

Climate Change and its Effect on World Food

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In February of 1972 earth-orbiting artificial satellites revealed the existence of a greatly increased area of the snow and ice cover of the north polar cap as compared to all previous years of space age observations. Some scientists believe that this may have presaged the onset of the dramatic climate anomalies of 1972 that brought far-reaching adversities to the world's peoples. Moreover, there is mounting evidence that the bad climate of 1972 may be the forerunner of a long series of less favorable agricultural crop years that lie ahead for most world societies. Thus widespread food shortages threaten just at the same time that world populations are growing to new highs. Indeed, less favorable climate may be the new global norm. The Earth may have entered a new "little ice age". Perhaps this future period will not be so extreme as that around 1700 AD, but it seems likely, at least, to be a cooler period resembling the hemispheric climatic regimes of the period from 1880-1920.

Hot, dry weather in July and August of 1972 devastated food crops in the Soviet Union in the Moscow region. This was preceded by unusually cold and severe growing conditions in the Ukraine for winter wheat. The Soviet Union, as a consequence, purchased over 25 million metric tons of grain abroad. In the same year, India's monsoon rains came one to two weeks late, and retreated early. This materially reduced India's cereal production. The South Sahara (Sahel) drought worsened. Inadequate rains damaged grain production in Argentina and Australia. Peru's anchovy catch, a major Latin American protein resource, dropped drastically, though it is not certain that this was the result of a climate change. Abnormally wet weather, clearly a climate anomaly, in the fall of 1972 and into the spring of 1973 reduced U.S. production of corn and soybeans.

Reflecting all this, world food prices skyrocketed as world grain reserves dwindled.

By the start of 1974 corn and wheat prices had doubled or tripled, as compared to a mere two years before. Many countries of the world are now experiencing serious waves of inflation; most economists consider the food cost spiral to be a significant contributing cause.

There are strong signs that these recent climate disasters were not random deviations from the usual weather, but instead signals of the emergence of a new normal for world climates. If so, it is a normal that will be far less favorable to global agriculture, and thus to world food supplies.

Not all climate experts agree, however, that this is so. Because of this difference of view there is a clear and pressing need for a major new thrust of basic and applied research on climate change. In this respect it is most encouraging that the Global Atmospheric Research Program, at a special meeting in Sweden this summer, is dedicating heightened attention to the pursuit of

a fundamental understanding of the causes and predictability of world climate changes.

If we are, indeed, experiencing a worsening of world climates it is, perhaps, equal in severity to any within the last millenium. The arguments for this view were developed by several of the climatologists who attended an international workshop on climate and its effects on human life convened in May 1974 in Bonn, Germany.

At this meeting Profs. H. Flohn of Germany, H.H. Lamb of the United Kingdom and Reid Bryson of the United States developed a highly persuasive demonstration that there has been a steady cooling of northern hemisphere temperatures during the last 30 years, with the strongest cooling at the higher latitudes. The average cooling has been only about 0.3°C, but this appears to be sufficient to cut about one week from the mid-latitude growing season, a highly significant matter agriculturally. Even more important, however, such a cooling appears, these climatologists believe, to be accompanied by a more variable climate, with agriculturally adverse droughts, abnormally cold spells, heat waves, and other extremes becoming more common.

The workshop, sponsored by the newly-created International Federation of Institutes for Advanced Study (IFIAS), was primarily focussed on the social, economic, political and ethical consequences of the climate changes. The participants, from 11 countries, included climatologists, agricultural economists, geographers, lawyers, oceanographers, political scientists, as well as representatives from the World Council of Churches and the League of Red Cross Societies.

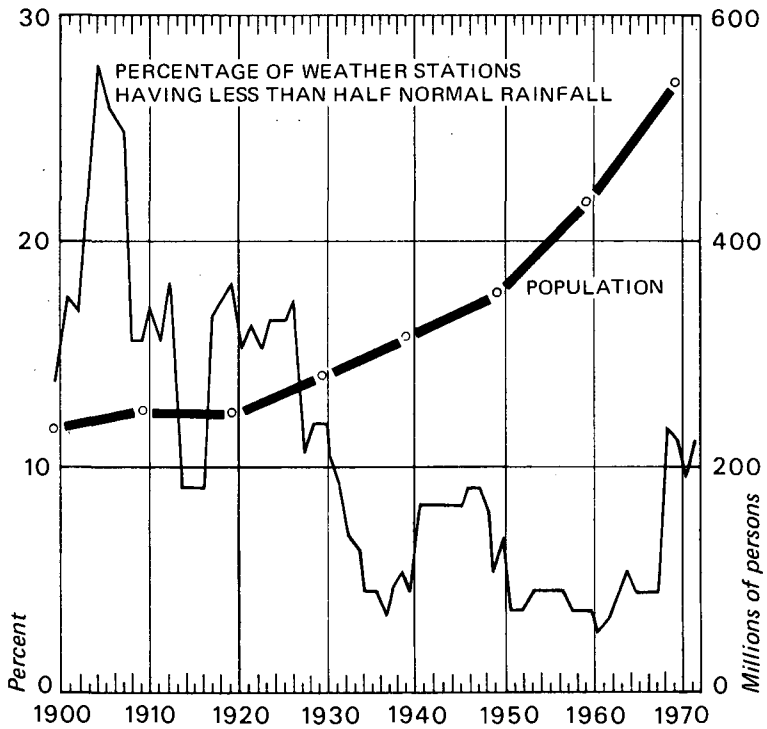
Their unanimously adopted conclusions are sobering. They expect anomalies like 1972 to recur, and consider the world ill-equipped to deal with them. They state:

"Grain reserves which used to be abundant in some regions are no longer sufficient to serve as insurance against disaster and by some estimates have dropped to such low levels that they can suffice to supply the world needs for less than one month at present consumption rates. At the same time wasteful and excessive consumption by the affluent, along with increasing numbers of mouths to feed, strains the capacity of farmers to deliver enough food even from the best of harvests. It becomes ever more difficult, expensive and risky to open up new arable land, and at least as difficult to limit the use of marginal land highly vulnerable to erosion and worsening of climate.

"In short, the current food-production system now has little flexibility with which to meet emergencies. What we have hitherto regarded as occasional emergencies, moreover, can no longer rationally be so regarded.

"The facts of present climate change are such that the most optimistic experts would assign near certainty to major crop failures within a decade. If national and international policies do not take these near certain failures into account, they will result in mass deaths by starvation and probably in anarchy and violence that could exact a still more terrible toll. It would be irresponsible in those circumstances to continue passively in our present condition of helplessness: without food reserves or alternative technologies to produce food and without adequate means to redistribute food from the more favored nations or more favored groups within nations to the less favored in time of urgent need."

The crop season of 1974, in the U.S. at least, already shows alarming signs of adverse growing weather. Texas and the agriculturally important high plains of Western United States are experiencing sustained drought, and significant parts of the "corn country",



A grim prospect for India is suggested by the chart above, drawn from data compiled by Reid Bryson. Droughts in northern India declined in frequency during the period when the world was getting warmer, but have been increasing in recent years. Points on the chart indicate the proportion of weather stations whose average rainfall for the previous ten years was less than 50 percent of normal. The population line shows India's population growth, which Bryson contends was encouraged by the warmer climate.

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slightly farther east in the United States, after a wet planting season, have suffered hot, dry winds that have dessicated the immature ears of corn, grossly reducing their production. After months of predictions of all-time record crops, the U.S. Department of Agriculture, during the 1974 summer, reduced its estimates downwards with each passing month. Some farmers fear a drought period equal to that of the 1930's, which continued for about four years and had agricultural repercussions for a decade.

In the face of such evidence, the nations of the world should take steps, as the IFIAS workshop urged, "individually and collec-

tively, to plan and act to establish the technical, social and political means to meet this challenge to peace and well-being."

Among the necessary steps are measures to build internationally-available food reserves. This will involve not only all-out agricultural production in favorable areas, and the rebuilding of stored food reserves, but also measures designed to permit efficient and affordable access to these reserves by the poorer nations. Moreover, it will demand of us mindful attention to the intimate systems-relations amongst resources of energy, water, fertilizer, manpower and capital, all involved in the food/climate equation.

As the IFIAS workshop cogently observed, *“New, or at least newly urgent, ethical problems loom in perhaps unavoidable decisions to allocate food supplies that are grossly inadequate to keep everyone alive. Age-old problems of social justice inherent in the current distribution of wealth among economic classes will at the very least be sharpened. These furthermore may now have practical as well as ethical significance; one way to find reserves could be to eliminate wasteful and physiologically excessive consumption among the affluent of the world; another might be to improve food-handling processes to plug the holes through which so much grain now goes to*

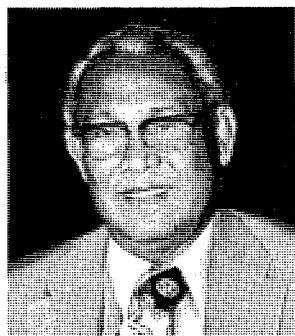
waste; finally, further reform is still needed in the land-holding systems of some of the poorest countries that too often have discouraged farmers from increasing production.”

It is evident that the world faces a grave challenge to its political machinery and its capabilities for social and technological innovation. The right to adequate nutrition should be guaranteed to every human born to this planet. To accomplish this, the peoples of the Earth will be called upon to take unprecedented measures of co-operation and self-restraint. The successful solution of this problem may be the most important item on the entire agenda of humanity.

NEWS IN BRIEF

From Headquarters

The 18th General Conference of the IAEA took place in Vienna from 16 - 20 September. Eighty-two Member States were represented at the Kongresszentrum in the Hofburg.



Mr. Florencio A. Medina, Chairman of the National Science Development Board of the Philippines, was elected President of the Conference. Mr. Medina, a chemistry graduate of the University of the Philippines, has long been connected with the work of the Agency, and has been a Commissioner of the Philippine Atomic Energy Commission since 1958. In 1964 he was appointed Director of the Division of Exchange and Training of the IAEA; he remained in this position for four years.



H.E. Mr. Ulises Schmill Ordóñez of Mexico (Ambassador to Austria and Resident Representative to the Agency) was elected Chairman of the Programme, Technical and Budget Committee, and Professor Wojciech Morawiecki (Director, Department of International Law, Central School of Planning and Statistics, Warsaw) was elected Chairman of the Administrative and Legal Committee.