

EMERGING ISSUES OF AGRICULTURE IN DROUGHT PRONE REGION OF RAYALASEMA OF ANDHRA PRADESH

K. CHINNA VENKATASWAMY¹ & P. DEVARAJU²

¹Lecturer in Economics, Silver Jubilee P.G. College, Kurnool, India

²Assistant Professor in Computer science and Technology, S.K. University, Anantapuram, Andhra Pradesh, India

ABSTRACT

Rayalaseema is one of the three major geographical regions of Andhra Pradesh. The other two regions are Coastal Andhra and Telangana. The Rayalaseema region of Andhra Pradesh comprises of four southern districts of Kurnool, Anantapur, Kadapa and Chittoor. The population of Rayalaseema region is 116.86 lakhs according to 2011 census. It accounts for 17.6 percent of total population of Andhra Pradesh (census of India, 2011). The region lies in between the north latitudes 12°30' and 16°20' and east longitudes 76°13' 30" (Rayalaseema and lies in the extreme south of the state approximately between 12°37' - 14°8' north latitudes and 78°3' - 79°55' east longitudes)

KEYWORDS: Emerging Issues of Agriculture in Drought Prone Region of Rayalaseema of Andhra Pradesh

INTRODUCTION

Monsoon failures have been recurring phenomena in many parts of India. Hardly a year passes in which some part or other of the country does not, in some degree, suffer from the calamity of drought. The most disastrous droughts come at irregular intervals. The core areas of drought comprise about 16 percent of the total geographical area of the country and account for 11 percent of its population (Ministry of Irrigation and Power, 1972:157). Starvation, migration and such problems have been a part of the lives of people in these regions. The criteria for declaring 'drought' have been variously debated. However, two criteria adopted by Government of India - rainfall deficit and available irrigation facility seem to be reasonable. It is observed that, "Areas where the frequency or probability of failure of annual rainfall by more than 25 percent from the normal was found to be 20 percent or more for the observed years, were considered as drought-prone. Areas where the frequency exceeded 40 percent were considered as chronically drought-prone" (cit. in Nadkarni, 1985: 24). However, the emphasis on total rainfall may not be correct. The even distribution of rainfall and the number of rainy days are important. Even if the total rainfall received is normal, lack of its proper distribution vis-a-vis plant requirements will lead to failure of crops. In regions like Gujarat, Rajasthan or Andhra Pradesh, where rainfall is highly deviant from year to year, 'drought' can be shown in any district in any year. In fact, in acutely drought affected regions like Rayalaseema, studies (on the basis of rainfall data since 1945) have indicated that no meteorological drought had occurred (Olsen, 1987:441-43).

The Rayalaseema region is historically known as "stocking ground of famines". Districts located in Rayalaseema are the driest among all the districts of Andhra Pradesh and is drought-prone. The Irrigation committee (1972) has identified the districts as drought-prone. It is estimated that drought visits the districts every alternate year. A single dry crop is raised in most parts of the districts under rain fed conditions. The districts of Rayalaseema in India known for their low average rainfall, frequency and severity of droughts and low proportion of the irrigated land to total cultivated land.

Consequently, the region is rated low for its level of socio-economic development. The World Bank has also bestowed its attention in this region because of its drought-prone nature and its severity.

In general, agricultural policy at the national level has given priority to increase agricultural production so as to attain self-sufficiency in the production of food grains. True, that goal has been attained in India but only through lopsided development of the agricultural sector. Policies to promote agricultural production in the drought prone region have been weak and have not attracted adequate attention of the policy makers of the country. Consequently, problems of the drought prone areas have remained at the periphery of agricultural policy making and people dependent on such agriculture attract attention only when disaster strikes them and then all the blame is put on the vagaries of the nature. Agricultural policies which are designed at macro level are not necessarily applicable to the drought prone areas where the malady is seriously caused by adverse climatic conditions. Hence, different policy packages for the agricultural development of the drought prone areas all over the country are very much desired.

DEFINITIONS

The climate and weather systems of the earth are constantly changing. As part of these dynamic processes, extremes of temperature, rainfall, and air movement will naturally occur. Periods of unusual dryness, i.e. droughts, are therefore a normal feature of climate and weather systems in all countries, including those generally regarded as being “wet” and “cold” as well as those areas usually associated with the term “drought” – the semiarid areas of the tropics. While droughts may be regarded as unusual in that they do not occur all the time, or in some areas for most of the time, droughts should not be regarded as being “abnormal” and, in fact, should be planned for in all countries.

Drought is notoriously difficult to define and different definitions abound. Nevertheless, it is important that those involved in drought preparedness, mitigation, and declaration activities share a common understanding of the ways in which drought may be defined and the assumptions and constraints involved in using particular definitions.

Among the factors contributing to the difficulties involved in defining drought are:

- In most cases the drought phenomenon is temporary. A “drought” lasting a month may occur in an area which is known to experience cycles of alternating wet and dry periods (say every 5 years) and which is also known to be experiencing an increasingly drier climate for the past 50 years. (See Box 1.). Defining a temporary reduction of water/ moisture availability as a drought given such dynamic processes is extremely difficult as much depends upon the length of the time period being considered.
- Droughts of similar severity may have dramatically different impacts on different societies as a result of ecological, socio-economic and cultural differences. This, in turn, affects how drought is perceived and how the term is used. Thus, it is difficult to define the term solely with regard to the physical event, i.e. the reduction in water/moisture availability. Invariably the definition has to take some account of how the physical event impacts upon society.

A generally accepted definition of drought is a temporary reduction in water or moisture availability significantly below the normal or expected amount (norm) for a specified period.

The key assumptions of such a definition are:

- The reduction is temporary (if the reduction were permanent then terms such as “dry” and “arid” would be more

appropriate)

- The reduction is significant
- The reductions is defined in relation to a “norm” i.e. normal expectation
- The period taken as the basis for the norm is specified.

How the “norm” is defined is of critical importance. Assumptions 3 and 4, therefore, require more detailed clarification. The “norm” may be defined either:

- **Technically** – a reduction of water availability might qualify as a “drought” when it falls below about 80% of the average availability over the preceding 20 years. However, the period selected as the basis for estimating the average may prove misleading. (See Box 1) or
- **Culturally** – in terms of the level of water availability the society has come to expect. Thus, after a run of ten years with above average rainfall a society may have become used to the wetter state and perceive the first year of average rainfall as a drought. His physical event impacts upon society.

TYPES OF DROUGHT

It is conventional practice to distinguish between three different types of drought, namely meteorological, hydrological and agricultural. Particularly in the case of meteorological and agricultural droughts, these types are frequently, but wrongly, seen as being synonymous.

Of the three types of drought, the first two describe the physical event whereas the third describes the particular impact of the first two on agricultural production. It is necessary to carefully distinguish between these types and clarify where and how they overlap.

Water used in support of human activity is derived from either direct rainfall or previous rainfall which is temporarily “stored” in rivers lakes, groundwater aquifers and snowfields/glaciers.¹ In the case of some aquifers and glaciers, such “stores” may contain rain that fell decades or even centuries before. A temporary reduction of either of these two main types of water source may cause a drought.

In particularly Agricultural drought is the impact of meteorological and/or hydrological droughts on crop yields. Crops have particular temperature, moisture and nutrient requirements during their growth cycle in order to achieve optimum growth. If moisture availability falls below the required amount during the growth cycle then crop growth will be impaired and yields reduced. However, droughts have different impacts on different crops, e.g. sesame often thrives in dry years. Because of the complexity of the relationships involved, agricultural drought is difficult to measure. A fall in yields may be due to insufficient moisture but it may also stem from, or have been exacerbated by, such factors as the unavailability of fertilizers, lack of weeding, the presence of pests and crop diseases, the lack of labor at critical periods in the growth cycle, and unattractive crop prices. Also these factors can interact with each other and exacerbate conditions. For example, in the 1984 drought in Ethiopia, the drought contributed to army worm infestation which substantially increased the amount of crop damage.

EMERGING ISSUES OF AGRICULTURE IN DROUGHT PRONE REGION

Agriculture in the drought prone areas is subject to the vagaries of nature. Failure of rainfall at critical stage of plant growth in such areas results in drought and crop failure which adversely affects the economic condition of the farmers and create an acute problem of food scarcity, livelihood and problems of livestock survival. Drought prone areas are exposed to frequent rain failures and consequently their agricultural production base is found to be extremely unstable and unpredictable. Therefore, farmers in such areas keep high proportion of their cropped areas under drought, low yielding and low cost crops to guard against natural calamity. They prepare to choose their crops in such a way that even under adverse climatic condition they should get something to subsist on their main concern is to minimize loss rather than to maximize profit unlike irrigated farming where profit maximization is the main Endeavour of the farmers. In low rainfall areas the cropping pattern is adjusted to the climatic condition and to a great extent to their own food habits and consumptions pattern. In fact, in such agriculture technological changes take place at low rate as majority of the cultivators are naturally reluctant to make new investments in the wake of possible risks and uncertainties due to scanty rainfall and limited irrigation facilities. Rather, they prefer to carry on with the traditional mode of production and remain satisfied with the meager income accurable from it. Generally, in low rainfall areas uncertainties of the various types namely: (1) yield uncertainty, 2) Price uncertainly, 3) technological uncertainties adversely affect the growth prospect of agriculture in the drought prone areas.

Yield Uncertainty

It is one of the important factors that cultivator keeps in mind while allocating acreage to a certain crop. He might restrict the acreage under the crop which is most susceptible to yield uncertainty. A farmer by himself cannot accurately predict the future outcome of his resource allocation and other entrepreneurial efforts. Yield variability in such agriculture is caused by some factors which are controllable like seed quality and its timely application, fertilizer, and labor use etc. and some others which are non controllable most notably rainfall aberrations, weather etc., The latter set of factors always acts as limiting factor in determining yield fluctuations is likely to vary across the different area within the region, depending on the rainfall condition.

Price Uncertainty

Fluctuations in prices of products and of inputs also create substantial instability in agricultural income of the farmers. The product prices are often uncertain unless they are pre-determined by the government. It is not possible to predict them very accurately because the factors which determine the prices are themselves subject to change. Price instability is caused in the short by fluctuation in output and in the long run, change in taste and income levels of consumers, change in techniques of production and external marketing condition. Moreover, price is more or less an uncontrolled of exogenous variable so far as the individual farmer is concerned. Farmers are price takers not price maker. Price fluctuations are likely to be reduced further in case of industry because it is easier to adjust the supply of its product to change in demand. Another aspect of price instability is the uncertainly agricultural inputs whose prices are subject to frequent fluctuations. The farmers generally react to this type of input price uncertainty by postponing the purchase of such inputs.

Instability in Agricultural Income

The income level of agricultural producers depends upon the quantities of output they produce and price they

receive for their products. Unfortunately in drought prone area quantity as well as prices are subject to a large degree of variability; thereby create instability in income at larger magnitude. Quantities to be produced and price to be realized cannot accurately be predicated accurately, because factors which determine the magnitude of quantity and price instability are themselves subject to change. Therefore, in drought prone areas income investment ratio varies from year to year depending upon the nature of rainfall condition. Because agriculture in such areas depends more on nature than farmer's inputs and since the return is not predictable, the risk of monetary loss persists like a hanging sword. Therefore, the attitude of the farmers has always been to keep monetary expenses of his farming activity of the minimal.

Technological Uncertainty

It arises due to lag in understanding the significance of new agriculture technology by farmers. In drought prone areas farmers are reluctant to adopt new technology in the production process due to uncertainty of returns associated with it due to low and uncertain rainfall and lack of proper farm management practices.

Tenurial Uncertainty

This type of uncertainty is quite conspicuous in such agriculture with respect to period how long tenant farmers will be able to retain the land in his possession and about the exorbitant rent that he will have to part with. The implication of such type of uncertainty lead to deterrent to any kind of long term investment in land improvement, irrigation etc. Thus, subjective uncertainty of the tenant farmer hampers the growth prospect of agriculture.

Uncertainty and Agricultural Credit

Moreover, in low rainfall region lack of availability of adequate credit and proper use of credit are additional constraints. Basically, the probability of losses likely to result from risks and uncertainties in agriculture may restrict capital investment in agriculture due to two reasons 1) Risk aversion i.e. the producers psychological discount of return and 2) Capital rationing, i.e. inability of the borrower to obtain credit on reasonable terms.

Moreover, Poverty and ignorance prevent farmers to undertake the risk of investment in such agriculture. In addition, risk inherent in farming influences not only the borrower's decision to invest capital but also the lenders willingness to supply credit. The greater the degree of uncertainty in a given investment proposal, greater would be uncertainty to the financial institutions which advance credit. Hence, empirical evidences show that financial institutions prefer irrigated farming rather than rain fed farming for providing financial assistance.

Moreover, it is also to be emphasized that uncertainty in output has got functional relation with size of farm due to farms of different sizes require varying amount of capital. If investment is successful, then large farms add more to capital than small farms. If price and yield are unfavorable, then large farms suffer greater losses and through that considerable portion of their capital withers away. Therefore, small producers adopt the strategy of crop diversification to overcome the potential uncertainty in agriculture where large farmers stick to mono cropping as they could plant different crop on each of their plots of land.

STRATEGIES FOR AGRICULTURE IN DROUGHT PRONE REGION

For overcoming at least reducing the magnitude to uncertainty in crop production, income and stimulating the growth prospect of agriculture in such region, some appropriate comprehensive measures are required. Given the nature of distribution of scanty rainfall within the region, well-conceived plan of agricultural development is the need of the time. It

is generally accepted and also realized that availability of irrigation facilities is beneficial for enhancing the output in such areas. In logical conclusion, it follows that irrigation development should be given top priority in such areas. Well irrigation whose irrigation base is itself unstable in such region due to scanty rainfall. This source more often fails to provide adequate insurance cover for the crops during the severe drought condition. Shallow dug wells are prone to drying during a drought unless they happen to be location within the command areas of wells fed tanks and canal whose seepages and percolations protect the wells from drying. The given situation of water supply in the such region, warrants policies and action programmes should be designed to conserve every drop of rainfall water during the monsoon season as best as possible. The economic backwardness of the drought prone areas is due not only to the insufficiency of natural endowments but also to the manner in which the available stock of natural resources has been put to use by human beings. Water use has been unplanned and unrestrained. Specific efforts are required to develop horticultural crops in such areas. Growing of fruits varieties like pomegranate and ber have brought astonishing transformation in the agricultural economy. Cooperative marketing societies provide backward and forward linkages to the fruit growers. This kind of transformation can be brought about throughout the drought prone region by adopting a systematic, well thought out and integrated programme of horticultural development. Similar experiments are being conducted in kalyani farm in Satara district and Ralegan Siddhi in Ahmednagar district which are drought prone districts in Maharashtra, and can be extended to the drought prone areas in the country. Moreover and appropriate comprehensive strategy of agricultural development for the drought prone areas comprise multi-dimensional measures is needed to design.

THE STUDY

Brief discussed about the deferent aspects of drought in general and also enlightened the various circumstances under which the drought is to be treated in different parts of the country. Further the basic definitions and types of drought are well presented and how it is appropriate to the study area of Rayalaseema region of Andhra Pradesh. Also it is opined that the emerging issues of agriculture in drought prone region is to be taken care of and the much needed exercise is to be observed in the drought and famine regions and together a novel aspect of uncertainties are coined by the author to encounter the frequent droughts which issues are to be studied, analyzed and put to implementation , definitely the rural and people in the drought effected areas can be given the all needed help to strength their economy which in turn enhances their quality of life.

The very sensitive and critical areas which are to be taken care of and also the following aspects if, studied and properly implemented, the grave situation like frequent droughts and famines can be overcome by observing the following remedial care.

- To execute watershed development programme on priority basis
- To undertake soil, water and moisture conservation programmes
- To make rational distribution of ware based on the actual need of each crop in each farm for the optimum growth through appropriate agency in such areas, something on the line of the pani panchayat, Water Users Association.
- To make optimum use of land by providing scientific land use information to the farmers
- To devise the cropping pattern suitable for the quality of soil and availability of water rather than on the consumption pattern, moreover emphasize on horticultural crops is also required

- To develop and introduce the drought resistant short duration and high yielding varieties of seeds
- To enlighten and educate the farmers regarding selection of seeds, proper use of chemical fertilizers and economical use of irrigation etc.
- To arrange for the marketing of the farm surplus to the best advantage of the producers, and price assurance and implementation of crop insurance scheme exclusively for drought prone areas
- To promote pasture and livestock development with special effort and to provide facilities to develop subsidiary occupation and to create assured market for such products
- To develop and promote the non-farming sectors which help the farmers to earn during drought and non-farming days.
- To setup National Commission on Drought Prone Agriculture for stimulating the growth prospect of agriculture in such areas.

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