OR months starting from

the beginning of 1998 a vast

swath of South-east Asia

namely Papua New Guinea, the

Phillipines and Indonesia bore

the brunt of the disastrous El

Nino effects that would invite

extreme weather conditions

like drought and swings in tem-

peratures, followed by torren-

tial rain and cold spell. In In-

Teluk Pandan located in In-

donesia's East Kalimantan

province. Rice could not be

planted there. Banana planta-

tions were withering. Forest

fires were all around. Meteorol-

ogists assert that El Nino's fury

manifest in the drought and raging blazes of Borneo, and

other islands of Indonesia

would continue to wreak havoc

even through the length and

appearance of unusually warm

water in the Pacific ocean, oc-

curring near the beginning of

the year. El Nino means "the lit-

tle boy" in Spanish. The name

was used for the tendency of the

phenomenon to arrive around

tion between the surface layers

of the ocean and the overlaying

atmosphere in tropical Pacific.

Stated in clear terminology, the

phenomenon is caused by winds

that blow across the Pacific

Ocean. The winds shift periodi-

cally and alter water currents.

causing a giant mass of warm

water normally located off Aus-

tralia to move toward Peru. The

warm water displaces the cold

Humboldt current (flowing

north up the coast of Chile and

Peru) altering weather patterns

across a wide swath of the

Earth. Climatologistis assert

the phenomenon as the internal

dynamics of the coupled ocean-

atmosphere system that deter-

mines the onset and termina-

complicated, but they involve

unstable air-sea interaction

and planetary scale oceanic

The physical processes are

tion of El Nino events.

El Nino results from interac-

El Nino was originally

breadth of Asia.

Christmas.

El Nino/La Nina

Wreaking Havoc Across the World

by Md. Asadullah Khan The abrupt weather patterns, unusually dry spell for days, followed by torrential rains running to deluge and frequent hurricane formations in the coastal belts of Bangladesh are tell-tale signs that El Nino effects are already there. From Manila to Bangkok to Beijing, governments have taken preventive measures to minimise the damage caused by this sinister natural havoc. Bangladesh government's preparedness in this

respect seems little known to people.

waves. The system oscillates between warm (El Nino) to neutral (cold) conditions with a periodicity of roughly 3-4 years. The strongest El Ninos this century struck were in 1925-26 and The great width of the Pacific Ocean is the main reason we see El Nino Southern Oscillation (ENSO) events occurring there

donesia the drought has comas compared to the Atlantic and pounded the economic crisis Indian Oceans. Most current unleashing forest fire and Intheories of ENSO involve planetary scale equatorial waves. donesian government and people even with help from the The time it takes these waves to neighbouring countries could cross the Pacific is one of the hardly tame the raging blazes. factors of ENSO climate The El Nino related climatic anomalies. The narrower width event of the decade has wracked of the Atlantic's or Indian the Phillipines so much so that ocean means the waves can thousands of families in Southcross those basins in less time. so that ocean adjusts more ern Mindanao face severe quickly to wind variations. shortage of food and other eco-Conversely, wind variations in nomic hardship. On the other the Pacific Ocean excites waves side, Palawan situated in the west of the Phillipines has been that take a long time to cross the basin, so the Pacific adjusts ravaged by forest fires and most to wind variations more slowly. The slower adjustment time alparts of the country are experiencing dry spell. The situation lows the ocean-atmosphere sysis equally grim in Vietnam. Ho tem to drift further from equi-Chi Minh city is going through librium with result that interits driest spell in a century and annual climate anomalies (e.g. the hottest since 1912, as reunusually warm or cold sea ports suggest. In the southern and central areas of the counsurface temperatures) are larger in the Pacific. try, scorching temperatures and There is another way in lack of rain have damaged cofwhich the width of the Pacific fee and cashew crops. Losses allows ENSO to develop there as from the coffee alone are esticompared to other basins. In mated to be around US\$100 million. The woes in Indonesia are much more grim. For months there was no rain in

the narrower Atlantic and Indian oceans, bordering land masses influence the seasonal climate more significantly than in the broader pacific. The Indian ocean in particular is governed by monsoon variations, under the strong influence of Asian land in Seasonally changing heat sources and sinks over the land are associated with the annual migration of sun. Heating of the land in the summer and cooling of the land in the winter sets up land sea temperature contrasts that affect the atmospheric circulation over the neighbouring recognised by fishermen off the ocean. The land influence comcoast of South America as the petes with ocean and atmospheric interactions which are essential for generating ENSO (El Nino Southern Oscillations).

La Nina, the temperamental sister of El Nino means "the little girl". La Nina is sometimes called El Viejo, anti-El Nino or simply a "cold event" or a "cold episode". La Nina is characterized by unusually cold ocean temperatures in the equatorial Pacific, as compared to El Nino, which is characterized by unusually warm ocean temperatures in the equatorial Pacific. Global climate anomalies associated with La Nina tend to be opposite those of El Nino.

At higher latitudes, El Nino is only one of a number of factors that influence climate. However, the impacts of El Nino and La Nina at these latitudes are most clearly seen in winter time. In the continental U.S. during El Nino years, temperatures in the winter are warmer than normal in the North Central States, and cooler than normal in the Southeast and the Southwest. During La Nina or El Viejo year, winter temperatures are warmer than normal in the Southeast and cooler

than normal in the Northwest. El Ninos usually occur irregularly, approximately every two to seven years. The El Nino

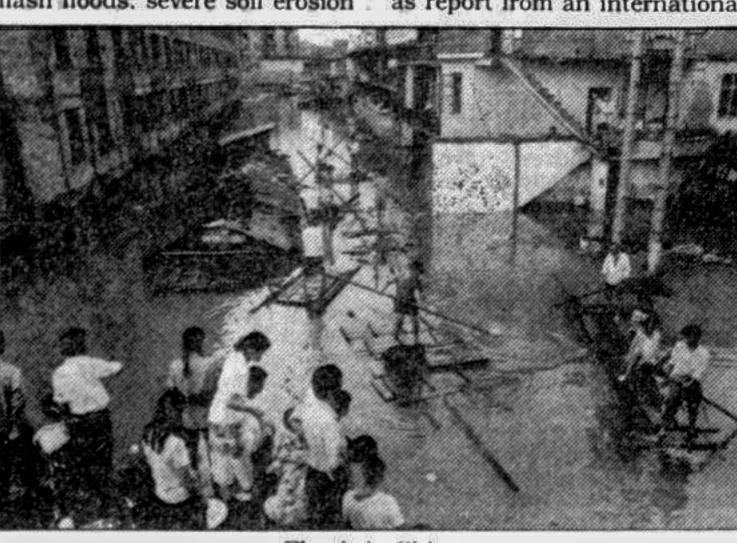
years 1976-77, 1982-83, 1986-87. 1991-94 are distinguished by large SST (Sea Surface Temperatures). The latest coming of El Nino in 1998 is among the worst on record and the impact has varied wildly from one region to another. While floods have engulfed the Americas and deadly storms have swept over China and Taiwan droughts have parched Australia and fueled fires in Southeast Asia and

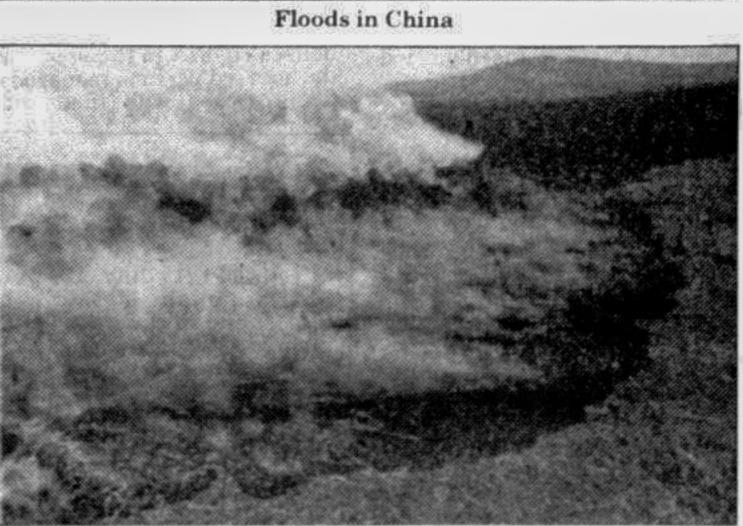
around the globe. Some scientists now say that 1998 could witness an unusually strong La Nina and Asia is bracing for its

onslaught. In general warm ENSO episodes are characterized by a number of tropical storms and hurricanes in the eastern Pacific and a decrease in the Gulf of Mexico and the Caribbean sea. As many as 14 storms have hit the regions of the Pacific Ocean in places where it never happened so before. Hurricanes seldom hit California, but this time it struck. It never rained in

region in the past but in the year 1997, only one storm hit this region. It is so believed by scientists like Prof. Bill Gray of Colorado State University that El Nino conditions suppress the development of tropical storms and hurricanes in the Atlantic and the La Nina (cold conditions in the equatorial Pacific) favours hurricane formation In Indonesia, meteorologists believe that when torrential rains fall on the ground charred by more than 1000 forest fires the downpour could produce flash floods, severe soil erosion

Last fall a vast swath of Southeast Asia was immersed in smoke from Indonesian forest fires : hundreds died and tens of thousands were stricken with respiratory ailments. Damage caused by the haze alone exceeded \$1 billion. Meanwhile, famine has struck the region and hundreds have perished from hunger in Indonesia's Irian Jaya province as a result of crop failure. This year dry conditions and fire have brought 60,000 close to starvation in East Kalimantan, as report from an international





Fires in Brazil Photos — Courtesy: TIME

and the depletion of fish stocks as toxic ash seeps into rivers. lakes and coral reefs. In the Phillipines ex-president Fidel Ramos ordered officials to unclog and repair drainage and ' flood control systems nationwide to prepare for floods that could destroy rice fields causing huge crop losses. Says Natural Resources Secretary of the Phillipines, "We are more worried about La Nina than El Nino". That's saying something considering the toll that La Nina's temperamental brother has taken so lar.

organisation suggests. In the Phillipines agricultural losses and malnutrition are mounting as hordes of rats have surfaced from the scorched earth to infest farmlands. Heavy rains have hit coastal China and Taiwan, where the worst typhoon in a decade blew through last summer, killing more than 200 people. Damage caused by cyclones in parts of coastal areas of India in the recent past in terms of loss in human lives and property were extensive.

The eastward flow of the

that drive El Nino", says Scripps' Nicholas Graham. The sloshing sends waves across the ocean like ripples in a pond. These waves, in turn, push down on the so-called "thermocline", a layer of cooler water that normally mingles with the warmer water at the surface. As the thermocline sinks to greater depths, the mixing stops, the temperature at the sea's surface rises, and an El Nino begins.

These ripples can be thou-

sands of kilometres long, but since they travel 30 metre or more beneath the surface they are hard to detect directly. Scientists, have as such taken resort to the use of satellites that pick up the subtle undulations in sea level produced as the ripples pass by. NASA oceanographer Anthony Busalacchi in making a study could see early last year that swarms of undersea waves had started to head out across the Pacific toward the coast of Peru. He followed them in a research vessel as they slammed into the continental shelf, then spilt, heading sharply south toward Chile and north toward Alaska. The warm water created by the south-moving ripples created a heat wave that sent residents of Santiago flocking to nearby beaches in the middle of their winter, while the north moving waves triggered a sharp rise in ocean temperatures off the U.S. west coast, delighting sport fishermen by attracting tropical species like marlin to usually frigid waters.
Continuing their study on

the Pacific, researchers could see that when the waves first hit the South American coast, some reflect back, like sound bouncing off a wall. When the reflected waves reach Asia, they rebound again. But this double bounce inverts their effect : instead of depressing the thermocline (layer of cooler water that normally mingles with the warmer water at the surface). these twice reflected waves now lift it up. Cool water dilutes the warmer liquid at the surface causing a temperature drop in the eastern Pacific and that decrease is known as La Nina. So observes Ants Leetmaa, director of the National Climate Prediction Centre, "Each El Nino contains the seeds of its own destruction". For every Nino ther's a Nina.

To be sure, predicting the onset of an El Nino has improved remarkably since the last major event caught the world by surprise in 1982. For months, and in some cases years, meteorologists have been poring over weather maps, running super computer simulations, studying coral reefs, tree rings and glacial ice - all in an effort to study the dynamics of water temperatures in the Pacific.

Using a powerful oil drill, Columbia University oceanographer Richard Fairbanks floated in the equatorial Pacific in a research vessel spending weeks at El Nino's very epicentre that helped him obtain important clues through boring the reef bed buried beneath sea floor and plugging chunks of Pacific is central to the physics coral. Corals, it turns out, are Examinations, BUET.

like miniature thermometres and rain gauges. When water temperatures rise, these small creatures incorporate less strontium into their skeletons than they do under cooler conditions. Their oxygen content, meanwhile records salinity swings, which in turn can be used to estimate rainfall. And warm temperatures and heavy rainfall - here, at least - are the telltale markers of El Nino.

It is now possible to provide a six-month lead time that allows governments to warn farmers to switch crops or planting times and dig wells and reservoirs. A forecast can also help industry prepare their production mechanism and marketability of their goods. If garment factories know the coming season will be hotter than usual, they can produce lighter trousers and shirts. If heavy rains are predicted. umbrella-makers can rev up their production lines. Researchers hope that in time they will increase the forecast lead time to 12 months, though Colorado University climatologist Peter Webster acknowledges that the picture will always be short on

Many experts believe that by the time this "El Nino" event passes, it may prove to be the worst on record in terms of impact and staying power. Some months back, a host of meteorologists, oceanographers and climatologists assembled in Bangkok for a first ever Asian meeting on "El Nino related crises". Participants agreed to help set up a regional advisory board and called on governments to co-ordinate better and share information. They also highlighted what the region might expect weather wise, and the news did not give much hope, since science till now has only a limited anti El Nino arsenal. The abrupt weather pat-

terns, unusually dry spell for days, followed by torrential rains running to deluge and frequent hurricane formations in the coastal belts of Bangladesh are tell-tale signs that El Nino effects are already there. From Manila to Bangkok to Beijing, governments have taken preventive measures to minimise the damage caused by this sinister natural havoc. Bangladesh government's preparedness in this respect seems little known to people. There is still a way out to meet the challenge of this mischievously destructive kid, largely by protecting the forest wealth. The tropical rain forests, meteorologists say, form the "balance wheel" that governs the weather patterns of the earth. There are millions and millions of hectares of these forests around the world.

Meteorologists have warned time and again if these forests disappeared or were substantially reduced, chaotic weather conditions would wreak havoc in the world. The catastrophic weather patterns during the past seven years and thus far in 1998 proved their theory. True, El Nino is a destructive kid, but does it deserve all the blame?

The author is Controller of

Global Bid to Trap Landmines in a High-tech Web

New communications technology is being harnessed to help the fight against landmines. Gemini News Service's Internet column examines the computer campaign against a world scourge that kills or injures 2,000 people a month.

Arlene Getz writes from Boston, US

T ITH landmines still /// claiming the lives and limbs of dozens of victims every day, the United Nations is building a high-tech system to assist efforts to eradicate the weapons.

UN officials are working on a European-initiated project to create an information management system using a combination of satellites, sensors, data banks and the Internet to coordinate mine-removal operations.

The new system will also improve communications between UN agencies and other humanitarian and donor organisations.

"Our problem has been that there was almost no communication between field and UN headquarters," says Colonel Jacques Baud, the Swiss officer who is designing the system.

Baud has been seconded to the UN headquarters in New York to work on the project, an integral part of the International Humanitarian Mine-Clearance Centre established by the Swiss government in Geneva last November.

As part of the new system, a computer software package should be ready by next year to help organisations needing preliminary data to start mineremoval projects.

Meanwhile, a computerised mapping facility, known as a Geographic Information System (GIS), is being developed by

the Joint Research Centre of the European Commission for use in Angola. This enables a computer to update, analyse and manipulate all forms of geographically referenced infor-

"It is envisaged that a handheld GIS-based tool will be used at field level to record and report day-to-day progress of mine-clearance projects," research centre official Geoffrey van Orden wrote in a recent issue of the UN Department of Peacekeeping Operations publication Land Mines. 'With the recent boom in satellite telecommunications technologies, it will be possible to send information from any location irrespective of the state of local communication facilities."

Some components of this system are already used in Bosnia and Croatia, where computer operators daily pro-cess large amounts of data about clearance, casualties and detailed maps.

In another advance, Baud says the establishment of data banks will enable clearance experts to share technical information about landmines, which kill or injure about 2,000 people - many of them children

— every month. The UN Mine Action Service estimates that 110 million anti-personnel mines have been planted around the world. in places such as Afghanistan, Angola, Cambodia, Ethiopia.

Iraq. Mozambique, Rwanda, Somalia, Thailand and Viet-

Brazil. But as bad as the past

year has been the future may

hold no relief. As stated earlier,

the period following an El Nino

often brings a cooling of those

same Pacific seas — a climatic

pattern known as La Nina

which generally produces sharp

reversals of weather patterns

Fires in Indonesia

According to Baud, these mines come in about 600 different types and each can be planted in 10 or 15 different ways. In Afghanistan, for example, anti-tank mines, which are designed to be activated by the weight of a heavy vehicle have been adapted so that they

can be detonated by a child. Clearance operations can be assisted by data banks. There are only a limited number of people - maybe a couple of hundred — with mine [clearing] experience," says Baud. "As long as you have countries with new [de-mining] requirements, you need to know who is available."

Another advantage of the new information system is its ability to keep contributors informed about how their money is spent. The campaign against landmines gained global prominence with the high-profile involvement of personalities such as the late Diana, Princess of Wales, and last December's signing by 132 states of the Ottawa Treaty banning the use, manufacture, sale and stockpiling of anti-personnel

One consequence of this has been that organisations such as the UN now find that donors are demanding more say about how their contributions are used. "With all the new needs. donors are getting fussier.

points out Baud. Eventually, he hopes antimine personnel around the world will be able to communicate with each other and obtain relevant information over the Internet.

the desert area of northern

Chile before. But in October

1997, it rained so heavily that

the season of storms in the At-

lantic, at least six or more hur-

ricanes or tropical storms

swept over the Atlantic ocean

During August to October.

there was flood in the desert.

These high-tech plans, however, are still encountering a range of lower-tech problems One is that some governments are unwilling to cooperate because they consider information about mines too sensitive to be released to outside agencies. While Baud is unwilling to name specific countries, he says their reluctance to share data stems from reasons such as wanting to keep information away from political opponents of because they are afraid of frightening off tourists.

Use of the Internet could also be hampered because some ruling parties restrict access to the worldwide computer network. Inadequate domestic infrastructures are another problem, with some developing countries still relying on maps compiled during colonial times.

"It doesn't help to start with computers [in those regions], says Baud. "We have not only to set up an information system, we have to set up the basic tools of mapping. That's a problem especially in Africa."

The writer is a former South Africa correspondent for 'Newsweek' magazine and the 'Sydney Morning Herald'.

Eco-feminist's Passionate Love Affair with the Environment

Durga Ray writes from New Delhi

Conservation of forests and concern about agriculture runs in her blood. Her father, who had served in the Army during World War II, was with the Uttar Pradesh Forest Division, while her mother was a farmer.

ER living room says it all. Paddy stalks in preservative solutions and varieties of seeds of rice pulses in neatly labelled jars share the shelves with stacks of books she has written and magazines she contributes

A leading international environmentalist. Vandana Shiva's home in the capital serves as the office for the Research Foundation for Science, Technology and Ecology (RFSTE), an organisation which she heads. With the issues of patents, biodiversity and biopiracy hotting up in India, Shiva and her group have often been in the international spotlight recently.

The foundation has been spearheading research and action for biodiversity conservation and people's rights which, Shiva says, "are threatened by centralised system of monocul ture in forestry, agriculture and fisheries"

A visiting professor at universities in Norway, Britain, Sweden, Canada and the U.S. prestigious international awards have become a sort of a habit for Shiva. They include the Order of the Golden Arc. Earth Day International award and the Alternative Nobel Prize (Right Livelihood award).

all of which she got in 1993. In 1997, she was given the Golden Plant award in Denmark and the Alfonso Comin

Navdanya. award in Spain. the national movement to protect the diversity and integrity of living resources, specially native seeds", was started by her 1991. Under this project. seeds belonging to indigenous varieties of cereals and pulses have been collected from all over India and community seed banks set up.

Workshops are held for farmers in villages from time to time and they are encouraged to take up organic farming -- using native seed varieties and avoiding the use of pesticides and fertilisers. Navdanya also has a con-

sumer support system which involves encouraging consumers in cities to use products of organic farming. "It is a package that saves biodiversity. the soil and creates a market which supports the shift of the farmer towards biodiversity.

Thirty farmers in Dehradun. a small hill town in the northern state of Uttar Pradesh, have shifted towards organic farming." Shiva, 45, told IANS in an interview.

"The movement towards sustainable agriculture is the most invisible movement going on." Shiva said. "The Green Revolution was a mistake," she said about the agricultural boom in the 1960s which, using hybrid varieties of wheat and rice, made India self-sufficient in its foodgrain requirement.

"It would have happened if our own seeds had been improved by selective breeding.

Shiva, a physicist by training, did her doctoral research from the University of Western Ontario in Canada. In 1982, she founded the RFSTE in Dehradun, her hometown. She had been sent there by the Union government to assess the impact of limestone quarrying in the area.

A firm believer in "ecofeminism which is second nature" to her, Shiva has initiated a global movement called 'Diverse women for diversity' against monopolisation of various sectors "like the seed market". Shiva is also a part of the 'International Forum' on Food and Agriculture' which is an international network of experts on sustainable agriculture from Africa, Asia, Latin America and even the United

States. "We are trying to redefine agricultural paradigms." Shiva

commented.

Shiva generally spends much of her time travelling. If she is not attending conventions and lecturing university students abroad, she is travelling within India to express solidarity with people protesting against destruction of their habitat or to hold workshops with farmers.

Conservation of forests and concern about agriculture runs

in her blood. Her father, who had served in the Army during World War II, was with the Uttar Pradesh Forest division.

while her mother was a farmer. "During the '70s, when I used to come home on vacation from Canada, I used to work for the Chipko movement in the Garhwal hills (where women clung to trees to save them from cutting)," Shiva said. Her love affair with the environment has always been as passionate.

Labelling the biodiversity law, recently proposed by the Union Environment Minister of India Suresh Prabhu as "an act to protect biopirates", Shiva said that it only proposes "cleverer mechanisms to take away the resources of the

According to Shiva, the only way forests and the biodiversity they harbour can be protected is by giving "legal shape to the inalienable rights of the local communities on their biodiversity in the form of seeds, medicinal plants, fish

and animal diversity". Calling the proposed 'Environment Fund' which would be formed by levying fines on industrialists who set up projects on forest land as "Prabhugreenwash", Shiva said, "This would cause double destruction - destruction of forests and de-

struction due to pollution." India Abroad News Service









