

## *Environment Management*

# Drought - Reasons and Strategies to Combat it

T.N.K. Kurup\*

The General Election early this year resulting in a stable Government at the Centre, created a healthy climate as it promised continuity of policies without disruption towards progress and prosperity which are essential to tide over the financial crisis and melt down of economy facing the country. Everyone had hopes that the annual South West Monsoon for a KHARIF bumper crop would be just round the corner. The Met predictions before the start of the monsoon were that this year, the rainfall would be more or less normal. However, it has been a slow and agonizing wait for a nation that lives on normal hope. With just a few weeks left before the South West monsoon runs its course, the harsh reality is sinking in. Half the country reels under drought like conditions. In many of the rural areas there is no drinking water, let alone saving of crops, feeding of families and the cattle. The Government is assuring that there are enough stocks of wheat and rice to ensure food security in the Country, thanks to the bumper crops during the previous two years. This may be a solace for the present but if this pattern of monsoon repeats for a couple of years, the Country would be in real peril. This needs an analytical study on the pattern of rainfall and how to conserve our efforts, if such situations were to repeat. The earlier adage was save for

the rainy day. The present one is save for the rainless day. Save what? Water of course!

EL NINO: El Nino years were happening over centuries but only recently Scientists have started looking at the phenomenon in minute details as it has wide ramifications on the spread and intensity of trade winds and monsoons. Under normal circumstances there is high pressure conditions over East Pacific ocean and low pressure conditions over Western Pacific. This results in Trade winds blowing Westwards from the high pressure to low pressure areas. But during certain period known as El Nino the high and low pressure conditions weaken and so also the Trade winds. This raises the temperature of Pacific ocean resulting in changes in the regular Monsoon when we experience lesser rains and even drought in some areas in our Country. Accurate monsoon prediction is so essential for our agricultural production and for our country as we depend on agriculture for our survival and economy. This year is an EL NINO year and possibly next year as well. This is very alarming.

### **Global Warming and Heat Waves**

Circulation of air helps distribution of heat over earth. Any change in circulation results

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\* The author is Secretary, CARTIMAN, a Bangalore based NGO specialising in environmental activities. Email : cartman@vsnl.com

in surprises. This year Heat Waves scorched ORISSA and West Bengal in April earlier than expected, i.e. May and June. This killed many persons in both the States. The easterly winds kept the East Coast cool but in their absence North Western desert winds blowing from Rajasthan prevailed. Hot spells are increasing in other parts of the Country as well. It is reported that between 1991 and 2000, 22.7 sub-divisions were hit by heat waves per year while between 1971 and 1980 an average of 9.9 sub-divisions were hit by heat waves per year. Even though studies are yet to be completed for the current decade the observation at IMD indicates that the increase is steeper this decade. One reason behind the increase could be that different parts of the earth warming at different rates. This is likely to bring frequent changes in air circulation. These changes in the wind pattern can cause serious disturbances on the spread of the monsoon. Our Met department may predict a normal monsoon but the wind pattern finally distribute the rain, some areas receiving excess rain, others not having rain at all, creating total disarray of farming operations. With the phenomena of global warming the pattern of monsoon could be erratic in future years. Excess rain and drought could occur in future as well. Therefore there is every need to have alternate plans for our agriculture and food security for a Country having high population depending mainly on agriculture for survival.

### **Cloud Seeding**

There are occasions when moisture laden clouds present in the sky do not result in precipitation of rain. This is because the moisture in the clouds is not able to condense and form droplets of rain. In such cases cloud seeding is attempted with the use of contractual

services. Aircraft flying at lower altitudes spray silver iodide crystals which assist in condensation of moisture in the clouds to form drops of rain. During the past few years Government of Andhra Pradesh has been able to provide rains in a few drought areas using this method.

### **The Present Scenario**

After sixty two years of independence we should have been able to tide over the crises if we had sound plans which were executed properly. Every Government taking over governance of the Centre and States speaks of water and food security but even now all our efforts are towards fire fighting and acting on emergencies. This does not augur well for the country and especially for millions of poor living in rural areas. Over the years we have constructed major dams for irrigation and power but sad to say that even now most of the crops in dry lands are irrigated by bore wells. Water management through irrigation canals without proper control and improper construction and maintenance have created conditions of salinity, water logging and monoculture spoiling the very soil which it is supposed to nourish. The eating habits of the poor have also taken a change from usage of millet and other cereals to only rice. Rice cultivation needs large quantities of water and so also sugarcane. Wherever cultivation of crops are dependent on bore wells the water table had gone down considerably as reported in a NASA Study of Satellite maps. The ground water levels in North India, Punjab, Delhi, Rajasthan and Haryana are falling by a foot a year, 109 cu km lost in last 6 years. This trend has to be reversed.

### **What need be done over the coming years?**

The answer is simple but achieving it calls for proper planning, execution and empowering the local people for construction, continued maintenance and upkeep. Conservation of water by communities in drought prone areas like Rajasthan, Andhra Pradesh, Tamil Nadu and Karnataka over the last few centuries by traditional rain harvesting methods ensure adequate water supply for drinking and irrigation during the lean years of monsoon. Recharging of underground water by rain water harvesting structures constructed at correct locations would over the years improve the water table so that water availability could be ensured whenever rains play truant. Over the last two decades there was a concerted action by the State and Central Government to create water shed areas for sustained water availability. Watershed are planned and designed to contain rain water draining out through valleys from higher elevations by constructing check dams at suitable locations. The water stored can be utilized for drinking and irrigation needs of the locality. Another area of work is in constructing small bunds or structures to slow down the flow of rain water to lower regions. Both these arrangements retain water and also facilitate recharging underground water sources. Since some of these check dams and structures are mainly constructed by compacting earth or rubble masonry they need regular maintenance and upkeep failing which the watersheds become defunct after a few years. The only answer is to empower the local communities in full and once they are convinced that their survival depends on water availability through all seasons they will treat them as part and parcel

of their assets. Such success stories are reported in pockets like Ralegaonsiddhe in Ahmednagar in Maharashtra, and in Rajasthan and Madhya Pradesh. Major dams displace thousands of people but these rain harvesting structure like check dams, small lakes, planting of trees to preserve water bodies do go a long way for improving the ground water table without affecting the local community. The Government NREGA scheme should be dovetailed for creating such assets to ensure adequate water supply for irrigation and drinking water. In this venture Corporate bodies also can participate along with Government for well planned and executed water shed programme, the maintenance and upkeep of which should be entrusted to local bodies. With funds available under NREGA the priority should be to utilize creation of water sheds and rain water harvesting structures to raise the underground water table. This will ensure sustainability and also provide employment to rural population in creating wealth.

The number of lakes in Karnataka and particularly in Bangalore have been reduced to one fourth, over the last fifty years or so. Is not this a matter of concern? Government on its part spend money on advertisements such as "Preserve lake. Do not pollute". Not in words alone but in action as well, Government should show its competence in preserving lakes so that water availability increases.

The whole of Deccan plateau throughout the previous centuries depended on lakes which provided good quality of water for drinking and cultivation. Reviving and maintaining them are more important than creating SEZ.

## **Storage and Distribution of grains**

Whenever the spectre of drought happens, the Ministry in-charge of Agriculture and Civil Supplies announce that we have adequate stocks and effective distribution could be done. This might be true but the present methods of storage and the modus of distribution could be improved. Because of poor storage or lack of storage space the grains collected sometimes amounting to hundreds of tones rot and become unfit for human consumption. Instances have been reported in T.V. about diversion of PDS stocks to hoarders and black marketers with the connivance of truck drivers and corrupt officials. These are to be prevented and such culprits should be prosecuted and put in prison. Silos installed at certain locations in Punjab have shown their utility, better preservation of grains, loading and evacuation. These could be replicated in proper places on all the drought prone States so that the distribution of grains to the needy could be done faster. Local Panchayat bodies also could be associated with the distribution so that the grains do reach the correct individual or families. Regarding the construction of SILOS Corporates also could contribute funds/effort so that such facilities could be established at many locations. Both in terms of storage and distribution Pub-Private participation would ensure better control and coordination. This would also prevent grain supplies to hoarders and black marketeers.

## **Forecast of Weather and Rain**

Accurate forecast of weather and rains is an absolute necessity. The present system is not only inaccurate but delayed also. Prediction of changes in the pattern of rain in time is

essential for farmers and officials concerned for taking timely action. The present system and models need be changed to the latest available in advanced countries. It is understood that ISRO has developed some Doppler module which is better than what are used now. The need of getting correct equipment for forecasting of weather and rain is an urgent one. IMD should upgrade its facilities and know-how.

## **Changes in Cultivation**

Our farmers are reluctant to change over from their normal practices of growing traditional crops. Considering the problems of adequate water availability cropping pattern and product change may have to be resorted to. A case in point is the yearly tussle going on with the Government of Karnataka and Tamil Nadu on the release of water from Cauvery. Mandya farmers want to cultivate only sugarcane while lower down Tamil Nadu farmers insist on growing three crops of rice as is their practice. Both crops do need water to a much larger extent than other products. A change in their agriculture product could be thought of, so that the constant bickering between the two States can be stopped. This would need political intervention to sort out the problem. Both Karnataka and Andhra Pradesh used to grow millets and other cereals which were consumed by many families. Because of high demands for rice and the State Government's willingness to supply rice at cheaper rates the demand for rice has increased many-folds. Growing crops needing lesser amount of water are to be encouraged. Participation of Agricultural Scientists is necessary for the farmers to update the technology for

production of alternate items in drought conditions. Our agricultural Scientists are specialists in laboratory to field transfer of technology which have not been very effective. As against this, in CHINA agricultural scientist set up their shops in the field and advise the farmers in situ which give better results. The cooperation between the farmers and scientists are forged better. Both get benefited in the bargain.

### **Organic Farming**

Farmers do spend considerable amount of money for purchase of inorganic fertilizers and pesticides which are costly. If their agricultural operations do not succeed because of low or deficient rainfall they are not able to pay back the money from lenders and in many cases result in suicides. Against this backdrop, we should encourage use of organic fertilizers from agricultural wastes, cowdung, etc so that they may be able to save money to some extent. Many farmers have also taken up cultivation of legumes, beans, grams, etc which when sown following the harvest of the previous season would provide better fertilization of the soil and requirements of water reduce for growing major crops for the oncoming season. In such matters, the presence of experts and agricultural scientists in the field operation will be a boon to farmers. The farmers also are to be encouraged to use organic pesticides which cost much less than the chemical ones.

### **BAIF(K)**

Recently, I had been to BAIF, Tiptur, on some official work and had interaction with their facilitators who transfer technology to farmers.

I had discussion with their Student Community and faculty. After completing their training assignments, the young facilitators stay in villages with the farmers and assist them with their inputs so that the technological needs are directly met. The facilitators have better interaction with the farmers. It was also seen that with practically little rain, the cooking and drinking needs of the entire Institute's requirements are met with rain water harvesting. There are many such structures erected in the LAKKI HALLI farm Institute, BAIF, Tiptur. Similar methods of giving inputs to farmers and rain harvesting methods could be replicated elsewhere for effective management of drought in future. No wonder BAIF(K) received the "PARYAVARAN PURASKAR" for this year from the Central Government.

### **Conclusion**

I have not written anything for the current drought management facing many States. These are receiving the attention of the Central and State Governments and their concerted action might see better conditions of food availability to the rural population. The Government and officials do know how to tackle the present situation. But this is not a permanent solution.

With the erratic monsoon and its unpredictable distribution, it is likely that the Country may face such situations in future. This could be achieved by better planning and proper implementation. Some of the activities needed, I have outlined. Many more might be there which can be elaborated upon by our qualified Scientists, experts and Technocrats so that the present problem of drought could be tackled effectively in future.