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Water Supply Service System in Ranchi City, Jharkhand

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Abstract: ***Water supply system in Ranchi city is poor in terms of accessing safe drinking water by Ranchi Municipal Corporation. Safe drinking water is basic need for human being and Municipality is a responsible to provide across the section of society. Therefore, paper is carried out the research on accessibility drinking water and its quality within the city administrative boundary. The objectives of research are (1) to find the numbers of ward cover by water supply connection by Ranchi Municipal Corporation, (2) to find out the level of underground water in order to understand the exploitation of underground water resource and (3) to find out the present condition from common people through household survey. Research methodology is based on the secondary data that available to public domain.***
Key words- Water, Urban, Development

I. INTRODUCTION

Water is one of the most precious gifts of the nature for the living organism (Mohammad Zakir Hussain, 2015). Water is considered as driving for development (CSD, 2005). Clean and safe drinking water is essential for survival for human being (Josephine Fogden, 2009). In this context, paper is addressing the issues of water supply system in Ranchi city. The major sources of water supply in Ranchi city are Kanke Dam, Hatia Dam and Rukkka Dam and almost 40 percent of the city population having a water supply connection. This city is depending on the ground water source apart from the Dams. Almost 60 percent of city populations are being drawn water from underground water (Ranchi Municipal Corporation, 2017). Due to increasing number of population is leading to pressure on the ground water sources.

II. CASE STUDY OF RANCHI CITY

Ranchi is the capital of Jharkhand state in India and with a population of 10,73,427 at 23.22'N latitude and 85.33"E Longitude on the North West bank of Subarnarekha River. Ranchi Municipal Corporation (RMC) is 175.12 sq km (Census, 2011) (Fig. 1). This city is also known as Industrial city with the setting of a large number of public sector enterprises example Heavy Engineering Corporation (HEC), central Coal Field Ltd (CCL), Steel Authority of India Ltd (SAIL), Mecon Ltd etc (Ranchi Municipal Corporation, 2017). The topography of Ranchi city is dense tropical forest approximately 59.14 hectors (MoWR, 2013). The climatic condition is ranging from 20 degree Celsius to 42 degrees Celsius where as in winter temperature ranging between 0 degree and 25 degree Celsius.

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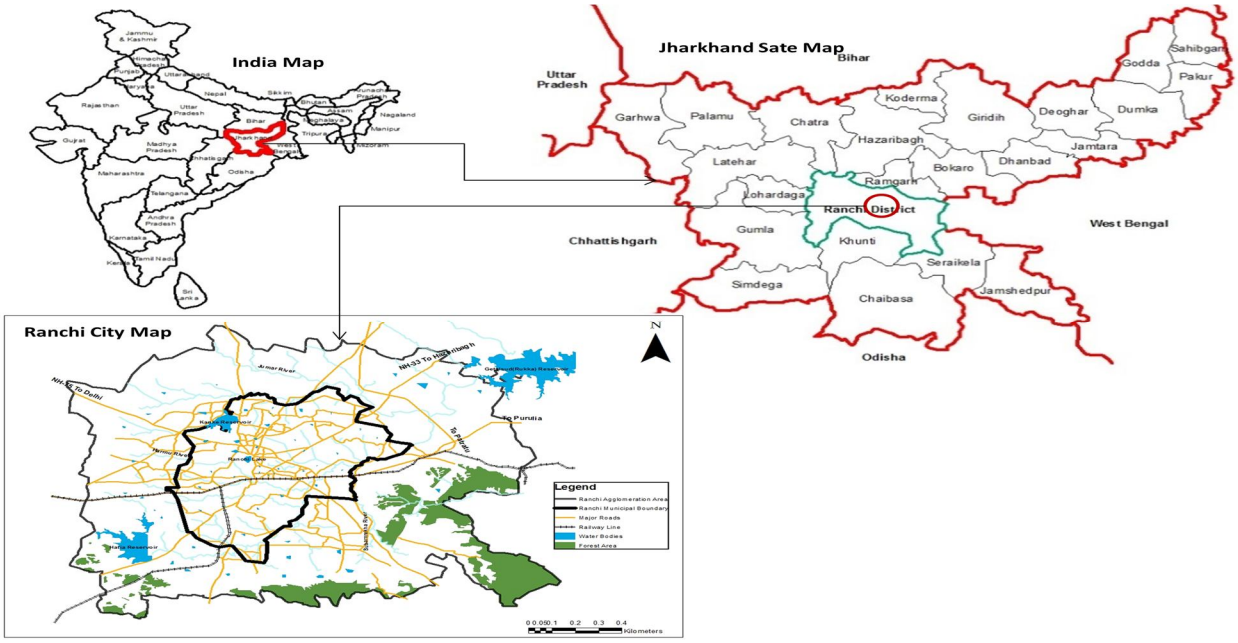
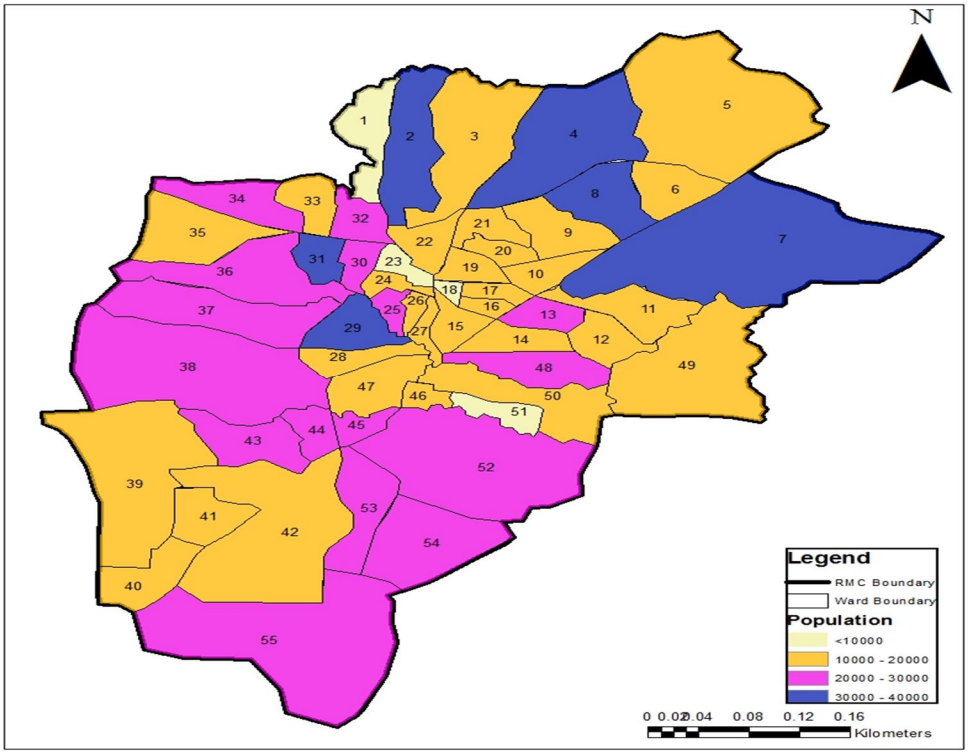
Fig: 1: .Location Map of Jharkhand State



Source: Author, 2017

Spatial distributed of city population in Ranchi is scatter. The highest concentration of population is in the wards Numbers 2, 4, 8, 7, 31 and 29 with a range of 30000 to 40000 populations and lowest category of population concentration is in ward number 1. The second highest concentration of population are in the wards numbers 5, 6, 3, 9, 21, 22, 20, 10, 19, 17, 16, 15, 14, 24, 26, 27, 28, 47, 46, 50, 49, 33, 35, 39, 41, 42, and 40 with a range of 20000 to 30000 population and remaining wards are in range of 10000 to 20000 population (Fig. 2).

Fig.2: Spatial Population Distribution of Ranchi City (2011)



Source: Ranchi Municipal Corporation, 2017

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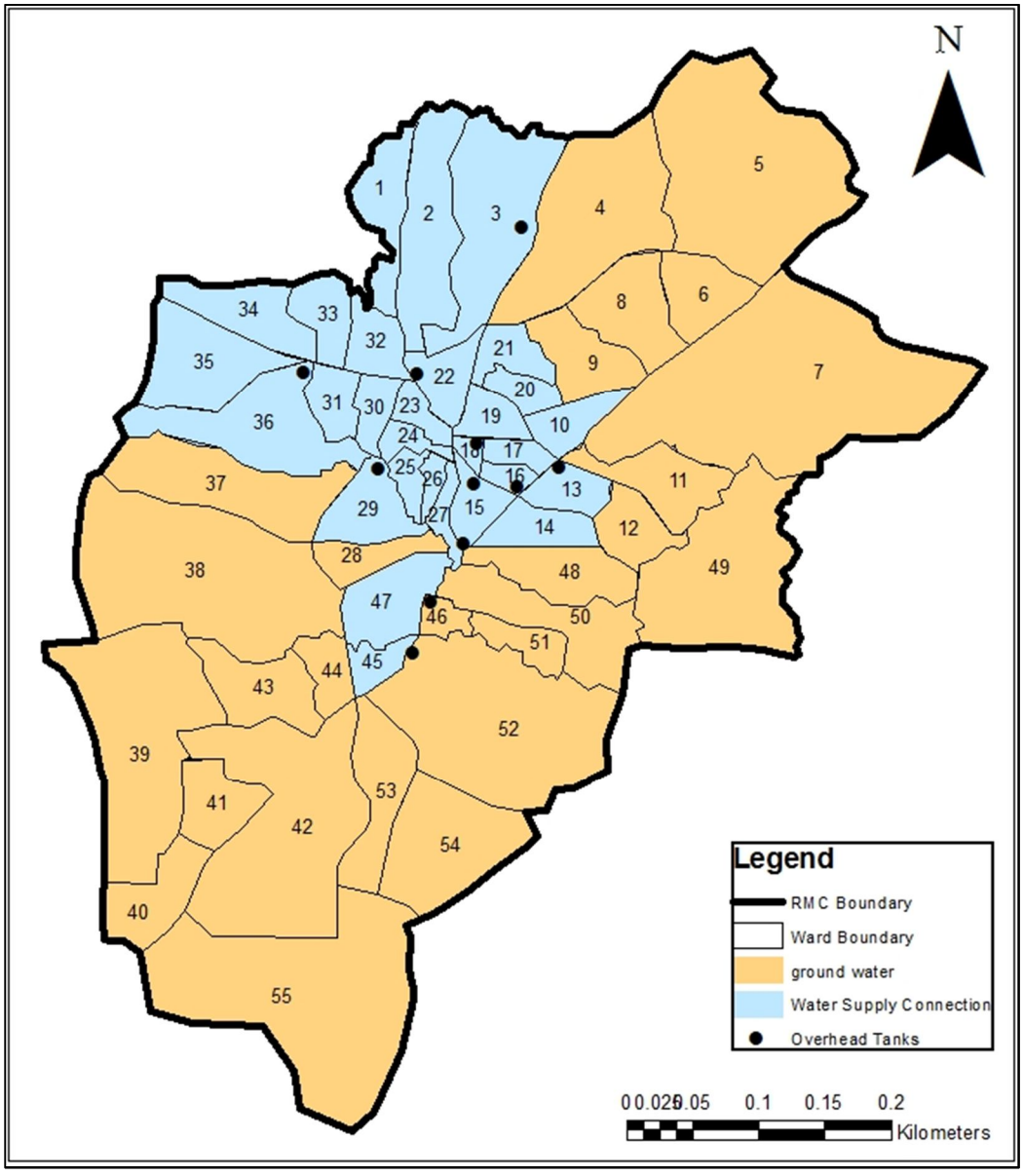
III. WATER SUPPLY COVERAGE

Coverage of water supply by Ranchi Municipal Corporation is very less in percentage in area wise. Ranchi Municipal Corporation is being supply water in wards Numbers 1, 2, 3, 34, 33, 32, 22, 21, 20, 10, 16, 17, 19, 23, 30, 31, 36, 34, 35, 24, 25, 26, 18, 13, 14, 15, 29, 47, and 45 only. The remaining wards are extracting the ground water for different purposes such as drinking water, washing etc and it will exploit the ground water source (Fig.3). The main reason for exploiting the ground water source is due to the lack of water supply connection by Ranchi Municipal Corporation.

Fig: 3: Water Supply Access in Ranchi City



Source: Ranchi Municipal Corporation, 2017

IV. GROUND WATER LEVEL

The present scenario of ground water level in Ranchi city is varied from place to places. The deepest of ground is in wards Number 5, 2, 12 and 52 and its deep is 10 to 20 meters below ground level and lowest are in the wards numbers 40, 45, and 4 only with a deep of less than 2 meter below ground level. The second highest deepest are in the wards numbers 8, 7, 11, 10, 13, 20, 19, 22, 35, 36, 31, 29, 28, 50, 38, 43, 44, 42, 53, 54, and 55 with an a deep of 5 to 10 meters from the ground level and remaining third highest category (Fig.4).

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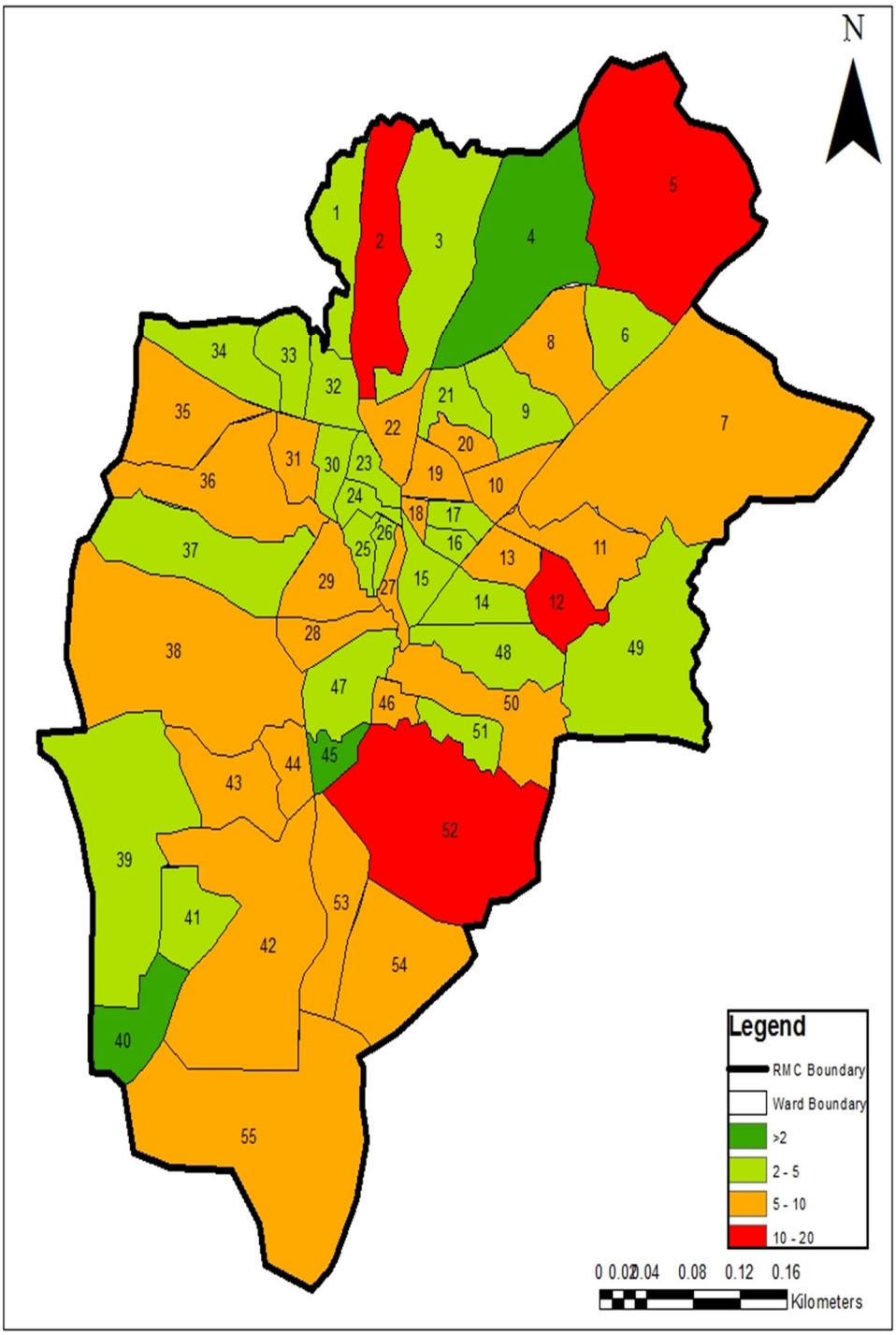
Fig. 4: Ground Water level (Depth in Meters below Ground Level) in 2016



Source: Central Ground Water Board, 2013

V. HOUSEHOLD SURVEY FINDING

The sample size for survey in the selected areas of wards and locality was 50. The water quality is good in wards 1 in locality of Jawahar Nagar and Kanke. The water quality is average in the uncovered area such as 5 and 8. The residence of wards numbers 5 and 8 are depending on ground water only. Based on the field survey data has reveals that water born diseases is existing namely typhoid, cholera, diarrhea and jaundice and level of effect by water born diseases is not high (Table 1).

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Table. 1: Households Survey Finding

Locality Name and Wards	Sample Size	Source of Water	Water Quality	Water-Borne Diseases in Number	
				Type of Diseases	Percentage of effect people
Jawahar Nagar (Ward no. 1)	50	RMC	Good	Typhoid	8
				Cholera	11
				Diarrhea	16
				Jaundice	9
Kanke (Ward no. 1)	50	RMC	Good	Typhoid	10
				Cholera	5
				Diarrhea	20
				Jaundice	13
Booti (Ward no. 5)	50	Ground Water	Average	Typhoid	10
				Cholera	15
				Diarrhea	26
				Jaundice	22
Tangratoli (Ward no. 5)	50	Ground Water	Average	Typhoid	17
				Cholera	32
				Diarrhea	21
				Jaundice	20
Bariyatu (Ward no. 8)	50	Ground Water	Average	Typhoid	15
				Cholera	13
				Diarrhea	24
				Jaundice	12

Source: Primary Survey Data, 2017

VI. CONCLUSION

The coverage of water supply by Ranchi Municipal Corporation in Ranchi is very less. The water quality is poor based on detection of water born disease in selected areas of study. Maximum residence of the Ranchi is drawing ground water and exploiting and it's reduce the level of ground in coming future. Therefore, it suggests to be prepared the master plan for water supply in the uncovered areas of water supply connection by Ranchi Municipal Corporation within the administrative boundary. This will help to reduce the exploitation of ground water.

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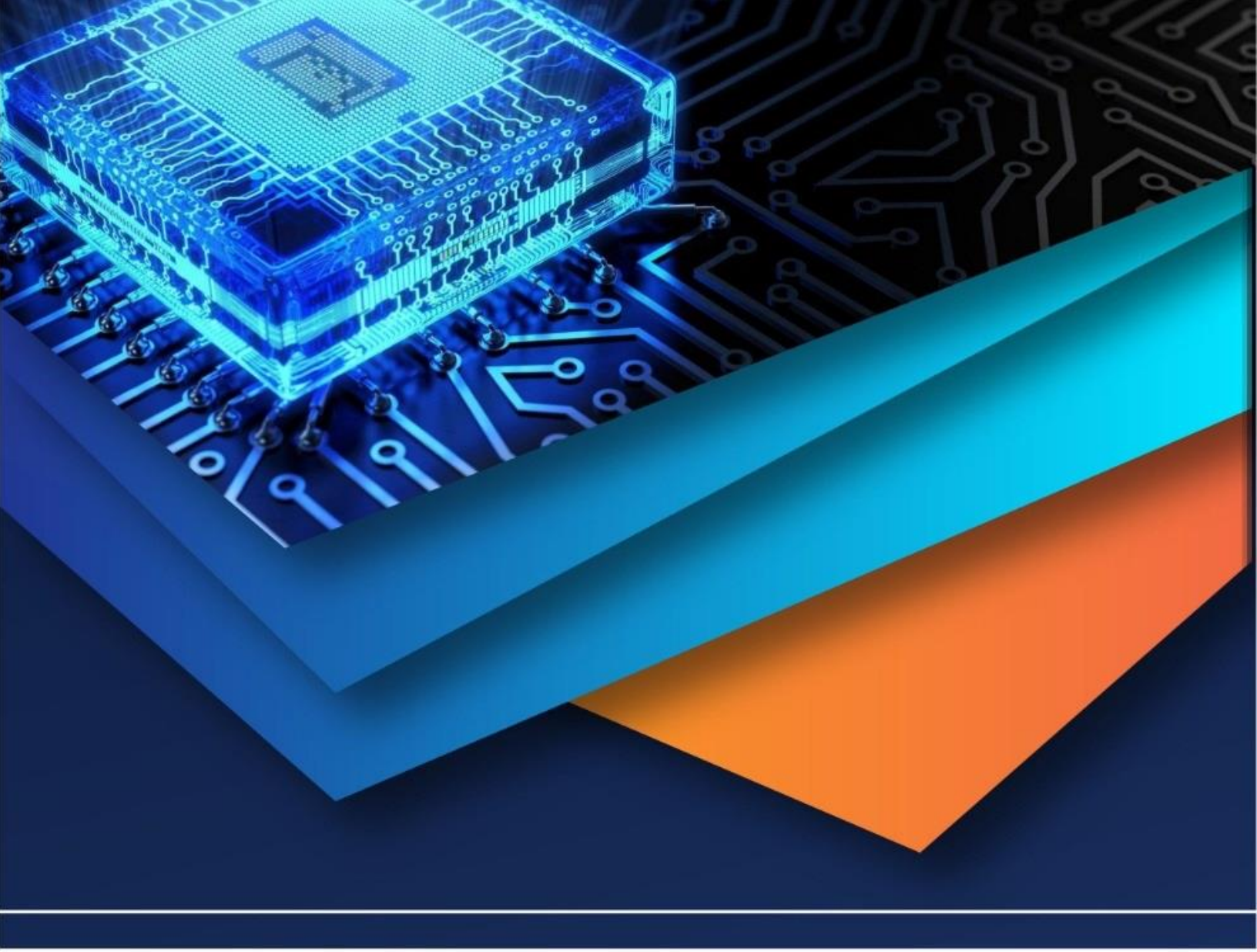

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