

Study of Alarming Situation of Biodiversity and Human Population in Patna Town due to Heavy use of Underground Water during Month of May.

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Abstract

Freshwater found in 30% of area of the earth where lands found with several water resources and human living here along with 80% of biodiversity. Population of human is increasing and demanding more freshwater. Presently human is depending 80% of freshwater on underground water for their agriculture and daily activities in urban area. Due to heavy use of underground water, the surface resources of water is also affected, specially during summer season.

Patna is the capital of Bihar state (India), the urban area is growing very fastly presently loaded with about two million people surrounded by Sone, Punpun and Ganga with Gandak rivers. The land is plain and there is one dozen ponds to recharge the underground water. During month of May, Punpun river contains negligible water, Sone and Ganga contains less than 10% of water in October month. People are using underground water by mostly using tube well of >200 feet depth which is going down 30-50 feet deeper each year due to less recharge capacity. It is due to least rainwater harvesting. Most of rainwater run off in the Ganga river. Patna needs 12 billion liter water of billions of rupees during May month, and temperature rising 5 -7 Degree Celsius more than temperature of April month causing alarming situation on the community especially to fishes, amphibians, birds and even to mammals. The situation become more dangerous when air pollution and fluoride and arsenic poisoning etc causing death to organism leading to extinction.

To meet this alarming situation, every drops of rainwater must be harvested through ponds network. At least > 10% land is required for ponds to meet demand of water of increasing human population and other organisms to save green earth.

Keynotes: Drinking water, arsenic, rainwater harvesting, extinctions, Punpun

INTRODUCTION

Underground water is the most essential resource of water for more urbanization. Every organism of urban area needs water which is supplied 80-100% by underground water. Demand of underground water is least during winter and highest during summer especially during 15th May to 15th June in Patna. During this period recharge of underground water is negligible. So, before raining, the water scarcity of underground water is felt due to failure of tube well and hand pumps. Heavy use of underground water causing unhealthy for organisms to survive.

Patna, the capital of Bihar (India), one of the fastest growing population affecting much on the quality of underground water. Heavy water demands during summer caused failure of the most sources of water and producing alarming situation. So, it is matter of extinction of organisms which must be removed.

MATERIALS AND METHODS

Density of Patna town was studied and sources of water supplies were noted. During summer months alarming situation of human population and other dependents were studied. The removal of alarming situation were also find out.

RESULTS AND DISCUSSIONS

Patna city is facing increasing of population about 1lakh people each year reached > 20 lakhs population. People is using only underground water by—

1. Hand pumps: It is found unto 120 feet depth— not found working from January. So, most of hand pumps were removed because of not providing water in summer season. Although, where surface water like river, pond etc are found, hand pumps were found workable but its water quality become worse as temperature of environment increases. So, again these hand pumps due to high TDS (Fluoride, arsenic etc) is non hygienic.
2. Water supplied by municipality through water tube wells — Government has established tube well of 500 feet depth with high supply of water, distance 200-500 m between two tube well. The supply pipes run through drainage found leakages caused polluted water supply to poor areas, population is forced to drink that water specially during summer. Some building getting these water to fill the plastic tanks by water pumps, because force of water found very less to reach four storied buildings, municipality water tube wells become fell to supply during summer and situation become alarming.
3. Personal water tube wells— It is found single in building of 600 sq. feet to 2700 sq. feet which is mostly found with low and high power motors to meet the demands of the building. The tube well depth is found 200-300 feet. Tube wells of 200 feet depth is found, failed to supply water because of less recharge capacity of water level going down to 30-50 feet each year during month of May. TDS of these water is found very

high and population may be affected. Increase in depth of tube well is caused by less recharge affected by increase in population. On this >80-100% of population is dependent as tube well during summer.

4. Recharging status of water table 2 by river. Patna city is surrounded by Ganga along with Gandak in North, some in west and Punpun in south and east. So it is almost surrounded by rivers. But in month of May, Punpun river contains negligible water and Sone very small amount of water and Ganga contains about 10% of water in October month. So drastic decrease of water quantity is due to heavy use of ground water by population. So major sources of water is failed to provide water to the growing population in Patna. So rivers also not capable to remove alarming situation in May month.
5. Ponds - No. of ponds in Patna town decreased to dozen pond which is also contains least water in the month of May, No. of Ponds is negligible to recharge the underground water and to surpass the summer season.
6. Other resources the road and drainage is covered by cemented plates. The water found in the drainage is unable to recharge the ground water of the city. It is exposed at the outside of the city which capacity of recharge is found less. The rain water harvesting by building is not available which land is also cemented. The land area of building is very small to favor to rain water harvesting plant.

So in Patna city, water for other organisms is least available, the left water for other organisms is least available, the left water of municipality tube well is found major sources of water for road dogs, cats, rats, birds and other mammals. There is problem in the biodiversity along river of Punpun, Sone and Ganga on which most of the birds and other mammals are dependent, So water scarcity and its pollution along with high temperature during May caused to alarming to extinction.

How to remove the alarming situation?

Heavy use of underground water may be compensated by regular charging by direct filtration of surface water of that place. It may be compensated by (1) rain water storage be every houses (2) drainage must not be cemented at its floor (3) chain of small ponds approx (100*50) at interval of 500 meter distances (4) branches river mouth may be half closed from floor.

In this way every drops of rain water and extracted ground water may be fully utilized after recharging underground water place.

Neha Jaiswal et al. (2012). Fluoride act as white poison affect teeth, bones, leaver, stomach, kidney and developing fetus.

Umesh Chandra Joshi and Shashank Joshi (2004) shown unique properties of water. 1.2 billion people do not have safe clean water to drink. 1/3 of world's population lives in moderate high water stress. In Rajasthan, it is common practice to restore rain water in boolis'. Domestic roof water harvesting is also practiced in many parts of India.

H.S. Shergill (2003) stated that Rain water harvesting and ground water recharge can offer a solution to fresh water management problem.

Mintul Ali and Saurabh Sharma (2009) stated that the food security and quality of life of people are closely related to water.

Harendra Raj Gautam and Rohatshav Kumar (2006). According to International Management Institute about 250 Cubic Km of water are extracted for irrigation each year in India of which the rain put back around 100 Cubic Km only, resulting in gradual depletion of the aquifers. Alarming situation is not result of low rain water but too much wastage of valuable rain water. Tata Institute of Social Sciences (TISS) showed in their survey report that 50 lac house holds in Mumbai, Delhi, Kolkata, Hydrabad, Kanpur and Madurai are water deficient. Satish V Kulkarni (2013) stated that Unpredictable rain water and rapid urbanization cause majority of cities to suffer from water shortage and problem of urban flooding. Rain water harvesting is improvement of quality of ground water by recharging water in the aquifers.

REFERENCES

- [1] Harendra Raj Gautam and Rohtashav Kumar, (2006) Kurukshetra 54, 826-828
- [2] H.S. Shergile 2003. What is rain water harvesting? VIP NET News
- [3] Mintul Ali and Saurabh Sharma 2009, Everyman's Science volume XLIV No.2 Rain Water harvesting Managing water society.
- [4] Neva Jaiswal et al. 2012 Everyman's science Vol. XLVII (3) Fluoride toxicity
- [5] Salish V. Kulkarni (2013) Everyman's science Vol. XLVII(6)
- [6] Umesh Chandra Joshi and Shashank Joshi (2004) Everyman's Science Vol. XXXIX (3) Unique properties of water