

Nanotechnology in Terrain of Water Regimen

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Abstract— In this modern era where we are residing the need is also increasing with the increment in the technology and facility. In this way nanotechnology is one of the most important technology through which we can get rid of most of the vitals problem which commonly people like farmers, tribal peoples are facing through. So this paper is focusing on the application of nanotechnology in water treatment which is the one basic thing without which we could not reside. According to the survey it is mentioned that we people by 2020 could not get the pure water and now a day's also 60% of the people is taking in impure water as a basic component. There are conventional technologies which are affordable and can be produced locally for effective removal of contaminants from water and wastewater. However, there are several challenges with regards to the cost and the removal efficiency of certain pollutants, most especially, the persistent organic pollutants and endocrine disruptors by these conventional technology. Environmental nanotechnology viz. nanotechnology and/or nanotechnology combined with conventional technologies are able to treat organic and inorganic contaminants to acceptable levels. There is currently intense scientific interest in nanotechnology for water and wastewater treatment; nevertheless, there are concerns about the toxicity and environmental impact of nanoparticle. So in the following paper we will be describing the methods of hospitalizing the water and the ways taking different samples. So here we will target some area and we will decipher that how the implementation of nanotechnology will enhance the life span as well as lot of parameters which is directly hike the components of human surroundings.

Key words: Nanoparticle, Nanomaterials, Nanofiltrations

I. INTRODUCTION

In today's modern era it becomes essential that everyone should consume water in a limited way since only some amount of water left in the world is pure or in other words almost 90% of water is impure. Or else In order to consume or utilize pure water it is essential that we totally purify and remove all the harmful contents present in present water supplied to homes and industries. Nanotechnology has a great potential in advancing water and polluted or waste water treatment so as to improve treatment water and make it reliable for drinking and other purpose. It provide a great & innovative means and valuable relief in treatment of water which would be helpful for development of world, cooperation and disaster management. It has become a major challenge for the world to supply the pure water totally free of toxicants and residues to the coming decade. The issue of waste water disposal is often neglected and world population continuously consume these polluted water containing toxic compounds and pathogenic micro-organisms including different harmful residues. In waste water disposal the provision of safe and pure drinking water provides a base and foundation for decent life of today's population and coming decades. The main reason for neglecting this problem is that

the cost of purifying and treatment of polluted water is about 3 times the cost of water supply. Due to this reasons it leads to certain diseases and infections and also development of country and cooperation is disturbed. And thus water disposal has become a great and unavoidable challenge for today and coming decades.

II. WHY NANOTECHNOLOGY NOT OTHER WAYS TO SOLVE

Nanotechnology refers to one of the wide range of tools, and lots of techniques and applications that simply involve enormous particles on the approximate size scale of a few to hundreds of nanometers in the fluctuating diameters in systematic way of order. Particles of this size have some unique and unapproachable physicochemical and surface properties that lend themselves to provide filtered and thus purified water in respective regions. Yes the advocates of nanotechnology suggest that this area of research could contribute to solutions for some of the major problems we face on the global scale such as ensuring a supply of safe drinking water for a growing population as this is the one of the major problem in our populated country. To provide sufficient water is the one of the critical situation over here, this could successfully eliminate the problem as well as address issues in medicine, energy, and agricultural fields.

III. PRESENT ERA SITUATION

Waste water is a type of water which have been adversely contaminated with organic pollutants, micro-organisms, bacteria and industrial effluents that directly or indirectly affects the initial quality of water. The waste water have been divided into 2 sub- categories:

- 1) Municipal waste water: the waste water formed due to the liquid discharged from the domestic residences and commercial properties.
- 2) Industrial waste water: the waste water formed due to the discharge of industrial effluents, or due to agriculture waste.

The factors which are responsible for effecting the composition of waste water are:

- 1) Separation between storm water and sanitary waste
- 2) Land uses
- 3) Ground water levels

The municipal waste water due to the discharge of municipal waste is generally less variable than the industrial waste water since the industrial waste water is highly influenced by the amount of industrial effluents and also by the industrial activities.

Today treatment of municipal waste water has become a greater challenge as discussed and becomes necessary so that the product water would not consist harmful substance that would not affect the health of humans and also the environment. In Bilaspur the waste water is continuously refined and consumed by the people residing since latest technologies have not been available so fast in such a small city. This results in decrease in health of humans in Bilaspur.

It becomes necessary that the waste water should have a certain nanolutions (solutions by help of nanotechnology). By nanolutions the waste water or the water supplied for domestic or industrial purpose is eventually tested and even a small amount of water can be deeply researched for finding the present compounds or substances that affect the property of water and finally the human beings.

IV. ANALYSIS

In this section it comprises of all calculation and research part in which we are focusing. Actually Chhattisgarh consist of 25.5 millions of population over 135,194 km² which has many culture many types of people extended in many districts and villages. So as we know that we are discussing over a topic of saving water and by using nanotechnology we are just trying to purifying water and eradicate all sorts of water born diseases. So here is the graphical pie chart which is showing the population of each districts

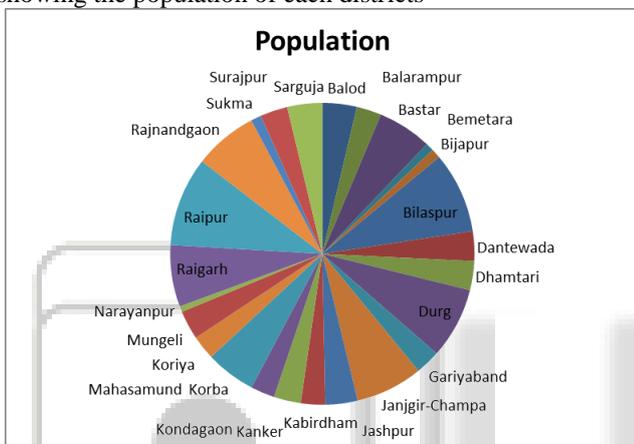


Fig. 1: Pie chart showing the population

District Names	Population
Balod	826,165
Baloda Bazar	122853
Balarampur	598,855
Bastar	1,302,253
Bemetara	197,035
Bijapur	229,832
Bilaspur	1,961,922
Dantewada	719,065
Dhamtari	703,569
Durg	1,721,726
Gariyaband	597,653
Janjgir-Champa	1,619,707
Jashpur	775,607
Kabirdham	584,667
Kanker	651,333
Kondagaon	578,326
Korba	1,206,563
Koriya	586,327
Mahasamund	1,32,563
Mungeli	701,707
Narayanpur	140,206
Raigarh	1,493,627

Raipur	2,160,876
Rajnandgaon	1,537,133
Sukma	249,841
Surajpur	660,280
Sarguja	840,352

Chart 1. Box representation population

Bilaspur Municipal Corp had a population near 331,030. Bilaspur urban area population is estimated at 452,851. Nearby or suburban areas will soon be included in the city limits. Males constitute 51% of the population and females 49%. Now for getting output we students target a district name bilaspur. The main reason for choosing this because we basically belong from this region. So calculation is like following

- 1) According to survey and research in Hemu nagar and Tikrapara we came to know that the people in consume 4 bottles of 1 liter water per day in average. So according to that in whole bilaspur total 1,32,4120 litres consume by people per day.
- 2) This statistic is obtained before the implementation of the nanotechnology method. Then after there is a drastic result we obtain. The following is describing well that how we saved many life's as well as we overcome many problem as after implementation.

V. HOW NANOTECHNOLOGY CAN REPLACE EVERYTHING

Nanotechnology has been given an importance for purification and production of water filtration membranes. Nanotechnology can be utilized for production of following water filtration membranes as reported.

A. Nanostructure membranes from nonmaterial's such as:

- Nanoparticles
- Carbon nanotubes
- Dendrimeres

B. Nanoreactive membranes from metal nanoparticles and other nanomaterial.

Other efficient, effective and economic method which can be used for removal for water contaminants is the process of adsorption. Adsorbents which are effective and can be used for the process of adsorption for water purification process are:

- Activated carbon
- Clay minerals and silicas
- Zeolites
- Metal oxides
- Modified composites

The disinfection of water under UV light and decomposition of organic compounds in water using TiO₂ mediated photo catalyst has become an effective process since the effectiveness of photo catalyst is gaining popularity. The application of nanotechnology in water disinfection and waste water treatment can be summarized as follows:

- Nanofiltration
- Adsorption process
- Break down of contaminants by nano particle catalyst.

S.No.	Area named in Bilaspur	Populations(based on govt. sites)	People die due to water born diseases per year	Month included	Water consumption per month	Water purified per month	Life saved after implementation of nanotechnology
1.	TIKRAPARA	6000	200 app	February	22800 L	22800 L	68

2.	HEMU NAGAR	5000	343	February	11372 L	11372 L	39
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Chart 2. On the basis of survey occurred

VI. ADVANTAGES OF THIS NANOTECH

A. Manufacturing Advantages

Nanotechnology is already making new materials available that could revolutionize many areas of manufacturing. For example, nanotubes and nano particles, which are tubes and particles only a few atoms across, and aerogels, materials composed of very light and strong materials with remarkable insulating properties, could pave the way for new techniques and superior products. In addition, robots that are only a few nanometers in length, called nanobots, and nanofactories could help construct novel materials and objects.

B. Energy Advantages

Nanotechnology may transform the ways in which we obtain and use energy. In particular, it's likely that nanotechnology will make solar power more economical by reducing the cost of constructing solar panels and related equipment. Energy storage devices will become more efficient as a result. Nanotechnology will also open up new methods of generating and storing energy.

C. Advantages in Electronics and Computing

The field of electronics is set to be revolutionized by nanotechnology. Quantum dots, for example, are tiny light-producing cells that could be used for illumination or for purposes such as display screens. Silicon chips can already contain millions of components, but the technology is reaching its limit; at a certain point, circuits become so small that if a molecule is out of place the circuit won't work properly. Nanotechnology will allow circuits to be constructed very accurately on an atomic level.

D. Medical Advantages

Nanotechnology has the potential to bring major advances in medicine. Nanobots could be sent into a patient's arteries to clear away blockages. Surgeries could become much faster and more accurate. Injuries could be repaired cell-by-cell. It may even become possible to heal genetic conditions by fixing the damaged genes. Nanotechnology could also be used to refine drug production, tailoring drugs at a molecular level to make them more effective and reduce side effects.

E. Environmental Effects

Some of the more extravagant negative future scenarios have been debunked by experts in nanotechnology. For example: the so-called "gray goo" scenario, where self-replicating nanobot's consume everything around them to make copies of themselves, was once widely discussed but is no longer considered to be a credible threat. It is possible, however, that there will be some negative effects on the environment as potential new toxins and pollutants may be created by nanotechnology.

F. Privacy and Security

Nanotechnology raises the possibility of microscopic recording devices, which would be virtually undetectable. More seriously, it is possible that nanotechnology could be vaporized. Atomic weapons would be easier to create and novel weapons might also be developed. One possibility is

the so-called "smart bullet," a computerized bullet that could be controlled and aimed very accurately. These developments may prove a boon for the military; but if they fell into the wrong hands, the consequences would be dire.

VII. RESULTS & DISCUSSION

The moment when we started implementing this innovative technology people over there surrounding were not cooperating at all, but after showing proper data sheets which we arranged from the government official sites and then explaining the actual need then they really moved very deeply. When we explained them about the nano particles importance and we installed our filters over their respective houses and after exact one year we get to know that the death rate of year based gradually decreases and hence this explains that this really enhanced the health issues and we successfully able to help people of slums and country bumpkins who really don't able to afford these type of technical things because they are actually not aware of it. Finally we came to an conclusion that if government of India will help us in this mission of nano filtration process then we the social workers could actually bring hope among all those people who cannot think about purified water resources. The main motto of providing crystal clear water is then completed in this way. We therefore mentioned the district places names with their populations so that, after placing these nano filters the ratio of the bad health people due to grabbing impure water could be taken down hopefully.

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