

# AGRICULTURE PRACTICES AND ASSOCIATED LAND USE: INSIGHTS FROM MALABAR MIGRATION A CASE STUDY OF TALIPARAMBA BLOCK, KANNUR DISTRICT, KERALA.

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## Abstract

Human migration is one of the interdisciplinary fields of research of social processes; this has a widespread consequence on both, individuals and the society. Rural to rural migration, although an overlooked field but it has also a particular stand in the arena of migration studies. In many developing countries, intra rural (rural to rural) migration was an important phenomenon up to late 1980s. This present paper discusses the various dimensions of Malabar migration in connection with intra rural migration with the focus over land use change. The quest for acquiring more land led to this migration, a venture into deep forests of the high and mid land area where untamed lands were abundantly found. Malabar district with large amount of uncultivated land appeared as a rescue from poverty, lack of land and social/political constraints held at the place of destination (Travancore, Kerala) for migrants. Malabar migration/high-mid land migration played an important role to introduce Plantation agricultural system in Malabar regions which later made the way for prosperity and development of capitalistic economy. Three temporal bases have been taken as 1.) Period prior to, 1921 with the help of SOI topographic sheets of scale 1: 63360 (inch sheets) (2.) Year 1971 using topographic sheets of 1: 50,000 scale, and 3.) Recent time period i.e. Year 2016 processing the Landsat 8 satellite imagery obtained from USGS website. Thus, land use change study is done using suitable software platform for above mentioned time periods. It is evident that plantation agriculture was introduced as a major impact of Malabar Migration in the hilly areas after clearing the dense forest.

**Keywords:** *Malabar Migration, plantation, land, prosperity.*

## Introduction

Migration is dynamic in nature and is the most fundamental to the understanding of continuously changing space-content and space-relationship of an area (Gosal, 1961). Migration studies usually concern over labour migrations from a low productive agrarian sector to a high productive industrial/ urban areas for requiring the wage differences. However, there is another set of migration that do take place within an agrarian, economy reflecting productivity differences of land and labour. Rural migration is spontaneous and forced which involves land settlement and can be, often a positive force in agriculture development. Rural to rural migration can lead not only to increase in food and agricultural production to keep pace with population and demand, but also increasing in the productivity of land or labour or both. (Mollett.J.A 1991). In many developing countries, intra rural (rural to rural) migration was an important phenomenon up to late 1980s. According to the literature review, the search for more land to sustain agriculture and livelihoods has been the core of rural-rural migration, further it has been examined historically that the migration of farmers from one countryside to another was a recurring event, until the margins of cultivation were finally reached. Land and agricultural practices has been the major focused dimension of the intra rural migration. Although most of the migration studies focus on immigration in the developed world, or rural –urban migration usually based on survey data obtained from the destination (Bilsborrow.et.al, 1984; Boyle, P.et.al 1998.) Thus, rural–rural

migration have been largely ignored, although they are key in the migration of population-environment relationships from micro level to macro level. In this context, the present study aims to focus over intra rural migration dealing with the association of land use and agricultural practices.

### **Malabar Migration**

Malabar Migration refers to the large-scale migration of cultivators, from south central Kerala to northern regions of Kerala (generally known as Malabar region) in the 20th century. The migration started from early decades of 20th century and continued to the 1970s and 1980s. It was a kind of internal migration stimulated by the peasant groups of mainly Syrian catholic denomination largely from the three midland taluk of erstwhile Travancore state ( Meenachili, Thodupuzha, and Muvattupuzha) to uplift their status of living in the virgin forest lands of Malabar area. The early settlements were established in the sub-mountainous region (High and mid lands) of Malabar, as the migrants were more inclined towards the rubber plantation economy culture. It was a kind of chain migration as migrants follow one another to the place of destination on the basis of information gathered from the earlier settlers. Malabar underwent rapid transformation in terms of agricultural and cropping pattern, dense scrub and forest were cleared and plantation crops were being cultivated by the migrants. Land cover and land use change was spontaneous, as a major impact of Malabar migration in these area, a shift from subsistence farming practices to large scale rubber and other small to medium level plantation crop or capitalist oriented farming was the major agricultural transformation afterward migration.

### **Study area**

Although the Malabar migration has stretch over all the high and mid lands of present districts included under Malabar in erstwhile Madras presidency. Thus Kannur being the part of the erstwhile Malabar also experienced this particular migration. Taliparamba block has been taken as study area to understand and explore the present study. This study area constitutes nearly 70% of the midland and high land of the total area under study, It lies between latitudes  $11^{\circ}54'52.13''N$  to  $12^{\circ}16'37.59''N$  and between longitudes  $75^{\circ}15'48.77''E$  to  $75^{\circ}34'6.08''E$ . It has the area of 603.95 sq.km. It consists of 13 gram panchayats and one municipality.(fig.1)

### **Objective**

The objective of the study is to ascertain the land use and land cover change over the time period of 95 year (1921 -2016).

### **Data sources and methodology**

Literature review basically makes the background for this study, in terms of migration and land use change.

The period taken into consideration is 95 years (1921 – 2016) three temporal changes in land use and its associated factors will be determined for the year -1921, 1971 and 2016.

The land use for the 1921 is taken from the topographic sheets of scale 1: 63360 (inch sheets) for the year 1971 the topographic sheets of 1: 50,000 scale, and for the year 2016, the Landsat 8 satellite imagery.

Land use classification is done with the help of Arc GIS and ERDAS software. Tabulation and representation is done in MS-Excel.

As physiography plays a critical role in the study of migration and the migrant settlements who settled in mid land and high land, The land use change is also been analysed according to physiographic of the study area, for this the three fold criteria of physiographic division adapted by Kerala land use board is considered. Less than 7.5 meter MSL- low land area. 7.5-75 meter MSL- mid land area and More than 75 meter MSL- high land area.

The map prepared by Kerala Land Use Board report, 2012 for Kannur District is taken as a base to divide the panchayats into three physiographic units for the selected study area, and analysis is been carried accordingly. The (fig.1) shows the physiographic division of the study area.

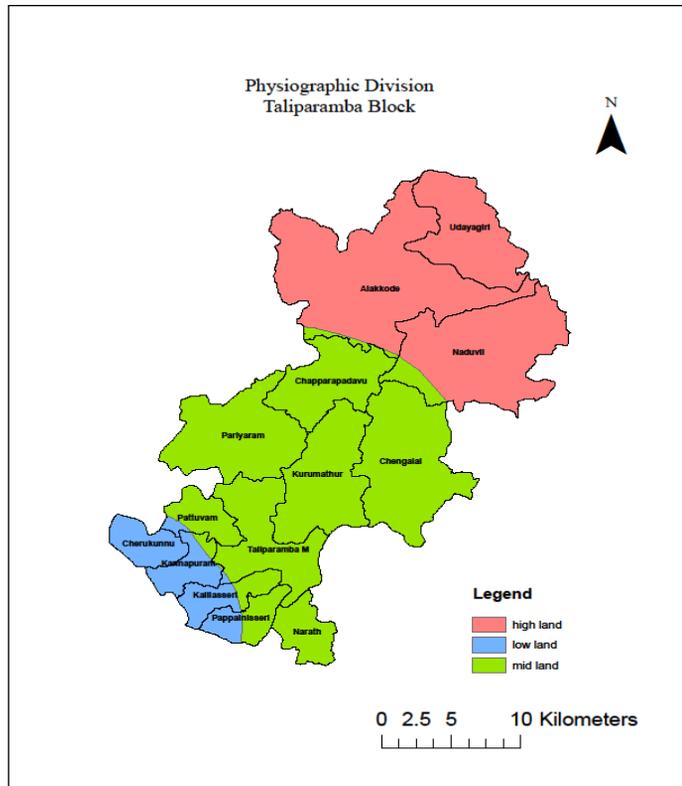


Figure 1. physiographic division of the study area.

Table 1. Percentage share of comprising physiographic units in the study area

physiographic units	area in sq.km	percentage share
high land	241.6	40.00%
mid land	315.55	52.25%
low land	46.8	7.75%
Taliparamba block	603.95	100.00%

## Analysis and results

Man has directly or indirectly altered the earth surface through various activities. Land use is defined by the purposes for which humans exploit the land cover (Lambin et al., 2003) and shaped by human, socio-economic and political influences and shaped by human, socio-economic and political influences (Geist & Lambin, 2002). Land cover refers to the biophysical earth surface (Geist & Lambin, 2002). Therefore, to understand the dynamics of LULC changes it is important to understand human intervention and its effects. Verburg (2010), states that LULC change as a result of diverse interactions between society and the environment.

Although literature on land use/ land covers change (LUCC) is yet to fully embrace the importance of migration in the conceptual models of deforestation. As discussed earlier migrants occupied the forest land in Malabar and sequentially transformed into the agricultural land, the land cover was changed dramatically in the hilly tracts of the destination areas.

Meyer and Turner (1996) suggest that "land use (both deliberately and inadvertently) alters land cover in three ways: *converting* the land cover, or changing it to a qualitatively different state; *modifying* it, or quantitatively changing its condition without full conversion; *maintaining* it in its condition against natural agents of change." In similar terms, land use change may involve either *conversion* from one type of use to another or *modification* of a certain type of land use. Thus in this study area both kind of change may have taken place. . After examining the salient features of land use and land cover in the study area over different period taken and then complex land use and land cover has been categorized. The major classes taken for this study are as follow:

**Cultivable area:** Paddy dominant agricultural field in low land, high land paddy area, which are not including any settlements concentration are grouped under this category.

**Cultivable area with settlement:** Some agricultural lands are present with settlements in 1921 and 1971 found in the respective toposheets.

**Area under pepper plantation:** here the commercial pattern of pepper farming is considered, pepper grown in the courtyards of houses along with other trees are not considered rather they are grouped under mixed crop with settlements.

**Area under rubber plantation:** High lands mid land of study area are more prominent to possess rubber plantation. There may be some hardwood isolated trees found among the plantation.

**Mixed crops:** miscellaneous trees, crops, fields with mixed crop, vegetal groves other than forest and farms come under this group.

**Land with scrub:** These are cultivable wasteland and free from any agricultural activity. Barren lands, scrub, small grass are considered under this category.

**Mixed crop with settlements:** mixed trees and crops with settlements are under this group which forms the major land use in recent time.

**Land without scrub:** These are the lands of rock outcrop where no green vegetation is grown and is bare in nature.

Apart from above, water body, cashew plantation, built-up is clearly taken same as the form they depict themselves in the respective toposheets and satellite imagery.

## Land use and land cover change –study area

The larger share of mid land and high land in the study area makes the study appropriate for ascertaining land use and land cover change over the years in the backdrop of Malabar Migration (Table 1). About 92% of the total area comes under the mid-highland zone. In this

way, the topography has contributed a lot to flourish plantation agriculture (mainly rubber) in the study area. Others main contributing factors are the migrant's endeavors and efforts, occupancy of larger land holding and capitalistic motive behind rubber plantation. If livelihood depends on agriculture, land emerges as a critical resource and it is very relevant in the case of Malabar migrants. Land seeking Travancoreans settled in Malabar impacted the agriculture setup in a much manifested way. The early settlement followed a subsistence type of agriculture practices in which migrants generally started growing paddy, tapioca, vegetables, maize after clearing the forest and dense shrubs. Later after 1960 onwards cultivation of Rubber took place at a large scale. Other plantation like pepper which was existing before the migration started in the Malabar, also increased its area in coming years. The following Table 2 shows the increase of rubber plantation area over the different time periods and loss of forest area as well.

Table 2. Land use and land cover change over the years in Taliparamba Block: 1921, 1971 & 2016.

classe name	1921		1971		2016		change in percentage over the years		
	area in sq.km	percentage	area in sq.km	percentage	area in sq.km	percentage	1921-1971	1971-2016	1921-2016
forest	190.94	31.62	71.71	11.87	17.26	2.86	-19.74	-9.02	-28.76
land with scrub	22.89	3.79	39.42	6.53	47.53	7.87	2.74	1.34	4.08
land without scrub	0.00	0.00	0.00	0.00	5.89	0.98	0.00	0.98	0.98
builtup	14.62	2.42	17.42	2.89	27.19	4.50	0.46	1.62	2.08
rubber	0.00	0.00	57.85	9.58	51.08	8.46	9.58	-1.12	8.46
pepper	10.09	1.67	12.89	2.13	56.26	9.31	0.46	7.18	7.64
waterbody	29.19	4.83	26.47	4.38	21.26	3.52	-0.45	-0.86	-1.31
cashew	0.00	0.00	4.58	0.76	0.56	0.09	0.76	-0.67	0.09
mixed crop with settlement	38.83	6.43	260.21	43.08	376.91	62.41	36.66	19.32	55.98
cultivable area	25.01	4.14	113.41	18.78	0.00	0.00	14.64	-18.78	-4.14
mixed crop	250.41	41.46	0.00	0.00	0.00	0.00	-41.46	0.00	-41.46
cultivable with settlement	21.97	3.64	0.00	0.00	0.00	0.00	-3.64	0.00	-3.64
Total	603.95	100.00	603.95	100.00	603.95	100.00	0.00	0.00	0.00

Compiled by author on the basis of LULC change study through data sources of different time periods.

The above Table 2 shows the area distribution of various land cover and land use classes within the study area. The most dynamic LULC class is found to be forest and mixed crop. Forest has lost the area 31.62 % in 1921 to 2.86 % in 2016. Mixed crop is also completely lost its areal expansion from year 1921 to 2016. This has resulted in the increase to mixed crop with settlements. Built-up has also shown the increase of 2.08 % in 2016 from 0.46% in 1921. Cultivable area are also shown the decreasing trends from 1971 to 2016 of 18.78%, although it shows the positive increase from 1921 to 1971 of 14.64% but in later years it has started decreasing . Mixed crop with settlements has depicted the positive growth over the time periods as it is 55.98% from 1921 to 2016. Rubber has also shown the increase of 9.58% from 1921-1971 but has decreased about 1% from 1971 to 2016. This could be considered as land fragmentation, transformation of rubber farm to mixed crop with settlement areas.

In this way it can be concluded that forest areas in the hilly and mid land of the study area has shown a decreasing trend which has been transformed to either plantation crop mainly

rubber and pepper or mixed crop with settlements at comparatively larger scale after the year 1921. 1971 land use depicts the growth of rubber plantation at extensive areas in the sub- mountainous tracts of the study area.

**Land use change according to physiographic units**

As it is stated in the methodology, that the study area is been divided in three criteria - high land, mid land and low land, so the study about land use change according to the physiographic division becomes more important and logical. The literature review suggests that migrant settlers first ventured into the dense forest region of the high land, and progressively transformed the agricultural and land relation set up there. So the analysis of land use change is more relevant in these areas. In this reference following figures are prepared to show the change over time according to physiography of the study area.

**Land use change in high land of the study area**

In the study area the high land constitutes the 241.60 sq. km of the total area and three panchayats ,(Alakode, Naduvil and Udaygiri) fall with major areas in this physiography division. ( as per fig. 1) . Following figure 2 and table 3 give the idea about land use change over years.

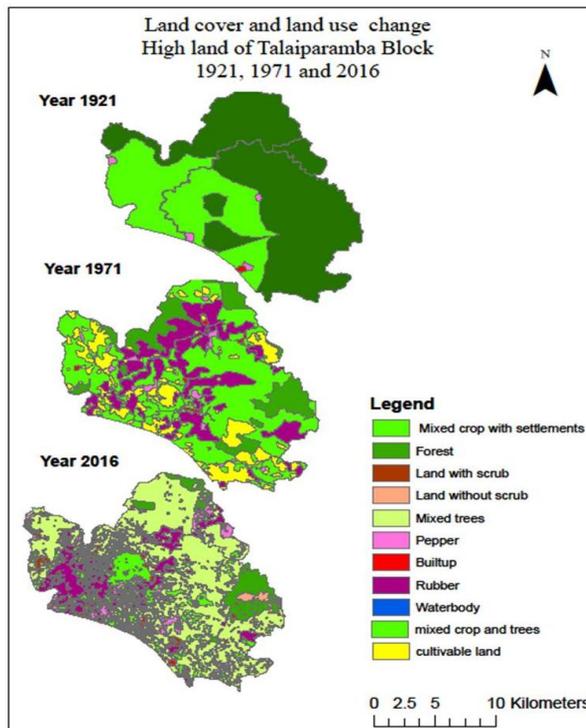


Figure 2. LULC change in high land-1921, 1971 and 2016.

According to table 3. It can be understood that forest area is decreased with great percentage from 1921-1971 and as well from 1971-2016. 51.66% forest area has been

decreased from 1921 to 1971. Rubber has shown a positive increase of 21.28% from 1921-1971. Pepper is also increased from 1921-2016 and shows 4.16% increase in its area. Mixed crop with settlements has also depicted a positive growth over years. Mixed crop without any settlements is showing decrease of 33.63%. Cashew is not prominent in the high land but pepper is increased of 4.16% from 1921 to 2016.

Table 3. land use and land cover change in high land of Taliparamba Block 1921, 1971 and 2016.

classes name	1921		1971		2016		change in percentage over the years		
	area	percentage	area	percentage	area	percentage	1921-1971	1971-2016	1921-2016
forest	157.22	65.07%	32.421	13.42%	17.262	7.14%	-51.66%	-6.27%	-57.93%
land with scrub	0	0.00%	0	0.00%	8.212	3.40%	0.00%	3.40%	3.40%
land without scrub	0	0.00%	0	0.00%	2.226	0.92%	0.00%	0.92%	0.92%
builtup	0.343	0.14%	1.672	0.69%	4.911	2.03%	0.55%	1.34%	1.89%
rubber	0	0.00%	51.418	21.28%	36.898	15.27%	21.28%	-6.01%	15.27%
pepper	1.552	0.64%	3.829	1.58%	11.6	4.80%	0.94%	3.22%	4.16%
waterbody	1.226	0.51%	1.836	0.76%	1.35	0.56%	0.25%	-0.20%	0.05%
cashew	0	0.00%	0	0.00%	0	0.00%	0.00%	0.00%	0.00%
mixed crop with settlement	0	0.00%	110.802	45.86%	159.141	65.87%	45.86%	20.01%	65.87%
cultivable area	0	0.00%	39.623	16.40%	0	0.00%	16.40%	-16.40%	0.00%
mixed crop	81.26	33.63%	0	0.00%	0	0.00%	-33.63%	0.00%	-33.63%
cultivable with settlement	0	0.00%	0	0.00%	0	0.00%	0.00%	0.00%	0.00%
total	241.60	100.00%	241.60	100.00%	241.60	100.00%	0.00%	0.00%	0.00%

Table 4. land use and land cover change in mid land of Taliparamba Block: 1921, 1971 and 2016.

classes name	1921		1971		2016		change in percentage over the years		
	area	percentage	area	percentage	area	percentage	1921-1971	1971-2016	1921-2016
forest	34.696	11.00%	37.117	11.76%	0	0.00%	0.77%	-11.76%	-11.00%
land with scrub	22.885	7.25%	37.351	11.84%	38.433	12.18%	4.58%	0.34%	4.93%
land without scrub	0	0.00%	0	0.00%	3.663	1.16%	0.00%	1.16%	1.16%
builtup	13.488	4.27%	10.73	3.40%	21.193	6.72%	-0.87%	3.32%	2.44%
rubber	0	0.00%	6.614	2.10%	13.901	4.41%	2.10%	2.31%	4.41%
pepper	8.537	2.71%	9.058	2.87%	45.056	14.28%	0.17%	11.41%	11.57%
waterbody	20.156	6.39%	18.39	5.83%	12.196	3.86%	-0.56%	-1.96%	-2.52%
cashew	0	0.00%	4.584	1.45%	0.561	0.18%	1.45%	-1.27%	0.18%
mixed crop with settlement	29.836	9.46%	140.726	44.60%	180.547	57.22%	35.14%	12.62%	47.76%
cultivable area	12.743	4.04%	50.98	16.16%	0	0.00%	12.12%	-16.16%	-4.04%
mixed crop	166.077	52.63%	0	0.00%	0	0.00%	-52.63%	0.00%	-52.63%
cultivable with settlement	7.132	2.26%	0	0.00%	0	0.00%	-2.26%	0.00%	-2.26%
total	315.55	100.00%	315.55	100.00%	315.55	100.00%	0.00%	0.00%	0.00%

**Land use change according to mid land of the study area.**

In the study area the mid land constitutes 315.55 sq. km of the total area and more or less six panchayats fall with major areas in this physiography division. ( as per fig. 1 ) , following figure 3 and table 4. gives the idea about land use change over years.

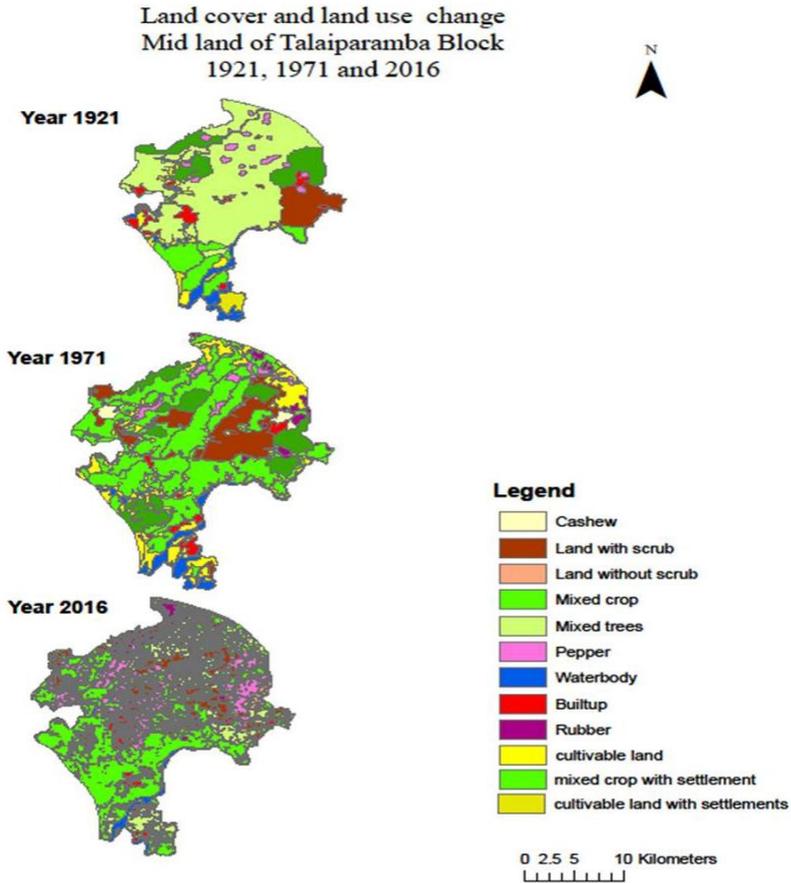


Figure 3. LULC change in mid land-1921, 1971 and 2016

According to table 4, again forest is in decreasing trend from 1921-2016 in the mid land. Cultivable area, mixed crop and cultivable area with settlements are also on decreasing trend from 1921 to 2016. Pepper has positive growth as 11.57% in the mid land areas. Rubber is also increased from 1921 to 2016 as 4.41% of areal increase.

**Land use change according to low land of the study area**

In the study area the low land constitutes 46.80 sq. km of the total area and 4 panchayats fall with major areas in this physiography division. (As per fig.1). Following figure 4 and table 5 give the idea about land use change over years.

As the table 5 suggests that in low land area of the Taliparamba block(study area) rubber, pepper and cashew plantation has no trace rather cultivable area dominant with paddy and

coconut which were prominent in low land areas has shown a progressive decline from 1921-1971 as well 1971 to 2016. Mixed crop and cultivable land with settlements has also decreased over the period but mixed crop with settlements has increased over years as 57.82% of increase.

Table.5: land use and land cover change in low land of Taliparamba Block: 1921, 1971 and 2016.

classes name	1921	percentage	1971	percentage	2016	percentage	change in percentage over the years		
							1921-1971	1971-2016	1921-2016
forest	0	0.00%	2.105	4.50%	0	0.00%	4.50%	-4.50%	0.00%
land with scrub	0	0.00%	0.27	0.58%	0.885	1.89%	0.58%	1.31%	1.89%
land without scrub	0	0.00%	0	0.00%	0.003	0.01%	0.00%	0.01%	0.01%
builtup	0.974	2.08%	0.19	0.41%	0.993	2.12%	-1.67%	1.72%	0.04%
rubber	0	0.00%	0	0.00%	0	0.00%	0.00%	0.00%	0.00%
pepper	0	0.00%	0	0.00%	0	0.00%	0.00%	0.00%	0.00%
waterbody	7.691	16.43%	7.529	16.09%	7.5	16.02%	-0.34%	-0.06%	-0.41%
cashew	0	0.00%	0	0.00%	0	0.00%	0.00%	0.00%	0.00%
mixed crop with settlement	10.361	22.14%	13.368	28.56%	37.423	79.96%	6.43%	51.39%	57.82%
cultivable area	12.698	27.13%	23.34	49.87%	0	0.00%	22.74%	-49.87%	-27.13%
mixed crop	0.26	0.56%	0	0.00%	0	0.00%	-0.56%	0.00%	-0.56%
cultivable with settlement	14.823	31.67%	0	0.00%	0	0.00%	-31.67%	0.00%	-31.67%
total	46.807	100.00%	46.802	100.00%	46.804	100.00%	0.00%	0.00%	0.00%

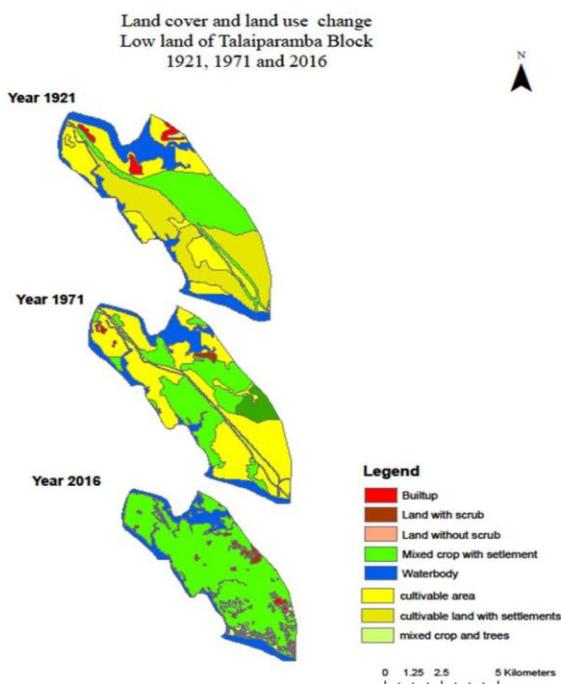


Figure 4. LULC change in mid land-1921, 1971 and 2016

