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Drought Network News

Summer 2000

A Newsletter of the International Drought Information Center and the National Drought Mitigation Center

Volume 12 No. 2

From the Director

We had a fairly good response to the call in the previous issue of *Drought Network News* for readers to receive future issues online. I would encourage more of you to consider this option, as it will save distribution costs and expedite receipt of the newsletter. If you are willing to receive the newsletter electronically, please contact Kim Klemsz (kklemsz2@unl.edu). Our plan is to notify you via e-mail when each new issue of *Drought Network News* is available. Back issues of *Drought Network News* are also available online.

At this writing, I am making final preparations for the Expert Group Meeting on Early Warning Systems for Drought Preparedness and Drought Management. This meeting, hosted by the Institute of Meteorology, will be held in Lisbon, Portugal, in early September. Co-sponsors of the meeting are the World Meteorological Organization, Secretariat of the U.N. Convention to Combat Desertification, and UNDP's Office to Combat Desertification and Drought. The purpose of the meeting is to assess the status of drought early warning systems and determine future needs to better contribute to the increasing demand for drought mitigation and planning efforts.

The specific objectives of the meeting are to:

1. Evaluate the current status and potential future value of drought early warning systems in drought-prone regions.
2. Determine the current and expected future value of seasonal forecasts in contributing to the effectiveness of drought early warning systems.
3. Identify accomplishments or specific examples of how drought early warning systems have reduced the impacts of drought in various country and regional settings.
4. Identify shortcomings or limitations of current early warning systems in providing decision makers with timely and reliable information on drought conditions.
5. Identify how improved delivery of climate information and its use by decision makers can reduce the risks associated with drought.

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6. Formulate recommendations that will provide guidelines for governments, international organizations, and NGOs for the improvement of drought early warning systems in support of drought planning and mitigation activities.

Senior experts in several fields have been invited to prepare discussion papers to address the above objectives, and the proceedings of the meeting will be published by WMO. Participants will discuss the papers and develop appropriate recommendations for all organizations involved in drought early warning systems, in particular the National Meteorological and Hydrological Services. A summary of the meeting will be included in the next issue of *Drought Network News*. Deborah Wood and I, with assistance from M.V.K. Sivakumar (WMO), will edit the proceedings, which will contain the papers presented by the experts as well as recommendations for improving drought early warning systems. This work should serve as a major source of information for all agencies and organizations involved with designing and implementing drought early warning systems. The proceedings should be available in late 2000.

Drought Network News readers may submit articles for the next issue until October 15, 2000. Readers are also encouraged to submit announcements of workshops, conferences, and other information of interest to our network members.

Donald A. Wilhite

Contents

The Drought in Chile and La Niña

La Niña in Chile

Precipitation is one of the climatic elements most affected by the presence of La Niña in Chile. An important precipitation deficit begins during La Niña events, from latitude 45°S to the north. This deficit prevails most of the year, with winter (April–September) being most vulnerable to these anomalies. The central region of Chile (30°S to 40°S) has negative anomalies, with precipitation values 35% to 100% below the climatologic annual average. These rain deficiencies in Chile are determined by the persistence of anomalies of anticyclonal circulation of middle and subtropical latititudes and an area of anomalies of cyclonic circulation in the sub-polar latitudes, from a north–south dipole of positive and negative anomalies of geopotential height in the mid troposphere. In Chile, La Niña usually produces air temperatures lower than normal, with deviations ranging from 0°C to -1°C. The social and economic impacts of La Niña events in Chile are serious. Agriculture, cattle and timber industries, energy, and industrial sectors are the most affected.

Patterns of atmospheric circulation in Chile during La Niña

Normal conditions

The atmospheric circulation in Chile is characterized by the existence of two meteorological occurrences: (1) the subtropical anticyclone of the Pacific southeast and (2) the circulation of the westerlies, where the frontal systems and their associated lows are formed and develop. The former corresponds to a region where high pressures prevail almost year-round. This high is in northern and central Chile and migrates from 30–35°S during winter to 35–40°S during summer.

The second occurrence that defines the seasonal precipitation cycle in central Chile is the displacement of the frontal bands from the west. This displacement is more frequent from April to September, and it contributes more than 70% of the annual precipitation.

La Niña conditions

In the presence of a La Niña event, the subtropical anticyclone of the southwestern Pacific intensifies, and its influence is extended to the south. This shift prevents the frontal systems coming from the western Pacific from being displaced (as they normally are) toward continental mid-latitudes. During La Niña, there is also an intensification of the polar jet stream and a weakening of the subtropical jet stream, favoring greater frontal activity in southern Chile (Figure 1). This condition reduces the frequency of frontal cloudy bands in central and northern Chile, blocks or weakens the passage of active fronts to the continent, and inhibits convective activity, all essential factors for the generation of precipitation.

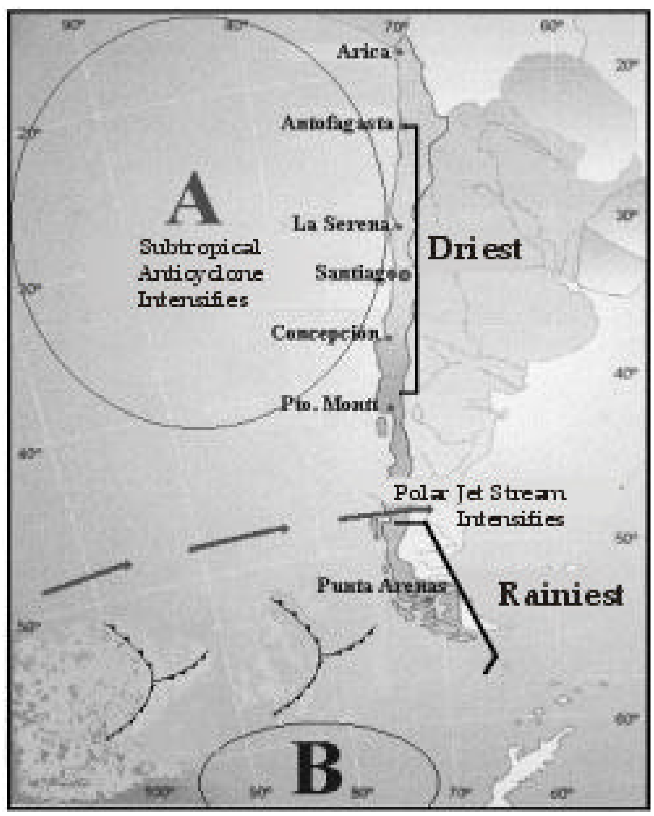

Figure 1. Characteristics of atmospheric circulation observed in Chile during La Niña.

Seasonal precipitation in central Chile, El Niño–La Niña events, and the Southern Oscillation

Three representative stations were selected from central Chile: La Serena (30°S), Santiago (33°S), and Concepción (37°S). In the central zone, precipitation occurring during April–September represents more than 70% of the annual total. Precipitation totals (April–September) for every year of the period 1950–98 were correlated with (1) anomalies of the sea surface temperature (SST) observed in the area of El Niño 3—the central equatorial Pacific, whose coordinates are 5°N–5°S, 150°W–90°W; and (2) the Southern Oscillation Index (SOI), expressed in standardizing anomalies. The arithmetic averages of the anomalies observed between April and September in both SST and SOI were used in the correlation analysis. The results show a significant statistical relationship ($P < 0.05$) between winter precipitation (April–September) in central Chile and the El Niño–La Niña events and the Southern Oscillation.

Precipitation at Santiago's station responds well ($r = 0.64$) to changes in the thermal condition of the equatorial Pacific (Figure 2). The other two selected stations, although statistically significant, had lower correlation coefficients (Table 1). Precipitation in central Chile and the SOI are inversely correlated, and the highest value ($r = 64$) was obtained for Santiago (Figure 3). In other words, there is a statistically significant phase between the amount of precipitation registered in central Chile and the atmospheric pressure (Tahiti–Darwin) defined by the SOI (Table 1).

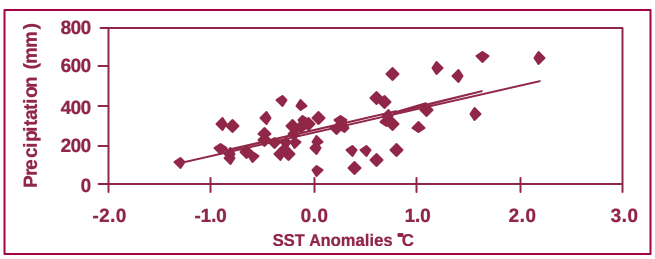

Figure 2. Precipitation for Santiago correlated with anomalies of the SST (Niño 3), April–September 1950–98.

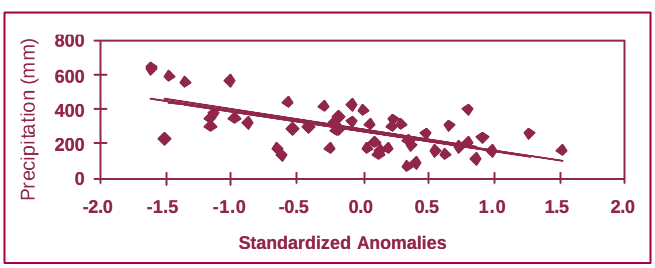

Figure 3. Precipitation for Santiago correlated with anomalies of the SOI, April–September 1950–98.

Station	Precipitation and SST	Precipitation and SOI
La Serena	0.54	-0.41
Santiago	0.64	-0.64
Concepción	0.31	-0.38

Table 1. Linear correlation of precipitation, SST, and SOI values.

In summary, in central Chile, precipitation between April and September correlates with the heating of the sea surface in the central equatorial Pacific (positive anomalies of Niño 3–SST) and the reduction in the surface pressures (negative SOI). When SST surpasses the average by more than 0.5°C and pressures decrease (-1.0 standard deviation), precipitation between La Serena and Concepción tends to increase. Actual precipitation is usually twice the climatologic value. However, if SST is 0.5°C or more below the average and the atmospheric pressure at the surface (SOI) is more than 1.0 standard deviation above average, significant precipitation deficits are more likely to occur during the rainy season. The close relationship between precipitation, SST, and SOI is demonstrated by the results of linear correlation, which reached their greatest magnitude for Santiago at 64% for SST and -64% for the SOI.

SST in the central equatorial Pacific, atmospheric pressure in Antofagasta, and rainfall in Santiago

The rain regime in central Chile in 1997 and 1998 shows sharp contrasts (Figure 4). In Santiago, precipitation in 1997 surpassed the climatological mean (312.5 mm) by 403 mm (positive anomaly). June was the rainiest month, with 188.6 mm above normal for the month. But during May–October 1998, a deficit or negative anomaly was registered—less than 234.1 mm below normal (286.4 mm). July 1998 was one of the driest months of the 20th century, with only 0.2 mm of rainfall (normal rainfall is 86.6 mm). This rainfall deficit persisted during 1999. Santiago displayed a negative anomaly of -117 mm below the cumulative normal value between January 1 and July 27, a deficit of more

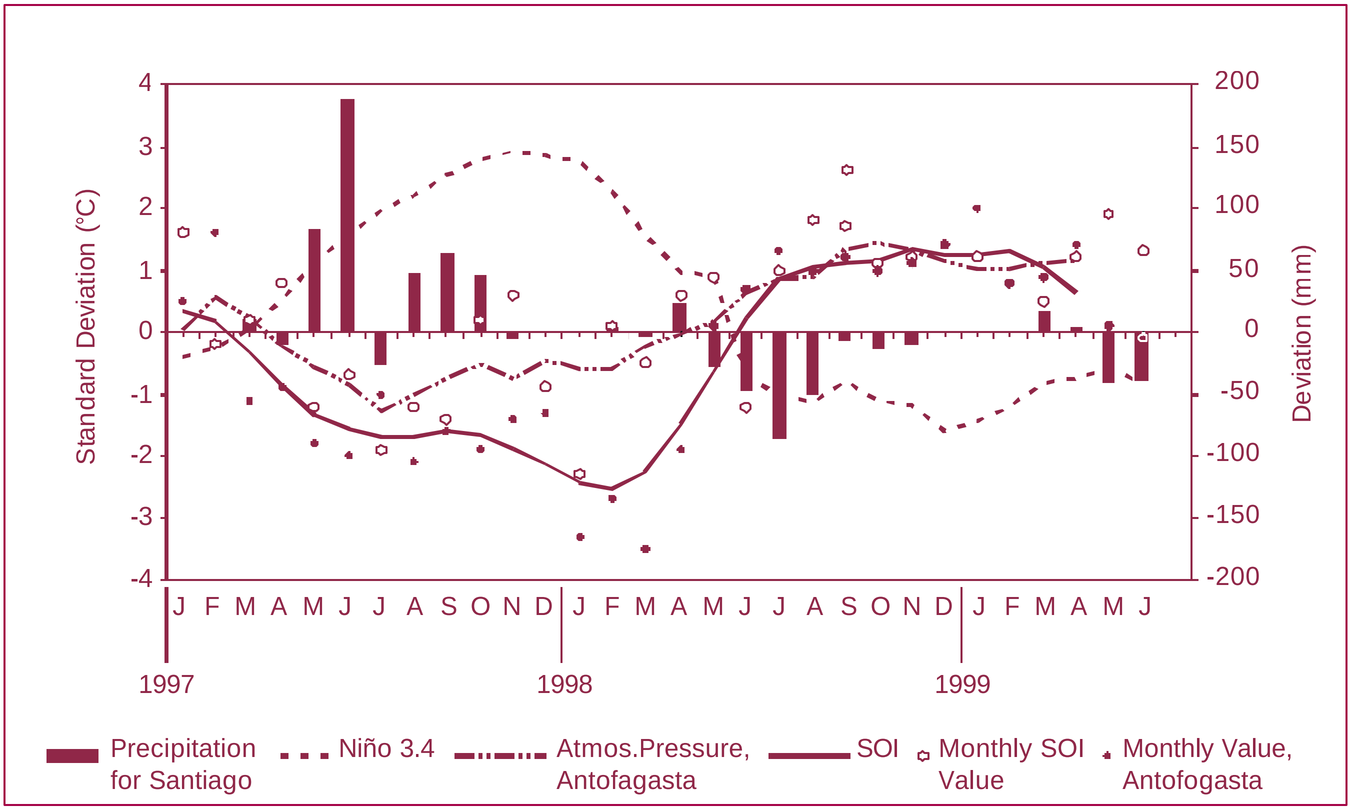

Figure 4. Sea surface temperature in the central equatorial Pacific, atmospheric pressure in Antofagasta, and precipitation in Santiago, January 1997–July 1999.

than 50%. The first half of winter 1999 was characterized by a low frequency of frontal systems in central Chile (30°S to 36°S), with precipitation below normal.

The standardized anomalies of the Southern Oscillation represent the atmospheric component of this cycle. In Chile, the most prominent of these anomalies are observed in the atmospheric pressure at sea level in Antofagasta (23°S), with negative anomalies during 1997 and positive anomalies in 1998, a product of the weakening and later intensification of the semipermanent anticyclone of the eastern South Pacific. The increase in precipitation during the rainy season (April–September) in 1997, and significant deficits in 1998 and part of 1999, are another clear signal.

Precipitation in Santiago during La Niña events

Between 1877 and 1999, twenty-six years show negative anomalies equal to or smaller than -0.5°C for three or more consecutive months in the central equatorial Pacific during April to September. These years are shown in Table 2, with their respective annual precipitation values for Santiago. The annual average precipitation in Santiago during La Niña years was 210 mm.

The analysis selected 25 years as El Niño years. For these years, Santiago had an annual mean of 494 mm. In 71 years considered as normal (an absence of La Niña or El Niño), the annual precipitation mean was 340 mm.

Figure 5 shows the histogram of relative frequencies of annual precipitation for Santiago for the period 1877–1998. The impact of La Niña on the annual cycle of precipitation in Santiago is clear, with a distri-

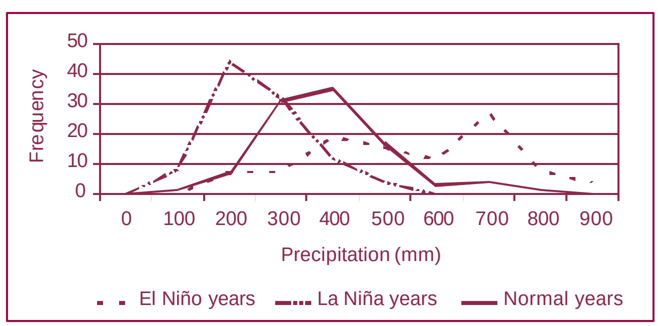

Figure 5. Relative frequencies of annual precipitation for Santiago, 1877–1998.

Year	Total (mm)	Year	Total (mm)
1879	166.0	1938	202.0
1886	126.0	1942	402.7
1889	230.0	1950	292.7
1890	222.0	1954	316.2
1892	123.0	1955	193.8
1893	238.0	1964	186.4
1903	194.0	1970	327.7
1908	202.0	1973	172.1
1909	184.0	1975	184.3
1910	270.0	1985	186.2
1916	225.3	1988	139.6
1924	66.3	1998	89.7
1933	316.4		

Table 2. Precipitation in Santiago during La Niña years during the period 1877–1999.

bution centered on the 200 mm annual precipitation and a frequency of 43%. For El Niño years, the annual distribution of precipitation in Santiago shows a greater variability (700 mm) and a smaller frequency (28%).

La Niña 1998/99's impact on Chile's precipitation

The rapid change of SSTs in the equatorial Pacific altered atmospheric circulation patterns worldwide. Conditions went from very warm in the first months of 1998 (January–April)—associated with El Niño—to a characteristic cold condition of La Niña during the second quarter of 1998. In Chile, the subtropical high was an almost permanent feature that reached 40°S to 45°S during May and July 1998, reducing precipitation during the rainy season in the central part of the country in both 1998 and 1999.

The atmospheric blocking observed during most of the period between May 1998 and July 1999 prevented the normal displacement and development of frontal systems in central and northern Chile. This blocking caused the driest year of the 20th century between 30°S and 36°S. Between 37°S and 45°S, the precipitation deficit reached 30–50%. Only the austral region (Punta Arenas) had a surplus (near 40%).

During the first half of 1999, meteorological conditions in Chile were similar to those of the previous year, with a precipitation deficit in almost the entire country, but of a lesser magnitude than in 1998. Up to July

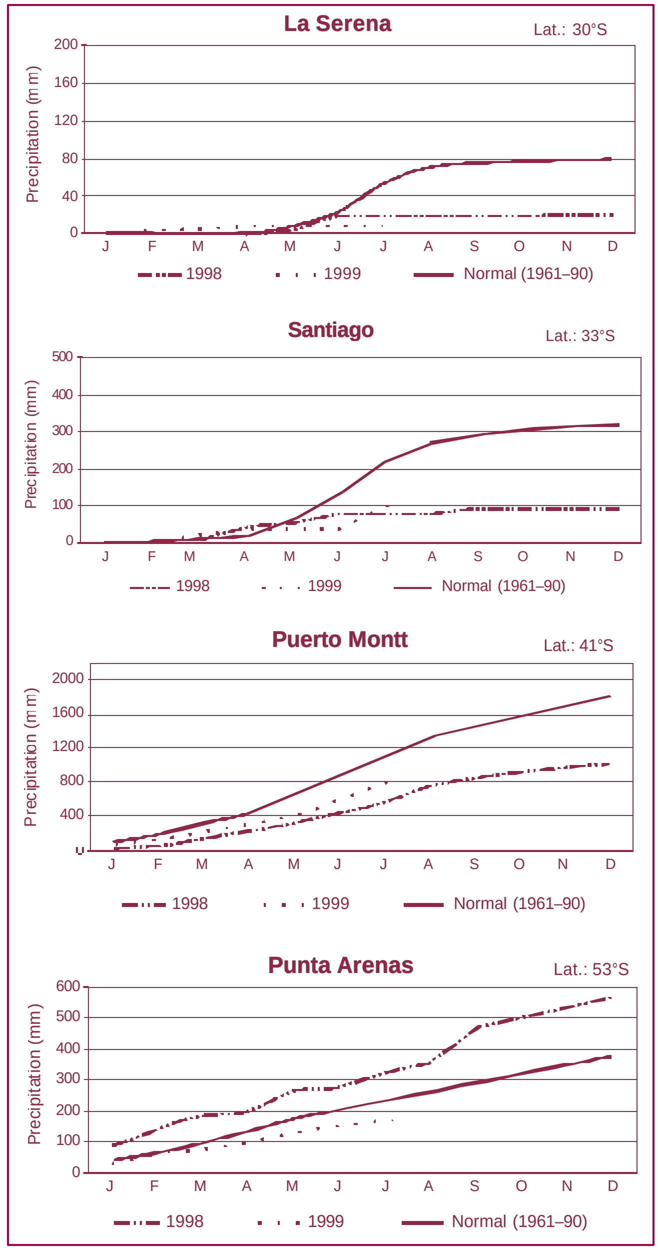

Figure 6. Accumulated precipitation for 1998 and 1999, compared to the normal, for four locations in Chile.

1999, the region with the greatest deficits was the central zone, from 36°S to the north, with values oscillating between 0% and 80% lower than average. Figure 6 shows accumulated precipitation for 1998 and 1999 versus the climatologic value for four locations in Chile.

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The Climatic Impact of La Niña-related Droughts in Entre Rios (Argentina)

The National Institute of Tecnologia Agropecuaria (INTA) at Parana, Entre Rios (Argentina), has a farming experimental station (E.E.A.) located at 31.5°S and 60.31°W, 110m above sea level. A meteorological observatory has existed at the site since 1934.

The region has a temperate humid climate and receives an average annual rainfall total of 1,000 mm. Distribution is monsoonal, with October–April rains accounting for 73% of the annual total.

Since August 1998, the area has been affected by La Niña, and experts expected the conditions of the cold episode to persist into 2000. The La Niña event in the humid Pampean region of Argentina is associated with negative anomalies of winter temperatures and below-normal precipitation in the June–December period (Magrin, 1998). From August 1 to November 30, 1999 (122 days), the area recorded its lowest precipitation since 1934 (Figure 1; Table 1).

Month	Decade	Precipitation (mm)	Percent of Normal
August	1	0.7	7
	2	0.0	0
	3	8.0	56
September	1	1.3	10
	2	0.0	0
	3	20.5	104
October	1	1.6	6
	2	7.6	24
	3	15.2	36
November	1	25.9	69
	2	0.9	3
	3	2.8	7
Total		84.5	29

Table 1. Ten-day precipitation totals for August–November 1999 and percent of normal, E.E.A. Paraná.

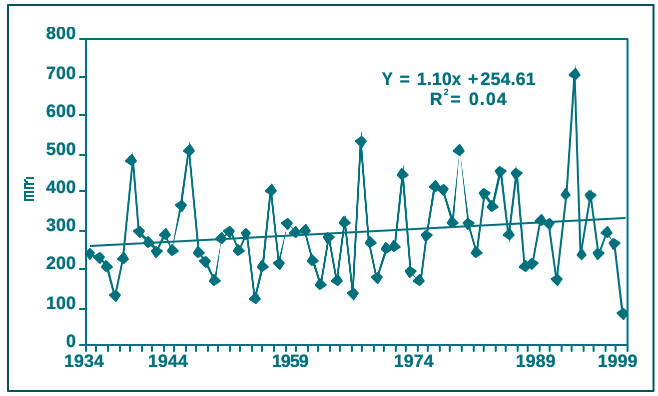

Figure 1. Cumulative rainfall, August–November 1934–99, for E.E.A. Paraná.

In this region, given the great variability of rain, it is essential to use an index to appreciate the degree of normality or abnormality of precipitation. A precipitation index (Xavier and Xavier, 1987) was used to allow comparison of precipitation data for 1934–99 to normal precipitation. The Precipitation Index (PI) allows rain to be classified in humidity or drought degrees according to scales from 0 to 1. Figure 2 shows that for 10 of the 66 years of this period, the PI of August to November was "very dry." The 10 years were 1937, 1949, 1954, 1962, 1966, 1969, 1974, 1991, and 1999.

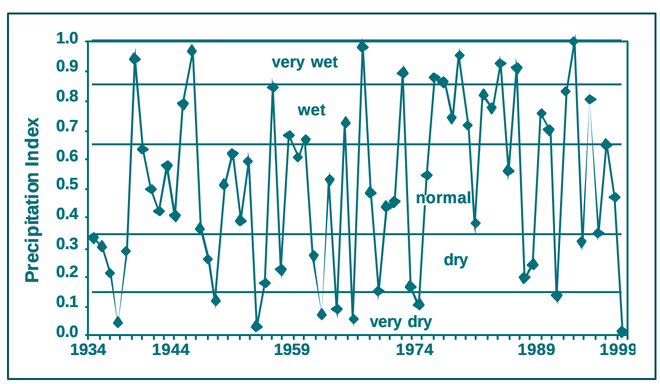

Figure 2. Cumulative precipitation index, August–November 1934–99, for E.E.A. Paraná.

Index	No. of Events	Percent of Total
Very dry	5	31
Dry	4	25
Normal	5	31
Wet	0	0
Very wet	2	13
Totals	16	

Table 2. Classification of August–November precipitation.

The values of the PI for 1999 indicate severely dry conditions. From 1934 to 1999, sixteen La Niña events were registered; the classification of precipitation for August–November of those years is shown in Table 2. "Very dry" and "dry" events account for 56% of these years, confirming the assertions of Magrin (1998).

The current serious situation has affected and continues to affect the culture of winter crops such as wheat and linen and the seeding and development of summer crops (sunflowers, corn, and soybeans) and pasture. Because of this situation, the Provincial Government declared a state of farming emergency and/or disaster from November 1, 1999, to February 28, 2000, noting that 50% of farm production had been affected by the intense drought and frosts.

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Xavier, T. de M. and A. F. S. Xavier. 1987. Clasificación de períodos secos y lluviosos y cálculos de Indice Pluviométricos ("dryness-wetness") para la región NE de Brasil. Anales del II Congreso Interamericano de Meteorología, V Congreso Argentino de Meteorología, Buenos Aires, Argentina; pp. 11.1.1–11.1.5.

India’s Arid Region and the Current Drought

We recently surveyed some of the drought-affected areas (Figure 1) in the Indian arid region in a publication entitled “Strategy to Combat Drought and Famine in the Indian Arid Zone.” This article is a summary of the report.

The present drought in the arid and semiarid regions of India is due to the cumulative effect of inadequate rainfall during 1997–99. Twelve states in India are in the grip of severe drought, with Rajasthan, Gujarat, Andhra Pradesh, and Madhya Pradesh (Table 1) being the most affected. The Indian arid zone encompasses 32 million ha and is highly prone to droughts and famines. During the 20th century, the region experienced agricultural drought an average of once every two or three years (Table 2).

Often droughts persist continuously for 3 to 6 years, such as the droughts of 1903–05, 1957–60, 1966–71, 1984–87, and 1997–99. When the monsoon rains do not occur, the region is totally dependent on buffer stocks for food and fodder to sustain its 19.8 million people and 28 million livestock. Migration in search of fodder, food, work, and water is a common feature, causing hardships for desert dwellers, livestock casualties, and famines during extreme drought situations.

During the 1999 monsoon, a cyclonic storm originating from the Arabian Sea passed over extreme western parts of Rajasthan and Gujarat, but the early rainfall received from this storm could not be used for sowing. The regular southwest monsoon was three weeks late during 1999 (its normal occurrence is the first week of July), but after sowing, there was a 35-day break in rainfall that caused the failure of most of the crops. The 1999 monsoon rainfall departures

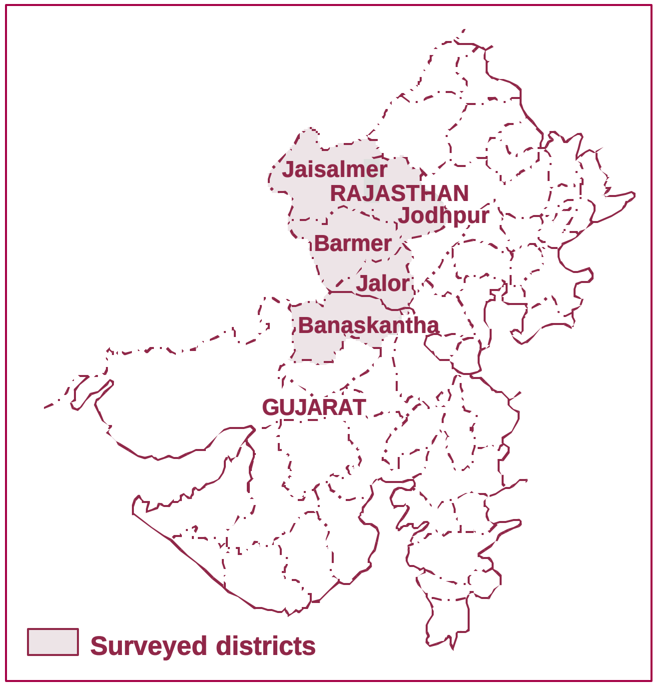

Figure 1. Drought-affected districts of Gujarat and Rajasthan.

from normal in various districts are given in Table 3. The other arid parts of north, central, and south India also received below-normal rainfall.

The major causes of agricultural drought in the Indian arid zone, besides failure of the monsoon, are increased pressure of both human (400%) and livestock (127%) populations during the 20th century; this has put tremendous pressure on land and also surface and ground water resources. A large number of rainwater-harvesting systems like Nadi (ponds) and Tanka (wells to collect rainwater) have been developed in each village, but during drought years, the surface water resources are reduced significantly. The

State	Number of Districts: Affected	Total	Population Affected (million): Human	Livestock	Rainfall Deficiency in 1999
Rajasthan	26	32	26	34	-25%
Gujarat	17	25	25	7	-38%
Andhra Pradesh	18	23	40	-	-26%
Madhya Pradesh	7	17	3	3	-20%

Table 1. Impact of current drought in selected states of India.

District	Severe Drought	Moderate Drought	Total
Barmer	18	30	48
Bikaner	23	23	46
Jaisalmer	25	12	37
Jodhpur	26	16	42

Table 2. Frequency of agricultural droughts in western Rajasthan (1901–99).

ground water table is declining at a rate of 0.2–0.4 m per annum, and deep wells have become deeper. The quality of the ground water is deteriorating, and sometimes the concentration of undesirable substances such as fluoride and nitrate increase to harmful or toxic levels. With the present rate of increasing demand for water, western Rajasthan is likely to face a deficit of about 2,500 million m^3. Grazing herds of animals quickly remove the scanty grass cover that comes up with the meager rainfall, thus aggravating the problems of soil erosion and desertification. Because most of the people of this region depend on agriculture and pastoralism, drought leads to a decline in income and employment opportunities.

To minimize the suffering of people and livestock, large-scale relief measures are undertaken by the respective state governments and social organizations. These measures center on provision of drinking water supplies and foodgrains through public distribution systems at subsidized rates; feed and fodder for livestock and subsidies to approved Gosalas (cattle campus); and human and livestock health care. Efforts to create direct and indirect wage employment through food for work barely provide sustenance for the rural people, who suffer the most because of drought. Long-term measures are also undertaken, such as early warning and drought monitoring and advising farmers and others involved in drought management. Suitable alternate land use systems, water harvesting, soil and water conservation, contingency crop planning, adopting approved technologies for dry lands, efficient irrigation methods, and enrichment of cereal straw as fodder are also under implementation.

Location	Rainfall in 1999 (mm)	Departures from Normal (%)
Barmer	129	-51
Bikaner	152	-38
Churu	181	-47
Jaisalmer	171	+13
Jalor	146	-56
Jodhpur	250	-24
Jhunjhunu	251	-23
Pali	368	-4
Sikar	231	-42

Table 3. Rainfall amounts during the cropping season and their departures from normal.

The desert dwellers have their own traditional water-harvesting structures. The Central Arid Zone Research Institute at Jodhpur developed improved designs for Nadis, Tankas, Khadins (water ponds), and other structures. The Institute has conducted research on integrated farming systems; identification of suitable fuel and fodder trees; arid-horticulture, silvopastoral systems; rainwater harvesting techniques; and watershed development. Using flash floods/surplus rainwater for artificial recharge of ground water to augment the dwindling water table is the need of the hour.

With the increased pressure on land, marginal lands are being brought under cultivation, which is a disastrous trend. Concerted efforts have to be made to adopt suitable land use systems, keeping in consideration the rainfall, soil type, and needs of the people. Growing crops, fruits, trees, and grasses in various combinations minimizes the risk of crop failure. Suitable combinations of these for each of the agro-climatic zones have been evolved by the Institute. Lastly, besides improving water and crop/fodder resources, the biotic pressures on the Indian arid zone also need to be controlled to protect the fragile Indian arid ecosystem.

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Conclusions and Recommendations from the Central and Eastern European Workshop on Drought Mitigation

The importance of prevention and planning in drought mitigation was the impetus for the Central and Eastern European Workshop on Drought Mitigation, held April 12–15, 2000, in Budapest-Felsőgöd, Hungary. The workshop was organized and sponsored by several Hungarian agencies: the Ministry of Agriculture and Rural Development; Ministry for Environment; Ministry of Transport, Communication and Water Management; Research and Development Division of the Ministry of Education; and Hungarian Meteorological Service. The United Nations Convention to Combat Desertification (UNCCD), Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP), World Meteorological Organization (WMO), European Commission Joint Research Centre (EC JRC–ISPRA), European Regional Working Group of the International Commission on Irrigation and Drainage (ERWG ICID), and the International Drought Information Center and National Drought Mitigation Center at the University of Nebraska–Lincoln, USA, also provided support.

Seven country reports on the status of national drought mitigation strategies in central and eastern European (CEE) countries and twenty-one scientific and technical papers were presented and discussed. U.S. scientists discussed drought mitigation practices used in the United States that might also be followed in Europe. Although some steps have been taken in several CEE countries toward the establishment of national drought mitigation strategies, participants noted that further efforts are necessary. Their recommendations are republished below.

"1. Participants of the Workshop—after discussing the papers and propositions presented—agreed . . . that an effective drought mitigation should be based on a comprehensive view of drought, because drought is not simply a deficiency of precipitation, but a more complex phenomenon which influences the whole society.

2. Recognizing the significant economic, social and environmental impacts of drought in the CEE countries, as well as in other drought-prone European regions, the participants of the Workshop recommend that each country develop national strategies and national action programmes to mitigate drought, and establish international cooperation for solving related common problems as follows:

2.1. Encourage and help non-member countries to join the United Nations Convention to Combat Desertification, recognize the important role of UNCCD in combating desertification and land degradation, and support each other in drought mitigation.

2.2 Establish a common methodology for drought preparedness and mitigation programs and policies including forecasting, early warning system, risk assessment, characterization of drought severity through common indicators and maps, etc., using the SPI index for international comparison. Any other indexes are appropriate at national level. To facilitate the establishment of this common methodology, the Workshop participants recommend the creation of a regional network of scientists, policy makers, and other experts.

2.3 Request authorities, scientific institutions and . . . organizations involved in combating land degradation to link their activities with efforts . . . to monitor and mitigate drought effects in order to promote sustainable development and nature conservation in drought-prone regions.

3. Taking into account the importance of US practice and experience in drought mitigation and

planning, the Workshop participants recommend the continued involvement of the US National Drought Mitigation Center in future European co-operation/collaboration, and the participation of US experts in the proposed regional drought mitigation projects.

4. Drought mitigation experts and institutions from any other countries are invited to participate.

5. Italy, on behalf of the Northern Mediterranean Annex of UNCCD, expressed the intention to foster collaboration between the Mediterranean and CEE regions. Participants of the Workshop accept this proposal and express their gratitude for that, and welcome coming opportunities for collaboration under the provision of Annex 5 to the UNCCD.

6. The participants of the Workshop ask the Hungarian authorities responsible for drought management to create an international interim task force with the participation of the representatives of countries concerned, and coordinate the next steps to realize the above mentioned proposals, and to find out and identify relevant international bodies for the necessary participation and financial support."

Talking Imperative for Grieving Farmers, Others

Editor's Note: *The following news release was provided by the IANR News Service, Institute of Agriculture and Natural Resources, at the University of Nebraska–Lincoln on June 8, 2000.*

Farmers who are losing their livelihoods to the drought shouldn't be surprised to feel depressed or angry, and neither should people around them. After all, these farmers are suffering a very real loss and they are grieving.

Farmers who lose a crop in many ways will react as have people who have lost loved ones, said John DeFrain, family and community development specialist at the University of Nebraska here. That is, they go into shock, denial and anger, and not necessarily in that order.

The loss of a crop means a loss of time, expenses, identity and, in some cases, a family tradition, DeFrain said. The worst nine-month drought in the state's history meant spring crops were planted in soils six to eight inches short of moisture. While there was sufficient moisture to get most of those crops up, without additional moisture by mid-June, dryland crops likely will burn up. Eastern and central and southwest Nebraska are affected the most, with the southeast being hardest hit. The drought is expected to continue for the rest of the year.

"These are troubling human issues," DeFrain said. "What can you say that makes any sense?"

People who try to console others who have suffered a loss must be careful with their words, the Institute of Agriculture and Natural Resources specialist said. While joking may make some people laugh, others may not be in the mood for humor. The key, DeFrain said, is to listen to people carefully, to see where they're at. That means not only listening to what they say, but sensing what they're reluctant to open up about.

"Find the courage to sit down and listen," DeFrain said. Don't make judgments and don't try to fix the problem, because you can't. Honor and respect the grieving by letting them know you want to hear their story, he advised.

At the same time, he said, the person grieving needs to find ways to open up to other people. That's difficult, he said, because farmers tend to be strong

(continued on p. 14)

Announcements

Disaster Management Workshops

The University of Wisconsin–Madison, Department of Engineering Professional Development, will offer a seminar series, Disaster Management Workshops, September 18–22, 2000, in Madison, Wisconsin. Participants may enroll for 1–5 days.

The program will benefit emergency managers from business, industry, government, service, and community organizations. During the workshops, participants will learn about emergency information management; disaster communications; response planning; damage, needs, and resources assessment; and monitoring, evaluation, and reporting.

For more information, contact Katie Peterson, Department of Engineering Professional Development, University of Wisconsin–Madison, 432 North Lake Street, Madison, Wisconsin 53706; telephone: (800) 462–0876; fax (608) 263–3160; e-mail: custserv@epd.engr.wisc.edu; www: http://epd.engr.wisc.edu/.

Fifth Annual Conference on Crises and Disasters Management

The Fifth Annual Conference on Crises and Disasters Management will be held October 28–29, 2000, in Cairo, Egypt. The conference is being organized by the Crisis Research Unit in Cairo.

Conference participants will discuss a wide range of crises and disasters, both natural and manmade, that threaten the continuity of society and its organizations. Major issues of the conference will include natural and environmental disasters; marketing, financial, technological, and production crises in business and governmental organizations; disasters in public facilities; crises caused by globalization, and its regional impacts; technical, social, political, legal, and international impacts of crises and disasters; the role of executive, legislative, and judicial institutions in crisis management; testimonies from real experiences and case studies; information and communications technology and their role in crisis management; and scenarios for crises and disasters in the third millennium.

For more information, contact Prof. Mohamed Rashad Elhamalawy, Director of Crisis Research Unit, Faculty of Commerce, Ain Shams University, Cairo, Egypt; postal code: 11566; fax: (202) 4049259; e-mail: cruegypt@hotmail.com.

DROUGHT 2000 Conference: Impacts, Policy, and Technology

DROUGHT 2000 Conference: Impacts, Policy, and Technology will be held October 11–12, 2000, in Des Moines, Iowa. The conference is sponsored by the National Drought Mitigation Center, National Ground Water Association, U.S. Department of Agriculture–ARS, U.S. Geological Survey, and American Water Resources Association. Topics will include economic impacts and drought relief; short- and long-term planning; hydrologic impacts; wells and drought; well deepening, development, and rehabilitation; groundwater modeling; groundwater/surface interactions; weather forecasting; climate change; artificial recharge of groundwater; drought-resistant crops; fire protection; the National Drought Policy Act; and new technologies.

For more information, visit the National Ground Water Association's website at http://www.ngwa.org/education/drought.html, or contact Bob Masters of the National Ground Water Association at (800) 551–7379, ext. 527; e-mail: rmaste@ngwa.org.

16th Annual International Conference on Contaminated Soils, Sediments and Water

The 16th Annual International Conference on Contaminated Soils, Sediments and Water will be held October 16–19, 2000, at the University of Massachusetts at Amherst. Platform and poster sessions will cover the following topics: Analysis, Arsenic Background Definition, Bioremediation, Brownfields, Chemical Oxidation, Environmental Fate, Environmental Forensics, Federal, Heavy Metals, Indoor Air, Mercury, MTBE/Oxygenates, Natural Attenuation, Phytoremediation, Radionuclides, RBCA, Remediation, Regulatory, Risk, Sediments, Site Assessment, UXO. Exhibits will bring real world application of technical theory and case studies. Focused workshops will provide attendees applicable practical information. For information, contact Denise Leonard at (413) 545–1239 or dleonard@schoolph.umass.edu.

Talking Imperative . . . *(continued from p. 12)*

and silent. But they need to let it out, he said, or they can get in serious trouble, possibly hurting themselves and others.

Every person who is suffering needs to have three or four good listeners so no one listener gets worn out, DeFrain said. Reach out to family, friends, clergy, counselors or crisis hotlines. In Nebraska, the toll-free number for the Nebraska Farm/Rural Response Hotline is (800)464-025.

In addition to talking to people, those suffering a loss should find some emotional space that is socially acceptable and positive. Exercise, go for quiet walks or drives, appreciate others, and remember there's always someone worse off. Avoid destructive behavior, such as alcohol abuse.

Remember that everyone suffers and suffering can be a catalyst for growth, DeFrain said.

"People often don't share their problems with others, and so we're often unaware of how much pain other people really are going through as they suffer in silence," DeFrain said. Although it's hard to look forward when there is uncertainty and you don't know where you're going, he said, there's really no choice but to move forward. Sometimes a crisis in life leads people down a new road that turns out to hold exciting new possibilities.

Human emotions are universal, DeFrain said. That is, everyone suffers and everyone experiences joy.

"The biggest fear is to be alone or disconnected because we're social beings," he said. Even though we have the need to be social, people in our culture often distance themselves from each other, particularly when they're in emotional trouble, he said.

And don't be afraid to cry.

"There's nothing wrong with crying. It's a good thing." He said crying cleanses the body because stress-related chemicals come out in the tears.

Cheryl Alberts
IANR news writer
University of Nebraska–Lincoln

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Drought Network News encourages readers to submit information on current episodes of drought and its impacts; timely reports of response, mitigation, and planning actions of governments and international organizations (successes *and* failures); recent research results and new technologies that may advance the science of drought planning and management; recent publications; conference reports and news of forthcoming meetings; and editorials. If references accompany articles, please provide *full bibliographic citations*. All artwork *must* be *camera-ready*—please provide clear, sharp copies (in black/gray and white only—we are unable to reproduce color artwork) that can be photocopied/reduced without losing any detail. Correspondence should be addressed to

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