

Why policy must mesh with climate

In February, the United Nation's Economic Commission for Africa (ECA) convened a scientific roundtable to discuss whether the climate in Africa has changed, whether it can be modified, whether droughts can be forecast and whether human activities affect the climate. They also produced a plan of action to remind African leaders and foreign-aid agencies that a drought doesn't end with a timely rain and that there is a need to develop long-range drought recovery programs to replace the stop-gap responses that often do more harm than good.

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By MICHAEL H. GLANTZ

Some researchers speculate that the increase of carbon dioxide in the atmosphere is increasing global temperatures and is beginning to change climates throughout the world.

The increase in carbon dioxide began with the Industrial Revolution and its increased burning of fossil fuels such as coal, oil and gas.

Deforestation also has contributed to the increase of carbon dioxide, but in a different way: Trees, during photosynthesis, take carbon dioxide out of the air. With

widespread depletion of forests around the world there are fewer trees to accomplish this.

What carbon dioxide does is prevent the escape of the Earth's heat into space. The result is the heating of the Earth's atmosphere — known as the Greenhouse Effect.

Climatic patterns around the world will be affected by the Greenhouse Effect, with some dry areas becoming wetter and some wet areas becoming drier. Scientists today do not know what the regional effects of such a global warming will be, nor can they identify who will be the winners and losers.

Another factor is the effect of El Niño, which is considered the cause of recent droughts not only in Africa, but in India, Indonesia, Australia, Brazil and the U.S. El Niño also is being blamed for floods in Brazil, Peru and Ecuador.

El Niño is the name given to certain meteorological-oceanographic events that occur periodically in the Eastern Equatorial Pacific Ocean, although there is little scientific consensus about how and why these events occur.

El Niño can be described as an invasion of warm water from the western part of the Pacific basin into the usually colder eastern part — off the coasts of Peru and Ecuador. This invasion, which can last as long as 18 months, has been associated with the disruption of weather patterns around the world. The last big one occurred in 1972-73 and precipitated droughts, floods and freezes, which in turn resulted in a major food crisis. El Niño events, which have been reported for hundreds of years, undercut theories that the world's climate is changing.

RAINMAKING: A PLACEBO OR A PANACEA

Doubts persist among scientists about whether cloudseeding really works; but, even if it does, it would make no sense to try the procedure during a drought, because there are so few clouds to seed.

Cloudseeding involves spreading a seeding agent such as silver iodide into the clouds by using

Effects of drought on economic development

- Sharp drop in crop yields — of cash crops for export, and the supply of seed available for next season's planting.
- Increases in food prices, in the level of malnutrition, black-marketeering, and human and livestock deaths.
- Migration into the cities from the rural areas.
- Depletion of scarce foreign currency (for emergency grain purchases) that creates long-term foreign debts; a dependence on costly food imports that inevitably derails long-range development programs.



either airplanes or ground generators.

According to the theory, if the cloud temperatures and other conditions are just right, the minute particles of the agent act as nuclei around which a tiny droplet of water in the cloud collect. Through this process, larger drops of water form and eventually fall from the clouds as rain.

If it really works, cloudseeding should be done in rainy periods and the excess water should be stored in reservoirs in anticipation of dry spells. Nevertheless, many African countries ask for and receive drought relief in the form of cloud-seeding programs.

CAN AFRICAN DROUGHTS BE FORECAST?

Some scientists are trying to develop ways to forecast droughts, but it is extremely difficult.

Recent studies, however, indicate that if a drought occurs one year in West Africa, there is a 60 percent chance that it will continue into the second year. This is important to know because most farmers and herders in West Africa can't ward off famine by using their grains sparingly for food and for planting in the first year of a drought.

Each drought has its own set of characteristics — they vary in intensity, location, duration, and geographic extension. Generalizations about droughts are possible, but applying those generalizations to a specific situation in order to forecast a specific drought in a specific location borders on the impossible. And there is little hope for the early development of a drought-forecast capability.

DO HUMAN ACTIVITIES ABET DROUGHT?

Many research projects are under way to determine whether human activities perpetuate drought.

Scientists suggest that the overgrazing of vegetation by livestock and deforestation by people in the West African Sahel increased the Earth's reflectivity by removal of dark vegetation. As people cut down trees to obtain wood for construction or to cook their meals, they remove the dark vegetation that absorbs the sun's energy and they leave bare soil that reflects rather than absorbs the energy.

The exposed surface of the Earth cools, causing the air masses above to fall instead of rise. And this is a problem because falling air masses

don't allow clouds to grow high enough to produce rain.

This can become a vicious circle as the overgrazing and deforestation can lead to drought conditions which in turn kill off the remaining vegetation, thereby perpetuating the drought.

DROUGHT FOLLOWS THE PLOW

Settlers opened up the American Great Plains to agriculture in the mid-19th Century. At that time, the belief was that "rain followed the plow," meaning that if grasslands were replaced with crops and trees, the rain would fall.

Today, in Africa, drought is following the plow. And the plow is being used on land that was only marginally suited for agriculture.

What happened was that farmers were encouraged by their governments to move into areas with poorer soils and a shortage of rainfall, because the best lands were already under cultivation.

Putting new land under cultivation in West Africa was started by governments from 1953 to 1967 — a period of favorable rains. Government officials tried to increase agricultural production to keep up with the food needs of growing populations, but they unwittingly set up the farmers for the inevitable drought that occurred between 1968 and 1973.

Farmers in the newly cultivated areas believed they had become victims of a natural disaster, but in reality they were victims of poor government decisions.

POST DROUGHT RECOVERY

People consider drought a passing phenomenon: Here this season, gone next season. Yet droughts frequently persist year after year. And policymakers often act in ways that leave an area unprepared for the return of drought or rain.

The scientific roundtable on climate and drought in Africa adopted a draft Plan of Action to Combat Drought in Africa to remind African leaders and foreign-aid donors of their need to develop post-drought recovery programs while they are in the midst of drought and to avoid stop-gap responses such as rebuilding the herds or relocating refugees.

While leaders of newly independent African countries have had to cope with a score of crises traditional to the development process they also have had to deal with drought for a large part of the period of independence.

The effects of drought have combined with, and even worsened, some of the other constraints to economic development.

Despite recurrent droughts, policymakers in Africa and donor countries continue to consider droughts as transitory, yet the current drought is this fourth in West Africa this century. Such an attitude leads to ad hoc emergency responses. Drought must be given more serious consideration in development planning than has been the case.

In arid and semi-arid areas, where rainfall is highly variable from year to year, drought must be expected as part of the climate.

The way governments use their land, and donor countries apply their aid must reflect this, or development policies will be doomed to repeated agricultural failures.

