WATER ISSUES IN THE SAHEL – Hanley and McNamara

There is a lot of research on the Sahel – we found several thousand citations – so this is a very, very preliminary overview! Both Charlie and I think that VX Insight, a Sandia program for mapping linkages among information sources, would be a useful tool to help us pinpoint the key researchers and issues in the region. We'll demonstrate this tool at the meeting on the 12th.

Research on water in the Sahel is part of a larger body of literature and work dealing with land and water quality in the region. The Sahel (which, incidentally, means "shore" in Arabic) is the transition zone between the Sahara to the north and subtropical Africa to the south. The Sahel is prone to cycles of excessive rainfall and long-term drought, and much of the region is impoverished, water stressed, and suffers from shallow topsoil. Food and water security are critical issues in a region that supports 50 million inhabitants.

A major drought and multiple famines in the 1960s and 1970s brought world attention to the region at a time when environmental issues were becoming increasingly important in the public consciousness. Consequently, the region has been a focus for research by international aid organizations, environmental NGOs, geographers, anthropologists, climatologists, foreign governments – in other words, it gets a lot of attention.

It's hard to separate water out from the host of ecological issues that the Sahel faces. Soil quality, unsustainable agricultural and pastoral practices, political struggles over resource control, population growth, urbanization, cropping practices – all of these either have water as a root issue or are impacted by water.

MAJOR PLAYERS. World Bank, United Nations, European governments and NGOs have invested a great deal of research funding in the Sahel. US seems to be less of a player in the area. Within the region, the Permanent Interstate Committee for Drought Control in the Sahel (CILSS) includes Mauritania, Burkina Faso, Cape Verde, Chad, Gambia, Guinea Bissau, Mali, Niger and Senegal.

ISSUES. Too many to list. Differentiating between human-induced and climate-induced desertification is a main focus of research; although desertification was initially thought to be caused by decreased rainfall, more recent research has indicated it's anthropogenic. Increased agricultural and pastoral linked to soil degradation and reduced water availability. Erosion a major problem. Tension between urban growth and rural demand for resources leads directly to conflicts over water, particularly in areas that have seen greater desertification.

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TECHNOLOGY. Major modeling efforts seem to include hydrological, geological, biosphere, and agricultural/crop models. Meteorological data, both historical and from weather stations currently positioned throughout the region, seem to be a major source for geoclimate models seeking to understand both regional and global temperature and rainfall trends. Interestingly, we found relatively few references discussing decision or

resource allocation models for decision makers in the area, though we believe that we should do more research into CILSS activities, since this seems to be the major regional discussion forum for water-related issues in the area. Research seems to indicate an interest in technologies that increase water availability, including improved methods for water use (irrigation and cropping especially), water storage and distribution. Management of Lake Chad, the region's major freshwater body and an important source of food (fishery) is a long-term problem for the countries that share the lake. Management of topsoil critically important, especially since desertification increases risk of soil loss due to wind and runoff erosion.