

Chapter 9

Use of Smart Farming Techniques to Mitigate Water Scarcity

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ABSTRACT

Scarcity of water resources due to increased demand as a result of exponential increase in population leading to accelerated requirement of food and industrial goods has led to a situation where many countries are facing severe water crisis. About 70% of water is being used for irrigation. As a result of this, in many cases untreated wastewater is also used for irrigation which further poses various threats to human health. Various studies have proposed that applying information technology in the irrigation techniques can help in reducing the water consumption in the farms. The smart farming techniques developed through the use of information technology can help the farmer in managing the water resources, reducing the wastage of water and to even measure the quality of water. Smart farming techniques can aid in solving biggest crisis and can help in attaining sustainable development goals.

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1. INTRODUCTION

Water is the most important aspect of life on earth and it is the most common fact that this blue planet is running out of usable water. It is projected that by 2050, 9.7 billion people will be living in water deficit areas while 3.9 billion people will face “severe” water crisis. Utilization of water in 20th century has increased many folds due to increased population, increased agriculture for food and industrial needs and increased industrialization. The usage is expected to further increase by 2050. Composite Water Resources Management Report as formulated by NITI Aayog perceives that currently about 600 million Indian are facing high to severe water crisis (Composite Water Resource Management, 2018). Shortage of water resources has turned out to be the biggest challenge for sustainable living, human health and normal functioning of ecosystem. By 2025, about one fourth of total population of world will be living in areas having acute water shortage (Seckler et al.,1998).

Water is a crucial resource in pace of sustainable development goals to attain “zero hunger” or to eliminate poverty. Climate change and recent urge to meet food security has further increased the utilization of water across the globe. As a result of which the scarcity of water is being evident. Increased urbanization has decreased the recharge of ground water and thus there is irreversible extraction of groundwater, leading to various issues for the life on earth.

Conventional cultivating system is one of the crucial reasons behind wastage of water and is responsible for about 70% of water utilization out of which 90% could be prevented by using proper techniques. So, while talking about water conservation the most important aspect is to have planned and newer irrigation technologies which are utilizing relatively less water. This can increase water accessibility, decrease soil degradation due to water logging/ run off, increase the crop production and feed the projected 9 billion people by 2050 (What India Wants, 2014; How to feed the world 2050).

Water use efficiency can be increased by growing the crops as per the local environment especially in arid and semi-arid areas, using drip and spray irrigation techniques, monitoring soil texture, water holding capacity and soil moisture.

2. INDIAN AGRICULTURAL LANDSCAPE

Farming contributes about 17% to India’s GDP. With an estimation of roughly \$390 billion, it is a standout amongst the most significant financial aspects in India. Around 60% of India’s population relies upon agriculture. Despite the fact that India is the main producer of different harvests, there is potential to improve the yield to meet sustainable development goals.

Irrigation in India depends heavily on monsoons. Rainfall is uncertain, irregular and uneven or unequal. 80% of rainfall in India occurs in four months, from June to October. There is an immediate need for sustained, efficient, reliable irrigation for the rest of the eight months. Water is a finite, crucial resource. In most places around the world, water is being used for industrial consumption and also for agricultural use. It is also an important part of wetlands and other natural ecosystems that are of huge value to us. Irrigation can contribute towards losses of water in many ways. Water can seep out of tanks or transmission canals before getting to the plants. After water is applied to plants in the field, some of it can get into the groundwater system, where it is no longer available to the roots of the crop, or it might run off the field altogether.

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