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The Social Challenges of Global Change

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Time: Monday 27 April, 14:00 - 15:30. Session: A130

Water Pollution and its Implication on Human Health: Challenges Ahead (I)

Location: Verwaltungsanbau World Conference Center Bonn, P86

Convenors: Saravanan Subramanian, ZEF, Germany and Shahbaz Khan, UNESCO, Paris

Water pollution has emerged as a major public health concern as a result of man-made and environmental changes at local and global scales. Increasing population, geological factors, rapid urbanisation, agricultural developments, global markets, industrial development and poor wastewater regulation have affected the quantity and the quality of water. These developments represent a multi-layered complex process affecting the environment-human activities-food production and human health, thereby placing human health and their environment at risk. Although there is considerable interest among researchers in understanding water pollution and its causes there is surprisingly little work in understanding the linkage between water pollution and health. This session welcomes theoretical approaches, methodological discussions and application of transdisciplinary knowledge in exploring this linkage and identifying the challenges involved for human health. The session would address the following questions: (1) What are the various socio-economic, ecological and institutional changes that contribute to water pollution and its implications for human health? (2) What is the relationship among diverse socio-economic, ecological and institutional factors influencing water pollution? (3) What are the uncertainties associated with water pollution impacting on human health? (4) Who are vulnerable and prone to risk from water pollution? (5) What are the various mitigation measures taken by various development agencies in addressing water pollution and to what extent do these address human health? The session expects to publish the collection in a special issue and to develop research projects with the presenters.



Soiled Agriculture and Spoiled Environment; Socio-Economic and Health Impact of Groundwater Pollution in Tamilnadu

Presenter: S. Janakarajan, Madras Institute of Development Studies, Chennai, India

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The problem of water pollution poses a great threat to basic human living. The ramification of pollution is indeed more severe in the less developed countries. The subject matter of groundwater and surface water pollution gains further significance due to economic liberalization policy, to which most underdeveloped countries have been subjected. In other words, the phrase, "sustainable development" emphasized in many international fora, has seemingly no meaning in many underdeveloped countries. Most river basins, in particular India, are heavily polluted. In addition, the river basins are stressed due to competing demand for water across different uses and users. In the process, millions of gallons of good quality water is transferred / transported from rural to urban areas everyday. The net result is depletion of groundwater potential. In coastal regions it has resulted in severe seawater ingress, along with water effluents. This contributes significantly to water pollution and ecological degradation. The present paper discusses impacts of groundwater pollution in the particular context of the Palar river basin in Tamilnadu, where the tanneries have contributed to the environmental degradation in a large measure. The paper draws on decade long research study and from a research project done by the author to discuss how the dependence on government agencies has in no way helped the society. Even when judiciary intervenes actively, things do not change radically because of the poor governance arrangements.

Combating Water Borne Diseases Under Climate Change in Bangladesh: In Quest of Suitable Alternative Solutions

Presenter: Sharmind Neelormi, Jahangirnagar University, Bangladesh

Authors: Sharmind Neelormi (1), Mohammed Amjad Hossain (1), Ahsan Uddin Ahmed (2)

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Bangladesh's climate and hydrology are heavily influenced by monsoon circulation. Diminishing rainfall and high evapotranspiration in premonsoon, local rainfall complemented by huge regional rainfall runoff in monsoon, and increased salinity along the coastal belt in dry season - temporal variability determines the availability of safe drinking water. Seasonal lack of flow and abundance, both create problems in water availability. From past experiences, it is observed that lack of safe potable water during and after an extreme weather event causes sufferings to millions of people from water-borne diseases. Diarrheal disease alone accounts for about two-thirds of all sicknesses in the country, incurring annual health cost exceeding US\$700 million. The country will face increased occurrence of extreme weather events under climate change. It is apprehended that under climate change the health cost will only be increased.

Common Bangladeshis apply curative measure and use oral rehydration saline, however cannot avoid high health costs. There are some preventive measures; however the current level of awareness regarding the use of preventive measures has been rather low. The willingness to pay for having safe drinking water appeared to be much lower

than the cost of alternative preventive measures, reflecting the inadequate ability to pay of the poor people. If one or more appropriate preventive measures to address diarrhea diseases could be popularized, especially by means of awareness raising, policy interventions, and market incentives, it could have been profusely effective towards adaptation to increasing risks of water-borne diseases, even under climate change.

Lessons from Aral Sea crisis: large scale irrigation on expense of human health

Presenter: Iskandar Abdullayev, Center for Development Studies-ZEF, Uzbekistan

Authors: Iskandar Abdullayev (1), Subramanian Saravanan (1), Peter Mollinga (1)

Center for Development Studies-ZEF, Bonn, Germany (1)

The Central Asia home of 40 million people, located in the land locked region with extreme continental climate. The agriculture feeds almost all population. The decisions during soviet times on making Central Asia cotton basket of Soviet Union had on-going impacts even today. Millions of people left their home places due to environmental crisis, every year millions suffering without drinking water and water for irrigation. The human environment of the basin has also been totally changed. The Aral Sea region now is a completely artificial territory, governed by unnatural processes. The extent of these changes is so great that natural rehabilitation is impossible. More than 2.5 million people live in this disaster zone.

The purpose of this paper is to reflect on (i) socio-economic, ecological and institutional changes that contributed to the Aral sea crisis, (ii) present status of water resources use and possible developments in the region. The research is based on author's extensive field trips and research during 2001-2006 to the Aral sea area, extensive literature review on impacts of large-scale irrigation, e.g. soil salinity, high ground water levels on human health. The research has indicated that in Central Asia, (i) the irrigation systems are unsustainable, tend to create still huge risks to the human health, (ii) there are "bright" spots in the region where local people are starting to create more sustainable systems, (iii) the large scale systems, became both economically and socially unfitting into the new systems of economy

The risk factors water, sanitation and hygiene for diarrhoeal disease in rural Uzbekistan

Presenter: Susanne Herbst, Institute for Hygiene and Public Health, Bonn, Germany

Authors: Susanne Herbst (1), Dilorom Fayzieva (2), Thomas Kistemann (1)

Institute for Hygiene and Public Health, Bonn, Germany (1), Institute for Water Problems, Tashkent, Uzbekistan (2)

The Aral Sea region is a synonym for environmental disaster which is considered to cause various human health problems. However, epidemiological evidence is still lacking. The vast majority of the rural population in Khorezm district, Uzbekistan, situated in the Aral Sea Basin, relies on drinking water from groundwater wells. The piped drinking water in Khorezm is mainly abstracted from surface waters. On one hand increasing numbers of drinking



water samples are faecally contaminated. On the other hand epidemiological data – obtained by passive monitoring – show a considerable decline in incidences of waterborne infectious diseases. These contradicting facts were studied taking into account also the risk factors sanitation and hygiene. Surprisingly, the person-time incidence rates for children in Khorezm exceed median global estimates for non-industrialized countries. In Khorezm each individual under the age of two suffers on average from 6.7 diarrhoea episodes/child per year, decreasing to 1.6 episodes/child per year for those aged between two and five. The faecal contamination of the drinking water increases between May and July, but the level of the contamination is dependent on the water source. The risk factor analysis revealed that two associated risk factors are important in diarrhoeal disease transmission on the inter-household level: the absence of anal cleansing materials and the visible contamination of stored drinking water. Therefore, sanitation-related hygiene, unhealthy excreta disposal habits and unsafe drinking water storage practices have to be tackled urgently in order to break the faecal-oral transmission route.