

# Nature Applies 'Screws'

## *Professor Pimentel speaks to issues of food, energy, and population*

by Evonne Moore

Nature is starting to put the screws on us, a leading USA authority on population and food, Professor David Pimentel, told a conference titled "Food, Energy, and Population" held in Adelaide at the University of South Australia in July of 2002.

"There are three billion people in the world suffering from malnutrition and this is contributing to the spread of AIDS, malaria and tuberculosis. Over two billion people are infected by tuberculosis and 2.4 billion infected with malaria. Four billion people are poor," he said. "With world population exceeding 6.2 billion, we are adding a quarter of a million extra people to the Earth every day."

As professor of ecology and agricultural science at Cornell University and a leading scientist on energy inputs and outputs in food production, Professor Pimentel told the conference sponsored by Sustainable Population Australia that population growth was undermining traditional freedoms.

"We all, everywhere in the world, favor reproductive freedom. However, this freedom to reproduce is degrading or reducing our freedom from poverty, our freedom from malnutrition, our freedom from diseases, our freedom to have a quality environment, and it's also eroding our social structure. And, equally, it's eroding our democracy because for each person that's added, it reduces your impact as a contributor to your democracy," he said.

Even with effective birth controls in place, future population growth will still be enormous. For example, if every couple in China were successfully limited to one child per couple, China would still add 200 million to its population, because of momentum.

"If every couple [in the world] were limited to a

maximum of two children tomorrow, it would take about 70 years to stabilize the world's population and during this period the world's population would double to 12 billion."

The Green Revolution allowed a 4-5-fold increase in food production, but this was accomplished with large fossil energy inputs. Today food production is failing to keep up with population growth. "As measured in grain production, which makes up 80 percent of the world's food, per capita food production has been decreasing for almost two decades," he said. This was due to a per capita drop of 20 percent in cropland and 12 percent in irrigation. Cropland loss was mainly due to urbanization, salinization and erosion. "Fertilizer use per capita has also fallen by 21 percent in the past decade for economic reasons."

The world's livestock population now outweighs the human population five-fold, and 250 tons of grain are fed to these animals each year. Over 800 million people could be sustained on this grain.

He pointed out that soil erosion was growing worldwide, especially in developing countries where it was intensifying. Four billion poor people depend on biomass energy for their fuel. Poor farmers have to burn crop residues and dung as fuel because firewood supplies are declining and fossil fuels are too expensive. The removal of crop residues for fuel leaves soil barren and subject to erosion. He expects that about one-half of the current arable land now in cultivation will be unsuitable for food production by the middle of this century. This is very bad news.

"Water is the main limiting factor in crop production because all plants need enormous volumes of water to grow. To produce one hectare of corn requires five million liters of water per hectare. But if you irrigate, you need twice that amount — about ten million liters in a commercial cornfield. One kilogram of grain requires 1,000 liters of water (rice is twice that). To produce one kilogram of grain-fed beef, you need 43,000 liters of water," Professor Pimentel said. In poor countries, 90

---

*Evonne Moore is an environmental policy consultant and an elected local government representative in South Australia.*

percent of infectious diseases come from water. In the USA, infectious diseases are increasing.

“The USA is adding four million people a year. During a 30-year period of urbanization and highway building, the USA blacked out an area larger than the state of Ohio, 30 million acres. For every extra USA person, we need one acre of land just for urbanization and highways.”

25 million children in the USA live in poverty.

“The USA population has doubled in my lifetime. Population growth is a slow, incremental and insidious process. In Los Angeles, commuters in automobiles spend 50-100 hours sitting in traffic each year, breathing in fumes. Each year, it increases half an hour to one hour a year. The cancer threat in Los Angeles is 5,000 times that of Ithaca, where I live,” he said.

Other conference participants spoke about Australia’s environmental problems.

John Williams, chief of the Land and Water Division of the Commonwealth Scientific, Industrial and Research Organization (CSIRO) said “Australia is an old, flat and salty land. How many people can we have in our old, flat salty land?”

In Australia, every three minutes, an area the size of a football field is lost to salinity. In Queensland alone, 20 million hectares of land are a salinity hazard. “Our continent is a very old, flat stable land mass that has eroded through time, accumulating sediments and salts. It is quite different to most other parts of the world,” he said.

“Our rivers meander, they are sluggish and slow. Their arteries and veins are not in good shape and need special care.” Environmental threats include salinity, erosion, soil acidification and habitat loss. Irrigation produces most of Australia’s food.

“We’re putting more water into the landscape than the landscape can cope with. Salinity is a loss of biodiversity — we’ve taken out the big gum trees. Failure to address salinization is a major constraint to sustainable population,” he said.

Kevin Goss, general manager of the Natural Resources unit of the Murray-Darling Basin Commission, said that

“competition for water is enormous in Australia.” 75 percent of water used is for irrigated agriculture. 70 percent of agricultural production is exported.

He believes that population growth is a “background issue” Down Under. “Whether Australia ends up with 25 million people or 28 million doesn’t make much difference in terms of water resources, but 25 million or 50 million does.”

Barry Pittock, recently retired as a scientist with the CSIRO’s division of Atmospheric Research, told the conference that “Australia’s population size will be determined by how we manage this old flat and salty land. Population growth is one of the main drivers of increasing greenhouse gas emissions, along with energy consumption, economic growth and land use,” he said

Dr. Mary White, paleo-botanist and author, told the gathering that the man-made deserts of the world were “testimony to what happens when these fragile areas are exploited.” She believes that plans to turn some of Australia’s rivers inland to water the desert are “irresponsible pipe dreams.” Australian decision makers seem unable to learn from the experience of other countries. Its arid lands are inherently fragile. “Within twenty years, Australia will be unable to feed its own population adequately,” she predicted. •