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RESEARCH ARTICLE

DECLINING LEVEL AND QUALITY ASSESSMENT OF GROUND WATER WITH A SPECIAL EMPHASIS
ON INDUSTRIALIZATION IN HARYANA, INDIA: A REVIEW

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ABSTRACT

Ground water plays a key role in meeting the water needs of various user-sectors in India. It is directly linked with human health, protection of the environment, plant growth and sustainable development. Experts believe that India is fast moving towards a crisis of ground water overuse and contamination. The Ministry of Water Resources, River Development and Ganga Rejuvenation, also stated that ground water scenario has reached a critical stage in 9 States of India, i.e. Punjab, Rajasthan, Haryana, Delhi, Karnataka, Tamil Nadu, Uttar Pradesh, Andhra Pradesh and Telangana. According to the data from June 1999 to June 2014, Haryana witnessed a decline of 8m in underground water level. From 9.36m in June 1999 it declined to 17.37m in 2014. Apart from ground water depletion, the pollution of ground water due to industrial effluents and municipal waste in water bodies is a major concern in many cities and industrial clusters as well as areas on their periphery. Rapid industrialization has been recorded in the Haryana over the last two decades. In most of the industrialized areas of Haryana, ground water is the first victim of the local contamination. This paper attempts to discuss the impact of industrial pollution on ground water quality of Haryana with its declining level problems and management strategies.

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INTRODUCTION

Our country is endowed with a rich and vast diversity of natural resources, water being the most precious of them. In India, where groundwater is used intensively for irrigation and industrial purposes, a variety of land and water-based human activities are causing pollution of this precious resource. Once the groundwater is contaminated its quality cannot be restored back easily (Maniyar, 1990; Mise, 1988; Shivasharanappa, 1988) and it is difficult and expensive to remove contamination (Avnish and Saksena, 2010). During the last four decades, uncontrolled withdrawal of groundwater for irrigation in parts of arid and semi-arid regions in India has seriously depleted the aquifers. The share of groundwater in the net irrigated area is 61%, and about 60% of the irrigated food production depends on groundwater for irrigation in the country (Shaha 2009 and CWC 2010). Besides fulfilling the irrigation needs, groundwater provides for more than 80% of the rural, and 50% of the urban and industrial requirements in India (Mall *et al.*, 2007). The quality of ground water is the resultant of all the processes and reaction that act on the water from the moment it condensed in the atmosphere to the time it is discharged by a well as spring and varies from place to place

and with the depth of the water table (Shyamala *et al.* 2011). Apart from ground water depletion, the domestic sewage and industrial waste are the leading causes of ground water pollution (Garg *et al.*, 1999; Gupta *et al.*, 2009; Sharma *et al.* 2013). The industrial effluents if not treated and properly controlled, can pollute and cause serious damage to groundwater resources (Olayinka, 2004). Industries continuously release solid as well as liquid waste into the environment without the recommended treatment and hence increase the pollutant levels beyond the absorptive capacity of the environment. A survey undertaken by the Central Pollution Control Board (CPCB) in 1995 identified 22 sites in 16 States as critical for ground water pollution, the primary cause being industrial effluents. Statistics shows that during the last few decades, groundwater wells and tube wells have increased many fold, mainly in arid and semi-arid regions of the country. In many blocks of Haryana, India, the stage of groundwater development is more than 100%, which indicates that groundwater withdrawal is more than its recharge per cent (CGWB 2009). According to a study by National Academy of Agricultural Sciences (2011) water-table in 63 % of the Haryana has gone down substantially. In Haryana, only 37% of the water is exploited within the safe limits while 63% over-exploitation has reached a semi-critical stage. Therefore, the present study has been taken

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Determination of water quality index of Indraprastha estate region and the vicinity area in Delhi, India



CrossMark

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ABSTRACT

Water quality index (WQI) expresses overall water quality at a certain location and time, based on several water quality parameters reducing great amount of parameters to a number that expresses the acceptability of water to the user. In the present study an attempt has been made to determine the water quality index of industrial outlet and along river Yamuna in Delhi, India. For calculating the WQI, the following eleven parameters were considered: pH, electrical conductivity, total dissolved solids, salinity, dissolved oxygen, biological oxygen demand, total hardness, calcium, magnesium, total alkalinity and chloride. A disturbing observation was the level of dissolved oxygen in Yamuna River at Nizamuddin drain which was found to be nil. The water quality index of gas turbine station outlet was 202.9136 and that of thermal power plant outlet was 207.869. The water quality index of Yamuna River at Nizamuddin drain was found to be the maximum at 262.555 indicating very high level of pollution. The present study revealed that Yamuna River was in a critical condition and the extent of pollution was extremely high.

KEYWORDS

Water quality index | Yamuna | Nizamuddin drain | Dissolved oxygen

CITATION

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B.A. (GENERAL) PART - I

पर्यावरण अध्ययन

Lesson No. : 01 - 07 (iii)

सहयोग

- यूनिट - 1 प्रो० मी०पी० कौशिक
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इस और उनके प्रभाव

पिछले कुछ दशकों में, नशीली दवा की खपत भारत में लाखों बच्चों और युवाओं को प्रभावित करने वाली सबसे बड़ी समस्याओं में से एक बन गई है। एक दवा कोई पदार्थ है (पोषण और पानी के अलावा के साथ), जो शरीर में ले जाने पर, शरीर के कार्य को भौतिक रूप में और/या मनोवैज्ञानिक रूप में बदल देता है। मनोवैज्ञानिक रूप में Drugs ऐसे पदार्थ हैं जो व्यक्ति के मस्तिष्क, म्नायुर्मंडल को प्रभावित करते हैं विभिन्न स्तरों पर (ड्रग्स/एचओ) के अनुसार Drugs कोई भी ऐसा पदार्थ है जो जीवन जीने में जाने से एक या अधिक कार्यों को प्रभावित कर सकता है। इन पदार्थों के सेवन से कुछ समय के लिए व्यक्ति मानसिक तनाव एवं विन्ताओं में मुक्ति का आभास पाता है। यहां तक कि उसका विषाद एवं कष्ट कम हो जाता है तथा उसे अस्थायी शान्ति एवं आनन्द का अनुभव होता है परन्तु धीरे धीरे व्यक्ति इनके सेवन का गुलाम हो जाता है तथा उसे इनकी लत लग जाती है। दवाएं कानूनी हो सकती हैं (जैसे अल्कोहल, कैफीन और तंबाकू) या अवैध (जैसे कैनाबिस, एकस्टसी, कोकीन और हेरोइन)।

विभिन्न नशीली दवाएं (शराब और तंबाकू समेत) मस्तिष्क के विभिन्न क्षेत्रों पर कार्य करती हैं और इसके रासायनिक संतुलन को बदलती हैं। एक निर्धारित समय के बाद नशीली दवाएं शरीर में अवशोषण, वितरण, ऊतकों में स्थायीकरण जैसी प्रक्रियाओं में शामिल होने लगती हैं। नशीली दवाओं का प्रभाव पदार्थ से पदार्थ में भिन्न होता है और यह कहना संभव नहीं है कि एक विशेष दवा किसी को कैसे प्रभावित करेगी। युवाओं के लिए दवाएं अधिक हानिकारक हो सकती हैं क्योंकि उनके शरीर और दिमाग अभी भी विकसित हो रहे होते हैं।

श्रेणी तथा ली गई मात्रा के आधार पर नशीली दवाएं विभिन्न प्रभाव दिखाती हैं। इस बहुत कम मात्रा में और किसी प्रक्रिया को धीमा करने के प्रयोजनों के लिए Sedatives के रूप में कार्य करते हैं। बड़ी मात्रा में दवा लेना किसी को उत्तेजित करता है इसलिए वे उत्तेजक हैं। इसे मुख्य रूप से निम्नलिखित मुख्य श्रेणियों में उनके मुख्य प्रभावों के अनुसार समूहीकृत किया जा सकता है: अवसाद, sedatives, उत्तेजक, opiates और hallucinogens ।

अवसाद (Depressants) जैसे कि शराब, हेरोइन और सॉल्वेट्स का उपयोग मन को शांत करने, चिंता में हटकाए पाने और नींद का कारण बनने के लिए किया जा सकता है।

सेडेटिव्स (Sedatives) और ट्रांक्विलाइजर में बेजोडायजेपाइन दवाएं, जैसे कि वैलियम शामिल हैं। इन्हें अक्सर आपको शांत करने या रात में सोने में मदद करने के लिए निर्धारित किया जाता है। उनके पास अवसाद के समान सामान्य प्रभाव होते हैं लेकिन वे एक अलग तरीके से व्यसन का कारण बनते हैं।

उत्तेजनाएं (Stimulants) ऐसी दवाइयां होती हैं जो आपको अधिक जागृत, मतकं, ऊर्जावान और आत्मविश्वास महसूस कराती हैं। उत्तेजक दवाओं में कोकीन और Amphetamines शामिल हैं ।

ओपियेट्स (Opiates) जिन्हें नारकोटिक एनाल्जेसिक भी कहा जाता है, वे मजबूत दर्दनाशक हैं जो उदारता (खुशी) और नींद की भावना पैदा करते हैं। ओपियेट्स में मॉर्फिन, हेरोइन और मेथाडोन शामिल हैं।

हेलुसिनोजेन (Hallucinogens) ऐसी दवाइयां हैं जो अजीब और गहन दृष्टि उत्पन्न करती हैं जिन्हें हेलुसिनेशन कहा जाता है (देखें, सुनें और चीजों को अलग-अलग महसूस करना)। इन दवाओं में कैनाबिस एलएसडी (एसिड) और जादू मशरूम शामिल हैं।

दवाओं का वर्गीकरण उनके मुख्य प्रभावों के अनुसार :

1. केंद्रीय तंत्रिका तंत्र अवसाद (Central Nervous System Depressants)

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ENVIRONMENTAL STUDIES
(For Under-Graduate Students)
Lesson No. : 01 - 7 (iii)

Drugs and their effects :

In the last few decades, drug consumption has become one of the biggest affecting millions of children and youth in India. A drug is any substance (with the exception of food and water) which, when taken into the body, alters the body's function either physically and/or psychologically. The World Health Organization (WHO) defines drug as *any substance which, introduced into the living organism can modify one or more of its functions*. Drugs may be legal (e.g. alcohol, caffeine and tobacco) or illegal (e.g. cannabis, ecstasy, cocaine and heroin).

Different drugs (including alcohol and tobacco) act on different areas of the brain and alter its chemical balance. The activity of the drug in the body over a period of time comprises the processes of absorption, distribution, localization in tissues, biotransformation and excretion. The effect of drugs varies from substance to substance and it is not possible to say exactly how a particular drug will affect someone. Drugs can be more harmful for young people because their bodies and brains are still developing. The same drug can also have very different effects at different times, depending on its purity and the person's mood, health, circumstances and surroundings.

Drugs depending on the category and the amount taken show different effects. Drugs act as sedatives when they are taken in very low amounts and for purposes of slowing someone down. Taking huge amounts of drugs stimulates someone; so they are stimulants. It can be grouped mainly into following categories according to their main effects: depressants, sedatives, stimulants, opiates and hallucinogens.

- **Depressants**, such as alcohol, heroin and solvents can be used to calm the mind, relieve anxiety and can cause sleepiness.
- **Sedatives** and minor tranquillisers include the benzodiazepine drugs, such as valium. These are often prescribed to calm you down or to help you sleep at