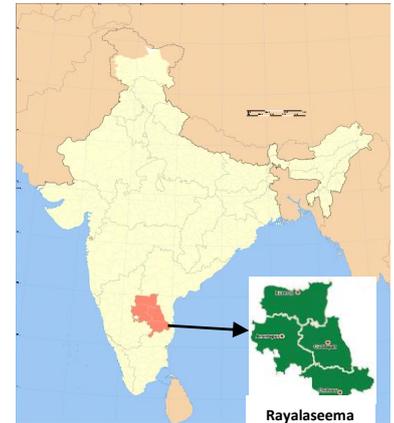


## Local Impact of Climate Change: Worsening the farmers distress in Drought prone Rayalaseema Region

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### **Rayalaseema Region:**

Rayalaseema Region is located at the heart of Deccan plateau (in South India) is arid, semi-arid and chronically drought-prone for centuries. This backward region has a dubious distinction for twin problems of drought and poverty. It is the second most driest region in India after Rajasthan. This geo-political region consists of 4 districts i.e., Anantapur, Cuddapah, Chittoor and Kurnool. The region has a geographical area of approx 67.29 lakh ha. and has a population of 130 Lakhs. The cultivated area is 24.16 lakh ha. of which only 5.57 lakh ha 23% area is irrigated with underground water and some river water. It has 14.9 lakh ha. (22%) under forest land mostly without tree cover. The groundwater irrigation as well as river water irrigation is also undependable in the region. There is very little industry in the region and livelihoods are dependent on mostly rainfed farming which is prone for very frequent droughts. The annual average rainfall in this region ranges from about 350 mm to about 650 mm from both South-West monsoon (from June to September) and North-East monsoon (from October and November). The region consists of predominantly (85%) small and marginal farmers mostly from poor and marginalized communities. From the year 1876 till 1975, in 100 years 64 years received less than normal rainfall and had witnessed more than 50 drought years including severe famines. In 1876 the region experienced a severe famine where in it was believed that almost 40% of the population died of hunger.



### **The situation is worsening due to increased climate variability:**

The last 20 years, from 1995 the region has experienced an unprecedented frequency of droughts. In February 2012, the District Administration of Anantapur District reported that there were only 2 normal crops in the past 14 years. There were about 3000 farmers suicides reported in the past 20 years. 90% of the farmers have been trapped in deep debts and see no hope in farming! The agricultural crises and rural distress deepened further because of LPG (Liberalisation, Privatisation and Globalisation) policies and programmes. The crop investments have gone up steeply due to cuts in fertilizer subsidies and all input costs have quadrupled. The living costs, health and education costs have gone up exponentially. There were no remunerative prices for agriculture produce and so even in good crop years the farmers experienced “price droughts”. The Green Revolution paradigm of agriculture which is also termed as “High External Input Destructive Agriculture” (HEIDA) has favoured the rich farmers with irrigation facilities and the multitude of small and marginal rainfed farmers rendered non-viable and pauper.

The author is closely working with farmers and implementing watershed development projects and promoting Low External Input Sustainable Agriculture (LEISA). His own

observations and interactions with farmers bring out the following changes in weather patterns with worsened consequences for farmers and other rural livelihoods.

### **Changes in weather patterns observed:**

The dispersion of rainfall has further increased. The crop-season (July-October) rainfall decreased and outside crop-season rain has been increasing, where as the volume of rainfall has not increased. The number of rainy days (rain events with a volume of >10 mm) have decreased from about 35 in 1980s to about 25 in the decade of 2010. At the same time, the intensity of rainfall in an event has increased. The duration of the dry-spells in rainy season and the scantiness have increased. The Regional Agricultural Research Station at Anantapur analyzed the rainfall data and traced a clear pattern that the rains in September month are coming down. September rains are crucial for rainfed crops (groundnut, millets & pulses) as they will be in grain-forming stage. Farmers experience that temperature variability is increasing. They say that the gap between day temperatures and night temperatures is widening. The summer is setting in as early as in February. The temperature fluctuations during the day are on the increase like a sudden rise in the temperatures in the evenings.

### **Impact on agriculture, livelihoods and environment:**

The above changes in the rainfall and temperatures have drastically impacted on crop production, cattle, livestock and other rural livelihoods in this already fragile arid region. The major rainfed crop in the region is Groundnut and other crops are Jowar, Bajra, Redgram, Cow-Pea, Bengal Gram etc. The duration of these crops is 100 to 160 days. They need a timely distribution of rainfall of about 20 mm each at intervals of about 10 days during the crop period. Just one shower missing with occurrence of a dry-spell of over 30 days, the whole rainfed crop will wither away! In the past 20 years such long dry spells of more than 20 days and 30 days are on the increase causing droughts. For the seasonal rainfed crops, it is the timely distribution of rainfall to match the crop moisture needs that is very important rather than the total volume of the rainfall in the season.

Further the temperature variability is said to be adversely affecting the crop production. In the last 8 years from 2007, 2 crops across the region have been lost in two years due to unusually high temperatures in the month of September-October; that affected the pod-formation in the groundnut crop which is grown in 20 lakh ha. in the region. So, the farmers say that earlier there used to be droughts because the rains failed. Now additionally the droughts are happening because of fluctuating temperatures. That is why the dismal record of 2 good crop years in 14 years since 1998.

Due to aggravated crisis in rainfed farming, the groundwater exploitation has been on the increase in desperation for survival. This over exploitation has depleted the groundwater table and the bore wells are drying up faster than ever resulting in wilting of crops. Even the fruit trees like sweet lime, citrus, pomegranate, banana, papaya are wilting due to drying up of borewells. These are high value crops that the farmers had grown with heavy investments under deep bore wells. Now these trees are drying up leading farmers into deep indebtedness. Put together all causes, the farmers suicides are on the increase as they see no way to repay the loans and save their face.

Due to increase in dispersion of rainfall it is affecting the surface water collection into the traditional surface water bodies. Earlier, the surface water bodies used to fill up at least once in 3 years. They are now filling up only once in about 10 years. This is also the reason why the groundwater is not adequately recharged. The traditional water bodies used to provide drinking water for cattle and livestock earlier. Now most of the time they are dried up and so the cattle have to travel sometime 10 to 15 kilometers to quench their thirst.

Earlier many farmers used to have cattle and livestock as part of their farming system. It was farmers main coping mechanism from droughts. The crops they grow are mostly dual purpose for grain and fodder. With crops failing more often, the fodder is scarce now. The traditional pastures are now barren and without a blade of grass. Further the severe crises in agriculture and distress of farmers also forced the farmers to sell in distress the cattle and livestock for their sheer immediate survival and cope with droughts. So in the past 20 years, many families have sold out their cattle. Bio-diversity is on decrease in terms of animals, insects, birds, trees, grasses, soil organisms etc. Due to the increased intensity of rainfall, the soil erosion has increased and the biomass in the soil (soil organic carbon) has been coming down faster. This degradation process has been also aided by decades of mono cropping, particularly of groundnut, which does not leave any crop residue in the soil. Due to increased soil erosion the siltation of local surface water bodies also increased. The land is more exposed to sun, wind and rain affecting the flora and fauna and as well the biotic life in the soil.

The above changes have affected seriously the farming system and thrown the farmers into severe distress. The impact has been even more telling on the fragile small and marginal farmers. The region is experiencing now a stormy social churning. The rainfed farmers are giving up farming and resorting to distress migration or wage employment under the Government run employment programmes. The rainfed farmers who are migrating in distress to cities to work as casual labour in construction industry, as gatemen, loaders, security guards etc. The last 3 years has seen an unprecedented large chunk of farmers becoming wage labour in distress. A large scale unprecedented occupational down ward mobility from wage providing farmers to wage seeking labour. It is really disgraceful and shameful.

### **Measures for Mitigation and Adaptation:**

The following Mitigation & Adaptation measures are recommended to be taken up on high priority with a sense of urgency:

1. Agriculture has to be included as an important sector for Mitigation of Climate Change and Adaptation to Climate change. So develop and include Low Carbon Farming technologies and practices that will generate carbon credits to farmers and benefit both the farmers as well as climate mitigation.
2. Develop, include and incentivize the farmers with Climate Adaptation technologies such as resilient crop varieties and practices in order to cope with changing patterns of rainfall and temperatures.

3. Provide Protective Irrigation to rainfed crops during dry spells through adopting conjunctive water use for drought mitigation and adaptation to climate change.
4. Promotion of rainfed horticulture and agro forestry in 33% of cultivated area : Tree crops are more drought tolerant, improve environment, combat desertification and mitigate climate change.
5. Increase vegetation and tree fodder availability through afforestation and common lands development : Vegetation improves environmental endowment, combats desertification and mitigates climate change.
6. Promote Integrated Farming System (IFS) at each rainfed household level. Each rainfed farmer to diversify the livelihood basket like own atleast 100 fruit trees, 2 or 3 milch cows, 10 or 15 sheep etc in order to supplement annual crops for livelihood security.
7. Promote mixed /inter cropping with millets and pulses and ensure food and nutritional security. Reduce Food Miles, provide locally grown food in ICDS, (Integrated Child Development Scheme) school Mid-day Meals and PDS (Public Distribution System)
8. Shift Green Revolution paradigm (HEIDA) to LEISA- a sustainable and climate – smart agriculture.
9. Provide remunerative prices and promote, processing and value addition of Agri-produce
10. Provide health security to all villagers
11. Provide education support to all rural students so that they seek non-farm employment.

Though late, better than never, there is an urgent need to take up above measures for Climate Mitigation and Adaptation and secure agriculture and other rural livelihood systems so that this shameful human displacement and suffering caused by climate change could be averted by stabilizing agriculture and other rural livelihoods as well as ecology and environment.

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