

Making of State Agricultural Policy: A Demonstration

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2017

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1. Introduction

India's experience in framing its own agricultural policies has been not less than pathetic. Right from the independence we had a few reports that could be termed as attempts towards building up of a policy, but no sooner these came in public domain the thrust was totally lost. The policies were always laid down in response to meet the ensuing crisis and hence could be called as a riverine experience. It is like a river, whose flow is dictated by the obstacles coming in the way and the smoothness offered by the neat slopes. Our concerns about policy studies are precisely directed at trying to improve the ability of a society and its governance to confront the issues with the well tested policy tools. It involves changing over the pattern of past policies to the present one and analyse the impact of these changes. In the process of current trade-led growth, where international trade serves as the engine of growth, the trade related decisions are likely to be at the centre stage. Most of the trade related decisions are taken by the Ministry of Commerce in the Union Government and the welfare implications of these decisions essentially befall on the sub-national governments. In this context the nations with federal constitution will be placed in a tricky situation. Therefore, in such situation, a clear design of the policy is an essential prerequisite at the sub-national level.

Policymaking in agriculture at sub-national level inevitably passes through difficult contours. One can list at least five bold reasons entailing such difficulties. First, agriculture is an unorganized sector and, therefore, policy responses could not be predicted a priori with objective probabilities. Second, the information flow to agricultural sector is not as quick as it takes place in other sectors. The information asymmetry in the absence of objective probabilities about outcomes virtually authenticates to formulate disjointed policies in isolation, without detailed homework or mostly arbitrarily. Third, the sector in most of the agro-climatic regions has strong proverbial weather dependence and thus a quick fire-fighting job is usually the core of the policy. Fourth, the significant factor is level of income and asset distribution in the sector that has always been a point in question. This is further complicated by variations, a mark of the peculiar sector. The policies framed need to keep these variations in view. Last, the sector has a strong link with consumers and other industries. The growth of the aggregate economy of any country is sensitive to the fluctuations in the

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sector. Therefore, agricultural policies in India as well as many other countries have a strong State dependence.

Our experience of policy formulation in India is largely from two sources namely the five-year plans and various schemes initiated by the development departments concerned. There is a general lack of awareness about the theory of policy making and, therefore, to a significant extent the policy is understood often as the problem solving steps taken in the context of severity of the issue and/or a common denominator of various programmes. Actually, "A policy aims at specific, often quantifiable, objectives, deploys an array of instruments to achieve them and operates according to a pre-planned time frame for implementation. It lends itself to standardised monitoring and evaluation procedures to assess the outcome and to identify those responsible for the success/failure of the policy." (Rao, 1998:1). In this paper, we shall attempt to deliberate on the process of policy making in India, initially through a theoretical perspective on policy making, followed by the experience of agricultural policy during the last seven decades. This is followed by an empirical study of policy making across the States in the Deccan Plateau region. We have chosen these states with a particular purpose. First, agriculture being a State subject any exercise at policy making has to be at State level. Second, the challenge of policy making in the States on Deccan Plateau is unique due to typically similar constraints and differential experience. Third, these are the States that are hot spots of agrarian distress as also rapid commercialization and differential experience. Therefore, these are typical cases that pose challenge for policy making.

2. Decoding Agricultural Policy

i. Theory of Policy Making

In understanding the theory of policymaking we need to take note of the kind of complexities involved in this process. At the first place are the objectives of the intended policy change. These objectives are sensitive to time but could also visualise a long-term goal. Often these changes are influenced by the response of the extraneous factors to the existing policy system. Hall (1993) puts forth three orders of policy changes:

- a. Changes that imply tampering with the current setting of the policy instruments (e.g., Changes that are occurring in the domestic policy to meet the WTO requirement).
- b. Replacing the earlier policy initiative with the other, with or without any in-house evaluation (The Agricultural Policy Document of 2000 or the policy changes that occurred in Canada during 1988, opening up the Federal-Provincial sharing of expenditure on the ongoing schemes).

Similar was the case about the developmental programmes in India during the early seventies).

- c. A complete departure in the policy goals following theoretical or ideological framework involving the state and political actors. (Like the shift towards opening of international trade from earlier strictly guarded trade policy).

We can call Hall's model of effecting policy changes as a mid-course correction model. The changes become necessary either due to fresh policy initiatives or when anomalies accumulate and create social, political and economic strain on the State. The question that arises relates to the possibility of incorporating a significant change in the policymaking process either ignoring or incorporating the present institutional mechanism. This model has to be treated differently from the Cumulative Policy Accumulation Model wherein, the policy instruments in the form of programmes change in rapid succession and the resultant cumulative interventions on the part of the State represent policy currents. Here only the new additions are accredited and the discontinued programmes along with the experience of failures are put in the trash bin even without recognizing their institutional corrective role or vacuum that they may create.

Another relevant policy model tracked from the literature is called the Rationalist Model of Harold Lasswell (Lasswell, 1956). This model perceives the policy formulation that goes through six steps.

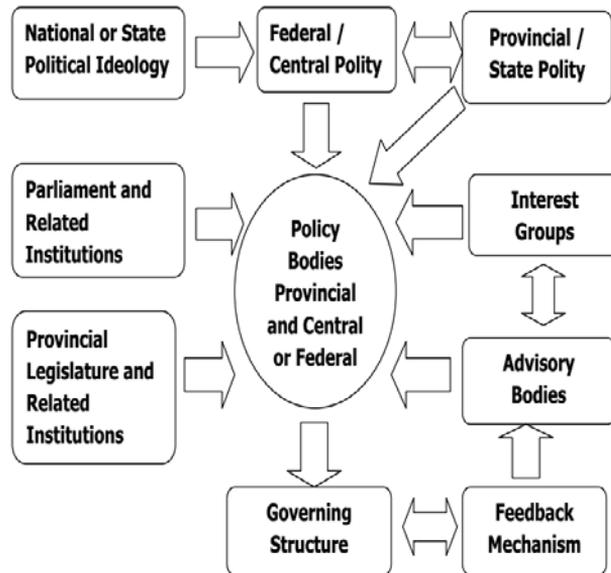
- i. Recognise a Policy Problem,
- ii. Identify the nature of the problem,
- iii. Call for alternatives,
- iv. Rank them all on the scale of welfare gain and ease of operation,
- v. Make predictions about risk and consequences,
- vi. Come to a decision combining qualitative and quantitative investigation.

Lasswell has elaborated this as the best possible way of looking at policy making (Lasswell, 1956). It assumes the stakeholders in the policy arena as mute participants or understood to be participating inherently at their respective levels of stake. Rebecca Sutton (1999) while writing on policy process rejects any linear policy or 'top down' approach, she prefers some ordered chaos. The steps usually advocated are i. Agenda Setting, ii. Formulation, iii. Adoption, iv. Implementation and v. Evaluation. These steps are advocated as the path but the models that are advocated have different goals. Prominently, among these we find, Rational Decision making receiving largest attention, followed by Conflict Resolution and Artifacts. Miller and McTavish (2013), while reviewing the process of making public policy across the world distinguish across situations and

rather argue that 'One Hat does not fit all'. In addition to these there are a few more theoretical constructs, but have little significance in the Indian context. A quick review of these theories suggests that any model of policy will have to be dynamic in its content, as there are rapid flows of different dominating responses from polity and society. Thus, flexibility is an essential component of the structure of any policy. In the beginning the stakeholders as well as the decision-makers will start with some expectations about the end results from a contemplated policy framework. It gets complicated as the political stakes increase by claiming the credit for success and to assigning the failures. The two phases in policy formulation, namely the phase of identification and that of negotiations with the stakeholders, are conspicuously absent. Coleman et al (1997) argued an alternative route of attaining feedback through negotiations between state actors and group of stakeholders. But when the stakeholders become aware of their role, at that time any mature economy witnesses the organisations of stakeholders asking for their rights.

In a generalised policy model the governing structure is dictated by the feedback mechanism as well as the goals set by the provincial and Central policy institutions. The parliament and related institutions along with the provincial institutions concerned should provide broad directions to the policy. Provincial and the central political ideologies contribute to this process through the legislature debates. The role of advisory bodies and the interest groups (farmers' organisations) is also quite crucial in this endeavour. Jordan et al (1994) argue this extensively. They state, "Extensive consultation is an integral part of the management of pressure. Civil servants have stated that it takes less time and effort to agree to have discussions with a group than to refuse them consultation time. This process may be purely cosmetic, but it allows civil servants to present an image of wide participation and over-consultation, rather than under-consultation". In the Indian context we have some weak evidence about functioning of this model, but there is no established drill in its functioning. It is, however, a common feature in Canada and European Union. Therefore, we argue for a unique 'Telescopic Chaos Organising Model' in the Indian situation.

Figure 1: A Generalised Model of Policy Formulation



3. Overview of India's Agricultural Policy Making and Development

In India, we had sporadic attempts at making agricultural policy but none of these attempts culminated into any long-term policy document. These include Foodgrains Policy Committee (Gregory), 1943; 1947 (Thakurdas); Maitra Committee, 1950, Mehta Committee, 1957, Vekatappaiah Committee, 1966, High Power Committee (BhanuPratap Singh Committee) 1990, Policy Document under the Prime Ministership of Mr Deve Gowda and the Draft Agricultural Policy Document prepared by Shri Sharad Joshi. Most of these documents focussed on the current problems and a little was done to allow long-term thinking. The Agricultural Policy document of 2000 was the first completed attempt towards formulating a long-term policy for the sector. The NAP (2000) seeks to realise by 2020: a) vast untapped growth potential of Indian agriculture; b) strengthen rural infrastructure to support faster agricultural development; c) promote value addition; d) accelerate the growth of agro-business; e) create employment in rural areas; f) secure a fair standard of living for the farmers and agricultural workers and their families; g) discourage migration to urban areas and face the challenges arising out of economic liberalisation and globalisation. The policy aims stated in the document to achieve these are: a) a growth rate of 4 per cent per annum; b) efficient use of natural resources and bio-diversity; c) growth with equity; d) protect from economic liberalisation and globalisation by demand driven growth and catering to domestic markets and maximise agricultural exports; e) environmentally, technologically and economically sustainable growth. However, the document is rather a collection and compilation of all the

niches in the literature and does not attempt any phased or properly directed programme.

A holistic approach to the development of the farm sector was brought out by the National Policy for Farmers in 2007. The broad focus areas of the policy included:

- Economic well-being of the farmers in addition to production and productivity
- Building skill sets of farm households by ensuring that each farmer household in villages either possesses or have access to a productive asset or a marketable skill.
- Maximize the use of irrigation water in all crop production programmes with stress on awareness and efficiency on water use.
- Encouraging new technologies like biotechnology, ICT, renewable energy, space applications and nano technology for improving productivity of land and water use.
- Establishing National Agricultural Bio-security system
- Issuing of Soil health passbook to farmers and supply of quality seeds and disease free planting material for ensuring seed and soil health.
- Funding of support services for women working in fields like creches, child care centres and adequate nutrition.
- Galvanizing the financial services of credit and insurance for timely, adequate and easy reach to the farmers at reasonable rates of interest.
- Effective implementation of Minimum Support Price mechanism to ensure remunerative prices for agricultural produce
- Enlarging of food security basket to include nutritious millets like bajra, jowar, ragi etc.

Notwithstanding this, it must be clear that largely our policy statements for the sector emerge from the Five Year Plan documents and thus the genesis and process can also be traced through these. In the absence of a long-term policy paper the experience based on the impact on ground gives us a fair idea about the policy directives. Therefore, we plan to review the policy experience over the five decades to understand the direction.

India's agricultural sector is presently at a crossroads with the advent of the forces of new economic policy. The sensitivity of aggregate growth of the economy to the fluctuations in growth trends of agricultural sector is undisputable. Thus, the onus of maintaining a good tempo of growth, provision of food security to the millions below poverty line, contributing to the overall development scenario and participating in the global trade are among the major expectations from the sector. The performance of agricultural sector during the nineties has not failed these expectations. However, there

are quite a few questions of specific nature, which have to be looked into while analysing the performance of the sector. First of all it is necessary to review the question of sustainability of the process of growth in a medium term perspective and the food security question in the background of performance during the last five decades. Any such analysis will require a long-term understanding of growth process of the agricultural sector in India. Secondly, the growth performance has to be viewed from two distinct perspectives, namely the resource use and institutional perspective. Thirdly, under the Indian Constitution agriculture is a subject assigned to provincial governments (State governments) for the purpose of policy. Therefore, the policy has to be viewed from the perspective of the states.

Table 1: Phases of Development of Agriculture Sector

Phase	Time Period	Specific Characteristics
First Phase	Pre-independence up to 1947	Problems inherited from the Colonial Rule
Second Phase	1947 to 1966	Food Insecurity Community Development
Third Phase	1967-1979	Period heralding the technological change (Green Revolution)
Fourth Phase	1980-1990	Two distinct phases marking the fallouts of technological change and environmental debate
Fifth Phase	1990-2001	Liberalisation process and its impact on agricultural sector. Complying with the WTO regime
Sixth Phase	2001 - 2007	Adjusting to the WTO norms and making Indian agriculture globally competitive
Seventh Phase	2007 Onwards	Inclusivity Dominates with trade. Increasing distress

Source: Deshpande et al (2004 & updated)

The analysis of agricultural development in India essentially involves six important phases of development. The first phase involves the period prior to independence of the country. This period was marked by the retrogression of the sector and ended by leaving the country with perhaps the world's most refractory land problem, (Thorner and Thorner, 1962). Quite a few unsurmountable problems were inherited from the colonial rulers. The second phase of development of the agricultural sector covers the initial years after independence, influenced both by the indigenous thinking about

growth/development strategies (Gandhian perspective) as also the western process of growth borrowed from the experience of the industrialised nations. This phase ended with the drought of the mid-sixties when food security became a prominent issue and acute poverty as well as meeting the famine conditions were among the major concerns for the planning bodies. By 1975, India not only met the domestic requirement of food but also became an exporter of foodgrains. This was the success of the technological change of the mid-sixties that was commonly known as 'Green Revolution'. This phase was followed by two distinct phases of growth namely the immediate fallouts of technological change and the phase of new economic policy.

4. Agricultural Policy – An Experience of Seven Decades

The Plan documents over the last five decades made it quite clear that policy for agricultural sector is of prime importance to the plan and the steps taken could be seen from the table 2. One expects a significant shift in the strategy during Tenth Plan. In keeping with this expectation the Approach Paper to the Tenth Plan makes it clear that *“First, agricultural development must be viewed as a core element of the Plan since growth in this sector is likely to lead to the widest spread of benefits, especially to the rural poor including agricultural labour. Also, since the majority of women workers are engaged in agriculture, investments in this sector have enormous implications for gender equality and must be designed to have maximal impact on this dimension. The first generation of reforms concentrated on reforms in the industrial economy and reforms in the agricultural sector were neglected. This must change in the Tenth Plan”* (Approach Paper to the Tenth Five Year Plan, GoI 2001).

From the First Plan onwards, the Plan documents are replete with ideas and objectives towards agricultural sector. In the process of planned development we have achieved significant strides in the sector but the experience of the earlier Plans rarely becomes a background for the policy. During the last three Plans the planning process has been revitalised incorporating specific working groups, drawing on the experience of the experts and circulation of the drafts for discussions. It is interesting that the First Five Year Plan emphasised organisation of agriculture through a continuous extension process and the community development programme was the instrument. The development philosophy underlying this was to involve participation from below starting at the grassroots. Opening paragraph of the approach to the Ninth Plan reiterates our commitment admitting little achievement in the direction. Plan documents and successive appraisal reports stand testimony to our riverine policy (flowing like a river directed by mountainous constraints and flows of successes in terms of streams). It is during the Seventh Plan that a medium term development perspective was evolved (GOI, 1985, p.8). The aim was to create, by the year 2000, the conditions for self-sustaining growth in terms of both the capacity to finance internally and the development of technology. The perspective plan for agriculture documented in the

Seventh Plan emphasised on self-sufficiency, employment, technology, extension and bypassed regions (rainfed agriculture) (GOI, 1985, p.15). The emphasis was continued through the Eighth Plan. But in response to the NEP and liberalisation the Ninth Plan had set the market participation and trade sector as the main diversions.

Over the last five decades we have learnt a good number of lessons in our planning exercise and appraisals of the plan programmes. Objectives have more or less stayed the same and revolved around poverty reduction, empowering poor sections, self-sufficiency and assimilating the by-passed regions and groups. But the instruments to achieve these have significantly changed. These together give varied choice and rich experience in framing policies.

4.1 Federalism and Agricultural Policy

Globally, intervention in agriculture by different levels of government is well documented, so also in India. This is despite the fact that agriculture is a private activity in its content. But there has been a lack of coordination between the Centre and the States to achieve a well-defined set of policy objectives. There have been inconsistent policies in the economy - wide macro policies like foreign trade policies, industrial policies on the one hand and agricultural macro policies on the other. These have large and offsetting impact on agriculture (Srinivasan, 1998). While determining the role of the Central Governments in formulating the agriculture policy, the views of the leaders at the time of independence were of great importance. In a memorandum to the Cabinet during 1947, it was stated that agricultural production policy, price control of agriculture products, the establishment of the central higher technical institutions, food distribution and then setting up of a twisted emission refer agriculture and industrial development are vital problems and the Central government should take steps to correct these. It was inherently accepted that the Central Government should have an authority of its own to coordinate agricultural production in the country as a whole and play an increasingly active role in the development of both industry and agriculture (Austin, 1966). The objective of the framers of the Constitution was to make states, primarily and directly responsible for all matters concerning the development of agriculture and rural poor, and at the same time, the Central Government owning the responsibility to oversee such arrangements. The powers over agriculture and the responsibility for its development were thus ambiguously divided between the Centre and the states. This exercise was quite fragile as the federal inaction in its own sphere can render the policy ineffective, either by the state or by the Centre. No wonder, neither the states nor the Centre could formulate a longstanding agriculture policy. The Twelfth Plan wanted more inclusive growth and its approach paper says "To achieve inclusiveness in all these dimensions requires multiple interventions, and success depends not only on introducing new policies and government programmes, but on

institutional and attitudinal changes brought about, which take time. A comprehensive assessment of outcomes on all these fronts during the Eleventh Plan is not possible at this point, because the data for recent years is still not available. However, available evidence suggests that there have been significant gains on many of these fronts, even though there are shortfalls in some areas on which further work is needed. (Gol, 2011,p.2)”

The functions directly undertaken by the Central Government and the functions that it coordinates may be listed as below:

- Providing financial assistance to the states for their agricultural plans through grants and loans.
- Overall planning and coordination of agricultural development in the country; coordinating state agricultural plans; ensuring the efficient implementation of development plans and their evaluation.
- Providing technical assistance to the states in planning and executing agricultural programmes.
- Assisting the states in ensuring timely supply of agricultural inputs such as pure seeds, fertilisers and pesticides.
- Providing credit; assisting the states in organising marketing, storage and transport facilities;
- Price stabilisation; enforcing incorporation with the States minimum and maximum prices for agriculture produce; regulating interstate trade and movement of the commodities;
- Laying down import and export policies in respect of agricultural requisites and products;
- Providing cooperation to the states for betterment of extension services to farmers;
- Coordinating programmes of land use and development; soil conservation and utilisation of water sources;
- Fundamental and applied research in agriculture, bio-sciences, agricultural economics, fisheries, home science and nutritional problems;
- Maintaining the standards of higher education in all agricultural sciences;
- The administration of external assistance in the agricultural sector.

Agricultural plans of the states are not built from below, as it is often claimed. There is hardly any consultation either with the Panchayati Raj bodies or farming interests and farmers' bodies. Mostly it is the Department officials who prepare the plans and these are usually the step up plans with little innovative approach. Even within the Agriculture Department there is hardly any machinery that can monitor the policy goals and exercise online corrections. Usually the plans are made at the headquarters, broken into district segments and later in turn split into local plans. The idea of farm plans built in the villages culminating into block level, district level, and finally state level plans, has never been practised, and possibly may not be

practised even after introduction of Article 243 of the Constitution of India. The states are hardly expected to plan realistically keeping in view their constraints and opportunities, and consultation down to the district or other tiers of governance is clearly a distant dream.

Table 2: Agricultural Policy Formulation through Five-Year Plans

Plan Period	Major Issues and Policy Thrust
First Plan 1951-56	Severe food availability constraints. Maximisation of Agricultural Production. Making Food available to masses. Food distribution network. Nationwide Community Development (CD) Programme Institutions for village development. National Extension and Community Projects Skewed Land Distribution, Inefficiency in Production and thus land reforms - Abolition of intermediaries. Bringing the fallow lands under cultivation and increase in land use efficiency. Tenants to be given the rights to cultivate land.
Second Plan 1956-61	Concern about low land productivity and thrust on irrigated agriculture. Irrigation Development for the rainfed areas. Land Reforms Enactment of laws. Tenancy Reforms & Ceiling on Holdings. Soil conservation as an important programme. Co-operative Development Institutions, National Extension Service Blocks created. Training and Extension work for the technology through Community Development network.
Third Plan 1961-66	Food security concerns continued to dominate. Technological Change and adoption of improved technology to increase land productivity. Cultivable wasteland to be brought under cultivation. Bringing the lagging regions under mainstream growth. Area development as an approach for development. Intensive Area Development Programme adopted for selected districts. Extension of non-agricultural activities in Rural areas. An integrated land policy approach. Soil Surveys were taken up.
Fourth Plan 1969-74	Emphasis on food security continued as minimum dietary requirements to be met. Deep concern about poverty. Regional inequality and correction of regional imbalances. Incentives created for diversion of land towards food crops and enhancing the capacity of such land. Increased emphasis on irrigation and soil conservation in dryland regions and technological change introduced. Higher cropping intensity was the concern. Emergence of Agri Price Policy. Concern about domination of large holding sizes and low allocative and technical efficiency. Second phase of land reforms with land ceiling acts and consolidation of holding. Encouragement to co-operatives. Institutional changes in Credit, Agri extension and training.

Fifth Plan 1974-79	Twenty point economic programme. Concern to eradicate poverty intensified. Area Development strategy continued. Drought prone areas attracted attention. Allocation on drought-prone area development programme, desert area development programmes, and soil conservation was enhanced. New impetus to dry farming. Problems of land degradation land management in irrigated command areas surfaced. Modernisation of irrigation in selected irrigation command areas.
Sixth Plan 1980-85	Minimum Needs Programme. Providing clean drinking water, elementary education and basic health facilities. Larger attention to unemployment and under-employment. Target group specific programmes for poverty alleviation. IRDP, NREP and RLEGP programmes were undertaken for employment and income generation. Under-utilisation of land resources. Drought-prone areas continued to attract attention. Further attention for lagging areas on the backdrop of green revolution. Land and water management under drought-prone area programme in selected districts.
Seventh Plan 1985-90	Direct attack on poverty, unemployment and regional imbalances continued. Soil erosion and land degradation surfaced as major issues. Larger share of land was going out of cultivation. Soil and water conservation was needed for averting land degradation. National Watershed Development Programme, Oilseed and Pulses Development Programmes, Wasteland Development Programmes, and long term view of land management was initiated.
Eighth Plan 1992-97	Priority for employment generation, strengthening of infrastructure, liberalisation and globalisation in agricultural sector. Trade sector priorities by generating surplus of agricultural commodities for exports. Emphasis on oilseed sector increased. Agro-climatic regional planning approach was incorporated. Productivity enhancement schemes. Horticulture sector to be encouraged. Degradation of land in irrigated command areas attracted attention. People's participation surfaced as major issue in land management at village level. Emphasis on watershed development approach. soil conservation merged with watershed programmes.

Ninth Plan 1997-2002	Priority to agricultural sector. Generating adequate productive employment through employment assurance. Renewed assault on poverty, accelerating growth with stable prices, Food and nutritional security for vulnerable sections, Providing basic needs for environmental sustainability, growth with social justice and equity, foreign trade to be tailored for accelerating growth, boost to agricultural research, development of infrastructure and increasing investment in infrastructure, export oriented growth and emphasis on horticultural crops for exports. Land degradation increased significantly. Integrating Watershed Development Programme across various components. Rethinking on land reforms. Gap between potentials and actual crop yields need to be bridged. Need for a long-term policy document. Bringing the under-utilised land under cultivation. Management of waste lands. Maintenance of village commons. Decentralised land management system. <i>Panchayat raj</i> institutions to manage the village lands. Rethinking on land legislation
Tenth Plan 2002-2007	Creation of employment; improving pace of growth in agriculture; sustaining demand for labour; employment generation programme to concentrate in diversification of agriculture and agro processing; land use policy; process oriented programmes focussing on poor; universalisation of joint forest management or macro management approach; precision farming; organic farming; wastelands to be brought under economic use; strengthening R and D for slow growth crops.
Eleventh Plan 2007-2012	Accelerating agricultural growth to 4 % per annum; bringing technology to farmers by focussing on strategic research and increasing the accountability of ICAR and SAUs; improving efficiency in investments, increasing systems support, and rationalizing subsidies; diversifying while protecting food security concerns; fostering inclusiveness through a group approach; Introduction of the Rashtriya KrishiVikasYojna (RKVY) for promoting decentralized planning in agriculture.
Twelfth Plan 2012-2017	Improving farm viability through securing economies of scale, better market access and returns; Availability and dissemination of appropriate technologies depending on quality of research and extent of skill development; Improved functioning of markets and more efficient use of natural resources; improved governance for better delivery of services like credit, animal health, seeds, pesticides, fertilizers and farm machinery.

Source: From various Plan documents. These are, however, not exhaustive statements but only indicative of the thrust.

5. Farming in the Deccan Plateau: Characteristic Features

Deccan Plateau lies in the southern peninsula of India, marked centrally by a high triangular tableland. The plateau is bounded by two mountain ranges – Eastern and Western Ghats on the east and west coastal plains. The Vindhya and Satpura ranges in the north forms its boundaries which separates it from the Gangetic plain. Its average elevation is about 2000 feet sloping towards the east. The principal rivers, Godavari, Krishna and Kaveri flow eastwards to the Bay of Bengal originating from the Western Ghat. Depending on the geographical conditions, the plateau region can be divided into sub-regions namely, Maharashtra Plateau, Andhra Plateau and Karnataka Plateau. Of these the Karnataka plateau is the highest. The Maharashtra plateau, which is the north-western part, covers the whole of Maharashtra and parts of the states of Gujarat and Madhya Pradesh and is formed of volcanic rocks called the Deccan Trap. The climate in the Deccan Plateau is drier than in the east and the west coasts and is arid.

5.1 Characteristic Features of Agro-climatic Regions in the Deccan Plateau

Farming in the Deccan Plateau region is characterised by the peculiar geographic and climatic conditions (Table 3). Eastern and Central plateau and Hill regions (Region VII, VIII) are generally characterised by vast extent of land and water resources with the predominance of subsistence crop. The region also has high proportion of problem soils. Water resource development through completion of ongoing major and medium irrigation projects, sinking of additional borewells to exploit groundwater, measures to conserve and harvest rainwater, introduction of modern agricultural practices and livestock improvement through upgradation of milch cows and buffaloes are some of the important strategies necessary to improve the agricultural sector in the region.

The Western and Southern plateau and Hills region have less favourable soil and water resources and low land productivity. Both the regions have experienced low irrigation development. The tanks, which are a major source of irrigation in Southern plateau and Hill regions, have deteriorated over time reducing their capacity. On the other hand Western plateau suffers from high soil erosion due to undulating land train and shallow soil covers. Livestock productivity is low in both the regions. Integrated watershed development for rainfed agriculture, renovation of tanks by desilting, groundwater development along with popularisation of water- saving devices like sprinklers and drip irrigation systems are some of the important strategies recommended to boost agricultural growth on sustainable basis in these two regions.

This study begins with the premise that any attempt to frame agricultural policy must begin at the State level and there too constructed from below. Essentially such exercise requires basic understanding at the State level and discussions with the stakeholders that include: Policy Makers, Administrators, Farmer Leaders, Farmers, Traders and researchers in the field. As indicated earlier the discussions were format free and were directed more towards finding out the Strengths, Weaknesses, Opportunities and Threats. These were to be located from the standpoint of the concerned State and not in the Centralised perspective. Four States from the Deccan plateau region – Andhra Pradesh, Karnataka, Gujarat & Maharashtra are chosen for the study

Table 3: Selected Features of Agro-climatic Region

Region	Rainfall (mm)	Climate	Soil	Crops
Eastern Plateau & Hills	1271-1369	Moist sub-humid to dry sub-humid	Sandy, red & yellow, red loamy laterite	Paddy, Linseed, Wheat, Jowar, Gram, Groundnut, Maize, Niger seed, Ragi
Central Plateau & Hills	490-1570	Dry sub-humid, semi-arid to arid	Mixed red & black, Red & yellow medium black shallow black, deep black, alluvial grey brown, desert soil	Wheat, Guava, Jowar, Paddy, Niger seed, Maize, Gram, Linseed, Tur, Soybean, Rapeseed, Bajra&Sesamum
Western Plateau and Hills	602-1040	Semi-arid to dry sub-humid	Med.to deep black shallowed red loamy	Jowar, Bajra, G.nut, Cotton, Wheat, Tur
Southern plateau and hills	677-1001	Semi-arid to dry sub-humid	Med. to deep black red loamy coastal alluvium, laterite, red sandy, deltaic alluvium.	Jowar, Bajra, G.Nut, Ragi, Paddy, Cotton, Castor seed maize

Table 4: Basic Performance of Agriculture in the States Selected

States	Overall Performance in Agriculture
Andhra Pradesh	The agricultural growth rate was witnessing sharp acceleration throughout the 60s and 70s except for a slight deceleration during 80s. Along with the Net Sown Area the area under foodgrains, especially that of coarse cereals, continuously declined. On the other hand, area under commercial crops like groundnut and sunflower were on the rise. The state has high levels of area under irrigation and the fertiliser use has been increasing tremendously
Gujarat	Agriculture witnessed a positive but low growth rate on the whole with moderately high growth rate of productivity. The extension of Wheat and Rice technology increased growth and productivity substantially during 70s but for a stagnation during 80s owing to the persistent droughts. The Net Sown Area declined continuously in the 80s with a moderate increase in cropping intensity. Coarse cereals like rice and wheat, which dominated the cropping pattern during 70s, gave way to oilseeds during the 80s recording a decline in the area under coarse cereals. The fertiliser use increased considerably.
Karnataka	A medium to high growth rate was attained in the agri-sector all through the period also recording very high growth rate in yield, in general. The growth in cropped area has been increasing right from the 70s, primarily because of changes in rainfall and remained reasonably high even during the 80s. The area under foodgrains, especially coarse cereals, declined with a shift towards oil-seeds and sunflower. There has been a tremendous increase in the use of pumpsets and fertiliser consumption.
Maharashtra	Wide fluctuations were experienced in the growth of the agri-sector leaping from a negative growth in the 60s to a very high growth in the 70s and further a deceleration during the 80s owing to persistent droughts in the late 80s. Primarily, a higher growth rate occurred in the cropped area and later the 80s witnessed a decline. A decline in area under coarse cereals took place with a shift to oil-seeds especially sunflower. The use of all modern inputs was on the rise.

Source: Authors' own.

Andhra Pradesh: Andhra Pradesh is one of the States that has scored well in the process of reforms, but mostly in terms of attracting capital investment. But in the process possibly the agricultural sectors took a back seat. The constraints that prevailed before setting in the reform process continued to dog the sector. But if these are attended, then the agricultural

sector of Andhra Pradesh can stand with resilience.

Gujarat: Gujarat is a proverbial dryland area of the country with large deserts spread across the coast. The State also have rainfed crops predominating their cropping pattern not by choice but as an adjustment process. Millets, cereals, pulses and oilseeds are the crops that dominate cropping pattern of this rainfed agricultural region. Incidentally, poverty is densely located in the rainfed regions of the State. One can see the face of acute poverty peeping out of the prosperity of the irrigated regions. The net income flow is depressed mainly because of the prices of rainfed millets have always stayed lower than the other crops and the net income flow in real terms of the majority millet growers never crossed above the cost of living index. Therefore, getting proper prices for these crops would be a natural choice for any policy frame, however in order to achieve this one must tap markets outside the domestic economy. Gujarat has been traditionally the business class economies and they have proved unequivocally their calibre by participating in all types of trade all over the globe. Therefore, it would not be difficult for these two States to participate aggressively in international trade with the commodities or products that they produce. At the same time, one must also note that there is good demand for these commodities in the world market but a large sector of these markets have remained untapped. But all that has to be done in the context of the constraints faced by the two economies in the agricultural sector.

Karnataka: Karnataka is one of the potentially high growth regions of the country. The State has participated aggressively in the process of reforms and agricultural trade. Productivity of major crops in the State has stagnated, but at the same time there are clear trends about increased commercialisation. New crops have entered the farmers' calculus and at the same time changes are taking place in marketing sector. **Maharashtra:** Agricultural sector of the State of Maharashtra has always remained neglected on policy front both due to increased attention attracted by the industrial sector and the natural constraint in the form of large share of drought prone areas in the State. Coupled with the presence of large rainfed steppe the State also has very low share of irrigated area. But still there are a few islands of great promise like sugarcane, grapes, fruits and fruit processing. However, the constraints are formidable.

6. Moving Towards a Policy

Policy can be considered as a response of the government indicating its position on an area of significant concern to a political and administrative system. Such sectors are of course connected with the other segments of the economy and more than that with the polity, bureaucracy and the outside pressure groups. Inter-relatedness of policies and their outcomes therefore cannot be fully explored a priori but their probable direction of impact can be visualized. Hence the study of policy making will

require understanding of the institutional dynamics and case studies in order to analyze the emergence of the situation and the resolution of possible conflicts in goals. One of the important points of discord and subsequent resolutions is the understanding between the Central and the state governments, even keeping aside the other important players for a moment. According to the Indian constitution, agriculture is in the State list but many facets of the sector are either in the central list or under the concurrent list. Even being on the state list, the policies pertaining to agriculture are mostly initiated at the Center, sometime after consultation with the state. The only way of handling such a tricky issue is to understand the policy matrix through revealed juxtaposition.

Therefore, an attempt was made to formulate policy for agricultural sector with active participation of the players at the state level (Deshpande, 2006). Among the important interest groups we included the polity, administrators, bankers, farm leaders, academicians, processors and traders, agricultural labor unions, NGOs engaged in agriculture and rural development activities, and other stakeholders. It was felt necessary that the policy statement emerge out of the felt needs and resource availability at these locales. Such policy statement will emerge, as a matrix having the states on one axis and the felt needs on the other. The cells will speak about the type of initiatives needed for handling the underlying issues. We have also attempted a SWOT analysis in the context of the states.

Plan documents both at Center and State level should be reviewed. However, the intention here is to go beyond that in terms of preparing a policy document, as prevailing at the current moment, irrespective of the fact whether such policies or explicitly stated or not. The expected output from the first two stages of this exercise will be a systematic policy document for the concerned State. Although interaction with important stakeholders of State agriculture would be useful to get access to prevailing and pre-existing documents and thus to bring out the current policy status during the first two stages of the study, such interaction would be of crucial importance during the third and last stage of this exercise. Obviously, the spirit of this interaction would be positivist (i.e., to bring out the prevailing factual position without any ideological or normative preoccupation) during the first two stages, while it has to be essentially normative in nature (i.e., to bring out the desirable features as per the wishes and aspirations of various stakeholders) during the last stage.

The States of Andhra Pradesh and Karnataka have been in the forefront of the economic reforms. A large number of initiatives were taken in these States by their respective governments to actively participate in the development process. However, the crop pattern as well as the other institutional support need to be put in proper place. Andhra Pradesh and Karnataka are facing the problem of deceleration in the output growth. It is essential to infuse a new technological phase in the agricultural economy

of both the States. One of the major constraints in the three states is the presence of vast patches of rainfed agriculture, with meagre irrigation support. There are a number of incomplete irrigation schemes and the watershed development programme is yet to make the required dent in the traditional drought-prone pockets of the two states. Land degradation and marginalisation of the size of holding also appear to be the major constraints in addition to the slow pace of capital formation in these two states. In addition to meeting these challenges, market as well as information support infrastructure are some of the important intervention spots.

These two states have shown a better promise in their participation in international trade. The process of strengthening and putting in place the institutional support is ongoing in Karnataka and Andhra Pradesh. It would be essential to build and support the forward and backward linkages for vigorous participation in the international trade. There are a good number of commodities, which have significant demand in the world market and these commodities could be encouraged on the farms of small and marginal farmers. Horticulture, floriculture, sericulture, and other sunrise sectors need to be promoted in order to enhance participation in the international trade.

The Central Indian states located on the Deccan Plateau face continuously infrastructural crunch mainly due to the inadequate investment from the public resources. Maharashtra is quite constrained on the natural resources front due to its low level and variability in rainfall. This is compounded by the fact that despite huge investment, the State could provide protective irrigation only to a small proportion of net cropped area. It is well known that irrigation is quite inadequate to initiate growth drivers. Further, the cropping pattern is predominated with low value, low yield crops, and that gives meagre returns to the farmers. The State resources are largely spent in meeting the exigencies due to drought and, therefore, investment on concentration on infrastructure has been lacking for over several years. In addition to that, funds marked for infrastructure are gobbled up by the metropolitan cities like Bombay, Pune and Nagpur. That leaves very inadequate resources for the rural areas in the state.

Among the infrastructural indicators access to villages, availability of electricity in the villages, marketing facilities, warehouses, and cold storages are quite inadequate and far from the normative level of need. In the absence of any forward linkages, there is hardly any incentive created for the farmer to go into new enterprises. Processing of agricultural products, and market chains to reach the international market, is the major inadequacy. There are parts of Maharashtra, that have forest areas and the concern of livelihood of the forest dwellers is one of the top priorities. The quality of life among these forest dwellers is a matter of policy concern. Many of the villages in both regions are not even accessible by

road. Therefore, infrastructure should be one of the important moves of growth areas for policy planning.

Gujarat is known for its rainfed character as well as their traditionally acquired business skills. It has large area under severe drought-prone conditions and substantial area under deserts. Irrigation alone could not be the development policy trick Gujarat on two counts. First, there are limitations on availability of water, as well as irrigation potential, and even if irrigation is made available, the irrigated area may inflict negative externalities on the soils of the state. That would pose serious environmental problems. Watershed development and water conservation programmes are being taken up in both the states. Given the speed and growth rates of these programmes in covering the land mass of the regions, it would take at least three decades to cover the most fragile ecosystems in the state. The cropping pattern of Gujarat is predominated by low value millets and cereals. Oilseeds and pulses are traditional crops grown in the state. But all have low yields even though the quality of the produce is one of the best in India. Presently the market conditions are such that the farmers cannot make the maximum out of their marketable surplus. Market margins are quite high and there is a strong presence of traders from outside the state, who make most of the money. It is quite well known that demand for millets, coarse cereals, oilseeds, and pulses in the international market is increasing. Therefore, it would be quite prudent to tap this demand, and the enterprising traders from Gujarat can certainly do that. In addition to tapping the export market, there is a large scope for processing units in the state. That will not only provide opportunities for the farmers to sell their products at a better rate but also employment opportunities to those who have basic skills for working in the processing sector. It is with this focus that we approach the policy frame for the state.

6. State-wise Constraints and Initiatives Required

The calculus of policy-making requires understanding of five important dimensions for the region in question. First, it is necessary to understand the nexus between resource use and growth, for this full information about the stock of resources and their historical utilisation in the context of growth. Any trends in depletion of resources may vitiate computations based on growth. Second, this is followed by a clear understanding of the historical path of growth and development in the region keeping in view the population that participated in this process over generations and specifically during the preceding few decades. This enriches understanding of a reviewer to locate policy in the correct domain of acceptance and automatically internalizes the aspirations of the stakeholders. We must, however, warn that reading of historical trends has to be done carefully keeping in view the negative externalities emerging in the process of growth and measures to avoid such eventualities. Third, the society also provides incisive information for understanding their needs, requirements and calculations for future

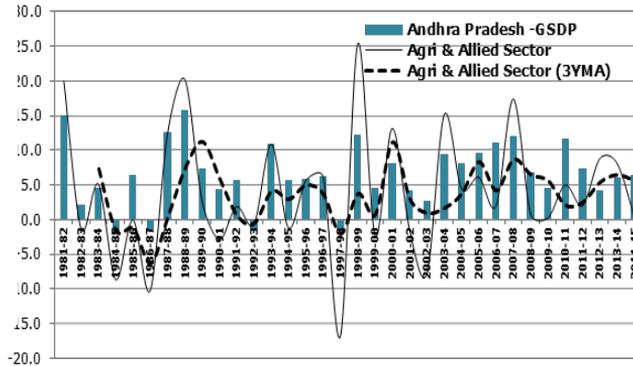
development. These emerge out of the discussions and writings of the academics, administrators and critics, who have reviewed the material available on the development process of these regions. Such review helps in placing the objective function in the right perspective. Fourth, any process of policy making requires full understanding of the constraints faced by the economy and these constraints have to emerge from the in situ discussions with the experts from the economy itself. Such discussions provide clear constraints faced by the stakeholders in the sectors and sub-sectors of the region concerned during the earlier phase of development. The policy makers' task is to assimilate these constraints to bring out cutting edge solutions. Lastly, one must understand the process of policy making from a few broad sub-sectors of the concerned economy. Here, we have taken crop economy, land issues, input delivery system, infrastructure (marketing, processing, roads and institutions), horticulture and allied agricultural sector as the major component.

a. Andhra Pradesh

Andhra Pradesh is endowed with a wide range of agro-climatic conditions and natural resources conducive for the development of agriculture. It has significant share of irrigated and rich delta lands in the coastal districts. The crop-pattern changes in the state have been taking in favour of water intensive crops and commercialisation. This over-emphasis has posed a threat to the water levels and also the sustainability of agricultural sector. This calls for a policy intervention to regulate the cropping pattern taking into consideration the available resources and the existing conditions. But since it is difficult to dictate cropping pattern directly a process of incentives/disincentives has to be put in place. Water pricing and water users' associations become quite crucial in this context. The growth of agricultural output in the State was contributed mainly by increase in yields in the 70s. Further the increase in yields coupled with a shift from low value crop to high value crops was witnessed in the 80s. During 90s the growth was contributed by yields and area had a negative effect. But during this period all prominent crops recorded deceleration in the growth of yields. As it is, the yield levels of these crops are relatively low in the State. For instance, the yield of rice in the state during year TE 2014-15 was 2.9 tonnes per hectare as against 39.3 tonnes in Punjab, indicating a gap of 36.4 tonnes of ha. The yield gaps point out that there is substantial untapped yield potential in the State and it could be harnessed through proper interventions. The State has a huge advantage for the development of horticultural crops due to varied agro-climatic conditions. In backward region of Telangana and Rayalaseema low value millets could be replaced by horticultural crops. The care, however, need to taken while promoting horticulture for export, as it poses significant threat to the small and marginal farmers from fluctuations in the world commodity prices. The decline or fluctuations in agricultural prices have huge implications for income and investment capacity of the farmers as well as food security and employment of the poor landless population. In order to protect the poor

from these effects, there is a need for better targeting of public distribution system.

Figure.2: Growth Performance of Agricultural Sector and Andhra Pradesh Economy during last four Decades (at 2004-05 Base year prices)



Source: Figures based upon various issues of state domestic products, CSO, New Delhi: Government of India.

Andhra Pradesh is endowed with a wide range of agro-climatic conditions and natural resources conducive for the development of agriculture. It has significant share of irrigated and rich delta lands in the coastal districts, backward and under-developed areas in Telangana, scant rainfall and drought prone areas in Rayalaseema and the hilly areas along the northern borders. The State faces continued threat of cyclones and floods in coastal districts and droughts in the rest of the area. However, the proportion of underutilised land that includes current fallows, other fallows and culturable waste lands, is much higher in the State compared to all India average. The existence of higher proportions of under-utilised lands and the increase in fallow lands is the most prominent constraint. Added to this, land degradation due to soil erosion, salinity, alkalinity and drainage problems complicate the issue. The existence of large chunk of under-utilised lands could be turned into a potential for agricultural development and these lands if brought under plough with suitable policy interventions will provide livelihood support to many. Policy interventions are also needed for arresting further land degradation. Although there has been a continuous increase in the area under irrigation in the State over the last fifty years, rain fed agriculture still prevails in more than 60 per cent of cultivated land. The minor irrigation programmes of the Government of India and NABARD, was implemented aggressively in the State. It contributed significantly to the increase in groundwater irrigation but the exploitation of groundwater at a faster rate is now causing concern. Thus there is an urgent need to improve the efficiency in the water use through

new methods and also by desilting the minor irrigation tanks.

Low and erratic rainfall is a major impediment to the development of rainfed agriculture in the State. The frequency of occurrence of droughts in the State is very high and even now there is no long term policy to deal with that. During the last 50 years there were 12 drought years. For the development of rainfed agriculture watershed management is the key approach. This involves a development package that includes creation of water harvesting structures, crop diversification in favour of less water intensive crops and horticultural crops, livestock and fisheries development. This calls for government interventions on the lines of promoting people's participation in watershed management by establishing Farmers' Associations for Watershed Management like the Water Users Associations functioning in the surface irrigated areas.

Significantly high variations are observed in the use of fertilisers across the irrigated and dry regions and within regions across crop varieties. These variations are due to excess use of fertilisers (more than the recommended dose) in some areas on some crops and deficient use in other regions and crops. In addition to this there exists an imbalance in the ratio in which N, P and K are used. Although pesticides consumption is relatively higher in Andhra Pradesh, it has been declining over time with the promotion of Integrated Pest Management (IPM) and Integrated Disease Management (IDM) methods.

There has been a significant improvement over time, in the access to organised sources of credit to the farmers; yet, there exists a huge gap between demand and supply. Access to credit has been one of the major problems so also the interest rates and availability. The rates of interest charged by moneylenders are very high. During the process of reforms in the 90s, there is a virtual breakdown of the extension machinery and decline in the access to institutional sources of credit. As a result, the small and marginal farmers are becoming increasingly dependent upon private traders for credit and extension services and often become victims of exploitation by unscrupulous traders and moneylenders interested in selling spurious materials, like pesticides. It will be a positive step to streamline the extension machinery.

The State intervention in the markets is quite visible in the product market. It appears that the product markets are functioning well, though, the available market infrastructure is not adequate in the sense that each

market has to cover a wide area handling large quantities of commodities with poor road and transport facilities. Also the weighing machines used in the markets are of traditional type leaving the farmers complaining of under weightment of the product. The electronic weighing machines have not been introduced.

In the input market, private sector is playing a dominant role. About 90 per cent of the seeds of HYV, fertilisers and plant protection chemicals, farm implements and machinery are being supplied to the farmers through private agencies. Seeds of HYV and agro-chemicals are supplied only to a limited extent by APSCDC and Agro-Industries Corporation. Most of the seed processing units are in the private sector. Further cold chains for storage of fruits and vegetables are also in the hands of private sector. Studies show that there are severe imperfections in the input markets and farmers are often exploited.

Present liberalisation and globalisation policies and W.T.O. are expected to promote exports and gain from trade. An exercise was carried out in the State to understand the competitiveness of crops and activities. Rice and pulse have been among the traditional crops that give significant competitive advantage to the State. The State has an advantage in marine fishing and aquaculture in coastal Andhra and horticulture in Telangana and Rayalaseema regions. The State can gain through the export of these products, though there are certain limitations which have to be dealt with effectively at policy level.

Andhra Pradesh has an advantage for the development of horticultural crops due to its varied agro-climatic conditions, especially in Telangana and Rayalaseema regions, where the low value millets could be replaced by horticultural crops. Promoting horticulture, for export, through change in cropping pattern may have an adverse effect on the small and marginal farmers. As the horticulture crops are less labour intensive, it may cause decline in employment and erosion of wages of the landless agricultural labourers. A shift to horticultural crops may also cause decline in food grain production and increase in further market dependence and food insecurity. In order to protect the poor from these effects, there is a need for better targeting of public distribution system.

The need of the hour is to increase the incomes of the farmers. Given the small size of holding, it cannot be achieved merely through increase in crop yields and production. What is required is gainful

employment in the activities allied to agriculture such as dairying, poultry, piggery, sheep farming, fish culture, bee culture, sericulture and mushroom culture. Andhra Pradesh has an advantage in the sectors of animal husbandry and dairying, fisheries and forestry and it will be prudent to utilise these comparative advantages.

Andhra Pradesh has a great potential for harvesting marine fisheries and development of inland fisheries with a coastline of 974 kms and with an area of 2.5 lakh hectares under inland fisheries. A number of programmes and schemes have been in operation in the State for the development of both marine and inland fisheries. There has been a drastic increase in the catch of marine fisheries and production of inland fisheries in the State. Many studies have shown that there is a vast unexploited potential in marine fisheries. It can be exploited only through the expansion in large scale mechanized fishing but a large number of fishermen are operating only through the traditional fishing crafts whose area of operation is low. Also the mechanized fishing operations reduce the catch of traditional fishing. Thus, there is a need to increase the coverage by giving training to fishermen on modern techniques of fishing and support them in acquiring mechanized fishing boats. Another constraint operating in the development of marine fisheries sector is marketing. In fish marketing role of middleman is quite strong and price spread is larger than that for any other crop products or livestock products. There is no organised marketing for fish, in the State, and the marketing infrastructure is very poor. In addition to the marketing problems there are some constraints that the development of inland fisheries is experiencing. These are: (i) Inappropriate use of technology and the consequent problem of the occurrence of diseases to fish and prawn and (ii) Groundwater pollution. Inland fish culture also has an adverse effect on wage earning of small and marginal farmers and agricultural labourers as fish and prawn cultures are less labour intensive than crop farming thus causing a reduction in employment.

b. Gujarat

Land is the essential base of agricultural sector in the State. Increased area under cultivation was major source of increased agricultural production in the pre-Green Revolution period, which almost reached its limits. Increasing cropping intensity is not feasible due to constraints in moisture availability. Increased irrigation can only bring about this change. Increased pressure on land resulted in fall in average size of operational holding from 4.11 to 2.93 in Gujarat by 1990-91. One thing is interesting in this State: small and marginal farmers are not many but the viability

threshold is quite high up. The number of cultivators and labourers has been increasing and the labourers are increasing at a faster rate than cultivators. That indicates increased pressure on the crop economy. But this is also accompanied by the stagnating yield rates of the major crops in the region. Technological innovations for these crops are not very supportive.

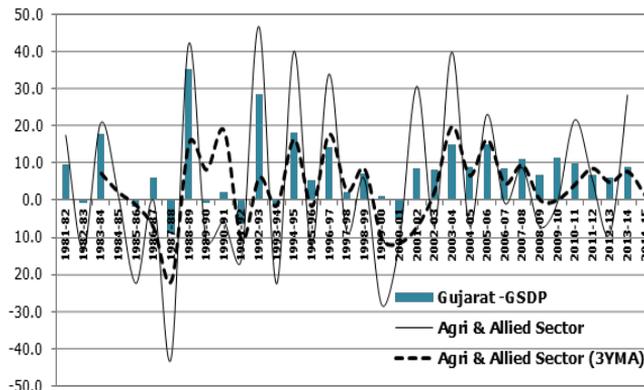
Irrigation is a major constraint of Gujarat. Per capita availability of water in Gujarat is only 40 per cent that of India's average. The position is dismal in north Gujarat, Saurashtra and Kutch. In this State main reason for imbalance is inadequate water and lack of irrigation schemes. In short, system inadequacies, physical, institutional and financial constraints are all operating simultaneously and creating obstacles in improving irrigation water management. The overall irrigation potential is estimated at 63 lakh hectares but by 1997-98, the potential created stood only at about 36 lakh hectares. Inefficiencies in irrigation management inhibit this further. Fertiliser is the most strategic input of modern agriculture. Fertiliser use was very low in Gujarat in 1960-61 (8.5 kgs/ha per NPK) but by 2000-01 it reached 71 kgs/ha. of NPK. If we compare this in 1997-98 then it shows declining trend. Although Gujarat's aggregate performance is satisfactory there are high inter-district and inter taluk variations in input use and there is fairly high level of wastages.

Adequacy and access to credit is one of the major bottlenecks. Commercial as well as cooperative credit system is not properly organised and executed to provide easy access. First, there are number of institutions and most of them are unable to reach a large number of rural people. These institutions failed to provide the required support to high value, high-tech agriculture and non-crop agricultural as also non-agricultural activities. Besides their linkages with support systems of extension, research input supplies, marketing and processing have been weak. The legal and regulatory mechanisms are also found to be inadequate and these adversely affect the financial and organisational health of the rural financial institutions.

Gujarat has a sea-port at Kandla and this helps to manage international trade. However, as far as agricultural commodities are concerned the port is put to least use. Roads, railways and extension are the major lacunae. Presently marketing facilities are not really a problem but getting the proper price for the crops had been one of the major issues. Gujarat farmers being innovative are tapping even the distant markets and therefore, warehouses and storage capacity at market yard have become the main issues. Irregularity of rainfall and insufficient irrigation are basic forces behind the weaknesses of agriculture in Gujarat. The reason for this is the insufficient research and communication efforts on the part of government and difficulties in marketing the tree and non-timber products.

It is required that marketing and production activities are properly organized. Tribals in Gujarat are closely associated with forests and the cause for concern is that conflicts prevail between the forest department and the tribals.

Figure.3: Growth Performance of Agricultural Sector and Gujarat Economy during last four Decades (at 2004-05 Base year prices)



Source: Figures based upon various issues of state domestic products, CSO, New Delhi: Government of India.

Animal husbandry is another important allied agricultural activity in Gujarat. The major constraints related to animal husbandry are stated below:

- Present availability of green and dry fodder as also concentrates is very low.
- Due to unplanned development of villages and towns the availability of village pastures has shrunk and has given rise to the problem for cattle and buffalo rearing for the households mainly depending on this source.
- The quality of roughages of straw is low.
- The State suffers from drought of different degrees of severity every one or two years, during which fodder shortage gets worsened.

Gujarat has a long coastline and fisheries has been a traditional occupation of many communities. In order to take full benefit of the situation, a lot of improvement will have to be made in respect of landing and berthing facilities, fishing harbours, terminal divisions and supportive facilities. In addition to these, attention will be needed towards boat building, processing ice, cold storages, dry and fish meal plants. The terminal and intermediate markets are situated far away from the scattered landing sites. Thus, a weak market link between landing sites and the terminals makes it difficult for producers to fetch a reasonable price for their products. This infrastructural bottleneck has been one of the hindrances in the progress.

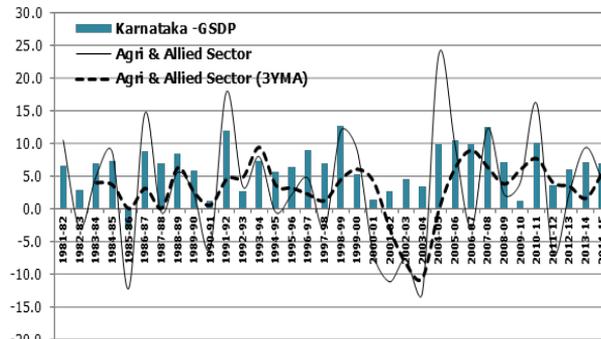
c. Karnataka

There are three major impediments to growth in the agricultural sector of Karnataka viz., the lagging Northern Karnataka regions due to large share of drought-prone area coupled with low private capital investment. Regional disparities, therefore, became quite sharp in the face of failure of initial investments in these regions. Second, the agricultural sector of Karnataka is also facing impediments in the form of growth initiatives in the post-harvest processing as well as value additions in the production process. These impediments are emboldened by regional imbalances, frequent drought conditions and inefficiency in managing irrigated agriculture. Third, the institutional bottlenecks in the form of generation and transfer of technology to the rainfed areas have caused significant stagnation and this is aggravated by the falling total factor productivity. The future vision, therefore, would require concerted efforts towards removing the regional imbalances in growth by promoting private as well as public initiatives in value addition focussed on the post-harvest sector and picking up growth leads from the allied agricultural sector to participate proactively in domestic and world trade.

In addition to meeting the above constraints, it is observed that the crop production sector faces alternative phases of growth and stagnation. In the near future the State is likely to confront a technological bottleneck in the coming decade as the yield rates have been reaching close to the technological optima. That would require placement of growth in the non-food crop sector, without neglecting the food security issues. Oilseeds, pulses, sugarcane, maize and other millets are the crops that need to be attended to on technological as well as trade fronts.

Issues pertaining to land take procedures over other issues in the State. There are quite a few problems concerning the land use policy and land reforms in the State. There exists a significant share of utilisable but wasted land resources that need to be brought under economic cultivation and the process of urbanisation has to be carefully monitored. Marginalisation of the size of holding and increasing number of the small and marginal farmers, is a problem that puts farming as non-viable enterprise. This has to be attended to, through a fresh process of reforms. It can either be done by consolidating the small patches of holdings but probably better achieved through formation of informal cooperative groups among the small and marginal farmers in the production process. This has to be done for selected crops and crop groups by developing proper market chains or forward markets. Land augmentation by private irrigation could have been one of the strategies however, in the present situation of over-exploitation of groundwater and limited availability of surface water resources, it will not be a prudent strategy to emphasise irrigation alone.

Figure.4:Growth Performance of Agricultural Sector & Karnataka Economy during last four Decades (at 2004-05 Base year prices)



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Source: Figures based upon various issues of state domestic products, CSO, New Delhi: Government of India.

Rainfed agriculture is the sector in which growth initiatives should be located in the coming decade. This is justified on two counts viz., efficiency of the production process and equity across region. Returns to investment in watershed development specifically under rainfed conditions are quite encouraging and therefore, the future strategy has to be guided by investment towards selective watershed development projects specifically under rainfed conditions. It will be more pragmatic to transfer the resources towards enhancing productivity in rainfed agriculture by undertaking selective watershed development programme. This will also establish indirectly equity between the high growth irrigated patches across the State and lagging rainfed regions specifically in the northern Karnataka. Watershed development strategy, however, is recommended to be selective in its approach and the areas to be focussed during the next decade have been indicated. Naturally, forestry is the major component in the natural resources management sector along with the watershed development. Forestry resources have to be utilised economically in order to supplement and enhance the aggregate agricultural growth. The investment portfolio for the forestry sector is indicated.

Under the input sector, the gap between supply and demand for seeds and fertilisers has been strongly felt. The presence of private sector in the production and distribution of seeds is a welcome feature, however, even with the the requirements not met in terms of quality of seeds, typology of seeds and the quantum but probably the current initiatives on bio-technology will help in improving this situation in the coming decade. Integrated Pest Management (IPM) and Integrated Nutrition Management (INM) are the two major planks to deal with increased use of pesticides and managing the soil nutrition capabilities. These sectors have to be emphasised in terms of investment as well as extension network. The best way to achieve this is to strengthen the KrishiVigyanKendras and the

RayatSamparkKendras and that has been recommended by three Commissions analysing the constraints of agricultural sector.

Another important bottleneck identified through our analysis is the availability of agricultural credit. Unfortunately, credit has not been as supportive to agricultural sector as it had been during the seventies and the eighties. No doubt, the quantum of credit flow has increased but the access has been difficult. More than that the demand for credit has increased but the supply is not meeting the targets. This has a telling effect on capital formation and lack of infrastructure in the sector. It needs to be underscored that credit institutions have not been meeting immediate requirements stipulated even by the Reserve Bank for providing the credit to the agricultural sector. Similarly, investment in Research and development as well as availability of material for extension are also severely limited. These sectors are the deserving candidates for additional investment in the coming decade.

The availability of funds from public sources to initiate agricultural and rural development schemes in the fragile regions itself is a challenge. Therefore, it is required that private partnership initiatives could be encouraged either in terms of group contract farming or bulk forward purchase and trade facilities. The requirement of investment in the backward regions can also be met by siphoning the excess savings from well-endowed regions to the deserving backward areas. This can be achieved by floating low interest investment bonds to be purchased by the private contributors from developed regions of the State. Commodity Development Boards could be specially set up to guide the process of development of the selected commodities in specified regions.

Agricultural sector in Karnataka has also been severely constrained on the front of infrastructure specifically the road connectivity, markets, credit and investment in research and development. It has been noted that the density of markets is quite insufficient to deal with the requirements of increased production of various commodities. In addition to this, the process of globalisation has put forth a fresh challenge in the form of integrating domestic marketing system with the world markets. The marketing infrastructure in Karnataka needs to be readied for integrating with the global market and to participate effectively in the international trade. This is feasible only with the initiatives from private sector supported by State initiatives developing in the marketing infrastructure. Model APMC Act, if adopted, may ease a few problems of markets but still the transfer of commodities to markets is impacted by quality of roads and other infrastructure.

Horticulture, floriculture, sericulture and fisheries are the allied agricultural activities which have been emerging very fast as new growth drivers are contributing to the aggregate economic growth. These four

sectors have opened up the new avenues for proactive participation in international trade. Karnataka's participation in international trade under horticulture, floriculture, sericulture and fisheries is quite laudable and increasing. However, this is constrained by investment, availability of infrastructure and proper exposure to the information about trends in the international market. Specific focus by specialized institutions (like KAPPEC) needs to be emphasized to promote the participation of these four vanguards of trade in the international sector.

Incidentally, our farmers will produce more if we can consume more. Opportunities for assured and remunerative marketing will determine the interest taken by small farmers in enhancing productivity. Our agriculture in the fifties through eighties was referred to as a gamble in the monsoon but now it is becoming increasingly a gamble in the market. Therefore, both monsoon and market management are essential for ensuring the economic well-being and livelihood security of farming families.

d. Maharashtra

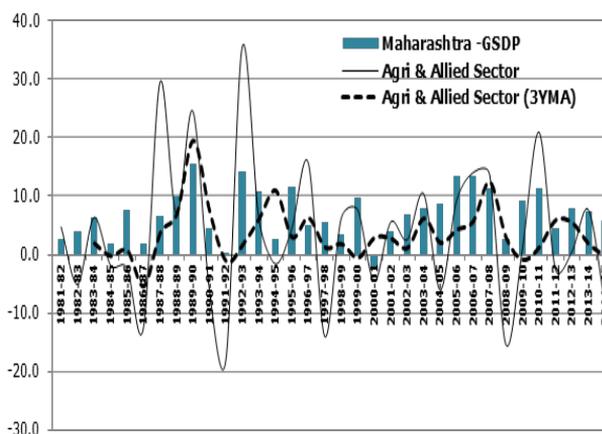
Despite various initiatives taken by the government to accelerate the growth of agriculture, the performance of agricultural sector in the State is not very impressive as compared to many states in India, owing to many constraints. The contribution of agricultural sector to the State's income has gone down from about 34 percent in 1960-61 to 16 percent in 2001-02 because of good industrial growth but also due to poor agricultural performance. But, on the other hand, the percentage of population relying on agriculture has declined only marginally between 1960-61 and 2000-01. There are a number of factors, which limit the growth of agriculture over the years in the State.

One of the important reasons for the limited growth of agriculture in Maharashtra State is the predominant cultivation of low value crops. Though the cropping pattern has been shifting in favour of high value crops in the State in the recent years as compared to the seventies and the eighties, this shift is not very impressive as compared to the national level changes. Therefore, greater attention needs to be given to accelerate the availability of irrigation and moisture (through watershed development programme) in order to shift the crop pattern in favour high value crops.

Over 83 percent of cropped area is cultivated under rainfed conditions in the State. Therefore, monsoon rain plays a critical role in the development of agriculture. Though the average rainfall of the State is higher than the national average, nearly one-third area of the State falls under rain-shadow region where rain is scanty as well as erratic. The low level of irrigation as well as the erratic rainfall pattern often discourage the farmers to take up intensive cultivation in many regions in the State.

Over-exploitation of groundwater is another important issue associated with the irrigation development of Maharashtra State. As per CWC data, the State has utilised about 30 per cent of its groundwater irrigation potential (25.47 BCM per year) but the exploitation is high in the regions that have larger stress on groundwater resources. Moreover, these are the regions that provided growth initiatives. Unless steps are taken to reduce the exploitation of groundwater through legal, institutional and technological options, this will have serious implications on the future growth of agriculture in the State. Even the WDP have had very limited success in this respect as only 15.47 percent of potential area has been treated through WDPs since 1983, the year in which the State started implementing WDPs. The average treated area from 1983 to 2002 comes to only 0.166 mha per year and the State has one of the largest targets to be treated under watershed

Figure.5: Growth Performance of Agricultural Sector and Maharashtra Economy during last four Decades (at 2004-05 Base year prices)



Source: Figures based upon various issues of state domestic products, CSO, New Delhi: Government of India.

Substantial variation in the use of inputs (irrigation, fertilisers and HYVs) across different regions in the State is also one of the constraints for agricultural growth. The use of both fertilisers and HYVs significantly varies across regions in Maharashtra. Low use and improper application of fertilisers (N P K ratio) affected the productivity of crops and thereby growth in agriculture. While making efforts to improve the use of yield increasing inputs through increased irrigation facility and moisture availability, proper use (mix) of fertilisers should be promoted through extension network.

In addition to the above-mentioned constraints, farmers of Maharashtra state have been facing inadequate marketing and post-harvesting facilities over the last several years. Though the level of spread of regulated markets is relatively good in Maharashtra, it could not solve the problems of huge market margins faced by the farmers. Due to inadequate facilities in the market yard, the exploitation of farmers by

middlemen and post-harvest losses to farmers have been continuing. As mentioned in the National Agricultural Policy 2000, the weekly markets under the direct control of Panchayat raj institutions should be encouraged and strengthened. Producers' markets on the lines of "Ryatu Bazars" (as has been followed in Andhra Pradesh, Karnataka and Tamil Nadu) should be promoted across different districts in Maharashtra to reduce the exploitation of farmers by middlemen. In addition to marketing infrastructure, the State also lacks in other infrastructural facilities like road connectivity and extension network.

Though significant growth has taken place in area under horticultural crops in the state between 1980-81 and 1997-98, the horticulture sector is not free from problems. The major impediments that may restrict the growth of horticultural sector in Maharashtra are:

- Less diversification of crops in non-traditional regions and lower acceptance rate.
- Deceleration in area and productivity of fruit crops.
- Poor post harvesting infrastructure facilities

Despite significant potential for horticulture crops in different regions in Maharashtra, the growth in area under horticulture crops in non-traditional districts is not quite expected. For instance, horticultural crops have been traditionally and also predominantly cultivated in districts like Ratnagiri, Nasik, Jalgaon, Ahmednagar, Pune, Solapur, Satara, Amravati and Nagpur. These nine districts accounted for over 57 percent of the total area under horticultural crops in the State during 1966-67 and the same districts also accounted for the same share (nearly 56 per cent) in 1997-98 as well indicating hardly any spread in the non-traditional area.

8. Conclusions

Policy making in India has never been a serious academic concern for all the seven decades. There were no departments in the Government dealing with policies and largely the policies were falling in the 'Chaos Response Model'. Even in the academic institutions Public Policy was not even discussed and the Management Institutions were no exceptions. It is only in the last decade that there is some discussion on making of policies and the phrase 'Policy Statement' has The exercise that we have carried out here in the case of four states demonstrates the mechanism of making an agricultural policy for sustainable agriculture. We chose four states from central India that have specific issues, seemingly of the same nature but that call for differential treatment in the policy.

The States of Andhra Pradesh and Karnataka have been in the forefront of the economic reforms. A large number of initiatives were taken in these States by their respective governments to actively participate in the development process. However, the crop pattern as well as the other

institutional support needs to be put in proper place. Both the states have participated aggressively in the process of reforms and agricultural trade and scored well in terms of attracting capital investment. Karnataka, on the other hand, potentially high growth regions of the country has. The states show clear signs of increasing commercialisation as new crops entering in the farmers' calculus and at the same time changes are taking place in marketing sector. These States, however, are facing the problem of deceleration in the output growth due to stagnation in the yield of major crops. It is essential to infuse a new technological phase in the agricultural economy of both the States. One of the major constraints in the three states is the presence of vast patches of rainfed agriculture, with meagre irrigation support. There are a number of incomplete irrigation schemes and the watershed development programme is yet to make the required dent in the traditional drought-prone pockets of the two states. Land degradation and marginalisation of the size of holding also appear to be the major constraints in addition to the slow pace of capital formation in these two states. In addition to meeting these challenges, market as well as information support infrastructure are some of the important intervention spots. Degradation of land and overexploitation of groundwater irrigation have been the common problems of the States and these need to be tackled on a priority basis. The constraints that prevailed before setting in the reform process continued to dog the sector. But if these are attended, then the agricultural sector in these states can stand with resilience.

These two states have shown a better promise in their participation in international trade. The process of strengthening and putting in place the institutional support is ongoing in Karnataka and Andhra Pradesh. It would be essential to build and support the forward and backward linkages for vigorous participation in the international trade. There are a good number of commodities, which have significant demand in the world market and these commodities could be encouraged on the farms of small and marginal farmers. Horticulture, floriculture, sericulture, and other sunrise sectors need to be promoted in order to enhance participation in the international trade.

The Central Indian states located on the Deccan Plateau face continuously infrastructural crunch mainly due to the inadequate investment from the public resources. The agricultural sector in Maharashtra and Gujarat has always remained neglected on policy front both due to increased attention attracted by the industrial sector and the natural constraint in the form of large share of drought prone areas in the State. The States are quite constrained on the natural resources front due to its low level and variability in rainfall. Incidentally, poverty is densely located in the rainfed regions of the State. One can see the face of acute poverty peeping out of the prosperity of the irrigated regions. The net income flow is depressed mainly because of the prices of rainfed millets have always stayed lower than the other crops and the net income flow in

real terms of the majority millet growers never crossed above the cost of living index. Presently the market conditions are such that the farmers cannot make the maximum out of their marketable surplus. Market margins are quite high and there is a strong presence of traders from outside the state, who make most of the money. It is quite well known that demand for millets, coarse cereals, oilseeds, and pulses in the international market is increasing. Therefore, getting proper prices for these crops would be a natural choice for any policy frame, however in order to achieve this one must tap markets outside the domestic economy. It would be quite prudent to tap this demand, and the enterprising traders from Gujarat can certainly do that. In addition to tapping the export market, there is a large scope for processing units in the state. That will not only provide opportunities for the farmers to sell their products at a better rate but also employment opportunities to those who have basic skills for working in the processing sector. It is with this focus that we approach the policy frame for the state.

The problems of agriculture in Maharashtra are compounded by the fact that despite huge investment, the State could provide protective irrigation only to a small proportion of net cropped area. It is well known that irrigation is quite inadequate to initiate growth drivers. Further, the cropping pattern is predominated with low value, low yield crops, and that gives meagre returns to the farmers. The State resources are largely spent in meeting the exigencies due to drought and, therefore, investment on concentration on infrastructure has been lacking for over several years. In addition to that, funds marked for infrastructure are gobbled up by the metropolitan cities like Bombay, Pune and Nagpur. That leaves very inadequate resources for the rural areas in the state. Access to villages, availability of electricity in the villages, marketing facilities, warehouses, and cold storages are quite inadequate and far from the normative level of need. In the absence of any forward linkages, there is hardly any incentive created for the farmer to go into new enterprises. Moreover, processing of agricultural products and market chains to reach the international market are inadequate. There are a few islands of great promise like sugarcane, grapes, fruits and fruit processing on which state can build its growth momentum by investing into infrastructure and making it one of the important drivers of growth for policy planning.

Table 5: Constraints and Policy Initiatives: Andhra Pradesh

Area of Concern	Initiatives Required
<p>Crop Economy</p> <ul style="list-style-type: none"> • Lower level of crop yields and the deceleration in the growth of yields in the Nineties. Decline in the rate of growth of total factor productivity • Increasing land degradation, Large size of under utilized lands and its growth over time. Fragmentation of holdings and decline in the size of holdings. • Inadequate irrigation facilities with the existence of untapped potential and over exploitation of ground water resources. • Crop diversification in favour capital-intensive high valued crops. • Excess and imbalanced use of fertilizer and pesticides. Supply of adulterated pesticides • Access to institutional sources of credit and higher dependence on non-institutional sources. • Inadequate market infrastructure and low coverage of input markets. • Decline in the investment in agriculture and its share in NSDP from agriculture. 	<ul style="list-style-type: none"> • Acceleration in the growth through area & yield expansion. Suggest area specific crop pattern basing on the resource availability in the region and less capital-intensive crops in resource poor areas. • Promote rice growing only in the Kharif and growing of I.D crops like ground-nut, sunflower, Soyabean, gingelly, pulses and vegetables during Rabi where irrigation water is limited in the irrigated areas, where no other crop than rice can be grown • Reduction in the fallow lands and bringing culturable waste lands under crop farming and fish farming. • Renovate tanks especially in the Telangana and Rayalaseema regions, through the integration of rural employment programmes. • Watershed development through public investments for creating new structures and maintenance of the existing structure through people's participation. • Promote aquaculture on the coastal wastelands through the participation of fishermen and other weaker sections • To regulate the spread of aquaculture in the paddy growing areas. • Complete immediately the PriyadarshiniJurala project, Sriramsagar project, Kalyanivagu scheme under Nizamsagar, Sa-ngeetham scheme under Teluguganga project, A. Madhava Reddy canal project, modernization of Cud-dapah - Kurnool canal project, modernization of Thungabadra High Level canal project of the Rayalaseema region. • Regulate the exploitation of ground water. Promote micro-irrigation like drip, sprinkler and sub-surface pipe irrigation. • Promoting. • To promote crop systems involving horticultural crops, coarse cereal

	crops, and animal husbandry & dairying in the un-irrigated areas.
Horticulture <ul style="list-style-type: none"> • Very high yield gap compared to demonstration plots. • Inadequate infrastructural facilities for post harvest operations. 	<ul style="list-style-type: none"> • To increase cold storage facilities and the other related infrastructure like transport vehicles, handling equipment. Promote the development of agro-based industries in the rural areas. • Development of skill of the people in agro-processing and handling of the products. • To develop the entrepreneurship for agro-based industries by establishing an institution like IRMA in Anand.
Livestock and Dairy Development <ul style="list-style-type: none"> • Low efficiency of work and milch animals, goats and sheep. • Lack of suitable product diversification and handling of the product to tap the global market for milk and milk products. 	<ul style="list-style-type: none"> • Improving the efficiency through reduction in the size of work animals and improvement in feeding and management. • To raise fodder on the waste lands using appropriate technology • Further upgradation of animals through cross breeding programme and improving feeding and management practices. • Selection of appropriate breeds and on the scientific feeding and management practices. • Strengthen the cross breeding programmes of the government. • Protect the grazing lands and regulate the grazing on these lands. • To promote fodder cultivation in the water logging areas and on other waste lands. • Establishment of units producing livestock products in the private sector along with the co-operative sector. R & D in handling of milk at the farmer level, suitable to local conditions. Improving marketing facilities. • To bring livestock marketing under regulated marketing Act and reduce the middlemen exploitation of the shepherds.
Fisheries <ul style="list-style-type: none"> • Low exploitation of marine fisheries • Exploitation by middlemen in marketing. • Low efficiency and attack of diseases in 	<ul style="list-style-type: none"> • Implementation of the programmes in operation for marine fishing. • Increase the coverage of the scheme for providing mechanized fishing crafts. • Create the market infrastructure and re-regulate the operations of traders

<p>Inland fisheries.</p> <ul style="list-style-type: none"> • Conversion of paddy fields into fish/shrimp ponds and their adverse effect on weaker sections 	<p>through proper market management.</p> <ul style="list-style-type: none"> • Up-grade the technology for processing, handling and storage of fish. • Provide the training to the fishermen to handle and process the fish on international standards to increase the share in global market. • Regulate the activities of the private traders involved in export business. Reregulate the conversion of paddy fields into fishponds.
<p>Forestry</p> <ul style="list-style-type: none"> • Inadequate forest cover and fast deforestation. • Deterioration in the livelihoods of tribals, who depend more on NTFP's 	<ul style="list-style-type: none"> • Protection of the Forests and Improvement through social forestry. For this strengthen the effectiveness of the implementation of J.F.M. Programme. • Train the tribals on scientific methods of collection so that the forest is not destroyed. • Promote co-operative marketing eliminating the private traders/moneylender traders. • Promote value addition and processing of NTFP for which there is an export demand of the products by co-operatives for better realization of price.

Source: AERC Report, Andhra Pradesh.

Table 6: Constraints and Policy Initiatives: Karnataka

Concerns	Initiatives Suggested
<p>Crop Economy</p> <ul style="list-style-type: none"> • Stagnated crop productivity in most of the crops. Insignificant R & D in coarse cereals. • Large scale land degradation and marginalisation of holdings. Prevalence of informal tenancy. • Large areas under drought-prone conditions. Drought sets back the clock of development in Northern Karnataka, twice in every five years the • Crop diversification in favour capital-intensive high valued crops. • Underdeveloped Credit market. • Inadequate market infrastructure and imperfections in the market. • Decelerating capital formation in agriculture. 	<ul style="list-style-type: none"> • Acceleration in the growth through area & yield expansion. Crop planning based on the resource availability in the region. Specific programmes for coarse cereals and millets. • Concentrated R & D efforts for groundnut, sunflower, Soyabean, onion, tur, moong and urad and vegetables in northern Karnataka. Fruits and vegetables in south and coastal region. • Tank rehabilitation and groundwater use regulation act. • Integrate all Watershed development programmes and revisit their effectiveness. • Complete the ongoing irrigation projects with one time budgetary support. • Promote aquaculture in the coastal and malnad regions. • Introduce and popularise micro-irrigation like drip, sprinkler and sub-surface pipe irrigation. • Crop systems involving horticultural crops, coarse cereal crops, and animal husbandry & dairying in the northern drought prone region. • Implement model APMC act and promote Contract Farming. • Rejuvenate cooperative credit system and availability of credit to small and marginal farmers at concessional interest rates.

<p>Horticulture</p> <ul style="list-style-type: none"> • Inadequate R & D. Lower yields. Inadequate infrastructural facilities for post harvest operations and unorganised marketing. Access to world market. Huge market margins. 	<ul style="list-style-type: none"> • Establish infrastructure including like trans-port vehicles, handling equipment, cold storage facilities. Organise fruit growers association to share purchase of inputs and joint marketing. • Establish agro-processing and train farmers in handling of the products & Training for entrepreneurship for agro-based industries. • Focus on the districts of Northern Karnataka that have inadequate resource support.
<p>Livestock, Dairy and Fisheries</p> <ul style="list-style-type: none"> • Low efficiency of work and milch animals, goats and sheep. Needed product specialisation and seek the global market for animal husbandry products. • Low exploitation of Marine and fresh water fisheries. 	<ul style="list-style-type: none"> • Improving the efficiency through better breeds of milch animals and improvement in feed and management cross breeding programme. • To raise fodder banks in the waste lands of the drought prone areas. • vi. Manging the grazing lands and regulate grazing with the help of Panchayats. • Encourage public- private partnership sector to handle R & D in the sector and provide marketing incentives. • Livestock marketing under regulated marketing Act and reduce the middlemen exploitation of the shepherds.
<p>Forestry</p> <ul style="list-style-type: none"> • Inadequate and unprotected forest cover and fast deforestation. • Impact on the livelihood of forest dwellers. 	<ul style="list-style-type: none"> • Protection of the Forests and Improvement through social forestry. For this strengthen the effectiveness of the implementation of J.F.M. Programme. • Encourage eco-tourism and use the revenue for the forest dwellers welfare programme.. • Promote co-operative marketing eliminating the private traders/ moneylender traders.

Source: Report from ADRT, Bangalore.

Table 7: Constraint and Policy Initiatives: Maharashtra

Areas of concern	Suggested Policy Initiatives
<ul style="list-style-type: none"> i. Sharp reduction in plan expenditure since the third plan period ii. Productivity of most of the crops is low as compared to all India average iii. Wide variation in productivity of crops across districts iv. Predominant cultivation of low value crops v. Predominant cultivation of rainfed crops 	<ul style="list-style-type: none"> i. Increase the allocation of funds for agriculture and allied activities. . Private investment in research and development activities concerning agriculture should be encouraged. ii. Balanced use of fertilisers (NPK ratio) should be achieved. iii. Through quality extension network, farmers should be advised to use recommended dose of various new technological inputs in crop cultivation. iv. Location specific policies/programmes should be introduced in those districts where productivity is low. v. Horticulture crops should be promoted in those regions where coarse cereals are cultivated predominantly. vi. Low-water-intensive cum high value commercial crops should be promoted. vii. Through rain water harvesting system and watershed development programmes considerable area can be brought under cultivation. viii. Proper distribution of water among different crops would help to reduce area under rainfed cultivation.
<p>Adoption of technology</p> <ul style="list-style-type: none"> i. Low and wide variation in the use of fertilisers ii. Imbalance in use of NPK iii. Mono-cropping 	<ul style="list-style-type: none"> i. Extension network should be strengthened. ii. Location specific programmes should be introduced. iii. Importance of P and K nutrients should be disseminated to farmers through quality extension network. iv. Proper pricing of N, P and K nutrients should be introduced with a view to reduce the imbalance in NPK ratio. v. Crop rotation should be advocated through quality extension network.

Watershed development programmes (WDPs) and Irrigation development

- i. Slow coverage of area under WDPs
- ii. Lack of coordination among different departments in handling WDPs; Low irrigation facility

Improper use of water among different crops
Over-exploitation of groundwater Less importance for minor surface irrigation. Slow progress in forming WUAs .(f) Low water use efficiency. Inadequate coverage of micro-irrigation

- i. Watershed development programme and rainwater harvesting system should be promoted in a big way to increase productivity
- ii. Required funds should be made available for WDPs. It should be treated as infrastructure development.
- iii. NGOs with proven record should be encouraged to take up WDPs.
- iv. Instead of top-down approach, bottom-up approach should be followed while implementing WDPs.
- v. A single agency should be established for monitoring and distribution of projects for different regions.
- vi. Public investment on irrigation should be increased to complete all the on-going projects.
- vii. No new projects should be sanctioned till the completion of all the on-going projects.
- viii. Projected crop pattern in each command area should be strictly followed.
- ix. Micro-irrigation (drip and sprinkler) should be made compulsory in all those areas, where over exploitation of groundwater is very high.
- x. Groundwater users' association (GWUA) should be promoted. Renovation activities should be carried out to restore the minor surface system. All minor surface systems should be handed over to water users' group under village Panchayat.
- xii. After handing over the system to users group, the government should not withdraw its support to WUAs at least for five years.
- xiii. Sugar industries should encourage the farmers to cultivate sugarcane under micro irrigation system.
- xiv. Differential rate of subsidy should be introduced for different crops based on water consumption.

<p>Horticulture development</p> <ul style="list-style-type: none"> i. Less diversification of crops in non-traditional areas ii. Deceleration in area and productivity in certain crops iii. Inadequate post-harvesting infrastructure facility 	<ul style="list-style-type: none"> i. Age-old crops (trees/plants) should be replaced by new high yielding (better quality) varieties, wherever possible. Tissue culture varieties should be introduced/promoted, wherever possible. ii. Studies need to be carried out to find out the reasons for deceleration iii. Bio-technology should be introduced wherever possible. Infrastructure facilities like cold storage, cold chain, processing, packaging and marketing should be created by the state sector. iv. Private sector should also be encouraged in this to reduce the post-harvesting losses. Contract farming in horticulture crops should be encouraged.
<p>Marketing facility</p> <ul style="list-style-type: none"> i. Inadequate marketing infrastructure facilities 	<ul style="list-style-type: none"> i. Weekly market under the direct control of Panchayat raj institution should be promoted. ii. Producers market on the lines of “<i>Ryatu Bazars</i>” should be promoted. Rural road network needs to be strengthened.

Source: AERC, Pune.

Table 8: Constraints and Policy Initiatives: Gujarat

Areas of Concern	Suggested Policy Initiatives
<p>Crops sector i. Low or negative growth in productivity, Low value additions, Inefficiency in marketing</p>	<ul style="list-style-type: none"> • Introducing new location specific varieties • Provide safety net and protection through remunerative prices • Investment in processing units – Financial institutions to provide financial support • Necessary market support for exports by the govt. agencies. • Opening of sea port and facilities for trade.
<p>Horticulture Sector i. Low yield, Low area, slow Growth, Difficulties in marketing - High post harvest wastages</p>	<ul style="list-style-type: none"> • Expansion in area under fruit crops through wasteland development, ravines reclamation, fallow land development, plantation of field boundaries, inter-cropping and crop rotations dry land agriculture to combat with drought in arid and semi-arid areas • Full use of available production through efficient post-harvest handling of the produce. Govt. and co-operative institutions participation can provide appropriate help in this work • Identification of thrust areas and setting the fixed targets – short-term and long-term plans to be framed and practiced. • iv. Increased facilities for processing fruits and vegetables – making available finance and marketing arrangements
<p>Land and Water i. Marginalisation of size of holding, desertification, Fast degradation of land ii. Wider inter & intra and temporal distribution of rainfall iii. Adverse water balance.</p>	<ul style="list-style-type: none"> • Soil and water conservation through establishment of vegetative barrier along the contour • Rapid development of watershed programme along with fast work on farm and social forestry can stop soil degradation. • Adoption of organic farming can help maintain soil fertility • Increased intensity of land use through expansion of irrigation, increased use of strategic inputs like fertilizer, fast spread of HYVs etc. • Rapidly tap the available irrigation potential. Development of SardarSarovar project and its allied aspects. Time bound plan

<p>iv. Groundwater over exploitation in many districts.</p>	<p>framework for the implementation of Kalpasar project. Inter-linking of the rivers south of Tapi with Narmada anal system as long run schemes</p> <ul style="list-style-type: none"> • Introduction of water saving devices like drip and sprinkler systems on large scale. • Rain water harvesting through watershed programmes. Recharging of wells. • Action in respect of pricing policy of water, appropriate operation and maintenance framework. • Restricting over exploitation of ground water by enacting and administering required law by govt.
<p>Fertilizer i. Low efficiency in use, unbalanced use of fertilizer. (inter-region, intra-crop and inter-farmer)</p>	<ul style="list-style-type: none"> • Continuous monitoring of factors determining fertilizer use. • Balanced use of fertilizer nutrients, For this wider use of soil testing laboratories is necessary. • Entry of private sector in the field of soil testing lab is required. • Extension agencies should try to create awareness of the importance of soil testing labs. Financial resources to be made available for equipping soil-testing laboratories. • v. Need for a shift in a policy of subsidizing inputs like fertilisers, irrigation etc. to subsidy for equipments and materials that are conducive to increased input use efficiency at farm level.
<p>Credit i. Low institutional coverage ii. Lack of institutional support to high value, high tech agriculture Weak links of credit institutions with support systems. Linking credit with marketing of crops and trade.</p>	<ul style="list-style-type: none"> • Adequate supply of institutional credit for marginal and small farmers. ii. Increasing credit needs arising out of further diversification of agriculture toward horticultural crops and non-foodgraincrops, finance various requirements of allied agricultural sector. • Credit institution must support declining public investment. • Revitalization of co-operative-operative credit structure is required. • Devising new institutions in risk management such as formation of

	joint liability groups will help to mitigate risk.
<p>Animal husbandry</p> <p>i. Low yield, Low quality breed Shortage of feed and fodder supply</p> <p>Fisheries</p> <p>i. Inefficient landing and berthing facilities, Weak market link between landing sites and terminals.</p>	<ul style="list-style-type: none"> • Developing synergies between feed production and feeding animals • Research in disease control, feeding efficiency, breeding and management • Efficient extension network to guide livestock keepers. • Dairy development – developing market chains. • Efficient harnessing of marine and inland fisheries resources. • Harbor development, dredging infrastructure, modernization of craft and gear seed production and rearing etc. on large scale.
<p>Forestry</p> <p>i. Recurrent droughts affecting efforts to contain the loss of forest cover.</p>	<ul style="list-style-type: none"> • Encouragement for farm forestry (FF). Research to establish financial viability of FF and extension on wider scale • Privatization of a part of new proposed forest cover – to develop and to maintain. NGOs to take up the work on a wider scale • Marketing arrangements for sale of forest produce by govt.
<p>Agricultural research</p> <p>i. Inadequacy against local requirement with meagre financial allocation.</p>	<ul style="list-style-type: none"> • Continuous evolution and production of new region specific HYVs for all crops grown in location specific conditions in Gujarat • Research in respect of dry farming to be activated • Evolution of effective and low value pesticides to control pests and diseases. Increased attention to organic farming • Use of remote sensing for planning watershed/water resource development, ground water targeting and sites for recharge, crop condition/loss assessment, coastal area management. • Post-harvest technologies to promote value addition through agro processing industries

Source: AERC, Gujarat.

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Appendix Table 1: Resource Availability and Input Use in Deccan Plateau States

States	Crop Groups/Years*	1962-63	1972-73	1982-83	1992-93	2002-03	2010-11
AP	% Cultivable Land	58.9	57.5	57.7	56.6	57.6	57.8
	% Net Cropped Area	41.0	41.4	40.2	38.3	37.8	38.8
	% Gross Cropped Area	45.4	46.5	46.3	46.3	46.0	49.6
	% Net Irrigated Area	27.0	27.2	32.3	40.2	39.8	43.9
	% Gross Irrigated Area	29.4	30.3	35.5	41.5	42.3	48.1
	% Cropping intensity	110.8	112.3	115.1	121.0	121.6	127.6
	% Irrigation Intensity	120.6	125.0	126.7	124.8	129.2	139.7
	Per ha fertiliser	-	20.9	51.7	117.0	146.0	256.7
KAR	% Cultivable Land	67.2	66.9	67.1	67.9	67.8	67.6
	% Net Cropped Area	54.8	53.3	53.6	55.8	53.0	54.4
	% Gross Cropped Area	56.7	56.6	57.8	64.0	62.1	67.0
	% Net Irrigated Area	8.8	12.0	14.8	20.8	25.3	32.5
	% Gross Irrigated Area	9.3	13.3	16.9	22.5	25.9	32.2
	% Cropping intensity	103.6	106.2	107.8	114.7	117.2	123.2
	% Irrigation Intensity	110.0	116.9	123.3	124.5	120.1	121.7
	Per ha fertiliser	-	18.7	34.4	70.0	101.2	168.3
MAH	% Cultivable Land	69.6	68.3	68.6	69.7	70.0	68.7
	% Net Cropped Area	58.5	54.9	59.0	58.4	56.6	56.6
	% Gross Cropped Area	61.6	58.1	64.6	68.5	68.8	74.9
	% Net Irrigated Area	6.1	7.9	10.6	15.0	18.4	18.7
	% Gross Irrigated Area	6.6	8.7	12.2	15.6	17.9	19.6
	% Cropping intensity	105.4	105.9	109.5	117.3	121.6	132.4
	% Irrigation Intensity	-	113.8	116.8	127.1	121.9	118.6
	Per ha fertiliser	10.3	24.3	55.0	74.6	140.6	10.3
GUJ	% Cultivable Land	60.0	61.6	66.1	65.6	66.1	66.4
	% Net Cropped Area	52.0	50.0	51.2	49.9	50.8	54.0
	% Gross Cropped Area	54.5	53.4	56.3	56.4	56.6	61.1
	% Net Irrigated Area	7.4	14.7	22.1	26.5	31.0	41.1
	% Gross Irrigated Area	7.4	15.1	23.5	28.3	33.2	45.3
	% Cropping intensity	104.9	107.0	109.9	113.1	111.5	113.1
	% Irrigation Intensity	105.7	110.2	116.8	120.5	119.3	124.6
	Per ha fertiliser	-	17.5	36.4	69.7	79.3	159.0

Note: *Years in Triennium ending averages; ** amounts in Kg units

Source: Based on various issues of Land Use Statistics, Ministry of Agriculture & Farmers' Welfare, Government of India

**Appendix Table 2: Cropping Pattern Change in Deccan Plateau States
(Percentage to Gross Cropped Area)**

States	Crop Groups/Years*	1962- 63	1972- 73	1982- 83	1992- 03	2002- 03	2011- 12
AP	Total Cereals	65.7	59.7	58.8	45.4	39.9	39.3
	Total Pulses	10.8	10.8	11.4	22.1	15.6	15
	Total Foodgrains	76.6	70.5	70.2	56.7	55.5	54.3
	Total Oilseeds	11.4	16.8	15.3	25	19.7	14.8
	Sugarcane	0.7	1	1.3	1.4	1.8	2.6
	Cotton	2.8	2.5	3.5	5.5	7.7	14.9
	Total Fruits and Vegetables	-	2	2.6	4.2	6.7	7.5
	Condiments and Spices	-	2.7	2.7	2.6	2.8	2.3
	Commercial Crops**	3.5	8.2	10	13.8	19.1	27.3
KAR	Total Cereals	59.7	55.3	52.4	45.7	45	42.4
	Total Pulses	11.9	10.9	13.2	13.8	16.9	20.3
	Total Foodgrains	71.6	63.1	61.7	65.4	61.9	62.4
	Total Oilseeds	9.7	11	12.3	22.7	15.9	12.1
	Sugarcane	0.7	1	1.6	2.2	3.4	5.3
	Cotton	9.3	9.2	8.9	5	4.4	4.4
	Total Fruits and Vegetables	-	1.4	1.9	2.3	4.2	5.1
	Condiments and Spices	-	1.9	2.5	2.3	3.3	3.5
Commercial Crops**	10	13.5	14.8	11.8	15.3	18.2	
MAH	Total Cereals	55.6	54.4	56.6	50.2	44.8	38
	Total Pulses	12.5	11.9	13.6	22.6	16.6	15.9
	Total Foodgrains	68.1	66.4	70.2	72.8	61.4	53.9
	Total Oilseeds	7.7	9	10.1	12.2	11.7	16.5
	Sugarcane	0.8	1	1.5	2.1	2.7	4.3
	Cotton	13.8	14.4	13.5	12.6	14.1	18.2
	Total Fruits and Vegetables	-	1.1	1.3	2.1	4.3	4.5
	Condiments and Spices	-	1	0.9	0.8	0.7	0.6
	Commercial Crops**	14.6	17.5	17.2	17.6	21.9	27.6
GUJ	Total Cereals	41.7	43.7	37.7	31.7	24.2	28.3
	Total Pulses	5.3	4.1	6.1	11.8	6.5	7
	Total Foodgrains	47	47.8	43.8	43.5	30.6	35.2
	Total Oilseeds	22.8	19.6	24.3	26.7	26.3	22.3
	Sugarcane	0.2	0.4	0.8	1.1	1.7	1.7
	Cotton	17.6	17.4	14.5	10.1	15.7	21.3
	Total Fruits and Vegetables	-	0.8	1.4	1.9	2.9	3.7
	Condiments and Spices	-	0.9	1.2	1.5	1.9	2.9
Commercial Crops**	17.8	19.5	17.9	14.6	22.3	29.7	

Note: *Years in Triennium ending averages; ** sum of Cotton, Sugarcane, Condiments and Spices and Total Fruits and Vegetables

Source: Based on various issues of Land Use Statistics, Ministry of Agriculture & Farmers' Welfare, Government of India.

Appendix Table 3: Predominant crops and their growth performance in major states

States	Predominant Crops (based on CCR TE 2010-11)	Growth Rate of Output of Major Crops		
		Crops	1970-71 to 1989-90	1990-91 to 2011-12
AP	Groundnut (3.82); Sunflower (3.36); Caster seed (2.84); Cotton (2.20); Tur (1.97); Rice (1.38); Maize (1.36); Gram (1.04); Total Fruits (2.54); Condiments & Spices (1.34); Total Pulses (1.16); Total Oilseeds (1.15)	Groundnut	3.04	-3.41
		Sunflower	5.76	1.25
		Caster seed	0.89	1.15
		Cotton	6.40	6.30
		Tur	3.40	5.42
		Rice	3.61	1.73
		Maize	2.82	9.60
		Gram	-0.43	17.45
KAR	Ragi (9.26); Sunflower (7.96); Safflower (3.61); Tur (2.84); Jowar (2.68); Maize (2.19); Groundnut (2.19); Gram (1.60); Sugarcane (1.18); Cotton (0.70); Rice (0.53); Condiments & Spices (2.03); Total Pulses (1.56); Total Fruits (1.13); Total Oilseeds (1.02)	Ragi	2.68	-0.32
		Sunflower	25.33	-0.40
		Safflower	2.59	-3.73
		Tur	1.97	5.82
		Jowar	-0.03	-1.15
		Maize	3.02	8.17
		Groundnut	2.65	-4.00
		Gram	2.38	9.06
MAH	Safflower (5.59); Jowar (4.57); Cotton (2.90); Soybean (2.58); Tur (2.56); Sugarcane (1.56); Sunflower (1.38); Gram (1.29); Total Fruits (1.59); Pulses (1.23); Oilseeds (1.12); Total Fruits & Veg (0.98)	Safflower	1.48	-4.68
		Jowar	5.27	-2.60
		Cotton	1.50	6.91
		Soybean	-	14.11
		Tur	4.15	3.15
		Sugarcane	4.54	3.60
		Gram	5.65	6.22
		Maize	8.30	13.30
GUJ	Castor seed (9.05); Groundnut (5.28); Cotton (4.04); Sesamum (2.15); Bajra (1.38); Tur (1.20); Maize (1.0); Small Millets (0.90); Total Oilseeds (1.67); Total Condiments & Spices (1.80); Total Fruits & Veg (0.72)	Castor seed	10.72	2.86
		Groundnut	-0.62	4.71
		Cotton	-0.93	10.47
		Sesamum	-2.09	1.99
		Bajra	-1.38	-0.08

Note - Crop Concentration Ratio is ratio of crop share in state gross cropped area to that of aggregated India; abbreviations for states as table 3.2a

Source - Author's calculations based on data from various issues of "State-wise Area, Production and Yield Statistics (1966-67 to 2011-12)", DE&S, Dept. Of Agriculture & Cooperation, Ministry of Agriculture, Government of India, accessed from http://eands.dacnet.nic.in/APY_96_To_07.htm, Jan 20 2013.