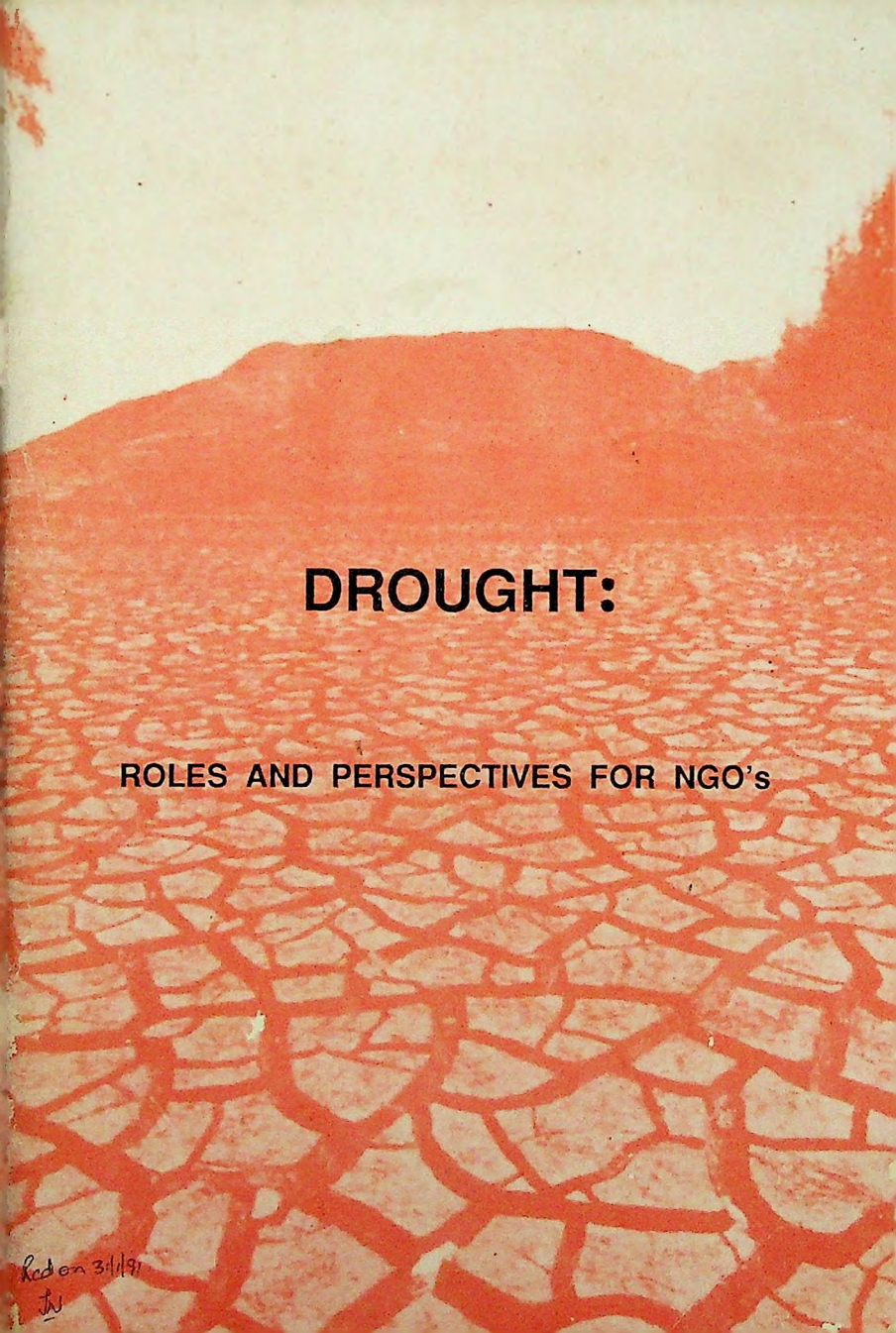

DROUGHT:

ROLES AND PERSPECTIVES FOR NGO's

1991

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A WORKSHOP REPORT

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PREFACE

I feel it is pertinent here to explain the background of this report. In order to do that, one needs to share about the evolving roles of SEARCH as a support institution. SEARCH, during its brief history of 15 years, has undergone several changes, but it is important to acknowledge here, two specific milestones which are very significant. When SEARCH was founded in the mid seventies, it focused on providing opportunities for young people to get into development. After 10 years of working with this as the main thrust, through a programme titled 'Apprenticeship Scheme for Development Workers', SEARCH changed its orientation in the year 1984. During the next five years, between 1984 and 1989, the focus was on Human Resource Development within NGO sector. It was through these interventions with about 200 odd NGOs in the states of Tamilnadu,Andhra, Karnataka and Orissa that we became conscious of the need for area analysis of specific regions and focusing on key issues that dominate those regions. In Tamilnadu during the past six years, we have been working with NGO partners in the districts of P.T.T, D.Q.M, Madurai,Trichy and Kamarajar. These interventions were at the level of people's organisations, grass root level NGO workers, middle and senior level staff as well as at the NGO leaders' level. These interventions also brought us to an awareness of how little we were focusing on the central issue of this belt,namely, drought, through our trainings. So, with a view to evolve together with NGO partners and people's organisations, a perspective on drought, SEARCH began exploring its strategy of work. And in this context, one of the steps envisaged by SEARCH was to bring the NGOs who are active in that region together with environmental experts with technical background, for an interaction, to a workshop. This report is basically an outcome of that workshop.

As most of you would agree, putting together a workshop report for a larger audience who were not part of the workshop is a challenging task. The workshop followed its own rythm and process, but we were convinced that the information generated from it needed to be shared with a larger NGO constituency who would be interested in the issue of drought and did not attend the workshop. But at the same time, making sense to somebody who was not there, using basically the same materials as were used in the workshop, was a difficult

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thing to do. Therefore, what followed was a compromise, using the materials that were presented, debated and discussed during the workshop, and at the same time, elaborating them with necessary additional information from secondary sources, to present the report in a more cohesive manner. Therefore this report does not match with the sequence of events as it occured in the workshop. Nonetheless, for a large part, it is based on the papers presented at the workshop. It is important to mention here that this report will be followed by another, which would be a compilation of the Participatory Action Research that has been initiated in the wake of this workshop in this agro-climatic belt with ten NGOs.

We would like to mention here that we cannot claim to have covered the topic exhaustively in this report. There could be several dimensions of the issue which may not be covered at all or inadequately covered. Likewise, certain approaches may be debatable and we are aware that there are different standpoints which could be in variance with the views expressed here. We would like to consider these as limitations of this report. It may also be pertinent to mention here that the strength of NGOs in India, by and large, come from their use of sharp tools of analysis, leading to the process of empowerment of the poor and mobilisation of marginalised people. Often NGOs use community organisation towards building up this process. The underlying assumption of this report is that the alternative drought action proposed here is based on the foundation of empowerment and mobilisation of the marginalised people. Since this report is basically aimed at the NGO constituency and the NGOs are fairly well-founded in the empowerment process, this aspect is taken as a pre-requisite and therefore not separately dealt with. It is our firm belief that if this pre-requisite is not met, the approaches suggested in this paper will become mere technical solutions and not a political solution. For, afterall, drought is a political issue.

F.STEPHEN

ACKNOWLEDGEMENTS

It is important to acknowledge here the support provided by Gandhigram University and the Vice-Chancellor, Dr.Oza, in extending their hospitality to us during the workshop and thus making the workshop possible. We are also grateful to them for the recording system which enabled us to put together the first draft of the report.

This report would not have seen the light of day, had it not been for the continuous support and valuable suggestions made by the key resource persons who attended the workshop. This manuscript was corrected by Dr.Walter Fernandes, Dr.Meher-Homji, Mr.Bhat and Mr.Malla Reddy, particularly pertaining to their respective sections. Mr.Fatimson provided an overall critique and gave very useful comments.

At the second stage the report was critiqued by Dr.Badal Sen Gupta, Consultant, EZE, who provided very helpful insights into the inadequacies of the report and his contribution provided cohesiveness to the report. The final draft was shared, besides the resource persons, with Dr.David Mosse, South India Representative, Oxfam India, Dr.Vijay Padaki, Professor, Institute of Socio Economic Change, Bangalore and Dr.Badal Sen Gupta. Taking their useful suggestions and comments, the report has taken its present form, though we were constrained in taking all the comments and suggestions as we were still keeping the report within the frame of the workshop. We want to record our sincere thanks to all of them for their valuable time and contributions which went a long way in bringing out this report.

We will be failing in our duty if we do not thank all the participants of the workshop, whose active participation and contributions made the workshop what it was. But we are not able to mention all their names here for want of space. We sincerely thank everyone who was associated with the workshop and in the compilation of this report in one way or the other.

CHAPTER I

DROUGHT - MANIFESTATION OF A LARGER CRISIS

1. INTRODUCTION

Drought is commonly understood to be a continuous period of dry weather resulting in acute shortage of water. It is generally assumed to be a natural phenomenon over which human beings have little or no control. But how far is this assumption true? Analysis of data from different regions of the country reveal that scarcity of water, food and fodder have been occurring systematically over a longer timespan and even during years of normal rainfall. Therefore it would be too much of a simplification if we consider drought as just another natural disaster which recurs periodically. Drought is the consequence of the imbalance created by human beings on nature, on environment and ecology. And the people who are the hardest hit by drought are the poor and marginalised people who do not have the means to tide over it and among them, the women and the children. Hence one has to look at the problem of drought both from ecological-environmental and societal standpoints to really understand it in all its enormity. One without the other would not be ideal, for any effort for drought - proofing has to take into account both these aspects.

2. A SOCIO-ECONOMIC INTERPRETATION TO DROUGHT *

Drought is a global phenomenon resulting from graver socio-economic realities. The moment anyone speaks of drought or famine, the names that come to mind instantly are Ethiopia and Sahel in Africa. (Sahel is the group of African countries immediately to the

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* **Note :** Dr.Walter Fernandes, former Director of Indian Social Institute, New Delhi, looked at the socio-economic dimensions of Drought at the workshop.

south of the Sahara desert.) These are two areas where drought and famine wreaked havoc on the lives of the people, and the world reaction to this devastating tragedy has been, by and large, the carrying out of welfare measures. Drought and famine are generally perceived to be natural phenomena, which call for welfare programmes for those who are the unfortunate victims.

2.1 What Went Wrong in Sahel?

If we analyse the history of Ethiopia and Sahel, we can see that the drought which occurred there was not natural but brought about by human hands. These were once fertile lands where there was balanced cultivation before the lure of foreign exchange made them dependent on a single crop, namely, groundnut in Sahel and coffee in Ethiopia. The population of Sahel was mostly involved in farming and animal husbandry. There existed a mutually beneficial relationship between the farmers and the nomadic pastoral groups there. After the harvest, the farmers would allow the cattle which belonged to the nomadic pastors to graze on the fields and also provide them with some food and money. This arrangement ensured that the farmer got the requisite manure for his fields and the nomadic pastors and their cattle survived.

Into this balanced atmosphere, the French colonial government came with groundnut as a viable commercial crop which could ensure regular supply of cheap cooking oil to France. Likewise, Ethiopia started growing coffee and exporting it to Europe. It is not difficult to see what went wrong after this. These countries had to import machinery and other manufactured goods from Europe. The prices of these products kept rising while that of groundnut and coffee either remained stagnant or rose only marginally. To be able to import manufactured goods and machinery (some of it even luxury items like automobiles meant for a few rich), these countries had to keep increasing the land under cultivation of the commercial crops, viz. groundnut and coffee. More and more agricultural land which was till then used for staple food production was brought under the cultivation of these crops. Pasture lands were closed. The fields were no longer accessible to the nomadic pastors to graze their cattle. Forests were destroyed either to grow staple food or the commercial crops or to graze cattle. This affected the rainfall pattern too.

Thus, because the rich countries are not prepared to give a better price for the agricultural produce on which the poor countries are dependent, the latter have to put more and more of their agricultural lands under commercial crops, which can be sold in the Western market while their own people are being deprived of their basic necessities. Forests are cut down and environment and ecology are being destablised. While, the benefits of these commercial crops are monopolised by a few who could appropriate more land, destroy more forests and cultivate more and more cash crops and thus earn more foreign exchange. The well-balanced systems of managing resources in the environment -land, forest and water - which ensured that these resources were renewed and preserved for posterity, have been destroyed. This is the root cause of drought, be it in Sahel, be it in India.

2.2 What is Happening in Our Country Today?

We see that the same thing, may be in a different way, is happening in India today. Here environment and ecology are destroyed not merely for export earnings but also,perhaps principally,for consumer needs (and greed) of the upper classes. To cater to these needs of the upper and middle classes in India and thereby make enormous profits and earn foreign exchange through exports, which again is used up mostly by these same classes, a few industrial groups have taken control of most of the available resources and are exploiting these resources. As Gandhiji said,"there is enough in nature for everyone's need, but not for anyone's greed." What has happened today is 20% of the country's population have taken over the country's resources, depriving the remaining 80% of their needs.

2.3 The Onslaught on Nature and its Consequences

Traditionally, each community in India had its own systems of distribution and utilisation of resources, be it water, land, forest or fisheries. These systems were based on two principles- distribution and renewal. Though the hirearchies of caste and position in the communities played their role in the distribution of resources, everyone at least got their basic needs. Secondly, the resources were preserved and replenished for the use of future generations.

But with the infiltration of modernisation into the villages, a departure occured, from these traditional systems, which led to a total collapse of the natural balance between man and nature. The Dominant Development Ideology, professed, propagated and practiced by the elite in India, and the corresponding praxis has led to a development process in which the rich and more powerful reallocate the nation's natural resources in their favour and Modern Technology is the tool that subserves this process.1

Today, land and forests are being indiscriminately destroyed. More and more land is used for industries, mines, offices. The poor are deprived of the land for cultivating food crops like millets, ragi, jowar, and maize etc, which are replaced by trees like eucalyptus which go to serve the needs of the big industries. Forests which yielded forest produce and livelihood for a large number of people, who could somehow manage to live earlier, are deprived of their livelihood today. The forests, the land, the water, the common property are being destroyed. The natural balance between rain and cultivation and food is being toppled, in the quest for profit by a very limited class.

2.4 Green Revolution Package

The Green Revolution has led to increased cultivation of a few crops in a few areas by a few individuals. Though it raised agricultural productivity and augmented production, it had adverse effects on the lives of the poor. It led to greater landlessness among the poor, whose lands were increasingly taken over by the rich farmers. With more and more land being brought under Green Revolution technology, resulting in greater mechanisation, there was a decline in the labour use which rendered many of the rural peasantry jobless and induced large scale migration to the cities.

Another consequence of the Green Revolution package has been a considerable reduction in the production of coarse cereals and pulses which constituted the staple food of the poor people, giving way to monocultures of commercial crops. The new high yielding varieties of seeds together with the intensive use of chemical fertilisers and pesticides drained the land of its fertility and the natural soil nutrients. It destroyed the traditional agricultural systems which

had inherent in them, methods of conserving soil and replenishing its nutrients.2

2.5 Exhaustive Water Mining

The same is the case with water resources too. Around 2,00,000 borewells are being bored in this country every year and the water level has gone down from 50ft-60ft to 130ft-150ft due to the exhaustive water mining . The groundwater has been extensively used not only for consumption needs but also to serve the needs of the industries whose demands are far greater. This would also mean that only the rich can use water and it is the poor and more particularly the women among them who are the sufferers. They are deprived of the water they need for survival. Since the water level has gone down, open wells dry up. The panchayats are controlled by the big farmers who can afford tube wells and hence the irrigation tanks and common ponds in the villages are neglected and their maintenance not looked after. The small farmers are thus deprived of water for cultivation and women, of drinking water. The latter have to either depend on unsafe water or walk long distances.

Some participants expressed concern about sea water reportedly seeping into wells in some places in the drought-prone central belt of Tamil Nadu. Replying to this, Dr.Meher-Homji said that due to exhaustive pumping of groundwater, this could happen in the coastal areas. Even in interior areas like the Deccan, it has been found that due to over-irrigation, soil becomes saline.

2.6 Drought - the Problem with Myriad Faces

Drought in India is a complex problem with its roots everywhere and it has become almost a permanent feature on our national scene. Drought occurs even during years of normal rainfall. Therefore, its causes cannot be any longer attributed to natural factors alone.

Droughts and famines were always there, but they have become disastrous for the poor today because there are no resources to fall back on; the resources of land, water, forests, have all been taken away from them; the resources are being destroyed for the luxuries of a few. Forests are treated just as raw materials. Crops are no

longer grown for survival needs, but only to make the maximum profit.This has resulted in the poor being deprived of their land, their water, their crops, their livelihood and even their survival systems. It is the poorest groups, the tribals, the dalits, the landless groups and more particularly the women among them, who are being destroyed in the process.

3. RAINFALL AND DROUGHT *

Drought can be defined in many ways and each of these definitions can also become very subjective. But, according to Dr. Meher- Homji, to identify drought-prone areas,the criteria that can be employed are the amount of rainfall received and the number of rainy days. And the degree of drought - proneness can be decided on the basis of climatic conditions, agricultural pattern, use of water and irrigation facilities etc.

In this context, it would be pertinent to examine what is rainfall and what are the factors affecting it.

There is a difference between dry period and drought and the duration of dryness varies in the Indian sub-continent from zero months in one region to almost 12 months in another region. The factors affecting the rainfall in any particular station are many. In Tamilnadu,the semi-arid zone in Ramanathapuram and Tirunelveli districts receives only scanty rainfall. The particular topography of the zone and its position in relation to Srilanka play a role in reducing the rainfall to the area.

3.1 Rainfall and Monsoon

Here, we have to distinguish between rainfall and monsoon. Monsoon is a planetary phenomenon. There are many factors which affect the monsoon, the temperature of the sea being one among

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* **Note :** Dr. Meher-Homji, Dean of the Salim Ali School of Ecology and Head of the Department of Bio-climatology, Pondicherry University, gave a scientific discourse on the subject of rainfall and desertification and excerpts from it form this section.

them. If the temperatures are high in the sea, the monsoon will be good, but if the sea temperature is low, then it augurs for a poor monsoon. Though the basic features of the monsoon are repetitive annually, there are certain anomalies which affect the occurrence of monsoon rains. "EL NINO" is such a global phenomenon, occuring every two to seven years which results in the failure of monsoons. 1987 was an "EL NINO" year, which witnessed unprecedented drought.3

Rainfall may either be of orographic origin caused by the effect of mountains or of convectional origin, produced by the warming up of the ground surface. Convectional rains are often the most affected by the presence or absence of forest cover.

3.2 Can Forests have any Effect on Rainfall?

It is true that the amount of rainfall and its distribution has an important role in determining the pattern of vegetation. But do the forests affect rainfall pattern?

This question could be answered either by studying the rainfall of two groups of stations which are climatically similar, out of which one group has been subjected to heavy deforestation in the recent past and the other not subjected to such heavy deforestation or by studying the rainfall pattern at the same station where deforestation has taken place on a large scale over a period of time. Meteorologists argue that deforestation has no pronounced effect on rainfall and that in India, rainfall does not show any trends but fluctuates around a mean value from year to year. But when this argument was scrutinised further it became apparent that the scientists while making this observation had taken into account only big cities like Bombay and Delhi which had lost their forest cover long back.

Studies were conducted at 30 stations in the Western Ghats on the basis of several criteria. Hosanagara in Karnataka was a densely forested area before the Lingnamakki reservoir was constructed. But now, in this area, the forest cover has been largely destroyed and the rainfall pattern here shows a considerable reduction in the number of rainy days as well as the amount of rainfall received, following the deforestation. On the other hand, at another station where there has

not been any considerable change in the extent of forest cover, very little variation in the rainfall pattern has been observed.

Historical records show that in Ooty, the number of rainy days in the 5 year period from 1885-1890, excluding the monsoon months (June - August) was 416 days but in recent years this has come down drastically due to the effect of deforestation and the subsequent afforestation programmes of planting Eucalyptus and Australian Acacia in the region.

3.3 Role of Forests in Rainfall Cycle

There are two aspects of forests which come into play in the rainfall cycle. One is as generator of rain and the other, as receptor of the rainfall. Meteorologists are of the opinion that forests have a greater role as receptors of rain than as generators.

Forests obstruct the wind and make the clouds rain. The presence of pollen grains and organic debri in the air act as very good condensation nucleii and help to increase the rainfall. But due to deforestation and soil erosion in its wake, soil particles would be floating around in the air, which, being inorganic matter, need very low temperatures for ice formation and condensation. Dust particles also increase the subsidence or the sinking motion of air and result in decreasing rainfall.

Forests preserve a good amount of the rainfall in the soil allowing water to percolate down into the soil and maintain a high water table. But, deforestation has dire consequences on the water retention capacity of the soil. Forests also keep soil temperatures down, at the optimum level.

Forests have another important role to play in the transpiration of water from the leaves and the evaporation of trapped water from the soil. So, with a good forest cover, dense, moist clouds are formed which can cause rainfall, but in the absence of sufficient forest cover, the winds would be dry. Transpiration, without doubt, is important in the rainfall cycle, but meteorological drought is caused more by the absence of a cooling mechanism which causes the moisture to condense into rain rather than the absence of moisture in the air.

3.4 Albido Effect

Another part played by the forests is in reducing the "albido" effect. "Albido" is the amount of solar radiation reflected back into the atmosphere. A dense forest cover absorbs most of the solar radiation and as a result, vigorous thermal currents are set into motion, which give rise to rain. But without the forest cover, much of the solar radiation is reflected back into the atmosphere which results in heating up the higher strata of the atmosphere. This would augment the sinking effect of air, which could lead to desertification of the land. Needless to say,the amount of convectional rainfall also, would be much less.

3.5 Some Case Illustrations

The hills in Chota Nagpur were once densely forested and used to enjoy heavy convectional rains which favoured the tea gardens on the hill slopes. But now due to deforestation, convectional rains have been reduced to such an extent that it is no longer possible to grow tea in that area. The Nilgiris have been subjected to large scale deforestation to make way for various plantations and as a result,the forest cover here has been greatly reduced and so also the rainfall. Recently, there was a move to put more forest land in the Nilgiris under tea cultivation, which met with heavy opposition and consequently was stopped. There is a similar move to bring forest land under tea cultivation in some districts of Orissa which if carried out could prove disastrous to the severely drought-hit districts of Kalahandi and Koraput.

In South America, some serious experiments have been conducted to study the effect of forests on rainfall in the Amazon basin,which is a densely forested area. It was found that 50-75% of the rainfall here was recycled.

3.6 Conclusion

Evidences from various parts of the world as well as from India point to the fact that forest cover does have an effect on rainfall.

NOTES:

1.Dr.Sen Gupta, Badal 'Alternative Drought Action Forums-Towards NGO Response to the Phenomenon of Drought in India'.An unpublished work on Drought, based on a series of workshops on the subject held in 1987/88.

2.Kothari, Smitu 'Ecology vs. Development: The Struggle for Survival' Social Action Oct-Dec 1985 Vol 35 No 4

3.Quraishi, M.A. 'Drought Strategy'(1989) B.R.Publishing Corporation (New Delhi) pp 88-89

CHAPTER II

A BROADER CLASSIFICATION OF DROUGHT

1. DROUGHT- METEOROLOGICAL AND HYDROLOGICAL

Various theories have been advanced to establish the correlation between several factors and drought, but still in common parlance, the term drought is very closely associated with rainfall and its failure. Under monsoonic weather conditions, as in India, determining what exactly can be counted as drought is a complex issue. " For official purposes of declaring drought, a 25% to 50% departure from normal rainfall is considered moderate drought, while a departure greater than 50% is considered serious drought". " But drought is no longer a phenomenon occuring only in the arid regions with scanty rainfall. High rainfall receiving areas like Kerala and Goa have also been demanding drought relief, of late ". This necessitates a look into the different forms of drought and the various causative factors for it.1

" The special situation in which rains do not arrive in time or in adequate quantity is only one form of drought - meteorological drought. There are many other processes through which scarcity gets generated". What needs to be understood in this light is the link between meteorological drought and hydrological drought - by which we mean the depletion of water resources with regard to surface water, soil water or groundwater systems. All these sources are inseparable and are very much interlinked through the water cycle . For instance, perennial rivers get their water from the rains during the rainy season which recharges the groundwater and maintains the river's flow throughout the year . Hence any disturbance in the water cycle could lead to hydrological drought.

Note: We felt that in addition to the discussions held in the workshop, we need to provide a detailed classification of Drought and its various contributing factors to present a more comprehensive picture of the problem; hence this chapter.

As we have dealt in detail with meteorological drought in the first chapter, in this chapter we shall endeavour to look into the factors causing hydrological drought, which can be further divided into surface water drought, soil water drought and finally groundwater drought." Deforestation and hydrological destabilisation in the mountain catchments of rivers can make the rivers and streams dry up in post - monsoon periods, causing **surface water drought**. Soils can lose their effective moisture conserving capacity leading to **soil water drought** again, inspite of a normal rainfall and good catchment. Excessive pumping of groundwater can create an almost irreversible groundwater drought even if rainfall and soil conditions are good ". We will also include in our analysis how these resources have been depleted by the intervention of modern technology into our eco- system and its linkages with drought.2

2. HYDROLOGICAL DROUGHT

2.1 Surface Water Drought

Surface water drought is the drying up of surface water sources like streams and rivers. This type of drought occurs due to the destruction of hydrological stability of the water source in a particular area. It has been proved scientifically that the major cause for such a situation is the reduction in forest cover.3 A classic example for this is the drying up of Cherrapunji due to failure in maintaining the ecological process which allows rainfall to infiltrate and percolate below the ground. With the destruction of the hydrological capacity of the mixed natural forests in the catchment, the 12,000 mm. of rainfall in Cherrapunji instantly runs off, accentuating the flood situation in Bangladesh. As soon as the monsoon is over, springs and streams start drying up and water scarcity haunts what was once the wettest spot on earth.4

2.1.1 Replacing Catchment Forests by Plantations

A major reason for the surface water drought is the indiscriminate destruction of forests in the catchment areas of rivers. And replacing these vanishing forests by profitable monoculture plantations of

commercial species like pine or eucalyptus has contributed to the failure in maintaining the natural water cycle in catchment areas. Studies have pointed out that pine and eucalyptus fail to provide adequate defense to the soil against the direct hit of the rain drops during intense storms. Their ecological instability also comes from their very poor contribution to humus formation. Eucalyptus plantations take away a major portion of the moisture remaining in the soil through evapotranspiration. As a result of the cumulative impact of these processes over 10 years, the water yield of experimental plots in the Nilgiris showed a significant decrease when the natural shola forests and grasslands were replaced by eucalyptus plantations. 5

2.1.2. Mining and other Causes

" Other causative factors for surface water drought are ecologically hazardous mining, reckless road construction, overgrazing of lands in the catchment areas and construction of big dams. In South India, iron ore mining in the Western Ghat watersheds of Tungabhadra is creating a situation of drought by reducing base flow and increasing the silt load in the river ".

2.1.3.Big Dams - How Viable Are They?

Construction of Dams was intended to provide irrigation and ensure more food production . But studies show that 3/4ths of the country has in no way gained from the water resources stored in the dams and also confirm the fact that dams have neither effectively controlled floods in the country nor has the drought protection expected from them been met. " The reason why inspite of such heavy investments these dams are not able to perform as expected lies in the non-ecological foundations of the engineering structure based approach. At the basin level no attempt has been made to improve 'in situ' water conservation while a small fraction of the total agricultural land has been blessed with excessive water supply, ensuring the most inefficient use of water for irrigation. The overall efficiency of water use in large dams is of the order of 35%-40%. Instead of seeing 'in situ' water conservation and smaller dams as complementary to big dams, they were seen as inefficient competitors. This non-ecological approach has resulted in excessive silt inflow into the large dams and reduced water holding capacity. Intensive irrigation based agriculture in India, thus, by virtue of its all-out dependence

on non-local inputs, will not be able to ensure food and nutrition security on a long term basis ".

" This of course should not lead us to assume that storage of water by dams and its transfer is altogether inefficient. Water needs to be stored. But the form, scale and period is a matter still to be optimized on ecological grounds. Without such an effort, the crisis of surface-water drought independent of rainfall will further deepen ".

2.1.4. Surface Water - A Decreasing Resuorce

" Year - round availability of surface water is not only essential for irrigation but it is the only source for large scale supplies to the urban-industrial sector and for hydro-power generation. Surface-water drought, thus, undermines all these activities. The reason has been that water resources development in India has been limited to utilization and has not touched ecological husbandry ".6 Thus there is an increasing competition for a decreasing resource.

2.2. Soil Water Drought

Soil water drought means non-availability of water in the soil which is essential for plant growth. All soils do not have the same resistance to drying up and need different water inputs. Organic matter increases water holding capacity and hence soils rich in organic matter do not dry up quickly. In India, the soil water balance had been efficiently maintained with the use of canals, anicuts, tanks and wells which provided water for ecologically suited crops. But when large scale canal irrigation system entered the agricultural scene, it brought along with it a qualitative change in crop selection,increased use of organic fertilisers and pesticides and need for frequent irrigation.7

2.2.1. The Effects of Green Revolution

" The Green Revolution package of improved seeds, heavy inputs of fertilisers, pesticides, water, energy, machinery and agricultural credit - much of it deliberately subsidized to stimulate production - led to astonishing productivity increases in parts of Asia and substan-

tial foreign currency earnings from the export of commodity crops ".[8]

But the very policies that brought these benefits have led farmers to practices that can have severe environmental consequences. " The intensive irrigation needs of Green Revolution agriculture have created a largely wasteful water requirement in the hope of increased food production in the limited areas where this irrigation has reached. The ecological impact of such irrigation has been, in several areas, large scale water logging and development of wet deserts in fertile agricultural land and increased salinisation. Further, this agriculture is so precariously dependent on irrigation that any delay in supply, either due to actual water scarcity or due to mismanaged distribution will enhance serious soil water drought ".[9]

2.2.2. Chemical Fertilisers and Pesticides

" To maintain soil fertility they excessively apply subsidized chemical fertilizers which run off the land and pollute streams, lakes and estuaries. And they have come to rely on heavy chemical pesticide spraying rather than on an integrated approach to pest management that is more effective and economical in the long run ".[10]

2.2.3. Degradation in Dry Land Farming

The Green Revolution package apart from affecting the land and crops has also changed the cropping pattern in many areas which in turn destabilised dry land agriculture. " Since irrigation could not reach all agriculture fields and irrigated agriculture preferentially got full national financial support for inputs, farmers focused their attention on irrigated lands. Dry lands suffered from lack of attention which led to the degradation of dry land agriculture ".[11]

2.2.4. Less Organic Matter in the Soil

" Loss of drought resistance was further enhanced by the reduced crop residues that go back to the soil as organic matter. Inorganic fertilisers and intensive irrigation create the problem of 'lodging'. As a solution dwarf varieties with much less non- grain biomass productivity have been introduced ".[12] Hence all the above discussions go

to prove that the present day drought and desertification are the results of lopsided technology intervention into our eco-system.

2.3. Groundwater Drought

Groundwater is the major source of our drinking water. People living in arid and semi-arid areas had a traditional system of harvesting rain water in a series of small tanks in order to enhance ground water recharge. Whenever there was a failure of monsoon or rain the groundwater was an important source to face the water shortage for them.

2.3.1. Increased Exploitation of Groundwater

But this scenario changed when energised pumps and credit for purchasing them came in along with the green revolution package in large quantities and that contributed immensely to the rapid depletion of groundwater. The use of groundwater for agriculture increased phenomenally from the late sixties onwards due to the advent of high yielding crop varieties, mobilization of institutional resources for financing the programmes and stepping up of rural electrification.

2.3.2. Groundwater Drained off by Borewells

" Most groundwater utilization in India is from the shallow aquifer zone with depth less than 400-500 feet. While pumps have been distributed liberally to encourage irrigation in arid and semi- arid areas, the close hydrological link between the local surface water sources, dug wells and shallow aquifer borewells, have not been given due importance. As a result, while drought is getting mitigated for the farmers growing cash crops, energized pumpsets are creating new drought for marginal and poor peasants by draining down the water table to below their reach. This phenomenon has become so pervasive in the hard rock areas of Maharashtra, Karnataka, Andhra Pradesh, etc. that large areas have been black-listed to stop groundwater over-exploitation".[13]

2.3.3. Sugarcane Cultivation Affecting Groundwater

A concrete case study of groundwater depletion is given below to make clear how modern technology contributed very much to this process.

"In Maharashtra, depletion of groundwater can be directly linked to the expansion of energized pumpsets, particularly to irrigate sugarcane. While sugarcane is cultivated on only 2% to 3% of Maharashtra's land, it consumes several times more water than the other irrigated crops. This has necessitated the intensive use of groundwater leading to drying up of wells, both shallow and deep. The sugar factories have been actively supporting their shareholders in deepening their borewells. As a result public wells and shallow wells belonging to small farmers have run dry. During the Sixth Plan, 15,302 out of 17,112 villages with water problems were provided with water, leaving only 1,810 villages as problem villages. Rapid depletion of groundwater resources has, however increased the number of problem villages with no source of drinking water to a staggering 23,000. This tremendous scarcity is clearly linked with the over exploitation of groundwater for sugarcane and repeated failure of food crops. The government, refusing to recognise the role sugarcane is playing, cites drinking water scarcity as the reason for increased grants for water development and failure of food crops as the reason for drought relief".[14]

2.4. Conclusion

To conclude, it could be said that drought is not a phenomenon associated with rain alone ,but arising out of several man-made factors as we have described in the above four categories of drought.

Our attempt here is only to provide a brief introduction to the causative factors of drought; but there are several studies and reports which could be of help for further references, which have been included in the Bibliography.

NOTES:

1. **Dr. Bandyopadhyay, J.** 'Ecology of Drought And Water Scarcity' Need For An Ecological Water Resource policy , Research Foundation For Science and Ecology , Dehradun, India. pp.1-2.

2. **ibid**.p.3.

3.4.5. **ibid**.pp.7-9.

6.7. **ibid**.pp.12-15.

8.10. **Welsh, B.J.** 'Poverty And Environmental degradation' World Resource Institute, Washington. pp.27-28.

9.**Dr.Bandyopadhyay**, J. op.cit.p.16.

11.12. **ibid**.pp.16-17.

13. **ibid**.p.22.

14.**ibid**.p.26.

CHAPTER III

RESPONSES

1. INTRODUCTION

The response of the Government to drought and the varied problems arising from it has been mostly relief-oriented and consequently the programmes too, by and large, fall into the category of relief and welfare measures.

" The responses of the Government are largely relief based programmes unrelated to causes and character of drought - politicisation of drought, enlargement of public distribution system, enhancement of State intervention/control and increase in subsidy and loans leading to greater dependency of the people to the Government ".1

2. NGO RESPONSES AND EXPERIENCES

Some of the participants who had been working in the area for quite a number of years shared their experiences. Most of them said that they had had a relief oriented approach to drought earlier.They dug wells and deepened the existing wells.They tried to provide alternate employment to the people and thereby check their migration to other areas and cities. They also organised the people into sangams and encouraged them to take up the general issues of their villages.

2.1 A Change in Approach

But slowly, some of them realised that these were all short term solutions and decided to change their approach to the problem of

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Note: Since we did not go in depth into the aspect of government's approaches and programmes during the workshop, it has not been covered extensively in this document.

drought.One organisation found out that there was sufficient amount of rainfall in the area, but the water was not conserved or managed properly.They felt that this could be done only through the development of the watershed. Another organisation started organising the women and educating them on the inadequacies of the government programmes. Yet others felt the need for evolving a policy plan that could be implemented by the government.Some members elucidated how they were giving training to the people on technical aspects by involving experts. Awareness building on drought was also concentrated on. One participant spoke about the problems he encountered from the government and the rich people who tried to create problems by instigating caste conflicts among the people, while efforts were on to develop a micro watershed.

2.2 Drought - An Issue to be Tackled

At the end of the sharing what became apparent was that they have all recognised drought as an issue that needs to be tackled to alleviate the condition of the people. But the reality and magnitude of the problem had not struck home for a few - they were still talking about digging borewells to combat drought. Much importance was also given to mobilising the people towards empowering them. But with migration rampant in the region, mobilisation was a task difficult to fulfil. Mobilisation only if it goes hand in hand with drought - proofing measures, can check migration.

3. TECHNICAL RESPONSES

3.1 Social Forestry

Social forestry is the most talked - about measure of the government to try and set right the ecological balance. With the issue of environmental conservation gaining importance all over the world the need to conserve forests has been recognised by our government also. Afforestation appears to be a very logical solution, as it tries to reconstitute the forest cover that has been destroyed.But the afforestation programmes as they are carried out today leaves one with many questions regarding their feasibility. They may lead to green

deserts rather than providing a safety valve against the ecological disaster looming over our heads.

3.1.1 Social Forests- the Ideal and the Practice

A forest should consist not only of trees, but also of plants,creepers,shrubs,bushes and an undergrowth of lesser plants and grasses.The trees should have economic and social relevance for the immediate society.A forest of mixed species would provide the region with food,fuel, fodder and various other means of living. Such a forest would ensure that the soil-moisture would be retained and soil erosion prevented and would rightly justify the word "social forest", because it sustains the neighbouring rural society. But today, social forestry efforts have been more or less limited to the planting of monocultures like eucalyptus, which do not provide any of the requirements of the rural people. The people are robbed of their food, fuel and means of survival because of these social forestry programmes. These trees do not offer shelter from the sun or rain nor do they prevent soil erosion, nor provide manure, not to speak of their dubious role in further depleting the groundwater resources. Their only use is in providing timber for the industries, which fact leaves no doubt about the class that benefits from the social forestry efforts-the industrialists and the rich powerful class. Where therefore does this leave the people who are already suffering from the after-effects of the ecological imbalance? Where they always were - at the receiving end of further marginalisation by the government programmes.

3.2 Dry Land Farming

While tackling the current crisis of water resources, one has to break away from the traditional approach to water resource management, which is mainly a legacy left behind by the British agriculture and irrigation experts who made us dependent on large canal systems for irrigation. Much before the arrival of the colonial rulers, agriculture was thriving well in the dry areas here. Sophisticated water management and agricultural techniques which were evolved particularly for the dry areas, protected the land fairly well from soil water and groundwater droughts in these rain-fed areas, which constituted a large portion of the country's land. Even today, about 70% of the

cultivated area in the country is dependent on rains and this area produces 42% of the total food production in the country.

But the Green Revolution technology has largely neglected these rain-fed areas and their development giving priority only to the areas of already assured irrigation. Though Green Revolution helped in achieving self sufficiency in food grains, we made no breakthrough in dry land farming and as a result, the farming practices which were very much suitable to the dry areas fell into rapid decline.2

It is time we rediscovered the dry land farming techniques which were used by our forefathers and took efforts to promote them. The positive aspects of the indigenous wisdom of land and water management and the cropping systems in dry areas should be made the starting point of the new water resource policy and not the assumption that it is only through the intensive irrigation based Green Revolution agriculture that we can feed our people. Our water resources policy must encourage 'in situ' conservation of water as against the large dams.

The development of micro watersheds, contour farming, contour ploughing and cropping patterns like mixed cropping are a few of the dry land farming techniques which had been in use in our country earlier and they need to be encouraged and fostered so as to fulfil the present day requirements of dry land agriculture.

3.3 Water Shed Management *

In our country, 2/3rd of the land is still dependent on rainfall for cultivation. To mitigate the impact of drought and to improve the productivity of dry land areas, the development of micro water sheds appears to be a plausible solution. This has been taken up seriously by the Government and water shed development programmes have been initiated in many of the states. The Karnataka Government has

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* **Note :** Mr.K.V.Bhat, from the State Water Shed Development Cell under the Government of Karnataka, explained the objectives of the Water Shed Development Programmes undertaken, particularly in Karnataka and how they were carried out.

started 20 watershed development projects in various districts to suit the 10 agro climatic zones in the state. The projects envisage the augmentation of water resources on an integrated basis with situation specific treatment.

3.3.1 Soil Erosion and its Effects

Cultivation on the non-arable lands and hillocks leads to the erosion of top soil from the ridges down to the valley. This could give rise to sheet erosion in places and sometimes, lead to formation of ravines. As a result 20-25% of the cultivable land would become non-cultivable.Soil erosion is also a factor which causes agronomic drought on account of the poor moisture retention capacity of the soil. Each year, in India, Rs.8000/- crores worth of soil nutrients are lost due to erosion which is nearly 300% above the tolerance limit for maintaining the productivity. This should be a matter of serious concern to us, as it would definitely have an impact on the agriculture scene as a whole, a few years from now.

3.3.2 Watershed and its Objectives

Watershed can be defined as the area having a particular drainage point. The objectives of watershed management can be briefly summed up as conservation of soil and rainwater and sustaining land to use based on its capacity. This could be achieved through i) development of arable and non-arable lands ii) evolving alternate land use systems for marginal and submarginal land iii) in-situ conservation of rain water. This programme is primarily people-oriented and the development and implementation of such a plan is carried out based on the people's preferences.The selection of treatment is also made on their consent from among the available alternatives.

3.3.3 How Water Shed Development Is Initiated

Prior plans would be made for developing an area, considering the preference of the people, down to the last detail and development activities would be carried out in accordance with this plan.The officials, before planning a programme for a particular village, visit the village and meet the villagers together. In the first meeting the villagers/beneficiaries of micro watershed are explained about the programme, the approach, the benefits which they can get out of the

programme, their role in it, etc. Then they ask the villagers for their opinion on how the area should be developed. They study those suggestions which would come from the villagers and after that they go to each of the fields and farms along with the farmers and study their situation. Then, they prepare the treatment which they present to them in the second meeting. In this programme, the people's participation is given top priority unlike in many other programmes. People are involved at every level right from the beginning and all the community aspects are dealt by them. Once the land is developed, it becomes the duty of the farmer to maintain the private developed land.

3.3.4 Land Treatment

The treatment starts with the ridges and goes down to the valleys. In order to protect the top soil on the ridges, trees or plants are grown wherever there is top soil and this vegetation binds the soil.It also provides fodder and develops a good canopy. Going down the slope, if the soil is better, block plantations or forestry development are initiated there,with plants having varied uses to the local people.

Contour trenches or "V' ditches of 4m*50cm*50cm in size are dug at the rate of 500 trenches per hectare. These trenches help in water harvesting and checking of erosion.The water shed would be available for underground recharging of water at a very low cost. Trees are planted on these trenches at the rate of 4 plants per trench. These trees supply fuel, fodder, food and also provide a good canopy. The block plantations, once developed, would give the people fuel, fodder, and minor fibre which they can harvest at various intervals. One of the plants, either economic or some fruit yielding variety would be retained in the trench permanently to develop a good canopy as well as check soil erosion (due to splash effect).

An alternative option in submarginal lands is to grow agave plants, which find extensive uses in various fields. The cultivation of this plant has been found to be very economical. Employing an agri-horticultural system of cultivating fruit trees like mango, amla etc., is also found to be helpful in developing marginal land and economic in the long run.

3.3.5 Measures to Conserve the Run-off Water

Once the non-arable land is treated, diversion channels should be provided which would take away the excess run-off water to natural nallas or percolation tanks. These channels reduce the inflow of water from non-arable to arable land which would also check the erosion in arable lands. The excess water is diverted and conserved in water nallas through percolation tanks or by means of any water harvesting structures like check dams, which would be highly useful in rainfed areas to increase the ground water recharges . The water collected in such structures can also be used to give life saving irrigation to crops and to rear fish which would provide additional income to local people. In the arable lands the graded bunds are stabilised with vegetation and it would have a wost vier to take out excess water from the field to the waterways. The waterways are also laid between the fields to make provision to harvest from the field and to lead to farm ponds. The water so harvested is used in peripatetic irrigation.

3.3.6 Cultivating the land

Before cultivating the arable lands, the first step is to level the humps and depressions on the land. Then the farmers are asked to cultivate along the contours, and lay out small section bunds. These bunds are stabilised by planting vetiver grass or salosantha hemat.

3.3.7 Increasing the Productivity of Arable Land

All these treatments form part of an integrated approach and are expected to increase the infiltration of water into the soil,thereby improving the availability of moisture for crops. The productivity of arable lands could be improved by the following 4 steps (1) ensuring availability of water to plants, (2) enhancing the availability of nutrients, (3) improving the greater character of plants and (4) following better cropping packages. All these four factors are taken care of in water shed management to enable the farmers to realise the impact of this approach, explained Mr. Bhat, who represented the Karnataka Water Shed Management Cell.

3.3.8 Some Critical Questions

Answering questions from the participants, Mr. Bhat said there was no ground for any possible conflicts with the forest department, as the watershed management authority was entitled to develop those areas,which were notified under the gazette and they could develop those areas,even if they came under reserve forests, without destroying any existing vegetation. (The situation could be different in Tamil Nadu.) He also made it very clear that under this project, no irrigated land need to be developed. As for the cost component, the development charge which would be elicited from the farmers would be proportionate to the extent of land which needs to be developed for each farmer. The participants raised serious questions about who would benefit from these programmes ultimately, with the land being as unequally distributed as it is at present. Mr. Bhat conceded that there could be a benefit of site which would go in favour of some of the farmers, like for instance, if the higher land is being developed, the person who owns the land below would also enjoy the benefit of it.

He went on to say that the people themselves know how to conserve and preserve the forests and the environment,but they need to be provoked a little and their thinking developed on those lines.He gave the example of a village near Ahmednagar, where the whole village collectively took up the watershed management programme and a new awareness was growing among them that water was the common asset of all the villagers. In another village in Tumkur district, the villagers themselves decided to stop their goats from grazing in the forest land, having realised that they had to allow the vegetation to grow. He was of the opinion that there was an increase in the standard of living of the people in the developed area due to improved farm production, increased employment opportunity and augmented water resources. This view, however, was challenged by some of the participants in the workshop.

4. ECO DEVELOPMENT - AN NGO EXPERIMENT *

RDT is an NGO working in the drought affected district of Anantapur in Andhra, where some pioneering work in combating drought, both from sociological and tehnical angles, has been initiated. They are working with 15,000 families. The main crop in the area, now, is groundnut. There is hardly any forest cover left in the region, which is a frightening reality.

4.1 Beginning of an Ecological Perspective

When RDT started their work in 1979, the focus was very much on community organisation, education, community health, women's development and vocational skill training. This continued till 1986, when the programmes were analysed and it was found that there was a pronounced impact on the lives of the people in all the aspects mentioned above - health, literacy, nature of work, leadership among women etc. But following three years of continuous drought in 1984, 1985 and 1986, there was a regression in the impact. There were starvation deaths and large scale migration. At this time, RDT realised that if the problem of drought was not attended to very seriously, all the other programmes would come to nought. Drought was the important issue in the area and this realisation prompted RDT to start working with an ecological perspective.

4.2 Objectives and Programmes

The objectives of their work were to minimise the extent of drought and more importantly to enhance the poor people's capacity to withstand drought. They are involved in experiments related to soil and moisture conservation and putting up water harvesting structures like small percolation tanks and taking steps to preserve the precious top soil, which has been very badly depleted. The rainfall

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* **Note :** Mr.Malla Reddy, Assistant Director, Rural Development Trust (RDT), Ananthpur, presented at the workshop RDT's experiences of combating drought.

in the area is very low and so it is vital that the rainfall be harvested in the area where it falls. Though the programme of watershed management includes both target and non-target people, special programmes have been designed for the target people, promoting dry land farming practices among them, such as contour ploughing, contour bunding etc, to name a few and making compost which can be used in the place of chemical fertilizers which are quite expensive and at the same time, very harmful. They also promote horticulture, particularly cultivation of mango trees which are well suited to the environmental condition there and kitchen gardens, which could provide an alternative source of income in case of drought or crop failures.

Under waste land development farm forestry, they promote the cultivation of local flora, those trees which were growing in the area earlier,like neem, tamarind, soapnut etc, and useful to the people, cultivated in areas where cultivation of groundnut or food grains is not possible. They are also negotiating with the government to assign hillocks which have been denuded of all vegetation over the years to the local communities for cultivation and afforestation. In two places, the government agreed to let the community own the land or at least claim the fruits of their labour for themselves. Surprisingly,50% of the vegetation they had planted was surviving even after the first year. But, as far as the drought programmes are concerned, they are still in the initial stages and the progress is very slow, considering the resources and labour spent. They also realise that it is necessary to relate to others who are facing similar problems even in other regions and together work out newer options.

4.3 Points to Remember

Two important points were made by Mr. Malla Reddy, who explained the programmes of RDT. One, unless we attend to the problem of drought in a drought-prone area, all our efforts in any other direction would be in vain. Two, it is important to identify those with whom we are working. For the government and others, the priority is land and its development. But for us, who are working with the people, the poor people, unless they are made part of the development process, all the work would be futile and this process

should involve creating awareness at the micro level with a macro perspective.

4.4 Feasibility of New Irrigation Techniques

Referring to the new methods of irrigation like dry irrigation, sprinkler irrigation, etc., he said they need to be explored further to see whether the introduction of such methods would benefit the poor. Technology is often a tool in the hands of multi nationals, which they wield for furthering their interests and exploiting the poor.

4.5 Question of Land Holdings

The question of land development becomes difficult when the land holdings of the rich are also involved. But in such situations,local solutions have to be found and in some cases, there could even be dead ends. But we have to work through those difficulties and arrive at solutions.

NOTES:

1.From an unpublished document on the workshop, **"Alternative Drought Action(?): Conceptual Perspectives, Strategic Options, Challenges and Limitations"**.Udaipur, June 1988

2.**Quaraishi,M.A.**'Drought Strategy' (1989) B.R.Publishing Corporation, New Delhi.pp.19-21.

CHAPTER IV

CHALLENGES, PERSPECTIVES AND NGO ROLE

1. The Challenge before NGOs

What is the solution? Today what is being done by way of measures to combat drought is relief, relief that gives rise to some employment and consequently wages. But these relief programmes more often than not, further destabilise the ecological balance, thus giving rise to more drought and resultant poverty. None of these measures tackle the root causes of drought. Therefore,what we need today are measures for drought - proofing, measures that would help in rebuilding the resources, in re-establishing the ecological balance.

This has to be done by reviving the bio-mass around us- the trees, land, water, animals, birds, human beings; but mere revival will not be enough because the poor do not have access to the resources. So the revival of the resources should go hand in hand with the establishment of a new distribution mechanism, an ownership pattern that would give back to the poor the livelihood that was taken away from them as a community. The community should take charge of the resources and rebuild the resources and with that the ecological balance. This could be the only solution. And that is the challenge before the voluntary organisations today.

2. A Geo-political perspective

NGOs need to develop a perspective based on agro-climatic belts and a common strategy to deal with and tackle an issue of this magnitude. This would mean recognising the fact that drought cannot be combated by people working individually to try and arrest its impact. As part of the strategy, a perspective plan should be evolved with definite guidelines to facilitate collective action and that plan would need a collective and sustained effort to make it work. Such a collective effort would be possible only if there is common

understanding of the problem and cooperation among the various organisations operating in the affected areas.

3. Need for Collaboration

This calls for collaboration; collaboration between various organisations, or rather, social activists who can bring the community together for a common cause and get the community to act on it, to work together with research institutions, technical institutions and mobilise these human resources to act together for the revival of the surroundings and the community.

Drought is a colossal issue and cannot be tackled by bringing about a change in the 40 or 50 villages that an NGO works in. It has to be taken up by everyone within the agro-climatic belt to bring about change. The voluntary organisations have to identify their strengths and work together with others so that they could complement each other and thereby strengthen themselves. Secondly they have to understand the magnitude of the problems created by drought, most important among them being migration and the impact of migration on the lives of the people and more particularly on the women. Thirdly they have to take the assistance of support institutions and universities and along with them develop a common perspective and plan to combat drought.

Not only should there be collaboration between NGOs but also among the people's organisations of the particular belt. This has to be facilitated and encouraged by the NGOs, at least initially.

4. Reintroducing Old Systems

NGOs need to deal with the causes of drought and try to reintroduce the coping mechanisms which the weaker sections have been deprived of, such as the well-conceived and well-carried-out systems for the maintenance of ponds and tanks which had been in prevalence in the earlier days. There was a definite inter- relationship between the people, land and water, which we are sadly losing or have already lost today. For example, earlier the people used to desilt the village tanks every year. The silt used to be utilised for thatching or as manure for the fields. The people used to take charge of the

resources themselves and meet their needs as well. Now with no mechanism to cushion the harshness of drought, they have become totally dependent on government relief for their livelihood.If the present situation needs to be changed, it is essential that these long-forgotten mechanisms for coping and survival be ressurected in today's context.

5. Using Participatory Action Research

These traditional systems and mechanisms can be brought to light using Participatory Action Research, where the people themselves are the researchers and researched, both. This could be an effective methodology to work on the issue of drought where they could, on their own, rediscover the traditional systems of water conservation and management. It can bring out the impact of drought on the land, on agriculture and the people. It could highlight the impact of migration on women, children and the dalits on the one hand and on the other, it can bring to light the traditional systems for preserving the soil, the kinds of trees that were grown, crop patterns, and systems of agriculture.

6. Long Term Perspective for Agriculture

In the same vein, there is a need to develop a long term perspective where agriculture is concerned. Our lands have retained their fertility over the centuries because of the judicious cropping pattern of our ancestors. We also need to take the same precautions so that the land will be available for future generations.

The cropping pattern of the drought-prone areas should be carefully looked into and those crops which require less water and help in replenishing the water table and increasing the moisture in the atmosphere, need to be increasingly popularised. Crops should be such that they provide food for the people and fodder for the cattle.Considering the urgency of the situation, some hard decisions may have to be taken, regarding the eating pattern of the people. As one of the NGO leaders pointed out, high yielding variety paddy brings in more income but it also brings with it a lot of extra expenses like the cost of fertilisers,pesticides etc. Added to this, they provide very less fodder so the farmer has to buy it, which is not the case

when normal varieties of paddy are cultivated. Scientific innovations should not look at production alone, but at the needs of the people too.

The NGOs have to try and evolve a common agricultural pattern for an area making use of the expertise of the various resource agencies and of the people themselves. Only then will they be able to influence the government when it introduces a programme like sericulture development, which would not provide the people with any of their needs like food, fodder or fuel nor would give them a steady income. The value of their produce in suh a case would be determined by a market alien to them and they themselves would be alienated from their land as it affects the fertility of the soil.

7. Developing New systems of Water Conservation and Utilisation

Today, in the name of development, concentration is on individual tube wells, most of them owned by rich farmers.Tanks and other community resources are badly neglected. The national water policy itself lays much emphasis on the construction of large dams, with dire consequences to the lives of the poor. Legislation seems to be reinforcing this trend towards the monopolisation of common resources by the powerful individuals.

We need to realise that borewells are not the answer to our water problems. They will only worsen the situation. We ought instead, to develop new systems of water utilisation and conservation, or rather, bring to light the old methods, which have gone into disuse.

8. Policy Research and Review - How and Why

Policy research and review is another area that the NGOs should focus on. This could become absolutely necessary in situations where the policies adopted by the government are in conflict with the interests of the poor people. To illustrate the point further,as one participant pointed out, the government could easily introduce a lucrative plan to install sugar factories in a drought affected district under the guise of providing employment to the people. And the consequences such a policy would have on the people's lives would

be to cause more misery and hardships. The meagre water resources of the area would be exhausted and the land would lose its fertility rapidly. And all the benefits would accrue to the industrialists or the rich landlords. On the sociological side , there would be migration and community and social life would suffer. Worst of all, the produce of the land would not be sufficient to feed the people. In such cases, the NGOs have to take a clear stand and pressurise the government to review its policies. Another case in point could be the new National Water Policy (1987). Its original draft did not mention women even once, though they are responsible for keeping the household supplied with food and water, in the present division of labour.

While taking position on any policy which adversely affects the poor, NGOs need to be armed with sufficient concrete data. Taking sugar cultivation for example,there should be adequate data to show how precarious the ground water level is due to indiscriminate exploitation for the crop, using tube wells, that could well have been financed by the industrialist, the rate of migration, the hardships caused to the people on account of migration, especially to the women,the loss in fertility of the soil etc. In order to carry out policy research which would unearth the required data, the NGOs can collaborate with the technical and research institutions in their respective areas. The findings of any research, or any relevant information for that matter, should be shared with the people, and that can help bring about social action, by mobilising the people to protest against policies that are against their interests.

9. Tools NGOs could use to Disseminate Information

Appropriate methods should be used to disseminate information to the rural poor people to lead to any kind of mass action. Street theatre could be one medium. Other popular modes of communication like folklore, village plays, dances, villupattus etc. can be used effectively to create awareness among the people about the ecological crisis,the need for afforestation, conservation of soil and water, the dangers of tapping ground water limitlessly and so on. These are simple media that the people can comprehend easily and the use of these media in creating an environmental awareness among the people can help bring about a people's movement for environmental reconstruction.

10. Collaboration in Government Programmes

Any action, to be really productive, calls for collaboration with the Government. It is unfortunate that we, NGOs, often work in isolation from other agencies. As far as Government is concerned, NGOs tend to take an either-or position. They may either take an anti-Government stance and not cooperate with the Government at all, or blindly follow without challenging the perspective or rationale or approach of a particular Government programme. Both these positions seem to be unwise.

The government when it introduces a project like social forestry which has been acclaimed by scientists to be one of the solutions to tackle the causes of drought, it is up to the NGOs to collaborate with the government on this programme or not. By working together, they could influence the choice of trees or organise the people to do it so that the benefits of the forest go to the community surrounding the forest and cater to their needs. If there is no collaboration, it is the people who stand to lose. NGOs should also point out the disparities in the policies and functions of the various departments and try to bring about a change so that there will be coordination and therefore efficiency and effectiveness, in the formulation and implementation of the programmes for the poor.

11. Developing Community Assets

But it is also necessary to develop the common assets of the people so that they will be able to support the programmes. For instance,it is essential that grazing lands for the cattle are developed, or else the people will have no option but to allow their cattle to graze on the saplings under the social forestry programme.

12. Need to Develop Relevant Technology

Every technology has its own environment and context. Western technology might not be adequate for our needs. We should try to modernise our local technology and traditions in collaboration with our technical institutions to suit our needs. It would be the job of the NGOs to familiarise these technologies to the villagers.

13. Focus on Rebuilding Community

While the technical aspects are important, re-building the people's community has to receive the first priority. The concentration in soil and water management and afforestation programmes cannot be primarily on techniques.The most important aspect that should concern us in afforestation programmes,is what is planted and who has access to it and how it benefits the community.

It is very important, to examine how drought is perceived, whether it is from a purely technical point of view or from a sociological point of view. Drought could be seen as a problem in itself and dealt with technically, presupposing that once the problem is solved, the benefits would naturally go to the poor. But this is a very wrong assumption which has been proved false time and again in our own experience in tackling various problems. A purely technological solution can, on the other hand, further intensify the existing inequalities because the basic problem centres around ownership, not technology.

14. An Alternate Vision

In all our efforts, we should never lose sight of the people who are our focus - the marginalised women, the children, the dalits and the marginal farmers and landless labourers. The programmes like social forestry, water shed management, should not become instruments in the hands of the powerful to further marginalise the poor. This necessitates a realignment in the ownership and power structures. This can be brought about by using participatory pedagogy as a tool. This is a long term vision but our immediate task can be providing alternate employment to the people so that migration and further land alienation is arrested and people can take part in this process. Only the poor woman/man's attachment to the land can arrest drought. The real caretaker of the land and the environment can only be the poor woman/man because to them, Earth is the mother.

CHAPTER V

SPECIFIC ORIENTATIONS FOR ALTERNATIVE DROUGHT ACTION OF NGO'S IN INDIA - A SET OF 'CRITERIA'

-by DR.BADAL SEN GUPTA
CONSULTANT, EZE

I. Alternative Drought Action shall be based on community's and people's action.

1. Alternative drought action of the NGOs in India should emerge from or build upon the initiative of the people. It should be decentralised, community based and multi-dimensional, social and economical action of the organised poor at the micro-level.

2. All alternative drought action should be based on people's vision, facilitating and ensuring people's action at all stages of planning and implementation.

3. All assets created through alternative drought action programmes shall be for the entire community of the marginalised people, to be owned and managed by them.

II. Alternative Drought Action shall be directed to the most neglected eco-regions and to the most marginalised societal groups.

4. Alternative drought action of either single or several NGOs, to be a societal action, should ideally attempt to relate to and cover eco-regions coinciding with administrative (geo-political) areas.

5. Alternative drought action of the NGOs in India should be directed to the most severely drought-affected areas. Thereby, priority should be attached to those areas which, in the present inter-regional power context, are perpetually the weaker and neglected ones.(e.g. Orissa compared to Uttar Pradesh or Gujarat)

6. NGO-related alternative drought action should be exclusively directed towards the most marginalised groups, among them to marginal and small farmers and to the landless.

7. Alternative drought action should primarily relate to Dalits and Adhivasis.

8. Among the marginalised, the primary focus of the drought action in India should be on WOMEN and CHILDREN.

III. Alternative Drought Action shall be multi-dimensional and an integrated cultural, social, political, economic and ecological action.

9. Alternative drought action of the Indian NGOs should necessarily attach high priority to appropriate ecological measures, e.g. afforestation, dry-farming, soil and water conservation, etc. Integrated into it, should be efforts for improvement of the structurally determined social, economic, cultural and political situation of the poor. Thus, efforts towards enhancement and consolidation of people's organisations and bargaining power, people's education, people's self-determination ability, people's cultural identity etc., should be an integral part of the action. These should be reinforced by appropriate measures to meet the basic needs of the poor including their energy needs, should go hand in hand with regenerative and promotive ecological actions.

10. Alternative drought action should include measures to counteract land-alienation, distress-sale or perish of the cattle and the deterioration of the debt situation and of the present strength of the organisation of the marginalised people.

11. Alternative drought action in India should concurrently take up water resources mobilisation, water resources conservation and management, soil conservation, afforestation and other measures to

counteract soil-water, surface water and ground water drought (e.g. Micro Watershed Management, Pani Panchayat, etc). Particular care should be taken to avoid ecologically harmful over-exploitation of ground water. In principle, all these measures (including the agricultural practices, cropping pattern,etc.) should be ecologically regenerative, preservative and ideally promotive.

12. Alternative drought action in India should include ***massive educational and training efforts*** with regard to the above requirements, both at the level of the NGOs as well as particularly, at the level of the people in the villages to build up and strengthen people's own ability to take appropriate steps to face, counteract and live with drought.

IV. Alternative Drought Action shall contribute to social change and to social justice in favour of the poor and marginalised.

13. Ideally, all alternative drought action measures should contribute to the improvement of the socio-economic status of the marginalised people. In any case, it should prevent deterioration of the present status.

14. Structural change, justice and participation are basic fundaments of alternative drought action. If environmental and ecological demands are the unavoidable over-riding emphasis, definite steps should be taken to safeguard the interests of the marginalised or to compensate effectively the socio-economic disadvantage created.

V. Alternative Drought Action shall counteract the onslaught of the present dominant development ideology and praxis of the elite.

15. Alternative drought action of the NGOs in India should essentially counteract the praxis of the dominant Modernisation Ideology. It should attempt to re-establish and/or secure the social, cultural, political and economic sustainability of the poor in human dignity as well as their autonomy and self- determination with regard to their total environment. These could be approximated or accomplished by:

- A gradual and realistic departure from the Green Revolution Package and subsequent renewal, adaptation and promotion of traditional irrigation and drainage systems, soil and water conservation methods, cropping patterns, dry farming, organic manuring etc. Thereby, it will be necessary to build up appropriate/alternative socio-organisational systems to ensure upkeep, maintenance and management of the infrastructure re- established or newly built up (particularly drainage and irrigation systems).

-A consequent redirection of the productive activities in the field of agriculture, forestry, and village crafts and industries, first to meet the subsistence needs of the people in the area or region, reducing gradually and realistically the dependency from the organised and exploitative capitalistic market system. Appropriate forms of exchange among the marginalised people within a region should be promoted with systematic promotional and counteracting efforts against the market forces.

-Application of technology which is socially just, non- violent,non-gendered and has bias towards the marginalised people. Particularly, the technology applied should be labour- intensive. Special attention should be given to research and application or/of post-harvest technology, secondary production etc.

-Socio-legal advocacy, education and concentrated action (e.g. public interest litigation) at the micro and macro levels against the intervention and encroachment of the industry and commerce.

-Renewal and strengthening of the often given but meanwhile eroded or lost values of cooperation, solidarity, communitarism, harmony (between nature and humanity) etc. as constitutive elements of the socio-organisational and educational efforts of the NGOs.

VI. Alternative Drought Action shall build up or contribute to corporate NGO action,public opinion,advocacy and movements on the drought issue.

16. Alternative drought action should counteract the onslaught of national and multinational forces on the genetic wealth and diversity in our natural environment.

17. Alternative drought action should attempt cooperation, coordination and issue-based networking in an administrative area and eco-region (geo-political region) based on a common understanding and anlysis of the manifestations, effects and root causes of drought. The action perspective of the NGOs in a region should be oriented to and guided by a mutually worked out and agreed upon analytical and operational framework. Subsequently, the NGOs should mutually ensure a broad diffusion of the common understanding as well as counteract contradictory drought action and support activity of national or foreign funding agencies in the eco-regions.

18. Alternative drought action of the NGOs in a region should be ideally a part of or be reinforced by macro level efforts - awareness -building and generation of public opinion, advocacy. According to the needs, resistance movements or promotional campaigns etc.- particularly, with regard to the issues like deforestation of upper catchment areas of the rivers, water policy, rural energy etc.- should be initiated.

19. With socoi-legal efforts, alternative drought action of the NGOs should attempt to regain and/or safeguard the rights of the poor and marginalised on common lands and ensure environmentally regenerative and promotive utilisation of the same.

20. The NGOs in India, in their alternative drought action, should attach special relevance to mobilize the middle-class for their cause as they have an important role in influencing and moulding public opinion.

21. Alternative drought action of the NGOs in India should seek and consciously promote the coalition and effective cooperation with committed intellectuals, scientists, technoogists and Government officials.

22. In their alternative drought action the NGOs in India should meaningfully relate to the media to mould the public opinion on different micro and macro factors causing the drought situation in India as well as on the necessary and appropriate action perspective.

VII. Alternative Drought Action should have the following other orientations:

23. The NGOs should mobilize for alternative drought action as much as possible available national resources as well as re- create and build upon resources, abilities, skills and wisdom of the people at the grass roots.

24. All alternative drought action should build upon a sound analysis of the historic-political, economic - strucutral and ecological processes, either on their own or from other knowledgable groups and be accompanied by a concurrent action- research-reflection process.

And finally,

25. Alternative drought action of the NGOs in India should rule out all purely relief-oriented vertical interventions or ad-hoc drought operations of just emergency character. Where immediate 'relief actions are unavoidable, these should be designed in a manner to fit into mid and long-term drought action within a community based social action of the organisations of the poor, or have the definite potential to be transformed to such social action programmes.

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* These criteria were formulated based on a series of workshops held on the subject of drought in 1987/88. The most important among these workshops was held at Udaipur in Rajasthan in 1988, jointly by ANITHRA TRUST, Madras and SEWA MANDIR, Udaipur.

GLOSSARY

Albido : Albido is the ratio of the amount of heat received by the earth to the amount of heat reflected back into space.

Arable land : is land currently ploughed and cultivated. It is also called cultivable land and includes both cultivated and temporary fallow land.

Contour : is a line joining points of equal elevation in a particular area.

Contour bund : is constructed to intercept the run-off by an embankment whose ends may be closed or open, to conserve soil moisture as well as reduce soil erosion. Construction of earthen bunds at suitable intervals in accordance to the slope increases retention period of run-off water and helps to conserve both soil and water. These bunds are placed along the contours.

Contour trench : When we open a trench on a contour it is called a contour trench.

Ecology: The study of the relation of animals and plants to their surroundings,animate and inanimate.

El Nino : When there is extensive and abnormal heating of the waters of the Pacific Ocean, due to differences of pressure it gives rise to a phenomenon called "El Nino". Every incarnation of El Nino is accompanied by the failure of monsoon in India in the following year.

Furrow : Long cut in the soil made by a plough.

Fallow land : arable land left uncultivated for one season or more.

Groundwater table : the level of water in the ground for a particular area.

Horticulture : The cultivation of flowers, fruits, vegetables and ornamental plants.

Peripatetic irrigation : is when irrigation is provided to all parts of the cultivated lands.

Percolation tanks : These are tanks constructed to collect and store the run-off water which will help to recharge the ground water in the area. These tanks would also help retain soil moisture.

Precipitation : The process by which the moisture from the clouds gets condensed into water, fall through the atmosphere and reaches the earth's surface as rain,sleet, snow or dew.

Ridge : In a watershed, the highest point of the catchment area.

Run-off: is that portion of precipitation that makes its way to stream channels, lakes or ocean as surface or sub-surface flow. The term run-off, however, usually means surface run-off.

Sheet erosion : Sheet erosion is the removal of soil material more or less uniformly from the surface of the land by the forces of raindrop impact and surface runoff or wind action.

Sinking effect of wind : The heating up of the higher strata of the atmosphere results in the sinking of winds that are heavy and cold because they are rain bearing winds. This results in loss of rainfall and desertification.

Splash effect: is the effect of the raindrops falling on the ground causing large scale soil erosion as,the falling raindrops break down soil aggregates and detach soil particles from the soil mass. From this, fine particles form a thin muddy film on the surface and this affects infiltration and causes more run- off. Raindrop splash gradually removes the fine materials from the soil and leaves the less fertile sand and gravels behind.

Watershed : is an area from which run-off, resulting from precipitation, flows past a single point into a large stream, a lake, or an ocean.

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b. Man and Environment (60 Slides)
c. Western Ghat (200 slides)

Alternative Communication Forum Productions (Videos).

a. Living in Fear (English, 33 mts).
b. A Valley Refuses to die (English)

TATA Energy Research Institute Productions (Video).

a. Global Warming Up: (English)

APPENDIX - I

APPENDIX I

WORKSHOP ON DROUGHT

VENUE : Gandhigram Rural Institute
DATES : 29th & 30th May, 1990

PROGRAMME CONTENT

29th May '90

10.00 A.M : Welcome by Mercy, SEARCH Tamil Nadu Faculty. Inauguration of workshop by lighting the lamp - Dr. OZA, Vice-Chancellor, Gandhigram University.

10.20 A.M : Introduction to the workshop by Mr. F.Stephen, Director, SEARCH.

10.40 - 11.25 A.M : Keynote address by Dr. Walter Fernandez, ISI, Delhi on the social dimension of drought at the macro and micro levels.

11.55 -1.20 P.M : Dr.Meher- Homji-"Rainfall and Desertification".

2.30 - 3.00 P.M : Question-Answer session on

1. National Water Policy 2. Adverse effects of dams.3.Adverse effects of sugarcane cultivation. 4. Science and Technology and its effects.

3.00 - 5.10 P.M : Water Shed Management Programmes explained by Mr.K. V. Bhat (Project Officer - State Water Shed Development Cell, Bangalore), emphasing the need to conserve soil and water to combat drought.

5.15 - 5.45 P.M : Questions answered on Water Shed Management and its social implications. Moderator - Mr. Malla Reddy.

5.45 - 6.05 P.M : Mr. Chenniappan (Joint Director, Irrigation Management Training Institute, Trichy). Session on Irrigation and Agricultural methods.

6.05 - 7.30 P.M : Street Theatre depicting the causes and effects of drought by Black Theatre and Yatra groups.

8.30 - 10.00 P.M: Video Programme on Ecology.

Wed 30th May ' 90 :

9.30 - 10.00 A.M: Presentation by Mr. Ravi (Project Economist, DRDA, Kamarajar District) on DRDA and Government's programmes for combating drought.

10.00 - 10.30 A.M: Response to Mr. Ravi's presentation. Moderator - Mr. Fatimson.

10.30 - 11.30 A.M: Presentation by Mr. Malla Reddy (Assistant Director, Rural Development Trust, Anantapur) on the programmes undertaken by RDT to combat drought.

11.30 - 1.30 P.M : Panel Session chaired by Dr. Chellappan, Head of the Department of Extension Eduction, Gandhigram Rural Institute.

Local NGO leaders and senior staff presented their experiences related to drought and the actions taken by them.

Panel:

1. READ, Manamadurai : Mr. Rayar Laxmikanthan.
2. SIRD, Usilampatti : Mr. C. Periyasamy.
3. CENTREREDA, Kodai Road : Mr. Chinnan.
4. ISM, Madurai : Mrs. Manohari A. Doss.
5. REDS, KalyarKoil : Mr . B.S.J. Victor.
6. IRCDS, Sivaganga : Mr. Arulanandam.
7. SFIP, Madurai : Mr. Fatimson.

Expert Comments :- Dr. Meher - Homji.
Dr. Walter Fernandez.

1.00 - 1.30 P.M : Dr. OZA on Gandhigram's support to rural development and how NGOs and Gandhigram could collaborate.

2.30 - 4.00 P.M : Group Discussion on Action Plan.

4.00 P.M : Report presentation by the two groups. Session moderated by Mr. F. Stephen.

5.30 P.M : Departure.

APPENDIX - II

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APPENDIX II

WORKSHOP ON DROUGHT
Organised by SEARCH, Bangalore

VENUE : Gandhigram Rural Institute
DATE : 29th & 30th May 1990.

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1. Mr. Malla Reddy,
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ABOUT SEARCH

SEARCH is a secular, non-profit voluntary organisation registered under the Registrar of Societies Act, Karnataka.

- It is committed to the promotion of marginalised groups such as Dalits, Tribals, Landless Agricultural Labourers, Women and Children.

- It is a support institution working primarily with voluntary agencies with the two-fold objectives of Human Resource Development and mobilising the people around Development issues.

- It collaborates with NGOs in initiating, promoting and strengthening issue - based networks.

- It carries out policy reviews and plays advocacy roles.

- It is operational in a hundred villages in Dharmapuri district in Tamilnadu through its Field Extension Programme.

- It works with a variety of partners, People's Organisations,Network Associations,Donor Agencies and Government Departments, besides Voluntary Agencies and Support Institutions.

- Its strength lies in the use of participatory methodologies, namely, Participatory Research, Participatory Training, Participatory Evaluation.

- It concentrates primarily in the Southern states of India, while working specifically on a few programmes at the National level too.

- It brings out a quarterly newsletter titled SEARCH NEWS, which provides a periodical review of SEARCH's activities

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