

Punjab in the Grip of an Ecological Disaster: Is there a Solution?

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Abstract

Introduction-Punjab, the land of five rivers, is facing one of the worst crisis in its history. Its youth is trapped in drugs, marginal farmers are trapped in bank loans and are forced to commit suicides, the financial situation is so dismal that the State is in a debt trap, and the moral fabric of vibrant Punjabi society is under attack by internal and external contradictions. However, I am not going to focus on the obvious but will like to investigate the long term effects of Ecological Disaster hovering over Punjab. During 1990s, when our research group in Guru Nanak Dev University was sanctioned a research project by Bhabha Atomic Research Centre (BARC) of Department of Atomic Energy (DAE) to undertake a survey for Environmental Radiation Health Hazards to population of Punjab, we could never imagine the consequences would be so alarming? Our aim was to assess the environmental radiation dose to inhabitants due to Radon gas emanating from the soil; the source of this gas being radioactive Uranium in soil and groundwater. We reported that in Malwa belt, the radiation dose is 20

Index terms—

1 Introduction

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We did not bother to evaluate the risk due to presence of Uranium (U) in soil and groundwater of Punjab. Uranium poisoning in Punjab first made news in March 2009, when a South African Clinical Metal Toxicologist, Carin Smit, visiting Faridkot city in Punjab found surprisingly high levels of uranium in 88% of the blood samples collected from amongst mentally retarded children in the Malwa region of Punjab. The results revealed that 87% of children below 12 years and 82% beyond that age having uranium levels high enough to cause diseases, and in the case of one child, the levels were more than 60 times the maximum safe limit.

This report opened the Pandora's Box and the echo of this report reverberated in the Parliament House. BARC teams under the direction of DAE were alerted to visit Punjab and an MOU was signed with GND University for undertaking a comprehensive survey of all districts for assessment of health risk due to Author:

Visiting Professor, GGS World University, Fatehgarh Sahib. e-mail: hardevsingh.virk@gmail.com Uranium concentration in ground waters. A large number of reports have been published in research journals. Most of the team members involved in this Project have been my old students and collaborators. My recent survey of four districts (SAS Nagar, Fatehgarh Sahib, Sangrur and Bathinda) have shown that Uranium content in water is within safe limits in SAS Nagar and Fatehgarh Sahib but it is higher than the safe limit fixed by Atomic Energy Regulatory Board (AERB) of India for Malwa belt (Sangrur, Bathinda, Mansa and Ferozpur). Punjab State department of Sanitation and Water Supply based in Mohali has reported the highest value of Uranium content of 2200 microgram per litre (ppb) in ground water collected from a deep borewell (700 feet) in Badla village of Dasuya Block of Hoshiarpur district. Some scientists propose that Uranium can be mined from underground waters of Punjab. What is the source of high U content in water? The Scientists of PU Chandigarh group report that high U content in water can be attributed to high salinity of water and Phosphatic fertilizers being used in Malwa region of Punjab. Calcium bicarbonate acts as a leaching agent for U in soil and it gets concentrated in groundwater by geochemical processes. It seems to be a plausible explanation but not the ultimate solution of the problem.

High U content in soil and groundwater is harmful for human beings as well as flora and fauna of Punjab due to its radiological and chemical toxicity. The survey conducted by BARC and GNDU teams have confirmed that 50% samples are unfit for human consumption due to excess amount of U and heavy metals like Arsenic, Cadmium, Nickel, Manganese and Barium. It is recommended that canal water may be used as potable water in water supply schemes of Punjab, as its U content is much lower than U content of the ground water. The second alternative is installation of RO (reverse osmosis) system to remove toxic elements (U and heavy metals) from water supply lines using underground water. Punjab has opted for both these alternatives in Malwa belt.

During 1950s, prior to Green Revolution in Punjab, the landscape was looking like a desert dotted with sand dunes right up to the foot hills of Siwalik range. But the water table of this sandy desert was quite shallow with depth of aquifer varying from 5 to 10 meters in most of the districts. During Monsoon months, it rose up to 1 meter within the top surface layer. Green

70 A simple solution to the problem is also suggested: (i) promote Organic farming in Punjab, (ii) stop free supply
71 of power to Tubewells, and (iii) adopt a cropping pattern which breaks the wheat-paddy cycle. By our actions,
72 we shall bring back desert conditions in Punjab in next 50 years; with hardly any hope of survival for future
73 generations in Punjab. Clock is ticking fast for Punjab to act, otherwise the backbone of Punjab, its peasantry,
74 will be destroyed! I am reminded of a couplet of Oliver Goldsmith in his celebrated poem "The Deserted Village":
75 Ill fares the land, to hastening ills a prey, Where wealth accumulates, and men decay: Princes and lords may
76 flourish, or may fade-A breath can make them, as a breath has made: But a bold peasantry, their country's
77 pride, When once destroyed, can never be supplied.