



# CONVERSION OF PADDY LANDS IN KERALA: ENVIRONMENTAL RAMIFICATIONS

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## Abstract

Land an important factor of production is subject to various uses. Among the different uses agriculture is the most prominent one. The urbanization and industrialization process mostly affects the agricultural land. Land use change effects are generally categorized into environmental and socio-economic. The environmental effects received more attention than the socio-economic effects. Paddy fields play an important role in the environmental and ecological systems. They are typical wetland ecosystem. Paddy land and wetland resources are regarded as the most productive ecosystems in the world. They are known for their distinctive flora and fauna. Since the dawn of civilization man was very much associated with wetlands. Destruction and permanent conversion of this ecosystem will threaten the water security as they are the water reservoirs of the state. There should be a concerted effort to restore or re-create these wetlands and paddy lands in order to compensate for those lost. The objective of this paper is to examine the implications of changing paddy land use in Kerala on its natural environment. One district from each geographical division is selected to get the representation of the whole Kerala. This land use changing process threatens the sustainable development and its impact is unable to be measured. In Kerala land is getting fast transformed into commodity which focuses on its exchange value. Paddy fields feed millions of the people and it also plays a critical role in the sustenance of several species. The peculiar characteristics of the paddy fields help to grow many micro organisms and it also helps to grow many rich plants in the bunds of the paddy fields. The respondents reported several issues as a result of the destruction of the paddy fields.

## Key words

Land use pattern, paddy land conversion, environmental threats, natural environment

## I Introduction

Land is the prime resource of the economy of any country and agriculture is the principal occupation of man from time immemorial. In the earlier days population was limited and necessities of human beings were less. As a result of increasing population pressure, requirements increased and became complex. Economic development and structural changes led to considerable changes in the land use and cropping pattern because land plays a crucial role in the development process.

Kerala has witnessed major changes in its land use pattern. The most important among them are the shrinking area devoted to cultivating food crops and an increase in the rate of deforestation. With the changing land use pattern, wetlands and paddy lands have been severely affected either by converting them for constructing buildings or for cultivation of other crops or for the construction of infrastructural facilities.

Paddy cultivation as well as rice occupies a special status in the cultural, traditional and economic condition of Kerala. In addition to being the staple food, rice plays an important role in the festivals and rituals in Kerala. State puts legislation against the conversion of paddy fields but people do it illegally based on the argument that its cultivation is economically not viable and the individual has the right to opt the crop of their own choice.

The sustainable management of paddy fields requires regular monitoring from the part of the authorities. Concern over the increasing impact of human activities on environmental system has received global attention. This study intends to understand the implications of the paddy land conversion in Kerala.

## II Background of the Study

After the formation of the state of Kerala, there has been a considerable change in the cropping pattern. In the name of developmental activities, land use changes are occurring in Kerala day by day. In this the most seriously affected are paddy fields. Kerala was blessed with vast area of paddy fields which act as the cradle of immense biodiversity sources. But now the glory and enchanting nature of paddy fields have lost their value. The ecological and environmental value of paddy fields cannot be regained. In Kerala, wide range of

laws is made to protect and promote agricultural land. With all the legislations in Kerala paddy land area under rice has been declining consistently over the last several years.

#### **IV Aims and Objectives**

The decline in the paddy cultivation in Kerala not only affects the domestic requirement of the staple food but also it seriously affects the environment. The filling up of paddy fields by leveling the hillocks causes serious ecological implications. With the developmental activities, the most ecologically valuable paddy fields have got drastically reduced. It is high time to study the causes and effects of changing paddy land use pattern in Kerala. The major objective of the study is to examine the implications of the paddy land conversion on the natural environment of Kerala.

#### **V Methodology of the Study**

The study is based on both primary and secondary data sources. The objectives and of the study are analyzed by using the survey method. Multi stage sampling was used. Three study areas are selected on the basis of their characteristics. Secondary sources consist of books, journals and articles, reports, newspapers and various published sources in this field.

Primary data was collected through a household survey by using a structured interview schedule. Participant observations and interviews were the other tools used for generating information in this context.

#### **VI Results and Discussions**

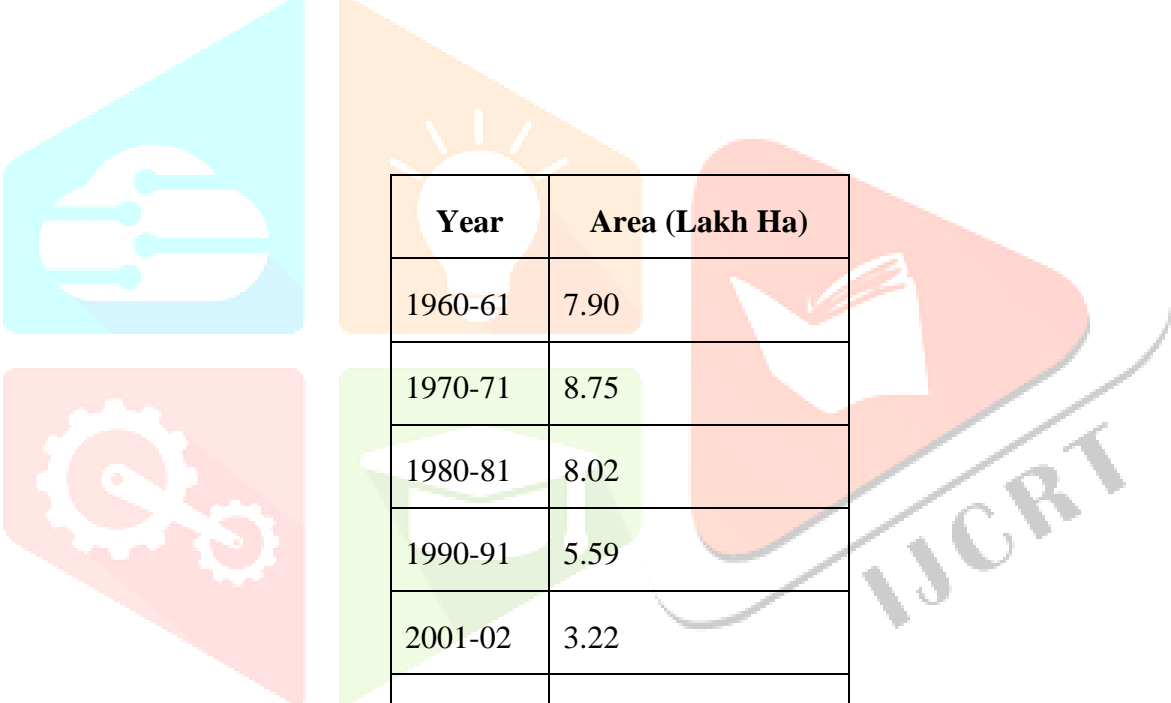
Kerala, the state in the south west region of India is a small narrow strip of land, was formed on 1<sup>st</sup> November 1956 as per the States Reorganization Act. The state also has a vast area of paddy fields and wetlands. In Kerala in the earlier ages agriculture was mainly meant as paddy cultivation. The Kerala culture has been very much dependent on paddy. The customs, traditions, festivals etc are greatly related to paddy.

But during the last several decades the paddy cultivation in Kerala has got reduced significantly. With the passage of period and changes in the attitude of the people, the biodiversity of the paddy field got disturbed. The living creatures which connect the food chain in the paddy fields have become extinct.

### 6.I Area of Paddy Cultivation in Kerala

Analyzing the area under paddy cultivation in Kerala it can be seen that there was reduction in the area of paddy cultivation.

**Table 1. Area of paddy cultivation in Kerala.**



Year	Area (Lakh Ha)
1960-61	7.90
1970-71	8.75
1980-81	8.02
1990-91	5.59
2001-02	3.22
2002-03	3.10
2003-04	2.87
2004-05	2.90
2005-06	2.75
2006-07	2.63
2007-08	2.29
2008-09	2.34
2009-10	2.34

2010-11	2.13
2019-20	1.91

Source: Computed from Economic Review (Various Issues), Kerala State Planning Board, Thiruvananthapuram.

## 6.2 Implications of Paddy Land Conversion in Kerala

Paddy land and wetland resources are regarded as the most productive ecosystems in the world. There should be a concerted effort to restore or re-create these wetlands and paddy lands in order to compensate for those lost. Wetlands are valued highly for their high nutrient retention and potential and their unique biodiversity. They are known for their distinctive flora and fauna. Rapid land use changes create positive and negative effects to the society and environment. Social, economical and political factors are responsible for this. This land use changing process threatens the sustainable development and its impact is unable to be measured.

## 6.3 Modes of Conversion of Paddy Fields

The major modes mentioned by the respondents for converting the paddy fields are putting sand from hillocks, putting sand as part of construction of infrastructural activities in the nearby areas, digging canals by manual work, digging canals by using machines, putting large stones and certain others factors. Putting sands from hillocks as a mode of conversion of paddy fields affects the environment mainly in two ways. Hills have the capacity of storing water and by razing down the hillocks the water flows to the low lying areas. Paddy fields serve as water-conserving tanks and it replenishes the ground water. By filling it the specific characteristics of paddy fields are lost. As the paddy fields are flooded parcel of land it helps to maintain the ground water level and much helpful for the recharging capacity of the nearby wells. The enchanted beauty of the paddy fields creates nostalgic feeling for many people in Kerala. Destruction of the paddy fields creates severe environmental issues. The respondents reported several issues in common and they are requested to rank their severity in their regions. The following table reveals the severity index for the various environmental issues.

### Severity Index for Environmental Issues Because of Changes in the Paddy Land

Reason	Kuttippuram		Koovappady		Veliyanad		Total	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Reduction in the ground water level	1.94	1	2.03	1	10.33	10	4.29	1
Increase in flood during rainy season	6.48	8	4.05	4	7.27	9	5.56	7
Decreasing availability of fresh water	4.06	2	3.86	3	5.82	7	4.45	2
Contamination of water resources	5.24	5	5.80	5	4.01	3	5.16	4
Reduction in fish and other small creatures	8.37	9	8.55	8	6.80	8	8.02	9
Decrease in the water storage capacity of the soil	4.32	3	3.17	2	10.33	10	5.44	5
Improper discharge of waste, plastics	5.21	4	6.20	7	4.41	4	5.45	6
Increase in pests	9.25	10	10.01	10	5.24	6	8.50	10
Increasing incidence of diseases	9.51	11	9.54	9	5.02	5	8.29	11

Disappearance of scenic beauty of enchanting paddy fields	5.85	7	7.21	8	3.84	2	5.93	8
Loss of biodiversity	5.88	6	5.83	6	3.11	1	5.10	3
Others factors	12.00	12	11.85	11	11.95	11	11.92	12

Source: Primary Data.

#### 6.4 Disappearance of Some Medicinal Plants and Some Creatures from the Paddy Fields during the Last Several Years

The respondents reported that the medicinal plants in the bunds of the paddy fields and small creatures are disappearing because of the conversion of the paddy fields. Almost all of the respondents (99.3 percent) are agree to this opinion.

#### 6.5 Concerns for the Paddy Fields and Wetlands

Wetlands in their original form provide extensive benefits to the society. They provide main functions like biological productivity, water filtration, water storage and habitat for many species. The conversion of wetlands and its irreversibility involves many uncertainties and threat in the ecological and environmental processes. Fresh water availability is one of the important serious limitations in the state. Large scale conversion of wetlands, breaking the hillocks followed by the acute degradation of land and the consequent urbanization and industrialization results in the pollution resulted in the scarcity of safe drinking water. If proper and timely precautionary steps are not taken from the part of the authorities, this will become a very acute problem in the future.

The data from the Central Ground Water Department shows a reduction in the ground water level in the study regions. The ground water level varies depending on the type of rocks, rivers, drainages, land use pattern, geo morphology etc.

Kerala's abundant availability of rainfall, availability of water even in the summer season and food security is protected by the existence of vast paddy fields and their cultivation. Studies show that climatic changes and water shortage in Kerala was mainly due to the disappearance of vast area of paddy fields. Paddy fields which have minute soils and 1 Hectare of paddy field has the capacity of storing 5 lakh litres of water. Kerala has a history where during the acute summer seasons rivers were flowing mainly because of the water stored in the paddy fields which trickles to the rivers. Even the soils in the thick forest have the water storage capacity of 50000 litres of water. Other dry land has only the capacity of storing 30000 litres of water. 1 ha of paddy field conversion will result in the loss of 470000 litres of water for the summer season. (*Mathrubhumi Newspaper daily dated February 14, 2015*)

### **6.6 Water Shortage during Summer Season in the Study Area**

During the summer season major parts of Kerala are facing acute water shortage. 92.8 percent households responded that they have water shortage during summer season.

The discussion with the households reveals that the water shortage was not so acute in the past 20-30 years. They are of the opinion that changes in the use pattern of paddy fields play a key role in the water shortage because paddy fields act as the water reservoirs.

### **6.7 Responses made by the Households that Water Shortage was because of the Changes in the Paddy Land**

Out of the respondents 87.0 percent are of the opinion that water shortage was due to the changes in the use pattern of the paddy fields.

### **6.8 Perception about whether Water Shortage was Due to the Changes in the Use Pattern of Paddy Land**

91.2 percent of the total respondents agreed to this opinion. 7.7 strongly agreed to this opinion. 1.2 percent had no opinion regarding this.



## 6.9 Environmental Awareness regarding the Changes in Paddy Land Use

To analyze the impact of changes in the paddy land use on the environment, study was conducted among the sample households to assess whether they were aware about it. Regarding the environmental awareness of the sample households, reported that 97.2 percent were aware about the changes in the paddy land use pattern while 2.8 percent were not aware about it.

The respondents in the area are aware about the impact of the changes in the paddy land use and they fear that repercussions in the land filling will seriously affect their region. The interesting factor is that even with the awareness regarding the impact of the paddy land conversion this conversion is continuing in our society.

Analyzing the threats of changes in the paddy land conversion, it is found that the food security of the households and the environment are severely affected.

## VII Conclusions and Recommendations

The economy of Kerala changed its path from the traditional backward agrarian economy to a modern growing economy. There occurred a tremendous change in the agrarian structure of Kerala. With the introduction of the plantation crops farmers are in favour of these crops because of the high profitability. The result is the neglect of the cultivation of the traditional crop of Kerala especially paddy. Changes in the paddy land use in Kerala create several threats to the environment as well as the food security of the people. The conversion of the wetlands and paddy lands which are the ecological hotspots affects the water storing capacity of the soil. The remaining paddy fields of Kerala are to be preserved for the better future of the coming generations. The existing laws for protecting the wetlands and paddy fields give legal support for the preservation of the paddy fields. But in its enactment side there is much failure. The local self governments have to play an important role in conserving paddy fields and reviving paddy cultivation. The protection of these ecological spots is very important for the sustainable development of Kerala.

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