A QUESTION TOWARDS THE SUSTAINABILITY OF MODERN AGRICULTURE IN WAYANAD DISTRICT, KERALA

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Abstract: Wayanad is basically an agro based district in Kerala. More than 60% of rural populations are directly dependent on agriculture sector as a major source of income and social progress. In the last few decades, agriculture the main sector of society had undergone drastic changes in tune of market economy. The traditional tribal agriculture was rejected in favour of modern intensive kind leading to several unscientific and inconsiderate agricultural practices in the fragile lands. In order to increase the productivity, farmers are using huge amount of inorganic fertilizers with various forms of pesticides, most of which belongs to Organochlorine, Carbamates and Organophospherous types which are banned by WHO. This had a negative impact not only on agriculture but also on the economy, environment, culture and social life of the people. The diversity of flora and fauna are greatly influenced by the new pattern of cultivation in Wayanad.

Keywords: Environment, Fragile land, Modern Agriculture, Wayanad.

Introduction: Wayanad, the so called Kashmir of Kerala falls entirely within the Western Ghats is well known for its rich biodiversity with a high percentage of endemism. About 300 species out of an estimated 2000 species of flowering plants endemic to Western Ghats are found in the district [1]. The district enjoys a unique topography and is primarily an agriculture dependent economy. Being an agro based district of Kerala Wayanad has long history of farming practices. The early immigration of Jains from the neighbouring areas of Karnataka paved the way for the introduction of settled agriculture in Wayanad. The tribes who were at the hunting, gathering and slash and burn stage of cultivation imitated the settled agriculture and the methods of cultivation of the Jain immigrants. Since paddy cultivation was very important in the district, it is estimated that more than 75 traditional varieties of paddy were cultivated in various parts of Wayanad districts during 1970's [9]. Over the last decades agriculture the main sector of society has undergone drastic changes in tune of operation of market economy. The intensification of cash crops like pepper, rubber, tea, coffee etc. on a commercial basis attested the growth of capitalist agriculture in the hilly areas of the district. When the production was commercialized; commodities demanded in international markets were given priorities, contrary to the tradition of producing food crops in the region.

The problem of agricultural modernization is merely severe in the districts like Wayanad since the transition from traditionally sustainable production systems of tribal economy in favour of capital intensive, market oriented and profit motivated economic enterprises. The paddy fields in Wayanad is mainly converted for banana cultivation in temporary basis and then converted into arecanut, rubber etc on permanent basis. Due to the failures in arecanut and rubber many of these wetlands are converted for construction purposes. The unscientific cultivation practices followed by the people have caused serious environmental problems. The change in cropping pattern like switching from paddy to banana cultivation has paved the way for indiscriminate application of chemicals and pesticides deteriorating the structure and quality of soil, contaminating water, polluting the associated plants and animal biodiversity causing the extinction of local flora and fauna in the region. The paper critically examines the agricultural development experience of the Wayanad over the past decades and tries to bring out the environmental changes due to the changing cultivation.

Materials and Methods: The present study tries to examine the agricultural development experience of the Wayanad over the past decades and brings out the environmental problems associated with the intensification of agriculture. The study is concentrated in 6 agricultural villages of Wayanad district namely Thavinjal, Muttil, Vellamunda, Pozhuthana, Padinjarathara and Noolpuzha. Direct household survey, group discussion, personal observation and key informant interview is adopted to collect primary information from farmers and villagers. A structured interview schedule comprising both closed and open ended questions has prepared for this. The distribution of sample was randomized. Secondary data has also been employed from books and journals related to the issue and various publications of the Government of Kerala. Participatory Rural Appraisal (PRA) method has used for collecting a detailed information about the problem.

Results: Changing agriculture and environment in Wayanad: The traditional agriculture of Wayanad was basically the cultivation of paddy in wet lands and ragi in dry lands. Since paddy cultivation was very important it has cultivated extensively in the

district. According to the *Statistical Abstract of Malabar* District (1908), there were a total area of 39,858 acres of paddy cultivation and 3,086 acres of ragi cultivation in Wayanad. Traditional varieties like Urinikaima, Poothodikaima, Gandhakasala, Jeerakasala and Mullankaima were the unique scented varieties of paddy cultivated in the district. Beside pepper, cardamom, horse gram, dry grains, sugarcane, orange, jackfruit, mango, arecanut and mustard were the other important crops cultivated in the district along with paddy [8]. Agricultural production in Wayanad was intended for local consumption. As a result there were no practices of production for external market.

The origin of capitalist agriculture in Wayanad can be traced back to the middle of the nineteenth century when British planters started coffee and tea cultivation [3]. In course of time the non tribal immigrants embarked on the cultivation of commercial crops like coffee, pepper, cardamom etc for material advancement in their life. In the decades following the 1970's the settlers transformed Wayanad's agriculture into a market oriented and speculative enterprises and the region became a hub for high value cash crops such as pepper, ginger, coffee and rubber. For many years the region was a major producer and exporter of spices and other cash crops producer in India, thus contributing substantially to the GDP of the state. As green revolution technologies became available, cash crop farming intensified and chemicalized [2]. This over the years led to the over exploitation of land and resources without concern for the environment or its replenishment. In the past decades the alterations in price regimes and intrinsic changes that have taken place in the economy in the past decade have influenced the changes in the patterns of agriculture as we see cash crops increasingly replacing food crops on a large scale [7].

Table 1: Change in the area of cultivation of food and cash crops

Crops	1970-71		1994-95		2002-03	
	Area(ha)	Share (%)	Area(ha)	Share(%)	Area(ha)	Share (%)
Tea	37,422	1.73	34,745	1.55	36,899	1.68
Coffee	30,183	1.39	82,348	3.68	84,795	3.87
Cardamom	48,000	2.22	44,237	1.97	41,336	1.88
Cashew nut	98,960	4.57	103,451	4.62	89,718	4.10
Pepper	117,540	5.43	186,720	8.33	203,956	9.31
Coconut	719,140	33.20	910,963	40.67	905,718	41.34
Rubber	198,424	9.16	443,300	19.79	475,039	21.68
Total	1,249,674	57.69	180,5764	80.61	1,857.663	83.86
Net sown area	2,165,902		2239405		2190690	

Source: Govt of Kerala, Economic Review different year

The intensification of cash crops has led to large scale conversion of paddy lands to banana fields that deplete water at a faster rate. With shrinking wet lands the ground water levels in the district has also reduced considerably making some areas prone to droughts during the long summer months [5]. These characteristics of changing cultivation patterns have made this region vulnerable to environmental disasters like drought. Moreover, in recent times the serious concern over the profit and increased cost of cultivation has been forcing people out of their traditional paddy cultivation to cash crop cultivation which has resulted in blind usage of fertilizers, pesticides, seed treatment chemicals, plant growth regulators, etc. The new technologies converted prime agricultural lands of Wayanad into the chemical farming. This unmindful development has reverted the ecological balance which was been practiced for centuries and has led seemingly irrevocable health issues and environmental catastrophes in the district. The presence of visible indicators of degradation is the absence of commonly seen species in the field. The new trend of growing rubber is also gaining momentum in Wayanad which is a real threat to its environment.

Discussion: Wayanad is one of the richest "hot spot" biodiversity in Western Ghats. Over the last 20 years agriculture in Wayanad has experienced noteworthy changes. A relevant transformation has happened around the cultivation of paddy fields to the plantation crops such as banana, arecanut, rubber etc. This over the years has led to the over exploitation of land and resources without concern for the environment or its replenishment. The pressure from the markets has forced the farmer to increase their inputs and produce more crops leading to the popularization of harmful agricultural practices. Though the new technologies has steered the district to advance agriculture production and related economic gains but surprisingly it has led the development of many unsuitable and harmful agricultural practices. The century long sustainable

agriculture system collapsed, cost of the cultivation soared, income of the farmers stagnated and food security became a daunting challenge. The uncontrolled use of fertilizers and pesticides has resulted in mining away of soil micro nutrients and reduced soil microbial activity leading to soil borne diseases and crop failures. Most of the farmers of remote rural areas are using chemical fertilizers haphazardly, they don't know either their land has needed particular fertilizer or not. More over the agrochemicals that has used for increasing crop production are nowadays found in virtually all natural habitats, including those where they have never been applied. This have severe negative effects on natural flora and fauna, biodiversity, water resources and ecosystem functioning and the equilibrium of agricultural systems. Wayanad has estimated the presence of carbofuron residues a pesticide used widely in plantain cultivation as higher than the normal level permissible to human consumption in the ground water [3]. There is growing erratic pattern of climatic change in the district. The major climate trends observed in Wayanad include a weakening in the early phase of the south-west monsoon precipitation; increasing polarization of daily rainfall and more frequent heavy rainfall days. In Wayanad, it was found that the number of days in a year which received a 'moderate' amount of rainfall (20-30mm) is found to be decreasing, but the numbers of days receiving very low or very high rainfall were increasing in number, at high confidence level.

Moreover there is evidence that the extent of the loss of agro biodiversity is accelerating and accompanied by diminishing food security. The agriculture practices that have intended to increase the production have led to multiple issues in the fragile land of Wayanad. Environmental degradation is threatening the all aspects of human well-being and has been demonstrably linked to human health problems, including some type of cancers, vector borne diseases, nutritional deficits and respiratory illness among the people. The district has now reached to the stage of stagnation where ecological and social costs could easily surpass the economic benefits from agriculture produce. The traditional sustainable subsistence agriculture became a matter of the past relegated to memory. The over dependence of modern agriculture is raising the question of about the long term sustainability of agriculture.

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