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Coffee industry and its impact on environment: A case study of Chickamagalore district Malanadu Region Karnataka

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Abstract
Chickmagalur is known as "coffee land" of Karnataka and it is widely known for the coffee plantations. Chikmagalur is a hill station located in Baba Budan Hills and Hassan is the closest town. Coffee is so much more than just a drink. As the world's second most tradable commodity after oil, coffee is now a multibillion dollar global industry and growing. Coffee is typically cultivated in tropical and subtropical areas at high elevations, often in mountainous areas and naturally grows under a shaded canopy of trees. Traditional coffee is often integral to agro-forestry systems in which tree species are cultivated together with coffee and other agricultural commodities. Many streams and rivers are losing their natural beauty and they began to dry even in the month of January. So there is an urgent need to take required action to save the Malanadu.

Keywords: coffee, environment, commodity, deforest ration, pollution

Introduction
Chickmagalur is known as "coffee land" of Karnataka and it is widely known for the coffee plantations. Chikmagalur is a hill station located in Baba Budan Hills and Hassan is the closest town located at a distance of 55 km. Bangalore is at a distance of 251 kms. The coffee is grown at a 12° 54′ 42′′ and 13° 53′ 53′′ North latitude and between 75° 04′ 46′′ and 76° 21′ 50′′ east longitude, with the production of Arabica and Robusta coffee beans. In this district major part is falling in Malanadu region, covering chickamagalore, N.R. Pura, Kappa and Sringeri taluks. The famous Mysore coffee, which has different looking bluish grey colored long wide beans, and the coffee has a very mild and subtle flavor, is also produced in coffee plantation of Chikmagalur. Known for its coffee plantation, the view from the hills is splendid, with views of the valleys and white blossoms of coffee plantation and streams. The tourists and visitors can take walk and stroll through the private coffee estates.

But coffee is so much more than just a drink. As the world's second most tradable commodity after oil, coffee is now a multibillion dollar global industry and growing. We are all aware of fair trade coffee but have you ever stopped to think what impacts the world's favourite beverage is having on our environment.

Statement of the problem
The increasing coffee culture that has sprung up over the last few decades has led to an overwhelming increase in demand for this liquid gold which has had a knock-on effect on the environment in Malanadu, due to monoculture and modern method of coffee cultivation. And given that most coffee growing regions are also home to some of the most delicate ecosystems on earth, the potential for serious damage is great.

Objectives
1. To study the impact of coffee plantations on deforestation.
2. To study the impact of coffee industry on water pollution and contamination
3. To study the impact of coffee industry on soil in the coffee growing area.

Method of study
The researchers collected the data from secondary sources. It includes newspapers, journals and books. And the information is also collected from environmentalists, scientists, farmers and coffee curing board.

Findings of the study
Traditional forms of growing coffee
Coffee is typically cultivated in tropical and subtropical areas at high elevations, often in mountainous areas and naturally grows under a shaded canopy of trees. Traditional coffee is often integral to agro-forestry systems in which tree species are cultivated together with coffee and other agricultural commodities. These regions are home to many different floras that contribute to high biodiversity levels. The sheltering from canopies also provides a valuable habitat for indigenous animals and insects, as well as preventing topsoil erosion and removing the need for chemical fertilizers.

Moreover, because many traditional methods have been passed down to today's' farmers by previous generations before synthetic pesticides and fertilizers were widely used in agriculture, a human-land use equilibrium has evolved in traditional coffee production over time. However, due to increased market demands in recent years, this traditional form of agriculture has been superseded by *"*sun cultivation*"* techniques.

Sun cultivation coffee

Originating in the 1970's, sun cultivated coffee is produced on plantations, where forestry is cleared so that coffee is grown in rows as a monoculture with no canopy. Sun cultivated coffee, in concert with the necessary addition of fertilizer, creates the highest yield of coffee, but eliminates the diversity of plants which support an array of insects and animals, posing detrimental impacts to the biodiversity of the western ghat region, as well as other environmental harms.

Deforestation

Farmers have been positively encouraged to replace their traditional and supposedly inefficient farming methods with the higher yielding technique of sun cultivation, which has resulted in thousands of acres of forest being cleared in Chickamagalore district alone to make way for coffee farming in this way. Deforestation trends are serious throughout the coffee producing lands of Chickamagalore and remarkable biodiversity values are at stake. Western ghat forests are critical ecologically for the purposes of protection of atmospheric dynamics, water quality, wildlife species, as well as economically.

Water pollution and contamination

Contamination of waterways also poses serious environmental threats from the processing of coffee beans. Largely irrespective of how coffee is grown, discharges from coffee processing plants represent a major source of river pollution. Ecological impacts result from the discharge of organic pollutants from the processing plants to rivers and waterways, leads to change of water systems and robbing aquatic plants and wildlife of essential oxygen.

Agrochemical Usage

Traditional coffee is often integral to agro-forestry systems in which tree species are cultivated together with coffee and other agricultural commodities. This cultivation of coffee relies on much lower chemical inputs than industrial plantations due to the other plants reducing the susceptibility to pests.

However, in recent years coffee growers employ intensive pesticides and chemicals in order to get high yield. That presents serious health and ecological concerns. The correlation between increased nitrogen fertilizer application and the widespread removal of shade cover from coffee plantations is evident, with these heavy synthetic fertilizer inputs contributing to increasing contamination of waterways and aquifers.

Waste

Another problem from coffee curing is, there is an enormous amount of waste produced during the manufacturing of coffee. The process of separating the commercial product (the beans) from the coffee cherries generates enormous volumes of waste material in the form of pulp, residual matter and parchment. This excess waste can also play havoc with soil and water sources as coffee pulp is often dumped into streams, severely degrading fragile systems. Recent years have witnessed important progress in the development of environmentally sound measures due to recognition of such wastage. This includes composting coffee husks mixed with farm animal manure to use as organic fertilizer in farming practices.

Soil Quality

Soil quality is also seen to be affected due to modern cultivation practices are favoured over the traditional growing means. The elimination of shade cover can cause significant impacts on various soil quality parameters, with higher rates of erosion occurring on renovated coffee plantations where vegetation has been reduced.

Encroachment of forest land under "Akrama Sakrama Scheme

The government of Karnataka launched Akrama Sakrama Scheme in order to grant the cultivated land to the land less farmers. But many people illegally encroached thousands of acres of land in order to misuse the scheme. Many reports revealed that large volume of forest encroachment was takes place in Chickmagalore district mainly due to extension of coffee growing areas.

Recommendations to reduce environment pollution from coffee industry

1. Illegal encroachment of forest land by big plantation holder should be cleared by the government.
2. Awareness should be created among the farmers related to environment pollution and its evils.
3. An environmentally favoured alternative to sun cultivated coffee is shade-grown coffee. In this method, coffee plants are interspersed beneath local forest trees, it will help to manage ecology balance.
4. What's more is the presence of vegetation amongst coffee plants reduces the need for intense herbicide preparations, supports at least 50% of the original forest snakes and small worms protects topsoil effectively.
5. Organic grown coffee can be purchased by the bag in leading supermarkets and across the internet and are labelled as organic grown coffee. Although more expensive, these means of cultivation are the best alternatives to an environmentally detrimental and ever expanding industry.

Conclusion

In recent years Chickamagalore district due to growing of coffee industry with high pesticides and chemical fertilizers environment is polluted significantly. Many streams and rivers are losing their natural beauty and they began to dry even in the month of January. So there is an urgent need to take required action to save the Malanadu.

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