

ECONOMY OF GHANA NETWORK
Public Health and Population Forum

Pollution has a linkage that is much wider than what we think! Let us discuss these linkages as Public Health and Population Practitioners

The advent of cheap energy, the rise of science and technology and the green revolution have somehow prevented Malthus' prediction. Since Malthus' time world population has risen six fold to more than 6 billion. Most demographers predict that by 2100, global population will level off at about 10 billion to more than 18 million by 2005. **(What does this mean in terms of global pollution?)**

The urgent question is whether current standards of living can be sustained while improving the plight of those in need. Consumption of resources – not just food but also water, fossil fuels, timber and other essentials – has grown enormously particularly in the developed world. **(How much have we in Ghana contributed to this destruction?)**

In addition, humans have compounded the direct threats to those resources in many ways, including changing the climate, polluting land and water and spreading invasion species. **(What specific actions of ours are the main contributors to climate change, land and water pollution?)**

How can humans live sustainably on the planet and do so in a way that manages to preserve some biodiversity? **(How can we start in our own small way in Ghana?)** Tackling that question involves a broad range of research for natural and social scientists. It is abundantly clear that humans are degrading many ecosystems and hindering their ability to provide clean water and other foods and services. **(Can we identify some of these for Ghana?) (But exactly how bad is the situation in Ghana?)** Researchers need better information on the status and trends of wetlands, forest and other areas. To set priorities, they'd also like a better understanding of what makes ecosystems more resistant or vulnerable and whether stressed ecosystems, such as marine fisheries, have a threshold of which they would not recover.

Agronomists face the task of feeding more mouths. Yields may be maxing out in the developed world, but much can still be done in the developing world, particularly sub-Saharan Africa, which desperately needs more nitrogen. Although agricultural biotechnology clearly has potential to boost yields and lessen the environmental impact of farming, it has its own risks and winning over skeptics has proven difficult.

There is no shortage of work for social scientists either. Preserve subsidies that encourage overuse of resources-tax loopholes for luxury Hummers and their inefficient vehicles for example, remain a chronic problem. A new area of activity is the attempt to place value on ecosystems' services so that the price clear-cut lumber, for instance, covers the loss of a forest's ability to provide clean water. Incorporating those "externalities" into pricing is a daunting challenge that demands much more knowledge of ecosystems. In addition, economic decisions often consider only net present values and discount the future value

of resources-soil erosion, slash-and-burn agriculture and the mining of groundwater for cities and farming are prime examples. **(Do we have examples to talk about here in Ghana?)**

All this complicates the process of transforming industries so that they provide jobs, goods and services while damaging the environment less.

Researchers must also grapple with the changing demographics of housing and how it will impact on human well-being. In the next 50 years, the number of people living in cities will double. **For Ghana, much of the growth will likely happen in Accra (where the World Bank estimate suggests half of the population of Ghana will be residing fifty years hence.)** Coping with that huge urban influx will require everything from energy-efficient ways to make concrete to simple ways to purify drinking water. **(Why is the water situation in Accra and other urban capitals so acute?)**

In an age of global television and relentless advertising, how will the pattern of consumption affect levels of pollution?

FOOD PRODUCTION

Together, croplands and pastures have become one of the largest terrestrial biomes on the planet, rivaling forest cover in extent and occupying about 40% of the land surface changing land-use practices have enabled world grain harvests to double in the past four decades.

FRESHWATER RESOURCES

Land use can disrupt the surface water balance and the partitioning of precipitation into evapotranspiration, run off, and ground water flow. Surface runoff and river discharge generally increase when natural vegetation (especially forest) is cleared. **(Take the Densu River as an example for discussion).**

FOREST RESOURCES

Highly managed forests, such as timber plantations in North America and Oil-palm plantations in Southeast Asia, have also replaced many natural forests. **(Are there examples in Ghana?)**

Land-use practices like fuel-wood collection, forest grazing, and road expansion can degrade forest ecosystem conditions – in terms of productivity, biomass, and stand structure and species composition – even without changing forest area. Land use can also degrade forest conditions indirectly by introducing pests and pathogens, changing fire-fuel loads, changing patterns and frequency of ignition sources, and changing local meteorological conditions. In East Asian countries, reforestation and afforestation are increasing the area of forested lands; furthermore, forest management in many regions is acting to improve forest conditions. **(What is our contribution to forest management**

in Ghana?) (Can we provide examples in terms of what is being done? Where? And in terms of acreage?)

Regional Climate and Air Quality

Land conversion can alter regional climates through its effects on net radiation, the division of energy into sensible and latent heat, and the portioning of precipitation into soil water, evapotranspiration and runoff. Modeling studies demonstrate that land-cover changes in the tropics affect climate largely through water-balance changes, but changes in temperate and boreal vegetation influence climate primarily through changes in the surface radiation balance. Large-scale clearing of tropical forests may create a warmer, drier climate, whereas clearing temperate and boreal forest is generally thought to cool the climate, primarily through increased albedo.

INFECTIOUS DISEASES

Habitat modification, road and dam construction, irrigation, increased proximity of people and livestock and the concentration or expansion of urban environments all modify the transmission of infectious disease and can lead to outbreaks and emergence episodes. For example, increasing tropical deforestation coincides with an upsurge of malaria and/or its vectors in Africa, Asia and Latin America, even after accounting for the effects of changing population density. **(What can we say here?)**

Disturbing wildlife habitat is also of particular concern, because 75% of human diseases have links to wildlife or domestic animals. Land use has been associated with the emergence of bat-borne Nipah virus in Malaysia, cryptosporidiosis in Europe and North America, and a range of food borne illness globally. In addition, road building is linked to increased bush meat hunting, which may have played a key role in the emergence of human immunodeficiency virus types 1 and 2; simian foamy virus was recently documented in hunters, confirming this mechanism of cross-species transfer.

The combined effects of land use and extreme climatic events can also have serious impacts, both on direct health outcomes (e.g., heat mortality, injury, fatalities) and on ecologically mediated diseases. For example, Hurricane Mitch, which hit Central America in 1998, exhibited these combined effects: 9,600 people perished, widespread water-and vector-borne diseases ensued, and one million people were left homeless. Areas with extensive deforestation and settlements on degraded hillsides or floodplains suffered the greatest morbidity and mortality. **(Are there lessons and if there are what can we learn from these?)**