.

With the global warming and the evident impacts of the climate change, the coastal region is more prone for increased frequency of cyclonic storms as well as heavy rainfall events and at the same time, the Rayalaseema region is more vulnerable to increased frequency of occurrence of droughts due to water scarcity as well as the increasing temperature. The impacts of climate change with increased vulnerability in the region as well as increasing temperature not only calls for climate smart agriculture but also will have to be equipped with capacity to deal with diseases of plants, animals as well as aqua culture.

How we will achieve? The Andhra Pradesh Primary Sector Mission, which is renamed as “Raithu Kosam” will adopt science-led development through for equitable, scientific, prosperous and climate smart agriculture in the state.

“Raithu Kosam” mission will adopt two prong strategy for double digit growth sustainably in the state by harnessing the potential of low-hanging fruits through scaling-up of matured and proven technologies for development of primary sector (agriculture, horticulture, livestock and fisheries) through area expansion during the next four to five years. Secondly, at the pilot sites in each districts representing different primary sector systems innovations in technology, institutions, delivery mechanisms and value addition will be developed/tested to develop new interventions for sustaining the double digit growth when the proven technologies saturate the area as such.

Our strategy will be to convergence not only the schemes within the department but also converge the various sectors and the actors who are working to help the farmers in the state. Through convergence, consortium, by building the partnerships including public private partnerships and collective action of the various actors (e.g., farmers’ producer organizations) and improved wellbeing of our farmers through capacity development. The final goal of achieving the increased production through increased efficiency, increased profits, through value addition and enhancing the employment opportunities through skill development will be achieved as depicted in the following figure.

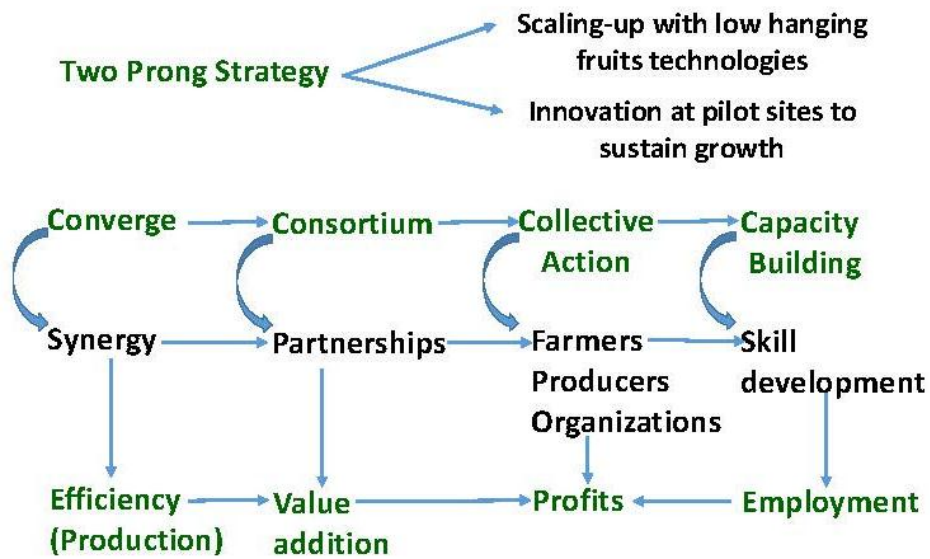


Figure 2. How we will achieve Double Digit Growth

What we will need to do? For achieving the double digit growth, the mission will innovate the technologies, partnerships, institutions and enabling policies through convergence of schemes, departments/sectors, resources through improved communication and convergence of minds of various actors for enhancing the efficiency through use of ICT, science-led interventions, value addition and market linkages as depicted in the following figure.

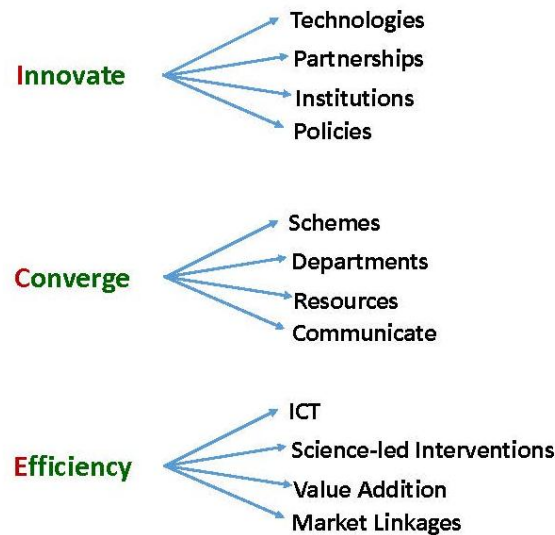


Figure 3. What we will need to do to achieve Double Digit Growth

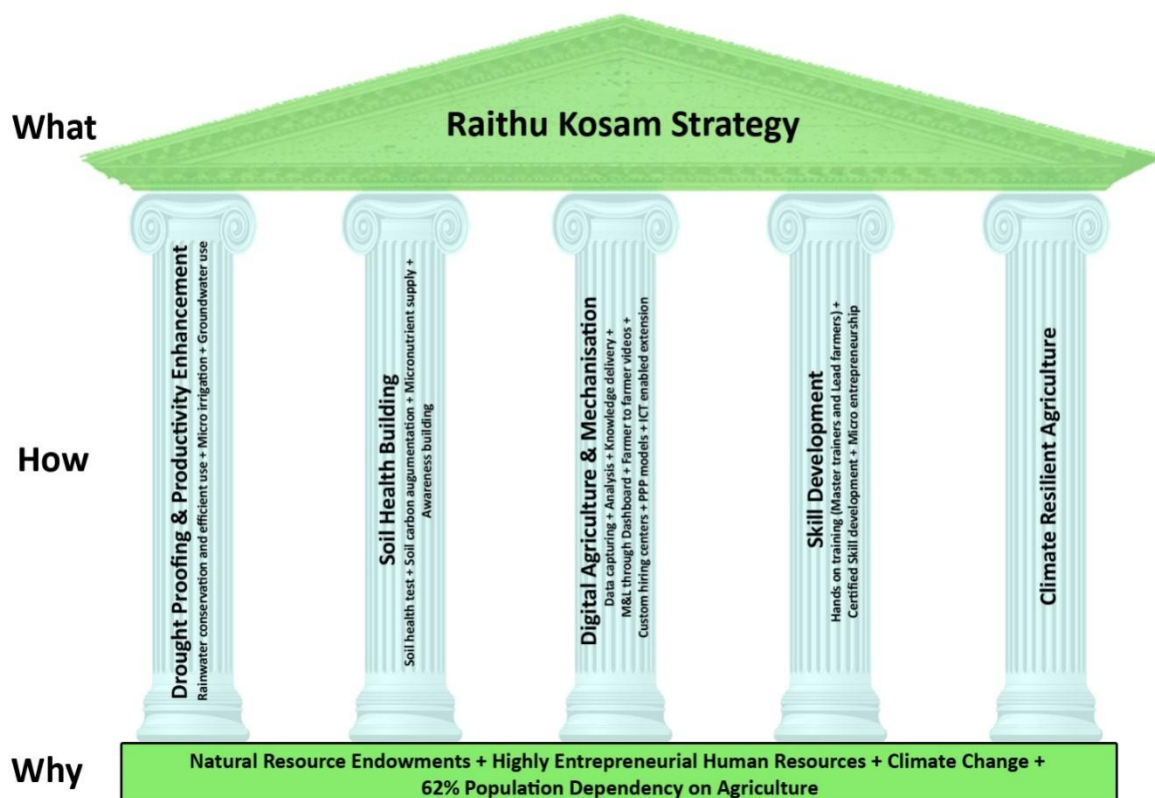
The important strategy in addition to the above mentioned components, the mission will target increasing the awareness, ensuring the effective delivery systems for knowledge and inputs; processing by adopting value chains and

market linkages and ensuring enabling policies and institutions along with effective and regular monitoring mechanisms at all the levels.

The mission has identified the suitable structure for convergence at the district level under the leadership of the District Collector, with appropriate powers and necessary resources to undertake needed technical support as well as innovations for success of the Primary Sector. The Collector in the district have identified the Joint Collector for the Primary Sector Mission as responsible person to ensure convergence and effective implementation of the planned activities. The different line departments have identified 43 growth engines for specific commodities as well as products for achieve the double digit growth @ 18.2% in 2015-16 with gross value to addition through Primary Sector development as estimated Rs. 1,69,552 crores with a base value of Rs. 1,43,498 crores.

For the effective implementation of the above mentioned strategy, the

Andhra Pradesh Primary Sector Mission: Double Digit Growth



important five pillars are identified as shown in the diagram below:

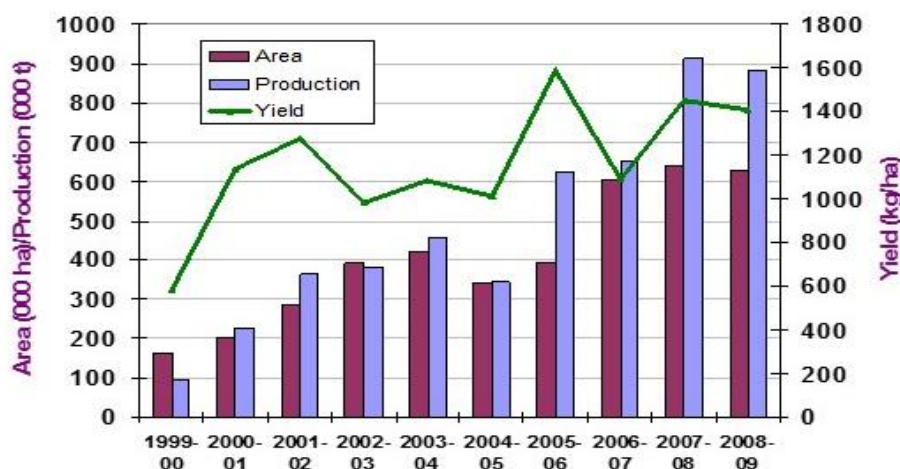
Figure 4. Raithu Kosam Strategy

Example of climate resilient agriculture: chickpea revolution in Andhra Pradesh. Chickpea was not a major crop grown in Andhra Pradesh because of the short winter season and high temperature, however, using science-led development, chickpea revolution is achieved in the state. The chickpea revolution has proven the concept that climate resilient agriculture is possible in the state. The chickpea area which was 1.33 lakh ha in year 1996-97 has increased to 5.68 lakh ha by 2012-13 with the productivity increased from 714 kg/ha⁻¹ to 1319 kg/ha⁻¹. The highest production was reached to 6.48 lakh tons during 2013-14 in the state of Andhra Pradesh (p. 111, DES, GOAP 2014). This revolution was possible largely because of development of suitable varieties (short duration, high yielding, wilt resistant and market preferred seed quality) which could mature within 100 days in the state. High adoption of these varieties led to 90% coverage of chickpea area in the state. This has opened up the new vistas for agricultural development through primary sector mission as “proof of concept” to be applied and scaled-up for different growth engines



During the past decade:

- 4-fold increase in area
- 2.4-fold increase in yield
- 9-fold increase in production
- Over 80% area under improved cultivars



like rice, and other crops grown in the state.

Figure 5. Chickpea Revolution in Andhra Pradesh

Mechanization:As it is a well-established fact that agriculture productivity is directly associated with increased inputs of power for agriculture development. At the same time to address the issues of increasing labor cost and timely unavailability of the labor, increased mechanization can transform the agriculture. However, the challenge is how small landholdings can be mechanized with poverty taken farmers as well as absentees landlords whose lands are cultivated by the tenant farmers. For this, “Raithu Kosam” mission is adopting the public private partnership approach for mechanization of agriculture through custom hiring centers with the help of private corporates like Mahindra and Mahindra, John Deere and Sumitomo & Kubota companies in the pilot areas these companies will be establishing their models in the pilot districts as a business model and the mission will work out the enabling, institutional policies and incentives needed to transform the agriculture in the state through mechanization.

c) Capacity Building

A series of capacity building activities have been initiated to enhance stakeholders capacities both in different departments of the government and private sector and NGOs. To begin with, as a follow up of the Strategy document released on October 6th 2014, a series of consultation meetings were organized, under the chairmanship of the Agricultural Production Commissioner to deliberate on, department-wise, status, constraints, possible options to growth, identifying specific growth engines, support required by the decision makers and funding options and areas for PPP.

In addition to these meetings, state level workshops were organized to consult both private agencies and specialists and related agencies. The list of workshops is shown below (Table 4).

2.3 Large Scale Pilot Sites for Learning

Andhra Pradesh has different agro-ecological zones (AEZ) spread over nine districts in Coastal region (water abundant) and four districts in Rayalaseema region (drought prone). In order to integrate, innovate, intensify ensuring inclusivity a pilot site of around 10,000 ha has been established in each district. The pilot site provides an on-farm field laboratory to test and evaluate technological, institutional, policy innovations and fine-tune as needed before scaling-up in the districts. In the marketing parlance, pilot areas are test

markets for innovations which will be demand driven, impact oriented with measurable indicators.

Table 4. Workshops held for AP- Primary Sector Mission					
Sl No	Date	Title	Location	Focus	No. of participants
1	4 February 2015	Experts Consultation Workshop	AP Secretariat, Hyderabad	Convergence and Building Partnerships for Impact /Working Groups on each sector – Concerned Secretary to Chair subsector working group sessions and set the scenes	72
2	24 February 2015	Agriculture Investment Opportunities in Andhra Pradesh – Public Private Partnership for Integrated Agricultural Development (PPPIAD)	Visakhapatnam	concept of Public Private Participation (PPP)	41
3	10 March 2015	AP Primary Sector - Private Sector and NGO Role	AP Secretariat, Hyderabad	Private and NGO role contribution / Action Plan by CGs	52
4	25 and 26 March 2015	Team Building and Planning Workshop	ICRISAT, Hyderabad	State & district level plans for DD growth	82
5	16 and 17 April 2015	AP Mission Sensitization Workshop for district coordinators	ICRISAT, Hyderabad	Agriculture & Agroclimate / Horticulture; Fisheries; Livestock and Dairy / Mgmt Dissemination of Information; Farmers' Producers Organization; More about Pilot Area	24
6	28 and 29 April 2015	Action Plan Preparatory Workshop	ICRISAT, Hyderabad	To enhance GVA during 2015-16	226

Figure 6. Andhra Pradesh Primary Sector Mission Pilot Sites

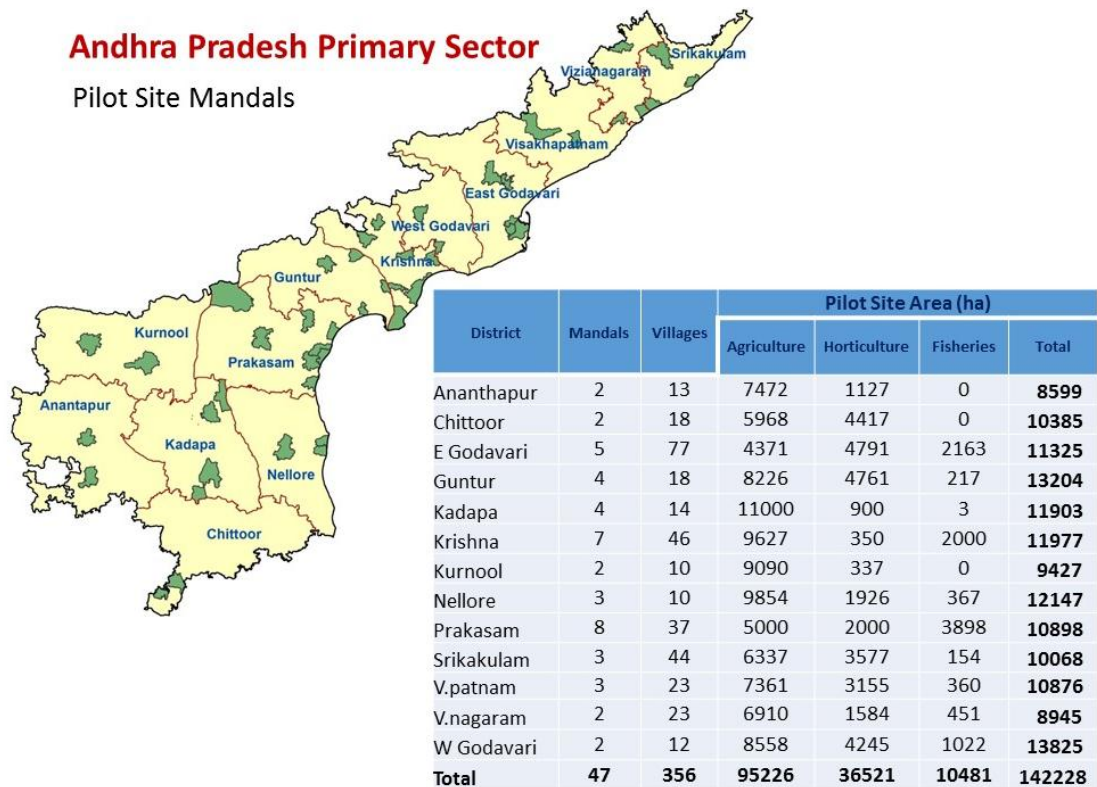
a) Criteria for Selection:

- i) Representative site for the district in terms of AEZ and systems;
- ii) Good potential for impact to bridge the gaps;
- iii) Accessibility;
- iv) Willingness to adopt new;
- v) Presence of suitable institutions;
- vi) Predisposition for change

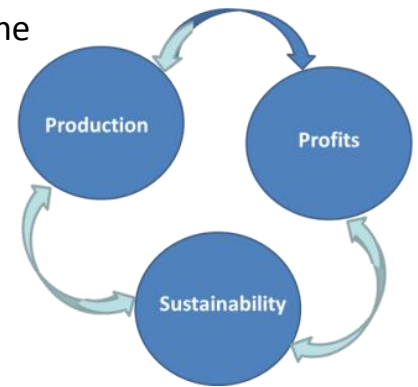
Process involved: i) Meeting with District administrator (Collector and District Planning Officer); ii) Meeting with Line department officials at district and Mandal level; iii) Interaction with farmers and community; and iv) Interaction with NGOs.

b) Strategy for Implementation:

- i) “Seeing is believing” - Innovation platform at Pilot sites;
- ii) Efficient use of available natural resources;
- iii) Science-led development approach;
- iv) Synergy through integration of Primary Sector actors need to be harnessed by discarding sectorial approach;
- v) Bringing in participation of the stakeholders;
- vi) New innovations through enabling policies and institutions as well as building the partnerships;
- vii) Bring science at the door steps of the farmers;



viii) Adopt the consortium approach for achieving the economic gain; ix) Promote Inclusive Market Oriented Development (IMOD) through public private partnerships (PPPs) to benefit small farm holders; x) PPPs through increased investment; xi) Adopt results framework approach as it is well-known that “what gets measured gets done”; xii) Must succeed “mindset”; xiii) Missionary approach; and xiv) Create visibility.



c) Mission Strategy 4 ICEs:

Innovative strategy of 4 ICEs as indicated below will be implemented to transform the primary sector through scientific development to increase production, productivity and profitability for the farmers as well as the state through sustainable intensification.

I	C	Es
Innovate	Convergence	Efficiency
Inclusive	Collective	Equity
Intensive	Consortium	Environment Protection
Integrated	Capacity building	Economic gain

2.4 Improve crop productivity and quality

a) Soil health management:

Over the years, inadequate soil health management has led to land degradation and excessive and indiscriminate use of chemical fertilizers. This has disturbed the balance of nutrients and crop growth; saline and alkali soils with low crop productivity were not reclaimed. Soil fertility degradation due to extensive mining and mismanagement over the years has led to appearance of multi-nutrient deficiencies like zinc (Zn), boron (B), sulphur (S) in addition to low levels of soil organic carbon (C), nitrogen (N), phosphorus (P) and potassium (K). Having seen the benefits in the past and in a quest to get higher yields, farmers in many parts are using indiscriminate amounts of NPK fertilizers, but without getting the desired results. Micro- and secondary nutrient deficiencies are apparently limiting the realization of optimum yields, and use efficiency of macronutrients as well. Soil test-based fertilizer management with focus on micro and secondary nutrients is needed for sustainable intensification and resilience-building of production systems.

The degrading soil resources in Andhra Pradesh have put in threat to the sustainability and future food security. A good soil health is the key to sustainable intensification, diversification and strengthening allied enterprises across the value chain and improving the return from investment in inputs like seeds, water and others. Therefore, improving soil health in the state inhabited by most small and marginal farmers is very important not only for ensuring food security, but also mainstreaming of underprivileged sections of the society. So when the state is envisioning being the best performing in the country or world, a sound road map for soil health management is need of the hour.

Soil health mapping & need-based fertilizer recommendation: Soil fertility degradation due to extensive mining and mismanagement over the years has led to appearance of micro- and secondary nutrient deficiencies in addition to primary nutrients and low levels of soil organic carbon (C). In a quest to get higher yields, farmers in many parts are still using indiscriminate amounts of NPK fertilizers, but without getting the desired results. Micro- and secondary nutrient deficiencies are apparently limiting the realization of optimum yields, and use efficiency of macronutrients as well. Due to lack of information, farmers are adding certain fertilizers or in amounts which actually are not needed and not adding certain fertilizers which actually are needed, and in both cases leading to uneconomic food production. In this scenario, a road map needs to follow that;

- Soils to be analyzed for micro and secondary nutrients in addition to primary macro nutrients.
- Soil test-based recommendations to include deficient micro and secondary nutrients.
- Soil need based (block/village/farm level) recommendations compared to state or eco-region level blanket recommendation.
- To initiate multi-location research trials to refine and develop crop-specific recommendation for micro and secondary nutrients.
- Revisiting a field/region for soil health assessment after 5 to 7 year period to endorse current soil health management strategy or to make changes required.
- Awareness and capacity building of farmers and stakeholders.
- Involving fertilizer companies and dealers in scaling-out soil need based fertilizer management.

Strengthening centralized state of the art soil laboratories: A thorough and accurate soil testing is most important as the results govern utilization of

expensive fertilizer inputs. So, the testing methodologies which are not complete to cover all parameters or not sensitive to provide accurate results, do not serve the desired purpose. What is more important is to upgrade or set up minimum required state of the art soil testing laboratories able to cater to detailed analysis of macro- and micro-nutrients and other parameters by adopting world class standard methods and state of the art instruments rather than many soil testing laboratories unable to give complete solutions. Therefore a sound strategy requires;

- Upgrading or setting up of state of the art centralized soil-water-plant testing laboratories one (or two) per district, rather than having many non-functional or under-equipped/under-staffed laboratories at block/village level or even soil testing kits and mobile laboratories.
- Arranging high precision instruments in the labs like ICP, AAS, MP-AES, auto-analyzer and other automated instruments.
- Dedicated staff under soil-water-plant analytical services.
- Laboratories to be strengthened for testing crop (and animal products as well) quality to target high-value national and international markets.

b) Integrated nutrient management:

Role of soil organic carbon and microbes in improving and sustaining soil health is well documented. Low soil organic carbon in AP soils is a major factor responsible for low crop productivity. Studies indicate that small changes in total carbon content in soil can have disproportionately large impacts on crop productivity. Management practices that augment soil organic carbon and maintain it at a threshold level are needed. Similarly, optimum microbial populations are very important for nutrient transformations and making available the nutrients to the plants. A strategy is needed on;

- Incentives to promote on-farm composting (vermicomposting/aerobic-composting) of domestic wastes and agricultural byproducts using local material low-cost structures.
- Biomass generation from soil fertility point of view e.g. through planting N-rich *Gliricidia plants* on farm boundaries, and using chopped leaves for composting.
- Production and integration of cost effective biofertilizers [VAM (vesicular arbuscular mycorrhiza), PSM (phosphate solubilizing microorganisms), N₂-fixing bacteria) (as livelihood enterprise for farm youth) for enhancing the use efficiency of fertilizer management.

c) Improve Crop Productivity Levels in Rainfed Areas

The improved techniques and practices, which have so far been generated and recommended for achieving the objective of increased and stable crop production in dryland areas, have been summarized in following lines.

Crop Planning: The farmers of the dry land areas, are growing a crop either on rainwater in *kharif* or on conserved soil moisture during the winter. The most of the crop varieties grown have low genetic potential for yield under low moisture scenario. Selecting suitable crops and varieties capable of maturing within actual rainfall periods will not only help in enhancing production of a single crop but in intensifying the cropping intensity. Many criteria have been laid out for selecting a crop variety for drylands. The capacity to produce a fairly good yield under limited soil moisture conditions is the most desirable criteria. The duration of *kharif* crops/varieties should not normally exceed the number of rainy days. In other words, crop varieties for dryland areas should be of short duration, drought resistant tolerant and high yielding which can be harvested within rainfall periods and have sufficient residual moisture in soil profile for post-monsoon cropping.

Planning for aberrant weather: Dryland agriculture is subject to high variability in areas sown, yields and output. These variations are the results of aberrations in weather conditions, especially rainfall. Delays in normal monsoonal pattern causes problems of sowing timings and have repercussions on the programme of activities for the entire agricultural year. Even after the onset of monsoon and the commencement of planting, there may be monsoonal withdrawal causing moisture stress on plants and creating difficulties in the adoption and timing of appropriate cultural practices ultimately causing reductions in yields and outputs. Major crops like rice and maize get seriously affected if monsoonal rains cease early. Thus there is need for introducing new technology along with suitable variety for increasing and sustaining yield in dryland areas. Therefore, to mitigate such weather situations, farmers should make some changes in normal cropping schedule for getting some production in place of total crop failure.

Crop Substitution: Alternate crop strategies have been worked out for important regions of the country for *Vertisols*, *Alfisols*, *Entisols*, etc. Strategy has also been evolved for normal onset of rains, breaks in rains, early withdrawal, its uneven distribution; through selection of uneven crops/varieties which are inefficient to utilize soil moisture, less responsive to production input and potentially low producers should be substituted by more efficient ones. Appropriate crops, suiting varying rainfall situations, need to be

identified for sowing. Time has come for implementing a plan of integrated research programme for maximizing the profitability, productivity and sustainability of vulnerable systems of rainfed areas. Sericulture offers great promise in rainfed farming strategy, particularly of the watershed areas in peninsular India.

Enhancing the cropping intensity: Besides putting various measures to increase the productivity levels of dryland crops, efforts would also be needed to increase the cropping intensity in dryland areas which was generally 100%, implying that a single crop was taken during the year. Cropping intensities of these areas could be increased by through inter cropping and multi cropping (sequential) by way of more efficient utilization of resources. The cropping intensity would depend on the length of growing season which in turn depends on rainfall pattern and the soil moisture storage capacity of the soil. For example in Indore region, receiving 1000 mm annual rainfall, only single crop can be taken on shallow soils, inter cropping in medium depth soils and double cropping on deep soils.

Fertilizer Use: Soils of drylands in the country are not only thirsty but hungry also because these soils are severely eroded horizontally as well as vertically. It is, therefore, necessary to apply all the three major nutrients in adequate amounts along with deficient secondary and micro nutrients. Since soil moisture is limiting in dry lands, the availability of nutrients becomes limited, attempt should always be made to apply fertilizers in furrows below the seed and preferably by seed-cum-fertilizer drills.

Rainwater management:Efficient management of rainwater can boost agricultural production from drylands. The broad bed and furrow system popularized by the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) for managing rainwater along with improved soil, water and nutrient management options in *Vertisols* made it possible to increase crop yields four to five times as compared to normal practice. However, this method could not be adopted widely by the farmers in India because it is costly and need machinery. The scope for managing profile moisture is limited in Alfisols but the surface run off in such soils can be reduced by ridge-and-furrow technique. Alternatively, application of compost and farm yard manure as well as raising legumes will add the organic matter to the soil and increase the water holding capacity.

Watershed Approach for Resource Improvement and Utilization: Watershed management is a holistic approach arrived at optimizing the use of land, water and vegetation in an area and thus, providing solution to alleviate drought, prevent soil erosion, improve water availability and increase fuel, fodder and agricultural production on a sustained basis. On the basis of the experiences of ICRISAT, which attracted the attention of our farmers, State departments, administrators and scientists, 13 model watersheds were established in India for development. The model watersheds in operation have provided a fruitful experience of how development can lead to all round improvement in food and fodder production, economic condition of the farmers.

Alternate land use system: All drylands are not suitable for crop production. Some lands may be suitable for range/pasture management, while others for tree farming, ley farming, dryland horticulture, agro-forestry systems including alley cropping. All these systems which are alternatives to crop production are called as alternate land use systems. This system not only helps in generating much needed off-season employment in mono crop dry land but also minimizes risk, utilizes off season rains which may otherwise go waste as runoff, prevents degradation of soils and restores balance in the ecosystem.

Efficient Implements: In order to take full advantage of annual precipitation in dryland agriculture, higher energy input is essential. Farm implements can help to conserve as much rainwater *in-situ* as possible and to harvest rainwater. Shallow off season tillage with pre-monsoon showers ensures better moisture conservation and lesser weed intensity. It has resulted in 20% yield increase in sorghum in Andhra Pradesh. Deep tillage helps in increasing water infiltration in soils having textural profiles and hard pan.

Enhance utility of rice fallows: In coastal Andhra Pradesh with scarcity of water as well as in rainfed paddy areas, farmers earlier grew green gram (mung bean) and black gram after paddy and then shifted to maize. However, less water requiring crops like sorghum as well as other suitable crops like safflower and sunflower also need to be integrated into the system. There is a need to popularize minimum tillage and seed priming technologies for improving crop establishment as well as efficient use of stored soil moisture in these areas.

d) Enhancing Productivity of Food Crops:

Good scope exists for enhancing the pulses and oilseeds production in the state using multipronged and coordinated strategies. Crop and area specific

programs need to be undertaken as the problems of different crops vary; for example, in groundnut the main issue is managing the seed availability as generally it is not produced by the private seed companies. Along with seeds of improved cultivars we propose to adopt the holistic approach through value chain and through special efforts ensure that small and marginal farmers are included in the value chain to get the market benefits.

As regards groundnut, Andhra Pradesh is known for the largest growing district (Anantapur) in the world with a total cultivation of 80,000 ha in a single district. Unfortunately the farmers are still growing the variety TMV 2 which was released in 1940s. We propose to change this scenario through introduction of improved high yielding varieties of groundnut along with a village based seed system through women self-help groups (SHGs) and by providing seed godown storage capacity. This will promote timely availability of seed. We propose to use the new extension system to support the farmers to adopt holistic soil health management, rainwater management as well as good integrated pest management practices to minimize postharvest losses and improve seed quality. Groundnut seed is affected by aflatoxin contamination which not only reduces the quality but also is carcinogenic. In a phased manner we propose to enhance the productivity of groundnut in the state by 30 to 100 per cent. The common interventions of soil health mapping, soil test based fertilizer recommendations and strengthened extension systems will be undertaken to make this initiative successful. Collective action through co-operation and scaling up will benefit the farmers.

As regards to pigeonpea, it is grown in the state on 2 lakh ha and the current productivity is 600 kg/ha. For the first time in the history, ICRISAT developed pigeonpea hybrids using male sterile lines. Now, several private companies have started production of hybrid pigeonpea seeds. There is huge potential to transform 1.2 lakh ha in the state using hybrid cultivars of pigeonpea and increase the productivity in these areas by 30 to 40 percent. Further incremental growth can be achieved through new technologies of fertility management, irrigation and pest management which can benefit the farmers immensely. We will also need to adopt the holistic approach ensuring fertility, quality, seed systems, rainwater management, pest management, marketing and value chain for processing and linking the farmers' cooperatives to markets.

With respect to chickpea, Andhra Pradesh is known for the highest chickpea productivity in the country over the last decade largely through achieving the revolution through shortduration cultivars released and adopted by the farmers along with mechanization and improved management practices. We have scope to further enhance the production and productivity through appropriate value chain, storage infrastructure and marketing arrangements. Along with these measures research institutes like ICRISAT are working on developing new varieties which can be mechanically harvested and threshed and can be integrated soon in the district.

The following initiatives are planned to boost productivity of pulses, oilseeds and millets.

Improved cultivars: Matching crop maturity duration to available cropping window, including soil moisture availability, is a major strategy to avoid drought stress. These short duration varieties provide opportunities for inclusion of a given crop/ variety in the cropping systems with a narrow cropping window or new production niches. For example, early maturing, chickpea varieties, particularly JG 11, KAK 2, JAKI 9218, and Vihar have brought a chickpea revolution in Andhra Pradesh state of India, where the production has recorded 9-fold (95,000 to 884,000 tons) increase over the past 10 years (2000-2009), as a result of a 5-fold increase in area (102,000 to 602,000 ha) combined with a 2.4 fold increase in yield levels (583 to 1407 kg ha⁻¹) (Gaur et al, 2012).

Improved varieties with drought tolerance: The drought tolerant varieties can provide cost-effective long-term solutions against adverse effects of drought. A wider dissemination of drought-tolerant material would provide sustenance to the livelihoods of farmers who are more vulnerable to shocks of crop failure.

New niches: Pulse crops have great diversity of maturity durations that enable their cultivation in many niches and different production systems to increase production. For example, short-duration desi and kabuli chickpea varieties were found suitable, and the farmers preferred the kabuli varieties ICCV 2, KAK 2 and JGK 1 in most areas as they fetch high market prices. More recently, a heat tolerant chickpea variety JG 14 has been found to be highly adapted to late-sown conditions in the rice fallow area in the state.

Seed systems: Despite a long list of improved pulses varieties released for cultivation, their impact has not yet been fully realized by the resource-poor farmers in many states in India. The accessibility of smallholder farmers to quality seed of improved pulses varieties is constrained by both inadequate demand creation and limited supply. This situation is also compounded by unfavorable and inadequate institutional and organizational arrangements, and deficiencies in production and supply infrastructure and farmers' socio-economic situation.

Input supply (micro-nutrients and fertilizer application): Legumes fix atmospheric nitrogen. However, availability of quality of *Rhizobium* inoculum is limiting. Phosphorous is becoming a limiting macro-nutrient which affects the pulses production. A common difficulty in recovering P from the soil is that it is not readily available to plants because P reacts with aluminum, iron and calcium in the soil to form complexes. These nutrients are essentially insoluble resulting in very little movement of P in the soilsolution, and none of the complexes can be taken up directly by roots (Sinclair and Vadez 2002). The use of phosphate solubilizing bacteria (strains from the genera of *Pseudomonas* and *Bacillus* are among the most powerful P solubilizers) as inoculants simultaneously increases P uptake by the plant and thus crop yields (Khan et al, 2009).

Response to irrigation: In many areas, grain legumes are grown under moisture stress conditions. Crops such as cowpea, pigeonpea, and chickpea are grown where soil water may be substantially limiting. Yields are necessarily limited by the amount of water. Supplemental irrigation with a limited amount of water, if applied to rainfed crops during critical stages can result in substantial improvement in yield and water productivity. A recent review has quantified this relationship. Results have shown that by doubling the available soil water from 150mm to 300mm will double yield to 3.52 t ha⁻¹ (Sinclair and Vadez, 2012). This shows the great potential for enhancing the legume crop yields through providing supplemental irrigations.

Mechanization and custom hiring centers: Many pulses are harvested by hand in India because the available cultivars are not suited to mechanical harvesting. In developed countries, such as Australia, Canada and USA, pulses like chickpea, pigeonpea, lentils etc. are harvested mechanically. With continuously increasing labor cost, manual harvesting has become an expensive field operation for many crops including pulses in India and farmers are increasingly opting for mechanical harvesting where it is feasible. The farmers, particularly

in Andhra Pradesh, are demanding chickpea cultivars suited to mechanical harvesting. The current chickpea cultivars are not suited to mechanical harvesting because the plant height is not adequate and the branches are close to ground due to semi spreading growth habit. Development of chickpea cultivars with 30 to 40% more height than the existing cultivars and semi-erect to erect growth habit will make the cultivars suited to mechanical harvesting (Gaur et al, 2012). Availability of cultivars suited to mechanical harvesting will reduce production cost and attract farmers towards increased pulses cultivation.

Management of weeds in pulses: Weed management is becoming expensive and in some cases uneconomical due to high labor cost involve in manual weeding. Herbicide-tolerant cultivars offer opportunity of controlling weeds through need-based applications of herbicides. Weed management through herbicides is not only economical but also facilitate zero-tillage or minimum tillage methods.

In addition to other sources of organic matter addition, growing green manuring plants on two sides of farm bunds can add 30 to 50 kg Nitrogen per ha along with 2-3 tons organic matter which will improve not only soil health but also water holding capacity and store more rainwater as well as provide carbon and other nutrients along with N. We need to take this initiative on war footing with the help of forestry department as well as watershed development department in the state. We propose to make this a farmers' movement. A lot of work has been done by ICRISAT, CRIDA and agricultural universities but has not yet reached the farmers. Recycling of farm residues through composting and vermicomposting will be emphasized.

e) Improve Inputs Use Efficiency Levels:

Input use efficiency levels are quite low in Andhra Pradesh State compared with those across the country; for example, fertilizer use efficiency needs to go up to 60% from the current level of 30%; varietal improvement and seed replacement may enhance crop yield by 15-20%; providing one or two critical irrigations to dry crops, may increase crop yield levels by another 20%; Keeping all this in view, crop specific/sector specific measures will be introduced to improve specific crop/animal yield levels. Micro-irrigation with water soluble balanced fertilizer using soil test-based recommendations, will enhance the fertilizer use efficiency level. Similarly, soil health status and use of best micronutrients will increase the crop yield level by 15-20%.

f) Quality of Agri Produce:

While we talk of linking the farmers with markets, it is not only the quantity that matters but also the quality of the produce, which is most important. It signifies physical characteristics, nutritional status, ingredient components and safety from toxins. Addressing agricultural produce quality is a very effective means of addressing rampant malnutrition and health issues with children, women and youth in the state. Moreover, the government of Andhra Pradesh is revamping the agriculture and allied sectors in the state to improve farm-based livelihoods through targeting national and international markets, so the focus on adhering to quality standards assumes more importance.

Some of the important issues and crops to be addressed in near future are discussed here:

Aflatoxins in food stuff: Aflatoxins are toxic metabolites produced by plant-invading fungi (*Aspergillus flavus*) in several crops, processed food, feed, and milk, meat (when animals fed with contaminated feed). Contaminated grain and food/feed is toxic to humans and animals (cattle, small ruminants, poultry, especially young ones) and result in serious health problems like liver cirrhosis, liver cancer, immunosuppression, malnutrition syndrome. In poultry and livestock, aflatoxin can cause feed refusal, loss of weight, reduced egg production and contamination of milk. Maize, groundnuts (peanuts), chillies, black pepper are all known to be high risk foods for aflatoxin contamination.

Aflatoxin management in groundnut, maize and chillies: The ability of aflatoxin-producing fungi to grow on a wide range of food commodities and the stability of aflatoxins in foods mean that control is best achieved by measures designed to prevent the contamination of crops in the field and during storage, or detection and removal of contaminated material from the food supply chain. Aflatoxin management practices not only minimize the contamination for targeting national and international markets, but also contribute to increased yields. Therefore, under the AP Primary Sector Mission, aflatoxin management may contribute twin benefits and need to be managed through proper pre-harvest, harvest and processing methodologies as described below:

Preharvest management

- Aflatoxin-tolerant varieties.

- Good cultural practices - application of compost and gypsum.
- Proper land preparation, crop waste removal, soil test-based fertilizer application and crop rotation.
- Biocontrol agents (*Trichoderma*, *Pseudomonas*).
- Good practices like fungus- and pest-tolerant crop varieties, seed treatment, optimum plant population, control of insect pests & diseases.
- Prevention of drought stress by irrigation.

Harvest and post-harvest management

- Harvesting at a safe moisture level– 13-14% for maize, 7% for groundnuts and 10% for chillies.
- Moisture levels must be maintained during storage and transport.
- Removal of mechanical- and insect-damaged and immature pods/grains.
- Stacking the pod/cob-filled gunny bags on a wooden plank and storing in well aerated, waterproof storage.
- Prevention of insect damage during storage.
- Use of clean grain bins/storage areas before putting the new crop.
- Physical separation of contaminated material.

Aflatoxin permissible limits: Around 100 countries around the world have regulations governing aflatoxins in food and most include maximum permitted or recommended levels for specific commodities.

- The EU sets limits for aflatoxin B₁ and for total aflatoxins (B₁, B₂, G₁ and G₂) in nuts, dried fruits, cereals and spices. Limits vary according to the commodity, but range from 2-12 µg/kg for B₁ and from 4-15 µg/kg for total aflatoxins. There is also a limit of 0.050 µg/kg for aflatoxin M₁ in milk and milk products. Sampling and analytical methods are also specified. Limits of 0.10 µg/kg for B₁ and 0.025 µg/kg for M₁ have been set for infant foods.
- US food safety regulations include a limit of 20 µg/kg for total aflatoxins (B₁, B₂, G₁ and G₂) in all foods except milk and a limit of 0.5 µg/kg for M₁ in milk. Higher limits apply in animal feeds.
- Both Australia and Canada set limits of 15 µg/kg for total aflatoxins (B₁, B₂, G₁ and G₂) in nuts. This is the same as the international limit recommended for raw peanuts by the Codex Alimentarius Commission.
- In India, the maximum permissible level of aflatoxin is 30 µg/kg for food and 1000 µg/kg for feed.

cELISA kits for aflatoxin detection: It is in the face of such challenges that scientists at the International Crops Research Institute for the Semi-Arid Tropics(ICRISAT) devised a fast, simple and affordable test kit for detection of aflatoxin. The test uses a competitive enzyme-linked immunosorbent assay (cELISA) to rapidly detect the presence of aflatoxin. The new detection kit has cut the cost of testing crops to \$1 (~ Rs 64) per sample.

Other important food quality issues and measures:

- Strengthening centralized food quality testing laboratories with high precision instruments and world class quality testing standards.
- Promoting nutrient-dense varieties with high active ingredient content and other desirable traits.
- Soil test-based fertilizer management – to reduce high NO₃ levels; improve/maintain plant nutrient contents and ingredients like oil, sugar; etc.
- IPM – to reduce high pesticide levels while getting produce with good physical traits.
- Good land preparation and recommended practices for better produce quality (e.g. pulverized soil to get round potato tubers).

2.5 Water Use Efficiency

Andhra Pradesh state is endowed with 50.38 per cent of total irrigated area to gross area sown. All sources (canal command areas, tanks, tubewells, dugwells and other sources) together provide a gross irrigated area of 40.96 lakh ha (DES of GOAP, 2014). The state is constrained by the declining groundwater table (up to 1200 feet) and its overexploitation (area under tubewells has gone up by 500 per cent in 25 years - from 3.05 lakh ha in 1990-91 to 15.07 lakh ha in 2013-14). The state needs to adopt integrated water resources management approach for efficient utilization of its water resources from all sources.

a) Integrated water resource management (IWRM): There is good scope to improve the water use efficiency by adopting and popularizing the concept of IWRM in the irrigated areas. Work has been initiated by the irrigation department but lot more need to be done and better results can be achieved through IWRM in an integrated manner.

- The state needs to bring the following technologies closer to the farmers for adoption: sprinklers for efficient irrigation; drip irrigation systems; deficit irrigation concept; use of water impact calculator for scheduling irrigation and applying measured quantities of water; integrating

domestic wastewater treatment and safe use in agriculture as a business model; and direct seeded rice as well as use of drip for rice cultivation in command areas. Machine hiring centers as well as inputs delivery systems in cluster of villages need to be established through PPP.

- Other activities that need to be undertaken are: create river basin, sub-basin plan and river basin organizations; rejuvenate all water bodies (tanks/ponds/others); establish water quality database and refine regularly; desilt and protect all reservoirs; promote designed crop pattern in wetlands; recycle and reuse of wastewater in all urban and industrial areas; promote user management and accountability; and adopt outcome based and GIS based monitoring.
- Making improvements in saline (e.g., 2.5 lakh has in irrigated command areas) and alkaline soils would enhance production levels in the state. Provision of drainage and cultivation of upland crops instead of lowland rice will prevent conversion of soils into saline patches.
- Soil and water quality analysis centers should be set up and operated at mandal level with the support of agriculture universities, ICRISAT and other leading organizations. If needed, these services may be outsourced for functional efficiency.

b) Groundwater management: The new Andhra Pradesh is bestowed with both high rainfall (in coastal area) and low rainfall in Rayalaseema region. Indiscriminate use of groundwater has resulted in over exploitation from deeper depths (around 1100 feet) across the state. The irrigated crops in dry belts of Rayalaseema region largely depend on groundwater (Figure 7). By 2013-14, the number of irrigation pump sets fixed to groundwater extraction (opens well and bore well) has gone up to 14.54 lakh. The government has allocated for the year 2014-15, Rs 3188 crores for free power supply to these pump sets.

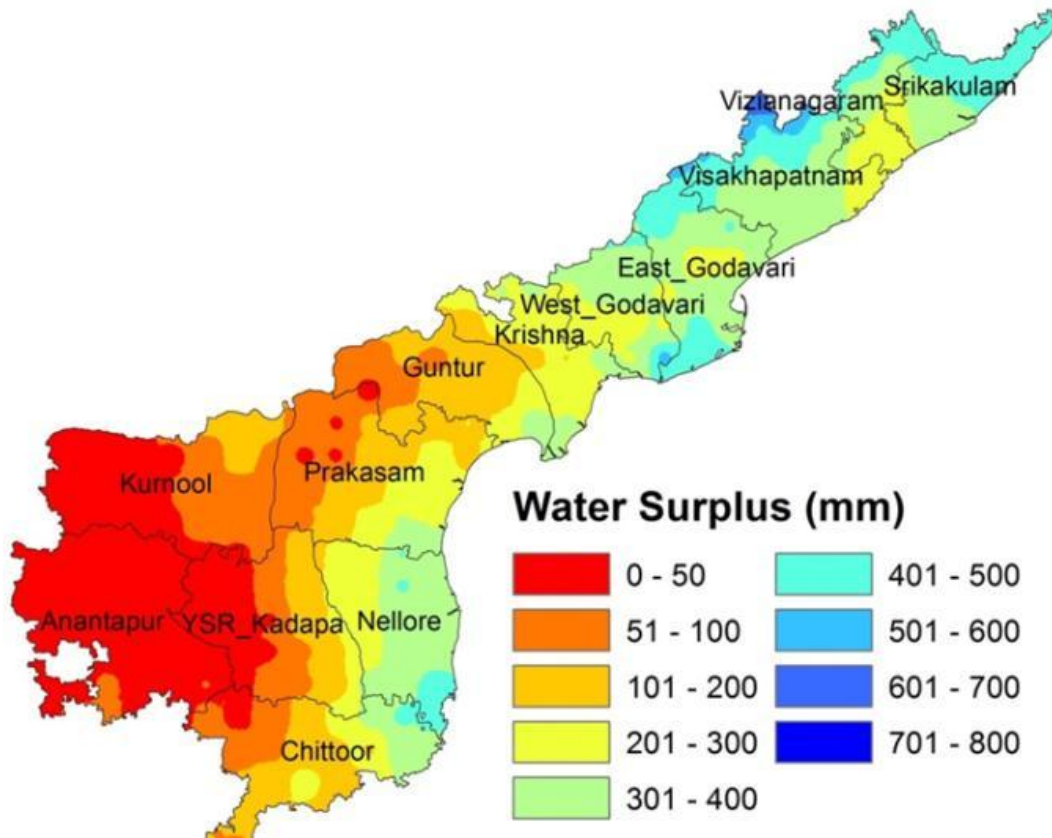


Figure 7. Water Surplus across districts

- On priority basis, subject to feasibility, all irrigation pump sets, should be equipped with solar pumps. Around 36,000 non-ISI pump sets can be replaced with solar pumps in the first phase. Even all river based pump sets (up to 5-10 hp) can be replaced with solar pumps. It would help to save huge electricity supplied at free cost.
- Licencing of borewells should be made compulsory. Regularising the permission and thereby groundwater extraction should be scientifically analysed before any approval. In over extraction areas may be declared as no-zones for groundwater extraction.
- Percentage of net area irrigated in some districts has led to serious depletion of groundwater in the districts of Chittoor (73% of net irrigated area), Cuddapah (91%), Prakasham (75%) and Ananthpur (83%) districts. In first phase, these districts should be focused to regulate groundwater extraction and licence them and completely stop any future drilling for new wells.

- Some coastal areas are faced with salinity ingressions caused by sea water and over exploitation of groundwater in these areas. Urgent and scientific efforts are required to arrest this problem.
- Most of the pump sets perform below efficiency (50%). A separate technical group should be set up to review the deficiencies to upgrade the pump efficiency of groundwater pumps.
- Both in dry and irrigated belts, groundwater recharge structures should be constructed on mission mode across the state. The proven example of ICRISAT's Kothapally area may be adopted to scale up this approach across Andhra Pradesh.
- The lessons learnt from FAO supported Community Groundwater Development Project in Andhra Pradesh should be adopted for better governance and development of groundwater.
- Also need to relook at the experience over the last 12 years regarding the implementation of the Andhra Pradesh Water, Land and Trees Act-2002 to promote water conservation, tree cover and regulate the exploitation and use of ground and surface water for protection and conservation of water sources, land and environment in the entire state.

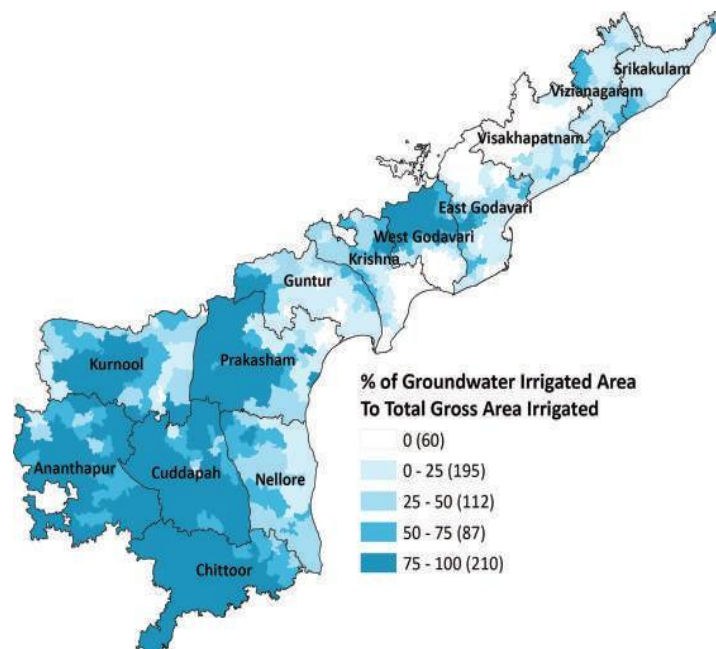


Figure 8. Percentage of groundwater irrigated area to total gross area irrigated

c) Micro-irrigation and fertigation: In view of the recent technological development, major stress should be laid on promoting micro-irrigation (including drip/sprinkler) on a larger scale by involving the appropriate

corporate agencies. Through improved technologies, the state may double the irrigated area at a lesser cost. These specialized agencies may bring in efficient technologies, capital investments, operate and maintain the entire systems on a large scale (up to 1,000 ha block each and several blocks in each district). The agency may provide 24/7 access to water on pay and use method, provide improved seeds, technical know-how in the cultivation process for high value crops and if necessary, a guaranteed buy-back arrangement both for low and high value crops. This will enable even a small farmer to adopt micro-irrigation and thereby expand irrigated area (both by groundwater and surface water resources). It will also enable a small farmer to earn more income at lesser cost.

Depleting water resources along with climate-induced projected water scarcity demand a sound plan in water management. Existing irrigation system in many command areas is inadequate and farmers face water-scarcity during different periods of the year. Micro-irrigation not only helps in enhancing water use efficiency and expanding areas under irrigation through saved water, but also improves productivity through regulated water supply. (Water use efficiency of micro-irrigation system is 70-90% compared to 20-40% in flood irrigation). There is vast scope to improve best practices with reference to water management in existing micro-irrigation systems with farmers. Moreover, the micro-irrigation systems can be effectively used for regulated supply of essential plant nutrients i.e. Fertigation and soil test-based addition of micro- and secondary nutrients. Key action points should focus on:

- Enhancing productivity in existing micro-irrigation system in 17 Lakh ha through fertigation along with soil test-based addition of micro- and secondary nutrients.
- For implementation of fertigation and best water use practices in existing MI systems an investment of Rs. 60 crore is required; and this is expected to add to GVA by 1200 crore in the year 2015-16. Similarly, annual focus is required to enhance water use efficiency and improved crop productivity.

Promoting fertigation with existing micro-irrigation systems: Currently, Andhra Pradesh state has more than 5 lakh ha area under micro irrigation in agriculture and horticultural crops. These systems are not utilised to their potential and moreover need high attention for soil health management due to high yields being taken under irrigation. An area where there is large scope to improve on is that micro-irrigation systems can be effectively used for

regulated supply of essential plant nutrients through fertigation and soil test-based addition of micro- and secondary nutrients. A sound strategy requires;

- Developing and promoting crop-specific fertigation schedule both for field and horticultural crops.
- Promotion and expansion of fertigation along with micro-irrigation in water scarce regions like Rayalaseema and other regions.
- Establishing micro-irrigation/fertigation system repair centers (as livelihood option for youth).

2.6 Value addition

a)Promoting agri business: Agriculture is critical for development of the State of Andhra Pradesh. It is the source of livelihood for around two third of its population. In order to increase per capita income at the bottom of the pyramid, it is essential to enhance farmers' realization as a percentage to consumer paid price. This needs a focused approach towards grading, packaging, standardization, processing and value addition at farm gate level, which implies a paradigm shift from "Agriculture" to "Agribusiness."

There remains immense scope for promoting agribusiness ventures in the rural parts of the state given the diversity of crops cultivated. Apart from farming, other sectors such as aquaculture (70 percent of India's shrimp production is from the State), horticulture, livestock and dairy sectors also offer opportunities for farmer, women and youth led agribusiness ventures at the rural community level. Food processing ventures needs to be promoted to help improve returns to farmer producers. Given the geographical location of the state both marine and inland fish production through cage culture technology can be undertaken and agribusiness ventures can be developed around the same. The dairy sector in the state needs a shot in the arm to boost its productivity and various government schemes can be availed to promote women-led dairy ventures.

Horticulture is another emerging sector in the state with wide variety of fruits, vegetables and spices being cultivated in the state that can act as a primer towards developing value-adding processing industry and in forging links between farmer-producers and private industry in the region that benefit the farmers with better returns and create jobs in the local economy. The fact that the State is the gateway to South Asia and Australia is another opportunity that can be explored by the agribusiness segment. Agro-machinery and agri-input industries are already eyeing interventions in the state to tap into the

vast opportunities of the rural agri-based rural communities. Scope of franchisee-based agribusiness models that can be operated by rural youth and women can be explored which may benefit in employment opportunities and reducing transaction costs. Other potential areas to promote agribusiness ventures is that of ancillary units for agro-industries and promoting small cold-chain units for storage and enhancing shelf life of crop and animal produce.

The proposal envisages capitalizing the burgeoning opportunities of Andhra Pradesh agribusiness through establishment of innovative institutional system: Agri Business Incubator (ABI) they can be set up s based on technology and Value chain to foster Inclusive market oriented development. The following model Agribusiness Value Chain Incubators, Agricultural Research and Commercialization Incubators and Rural Incubators can be set up at 10 institutes to promote FPO, Hi-tech, SME and MSME benefitting the farmers and helping the agricultural development of the state.

b) Boost up agro processing and value addition

Infrastructure: Integrated supply chains (forward and backward) in agricultural and allied sectors should be encouraged to facilitate adequate supply of raw materials for food processing industry and to help price stabilization. Various areas are identified to set up AEZs for produce like mango, fresh vegetables, chilli, grapes and gherkins. Wherever required, the non-functional or low level functioning units needs to revived.

Institution development: There should be a clear mandate to train farmers on market orientation through strong market led extension methods. The farmers and farm labourers need to be trained on value addition activities to facilitate their shift towards food processing industry. There is an urgent need to enhance provision of certified skills in the areas of technical, processing and agribusiness. The objective is to position the significant percentage of agri, horti, poultry and fisheries farmers into the agribusiness league for enhancing overall sectoral value creation. Formation of more Farmer Producer Organizations/Companies need to be encouraged and made functional.

A cluster based approach to enable primary processing at the local level is essential for minimizing losses, increasing gainful employment at local level, arresting migration and boosting the food processing industry. There should be compulsory unit registration and licensing of FSSAI for all FPU. All the standardization norms should be viewed carefully and reinforcement should

be done in the production and processing of agricultural and allied products. The range of norms and standards include AGMARK, HACCP, FSSAI, ISO 22000, EU norms, APEDA norms, MPEDA norms, FairTrade etc. Also, the food safety related issues like bringing down aflatoxins and bacterial counts should be given importance in food safety regulations.

In the absence of any specific agency for post-harvest and processing, in spite of several agencies⁴ in AP state, stress is required in setting up a specialised agency for this purpose. Periodical seminars/one-to-one interactions of Departments and entrepreneurs of food processing segment should be organized. Convergence in the activities related to post harvest management and food processing by way of collaboration and institutional structures (Agricultural/Horticulture/Veterinary University, Department of Agriculture, FEC etc) is required. Integrated studies need to be initiated in the aspects of production, conversion and value generation aspects of crops and livestock which are cross cutting through subsectors (for example, production of maize, soybean, and paddy by products goes to poultry feed). Also required is functional collaboration with world's leading food processing research institutes⁵. Food development and incubation centres may play a major role in developing new products and assist entrepreneurs to test market with new products before setting up requisite infrastructure for commercial production. Establishment of such centres can provide hand holding support to the budding entrepreneurs.

Technology: There is need to facilitate the wide spread usage of modern technology and digitization in post-harvest management, crop estimation and value addition, tools like mobile phones apps, digital extension technology for the farmers. Process development and technology upgradation has to be appropriated for efficient utilization of animal by-products like variety meat, wool, hides, skins, bone, hoof, horn, tallow, etc. of pharmaceutical importance.

Crop diversification in AP

SN	Product/Crop	Proposed area under production
1	Organic Cashew	Srikakulam
2	Organic jiggery, Hybrid tomato	Chittoor, Vizianagaram
3	Organic chilli powder	Guntur

⁴ Andhra Pradesh Livestock Development Agency, Andhra Pradesh Medical & Aromatic Plants Board, State Agriculture Management & Extension Training Institute, State Management Institute for Livestock Development in Andhra Pradesh, State Animal Husbandry Training Centre, State Institute for Fisheries Technologies are some of the Institutes/organizations.

⁵ E.g., Wageningen University in the Netherlands, Kansas State University in U.S.A. and Indian Institutes like Indian Institute of Crop Processing Technology, National Institute of Food Technology.

4	Organic Turmeric, Ginger, Grand 9 Variety of Banana	Kadapa
5	Sorghum	Coastal AP (Rabi)
6	Grapes	Ananthapur, Parts of Chittoor
7	Flowers	Ananthapur
8	Fruit crops, Grand 9 Variety of Banana	Chittoor, Krishna
9	Grand 9 Variety of Banana	Kurnool

c) Incubator models: Considering the need and potential for Agribusiness in the Andhra regions, minimum 10 ABI can be setup and the following are the models that are appropriate:

- **Agribusiness Value Chain Incubators:**specialized in integrating critical elements of the value chain, providing market access and supporting the creation of new enterprises that fill gaps in the value chain; These incubators can incubate FPO's and mobilize multiple resources to respond quickly to new opportunities.
- **Agricultural Research and Commercialization Incubators:**Facilitate transfer of technology from institutions of higher learning and research centers and stimulate the commercialization of research and the creation of new enterprises. At the high tech end, supporting technology transfer across borders soft landing and across corporate boundaries in the multiple forms of Intellectual property (IP), contract manufacturing, joint technology ventures, and access to venture capital. These incubators foster diffusion of new technologies and create innovative hi-tech agri enterprise.
- **Rural Technology Incubators:**Focus on facilitating the transfer of technology at the low tech end or at the high tech end of the spectrum. At the low-tech end, with incubators specializing at the grass roots, supporting skill based entrepreneurship, agri service based industry, franchising opportunities and incubating SME, MSME in a diversity of small scale and under-served rural areas.

There are well established State Agricultural University's ,Veterinary University, ICAR Institutes (like Tobacco Research, Fisheries, Oil Palm etc.,) Krishi Vigyan Kendras private agribusiness organizations etc., in AP which can be capitalized to set up the ABI.The ABI will cost Rs 2 to 7 crores and there are Central funds and CSR Funds available for the same. ICAR proposes to 50 incubators/Business planning and Development (BPD) units under the 12th Five year plan and MSME Ministry is planning additional 30 new Agri Incubators this financial year. Besides CSR Investment in Business Incubator is exempt from tax for corporates can help create PPP based incubators.

d) Potential and benefits:

- Entrepreneurship Promotion and Development: Innovative institutional mechanism that promotes agricultural development through promotion and development of new enterprises and improving the performance of existing enterprises and provides access to technologies.
- Empowered rural communities: Improve the profitability of the farmers through agribusiness and collective bargaining and improve the agriculture production and quality through comprehensive service and collective action.
- ABI is Self-Sustainable based on the initial investment the business model is such that it becomes self-sustainable in operations through Revenue generation in 3-5 years.
- Employment Generation: To enhance the opportunities through direct and indirect employment through agribusiness.
- Inclusive Market oriented growth (IMOD): promoting optimum accumulation of wealth by market oriented Agriculture and farmer managed Business so that they ensure inclusive and equitable growth and employment

e) Enable better agricultural marketing facilities:

The state of Andhra Pradesh has 190 Agricultural Market Committees including 10 for commercial crops, 19 for fruit markets, 22 for vegetable markets and 29 for cattle markets. In total, 170 market yards have infrastructure facilities for various training programs and other activities, which may be used by agriculture and allied departments for farmer-centric activities. Though, 29 market yards have soil testing labs, some of them are non-functional owing to staff crunch. Distribution of chemical fertilizers (through agricultural markets) in Andhra Pradesh shows declining trend over the last five years.

- With support of NCDEX (National Commodity and Derivatives Exchange, an agency of Government of India), develop a strategic and operational plan for Andhra Pradesh for the next five years. Then, establish NCDEX terminals in all mandals, districts and major markets. This would enable e-governance of Agricultural Market Committees to facilitate e-trading and online issue of e-permits to enable traders to transport produce to processing place without hassle. It will also help to develop modern communication technologies for market information services to improve information delivery through SMS, voice mails and FM radio channels.
- Strengthen the existing Rythu bazaars and establish new Rythu bazaars wherever feasible with cold storage facility, to be managed by Farmers

Producers Processors Organisations (FPPO). Utilize funds from the Government of India scheme to construct warehouses and tie up with Rythu bazaars and /or agricultural marketing yards.

- Rythu Bandhu Pathakam – pledge loan to increase loan amount from Rs.1 Lakh to Rs.2 Lakhs, free of interest up to 180 days.
- Shape Agricultural Market Committees into integrated supply chain centers to minimize postharvest losses, provide scientific storage facility and also provide postharvest credit through warehousing receipt financing.
- Need to set up Terminal Markets to stimulate trade in agricultural commodities at Guntur, Kurnool and Anantapur and other places. This would help in gaining the advantages of the locations and lead to better connectivity.

Usage of Farm fresh fruit/vegetable vending vans can increase direct marketing by farmers and help in getting remunerative prices for the produce. APMC Act needs to be amended by de-listing fruits, vegetables and other perishable agriculture products which would allow farmers to sell to anyone inside or outside the APMC markets. Creating electronic linkages from individual farmer level to markets, financial institutions, storage and logistics providers, buyers and processors will pave the way for higher efficiency in supply chain operations of agricultural and allied produce. Strong farm-firm linkages through contract farming will enhance production for good quality and high value commodities and thereby ensure good returns to the farmer. Such potential farm produce with high remunerative crops should be encouraged with appropriate marketing facilities. Niche foods and organic food hub may be made to target markets like Europe and USA, Canada.

f) Generate more Jobs:

Primary Sector as a whole in the state of Andhra Pradesh has huge potential to absorb a million jobs over the period of five years. Any state with availability of skilled human resources and supporting infrastructure facilities (like land, connectivity, power, water) can attract huge investments in Primary Sector related activities. There is increased demand for certified skilled human resources in agro-processing, polyhouses, breeding farms, dairy industry and all value addition based industries, both small and big and others. Building certified skills is one of the most essential aspects in transforming agriculture in Andhra Pradesh. This needs to be done at two levels: (1) across all government departments/agencies to enable follow-up of the suggested

strategies across all sub-sectors; and (2) to fulfill the need for skilled human resource in agri and allied sectors across the state.

2.7 Policy orientation:

As most of the farmers in the state are smallholders who alone are not capable to implement sound soil health management, a state supported policy-support is needed as under;

- Department of Agriculture as nodal agency to facilitate awareness, capacity building and arrange/distribute micro- and secondary-nutrients.
- Convergence between line departments for inputs.
- The human resource issue need to be handled by training lead-farmers to develop into extension agents (incentive-based) to facilitate scaling-out soil health management practices.
- Incentives on adoption of deficient micro and secondary nutrients.

An integrated policy to promote agri and food processing is required to provide support to processing of agriculture produce for achieving value addition. The policy should ensure cutting the supply lines in order to connect farmers directly to organized processors, retailers and exporters (as suggested by the Associated Chambers of Commerce and Industry of India). Small, medium and big entrepreneurship should be promoted for all value addition activities with adequate financial incentives and single window approval system. Tax structure need to be reviewed and altered to create conducive environment for investments in food processing sector like reducing the VAT/exempting for an initial period may be 5-7 years. Establishing direct and formal credit system to remove cyclical traps of farmers with the traders and commission agents. Financing to food processing units should be included in priority sector lending guidelines of RBI.

Part-3 Action Plan for 2015-16

3.1 Introduction:

To boost up the primary sector, a well-integrated double digit growth was proposed in the annual budget presented in March 2015. Rationale was discussed in the earlier section. In the following sections, details of this double

digit growth contributors, sectoral targets, and growth engines are discussed. Also shown in the tables 5 to 8 are year on year growth rates, district-wise projections, commodity-wise gross value addition and growth rates.

3.2 Primary Sector Contributions

- Primary sector in Andhra Pradesh accounts for 27% of the State GSDP.
- Contribution from primary sector is expected to increase to Rs. 1.69 lakh crore in 2015-16 compared to Rs. 1.43 lakh crore in 2014-15 (a growth of 18.2%).
- Agriculture is the largest contributor to the primary sector accounting for over 30% of the primary sector followed by livestock at 26%, horticulture at 25% and fisheries at 15%. The sector has witnessed a compounded annual growth rate of 13% during 2005-06 to 2014-15.
- Horticulture is fastest growing component of the primary sector growing at CAGR of over 19.3% between 2005-06 and 2014-15 followed by livestock at 14.7%.
- Primary sector provides employment to 46 lakh farm families or around 62% of the state's population.
- Andhra Pradesh has a total cultivation area of 63.54 lakh ha covering rice, oilseeds, pulses, cotton, maize, tobacco, vegetables, fruits, oil palm and others.
- The Agriculture sector contributed an estimated amount of Rs. 1.43 lakh crore to the State GSDP in 2014-15 registering an annual increase of 11% from Rs. 1.29 lakh crore in 2013-14.

3.3 Sectoral Targets (at Current prices)

- **Agriculture:** Agriculture's contribution to GSDP is expected to increase to Rs. 50,490 crore in 2015-16 from Rs. 44,565 crore in 2014-15.
- **Horticulture:** A GSDP target of Rs. 42,686 crore have been proposed for the year 2015-16 and a production target for the identified major crops has been set at 172 lakh tonnes for the year 2015-16.
- **Livestock Sector:** The livestock sector has a potential to increase its contribution to GSDP by 20% to Rs. 44,241 crore for the year 2015-16 contributing an additional Rs. 7443 crore.

- **Fisheries Sector:** The target is to increase its contribution to GSDP from Rs. 21,325 crore in 2014-15 to Rs. 25834 crore in 2015-16.

3.4 Growth Engines

To achieve the double digit growth in 2015-16, the Government of Andhra Pradesh has identified growth engines, which are of three types:

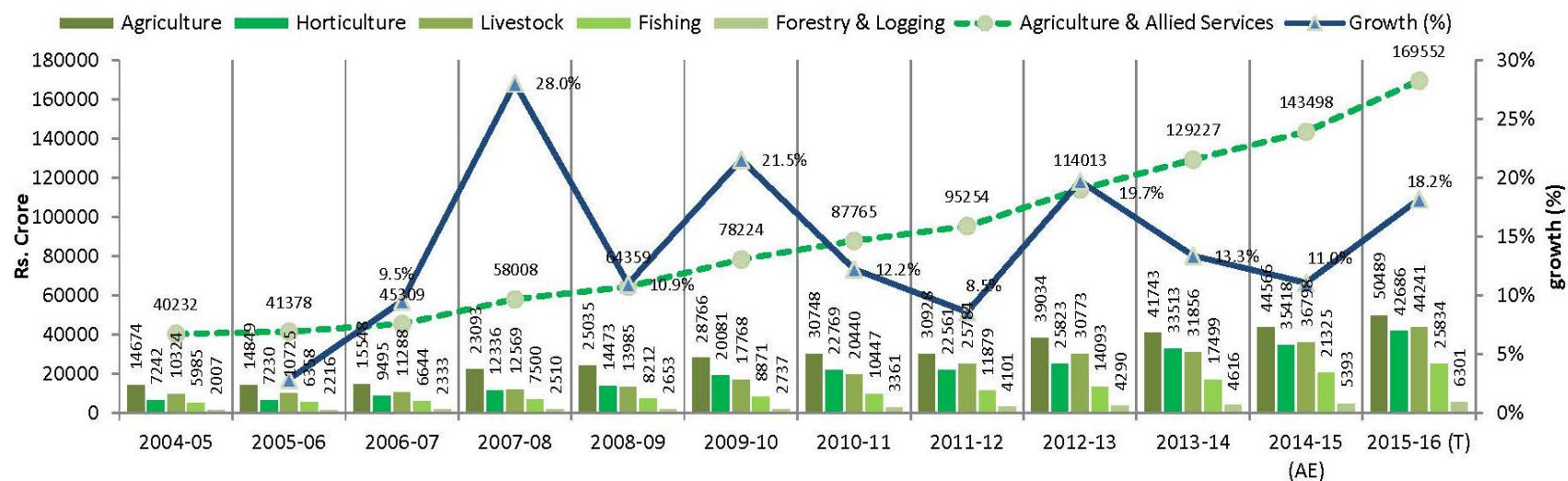
- Components of GSDP which contribute more than 80% to their respective sector, with potential for further growth.
- Sub-sectors which have been delivering a sustained double digit growth over the last 5 years.
- Sectors of GSDP which are aligned with the National thrust sectors with the promise of a large future potential.

The State Departments have identified 'Growth Engines' by adopting a bottom-up approach, with a focus on leveraging low hanging fruits in 2015-16 towards stimulating growth of the economy.

An in-depth analysis was carried out by the State departments using the following approach to identify the growth engines. The Planning Department of Government of Andhra Pradesh had initiated various consultative and participatory events to inform the creation of this strategy plan. Series of discussions were held with the various district collectors and government departments – Finance, Agriculture, Animal Husbandry and Fisheries, Energy, Industries and Commerce, Irrigation, Urban, Education (Primary and Higher Education), Infrastructure, Transport, Roads and Buildings among others. Their opinions and inputs have informed the direction of the sectoral plan to achieve the bold vision of an inclusive double digit growth. This approach of identifying growth engines is the first ever methodology to be adopted by a State government in the Country. These growth engines have the potential to grow at a sustained double digit rate and contribute to the GSDP beyond their current potential.

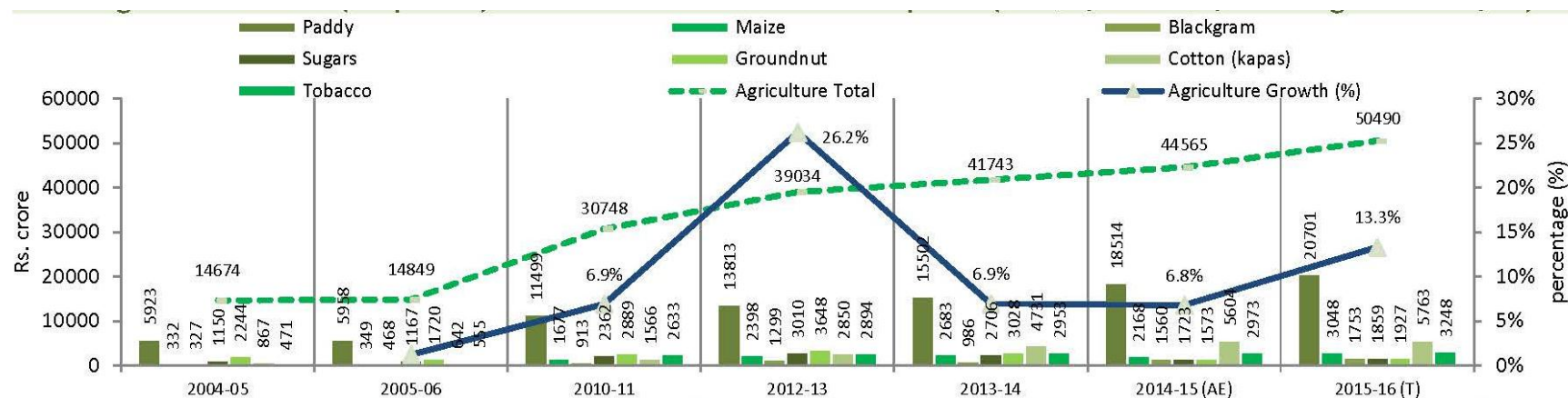
The Government of Andhra Pradesh in their budget allocated for the FY 2015-16, would be providing Rs. 10 crore for innovation in growth strategy to each of the districts, which includes Rs. 1 crore towards external expertise in preparing detailed project reports and supporting the district officials with other similar activities, Rs. 2 crore for tourism and Rs. 1 crore for communication and publicity.

Table 5. Agriculture and Allied Services – GDP Contribution and Growth Rate (current prices) (2004-05 to 2015-15 and Targets for 2015-16)



	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 (AE)	2015-16 (T)
i. Agriculture	14674	14849	15548	23093	25035	28766	30748	30928	39034	41743	44566	50489
ii. Horticulture	7242	7230	9495	12336	14473	20081	22769	22561	25823	33513	35418	42686
iii. Livestock	10324	10725	11288	12569	13985	17768	20440	25784	30773	31856	36798	44241
iv. Fishing	5985	6358	6644	7500	8212	8871	10447	11879	14093	17499	21325	25834
v. Forestry & Logging	2007	2216	2333	2510	2653	2737	3361	4101	4290	4616	5393	6301
Agriculture & Allied Services	40232	41378	45309	58008	64359	78224	87765	95254	114013	129227	143498	169552
i. Agriculture(YoY growth %)		1.2%	4.7%	48.5%	8.4%	14.9%	6.9%	0.6%	26.2%	6.9%	6.8%	13.3%
ii. Horticulture(YoY growth %)		-0.2%	31.3%	29.9%	17.3%	38.7%	13.4%	-0.9%	14.5%	29.8%	5.7%	20.5%
iii. Livestock (YoY growth %)		3.9%	5.2%	11.4%	11.3%	27.0%	15.0%	26.1%	19.3%	3.5%	15.5%	20.2%
iv. Fishing (YoY growth %)		6.2%	4.5%	12.9%	9.5%	8.0%	17.8%	13.7%	18.6%	24.2%	21.9%	21.1%
v. Forestry (YoY growth %)		10.4%	5.3%	7.6%	5.7%	3.2%	22.8%	22.0%	4.6%	7.6%	16.8%	16.8%
Agriculture & Allied Services (YoY growth %)		2.8%	9.5%	28.0%	10.9%	21.5%	12.2%	8.5%	19.7%	13.3%	11.0%	18.2%

Table 6. Agriculture Sector (Crop wise) GVA and Growth Rate at Current prices (2004-05 to 2015-16 and Targets for 2015-16)



(Rs. Crore)	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 (AE)	2015-16 (T)
1. Paddy	5923	5958	6747	9165	10994	11863	11499	12189	13813	15502	18514	20701
2. Maize	332	349	452	737	1438	1198	1677	1846	2398	2683	2168	3048
3. Blackgram	327	468	825	435	469	1035	913	1065	1299	986	1560	1753
4. Sugars	1150	1167	1396	1379	1524	1904	2362	3021	3010	2706	1723	1859
5. Groundnut	2244	1720	912	4449	1392	1535	2889	2145	3648	3028	1573	1927
6. Cotton	867	642	618	1005	1288	1333	1566	1637	2850	4731	5604	5763
7. Tobacco	471	555	499	580	2065	3174	2633	2300	2894	2953	2973	3248
Agriculture Total	14674	14849	15548	23093	25035	28766	30748	30928	39034	41743	44565	50490
Paddy (YoY growth %)		0.6%	13.2%	35.8%	20.0%	7.9%	-3.1%	6.0%	13.3%	12.2%	19.4%	11.8%
Maize (YoY growth %)		5.2%	29.5%	63.0%	95.0%	-16.7%	39.9%	10.1%	29.9%	11.9%	-19.2%	40.6%
Blackgram (YoY growth %)		43.2%	76.2%	-47.2%	7.7%	120.8%	-11.8%	16.6%	22.0%	-24.1%	58.2%	12.4%
Sugars (YoY growth %)		1.5%	19.6%	-1.2%	10.5%	24.9%	24.1%	27.9%	-0.3%	-10.1%	-36.4%	7.9%
Groundnut (YoY growth %)		-23.3%	-47.0%	387.8%	-68.7%	10.2%	88.2%	-25.8%	70.1%	-17.0%	-48.1%	22.5%
Cotton (YoY growth %)		-26.0%	-3.7%	62.6%	28.2%	3.5%	17.5%	4.5%	74.1%	66.0%	18.5%	2.8%
Tobacco (YoY growth %)		17.6%	-9.9%	16.2%	255.9%	53.7%	-17.0%	-12.6%	25.8%	2.1%	0.7%	9.3%
Agriculture Total		1.2%	4.7%	48.5%	8.4%	14.9%	6.9%	0.6%	26.2%	6.9%	6.8%	13.3%

Table 7. Major Agriculture Crops GVA and Production (2013-14 to 2014-15 and 2015-16 targets)

GROWTH ENGINES	2013-14		2014-15		2015-16(Targeted)	
	Production ('000 MT tonnes)	GVA (in Rs. Crore)	Production ('000 MT tonnes)	GVA	Production ('000 MT tonnes)	GVA (in Rs. Crore)
Paddy	11,990	15,502	12315	18514	13770	20701
Groundnut	881	3,028	498	1573	610	1927
Sugarcane	7,558	2,706	10787	1723	11644	1859
Tobacco	276	2,953	259	2973	283	3248
Cotton	1,116	4,730	1449	5604	1490	5763
Maize	2,214	2,683	1883	2168	2647	3048
Bengalgram	648	1,814	419	1031	593	1460
Redgram	104	389	85	337	110	437
Rest of Agri.		7938		10642		12047
Total GVA		41,743		44565		50490

- Paddy, Cotton, Tobacco and Maize together contribute over 65% of the agriculture sector contribution to GSDP
- Contribution from Cotton and Maize has registered the highest CAGR of over 27% between 2005-06 and 2014-15 followed by paddy at 14%
- Contribution in Q4 is expected to be the highest at over 50% of the total annual contribution.

Table 8. District Wise Agriculture Crops GVA (Rs. Crore) Targets for 2015-16 crop Wise GVA contribution for Districts 2015-16. (Source: GOAP, May 2015)

	Anantapur	Chittoor	East Godavari	West Godavari	Guntur	Krishna	Kurnool	Nellore	Prakasa m	Srikakulam	Visakhapatna m	Vizianagaram	Kadapa
PADDY	210	356	3641	3854	2770	2503	1114	2426	1030	1118	432	825	415
COTTON	251		111	28	2215	322	1893	48	585	84	24	87	111
TOBACCO			113	715	213	113	138	125	1806		0	13	
MAIZE	123	105	175	675	770	264	317	10	209	126	29	207	37
GROUNDNUT	1076	271		19	39	12	255	70	35	31	8	23	85
SUGARCANE		385	211	275		277		77		80	335	175	
BLACKGRAM			31	71	341	736		80	89	206	55	83	
BENGALGRAM	150				42		732	28	341				164
GREENGRAM			40	49	256	95		81		134	18	45	
JOWAR					199		209		40				25
REDGRAM	31				82		113		180				
SESAMUM									26			58	42
SUNFLOWER	3							37	30				33
CASTOR								60	3				
RAGI		8									37		
MESTA										9			11
BAJRA									15				
Remaining	758	771	569	830	273	1032	1249	391	1728	106	550	77	563
Total Agri.	2602	1896	4891	6516	7200	5354	6117	3336	6117	1893	1488	1604	1475

The crop GVAs for all districts are worked out on respective district GVO:GVA ratio and does not sum up to State GVA

3.5 Better governance mechanism

a) Separate Annual Agricultural Budget:

To provide special emphasis and to boost up the agriculture and allied sectors in the state, the government of Andhra Pradesh has introduced a separate agricultural budget for the first time in the year 2014-15. The Annual Agricultural Budget Speech (2015-16) presented by the minister for agriculture, animal husbandry and marketing, clearly indicated the innovative approaches of the government to increase the agricultural production and to reduce the cost of cultivation and make agriculture economically viable. Further on the primary sector mission, it said (p.4), “The government of Andhra Pradesh as a part of Swarnandhra Vision 2029 launched seven missions, five grids and five campaigns to increase the GSDP contribution in each sector. Primary sector mission is intended for overall development of agriculture and allied sectors”. During the year 2013-14, the primary sector contributed Rs.1.29 lakh crores at current prices contributing 27.84% of the total GSDP of the state; it includes 8.99% (Rs.41,743 crores) from agriculture, 7.22% (Rs33,513 crores) from horticulture and sericulture, 6.86% (Rs31,856 crores) from livestock, 3.77% (Rs17,499 crores) from fisheries, and 0.99% (Rs4,616 crores) from forestry and logging (p.5).

b) Effective Monitoring and key performing indicators:

The Chief Minister is the chairperson for all the missions and the concerned minister is the Vice-Chairperson. The Agriculture Production Commissioner & Special Chief Secretary, Planning Department is the Mission Director and Special Chief Secretary/ Principal Secretary, Agricultural Department is the Mission Coordinator for the Primary Sector Mission. Government of Andhra Pradesh has developed an action plan for achieving double-digit growth in the year 2015-16 and to sustain it for 15 years for realizing the development objectives as part of Vision 2029. The State Government has adopted a Mission-based approach to achieve sustainable development and double-digit growth through seven Missions, five grids and five campaigns.

Need and importance of a robust M&E Set up: The departments have been conventionally furnishing the outcome budgets on annual basis for monitoring the financial, physical progress and outputs for key schemes. A comprehensive monitoring and evaluation (M&E) framework is proposed for the first time in the State to monitor the growth in terms of the long-term vision of the state in addition to the annual plan monitoring. The M&E framework will also establish benchmarks for peer comparison with the other states on one hand and the

ranking on the global indicators on the other hand to establish the global competitiveness of the state of Andhra Pradesh. The M&E framework will be Sustainable Development Goal (SDG) compliant as when it will be adopted. The framework is built around multilevel monitoring linked to the functions discharged at the particular administrative hierarchy.

- A set of indicators pertaining largely to the input and output level will be at the department level and the departments would review the progress in respect of these indicators elaborately at their respective levels
- The monitoring at Chief Secretary and Hon'ble Chief Minister level will be performed Mission wise. The performance on this category of indicators, largely comprising of the outcome and output indicators is intended for reporting by the Mission Coordinators to Chief Secretary and Hon'ble Chief Minister. It will also include indicators from the Sustainable Development Goals.
- In addition to the departments grouped at the Mission level, certain departments whose indicators do not directly fall under any of the seven missions but require periodic monitoring have been broadly classified as Revenue earning and Governance (including regulatory departments)
- The grievances, CM's Assurances and issues pertaining to each of the departments shall also be monitored at mission level.
- However, there will be unavoidable overlapping of the indicators under the different categories. Overtime, these indicators will get firmed up and can be modified/added/merged/grouped.

Monitoring Double digit growth – Process: Hon'ble Chief Minister is keen to establish a robust Monitoring and Evaluation (M&E) Framework with Key Performance Indicators (KPI) to review the performance of the respective Missions (and departments concerned) and for timely addressing the bottlenecks and concerns of the departments. The Departments have prepared the State level action plan for the double digit growth. The Chief Secretary has reviewed the action plans of departments mission-wise to firm up the targets. It is proposed to have Mission-based periodic reviews at CM/Mission and CS levels. The following review mechanism at various levels is proposed:

Monthly reviews: The progress presented by the Secretary of the department concerned and coordinated by the Mission Coordinating Secretary will be reviewed by 5th of every month by Vice Chairman of the Mission and Chief Secretary. It will also include the following issues in addition to the progress on the KPIs.

- Inter-departmental coordination,
- Key project progress - identified as growth propelling projects
- Review the third party evaluation and adoption of best practices

Quarterly reviews by Hon'ble Chief Minister: The Mission Vice Chairman and the Mission Coordinating Secretary will present the Mission Performance Report to the Hon'ble Chief Minister after 10th of the scheduled month and the Chairman of the respective Mission. The quarterly report is proposed to include following

- Selected indicators
- Key project progress
- Performance report by Hon'ble Minister and the Secretary concerned on the performance of the department and mission and the steps taken by them to address the issues

Monitoring Double digit growth – Structure: A formal implementation review mechanism and structure will be established at various levels that is Planning Department, Mission Coordinators and District Collectors. The following units will consist of the government personnel and the professionals hired on contract.

- Planning Department – A Strategic Planning and Innovation Unit (SPIU) will be established under Special Chief Secretary (Planning). The Unit will consist of Senior Consultants and Research Fellows/Associates, GIS/MIS.
- Mission Coordinator Level - Mission Support Unit (MSU) already notified for establishment will also consist of experts of Knowledge Partner, GIS/MIS.
- District Collector Level – District Delivery Unit (DDU) consisting of district level persons of Primary Mission, SEM, Industry, Service Mission and Banking plan specialist, M&E specialist, Capacity building person, GIS & MIS person, NIC representative will be established.

Monitoring Double digit growth– Key Performance Indicators: A draft Monitoring and Evaluation Framework and an indicative set of indicators pertaining to different sectors have been prepared and circulated for comments and adoption by the Mission Coordinators and the departments.

The framework is primarily integration of the existing systems of reporting and monitoring with few additions for global benchmarking and creating a web application/dashboard for online status of KPI. The KPI to be finalized by the Missions and departments include the indicators from the following sources. A tentative draft list of indicators arrived at by integrating the indicators from

these sources, through consultations with Vision team, Mission knowledge partners and departmental persons, have been furnished to departments for consideration and to confirm/add/delete/ revise the same. The indicators are being firmed up by the departments.

- Global Benchmarking - The M&E framework is to be aligned with global benchmarks, widely adopted sector specific global indices, particularly conformity with Sustainable Development Goals.
- Outcome Budget - Indicators included in existing Outcome Budgets presented to the State Legislature by the respective departments should be part of the proposed list of indicators. The targets as provided by the departments, in the Outcome Budget, are also filled in which may be verified by the departments for correctness and appropriateness.
- Growth Engines – Each sector/district has identified certain growth propelling engines like value addition to the horticulture produce, Chennai Bengaluru Industrial Corridor, 4/6 lane road connectivity plan, Buddhist circuit tourism project etc. The list of KPIs will also include the indicators to review the implementation and performance of the proposed /identified growth engines
- 20 Non-Negotiable Priorities – The indicators will also reflect the achievement on 20 non –negotiable priorities identified under Smart Village and Smart Ward initiative
- Financial Performance – The M&E system will be linked to the existing Finance Department’s portal for reporting the scheme wise financial achievement against the Budget Estimate 2015-16, fund releases and Expenditure.
- GoI Priorities – The Government of India, from time to time, intimate its priorities. The proposed set of indicators will also include some of the KPI related to the GoI priorities.
- Surveys/Studies - The information on some of the Mission level indicators may not be readily available and require conduct of studies by the respective departments. The list of studies/ surveys to be undertaken is being finalized.

a) Independent Evaluations – The Mission coordinators and the departments will lay out a plan of third party evaluations of some important performance indicators to enhance the credibility of the M&E.

b) Learning by Best practices -It is requested to specifically report the best practices, innovations; either by our own staff or elsewhere in the country or abroad.

c) Quarterly News Letter – Quarterly newsletter to be brought out by each Mission highlighting the above and the quarterly progress on Mission Action Plan

Web Application - Linked to CM Dashboard: The M&E framework will be made online for ease of real-time reporting and access. The entire M&E framework will move on to State Enterprise Architecture (SEA), being developed by the ITE&C Department, as and when it is ready. However to address the immediate needs, the Centre for Good Governance (CGG) is developing a web application as an add on module to the Finance Portal already developed by CGG. Upon finalization of the list of indicators, it will be hosted through a web application. The Mission coordinating Secretaries and the departments would fill in the targets for 2015-16 and the achievements for the month of April 2015-16 as per the time line.

Achieving Double Digit Inclusive Growth – A Rolling Plan 2015-16

Linkages - To avoid duplication of efforts, the proposed M&E framework and its web application will be linked to the existing National/State databases/web applications like MCTS/Water soft etc to extract all possible data from the computerized databases of the departments. The existing databases already being used by the departments will be linked to the proposed M&E system.

- The Username/Password is provided to each department to ensure the security of data. The facility of drilling down to district level for each indicator will be provided.
- The departments will be responsible to provide required bench marks, annual targets and achievement and nominate one person to coordinate with the CGG and Planning department, till the system gets stabilized.

Online Data Transmission:

- The entire KPI data will be entered online by the department concerned and preselected indicators will be linked to the CM's dashboard to real-time access.
- Scheme-wise release of fund will also be monitored using the Finance department's portal.
- CGG have conducted a three-day workshop from 4th to 6th May, 2015 with all the Mission HODs on the web based application usage.
- The existing databases already being used by the departments will be linked to the proposed M&E system

- KPI wise performance may also be put in public domain upon stabilization of the M&E system, which will merge in the State Enterprise Architecture as and when ready.

Status update: The departments are providing required bench marks, annual targets and achievement. The departments are entering the targets and achievements for April, 2015 for respective indicators. The Planning Department will coordinate the aforesaid reviews and also carryout study based annual assessments/ global indicators. The Planning Department would facilitate the process through the respective Missions initially. Keeping the importance of the task in view, the Chief Secretary is personally monitoring the progress periodically and is guiding the departments in firming up the Key Performance Indicators. The indicators of certain departments have been discussed at length by the Chief Secretary with the Prl. Secretary and Secretaries to CMO, Spl. CS (Planning). Subsequently, the Prl. Secretary to the Chief Minister also discussed with the officers of the Planning department and reviewed the status to firm up key indicators of departments.

Districts- the Growth drivers: Bottom –up planning is the approach to achieve double digit growth on a sustained basis and time has come up to evolve strategies specific to local conditions and harnessing local strengths is the key for achievement. Districts as growth drivers have a key role in achieving the targets. Certain indicators from out of the KPIs that are directly contributing to Double Digit growth are also being firming up. The finalization of the list of indicators is still in the draft stage and will get consolidated in 2-3 months' time. The Monitoring & Evaluation framework being put in place shall eventually go down to the Mandal level and the district administration has to gear up to the task.

C) Building better field data systems

Over the years, the activities at farmer level, village level and state level have not been adequately captured through the existing data collection methods. Hence, the current picture displayed on the Primary Sector requires refinements based upon more accurate database systems. In this direction, Government of Andhra Pradesh has embarked on making a thorough survey of existing situation. During the months of February and March 2015, in consultation with ICRISAT, Department of Economics and Statistics has carried out a ground truth checking in 49 villages across the state (one village for each of the 49 revenue subdivisions). Later, based on lessons learnt, the entire state

will be covered in the new method of survey and data collection process. Accordingly, the existing data collection and processing methods will be refined to enable better understanding of the Primary Sector at all levels to make better decisions or activities related to land, water, forest and other related dependent livelihoods. This database will be linked to Aadhaar number of concerned individuals. Later, this would enable the state to focus on bottom quartile of the needy population for livelihood development.

As part of the 13 pilot sites implementation, across 13 districts, ICRISAT has initiated a baseline survey to cover 6500 households spread over in a total of 150 villages (including 31 fisherman villages) of 47 mandals in Andhra Pradesh state. This database would help to monitor the progress and enable course corrections required in the primary sector.

d) Integrate Agromet Advisory Services and Climate Smart Crop Insurance:

Agricultural productivity largely depends upon weather. Aberrations in weather have drastic impacts on various sectors like agriculture, horticulture, livestock, fisheries and markets. Agromet advisories can make a great difference to these sectors by taking the advantage of benevolent weather and minimize the adverse impacts of malevolent weather. Weather forecasts for six parameters, viz., rainfall, cloud cover, wind direction and speed, and minimum and maximum temperature are being issued by the India Meteorological Department twice weekly for all the thirteen districts in Andhra Pradesh. These forecasts are converted into farm-level advisories by the Agro Advisory Service Units under the Agricultural University (ANGRAU) and are disseminated to the farmers in Telugu through mass media and to selected farmers by SMS.

Climate smart crop insurance where farmers adopting climate resilient agriculture can pay lower premiums and the crop advisories as well as met station network can be effectively used for efficient implementation of crop insurance scheme. For this, the statewide network of agro-met stations will be strengthened and modernized and expand the farmers base to provide necessary communication on time. Wherever necessary, universities, research organizations, private agencies will be tied-up by the consortium for enhancing the awareness, adoption and reach of weather-based advisories and adaptation measures.

e) Rythu Sadhikara Samstha (Farmer's Empowerment Cooperation):

This *samstha* was established on 17th October 2014, with headquarters at Vijayawada under the companies act and is an integrated institutional

mechanism for all programmes, schemes and activities intended for farmers' empowerment, encompassing welfare, allied empowerment activities. The Government has released Rs. 5,000 crores towards Agricultural Debt Redemption Scheme to *Rythu Sadhikara Samstha*.

f) Adopt Result Framework Approach:

To a large extent, all policy makers and executors agree on “*what gets measured, gets delivered*”. The state needs to make a paradigm shift from the traditional practice of measuring physical and financial progress to a more rigorous system of evaluating the performance of government departments for their results/outcomes. Indeed, Andhra Pradesh should simply adopt (if needed modify) the Results Framework Document (RFD), introduced by the Government of India. It enables departments to articulate a long-term vision and mission; and think through the inter-se priorities among its key objectives, success indicators and action points.

RFD provides a summary of the most important results that any government department expects to achieve during the financial year. The RFD document has two main purposes: (a) shift the focus of the department from physical and financial target-based orientation to results-based orientation, and (b) provide an objective and fair basis to evaluate the department's overall performance at the end of the year. Therefore, RFD should be designed to help government departments define, measure and monitor their progress against specific outcomes and indicators and enhance the ownership and accountability.

g) Convergence of all Line Departments:

All line departments are requested to develop their district/mandal action plans to converge all their state and central schemes at pilot sites to operationalize the strategy of convergence and holistic system approach. Maximum coverage of pilot site areas through various schemes would make the pilot areas as a live model for the success of the Primary Sector Mission. It will also be a site of learning for the Primary Sector Mission and enable scaling-up through refinement of policies and institutions based on the learnings and evidences.

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Primary Sector Mission – Constitution of the Governing Body – Orders – Issued
=====

G.O.Ms.No.58

Dated:01.12.2014

Read:

G.O.Ms.No.20, Planning (VII) Dept., dated:26.09.2014

&&&

ORDER:

In the G.O. read above, Government of Andhra Pradesh has ordered for the constitution of Seven Sector specific Missions to focus on the activities/projects, which are critical for the Social and Economic growth of the State and require Inter-Departmental Coordination. The seven Missions are the Primary Sector Mission, Social Empowerment Mission, Industry Sector Mission, Infrastructure Mission, Urban Development Mission, Service Sector Mission and Knowledge and Skill Development Mission.

The Primary Sector Mission will focus on:

- a) Increasing productivity of the Primary Sector comprising Agriculture, Horticulture, Livestocks, Fisheries & Sericulture, etc.
- b) Mitigating the impact of droughts through Water Conservation and Micro-Irrigation;
- c) Post-Harvest Management to reduce wastages; and
- d) Establishment of Processing, Value Addition capacity and Supply Chain of the identified Crops.

2. In para-6 of the said G.O., it was mentioned that each Mission would have a Governing Body chaired by the Hon'ble Chief Minister. For Primary Sector Mission, the Hon'ble Minister for Agriculture will be the Vice Chairman and APC & Principal Secretary to Government will be the Mission Co-ordinator and Principal Secretaries of the departments concerned and Experts with National and International repute as Members.

3. Government after careful examination hereby constitute the Governing Body of the Primary Sector Mission with the following Members:-

Hon'ble Chief Minister	-	Chairman
Minister for Agriculture, Agri Processing, Marketing & Warehousing, Animal	-	Vice-Chairman

Husbandry, Dairy Development & Fisheries		
APC & Principal Secretary (Horticulture, Sericulture & Agricultural Marketing Coordinator Principal Secretary (Agri.)	-	Member and Mission
Secretary (Rural Development)	-	Member Principal
Secretary, Energy, Forest & Science & Technology	-	Member Principal
Principal Secretary (Animal Husbandry, Dairy Development & Fisheries)	-	Member
Principal Secretary (Irrigation)	-	Member
Principal Secretary, Industries & Commerce Dept., (Food Processing)	-	Member
E.O. Secretary (Civil Supplies)	-	Member

Experts in the Sector :

Sri G.V. Krishna Rao, Advisor to Government	-	Member
Dr.S.P.Wani, Director, ICRISAT Development Centre Hyderabad	-	Member
Dr.K.V.Raju, Principal Scientist, ICRISAT. Hyderabad	-	Member
Director, Directorate of Maize Research, Hyderabad	-	Member
Director, Directorate of Rice Research, Hyderabad	-	Member
Director, Directorate of Pulses Development, Bhopal	-	Member
Director, Directorate of Oil Seeds Research, Hyderabad	-	Member
Director, India Meteorological Department (IMD), Hyderabad	-	Member
Vice-Chancellor, Acharya N.G.Ranga Agricultural University ANGRAU), Hyderabad	-	Member
Vice-Chancellor, Dr.YSR Horticultural University, Venkatramannagudem, W.G.Dist., A.P.	-	Member
Vice-Chancellor, Sri Venkateswara Veterinary University, Tirupathi	-	Member
Deputy Director, National Remote Sensing Agency, Hyderabad	-	Member
Vice-President, Jain Irrigation Systems Ltd., Jalgaon	-	Member
Vice-President, Nuziveedu Seeds Ltd., Hyderabad	-	Member

4. The Mission Governing Body will approve and coordinate the activities/projects and the Annual Plans of the Mission. The Mission Governing Body will meet at least once in every three months to review the progress in the realization of the Mission objectives.
(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

RANJEEV R. ACHARYA
APC& PRINCIPAL SECRETARY TO GOVERNMENT

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Farmers' Empowerment Programme – Establishment of Rythu Sadhikara Samstha –
Orders - Issued

FINANCE (R&E) DEPARTMENT

G.O.Ms No.197

Dated 04-10-2014

Read the following:

1. GO Ms No. 164 Finance (IF) Department dated 02.08.2014
2. GO Ms No. 174 Finance (IF) Department dated 14.08.2014
3. GO Ms No. 20 of Planning (VII) Department dated 27.09.2014

ORDER:

1. In the reference first read above, the Government issued orders for redemption of 'agricultural crop loans and gold loans availed for agricultural purpose, together not exceeding Rs.1.50 lakh per family along with infusion of fresh capital not exceeding one lakh Rupees per DWCRA Group in order to financially strengthen the self-help groups". In the reference second read above, the Government issued operational guidelines for implementing the debt redemption scheme to the farmers.

2. In the reference third read above, the Government has outlined a "vision to be among the three best states in India by 2022 when India celebrates its 75th year of independence and to achieve the status of a developed state by 2029". In order to achieve these goals, the Government has decided to adopt a mission approach and ordered for constitution of seven sector-specific Missions to focus on the activities/projects, which are critical for the social and economic growth of the State. One of the seven Missions includes the Primary Sector Mission, which is expected to be the principal instrument for farmer's empowerment.

3. In this background, the Government has recognised that the farmers' welfare and development activities at present are delivered by multiple entities, that include different corporations, societies, etc., with suboptimal integration with the departments responsible for agricultural development. Further, there is no empowered entity with the capacity and the wherewithal to effectively deliver all farmers' empowerment activities. Further, the implementation of government's policy for farmer credit redemption requires a well equipped agency with the required capacity to manage multifarious functions for farmers' empowerment.

(P.T.O)

4. In this context, the Government, after careful and thorough consideration of all possible options, has decided to establish an integrated institutional mechanism for all programmes, schemes and activities intended for farmer's empowerment, encompassing welfare, development, capacity enhancement, credit flow, financial support and allied empowerment activities.

5. Accordingly, the Government hereby order for the registration of a corporate entity under section 8 of the Companies Act 2013, with headquarters at Vijayawada. The Government orders that the Corporation be known by the name and style of Rythu Sadhikara Samstha (Farmer's Empowerment Corporation) that would be located in the Department of Agriculture, as the one-stop-shop for all farmer development, welfare and empowerment activities. To ensure agricultural development receives a boost via the Primary Sector Mission, the farmers' empowerment corporation would be assigned a central role in the implementation of the Mission.

6. The Government orders that the Rythu Sadhikara Samstha should be a wholly owned enterprise of the Government of Andhra Pradesh and be registered with an authorized capital of Rs.1 crore, consisting of 10 lakh shares of RS.10 each. The corporation would be capitalised by the Government per the needs of the entity and it's activities.

7. The main objectives of the Rythu Sadhikara Samstha include the following:

- a) To provide an integrated empowered institution that would be responsible for planning, implementation, and monitoring of welfare, development, capacity enhancement, and other activities that would empower the farmers of the Andhra Pradesh State to achieve higher productivity and value addition to the farming sector.
- b) To take up various measures and activities, including but not limited to, financial support, technical assistance, technology transfer, agricultural debt redemption, and such other interventions that would empower the farmers of Andhra Pradesh State in diversification and intensification of agriculture, horticulture, sericulture, livestock, fisheries, forestry, food-processing and allied sectors contributing to value-addition and productivity enhancement.

(P.T.O)

- c) To support, assist, guide, promote and empower the farmers' groups, associations, societies, etc., and extend financial, technical or other support as may be needed to meet the demands of farming development in Andhra Pradesh State.
- d) To assist, advise, and provide inputs to the Government for formulation of effective policies for the empowerment of farmers and for accelerated development of farming sector in Andhra Pradesh
- e) To receive funds from the governmental and other agencies, as grant, subsidy, cess, levy, other receipts or by whatever name called for achieving the above objectives and to raise resources from any source duly adhering to the prudential norms defined by the Government.
- f) To mobilise resources from Banks, Financial Institutions, Funds, Public or Government by way of loans, bonds, debentures, monetary value certificates, etc., to realise the above objects.

8. These objectives would be further enlarged and detailed in the Memorandum and Articles of Association of the Rythu Sadhikara Samstha along with various ancillary and incidental objectives and the operating clauses of the Articles of Association with respect to shares, management, borrowing powers and other administrative provisions.

9. The Government would nominate national and international agricultural experts, official representatives, farmers' representatives, and others it deems appropriate, for the effective governance of Rythu Sadhikara Samstha. To begin with, the Government orders that the Rythu Sadhikara Samstha should be registered with the Principal Secretary, Department of Agriculture, Principal Secretary, Department of Animal Husbandry, Principal Secretary, Horticulture, Marketing and Co-operation, and the Principal Secretary, Finance Department, as Founder-Directors.

10. The Government hereby orders that the corporations, societies and other parastatal entities functioning under the Agriculture and Cooperation Department should be incrementally integrated with the Rythu Sadhikara Samstha. The Principal Secretary Agriculture is hereby ordered to work out the out the detailed modalities, institutional architecture and the standard operating procedures (SOPs) essential for

(P.T.O)

effective functioning of the Rythu Sadhikara Samstha and its structural and functional linkage with the departments, corporations, societies, etc., under the control of the Departments of Agriculture and Co-operation and Animal Husbandry.

11. The Government hereby accords permission to the Rythu Sadhikara Samstha to borrow and / or receive funds or any other financial instrument from Banks / financial institutions and the government for the purpose of farmer's empowerment, including the necessity to meet the debt obligations. The Rythu Sadhikara Samstha would be the principal agency of the Andhra Pradesh Government to manage the Farm-sector Debt Redemption Policies and Programmes of the Government.

12. The Principal Secretary, Department of Agriculture is hereby ordered to initiate immediate measures for the registration, establishment and ensure effective functioning of the Rythu Sadhikara Samstha. The Samstha shall be fully operational by 22 October 2014. The Commissioner and Director of Agriculture is hereby designated as the Nodal Officer to coordinate, facilitate and implement the orders issued herein to ensure that Rythu Sadhikara Samstha starts its effective operations on or before 22 October 2014.

13. In order to enable the Rythu Sadhikara Samstha to operationalise the Government's Farm-sector Debt Redemption Policy, the Finance Department is hereby ordered to release Rupees five thousand Crores (Rs 5,000 crores) from the 2014-15 BE to the Rythu Sadhikara Samstha, upon its establishment, for onward transmission to the eligible banks / farmers in accordance with the rules, regulations and procedures to be approved by the Government. The Finance Department is hereby directed to work out the procedures and guidelines for operationalization of the farmers' debt redemption policy in consultation with all stakeholders, including but not limited to the Agriculture department, participating banks and other key entities.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

I. Y. R KRISHNA RAO IAS
CHIEF SECRETARY TO GOVERNMENT

To

Principal Secretary, Department of Agriculture

Principal Secretary, Department of Horticulture, Co-operation and Marketing

Principal Secretary, Department of Animal Husbandry and Fisheries

Principal Secretary, Finance (R&E) Department

Principal Finance Secretary

Copy:

All Special Chief Secretaries / Principal Secretaries / Secretaries to Government

The Commissioner and Director of Agriculture

Registrar and Commissioner of Co-operation

Heads of all departments and Managing Directors and CEOs of Corporations, Societies and Co-operatives under the control of the Department of Agriculture and Co-operation

All Heads of Departments of Government of Andhra Pradesh

Convenor SLBC, Andhra Bank, Hyderabad

Joint Director of Companies, Vijayawada

Private Secretary / OSD to all Hon'ble Ministers of Andhra Pradesh Government

Private Secretary to the Hon'ble Chief Minister of Andhra Pradesh

Heads of all Departments

The Special Chief Secretary to the Governor, Andhra Pradesh, Hyderabad

All District Collectors

//FORWARDED BY::ORDER//

SECTION OFFICER

60

GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF HORTICULTURE
ANDHRA PRADESH MICROIRRIGATION PROJECT
Phone No.23398639 / 569 Fax: 23313265 email: apmiphyd@gmail.com,

From,
Smt.V.Usha Rani, IAS
Commissioner of Horticulture
Hyderabad.

To,
The Secretary to Govt.
A&C(Horti&Seri) Department
AP, Secretariat, Hyderabad

Lr.No. APMIP/PIq/621/2015, dt.12.02.2015

Sir / Madam,

Sub: APMIP- Horti. Department - Implementation of OFWM – Micro Irrigation as Annuity based projects – Expression of Interest to be called for from MI Companies - Reg.
Ref: Lr.No. 431/B/14, dt. 07-10-2014 of Collector & District Magistrate, Ananthapuramu.

<<<<>>

It is to submit that annual Action Plan of On Farm Water Management (OFWM) – Micro Irrigation (MI) is being prepared as per the budget provision given by the Government of India. Even though there is potential area of 12.26 lakh ha for Micro Irrigation, only limited area is being covered under MI due to meager budget allocation.

It is proposed to implement Micro Irrigation as an “Annuity based project” to cover larger areas under MI within a limited period.

Vide reference cited, the District Collector, Ananthapuramu has informed that Hon'ble Chief Minister of Andhra Pradesh during his visit to Ananthapuramu District on 06-10-2014 has announced that to introduce the concept of **Community Sprinkler Irrigation Systems** to provide life saving Irrigations during critical stages of Crop growth, to get optimum yields.

As a part of drought proofing measure it is proposed to provide **Portable Sprinkler Units** for an area of 4.00 Lakh hectares in Ananthapuramu and Chittoor Districts, so that they can be utilized by the farmers on rotation to get life saving irrigations for the entire area of 4.00 lakh hectares within a period of 10 to 12 days. For this purpose the water sources, which are having good yield will be identified and utilized to provide life saving irrigations at critical stage, with the total involvement of Farming community.

The following projects are proposed to be covered under Annuity mode

- a) Installation of Drip / Sprinkler Irrigation systems in the individual farmers fields with existing guidelines (unit cost, crop spacing, Prices of MI Components etc.,) of OFWM – MI of the year 2014-15,
- b) Designing, installation and maintenance of Community Sprinklers in Ananthapuramu and Chittoor Districts, including the cost of pipe line from water source to proposed fields, pump sets etc.

Requirement of budget for implementation of the above projects,

Sl. No	Name of the project	Area proposed (Lakh ha)	Implementing period	Estimated cost (Rs. in Crores)			
				GOI Share	State Share	Bene., Contribution	Total
1	Drip / Sprinkler Irrigations in individual farmers fields	5.00	5 years	1602.70	1618.00	879.85	4100.55
2	Community Sprinklers (Including cost of Pipe line, pump sets from water source to fields)	4.00	5 years		6400.00		6400.00
Total		9.00		1602.70	8018.00	879.85	10500.55

Rs. 1460,000/ha.

Since the above projects are proposed to be implemented on Annuity mode permission may be accorded to call for Expression of Interest (EOI) from the eligible MI Companies for implementation of the above projects.

Yours faithfully,
Sd/- V. Usha Rani
Commissioner of Horticulture

// Forwarded by Order //

Project Officer

**GOVERNMENT OF ANDHRA PRADESH
ABSTRACT**

Planning Department – Constitution of two Task Forces on Agriculture Development(Primary Group) and Poverty (Social Group) – Orders – Issued.

PLANNING(X) DEPARTMENT

G.O.Ms.No.

Dt. .06.2015.

Read the following:

1. D.O. F.No. Q-11040/02/2015-Agri., from Adviser, NITI Aayog, New Delhi, dated: 26-03-2015.
2. No.11013/O/2015, NITI Aayog, dated: 16th March, 2105

ORDER:

In the references cited above, NITI Aayog, Government of India, has constituted Task Forces on 'Agricultural Development' and 'Elimination of Poverty' at the National level and suggested the State Government to constitute two such similar Task Forces.

2. Accordingly, keeping in view the development vision and leverage the available strengths, the Government of Andhra Pradesh hereby constitute Task Forces on the following two important groups:

A) **Agriculture Development(Primary Group)** to review the strategies and outcomes of agriculture and allied sector activities in sync with the basic ideology of the National Task Force on Agriculture Development and

B) **Social Group, Skill Development and Poverty elimination**

3. Composition of members in the task forces and Terms of Reference:

A. Task Force on Agriculture Development(Primary Group):

Spl. Chief Secretary, Planning &APC	Chairman,
PrI. Secretary, Agriculture & Cooperation	Member
APC & PrI. Secretary, Agriculture	Member
PrI. Secretary, Animal Husbandry, Fisheries & Dairy Devpt.	Member
PrI. Secretary, Water Resources	Member
Sri SP Wane, Director, ICRISAT	Convener
Special invitees- Departments, experts etc	

Terms of References of the Task Force on Primary Group:

The task force will:

- Coordinate and develop synergy with all the departments in the state and similar Task Forces in the NITI Aayog.
- Recommend strategies for re-vigouring Agriculture sector in all its activities and eliminate poverty in its various dimensions.
- Formulate strategies for necessary reforms, innovation and technology diffusion
- Identify successful experiments and programmes from all states and UTs and learn best practices
- Any other pertinent points
- The Chairman of the Task Force may co-opt any other official/non-official expert as member to assist the Task force
- The Task force shall ensure that their reports are made available by 1st July, 2015.

B. Task Force on Social Group and Skill Development and Poverty elimination:

Spl. Chief Secretary, Planning	Chairman,
Spl. Chief Secretary, Health	Member
PrI. Secretary, Education	Member
PrI. Secretary, Rural Development	Member
PrI. Secretary, LET&F	Member
Secretary, Skill Development	Member
CEO, SERP	Member
CEO, MEPMA	Member
Director, Tata Institute of Social Sciences	Member
Director, Economics & Statistics	Convener
Special invitees- Departments, experts etc	

Terms of References of the Task Force on Social Group, Skill Development and Poverty elimination:

- To coordinate and develop synergy with the Central Ministries
- To develop a working definition of poverty
- To prepare a roadmap for the elimination of poverty
- To suggest strategies and anti-poverty programmes including reform of the existing ones
- To identify successful anti-poverty programmes from which all states and UTs
- The Chairman of the Task Force may co-opt any other official/non-official expert as member to assist the Task force
- The Task force shall ensure that their reports are made available by 1st July, 2015.
- Any other relevant measures.

4. The Planning Department shall coordinate two Task Forces.

The two taskforces shall meet as frequently as possible to have interactions and develop strategies that lead to poverty eradication and boost productivity in agriculture and submit reports to the government in the Planning Department for onward submission to the NITI Aayog, New Delhi.

Spl. Chief Secretary

To
All the Members and conveners of the Committees,
Copy to
PS to Chief Secretary,
PS to Prl Secretary to Hon'ble CM.

GOVERNMENT OF ANDHRA PRADESH
AGRICULTURE AND COOPERATION (APC) DEPARTMENT

Letter No.993/APC/2015-1, Dated : 15-06-2015.

From
The Spl.Chief Secretary to Govt., Planning & APC,
A.P.Secretariat,
Hyderabad.

To
Sri S.P. Wani,
Director,
ICRISAT Development Center,
Patancheru - 502324.

Sir,

Sub : A.P.Primary Sector Mission - Public Private partnership in pilot sites of A.P.Primary Sector Mission- Reg.

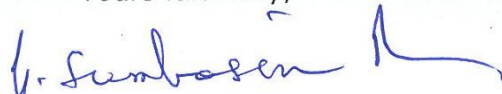
Ref : Letter dt.11.6.2015 of Sri S.P. Wani, Director, ICRISAT Development Center, Patancheru.

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I am to invite your attention to the reference cited and to inform you that permission is accorded to proceed ahead with the following companies to establish their demonstrations/models to benefit small farm holders through a public private partnership on a business model under Primary Sector Mission without any additional costs to Govt. :

1. Mahindra and Mahindra - Custom Hiring Centers for agricultural machinery.
2. Jain Irrigation - Improved seeds of crops and vegetables
3. Hitech Seeds - Micro-Irrigation systems and high density plantations
4. John Deer - Machine hiring centers, mechanisation of cotton and maize
5. Sumito (KUBOTA) - Rice mechanisation
6. Netafim/Premier Irrigation Ltd. (probable)
7. Nirmal Seeds Pvt.Ltd. (Probable)
8. Nuziveedu Seeds Pvt.Ltd. (Probable)
9. Cromandel Fertilisers Ltd. (Probable)
10. Nagarjuna Fertilisers and Chemicals Limited (Probable)
11. Any other organisation willing to participate in the pilot.

Yours faithfully,



GOVERNMENT OF ANDHRA PRADESH
AGRICULTURE AND COOPERATION (APC) DEPARTMENT

Letter No.993/APC/2015-2, dated : 15-06-2015.

From
The Spl.Chief Secretary to Govt., Planning & APC,
A.P.Secretariat,
Hyderabad.

To
The Spl.C.S. to Govt., Agriculture,
The Secretary to Govt., A & C (MKTG. & COOP),
The Commissioner of Horticulture & EOS (H&S)
The Commissioner of Agriculture, A.P., Hyderabad.
The Commissioner of Agrl.Marketing, A.P., Hyderabad.
All the District Collectors.

Sir/Madam,

Sub : A.P.Primary Sector Mission – Public Private partnership in pilot sites of A.P.Primary Sector Mission- Certain instructions - Reg.

Ref : Letter dt.11.6.2015 of Sri S.P. Wani, Director, ICRISAT Development Center, Patancheru.

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I am to inform you that ICRISAT was permitted to proceed ahead with the following companies to establish their demonstrations/models to benefit small farm holders through a public private partnership on a business model under Primary Sector Mission without any additional costs to Govt. :

1. Mahindra and Mahindra – Custom Hiring Centers for agricultural machinery.
2. Jain Irrigator – Improved seeds of crops and vegetables
3. Hitech Seeds – Micro-Irrigation systems and high density plantations
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8. Nuziveedu Seeds Pvt.Ltd. (Probable)
9. Cromandel Fertilisers Ltd. (Probable)
10. Nagarjuna Fertilisers and Chemicals Limited (Probable)
11. Any other organisation willing to participate in the pilot.

You are, therefore, requested to provide necessary logistical support to them.

Yours faithfully,
SD/- XX XX XX,
For SPECIAL CHIEF SECY. TO GOVT., PLANNING & APC

Copy to :
Sri S.P. Wani, Director,
ICRISAT Development Center, Paatancheru – 502324.
The P.S. to Spl.Chief Secy. to Govt., Planning & APC.

//FORWARDED BY ORDER//

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